









SMITHSONIAN INSTITUTION  
UNITED STATES NATIONAL MUSEUM

Bulletin 92

BIBLIOGRAPHIC INDEX OF AMERICAN  
ORDOVICIAN AND SILURIAN  
FOSSILS

VOLUME 2

BY

RAY S. BASSLER

*Curator of Paleontology, United States National Museum*



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ISSUED NOVEMBER 1, 1915



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# BIBLIOGRAPHIC INDEX OF AMERICAN ORDOVICIAN AND SILURIAN FOSSILS.

## BIBLIOGRAPHIC LIST OF GENERA AND SPECIES.

**LICHAS** Dalman. Genotype: *Entomostracites laciniatus* Wahlenberg.  
Lichas Dalman, Sven. Vet. Akad. Handl. för 1826, 1827, p. 278.—Beyrich, Ueber einige bohmischen Tril., 1845, p. 24.—Bell and Forbes in Burmeister's Org. Tril., London, Suppl. App., 1846, p. 126.—Hawle and Corda, Abh. d. k. bohm. Gesell. d. Wiss., 5, 1847 (extract), p. 141, pl. 7, fig. 76.—Barrande, Neues Jahrb. f. Min., etc., 1850, p. 777.—Hall, Pal. New York, 2, 1852, p. 311.—Barrande, Syst. Sil. du Centre Boheme, 1, 1852, p. 582.—McCoy, British Pal. Rocks Fossils, 1854, p. 150.—Pictet, Traité de Pal., 2d ed., 2, 1854, p. 506.—Nieszkowski, Archiv. f. Naturk. Liv-, Ebst- u. Kurl., 1st ser., 1, 1857, p. 565.—Malaise, Desc. Terr. Sil. du Centre de la Belgique, 1873, p. 82.—Steinhardt, Beit. z. Naturk. Preus. Phys.-Oekon. Gesell., Königsberg, 1874, p. 27.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 127.—Lindstrom, Ofv. K. Vet.-Akad. Forh., 1885, p. 56.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 7th ser., 33, 1885, p. 5.—Zittel, Handb. Pal., 2, 1885, p. 623.—Lindstrom, Ofvers Kongl. Vet.-Akad. Forh., 42, No. 6, 1885, p. 56.—Hall and Clarke, Pal. New York, 7, 1888, p. xxxvi.—Whidborne, Mon. Devonian Fauna South England, 1, Pal. Soc., 1889, p. 15.—Miller, N. A. Geol. Pal., 1889, p. 553.—Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 751.—Beecher, Amer. Jour. Sci., 4th ser., 3, 1897, p. 104, pl. 3, fig. 22; Zittel-Eastman Textb. Pal., 1900, p. 632.—Grabau, Bull. New York State Mus., 45, 1901, p. 224; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 224.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 34, 1901, p. 59.—Gurich, Neues Jahrb. Min., Geol. Pal., 14, Beilage-Band, 1901, pp. 520, 526.—Jaekel, Zeits. geol. Gesell., 53, 1901, p. 149.—Reed, Quart. Jour. Geol. Soc. London, 58, 1902, pp. 59, 61.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 721.

Observation.—Most of the above citations refer to *Lichas* in a broad sense.

**LICHAS** (*HOPLOLICHAS*) *BICORNIS* Ulrich. See *Amphilichas bicornis*.

**LICHAS** (*PLATYMETOPUS*) *BICORNIS* Clarke. See *Amphilichas bicornis*.

**LICHAS** *BOLTONI* Meek and Worthen. See *Arctinurus occidentalis*.

**LICHAS** *BOLTINI* Hall. See *Arctinurus nereus*.

**LICHAS** *BOLTONI* var. *occidentalis* Hall. See *Arctinurus occidentalis*.

**LICHAS** *BREVICEPS* Hall (1863). See *Metopolichas breviceps*.

**LICHAS** *BREVICEPS* Hall (1865). See *Dicranopeltis decipiens*.

**LICHAS** *BREVICEPS* Foerste. See *Metopolichas breviceps clintonensis*.

**LICHAS** *BYRNESANUS* Miller and Gurley. See *Corydocephalus byrnesanus*.

**Lichas canadensis** Billings.

Lichas Canadensis Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 65, fig. 22.

Anticostian (Gun River): East Point, Anticosti.

LICHAS CHAMPLAINENSIS Whitfield. See *Amphilichas minganensis*.

LICHAS (CONOLICHAS) CORNUTUS Clarke. See *Conolichas cornutus*.

LICHAS CUCULLUS Meek and Worthen. See *Amphilichas cucullus*.

LICHAS DECIPIENS Winchell and Marcy. See *Dicranopeltis decipiens*.

LICHAS EMARGINATUS Hall. See *Dicranopeltis decipiens*.

LICHAS FABERI Miller. See *Amphilichas halli*.

LICHAS HALLI Foerste. See *Amphilichas halli*.

LICHAS HANOVERENSIS Miller and Gurley. See *Corydocephalus phlyctainoides*.

LICHAS HARRISI Miller. See *Arctinurus harrisi*.

LICHAS JUKESII Billings. See *Amphilichas jukesii*.

LICHAS MINGANENSIS Billings. See *Amphilichas minganensis*.

LICHAS NEREUS Hall. See *Arctinurus nereus*.

LICHAS (ONCHOLICHAS) OBVIA Schmidt. See *Arctinurus obvius*.

LICHAS OBVIUS Hall. See *Arctinurus obvius*.

LICHAS PAULIANUS Miller. See *Corydocephalus wesenbergensis paulianus*.

LICHAS PHLYCTAINOIDES Foerste. See *Corydocephalus phlyctainoides*.

LICHAS (DICRANOGMUS) PTYONURUS Hall and Clarke. See *Corydocephalus ptyonurus*.

LICHAS PUGNAX Winchell and Marcy. See *Metopolichas pugnax*.

LICHAS (HOPLOLICHAS) ROBBINSI Ulrich. See *Amphilichas robbinsi*.

LICHAS TRENTONENSIS Hall. See *Amphilichas trentonensis*.

LICHAS (ARGES) WESENBERGENSIS var. PAULIANUS Clarke. See *Corydocephalus wesenbergensis paulianus*.

**LICHENALIA** Hall.

Genotype: *L. concentrica* Hall.

Lichenalia Hall, Pal. New York, 2, 1852, p. 171; Amer. Jour. Sci., 2d ser., 11, 1851, p. 401.—Bassler, Bull. 173, U. S. Geol. Surv., 1900, pp. 54, 299.—Grabau, Bull. New York State Mus., 45, 1901, p. 176; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 176.; Bull. U. S. Geol. Surv., 292, 1906, p. 60.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 165.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 166; Zittel-Eastman Texb. Pal., 1913, p. 347.

LICHENALIA Hall and Simpson. See *Fistulipora McCoy*.

LICHENALIA? CALYCUA James. See *Aspidopora calycula*.

**Lichenalia concentrica** Hall.

*Lichenalia concentrica* Hall, Pal. New York, 2, 1852, p. 171, pl. 40e, figs. 5a-g.—Grabau, Bull. New York State Mus., 45, 1901, p. 176, fig. 79; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 176, fig. 79.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 61, pl. 22, figs. 1-6; pl. 26, figs. 7-10; Bull. U. S. Nat. Mus., 77, 1911, p. 168, fig. 84.

*Orbicula corrugata* Hall, Nat. Hist. New York, Geol., 4, 1843, p. 108, fig. 3; p. 109; tab. ill. 15, fig. 3.

*Crania corrugata* Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 153, figs.

Clinton (Rochester): Lockport, Rochester, etc., New York; Grimsby, Hamilton, etc., Ontario.

Early Silurian (Borkholm): Borkholm, Esthonia, Russia.

*Plesiotype*.—Cat. No. 35775, U.S.N.M.

LICHENALIA CONCENTRICA of authors. See *Fistulipora neglecta*.

LICHENALIA CONCENTRICA var. MACULATA Hall. See *Fistulipora neglecta maculata*.

LICHENALIA CONCENTRICA var. PARVULA Hall. See *Fistulipora halli*.

**LICHENARIA** Winchell and Schuchert.

Genotype: *L. typa* Winchell and Schuchert.

*Lichenaria* Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 83 (extras, 1893).

**Lichenaria minor** Ulrich.

*Lichenaria minor* Ulrich, Geol. Minnesota, 3, pt. 1, 1895, p. 84, fig. 5.

Trenton (Prosser): Near Cannon Falls, Minnesota.

*Holotype*.—Cat. No. 42950, U.S.N.M.

**Lichenaria typa** Winchell and Schuchert.

*Lichenaria typa* Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 83, pl. G, figs. 10-13.—Sardeson, Amer. Jour. Sci., 4th ser., 8, 1899, pp. 101, 102, figs. 1-4.

Black River: Minneapolis, Minnesota (Decorah); Pauquette's Rapids, Ottawa River, Canada (Leray).

**LICHENOCRINUS** Hall.

Genotype: *L. dyeri* Hall.

*Lichenocrinus* Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 216 (adv. sheets 1866, p. 9).—Meek, Ann. Mag. Nat. Hist., 4th ser., 8, 1871, p. 341; *ibid.*, 9, 1872, p. 247; Amer. Jour. Sci., 3d ser., 2, 1871, p. 299; *ibid.*, 3, 1872, pp. 15, 261; Geol. Surv. Ohio, Pal., 1, 1873, pp. 44-51.—Zittel, Handb. Pal., 1, 1879, p. 424.—Miller, N. A. Geol. Pal., 1889, p. 258.—Sardeson, Amer. Geol., 24, 1899, p. 275.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 77.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 714.

**Lichenocrinus affinis** Miller.

*Lichenocrinus affinis* Miller, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 229, pl. 9, figs. 7, 7a.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 155.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 478, pl. 2, fig. 5.

Richmond (Waynesville): Warren and Clinton Counties, Ohio.

?Mohawkian: Baffin Land.

**Lichenocrinus crateriformis** Hall.

*Lichenocrinus crateriformis* Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 217, pl. 7, fig. 7 (adv. sheets, 1866, p. 9, and 1871, pl. 3, fig. 7).—Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 51, pl. 3, figs. 1a-t.—Billings, Trans. Ottawa Field Nat. Club., 1, 1881, p. 34.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 728, pl. 4, figs. 12, 12b; pl. 3, fig. 2.

Eden (Southgate-McMicken): Cincinnati, Ohio, and vicinity.

**Lichenocrinus dubius** Miller.

*Lichenocrinus dubius* Miller, Jour. Cincinnati Soc. Nat. Hist., 3, 1880, p. 234, pl. 7, figs. 5, 5a.

Eden (Economy): Cincinnati, Ohio.

Observation.—Probably the same as *L. crateriformis* Hall.

**Lichenocrinus dyeri** Hall.

*Lichenocrinus dyeri* Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 216, pl. 7, figs. 1-6 (adv. sheets, 1866, p. 9, and 1871, pl. 3, figs. 1-6).—Meek, Amer. Jour. Sci., 3d ser., 3, p. 15; Geol. Surv. Ohio, Pal., 1, p. 51, pl. 3, figs. 2, p. 46.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 729, pl. 4, fig. 5.

Maysville (Corryville): Cincinnati, Ohio, and vicinity.

**Lichenocrinus pattersoni** Miller.

*Lichenocrinus pattersoni* Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 118, pl. 10, figs. 6, 6a.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 729, pl. 4, figs. 4, 4a.

Trenton (Upper): Covington, Kentucky.

**Lichenocrinus subæqualis** Foerste.

*Lichenocrinus subæqualis* Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 125, pl. 1, fig. 10; Bull. Sci. Lab. Denison Univ., 17, 1914, p. 478, pl. 2, fig. 6.

Trenton (Upper): Near Rogers Gap, Kentucky.

**Lichenocrinus tuberculatus** Miller.

*Lichenocrinus tuberculatus* Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 346, fig. 38; Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 229, pl. 9, figs. 6, 6a.; N. A. Geol. Pal., 1889, p. 258, fig. 351.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 730, pl. 4, fig. 3.

Richmond (Whitewater): Richmond, etc., Indiana; Clarksville, etc., Ohio.

**LICROPHYCUS** Billings.

Genotype: *L. ottawaense* Billings.

*Licrophycus* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 99 (adv. sheets, 1862).—Miller, N. A. Geol. Pal., 1889, p. 125.

**Licrophycus flabellum** Miller and Dyer.

*Licrophycus flabellum* Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 25, pl. 2, fig. 4.—James, *ibid.*, 14, 1892, p. 161.

*Inocaulis flabellum* James, *ibid.*, 7, 1884, p. 164, pl. 9, fig. 8.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 191.

Maysville (Corryville): Lebanon and Bantam, Ohio.

**Licrophycus formosum** Billings.

*Licrophycus formosus* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 72.

Richmond (English Head): English Head, Anticosti.

**Licrophycus hiltonense** Billings.

*Licrophycus hiltonensis* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 101 (adv. sheets, 1862).

Black River: Near Hilton, St. Joseph Island, Lake Huron.

**Licrophycus hudsonicum** Billings.

*Licrophycus hudsonicus* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 101 (adv. sheets, 1862).

Richmond: Manitouwaning Bay, Lake Huron.

**Licrophycus minor** Billings.

*Licrophycus minor* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 100, fig. 88 (adv. sheets, 1862).

Trenton: Ottawa, Ontario.

**Licrrophyeus ottawaense** Billings.

*Licrrophyeus ottawaensis* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 99, fig. 87 (adv. sheets, 1862).—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 239 (loc. occ.).

*Licrrophyeus ottawense* Miller, N. A. Geol. Pal., 1889, p. 125, fig. 49.

Trenton: Ottawa, Peterboro, Belleville, and Lake Winnipeg, Canada.

**Licrrophyeus robustum** Billings.

*Licrrophyeus robustus* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 72.

Richmond (English Head): English Head, Anticosti.

**LICRORPHYCUS SUCCULENS** Billings. See *Buthotrephis succulens*.

**Licrrophyeus vagans** Billings.

*Licrrophyeus vagans* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 72.

Richmond: Near West End Lighthouse, Anticosti.

**LIMARIA** Steininger. See *Cœnites* Eichwald.

**Limaria tennesseæ** Troost.

Not recognized.

*Limaria Tennesseeæ* Troost, 6th Geol. Rep. Tennessee, 1841, p. 18.

Niagaran: Brownspport, Tennessee.

**LIMOPTERA** Hall.

Genotype: *L. macroptera* Conrad.

*Limoptera* Hall, Prelim. Notice Lam., pt. 2, 1869, p. 15; 1st Rep. State Geol. New York, 1884, p. 13; Pal. New York, 5, pt. 1, Lam. 1, 1884, p. 13; 35th Rep. New York State Mus. Nat. Hist., 1884, p. 406c.—Nettelroth, Kentucky Foss. Shells, Geol. Surv. Kentucky, 1889, p. 197.—Miller, N. A. Geol. Pal., 1889, p. 486.—Koken, Die Leitfossilien, Leipzig, 1896, p. 187.

**Limoptera limæformis** (Hall).

*Avicula limæformis* Hall, Pal. New York, 2, 1852, p. 332, pl. 75, fig. 6a-c.

*Limoptera? limæformis* Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 423 (gen. ref.).

Cayugan (Cobleskill): Schoharie, New York.

**LINDSTRÖMIA** Nicholson and Thomson.

Genotype: *L. columnaris* Nicholson and Thomson.

*Lindströmia* Nicholson and Thomson, Proc. Roy. Soc. Edinburgh, 9, 1876, p. 150.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1878, p. 80.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 395.—Miller, N. A. Geol. Pal., 1889, p. 194.—Frech, Palæontographica, 37, 1890, p. 81.—Koken, Die Leitfossilien, Leipzig, 1896, p. 312.—Pocta, Syst. Sil. du Centre Bohème, 39, pt. 2, 1902, p. 182.

*Kionelasma* Simpson, Bull. New York State Mus., 39, 1900, p. 207. (Genotype: *Streptelasma mammiferum* Hall.)

**Lindströmia? columellata** (Hall).

*Cyathaxonia columellata* Hall, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 415 (extras, 1882, p. 11).

Niagaran (Racine): Racine, Wisconsin.

**Lindströmia gainesi** (Davis).

*Cyathaxonia gainesi* Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 104, figs. 1-6.

*Lindströmia gainesi* Foerste, Bull. Kentucky Geol. Surv., 7, 1906, p. 311 (gen. ref.).

**Lindströmia gainesi**—Continued.

*Kionelasma gainesi* Simpson, Bull. New York State Mus., 39, 1900, p. 208 (gen. ref.).

Upper Medinan (Brassfield): Near Louisville, Kentucky.

**Lindströmia? herzeri** (Hall).

*Cyathaxonia herzeri* Hall, 12th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1883, p. 275, pl. 15, fig. 14; 35th Rep. New York State Mus. Nat. Hist., 1884, p. 416 (ext. 1882, p. 12).—Lesley, Rep. Geol. Surv. Pennsylvania, P 4, 1889, p. 165, fig.—Miller, N. A. Geol. Pal., 1889, p. 180, fig. 159.

*Kionelasma herzeri* Simpson, Bull. New York State Mus., 39, 1900, p. 208, fig. 25. Niagaran (Louisville): Louisville, Kentucky.

**Lindströmia lingulifera** Foerste.

*Lindstromia lingulifera* Foerste, Bull. Kentucky Geol. Surv., 7, 1906, p. 311, pl. 5, figs. 2a-f.

Clinton (Waco): Near Estill Springs, Panola, and Waco, Kentucky.

**Lindströmia whiteavesi** Foerste.

*Lindstromia whiteavesi* Foerste, Bull. Kentucky Geol. Surv., 7, 1906, p. 312.

Black River (Leray): Petite Chaudiere Rapids, Ottawa, Ontario.

**Lindströmia wisconsinensis** (Whitfield).

*Cyathaxonia wisconsinensis* Whitfield, Ann. Rep. for 1877, Wisconsin Geol. Surv., 1878, p. 79; Geol. Wisconsin, 4, 1882, p. 277, pl. 14, figs. 3-5.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 188, fig.

*Lindstromia wisconsinensis* Foerste, Bull. Geol. Surv. Kentucky, 7, 1906, p. 312 (gen. ref.).

Niagaran (Racine): Racine, etc., Wisconsin.

**LINGULA** Bruguière.

Genotype: *L. anatina* Lamarck.

*Lingula* Bruguière, Encyclopédie Méthodique, 1, 1792, pl. 250.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 189.—Billings, Canadian Nat. Geol., 1, 1856, p. 33.—Pictet, Traité de Pal., 2d ed., 4, 1857, p. 73.—Meek and Hayden, Smiths. Contr. Knowl., 14, 172, 1865, p. 68.—Hall, Pal. New York, 4, 1867, p. 5.—Dall, American Jour. Conch., 6, 1870, pp. 153, 154.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 9.—Meek, Hayden's U. S. Geol. Surv. Terr., 9, 1876, p. 7.—Dall, Bull. U. S. Nat. Mus., 8, 1877, p. 43.—Morse, Proc. Boston Soc. Nat. Hist., 19, 1878, p. 266.—Zittel, Handb. Pal., 1, 1880, p. 662.—Winchell, 8th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1880, p. 60.—Miller, N. A. Geol. Pal., 1889, p. 349.—Beecher, Amer. Jour. Sci., 3d ser., 44, 1892, p. 141.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 2, 161.—Beecher, Amer. Nat., 27, 1893, p. 599.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 338.—Koken, Die Leitfossilien, Leipzig, 1896, p. 228, fig. 187.—Hall and Clarke, 11th Ann. Rep. New York State Geol., 1894, p. 226.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 78.—Beecher, *ibid.*, 1897, p. 110, fig. 5.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 181.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 307.—Grabau, Bull. New York State Mus., 45, 1901, p. 178; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 178.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 194.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 890.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 374.

*Glossina* Phillips, Mem. Geol. Surv. Great Britain, 2, pt. 2, 1848, p. 370.—Dall, Bull. U. S. Nat. Mus., 8, 1877, p. 29.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 15, 164; 11th Ann. Rep. New York State Geol., 1894, p. 230. (Genotype: *Lingula attenuata* Sowerby.)

*Paleoglossa* (*Glossina*, preoccupied) Cockerell, Nautilus, 25, 1912, p. 96.

*Pseudolingula* Mickwitz, Bull. Imp. Acad. Sci. St. Petersburg, 1909, p. 765.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 374. (Genotype: *Lingula quadrata* Eichwald.)



**LINGULA ACUMINATA** Conrad. See *Lingulella* (*Lingulepis*) *acuminata*.

**LINGULA (GLOSSINA) ACUMINATA** Hall and Clarke. See *Lingulella* (*Lingulepis*) *acuminata* sequens.

**Lingula acutirostris** Hall.

*Lingula acutirostra* Hall, Geol. New York, Rep. 4th Dist., 1843, p. 77, fig. 9 on p. 76; Pal. New York, 2, 1852, p. 56, pl. 20, fig. 5.

Clinton: Wolcott, New York.

Observation.—Based upon a single specimen now lost (Schuchert).

**Lingula æqualis** Hall.

*Lingula æqualis* Hall, Pal. New York, 1, 1847, p. 95, pl. 30, fig. 3.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 203, pl. 8, fig. 3.—Walcott, Proc. U. S. Nat. Mus., 11, 1888, p. 480, fig. 3.—Lesley, Rep. Geol. Surv. Pennsylvania, P 4, 1889, p. 342, figs.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 9, fig. 4.

Trenton: Middleville, Trenton Falls, and Rome, New York.

*Plesiotype*.—Cat. No. 25351, U.S.N.M. (Walcott).

**LINGULA ANTIQUA** Rogers. See *Obolus* (*Westonia*) *rogersi*.

**LINGULA ANTIQUA** Hall. See *Lingulella* (*Lingulepis*) *acuminata*.

**LINGULA ATTENUATA?** Hall. See *Lingula* (*Palæoglossa*) *trentonensis*.

**LINGULA AURORA** var. Hall. See *Obolus* (*Westonia*) *stoneanus*.

**Lingula (Palæoglossa) belli** (Billings).

*Lingula belli* Billings, Canadian Nat., 1st ser., 4, 1859, pp. 431–432, figs. 7, 8; Geol. Surv. Canada, 15th Rep. Progress, 1863, figs. 47a–b, p. 124.

*Obolus belli* Walcott, Mon. U. S. Geol. Surv. 51, pt. 1, 1912, p. 386, pl. 38, figs. 3a–b.

*Glossina belli* Raymond, Ann. Carnegie Mus., 8, 1911, p. 216, pl. 33, fig. 1.

Chazyan.—Island of Montreal, Canada (Aylmer); Valcour Island, New York (Valcour).

**Lingula beltrami** Winchell and Schuchert.

*Lingula beltrami* Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 351, figs. 25a, 25b.

Richmond (Maquoketa): Spring Valley, Minnesota

*Holotype*.—Cat. No. 45212, U.S.N.M.

**Lingula bicarinata** Ringueberg.

*Lingula bicarinata* Ringueberg, Proc. Acad. Nat. Sci. Philadelphia, 1884, p. 149, pl. 3, fig. 8.—Miller, N. A. Geol. Pal., 1889, p. 349.

Clinton (Rochester): Lockport, New York.

**LINGULA** cf. **BILLINGSIANA** Matthew. See *Lingulella grandis*.

**Lingula bisulcata** Ulrich.

*Lingula bisulcata* Ulrich, Amer. Geol., 3, 1889, p. 380, fig. 2.

Eden (Economy): Ludlow, Kentucky.

*Plastotype*.—Cat. No. 44997, U.S.N.M.

**Lingula boliviana** Hoek.

*Lingula boliviana* Hoek, Neues Jahrb. Min., Geol. Pal., 34, 1912, p. 244, pl. 8, fig. 3.

Ordovician: Cochabamba, Bolivia

**Lingula brainerdi** Raymond.

*Lingula brainerdi* Raymond, Bull. American Pal., 3, 1902, p. 302, pl. 18, figs. 2, 3; Ann. Carnegie Mus., 7, 1911, p. 217, pl. 33, fig. 2.

**Lingula brainerdi**—Continued.

*Lingula limitaris* Seely, Rep. Vermont State Geol., n. s., 1, 1902, p. 145 (nom. nud.); *ibid.*, 5, 1906, p. 183, pl. 41; reprint of same, p. 30, pl. 41; *ibid.*, 7, 1910, pl. 51.

Chazyan (Day Point, Crown Point): Valcour Island, Crown Point, New York; South Hero and Isle La Motte, Vermont.

**Lingula briseis** Billings.

*Lingula briseis* Billings, Pal. Fossils, 1, Geol. Surv., Canada, 1865, p. 48, fig. 52 (adv. sheets, 1862); Geol. Canada, 1863, p. 161, fig. 136.

Trenton: Near Oliviers Mills on the Bayonne River, Canada.

**Lingula(?) canadensis** Billings.

*Lingula canadensis* Billings, Pal. Foss., 1, 1865, p. 114, fig. 95 (adv. sheets, 1862); Geol. Canada, 1863, p. 210, fig. 209.—Davidson, Mon. British Foss. Brach., 5, Sil. Suppl., Pal. Soc., 1883, p. 202, pl. 17, fig. 1.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 27.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 352, fig. 26.

Richmond (Charleton): Black Point, Anticosti.

?Trenton (Prosser): Mantorville and Hader, Minnesota.

**Lingula cincinnatiensis** Hall and Whitfield.

*Lingulella* (*Dignomia*) *cincinnatiensis* Hall and Whitfield, Pal. Ohio, 2, 1875, p. 67, pl. 1, figs. 2, 3.

*Lingulella cincinnatiensis* Miller, Amer. Pal. Foss., 1877, p. 115; N. A. Geol. Pal., 1889, p. 352, fig. 577.

*Lingula cincinnatiensis* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 244.—Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 127, pl. 2, figs. 2, 3.

Maysville (Fairmount): Cincinnati, Ohio, and vicinity.

Trenton (Upper): Near Rogers Gap; Kentucky.

**Lingula clathrata** Winchell and Schuchert.

*Lingula clathrata* Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 345, pl. 29, fig. 42.

Black River (Decorah): St. Paul, Minnesota.

*Cotypes*.—Cat. No. 45546, U.S.N.M.

**Lingula clintoni** Vanuxem.

*Lingula oblonga* Conrad (not Eichwald), 3d Ann. Rep. Geol. Surv. New York, 1839, p. 65.—Hall, Geol. New York, Rep. 4th Dist., 1843, p. 77, fig. 4; Pal. New York, 2, 1852, p. 54, pl. 20, fig. 1.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 823, fig. 629; Man. Geol., 1860, p. 107, fig. 4.—Lesley, Rep. Geol. Surv. Pennsylvania, P 4, 1889, figs.

*Lingula clintoni* Vanuxem, Geol. New York, Rep. 3d Dist., 1842, p. 79, fig. 4.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 197.

*Lingula suboblonga* D'Orbigny, Prodrome Pal. Stratig., 1850, p. 34.

Early Silurian Cayuga County, New York (Clinton); Pennsylvania; Hamilton, Ontario (Cataract); Arisaig, Nova Scotia.

**Lingula clochensis** Foerste.

*Lingula clochensis* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 253, pl. 2, fig. 11a, b.

Black River (Lowville): La Cloche peninsula, Ontario.

**Lingula cobourgensis** Billings.

*Lingula cobourgensis* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 50, fig. 54 (adv. sheets, 1862); Geol. Canada, 1863, p. 161, fig. 132.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 346, pl. 29, fig. 12.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 195, fig. 228a-b.

Trenton: Cobourg, Collingwood, and Ottawa, Canada; ?Minneapolis, Minnesota.

**Lingula columba** Raymond.

*Lingula columba* Raymond, Amer. Jour. Sci., 4th ser., 20, 1905, p. 368; Ann. Carnegie Mus., 7, 1911, p. 218, pl. 33, figs. 3, 4.

Chazyan (Day Point, Crown Point, Valcour): Chazy and Valcour Island, New York; Isle La Motte, Vermont.

**Lingula covingtonensis** Hall and Whitfield.

*Lingula covingtonensis* Hall and Whitfield, Pal. Ohio, 2, 1875, p. 67, pl. 1, fig. 1.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 8.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 911, pl. 34, fig. 7.—Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 22, pl. 5, figs. 5, 6.

Trenton: West Covington (Upper part), and Frankfort, Kentucky (Hermitage).

**Lingula (Palæoglossa) crassa** (Hall).

*Lingula crassa* Hall, Pal. New York, 1, 1847, p. 98, pl. 30, fig. 8.—Emmons, Amer. Geology, 1, pt. 2., 1855, p. 203, pl. 8, fig. 8.—Hitchcock, Geol. Vermont, 1, 1861, p. 292.

*Glossina crassa* Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 343, figs.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 224.

Trenton: Middleville and Lake Champlain, New York.

**Lingula cuneata** Conrad.

*Lingula cuneata* Conrad, 3d Ann. Rep. Geol. Surv. New York, 1839, pp. 63, 64.—Hall, Geol. New York, Rep. 4th Dist., 1843, p. 48, fig. 5; Pal. New York, 2, 1852, p. 8, pl. 4, fig. 2.—Owen, Amer. Jour. Sci. Arts, 48, 1845, p. 300, fig. 5.—Emmons, Man. Geol., 1860, p. 106, fig. 96.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 12, pl. 1, figs. 11, 12; pl. 4K, fig. 9.—Grabau, Bull. New York State Mus., 45, 1901, p. 178, fig. 81; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 178, fig. 81.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 197, fig. 230.

*Lingulella cuneata* Miller, N. A. Geol. Pal., 1889, p. 352, fig. 578.

Upper Medinan: Medina and Lockport, New York.

**Lingula curta** Conrad.

*Lingula curta* Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1842, p. 266, pl. 15, fig. 12.—Hall, Pal. New York, 1, 1847, p. 97, pl. 30, fig. 6.—Emmons, Amer. Geology, 1, pt. 2, 1855, pl. 8, fig. 6.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 818, fig. 604.—Billings, Geol. Canada, 1863, p. 161, fig. 138; p. 201, fig. 197.—Emerson, Geol. Frobisher Bay; Nourse's Narr. Hall's Arctic Exped., App., 3, 1879, p. 578.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 343, fig.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 195.

Trenton: East Canada Creek and Middleville, New York; Carlisle, etc., Pennsylvania; Montmorency Falls, Canada; Frobisher Bay, Arctic America.

LINGULA CYANE Billings. See *Obolus cyane*.

LINGULA DAPHNE Billings. See *Lingula (Palæoglossa) trentonensis*.

LINGULA DAVISI McCoy. See *Lingulella davisii*.

LINGULA (GLOSSINA) DEFLECTA Winchell and Schuchert. See *Lingula Palæoglossa deflecta*.

**Lingula (Palæoglossa) deflecta** (Winchell and Schuchert).

*Lingula (Glossina) deflecta* Winchell and Schuchert, Amer. Geol., 9, 1892, p. 284; Geol. Minnesota, 3, 1893, p. 348, pl. 29, figs. 15-18.

*Glossina deflecta* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 224.

Trenton (Prosser): Near Fountain, Minnesota.

?Richmond (Maquoketa): Spring Valley, Minnesota.

LINGULA DOLATA Sardeson. See *Obolus dolata*.

**Lingula (Palæoglossa) dubia** (D'Orbigny).

Lingula dubia D'Orbigny, Voyage dans l'Amérique Meridionale, 1842, p. 29, pl. 2, fig. 7.

Glossina dubia Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 224 (gen. ref.).  
Ordovician: Tacopaya, Bolivia.

**Lingula elderi** Whitfield.

Lingula elderi Whitfield, American Jour. Sci., 3d ser., 19, 1880, p. 472, figs. 1, 2; Geol. Wisconsin, 4, 1882, p. 345, pl. 27, figs. 1-5.—Chamberlin, *ibid.*, 1, 1883, p. 154, fig.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 11, pl. 1, figs. 21, 22.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 339, pl. 29, figs. 1-4.—Huene, Verh. d. Russ.-Kais. Mineral. Ges. zu St. Petersburg, 2d ser., 36, 1899, p. 333, fig. 16.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 196, figs. 221, 229c.

Lingula minnesotensis N. H. Winchell, 8th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1880, p. 61.

Black River: Rochester, Minneapolis, etc., Minnesota; Beloit, Wisconsin.

**Lingula (Pseudolingula) elegantula** (Shaler).

Lingula quadrata Billings (not Eichwald), Canadian Nat. Geol., 1, 1856, p. 319, fig. 8.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 820, fig. 615.—Billings, Geol. Canada, 1863, p. 161, fig. 131; Cat. Sil. Foss. Anticosti, 1866, p. 10.

Lingula elegantula Shaler, Bull. Mus. Comp. Zool., 1, 1865, p. 61.

Richmond (English Head) and Gamachian (Ellis Bay): English Head, Charleton Point, etc., Anticosti.

**Lingula ellipsiformis** Hoek.

Lingula ellipsiformis Hoek, Neues Jahrb. Min., Geol., Pal., 34, 1912, p. 245, pl. 8, fig. 4.

Ordovician: Near Tarabuco, Bolivia.

LINGULA ELLIPTICA Hall. See *Lingula subelliptica*.

**Lingula elliptica** Emmons.

Lingula elliptica Emmons (not Philips, 1836), Amer. Geology, pt. 2, 1855, p. 112.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 247.

Ordovician shales: Augusta County, Virginia.

**Lingula elongata** Hall.

Lingula elongata Hall, Pal. New York, 1, 1847, p. 97, pl. 30, fig. 5.—Billings, Geol. Canada, 1863, p. 161, fig. 135.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 202, pl. 8, fig. 5.—Hitchcock, Geol. Vermont, 1, for 1861, 1862, p. 292, fig. 194.—Lesley, Rep. Geol. Surv. Pennsylvania, P 4, 1889, p. 344, fig.—Whiteaves, Pal. Foss., 3, pt. 3, 1897, p. 165.

Trenton: Lewis County New York; Lake Winnipeg, Manitoba; Ottawa, Ontario.

**Lingula eva** Billings.

Lingula eva Billings, Canadian Nat. Geol., 6, 1861, p. 150; Geol. Canada, 1863, p. 141, fig. 73.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 341, pl. 20, figs. 5, 6.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 196, figs. 229i-j.

Black River: Murray Bay, Canada; Fremont, Winona County, Minnesota (Decorah).

*Plastotype*.—Cat. No. 45547, U.S.N.M.

**Lingula forbesi** Billings.

Lingula Forbesi Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 115, fig. 96 (adv. sheets 1862).

Richmond and Gamachian (English Head-Ellis Bay): English Head, Junction Cliff, etc., Anticosti.

**Lingula gibbosa** Hall.

*Lingula gibbosa* Hall, Description n. sp. Foss. Waldron, Indiana, 1879, p. 13; 11th Rep. State Geol. Indiana, 1882, p. 284, pl. 27, fig. 2; Trans. Albany Institute, 10, 1883, p. 69.—Lesley, Rep. Geol. Surv. Pennsylvania, P 4, 1889, p. 344, fig. Niagaran (Waldron): Waldron, Indiana; Newsom, Tennessee.

**Lingula howleyi** Matthew.

*Lingula howleyi* Matthew, Trans. Roy. Soc. Canada, 2d ser., 1, 1896, p. 259, pl. 1, fig. 3.  
Lower Ordovician: Kelleys Island, Conception Bay, Newfoundland.  
Observation.—Possibly the same as *L. murrayi* Billings.

**Lingula (Palæoglossa) hurlbuti** (N. H. Winchell).

*Lingula hurlbuti* N. H. Winchell, 8th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1880, p. 62.  
*Lingula* (*Glossina*) *hurlbuti* Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 347, pl. 29, figs. 13, 14.  
*Glossina hurlbuti* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 224.  
Trenton (Prosser): Mantorville and near Spring Valley, Minnesota.  
*Plastotype*.—Cat. No. 45213, U.S.N.M.

**Lingula huronensis** Billings.

*Lingula Huronensis* Billings, Canadian Nat. Geol., 4, 1859, p. 433, fig. 9; Geol. Canada, 1863, p. 124, fig. 48.—Raymond, Ann. Carnegie Mus., 7, 1911, p. 219.  
Black River: St. Joseph Island, Lake Huron.

**Lingula ingens** Spencer.

*Lingula ingens* Spencer, Bull. Univ. State Missouri, 1884, p. 56; Trans. St. Louis Acad. Sci., 4, 1886, p. 606, pl. 8, fig. 6.  
Niagaran dolomite: Hamilton, Ontario.

**Lingula inornata** Hoek.

*Lingula inornata* Hoek, Neues Jahrb. Min., Geol., Pal., 34, 1912, p. 241, pl. 8, fig. 2.  
Ordovician: Northern Argentina.

**Lingula insularis** Billings.

*Lingula insularis* Billings, Cat. Sil. Foss. Anticosti, 1866, p. 40.  
Gamachian (Ellis Bay): White Cliff, Gamache Bay, Anticosti.

LINGULA IOLE Billings. See *Lingulella iole*.

**Lingula (Pseudolingula) iowensis** (Owen).

*Lingula iowensis* Owen, Geol. Rep. Iowa, Wisconsin, and Illinois, 1844, p. 70, pl. 15, fig. 1.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 8, pl. 1, fig. 14.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 349, pl. 29, figs. 19-22.—Whiteaves, Pal. Foss., 3, pt. 3, 1897, p. 164.—Huene, Verh. d. Russ.-Kais. Mineral. Ges. zu St. Petersburg., 2d ser., 36, 1899, p. 337, fig. 17.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 196, fig. 229f-h.

*Lingula quadrata*? Owen (not Eichwald), Geol. Rep. Wisconsin, Iowa, and Minnesota, 1851, pl. 2B, fig. 8.

*Lingula quadrata* Hall, Geol. Wisconsin, 1, 1862, p. 46, fig. 1, and p. 435.—Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 305, pl. 2, fig. 4.

*Lingulella iowensis* Whitfield, Geol. Wisconsin, 4, 1882, p. 242, pl. 9, fig. 1.

Trenton (Prosser-Galena): Wisconsin; Iowa; Minnesota; Illinois; Lake Winnipeg, Manitoba.

*Plastotype* and *pleciotype*.—Cat. Nos. 17873, 44995, U.S.N.M.

LINGULA IRENE Billings. See *Lingulella irene*.

LINGULA IRIS Billings. See *Lingulella iris*.

**Lingula kingstonensis** Billings.

*Lingula kingstonensis* Billings, Geol. Surv. Canada, Pal. Fossils, 1, 1865, p. 48, fig. 51 (adv. sheets, 1862); Geol. Canada, 1863, p. 141, fig. 74.

Black River: Long Island, near Kingston, Canada.

LINGULA LAMELLATA Hall (part). See *Lingula tæniola*.

**Lingula lamellata** Hall.

*Lingula lamellata* Hall, Geol. New York; Rep. 4th Dist., 1843, p. 108, fig. 2; Pal. New York, 2, 1852, p. 249, pl. 53, figs. 1, 2 (not p. 55, pl. 20, fig. 4=L. *tæniola*).—Lesley, Rep. Geol. Surv. Pennsylvania, P 4, 1889, p. 344, fig.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 16, pl. 1, figs. 9, 10; pl. 4K, figs. 10–13.—Crane, Geol. Mag., dec. 4, 1895, 2, pl. 5, fig. 5.

Clinton (Rochester): Lockport and Rochester, New York; Hamilton, Ontario.

LINGULA LENS Matthew. See *Lingulella lens*.

LINGULA LIMITARIS Seely. See *Lingula brainerdi*.

**Lingula lineata** Hoek.

*Lingula lineata* Hoek, Neues Jahrb. Min., Geol. Pal., 34, 1912, p. 244, pl. 8, fig. 1. Ordovician: Near Tarabuco, Bolivia.

**Lingula lingulata** Hall and Clarke.

*Lingula lingulata* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 173, pl. 4K, fig. 5; 48th Rep. New York State Mus., 2, for 1895, 1897, p. 327, pl. 1, fig. 2; 14th Rep. State Geol. New York for 1894, 1897, p. 327, pl. 1, fig. 2.

Upper Medinan (Cataract): Hamilton, Ontario.

**Lingula lyelli** Billings.

*Lingula Lyelli* Billings, Canadian Nat. Geol., 4, 1859, p. 348, fig. 1, p. 431; Geol. Canada, 1863, p. 124, fig. 49.—Chapman, Canadian Jour., n. s., 8, 1863, p. 195, fig. 165c; Expos. Min. Geol. Canada, 1864, p. 167, fig. 165c.—Raymond, Ann. Carnegie Mus., 7, 1911, p. 218, 33, figs. 5, 6.

Chazyan (Aylmer): Allumette Island, Aylmer and Hog Back, near Ottawa, Canada.

**Lingula mantelli** Billings.

*Lingula mantelli* Billings, Canadian Nat. Geol., 4, 1859, p. 349, figs. 1e–1f; Geol. Canada, 1863, p. 113, fig. 20.

Canadian (Beekmantown): St. Eustache, Canada.

LINGULA? MANTICULA White. See *Lingulella manticula*.

LINGULA MARGINATA D'Orbigny. See *Lingula submarginata*.

**Lingula minima americana** Williams.

*Lingula minima* var. *americana* Williams, Proc. U. S. Nat. Mus., 45, 1913, p. 340, pl. 31, fig. 6.

Silurian (Pembroke): Sipp's Bay, Washington County, Maine.

*Holotype*.—Cat. No. 58973, U.S.N.M.

LINGULA MINNESOTENSIS N. H. Winchell. See *Lingula elderi*.

**Lingula modesta** Ulrich.

*Lingula modesta* Ulrich, Amer. Geol., 3, 1889, p. 382, fig. 4 on p. 378.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 344, pl. 29, fig. 41.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 196, fig. 229e.—Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 22, pl. 2, fig. 17.

*Lingula vanhorni* Hall and Clarke (not Miller), Pal. New York, 8, pt. 1, 1892, pl. 1, fig. 4.

Trenton: Frankfort (Hermitage) and Covington, Kentucky (upper part).

**Lingula morsei** (N. H. Winchell).

*Lingulepis morsensis* N. H. Winchell, 4th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1876, p. 41, fig. 6.—James, Jour. Cincinnati Soc. Nat. Hist., 17, 1895, p. 132.

*Lingulepis morsii* Miller, N. A. Geol. Pal., 1889, p. 352.

*Lingula morsii* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 62.—Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 77, pl. 4, figs. 2, 3.

Black River (Basal Platteville): Near Fountain, Minnesota.

LINGULA MOSIA Hall. See *Lingulella mosia*.

**Lingula müsteri** D'Orbigny.

*Lingula müsterii* D'Orbigny, Voyage dans l'Amérique Méridionale, Pal., 1842, p. 29, pl. 2, fig. 6.

*Lingula müsteri* A. Ulrich, Neues Jahrb. Mineral., Beilageband, 8, 1892, p. 7.—Hoek, Neues Jahrb. Min., Geol. Pal., 34, 1912, p. 243, pl. 8, figs. 6-8.

Ordovician: Tacopaya, etc., Bolivia.

**Lingula? murrayi** Billings.

*Lingula murrayi* Billings, Canadian Nat. Geol., n. s., 6, 1872, p. 467, fig. 3; Pal. Foss., 2, 1874, p. 66, fig. 34.

Upper Cambrian or Lower Ordovician: Bell Island, Conception Bay, Newfoundland.

Observation.—See *Lingula howleyi* Matthew.

LINGULA NORWOODI James. See *Lingulops norwoodi*.

**Lingula nympha** Billings.

*Lingula nympha* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 214, fig. 198.—Ami, Ottawa Nat., 8, 1894, p. 85.

Chazyan (Quebec-N): Table Head, Newfoundland.

**Lingula oblata** Hall.

*Lingula oblata* Hall, Geol. New York; Rep. 4th Dist., 1843, p. 77, fig. 8 on p. 76; Pal. New York, 2, 1852, p. 54, pl. 20, fig. 2.—Owen, Amer. Jour. Sci. Arts, 48, p. 306, fig. 8.—Lesley, Rep. Geol. Surv. Pennsylvania, P 4, 1889, p. 346, fig.

Early Silurian: Sodus and Wolcott, New York (Clinton); Ontario (Cataract).

LINGULA OBLONGA Conrad. See *Lingula clintoni*.

**Lingula obtusa** Hall.

*Lingula obtusa* Hall, Pal. New York, 1, 1847, p. 98, pl. 30, fig. 7.—Billings, Geol. Canada, 1863, p. 161, fig. 137.—Emmons, Amer. Geology, 1, pt. 2, 1835, p. 202, pl. 8, fig. 7.—Hitchcock, Geol. Vermont, 1, for 1861, 1862, p. 292, fig. 195.—Chapman, Canadian Jour., n. s., 8, 1863, p. 203, fig. 199; Expos. Min. and Geol. Canada, 1864, p. 175, fig. 199.—Davidson, Mon. British Sil. Brachs. Pal. Soc., 1866, p. 52, pl. 3, fig. 31.—Lesley, Rep. Geol. Surv. Pennsylvania, P 4, 1889, p. 346, figs.—Whiteaves, Pal. Foss., 3, pt. 3, 1897, p. 165.

Trenton: Middleville, New York; Lake Winnipeg and Ottawa, Canada,

**Lingula? ovata** Cleland.

*Lingula*(?) *ovata* Cleland, Bull. Amer. Pal., 4, 1903, p. 19, pl. 4, fig. 3.  
Canadian (Tribes Hill): Fort Hunter, Tribes Hill, etc., New York.

**Lingula papillosa** Emmons.

*Lingula papillosa* Emmons, Amer. Geology, pt. 2, 1855, p. 202, fig. 64; Manual Geol., 1860, p. 99, fig.—Lesley, Rep. Geol. Surv. Pennsylvania, P 4, p. 346, figs.

Trenton: ?New York.

**Lingula (Palæoglossa) perovata** (Hall).

*Lingula perovata* Hall, Pal. New York, 2, 1852, p. 55, pl. 20, fig. 3.  
*Glossina perovata* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 224.  
Clinton: Rochester, New York.

LINGULA PERPLEXA Hall. See *Lingula subelliptica*.

**Lingula perryi** Billings.

*Lingula perryi* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 20, fig. 23 (adv. sheets, 1862); Geol. Vermont, 2, 1861, p. 957, fig. 363; Geol. Canada, 1863, p. 274, fig. 278.

Black River(?): Highgate Spring, Vermont.

**Lingula philomela** Billings.

*Lingula Philomela* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 49, fig. 53 (adv. sheets, 1862); Geol. Canada, 1863, p. 161, fig. 133.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 1, fig. 8.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 342, pl. 29, figs. 7, 8.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 145, pl. 9, fig. 7.

Trenton: Montmorency Falls, Ottawa, etc., Canada; near Beaver Run, New Jersey.

?Richmond (Maquoketa): Near Granger and Wykoff, Minnesota.

*Plastotype*.—Cat. No. 45211, U.S.N.M.

LINGULA PINNAFORMIS Owen. See *Lingulella (Lingulepis) acuminata*.

LINGULA PRIMA Rogers. See *Obolus (Westonia) rogersi*.

LINGULA PRIMA Billings. See *Lingulella (Lingulepis) acuminata*.

LINGULA PRIMA Hall. See *Lingulella prima*.

**Lingula procteri** Ulrich.

*Lingula procteri* Ulrich, Amer. Geol., 3, 1889, p. 377, fig. 1.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 12, pl. 1, figs. 5-7.

*Lingula* cf. *procteri* Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 129, pl. 2, fig. 7.

Trenton (upper): Covington, Rogers Gap, etc., Kentucky.

**Lingula procteri versaillesensis** Foerste.

*Lingula procteri versaillesensis* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, p. 135, pl. 10, figs. 8a, b.

Trenton (Flanagan): Versailles, Kentucky.

**Lingula progne** Billings.

*Lingula progne* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 47, fig. 50 (adv. sheets, 1862); Geol. Canada, 1863, p. 161, fig. 134; p. 201, fig. 196.

Trenton (Collingwood): Montreal, Collingwood, Ottawa, etc., Canada.



LINGULA QUADRATA Billings. See *Lingula* (*Pseudolingula*) *elegantula*.

LINGULA QUADRATA Hall. See *Lingula* (*Pseudolingula*) *rectilateralis*.

LINGULA QUADRATA? Owen. See *Lingula* *iowensis*.

***Lingula quebecensis* Billings.**

*Lingula quebecensis* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 72, fig. 65; pp. 72, 216 (adv. sheets, 1862); Geol. Canada, 1863, p. 230, fig. 241.—Chapman, Canadian Jour., n. s., 8, 1863, p. 191, fig. 160c; Expos. Min. Geol. Canada, 1864, p. 163, fig. 160c.

Canadian: Point Levis, Sillery, etc., Canada (*Levis*, *Phyllograptus typus* and *Diplograptus dentatus* zones); Cow Head, Newfoundland (Quebec-P).

***Lingula* (*Pseudolingula*) *rectilateralis* (Emmons).**

*Lingula rectilateralis* Emmons, Geol. New York, Rep. 2d Dist., 1842, p. 399, fig. 6.—Lesley, Rep. Geol. Surv. Pennsylvania, P 4, 1889, p. 347, figs.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 195, fig. 228c.—Ruedemann, Bull. New York State Mus., 162, 1912, p. 91, pl. 4, fig. 1.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 254.

*Lingula quadrata* Hall (not Eichwald), Pal. New York, 1, 1847, p. 96, pl. 30, fig. 4; p. 285, pl. 79, fig. 1.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 9.

Utica: Rodman, Lorraine, etc., New York.

***Lingula riciniformis* Hall.**

*Lingula riciniformis* Hall, Pal. New York, 1, 1847, p. 95, pl. 30, fig. 2.—Emmons, Amer. Geology, 1, pt. 2, 1885, p. 203, pl. 8, figs. 2a-c.—Lesley, Rep. Geol. Surv. Pennsylvania, P 4, 1889, p. 347, figs.—Beecher, Amer. Jour. Sci., 3d ser., 44, 1892, p. 149.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 343, fig. 24; pl. 29, fig. 9.—Crane, Geol. Mag., dec. 4, 1895, 2, pl. 5, fig. 7.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 144, pl. 9, fig. 8.

*Lingula* (*Glossina*) *riciniformis* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 1, fig. 3.

Trenton: Middleville, New York; Charlesbourg, Canada; St. Paul, Minnesota; Jacksonburg, New Jersey.

***Lingula riciniformis galenensis* Winchell and Schuchert.**

*Lingula riciniformis* var. *galenensis* Winchell and Schuchert, Amer. Geol., 9, 1892, p. 284; Geol. Minnesota, 3, 1893, p. 344, pl. 29, figs. 10, 11.

Trenton (Prosser): Near Kenyon and Fountain, Minnesota; Neenah and Oshkosh, Wisconsin.

***Lingula scobina* Williams.**

*Lingula scobina* Williams, Proc. U. S. Nat. Mus., 45, 1913, p. 339, pl. 30, fig. 18.

Silurian (Pembroke): Leighton Cove, Washington County, Maine.

*Holotype*.—Cat. No. 58967, U.S.N.M.

***Lingula selwyni* Whiteaves.**

*Lingula Selwyni* Whiteaves, Geol. Surv. Canada, Rep. Progr. for 1875-76, 1877, p. 103.

Horizon unknown: Peace River, British Columbia.

***Lingula striata* Emmons.**

*Lingula striata* Emmons, Amer. Geology, pt. 2, 1855, p. 112, pl. 1, fig. 17; Manual Geol., 1860, p. 88, fig. 74.—Lesley, Rep. Geol. Surv. Pennsylvania, P 4, 1889, p. 348, figs.—Schuchert, Bull. U. S. Geol. Surv., 87, p. 254.

Ordovician (Lower Martinsburg): Augusta County, Virginia.

**Lingula subelliptica** D'Orbigny.

*Lingula elliptica* Hall (not Phillips), Geol. New York, Rep. 4th Dist., 1843, p. 76, fig. 7.—Owen, Amer. Jour. Sci. Arts, 48, 1845, p. 306, fig. 7.

*Lingula subelliptica* D'Orbigny, Prodrôme Pal., 1, 1850, p. 34.

*Lingula perplexa* Hall, Müller's Amer. Pal. Fossils, 1877, p. 244.—Lesley, Rep. Geol. Surv. Pennsylvania, P 4, 1889, p. 346, fig.

Clinton: Walcott, New York.

**Lingula submarginata** D'Orbigny.

*Lingula marginata* D'Orbigny, Voyage dans l'Amérique Meridionale, 3, pt. 4, Pal., 1842, p. 28, pl. 2, fig. 5; 8, Atlas, 1847.

*Lingula submarginata*, D'Orbigny, Prodrôme Pal., 1, 1850, p. 14.

Ordovician: Tacopaya, Bolivia.

*LINGULA SUBOBLONGA* D'Orbigny. See *Lingula clintoni*.

**Lingula tæniola** Hall and Clarke.

*Lingula lamellata* Hall (part), Pal. New York, 2, 1852, p. 55, pl. 20, fig. 4.

*Lingula tæniola* Hall and Clarke, *ibid.*, 8, pt. 1, 1892, pp. 18, 173, pl. 4K, fig. 8; 48th Rep. New York State Mus., 2, for 1895, 1897, p. 327, pl. 1, fig. 4; 14th Rep. State Geol. New York for 1894, 1897, p. 327, pl. 1, fig. 4.

Clinton: Clinton, New York; Hamilton, Ontario.

*LINGULA (GLOSSINA) TRENTONENSIS* Grabau and Shimer. See *Lingula (Palæoglossa) trentonensis*.

**Lingula (Palæoglossa) trentonensis** (Conrad).

*Lingula trentonensis* Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1842, p. 266, pl. 15, fig. 11.—Vanuxem, Geol. New York; Rep. 3d Dist., 1842, p. 48.

*Lingula attenuata?* Hall (not Sowerby), Pal. New York, 1, 1847, p. 94, pl. 30, fig. 1.

*Lingula daphne* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 50 (adv. sheets 1862).

?*Lingula attenuata* A. Ulrich, N. Jahrb. f. Mineral, Beilageband, 8, 1892, p. 7, pl. 1, fig. 3.

*Lingula (Glossina) trentonensis* Grabau and Shimer, N. A. Index Fossils, 1, 1907; p. 195.

*Glossina trentonensis* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 225.

Trenton: Glens Falls, Trenton Falls, Middleville, New York; Wisconsin; Montreal and Ottawa, Canada; ?near Vacas, Bolivia.

*LINGULA VANHORNII* Hall and Clarke. See *Lingula modesta*.

**Lingula vanhorni** Miller.

*Lingula vanhorni* Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 9, fig. 1; 18th Rep. Geol. Surv. Indiana, 1894, p. 309.—Foerste, Amer. Geol., 31, 1903, p. 340 (loc. occ.).

Richmond: Versailles, Indiana.

**Lingula waynesboroensis** Foerste.

*Lingula waynesboroensis* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1910, p. 23, pl. 2, fig. 18; pl. 5, fig. 7.

Trenton (Hermitage): Near Waynesboro, and Clifton, Tennessee.

**Lingula whitfieldi** Ulrich.

*Lingula whitfieldi* Ulrich, Amer. Geol., 3, 1889, p. 381, fig. 3.—Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 128, pl. 2, fig. 8.

Trenton (Upper): Covington, Rogers Gap, etc., Kentucky.

*Plastotype*.—Cat. No. 44996, U.S.N.M.

**LINGULASMA** Ulrich.Genotype: *L. schucherti* Ulrich.

*Lingulasma* Ulrich, Amer. Geol., 3, 1889, p. 383.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 24, 46, 163.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 353.—Hall and Clarke, 11th Ann. Rep. New York State Geol., 1894, p. 335.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 308; 2d ed., 1913, p. 374.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 198.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 891.

*Lingulelasma* Miller, N. A. Geol. Pal., 1889, p. 351.

**Lingulasma galenense** Winchell and Schuchert.

*Lingulasma galenensis* Winchell and Schuchert, Amer. Geol., 9, 1892, p. 285; Geol. Minnesota, 3, 1893, p. 354, pl. 30, figs. 1-4.—Weller, Geol. Surv. New Jersey, Pal., 3, p. 145, pl. 9, figs. 10-11.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 199, fig. 233.

Trenton: Fillmore and Goodhue Counties, Minnesota; Decorah, Iowa; Neenah and Oshkosh, Wisconsin; near Newton, New Jersey.

*Plastotypes*.—Cat. No. 45195, U.S.N.M.

**Lingulasma schucherti** Ulrich.

*Lingulasma schucherti* Ulrich, Amer. Geol., 3, 1889, p. 389, fig. 5.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 24, pl. 2, figs. 17-23.

*Lingulelasma schucherti* Miller, N. A. Geol. Pal., 1889, p. 351.

Richmond: Wilmington (Fernvale) and Savannah (Maquoketa), Illinois.

*Plastotype*.—Cat. No. 45194, U.S.N.M.

**LINGULELASMA SCHUCHERTI** Miller. See *Lingulasma schucherti*.

**LINGULELLA** Salter.Genotype: *Lingula davisii* McCoy.

*Lingulella* Salter, Mem. Geol. Surv. Great Britain, 3, 1866, p. 333.—Davidson, Mon. British Sil. Brach., Pal. Soc., 1866, p. 55.—Dall, Amer. Jour. Conch., 6, 1870, pp. 153, 159.—Zittel, Handb. Pal., 1, 1880, p. 663.—Miller, N. A. Geol. Pal., 1889, p. 352.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 55, 163; 11th Ann. Rep. New York State Geol., 1894, p. 232.—Walcott, Proc. U. S. Nat. Mus., 21, 1898, pp. 390-394, pl. 27, figs. 1-5; 23, 1901, p. 683.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 307; 2d ed., 1913, p. 372.—Matthews, Trans. Roy. Soc. Canada, 2d ser., 8, sec., 4, 1910, p. 103; Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, p. 116.—Walcott, Smiths. Misc. Coll., 53, 1908, pp. 142, 144; Mon. U. S. Geol. Surv., 51, 1912, p. 469.

*Lingulepis* Hall, 16th Ann. Rep. New York State Geol. Nat. Hist., 1863, p. 129.—Meek and Hayden, Smiths. Contr. Knowl., 172, Pal. Upper Missouri, pt. 1, 1865, pp. 1, 2.—Hall, Trans. Albany Inst., 5, 1867, p. 106.—Dall, Amer. Jour. Conch., 2d ser., 6, pt. 2, 1870, pp. 154-161.—Meek, Proc. Acad. Nat. Sci. Philadelphia, 23, 1871, pp. 186-187.—Zittel, Handb. Pal., 1, Abth. 1, 1880, p. 664.—Hall and Clarke, 11th Ann. Rep. State Geol. New York, 1892, pp. 231-232; 45th Ann. Rep. New York State Mus., 1892, pp. 547-548; Pal. New York, 8, pt. 1, 1892, pp. 59-62, 164.—Matthews, Trans. Roy. Soc. Canada, 1902, 2d ser., 8, sec. 4, No. 3, p. 102; Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, p. 126.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 193. (Genotype *Lingula acuminata* Conrad.)

*Lingulella* (*Lingulepis*) Walcott, Smiths. Misc. Coll., 53, pl. 11, pp. 142, 144; Mon. U. S. Geol. Surv., 51, 1912, p. 544.

*Obolus* (*Lingulepis*) Walcott, Mon. U. S. Geol. Surv., 32, pt. 2, 1899, pp. 443-444; Proc. U. S. Nat. Mus., 23, 1901, p. 683.

**Lingulella (Lingulepis) acuminata** (Conrad).

- Lingula acuminata Conrad, 3d Ann. Rep. New York Geol. Surv., 1839; p. 64.—Hall, Pal. New York, 1, 1847, p. 9, fig. .
- Lingula prima Billings, Canadian Nat., 1st ser., 1, 1856, p. 34, fig. 1.
- Lingula antiqua Hall, Pal. New York, 1, 1847, pp. 3, 4, pl. 1, figs. 3a-c.—Emmons, Manual Geology, 2d ed., 1863, p. 92, fig. 77.
- Lingulepis acuminata Matthew, Trans. Roy. Soc. Canada, 2d ser., 1, sec. 4, No. 13, 1895, pp. 257-258, pl. 2, figs. 5a-b.
- Obolus (Lingulepis) acuminatus Walcott, Mon. U. S. Geol. Surv., 32, pt. 2, 1899, p. 443.
- Lingula pinnaformis Owen, Rep. Geol. Surv. Wisconsin, Iowa, Minnesota, 1852, p. 583, pl. Lb, figs. 4, 6, 8.
- Lingulepis pinnaformis Whitfield, U. S. Geogr. and Geol. Surv. Rocky Mts. region, Rep. Geol. Res. Black Hills of Dakota, 1880, p. 335, pl. 2, figs. 1-4; Geol. Wisconsin, 4, 1882, pp. 169-170, pl. 1, figs. 2, 3.
- Lingulepis pinniformis Hall and Clarke, 11th Ann. Rep. State Geol. New York, 1892, figs. 237, 238, p. 232; pl. 1, figs. 16, 17.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 193, fig. 227.
- Lingulella (Lingulepis) acuminata Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 545, pls. 34, 40-42 (see for complete bibliography); Smiths. Misc. Coll., 57, 1912, p. 262, pl. 42, figs. 1-7.
- Middle Cambrian-Lower Ordovician: Chateaugay Falls, Franklin County, etc., New York; Vermont; Ontario; Virginia; Tennessee; Wisconsin; Minnesota; etc.
- Plesiotypes*.—Cat. Nos. 52469, 51878, 17999, U.S.N.M.

**Lingulella (Lingulepis) acuminata sequens** Walcott.

- Glossina acuminata Hall and Clarke (not Conrad), 11th Ann. Rep. State Geol. New York for 1891, 1892, pl. 1, figs. 10, 11.
- Lingula (Glossina) acuminata Hall and Clarke (not Conrad), Pal. New York, 8, pt. 1, 1892, pl. 1, figs. 1, 2.
- Lingulella (Lingulepis) acuminata sequens Walcott, Smiths. Misc. Coll., 53, 1908, p. 72, pl. 8, fig. 4; Mon. U. S. Geol. Surv., 51, 1912, p. 551, figs. 46A, B.
- Canadian (Beekmantown): Near Ticonderoga, Essex County, New York.
- Holotype* and *plesiotype*.—Cat. No. 53675, U.S.N.M.

LINGULELLA? AFFINIS Billings. See Obolus (Lingulobolus) affinis.

**Lingulella? allani** Walcott.

- Lingulella? allani Walcott, Smiths. Misc. Coll., 57, 1912, p. 232, pl. 35, figs. 7-9.
- Lower Ordovician (Goodsir): Moose Creek Valley, Mount Mollison, Ice River Valley, etc., British Columbia.

**Lingulella bella** (Walcott).

- Obolus (Lingulella) bellus Walcott, Proc. U. S. Nat. Mus., 21, 1898, pp. 397-398; ibid., 23, 1901, pp. 685-687.—Matthew, Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, p. 204.
- Lingulella bella Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 481, pl. 19, figs. 2, 2a-q; pl. 36, fig. 4.
- Upper Cambrian and Lower Ordovician: Near Lance Cove, Great Belle Island, Conception Bay, Newfoundland.
- Holotype* and *paratypes*.—Cat. No. 27308, U.S.N.M.

LINGULELLA? BILLINGSANA Schuchert. See Lingulella grandis.

LINGULELLA (DIGNOMIA) CINCINNATIENSIS Hall and Whitfield. See Lingula cincinnatiensis.

**Lingulella concinna** Matthew.

*Lingulella concinna* Matthew, Bull. Nat. Hist. Soc. New Brunswick, 4, pt. 4, No. 19, 1901, pp. 273-274, pl. 5, figs. 2a-b.—Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 486, pl. 33, figs. 2a-h; pl. 34, figs. 1a-r.

*Obolus* (*Lingulella*) *bellus* Walcott, Proc. U. S. Nat. Mus., 23, 1901, p. 685.

*Obolus* (*Lingulella*) *concinna* Walcott, Proc. U. S. Nat. Mus., 25, pp. 608, 609.

*Lingulella concinna* Matthew, Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, pp. 203-204, pl. 14, figs. 5a, b.

Canadian (Bretonian—Div. C3c): McNeil Brook, Barachois Glen, etc., Cape Breton, Nova Scotia.

LINGULELLA CUNEATA Matthew. See *Lingulella grandis*.

**Lingulella davisii** (McCoy).

*Lingula davisii* McCoy, Quart. Jour. Geol. Soc. London, 8, 1851, pp. 405-406; British Pal. Foss., 1854, p. 252, pl. 2, figs. 7a-b.

*Lingulella davisii* Davidson, Brit. Foss. Brach., 3, pt. 7, No. 1, 1866, pp. 56, 57, pl. 4, figs. 1-16.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 56, 57, fig. 18.—Hoek, Neues Jahrb. Geol., Min. Pal., 34, 1912, p. 219.

*Lingulella* cf. *davisii* Matthew, Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, p. 203; Bull. Nat. Hist. Soc. New Brunswick, 4, pt. 5, No. 20, 1902, pp. 407, 408.

*Lingulella davisii* Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 489, pl. 30, figs. 2, 2a; pl. 31, figs. 6a-h. (See for complete bibliography.)

Ordovician (Coniston—Bala): Coniston, Lancashire, England. Upper and lower *Lingula* flags of North Wales.

Canadian: McLeod Brook, near Boisdale, Cape Breton, Nova Scotia (Bretonian—Div. C3c2); Bolivia.

*Plesiotypes*.—Cat. Nos. 35239, 51740, U.S.N.M.

**Lingulella desiderata** (Walcott).

*Obolus* (*Lingulella*) *desiderata* Walcott, Proc. U. S. Nat. Mus., 21, 1898, pp. 399, 400; Mon. U. S. Geol. Surv., 32, pt. 2, pp. 445, 446, pl. 40, fig. 2 (not 2a).

*Lingulella desiderata* Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 492, pl. 20, figs. 4a-c, 5, 5a.

Lower Ordovician: Near Colorado Springs, El Paso County, Ouray County, etc., Colorado. Also Upper and Middle Cambrian of Montana, etc.

*Holotype* and *plesiotypes*.—Cat. Nos. 27355, 33867, etc., U.S.N.M.

**Lingulella ellsi** (Walcott).

*Obolus* (*Lingulella*) *ellsi* Walcott, Proc. U. S. Nat. Mus., 21, 1898, p. 402.

*Lingulella ellsi* Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 495, pl. 19, figs. 3, 3a-c.

Canadian ("Upper Sillery"): Chaudiere River at Grand Trunk Railroad bridge, Quebec.

*Holotype* and *paratypes*.—Cat. No. 27315, U.S.N.M.

LINGULELLA(?) ESCASONI Matthew. See *Obolus* (*Westonia*) *escasoni*.

**Lingulella** (*Lingulepis*) *exigua* (Matthew).

*Obolus* (*Lingulepis*) *gregwa* Walcott (in part) (not Matthew), Proc. U. S. Nat. Mus., 23, 1901, pp. 692-694.

*Lingulepis starri* var. Matthew, Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, pp. 193-197, pl. 14, figs. 2a-c.

*Lingulepis starri* *exigua* Matthew, *ibid.*, 1903, pp. 197, 198, pl. 14, figs. 3a-d.

**Lingulella (Lingulepis) exigua**—Continued.

*Lingulella (Lingulepis) exigua* Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 551, pl. 33, figs. 4, 4a; pl. 43, figs. 1-1z.

Canadian (Bretonian—Div. C3b): Salmon River, thirteen miles south of Marion Bridge, Cape Breton, Nova Scotia.

**Lingulella ferruginea** Salter.

*Lingulella ferruginea* Salter, Quart. Jour. Geol. Soc. London, 23, pt. 1, 1867, p. 340, fig. 1.—Davidson, Geol. Mag., 5, 1868, pp. 306-307, pl. 15, figs. 1-8; British Foss. Brach., 3, pt. 7, No. 4, 1871, pp. 336-337, pl. 49, figs. 32-35.—Matthew, Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, p. 108.—Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 496, pl. 29, figs. 1a-w, 2a-f; pl. 30, fig. 1; pl. 31, figs. 3a-c; pl. 35, figs. 4a-b. (See for complete bibliography.)

*Obolella?* *gemmula* Matthew, Trans. Roy. Soc. Canada, 9, sec. 4, 1892, pp. 41-42, pl. 12, figs. 8a-c.

*Leptobolus gemmulus* Matthew, Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, pp. 190-192, pl. 14, figs. 1a-c.

Middle and Upper Cambrian of Wales, Norway, Denmark, etc.

Canadian (Bretonian—Div. C3c): Navy Island, St. John Harbor, New Brunswick, and McLeod Brook, near Boisdale, Cape Breton, Nova Scotia.

**Lingulella grandis** (Matthew).

*Leptobolus grandis* Matthew, Trans. Roy. Soc. Canada, 1st ser., 11, sec. 4, 1894, pp. 91-92, pl. 16, figs. 7a-c.

*Lingulella cuneata* Matthew, *ibid.*, 1st ser., 11, sec. 4, 1894, pp. 92-93, pl. 16, figs. 5a-b.

*Lingula cf. billingsiana* Matthew, *ibid.*, 1st ser., 11, sec. 4, 1894, p. 93, pl. 16, figs. 6a-b.

*Lingulella?* *billingsiana* Schuchert (not Whiteaves), Bull. U. S. Geol. Surv., 87, 1897, p. 256.

*Lingulella grandis* Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 502, pl. 38, figs. 2, 2a-f.

Canadian (Bretonian—Div. C3c): Hardingleville, St. John County, New Brunswick.

**Lingulella iole** (Billings).

*Lingula iole* Billings, Pal. Geol. Surv. Canada, Fossils, 1, 1865, p. 215, fig. 199.

*Lingulella iole* Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 508, pl. 27, figs. 5, 5a.

Chazyan (Quebec—P): Four miles northeast of Portland Creek, Newfoundland.

LINGULELLA IOWENSIS Whilfield. See *Lingula iowensis*.

**Lingulella irene** (Billings).

*Lingula irene* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 71, fig. 64 (adv. sheets, 1862); Geol. Canada, 1863, p. 230, fig. 240.

*Lingulella irene* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 257.—Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 508, pl. 27, fig. 6, 6a.

Canadian (Levis, *Didymograptus* and *Diplograptus dentatus* zones): Point Levis, Quebec.

**Lingulella iris** (Billings).

*Lingula iris* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 301, fig. 290.

*Lingulella iris* Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 509, pl. 27, fig. 2.

Ozarkian? (Levis-erratic): Point Levis, Quebec.

**Lingulella lævis** Matthew.

*Lingulella lævis* Matthew, Trans. Roy. Soc. Canada, 9, 1892, p. 39, pl. 12, figs. 4a, 4b.—Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 512, pl. 19, figs. 4, 4a, b. Canadian (Bretonian—Div. C3a): St. John Harbor, St. John, New Brunswick.

**Lingulella lævis grandis** Matthew.

*Lingulella lævis grandis* Matthew, Geol. Surv. Canada, Rep. Cambrian Rocks, Cape Breton, 1903, pp. 200–201, pl. 15, figs. 1a–d.—Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 512, pl. 19, fig. 4c. Canadian (Bretonian—Div. C3a): Escasonie Shore, East Bay, Cape Breton, Nova Scotia and St. John, New Brunswick.

LINGULELLA LÆVIS LENS Matthew. See *Lingulella lens*.

**Lingulella lens** (Matthew).

*Lingula? lens* Matthew, Bull. Nat. Hist. Soc. New Brunswick, 4, pt. 4, 1901, pp. 274–275, pl. 5, figs. 3a–h.

*Obolus* (*Lingulella*) *bellus* Walcott, (part), Proc. U. S. Nat. Mus., 23, 1901, pp. 685–687.

*Obolus* (*Lingulella*) *lens* Walcott, *ibid.*, 25, 1902, pp. 606–607.

*Lingulella lævis lens* Matthew, Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, pp. 201–203, pl. 15, figs. 3a–h.

*Lingulella lens* Matthew, *ibid.*, 1903, pp. 205–206.—Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 512, pl. 33, figs. 1a–d.

Canadian (Bretonian—Div. C3a?): McAdam Shore, East Bay, Cape Breton, Nova Scotia.

**Lingulella lepis** (Salter).

*Lingula lepis* Salter, Murchison's *Siluria*, 3d ed., p. 543.—Davidson, *British Foss. Brach.*, 3, pt. 7, No. 1, 1866, p. 54, pl. 3, figs. 53–59; *British Foss. Brach.*, 3, pt. 7, 1871, pl. 69, figs. 31, 31a.—Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 514, pl. 31, figs. 4a–f. (See for complete bibliography.)

*Lingulella cf. lepis* Matthew, Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, p. 204.

Lower Ordovician: Ceratopyge limestone and *Dietyonema* shales of Norway and Sweden; Upper Tremadoc of Wales.

Canadian (Bretonian—Div. C3a and C3c): Cape Breton, Nova Scotia, and St. John Basin, St. John County, New Brunswick.

*Plesiotypes*.—Cat. Nos. 51741, 51742, U.S.N.M.

LINGULELLA MAERA Walcott. See *Obolus maera*.

**Lingulella manticula** (White).

*Lingula? manticula* White (part), U. S. Geog. Surv. W. 100th Mer., Prelim. Rep. Invert. Fossils, 1874, pp. 9, 10; *ibid.*, 4, pt. 1, 1877, p. 52, pl. 3, fig. 2b.

*Lingulella manticula* Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 517, pl. 20, figs. 1, 1a–c.

Lower Ordovician (Pogonip): Eureka District, Eureka County and White Pine County, Nevada. Also Upper and Middle Cambrian of Utah and Nevada.

*Holotype* and *plesiotype*.—Cat. Nos. 8569, U.S.N.M.

LINGULELLA? MATINALIS Walcott. See *Obolus matinalis*.

**Lingulella minor** (Matthew).

*Lingulella starii minor* Matthew, Trans. Roy. Soc. Canada, 9, sec. 4, 1892, pp. 58–59, pl. 40, figs. 5a–b.

**Lingulella minor**—Continued.

*Lingulella minor* Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 519, pl. 37, figs. 3-3g.

Canadian (Bretonian—Div. C3b): Long Island, Kennebecasis Bay, St. John County, New Brunswick.

LINGULELLA MINUTA Schuchert. See *Linnarssonella minuta*.

**Lingulella moosensis** Walcott.

*Lingulella moosensis* Walcott, Smiths. Misc. Coll., 57, 1912, p. 232, pl. 35, figs. 1-6. Lower Ordovician (Goodsir): Ice River Valley and Mollison Creek, near Leanochoil, British Columbia.

**Lingulella mosia** (Hall).

*Lingula mosia* Hall, 16th Ann. Rep. New York State Cab. Nat. Hist., 1863, p. 126, pl. 6, figs. 1-3a; Trans. Albany Inst., 5, 1867, pp. 102-103, pl. 1, figs. 1-3a.—Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, pt. 1, 1896, p. 95.

*Lingulella mosia* Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 520, pl. 18, figs. 1a-f.

Ozarkian (Oneota): St. Croix River, Wisconsin and Minnesota. Also Upper Cambrian of Minnesota, Iowa, etc.

*Plesiotypes*.—Cat. Nos. 27370, 27371, U.S.N.M.

**Lingulella pogonipensis** (Walcott).

*Obolus* (*Lingulella*) *pogonipensis* Walcott, Proc. U. S. Nat. Mus., 21, 1898, pp. 411, 412.

*Lingulella pogonipensis* Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 525, pl. 20, figs. 3, 3a-c.

Lowest Ordovician (?Upper Cambrian): Eureka District, Eureka County, Nevada. Also Upper Cambrian of Utah and Arizona.

*Holotype* and *paratypes*.—Cat. No. 27332, U.S.N.M.

**Lingulella prima** (Hall).

*Lingula prima* (Conrad MS.) Hall, Pal. New York, 1, 1847, p. 3, pl. 1, fig. 2.

*Lingulella prima* Walcott, Smiths. Misc. Coll., 57, 1912, p. 262, pl. 41, figs. 8-11.

Upper Cambrian or Ozarkian (Potsdam): Essex County, New York.

*Plesiotype*.—Cat. No. 27435, U.S.N.M.

LINGULELLA ROGERSI Grabau. See *Obolus* (*Westonia*) *rogersi*.

LINGULELLA? SPISSA Billings. See *Obolus* (*Lingulobolus*) *spissus*.

LINGULELLA STARRI MINOR Matthew. See *Lingulella minor*.

LINGULELLA STONEANA Whitfield. See *Obolus* (*Westonia*) *stoneanus*.

LINGULEPIS of authors. See *Lingulella* subgenus *Lingulepis*.

LINGULEPIS ACUMINATA Matthew. See *Lingulella* (*Lingulepis*) *acuminata*.

LINGULEPIS AFFINIS Walcott. See *Obolus* (*Lingulobolus*) *affinis*.

LINGULEPIS MAERA Hall and Whitfield. See *Obolus maera*.

LINGULEPIS MATINALIS Hall. See *Obolus matinalis*.

LINGULEPIS? MINUTA Hall and Whitfield. See *Linnarssonella minuta*.

LINGULEPIS MORSENSIS Winchell. See *Lingula morsei*.

LINGULEPIS MORSII Hall and Clarke. See *Lingula morsei*.



*LINGULEPIS PINNAFORMIS* Hall. See *Obolus matinalis*.

*LINGULEPIS PINNAFORMIS* Whitfield. See *Lingulella (Lingulepis) acuminata*.

*LINGULEPIS STARRI* var. Matthew. See *Lingulella (Lingulepis) exigua*.

*LINGULEPIS STARRI EXIGUA* Matthew. See *Lingulella (Lingulepis) exigua*.

*LINGULOBOLUS* Matthew. See *Obolus* subgenus *Lingulobolus*.

*LINGULOBOLUS AFFINIS* Matthew. See *Obolus (Lingulobolus) affinis*.

**LINGULOPS** Hall.

Genotype: *L. whitfieldi* Hall.

*Lingulops* Hall, Notes on some New or Imperfectly Known Forms among the Brachiopoda, 1871, p. 2; *ibid.*, 1872, p. 2, pl. 13, figs. 1, 2; 23d Rep. New York State Cab. Nat. Hist., 1873, p. 244, pl. 13, figs. 1, 2.—Davidson and King, Quart. Jour. Geol. Soc. London, 30, 1874, p. 164.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 18, 46, 163; 11th Ann. Rep. New York, State Geol., 1894, p. 233.—Miller, N. A. Geol. Pal., p. 352.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 308; 2d ed., 1913, p. 374.—Clarke, Archivos Mus. Nac. Rio de Janeiro, 10, author's Eng. ed., 1900, p. 6.

***Lingulops cliftonensis*** Foerste.

*Lingulops cliftonensis* Foerste, Jour. Geol., 11, 1903, p. 38.  
Richmond (Fernvale): Clifton, Tennessee.

***Lingulops derbyi*** Clarke.

*Lingulops derbyi* Clarke, Archivos Mus. Nac. Rio de Janeiro, 10, author's Eng. ed., 1900, p. 5, pl. 1, fig. 4.—Katzner, Grundr. d. Geol. d. unt. Amazonas., Leipzig, 1903, pl. 16, fig. 2.  
Silurian: Rio Trombetas, Brazil.

***Lingulops granti*** Hall and Clarke.

*Lingulops granti* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 19, 173, pl. 4K, figs. 14, 15; 48th Rep. New York State Mus., 2, for 1895, 1897, p. 328, pl. 1, figs. 7, 8; 14th Rep. State Geol. New York for 1894, 1897, p. 328, pl. 1, figs. 7, 8.  
Niagaran dolomite: Hamilton, Ontario.  
*Plastotype*.—Cat. No. 45197, U.S.N.M.

***Lingulops illinoisensis*** Savage.

*Lingulops illinoisensis* Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 111, pl. 7, figs. 3, 4.  
Upper Medinan (Channahon): Will County, Illinois.

***Lingulops norwoodi*** (James).

*Lingula norwoodi* James, Cincinnati Quart. Jour. Sci., 2, 1875, p. 10, fig. 2; Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 235, pl. 10, fig. 1.—Miller, N. A. Geol. Pal., 1889, p. 350, fig. 574.  
*Lingulops Norwoodi* Huene, Verh. d. Russ.-Kais. Min. Ges. St. Petersburg., 2d ser., 36, 1899, p. 336, fig. 3.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 19, pl. 2, figs. 24-26.—Hayes and Ulrich, U. S. Geol. Surv., folio 95, ill. sheet, 1903, fig. 35.  
Trenton (upper): West Covington, Kentucky.

***Lingulops ovata*** Savage.

*Lingulops ovata* Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 45, pl. 1, figs. 7, 8.  
Upper Medinan (Girardeau): Near Thebes, Illinois.

**Lingulops whitfieldi** Hall.

*Lingulops whitfieldi* Hall, Notes on some New or Imperfectly Known Forms among the Brach., 1872, p. 2, pl. 13, fig. 12; 23d Rep. New York State Cab. Nat. Hist., 1873, pl. 13, figs. 1, 2.—Davidson and King, Quart. Jour. Geol. Soc. London, 30, 1874, p. 164, pl. 19, fig. 9.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 19, pl. 2, figs. 27-30.—Crane, Geol. Mag., dec. 4, 2, 1895, pl. 15, fig. 6.

Richmond (Maquoketa): Near Lattners, Dubuque County, Iowa.

*Plasiotypes*.—Cat. No. 45196, U.S.N.M.

**Linipora** Troost.Genotype: *L. rotunda* Troost.

*Linipora* Troost, 5th Geol. Rep. Tennessee, 1840, p. 64.

**Linipora rotunda** Troost.

Not recognizable.

*Linipora rotunda* Troost, 5th Geol. Rep. Tennessee, 1840, p. 64.

Silurian: Near Brownsport, Tennessee.

**LINNARSSONELLA** Walcott.Genotype: *L. girtyi* Walcott.

*Linnarssonella* Walcott, Proc. U. S. Nat. Mus., 25, 1902, pp. 601-602; Smiths.

Misc. Coll., 53, pl. 11, pp. 142-146; Mon. U. S. Geol. Surv., 51, 1912, p. 665.

**Linnarssonella minuta** (Hall and Whitfield).

*Lingulepis?* *minuta* Hall and Whitfield, King's U. S. Geol. Expl. 40th Parl., 4, 1877, p. 206, pl. 1, figs. 3, 4.—Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 13.

*Obolella?* *minuta* Walcott, Amer. Jour. Sci., 4th ser., 3, 1897, p. 404; Walcott, Mon. U. S. Geol. Surv., 32, pt. 2, 1899, p. 443.

*Lingulella minuta* Schuchert, Bull. U. S. Geol. Surv., 1897, 87, p. 257.

*Acrotreta minuta* Walcott, Proc. U. S. Nat. Mus., 23, 1901, p. 673.

*Linnarssonella minuta* Walcott, Proc. U. S. Nat. Mus., 25, 1902, pp. 603, 604; Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 667, pl. 79, figs. 2, 2a-b.

Lowest Ordovician: White Pine District, Nye County, Nevada.

Upper Cambrian: Eureka District, Nevada.

*Plesiotypes*.—Cat. No. 24553, U.S.N.M.

**LINNARSSONIA** Walcott. See *Acrotreta* Kutorga.

**LINNARSSONIA PRETIOSA** Dawson and Hinde. See *Acrothele pretiosa*.

**LIOCLEMA** Ulrich.Genotype: *Callopora punctata* Hall.

*Lioclema* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, pp. 141, 154.—Miller, N. A. Geol. Pal., 1889, p. 310.—Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 376, 425.—Rominger, Amer. Geol., 6, 1890, p. 119.

*Lioclema* Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 33.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 165; Bull. New York State Mus., 45, 1901, p. 165.—Ulrich and Bassler, Smiths. Misc. Col., 47, 1904, p. 38.—Bassler, U. S. Geol. Surv., 292, 1906, p. 32; Bull. U. S. Nat. Mus., 77, 1911, p. 246.

**Lioclema asperum** (Hall).

*Callopora aspera* Hall, Pal. New York, 2, 1852, p. 147, pl. 40, figs. 4a-i.

*Lioclema asperum* Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 416, 425.

*Lioclema aspera* Grabau, Bull. New York State Mus., 45, 1901, p. 165, fig. 63; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 165, fig. 63.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, pp. 32, 33, pl. 11, figs. 1-3; pl. 24, figs. 14-16.

Clinton: Lockport, Rochester, etc., New York; Grimsby, Ontario (Rochester); Osgood, Indiana (Osgood).

*Plesiotypes*.—Cat. 35504, U.S.N.M.

**Lioclema circinctum** Bassler.

*Lioclema circinctum* Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 34, pl. 13, figs. 11-14.

Clinton (Rochester): Lockport, New York.

*Holotype*.—Cat. No. 35509, U.S.N.M.

**Lioclema explanatum** Bassler.

*Lioclema explanatum* Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 33, pl. 13, figs. 8-10; pl. 26, fig. 4.

Clinton: Rochester, New York (Rochester); Osgood, Indiana (Osgood).

*Cotypes*.—Cat. No. 35503, U.S.N.M.

**Lioclema? exsul** (Hall).

*Alveolites exsul* Hall, 28th Ann. Rep. New York State Mus., doc. ed., 1876, pl. 9, figs. 3, 4.

*Callopora exsul* Hall, *ibid.*, mus. ed., 1879, p. 115, pl. 9, figs. 3, 4; 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 238, pl. 8, figs. 3, 4.—Miller, N. A. Geol. Pal., 1889, fig. 463 (p. 295).

*Lioclema? exsul* Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 303. Niagaran (Waldron): Waldron, Indiana.

**LIOCLEMA FLORIDA** Grabau. See *Nicholsonella florida*.

**Lioclema globulare** Bassler.

*Lioclema globulare* Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 35, pl. 27, figs. 18, 19.

Clinton (Rochester): Lockport, New York.

*Holotype*.—Cat. No. 35771, U.S.N.M.

**LIOCLEMA (?NICHOLSONELLA) LAMINATUM** Nickles and Bassler. See *Fistulipora laminata*.

**Lioclema multiporum** Bassler.

*Lioclema multiporum* Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 34, pl. 11, figs. 4-6; pl. 23, fig. 18; pl. 27, fig. 20.

Clinton: Lockport, Rochester, etc., New York; Hamilton and Grimsby, Ontario (Rochester); Waldron, Indiana (Osgood).

*Cotypes*.—Cat. Nos. 35501, 35764, U.S.N.M.

**Lioclema peculiare** Bassler.

*Lioclema peculiare* Bassler, Bull. U. S. Geol. Surv., 292, 1906, pp. 35, 36, pl. 23, figs. 19-22; pl. 25, fig. 13.

Clinton: Lockport, etc., New York (Rochester); Osgood, Indiana (Osgood).

*Cotypes*.—Cat. No. 35770, U.S.N.M.

**Lioclema pulchellum** Ulrich and Bassler.

*Lioclema pulchellum* Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 274, pl. 43, figs. 9-12.

Helderbergian (Keyser): Keyser, West Virginia.

*Holotype*.—Cat. No. 53646, U.S.N.M.

**Lioclema ramulosum** Bassler.

*Lioclema ramulosum* Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 35, pl. 11, figs. 11-13; pl. 25, figs. 9, 10.

Clinton: Lockport, New York; Grimsby, Ontario (Rochester); near Waldron, Indiana (Osgood).

*Cotypes*.—Cat. No. 35508, U.S.N.M.

**Lioclema subramosum** Ulrich and Bassler.

*Lioclema subramosum* Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 273, pl. 43, figs. 1-4; pl. 44, fig. 5.

Helderbergian (Keyser): Keyser, West Virginia; Cash Valley, Maryland.

*Cotypes*.—Cat. No. 53647, U.S.N.M.

**Lioclema variporum** (Billings).

*Helopora varipora* Billings, Cat. Sil. Foss. Anticosti, 1866, p. 40.

Anticostian (Jupiter River): East Point, east of Jupiter River, etc., Anticosti.

**Lioclema wilmingtonense** Ulrich.

*Leioclema wilmingtonense* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 426, pl. 34, figs. 4-4b.

*Monticulipora wilmingtonense* J. F. James, Jour. Cincinnati Soc. Nat. Hist., 18, 1895, p. 76.

Richmond (Fernvale): Wilmington, Illinois.

Figured sections of *holotype*.—Cat. No. 43776, U.S.N.M.

**LIOCLEMELLA** Foerste.

Genotype: *Callopora ohioensis* Foerste.

*Lioclemella* Foerste, Geol. Surv., Ohio, 7, 1895, p. 600.—Nickles and Bassler, Bull.

U. S. Geol. Surv., 173, 1900, p. 33.—Ulrich and Bassler, Smiths. Misc. Coll., 47, 1904, p. 39.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 36; Bull. U. S.

Nat. Mus., 77, 1911, p. 249.

**Lioclemella annulifera** (Whitfield).

*Trematopora annulifer* Whitfield, Ann. Rep. Geol. Surv. Wisconsin for 1877, 1878, p. 67; Geol. Surv. Wisconsin, 4, 1882, p. 254, pl. 11, figs. 15-17.—Buel,

Trans. Wisconsin Acad. Sci., 5, 1882, p. 187.

*Batostomella annulifera* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 141.

*Lioclemella annulifera* (Ulrich) Foerste, Geol. Surv. Ohio, 7, 1895, p. 600.

Richmond: Delafield and Iron Ridge, Wisconsin (Maquoketa); Eaton, Ohio.

**Lioclemella fusiformis** (Whitfield).

*Chaetetes fusiformis* Whitfield, Ann. Rep. Geol. Sur. Wisconsin for 1877, 1878, p. 70; Geol. Sur. Wisconsin, 4, 1882, p. 248, pl. 11, figs. 13, 14.—Buel, Trans.

Wisconsin Acad. Sci., 5, 1882, p. 191.

*Monticulipora* (*Chaetetes*) *fusiformis* Chamberlin, Geol. Wisconsin, 1, 1883, p. 172, fig.

*Lioclemella fusiformis* (Ulrich) Foerste, Geol. Sur. Ohio, 7, 1895, p. 600.

Richmond (Maquoketa): Iron Ridge, Wisconsin.

**Lioclemella maccombi** Bassler.

*Lioclemella maccombi* Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 36, pl. 11, figs. 7-10; pl. 25, figs. 5-7.

Clinton: Lockport, Lewiston, and Niagara Falls, New York; Grimsby and Hamilton, Ontario (Rochester); Osgood, Indiana (Osgood).

*Cotypes*.—Cat. No. 35535, U.S.N.M.

**Lioclemella nitida** (Ulrich).

*Trematopora?* *nitida* Ulrich, Geol. Sur. Illinois, 8, 1890, p. 419, pl. 34, figs. 2-2f.

*Lioclemella nitida* (Ulrich) Foerste, Geol. Sur. Ohio, 7, 1895, p. 600.

Richmond: Savannah, Illinois (Maquoketa); Charleton Point, etc., Anticosti (Charleton).

*Cotypes*.—Cat. No. 43778, U.S.N.M.

**Lioclemella ohioensis** (Foerste).

Callopora ohioensis Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 174; *ibid.*, 3, 1888, pl. 16, fig. 6.

Lioclemella ohioensis Foerste, Geol. Sur. Ohio, 7, 1895, p. 600, pl. 29, fig. 6.—Ulrich and Bassler, *Smiths. Misc. Coll.*, Quart., 47, 1904, p. 39, pl. 12, figs. 6-9.

Upper Medinan (Brassfield): Dayton and Centerville, Ohio.

*Plesiotypes*.—Cat. No. 44063, U.S.N.M.

**Lioclemella solidissima** (Whitfield).

Fistulipora solidissima Whitfield, Ann. Rep. Geol. Sur. Wisconsin for 1877, 1878, p. 69; Geol. Sur. Wisconsin, 4, 1882, p. 255, pl. 11, 18, 19.—Buel, *Trans. Wisconsin Acad. Sci.*, 5, 1882, p. 188.

Lioclemella solidissima Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 308.

Richmond (Maquoketa): Delafield and Iron Ridge, Wisconsin; Savannah, Illinois.

**Lioclemella subfusiformis** (James).

Monticulipora (?Monotrypa) subfusiformis James, *Paleontologist*, No. 6, 1882, p. 52; *ibid.*, No. 7, 1883, pl. 1, 1.

Monticulipora fusiformis (not of Whitfield) James and James, *Jour.*, Cincinnati Soc. Nat. Hist., 11, 1888, p. 26.—J. F. James, *ibid.*, 18, 1895, p. 83.

Lioclemella subfusiformis Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 308.—Bassler, *Proc. U. S. Nat. Mus.*, 30, 1906, p. 42, pl. 7, figs. 4-7.

Richmond (Waynesville): Warren and Clinton Counties, Ohio; Indiana and Kentucky.

**LIOSPIRA** Ulrich and Scofield.

Genotypes: *Pleurotomaria micula* Hall and *P. americana* Billings.

*Pleurotomaria* and *Raphistoma* (part) of many authors.

Liospira Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 953.—Koken, Neues Jahrb. f. Min. Geol. Pal., 1, 1898, p. 18.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 950.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 640.—Dall, *Zittel-Eastman Textb. Pal.*, 2d ed., 1913, p. 525.

**Liospira abrupta** Ulrich and Scofield.

Liospira abrupta Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 995, pl. 82, figs. 35-38.

Stones River (Murfreesboro): Murfreesboro, Tennessee.

Black River: High Bridge, Kentucky; Minneapolis and Chatfield, Minnesota.

*Cotypes*.—Cat. No. 46060, U.S.N.M.

**Liospira affinis** (Foerste).

Raphistoma affinis Foerste, Bull. Sci. Lab. Denison Univ., 1885, p. 95, pl. 14, fig. 18; Geol. Surv. Ohio, Pal., 7, 1893, p. 550, pl. 26, fig. 18; pl. 37A, figs. 1a-c.

Liospira cf. affinis Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 95, pl. 6, fig. 5.

Upper Medinan: Near Dayton, and Clinton County, Ohio; Summerville, Georgia (Brassfield); Pike County, Missouri, and Calhoun County, Illinois (Edgewood)

**Liospira americana** (Billings).

*Pleurotomaria* (or *Raphistoma*) lenticularis (part) of American authors. (Not Sowerby.)

*Pleurotomaria americana* Billings, Can. Nat. Geol., 5, 1860, p. 164, fig. 7; Geol. Canada, Geol. Surv. Canada, 1863, p. 184, fig. 179; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 17 (loc. ref.).

**Liospira americana**—Continued.

*Liospira americana* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 191.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 165.—Ruedemann, Bull. New York State Mus., 49, 1901, p. 31, pl. 2, fig. 7.

Stones River—Richmond: Ottawa, Montreal, etc., Canada; Manitoba; Baffin Land; Minnesota (Trenton); Lebanon and Maury Counties, Tennessee (Stones River and Black River); Island of Anticosti, etc. (Richmond).

**Liospira angulata** Ulrich.

*Liospira angulata* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1000, pl. 69, figs. 42–46. Black River (Lowville): Mercer County, Kentucky.

*Cotypes*.—Cat. No. 45869, U.S.N.M.

**Liospira angustata** Ulrich and Scofield.

*Liospira angustata* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 997, pl. 68, figs. 35–37; pl. 69, figs. 1–2.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 192.

Black River and Trenton: Minneapolis, Minnesota (Platteville); Fillmore County, Minnesota (Prosser); Inmost Island, Lake Winnipeg.

*Cotypes*.—Cat. No. 45870, U.S.N.M.

**Liospira convexa** Ulrich and Scofield.

*Liospira convexa* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 998.

Stones River (Ridley): Rutherford County, Tennessee.

*Cotypes*.—Cat. No. 47804, U.S.N.M.

**Liospira decipens** Ulrich.

*Liospira decipens* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 998, pl. 82, figs. 39–41.

*Raphistoma decipiens* Miller, N. A. Geol. Pal., 2d App., 1897, p. 770 (gen. ref.).

Stones River (Murfreesboro): Murfreesboro, Tennessee.

*Holotype*.—Cat. No. 45871, U.S.N.M.

**Liospira docens** (Billings).

*Pleurotomaria docens* Billings, Canadian Nat. Geol., 4, 1859, p. 452, figs. 27–29;

Geol. Canada, Geol. Surv. Canada, 1863, p. 132, figs. 63a–c.—Lesley, Rep.

Geol. Surv. Pennsylvania, 4, 1869, p. 707, figs.—Raymond, Ann. Carnegie Mus., 4, 1908, p. 176.

*Liospira docens* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 994 (gen. ref.).—Raymond, Ann. Carnegie Mus., 4, 1908, p. 193.

Stones River (Pamelia): Near L'Original, Canada.

**Liospira eugenia** (Billings).

*Pleurotomaria eugenia* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 30,

figs. 29–31 (adv. sheets 1862); Geol. Canada, Geol. Surv. Canada, 1863, p.

144, figs. 87a–c.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 708, figs.

*Liospira eugenia* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 994 (gen. ref.).—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 640, fig. 872.

Black River: St. Joseph Island, Lake Huron.

**Liospira helena** (Billings).

*Pleurotomaria helena* Billings, Canadian Nat. Geol., 5, 1860, p. 165, fig. 8; Cat.

Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 17 (loc. ref.).

*Liospira helena* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 994 (gen. ref.).

Richmond and Gamachian: Cape Smyth, Manitoulin Island; Charleton Point and Macasty Bay, Anticosti.

***Liospira larvata* (Salter).**

- Helicotoma larvata* Salter, Geol. Surv. Canada, dec. 1, 1859, p. 15, pl. 2, figs. 11-14.  
*Liospira larvata* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 994 (gen. ref.).  
*Helicotoma*(?) (*Liospira*?) *larvata* Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 166.  
 Mohawkian: Allumette Island, Ottawa River, Canada (Black River-Leray); Baffin Land.

***Liospira micula* (Hall).**

- Pleurotomaria micula* Hall, Geol. Rep. Wisconsin, 1862, p. 55, fig. 1.  
*Raphistoma micula* James, J. F., Amer. Geol., 5, 1890, p. 355.  
*Liospira micula* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 994, pl. 68, figs. 24-29.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 182, pl. 12, figs. 24, 25.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 640, figs. 871a-d.  
 Trenton-Richmond: Wisconsin, Illinois, Iowa, Minnesota (Maquoketa); Kentucky, Ohio, Indiana, Tennessee, etc.; New Jersey, etc.  
*Plesiotypes*.—Cat. No. 45872, U.S.N.M. (Ulrich and Scofield).

***Liospira modesta* Ulrich.**

- Liospira modesta* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, pl. 82, figs. 42-44.  
 Black River (Decorah): Chatfield, Minnesota.  
*Holotype*.—Cat. No. 45873, U.S.N.M.

***Liospira*(?) *mundula* Ulrich.**

- Liospira*(?) *mundula* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 999, pl. 69, figs. 37-41.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 642, figs. 875a, b.  
 Black River (Leray): Pauquettes Rapids, Ottawa River, Canada.  
 Trenton: Mercer County and Danville, Kentucky.  
*Cotypes*.—Cat. No. 45874, U.S.N.M.

***Liospira numeria* (Billings).**

- Pleurotomaria numeria* Billings, Pal. Foss., Geol. Surv. Canada, 1865, p. 229, figs. 213a, b.  
*Liospira numeria* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 994 (gen. ref.).  
 Canadian (Quebec—G): Cape Norman, Newfoundland.

***Liospira obtusa* Ulrich and Scofield.**

- Liospira obtusa* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 997, pl. 68, figs. 30-34.  
 Black River (Platteville): Minneapolis, Minnesota; Dixon, Illinois; Beloit, Wisconsin.  
*Cotypes*.—Cat. No. 45875, U.S.N.M.

***Liospira perlata* (Hall).**

- Pleurotomaria perlata* Hall, Pal. New York, 2, 1852, p. 349, pl. 84, figs. 5a-c.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 193, fig.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 22; *ibid.*, pt. 2, 1895, p. 75.  
*Liospira perlata* (Ulrich) Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 332 (gen. ref.).  
*Pleurotomaria sofarioides* Billings, Geol. Canada, 1863, p. 341, figs. 347a, b.—Lesley, Geol. Survey Pennsylvania, Rep. P 4, 1889, p. 715, figs.  
 Niagaran (Guelph): Galt, Ontario; Wisconsin.

**Liospira persimilis** Ulrich.

*Liospira persimilis* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 998, pl. 68, figs. 45-47.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 192 (loc. occ.).

Trenton: Hartsville, Tennessee (Catheys); Reindeer Island, Lake Winnipeg.  
*Cotypes*.—Cat. No. 45876, U.S.N.M.

**Liospira prævica** (Whitfield).

*Raphistoma prævium* Whitfield, Bull. Amer. Mus. Nat. Hist., 2, 1889, p. 52, pl. 8, figs. 5-7.—Koken, Neues Jahrb. f. Min., Geol. Pal., 6, Beilage-Band, 1889, p. 478.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 851, figs.

*Liospira prævium* Ulrich and Schofield, Geol. Minnesota, 3, pt. 2, 1897, p. 993 (gen. ref.).

Canadian (Beekmantown): Beekmantown, New York.

**Liospira progne** (Billings).

*Pleurotomaria Progne* Billings, Canadian Nat. Geol., 5, 1860, p. 163, fig. 6; Geol. Canada, Geol. Surv. Canada, 1863, p. 181, fig. 176.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 714, figs.

*Liospira progne* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 996, pl. 48, figs. 38-44.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 640, fig. 871e-g.

Stones River-Trenton: Ottawa, Montreal, Belleville, etc., Canada (Trenton); Murfreesboro and Lebanon, Tennessee (Stones River and Black River); Kentucky; Minnesota; etc.

*Plesiotypes*.—Cat. Nos. 45877-45880, U.S.N.M.

**Liospira rugata** Ulrich.

*Liospira rugata* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 999, pl. 69, figs. 33-36.  
Richmond (Arnheim): Lincoln County, Kentucky.

*Holotype*.—Cat. No. 45881, U.S.N.M.

**Liospira strigata** Collie.

*Liospira strigata* Collie, Bull. Geol. Soc. America, 14, 1903, p. 419, pl. 59, figs. 8, 9.  
Canadian (Beekmantown): Bellefonte, Pennsylvania.

**Liospira subconcaua** Ulrich.

*Liospira subconcaua* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 999, pl. 69, figs. 30-32.

Stones River (Murfreesboro): Near Murfreesboro, Tennessee.

*Cotypes*.—Cat. No. 46061, U.S.N.M.

**Liospira subtilistriata** (Hall).

*Pleurotomaria subtilistriata* Hall, Pal. New York, 1, 1847, p. 172, pl. 37, figs. 5a-d.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 233, pl. 6, figs. 11, 12.—Ford and Dwight, Amer. Jour. Sci. Arts, 3d ser., 31, 1886, p. 253, pl. 7, figs. 1, 10a-i.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 717, figs.

*Raphistoma subtilistriata* Miller, N. A. Geol. Pal., 1889, p. 425 (gen. ref.).

*Liospira subtilistriata* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 944 (gen. ref.).—Ruedemann, Bull. New York State Mus., 49, 1901, p. 33.

Trenton: Watertown, etc., New York.

**Liospira vitruvia** (Billings).

*Pleurotomaria Vitruvia* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 171.

*Liospira vitruvia* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 995, pl. 69, figs. 3-8.—Cumings, 32d, Ann. Rep. Dep. Geol. Nat. Res. Indiana,



**Liospira vitruvia**—Continued.

1908, p. 965, pl. 40, figs. 14, 14b.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 641, figs. 871h-k.—Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 139.

Black River—Richmond: Pauquette's Rapids, Ottawa River, etc., Canada (Black River); New York; Ohio; Kentucky; Tennessee; Iowa; Wisconsin; Minnesota, etc.

*Plesiotypes*.—Cat. Nos. 45882-45884, U.S.N.M.

**LIOSTRACUS HAGUEI** Brögger. See *Ptychoparia haguei*.

**LIOSTRACUS?** *JERSEYENSIS* Weller. See *Solenopleura jerseyensis*.

**LISANIA** Walcott.

Genotype: *Anomocarella? bura* Walcott.

*Lisania* Walcott, Smiths. Misc. Coll., 57, No. 4, 1911, pp. 82, 83; Cambrian Faunas of China, Carnegie Inst., 3, 1913, p. 163.

**Lisania? hisingeri** (Billings).

*Dikelocephalus hisingeri* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 196, fig. 182.

*Conocephalites hisingeri* Matthew, Trans. Roy. Soc. Canada, 10, sec. 4, 1893, p. 11, footnote.

*Lisania? hisingeri* Walcott, Smiths. Misc. Coll., 57, No. 13, 1914, p. 351 (gen. ref.). Ozarkian? (Levis-erratic): Point Levis, Quebec.

**LISSATRYPA** Twenhofel.

Genotype: *L. atheroidea* Twenhofel.

*Lissatrypa* Twenhofel in Hortedahl, 2d Arct. Exp. Fram, 1898-1902, No. 32, 1914, p. 24.—Twenhofel, Bull. Victoria Mem. Mus., 3, 1914, p. 31.

**Lissatrypa atheroidea** Twenhofel.

*Lissatrypa atheroidea* (Twenhofel MS.) Hortedahl, 2d Arct. Exp. "Fram," 1898-1902, No. 32, 1914, p. 24.—Twenhofel, Bull. Victoria Mem. Mus., 3, 1914, p. 33, pl. 1, figs. 11-15.

Anticostian (Gun River, Jupiter River): Jupiter River, etc., Anticosti.

**Lissatrypa phoca** (Salter).

*Rhynchonella phoca* Salter, Sutherland's Jour. Voyage Baffin's Bay, etc., 2, 1852, p. 226, pl. 5, figs. 1-3.

*Atrypa phoca* Haughton, Journ. Geol. Soc. Dublin, 1, 1859, p. 240, pl. 5, figs. 3, 4, 7.—Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 576.—Woodward, Geol. Mag., dec. 2, 5, 1878, p. 389, pl. 10, fig. 8.—Lambe, Cruise of the "Arctic" in 1908-9, 1910, p. 481.—Lee, Proc. Roy. Phys. Soc. Edinburgh, 18, 1912, p. 258.

*Hindella phoca* Ami, Cruise of the "Neptune," App., 1906, p. 329.

*Lissatrypa phoca* Hortedahl, 2d Arct. Exp. "Fram," 1898-1902, No. 32, 1914, p. 25, pl. 7, fig. 13.

Silurian: Cape Riley, Seal Islands, Bessels Bay, etc., Arctic America.

**Lissatrypa scheii** Hortedahl.

*Lissatrypa scheii* Hortedahl, 2d Arct. Exp. "Fram," 1898-1902, No. 32, 1914, p. 24, pl. 7, figs. 9-12.

Helderbergian (Lower beds): Seal Bay, etc., Southwestern Ellesmereland, Arctic America.

**LITHODENDRON DICHOTOMUM** Eaton. See *Buthotrephis gracilis*.

**Lithodictyon** Conrad.

Genotype: *L. beckii* Conrad.

*Lithodictyon* Conrad, 1st Ann. Rep. New York Geol. Surv., 1837, p. 167, footnote.

Observation.—Not recognized. Founded on sand fillings in sun cracks.

**Lithodictyon beckii** Conrad.

Lithodictyon Beckii Conrad, 1st Ann. Rep. New York Geol. Surv., 1837, p. 167, footnote.

Dictuolites beckii Hall, Nat. Hist. New York, Geol., 4, 1843, p. 48, pl. 1, fig. 1; *ibid.*, Pal. New York, 2, 1852, p. 6, pl. 3, fig. 1.

Dictyophyton becki Miller, N. A. Geol. Pal., 1889, p. 158 (gen. ref.).

Upper Medinan: Near Medina, New York.

**LITHOSTROTION STOKESI** Edwards and Haime. See *Columnaria* (*Palæophyllum*) *stokesi*.

**LITOCERAS** Hyatt.

Genotype: *L. whiteavesi* Hyatt.

*Litoceras* Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 268.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 774.—Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 474.

**Litoceras biangulatum** Hyatt.

*Litoceras biangulatum* Hyatt, Proc. Amer. Phil. Soc. 32, 1894, p. 479.

Canadian (Quebec): Point Rich, Newfoundland.

**Litoceras hercules** (Billings).

*Nautilus hercules* Billings, Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, p. 306; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 23 (loc. ref.).

*Litoceras?* *hercules* Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 480.

Richmond (Charleton): Charleton Point, Anticosti.

**Litoceras insigne** (Whiteaves).

*Apsidoceras insigne* Whiteaves, Trans. Roy. Soc. Canada, 7, sec. 4, 1890, p. 82, pl. 17.

*Litoceras insigne* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 125.

Richmond (Stony Mountain): Stony Mountain, Manitoba.

**Litoceras? insolens** (Billings).

*Nautilus insolens* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 258.

*Litoceras insolens?* Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 476.

Chazyan (Quebec—L): Point Rich and Gargamelle Cove, west coast Newfoundland.

**LITOCERAS VERSUTUM** Hyatt. See *Litoceras whiteavesi*.

**Litoceras versutum** (Billings).

*Nautilus versutus* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 258.

Canadian (Quebec—H): Bonne Bay, Newfoundland.

**Litoceras whiteavesi** Hyatt.

*Litoceras versutum* Hyatt (not Billings), Proc. Boston Soc. Nat. Hist., 22, 1884, p. 268.

*Litoceras whiteavesi* Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 475.

Canadian (Quebec): Point Rich and Gargamelle Cove, Newfoundland.

**LITTORINA ANTIQUA** Hall. See *Holopea antiqua*.

**LITTORINA CANCELLATA** Hall. See *Strophostylus cancellatus*.

**LITUITES** Montfort.

Genotype: *L. lituus* Montfort.

*Lituites* Montfort, Conch. Syst., 1, 1808, p. 279.—Quenstedt, Neues Jahrb. f. Min., etc., 1840, p. 276.—D'Orbigny, Prodr. de Pal., 1, 1849, p. 1.—Saemann, Palæontographica, 3, 1852, pp. 159, 163.—Pictet, Traite de Pal., 2d ed., 2, 1854, p. 630.—McCoy, British Pal. Rocks Foss., 1854, p. 323.—Barrande,

**LITUITES**—Continued.

Neues Jahrb. f. Min., etc., 1854, p. 6, pl. 1, fig. 3.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 146.—Barrande, Bull. Soc. Geol. France, 2d ser., 12, 1855, p. 158.—Billings, Canadian Nat. Geol., 2, 1857, p. 136.—Chapman, Canadian Jour., n. s., 8, 1863, p. 23; Expos. Min. Geol. Canada, 1864, p. 131.—Barrande, Syst. Sil. du Centre Boheme, 2, 1867, pt. 1, p. 168; Cephalopodes, Ext. Syst. Sil. du Centre Boheme, 1877, p. 107.—Koninck, Ann. d. Mus. Roy. Hist. Nat. de Belgique, 2, 1878, p. 82.—Angelin, Fragmenta Silurica, 1880, p. 8.—Remele, Zeits. d. d. geol. Gesell., 32, 1880, p. 434.—Blake, Mon. British Foss., Cephalopoda, 1882, p. 66.—Noetling, Zeits. d. d. geol. Gesell., 34, 1882, pp. 156, 189.—Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1883, p. 267, footnote.—Noetling, Jahrb. d. k. Preuss. geol. Landesans. u. Bergak. für 1883, 1884, p. 129.—Zittel, Handb. Pal., 2, 1884, pt. 1, p. 376, 377.—Holm, Pal. Abhandl., Dames and Kayser, 3, Heft 1, 1885, p. 24.—Miller, N. A. Geol. Pal., 1889, p. 442.—Holm, Geol. Foren. Stockholm Forhandl., 13, 1891, p. 438.—Schröder, Pal., Abhandl. von Dames u. Kayser, Neue Folge, 1, Heft 4, Jena, 1891, p. 43.—Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 506.—Koken, Die Leitfossilien, Leipzig, 1896, p. 50, fig. 35.

Observation.—This genus is apparently unrepresented in American strata, and all references to it by American authors are probably erroneous.

**LITUITES AMERICANUS** Miller. See *Barrandeoceras americanum*.

**LITUITES AMMONIUS** James. See *Trocholites ammonius*.

**LITUITES APOLLO** Billings. See *Eurystomites apollo*.

**LITUITES BAERI** James. See *Gyroceras baeri*.

**LITUITES BICKMOREANUS** Whitfield. See *Plectoceras bickmoreanum*.

**LITUITES CANCELLATUM** McChesney. See *Nautilus? cancellatum*.

**LITUITES CAPAX** Hall. See *Nautilus capax*.

**LITUITES CIRCULARIS** James. See *Trocholites circularis*.

**LITUITES COMPLANATA** Shumard. See *Aphetoceras complanatum*.

**LITUITES CONVOLVANS** Hall. See *Barrandeoceras americanum*.

**LITUITES EATONI** Whitfield. See *Schroederoceras eatoni*.

**LITUITES EATONI CASSINENSIS** Whitfield. See *Schroederoceras cassinense*.

**LITUITES FARNSWORTHI** Billings. See *Aphetoceras farnsworthi* and *Tarphyceras farnsworthi*.

**LITUITES GRAFTONENSIS** Meek and Worthen. See *Discoceras grafftonense*.

**LITUITES HERCULES** Winchell and Marcy. See *Protophragmoceras hercules*.

**LITUITES (OPHIDIOCERAS?) HERCULES CARROLLENSIS** Kindle and Breger. See *Protophragmoceras hercules carrollensis*.

**LITUITES IMPERATOR** Billings. See *Eurystomites imperator*.

**LITUITES INTERNASTRIATUS** Whitfield. See *Trocholites internastriatus*.

**LITUITES? MAGNIFICUM** Billings. See *Apsidoceras magnificum*.

**LITUITES MARSHI** Hall. See *Discoceras marshi*.

LITUITES MULTICOSTATUS Whitfield. See *Discoceras graftonense*.

Lituites *murchisoni* Troost. Not recognized.

Lituites *murchisoni* Troost, 6th Geol. Rep. Tennessee, 1841, p. 175.  
Ordovician: Washington County, Tennessee.

**Lituites?? niagarensis** Spencer.

Lituites *niagarensis* Spencer, Bull. Mus. Univ. State Missouri, 1, 1884, p. 69, pl. 7, fig. 9; Trans. Acad. Sci. St. Louis, 4, 1884, p. 610, pl. 7, fig. 9.  
Niagaran dolomite: Hamilton, Ontario.  
Observation.—Poorly defined and figured.

LITUITES ORTONI Meek. See *Discoceras ortonii*.

LITUITES PALINURUS Billings. See *Schröderoceras palinurus*.

LITUITES PLANORBIFORMIS James. See *Trocholites planorbiformis*.

**Lituites?? pluto** Billings.

Lituites *Pluto* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 259.  
Chazyan (Quebec—I): Point Rich, Newfoundland.

LITUITES ROBERTSONI Hall. See *Eurystomites robertsonii*.

LITUITES SEELYI Whitfield. See *Tarphyceras seelyi*.

LITUITES UNDATUS Hall. See *Plectoceras halli* and *P. undatum*.

LITUITES UNDATUS var. OCCIDENTALIS Hall. See *Plectoceras undatum occidentale*.

**LLOYDIA** Vogdes.

Genotype: *Bathyurus bituberculatus* Billings.

Lloydia *Vogdes*, Bull. U. S. Geol. Surv., 63, 1890, p. 97; Cal. Acad. Sci., Occ. Pap., 4, 1893, p. 320.—Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 66.

**Lloydia bituberculatus** (Billings).

*Bathyurus bituberculatus* Billings, Canadian Nat. Geol., 5, 1860, p. 319, fig. 22; Geol. Canada, Geol. Surv. Canada, 1863, p. 238, fig. 270; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 410, fig. 391.

Lloydia *bituberculatus* Vogdes, Bull. U. S. Geol. Surv., 63, 1890, p. 97.—Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 67, pl. 7, fig. 15.

Ozarkian? (Levis—erratics): Point Levis, Quebec.

**Lloydia oblongus** (Billings).

*Bathyurus oblongus* Billings, Canadian Nat. Geol., 5, 1860, p. 321, fig. 25; Geol. Canada, Geol. Surv. Canada, 1863, p. 238, fig. 268 (fig. only); Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 412, fig. 394.

Lloydia *oblongus* Raymond, Bull. Victoria Memorial Mus., 50, 1913, p. 68.

Ozarkian? (Levis—erratics): Point Levis, Quebec.

**Lloydia saffordi** (Billings).

*Bathyurus Saffordi* Billings, Canadian Nat. Geol., 5, 1860, p. 320, fig. 24; *ibid.*, 6, 1861, p. 313, figs. 1, 2; Geol. Canada, Geol. Surv. Canada, 1863, p. 239, figs. 274a, b.—Chapman, Canadian Jour., n. s., 8, 1863, p. 29, fig. 142a; p. 192, fig. 162; Expos. Min. Geol. Canada, 1864, p. 137, fig. 142a; p. 164, fig. 162.—Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 259, figs. 241a, b; p. 411, fig. 393.

Lloydia *saffordi* Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 67, pl. 7, fig. 16.

Canadian (Beekmantown): Phillipsburg and Point Levis, Quebec; Cowhead, Newfoundland.

**Lloydia solitarius** (Billings).

Bathyrus solitarius Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 362.

Lloydia solitarius Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 67.

Canadian(?): Hare Bay, Newfoundland.

**Lloydia? strenuus** (Billings).

Bathyrus strenuus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 204, fig. 188.

Lloydia strenuus Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 68.

Canadian (Beekmantown): St. Antoine, above Quebec, Canada.

**LOCKEIA** James.

Genotype: *L. siliquaria* James.

Lockeia James, Paleontologist, No. 3, 1879, p. 17; Jour. Cincinnati Soc. Nat. Hist., 7, 1885, p. 161.

**Lockeia siliquaria** James.

Lockeia siliquaria James, Paleontologist, No. 3, 1879, p. 17.

Dawsonia siliquaria James, Jour. Cincinnati Soc. Nat. Hist., 14, pt. 2, 1892, p. 162, fig. 7.

Trenton (upper): Ohio River bank, near Ludlow, Kentucky.

**LOCULIPORA** Hall.

Genotype: *Fenestella perforata* Hall.

Loculipora Hall, Rep. State Geol. New York for 1884, 1885, p. 37.—Hall and Simpson, Pal. New York, 6, 1887, p. xxiii.—Miller, N. A. Geol. Pal., 1889, p. 312.—Simpson, 13th Ann. Rep. State Geol. New York for 1893, 1895, pp. 690, 716, 726; 47th Ann. Rep. New York State Mus., pp. 884, 910, 920; 14th Ann. Rep. State Geol. New York for 1894, 1897, pp. 511, 520.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 160.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, pp. 38, 308.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 52.

Tectulipora Hall, 7th Ann. Rep. State Geol. New York for 1887, 1888 [p. 395]; 41st Ann. Rep. New York State Mus. [p. 395]. (Not defined.)—Simpson, 13th Ann. Rep. State Geol. New York for 1893, 1895, pp. 690, 715, 726; 47th Ann. Rep. New York State Mus., pp. 884, 909, 920; 14th Ann. Rep. State Geol. New York, 1897, pp. 511, 520.

**Loculipora ambigua** (Hall).

Hemistrypa dubia Hall, 28th Ann. Rep. New York State Mus., 1876 (doc. ed.), pl. 11, figs. 17–21.

Fenestella ambigua Hall, *ibid.*, 1879, (Mus. ed.), p. 123, pl. 11, figs. 17–21; 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 248, pl. 11, figs. 17–21.

Loculipora ambigua Miller, N. A. Geol. Pal., 1889, p. 312.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, pl. 18, figs. 13–16; pl. 21, fig. 1.

Isotrypa ambigua Ulrich, Geol. Surv. Illinois, 8, 1890, p. 534.

Loculipora (*Fenestella*) ambigua Lesley, Rep. Geol. Surv. Pennsylvania, P 4, 1889, p. 356, figs.

Niagaran (Waldron): Waldron, Indiana.

**Loculipora ambigua precursor** Bassler.

Loculipora ambigua var. precursor Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 53.

Clinton: Lockport, New York (Rochester); Osgood, Indiana (Osgood).

*Cotypes*.—Cat. Nos. 35554, 35555, U.S.N.M.

**Loculipora ulrichi** Bassler.

Loculipora ulrichi Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 53, pl. 21, fig. 2; pl. 25, figs. 22–24.

**Loculipora ulrichi**—Continued.

Clinton (Rochester): Lockport, Rochester, etc., New York; Grimsby and Thorold, Ontario.

*Cotypes*.—Cat. No. 35766, U.S.N.M.

**LOGANELLUS** Devine.

Genotype: *L. quebecensis* Devine.

*Loganellus* Devine, Canadian Nat. Geol., 8, 1863, p. 98.—Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, pp. 200, 201.—Hall and Whitfield, U. S. Geol. Expl. 40th Parl., 4, 1877, p. 209.—Miller, N. A. Geol. Pal., 1889, p. 555.

**Loganellus logani** (Devine).

Olenus? *Logani* Devine, Canadian Nat. Geol., 8, 1863, p. 95, figs. 1, 2. (Named *Loganellus quebecensis* at end of description.)—Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 201, figs. 185, 186.

*Ptychoparia logani* Walcott, Bull. U. S. Geol. Surv., 10, 1884, p. 36.

*Loganellus quebecensis* Miller, N. A. Geol. Pal., 1889, p. 555, fig. 1029.

Ozarkian? (Levis-erratic): Point Levis, Quebec.

LOGANELLUS QUEBECENSIS Miller. See *Loganellus logani*.

**LOGANOGRAPTUS** Hall.

Genotype: *Graptolithus logani* Hall.

*Loganograptus* Hall, 20th Rep. New York State Cab. Hist., 1868, p. 251, rev. ed.—Zittel, Handb. Pal., 1, 1879, p. 299.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 669.—Barrois, Ann. Soc. Geol. du Nord., 21, Lille, 1893, p. 108.—Koken, Die Leitfossilien, Leipzig, 1896, p. 415.—Wiman, Bull. Geol. Inst. Univ. Upsala, 2, pt. 2, No. 4, 1896, p. 265.—Elles, Quart. Jour. Geol. Soc. London, 54, 1898, p. 475.—Elles and Wood, Mon. British Grapt., Pal. Soc., 1902, p. 80.—Ruedemann, Mem. New York State Mus., 7, 1904, p. 630, 631.

*Loganograpsus* Nicholson, Mon. British Grapt., 1872, p. 110; Ann. Mag. Nat. Hist., 4th ser., 11, 1873, p. 138.

LOGANOGRAPTUS KJERULFI Herrman. See *Dichograptus octobrachiatus*.

**Loganograptus logani** (Hall).

*Graptolithus logani* Hall, Geol. Surv. Canada, Rep. for 1857, p. 115; Canadian Nat. Geol., 3, 1858, p. 142, pl. 1, figs. 1-6; pl. 2, figs. 1-4; 12th Rep. New York State Cab. Nat. Hist., 1859, p. 51, figs. 12, 13, p. 50; Pal. New York, 3, 1859, p. 502, figs. 1-3.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 226, fig. 234.—Chapman, Expos. Min. and Geol. Canada, 1864, p. 100, fig. 67; p. 163, fig. 159.—Hall, Geol. Surv. Canada, Canada Org. Rem., dec. 2, 1865, p. 100, pl. 9, figs. 1-9; pl. 11, fig. 7, p. 9, figs. 5, 6.—Chapman, Canadian Jour., 8, 1863, p. 191, fig. 159.—Miller, N. A. Geol. Pal., 1889, p. 190, fig. 178.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 265, figs.

*Graptolithus (Loganograptus) logani* Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 175, figs. 6, 7; p. 226; rev. ed., 1870, p. 208, figs. 6, 7; p. 238.

*Graptolithus (Monoprigus) logani* Hall, *ibid.*, 1868, p. 223; rev. ed., p. 260.

*Graptolites (Didymograptus) logani* McCoy, Geol. Surv. Victoria, Prodr. Pal. Victoria, dec. 1, 1874, p. 19.

*Dichograpsus logani* Nicholson, Ann. Mag. Nat. Hist., 4th ser., 1, 1868, p. 56, pl. 3, fig. 5.

*Dichograptus logani* Nicholson, Quart. Jour. Geol. Soc. London, 24, 1868, p. 128.—Herrmann, Geol. Mag., dec. 3, 3, 1886, p. 24.—Matthew, Trans. Royal Soc. Canada, 10, sec. 4, 1893, p. 97; *ibid.*, 11, 1893, p. 114.—Roemer and Frech, Leth. Pal., 1, 1897, p. 595, fig. 162; pl. 3, fig. 9.

**Loganograptus logani**—Continued.

*Loganograptus logani* Hall, 20th Ann. Rep. New York State Cab. Nat., 1867, p. 226.—Nicholson, Mon. British Grapt., pt. 1, 1872, p. 109, fig. 52c; p. 110.—Etheridge, Ann. Mag. Nat. Hist., 4th ser., 14, 1874, p. 4, pl. 3, figs. 11, 12.—Ami, Geol. Surv. Canada, Rep., 2d ser., 3, pt. 2, 1889, p. 117k.—Elles, Quart. Jour. Geol. Soc. London, 54, 1898, p. 476.—Ruedemann, Ann. Rep. New York State Pal., 1902, pp. 556, 570.—Elles and Wood, Mon. British Grapt., pt. 1, Pal. Soc., 1902, p. 81, pl. 11, figs. 1a-g.—Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 631-633, pl. 9, figs. 3-6; fig. 46.

*Dichograptus* (*Loganograptus*) *logani* Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 28, fig. 41a.

Canadian: Point Levis, Quebec (*Levis*, *Didymograptus* and *Diplograptus dentatus* zones); Deepkill, Rensselaer County, New York (*Deepkill*, *Tetragraptus* and *D. dentatus* zones); St. Johns, New Brunswick (*Bretonian*—Div. C 3d); England; Australia.

LOMATOCERAS Bronn. See *Monograptus* Geinitz.

**LONCHOCEPHALUS** Owen.

Genotype: *L. chippewaensis* Owen.

*Lonchocephalus* Owen, Rep. Geol. Wisconsin, Iowa, Minnesota, 1852, p. 575.—Barande, N. Jahrb. f. Min., 1853, p. 336.—Hall, 16th Ann. Rep. New York State Cab. Nat. Hist., 1863, pp. 147, 160.—Shumard, Trans. Acad. Sci. St. Louis, 2, 1863, p. 104.—Hall, Trans. Albany Inst., 5, 1867, p. 129.—Miller, N. A. Geol. Pal., 1889, p. 555.

**Lonchocephalus calciferus** (Walcott).

*Conocephalites calciferus* Walcott, 32d Rep. New York State Mus. Nat. Hist., 1880, p. 129.

*Ptychoparia calcifera* Dwight, Trans. Vassar Bros. Inst., 4, 1887, p. 208.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 831, fig.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 117, pl. 1, fig. 14.—Walcott, Bull. U. S. Geol. Surv., 30, 1886, p. 21.

*Lonchocephalus calciferus* Walcott, Smiths. Misc. Coll., 57, 1912, p. 270, pl. 43, figs. 7-10a.

Ozarkian or Upper Cambrian: Saratoga Springs and south of Poughkeepsie, New York (Hoyt); Blairstown, New Jersey (Kittatinny).

*Cotypes*.—Cat. Nos. 58554-58556, U.S.N.M.

LONCHODOMAS Angelin. See *Ampyx* subgenus *Lonchodomas*.

LONCHODOMAS HALLI Billings. See *Ampyx* (*Lonchodomas*) *halli*.

**LOPHIOSTROMA** Nicholson.

Genotype: *Labechia? schmidti* Nicholson.

*Lophiostroma* Nicholson, Mon. British Strom., 1891, p. 160 (footnote).

*Chalazodes* Parks, Univ. Toronto Studies, Geol. Ser., 5, 1908, p. 33, pl. 11, figs. 1-8; *ibid.*, 7, 1910, p. 29. (Genotype: *C. granulatum* Parks.)

**Lophiostroma granulatum** (Parks).

*Chalazodes granulatum* Parks, Univ. Toronto Studies, Geol. Ser., 5, 1908, p. 36, pl. 9, fig. 7; pl. 11, figs. 1, 2, 7, 8.

*Lophiostroma granulatum* Parks, *ibid.*, 7, 1910, p. 29 (gen. ref.).

Niagaran: Drummond Island, Lake Huron.

*Holotype*.—Cat. No. 36940, U.S.N.M.

**Lophiostroma magnum** (Parks).

*Chalazodes magnum* Parks, Univ. Toronto Studies, Geol. Ser., 5, 1908, p. 38, pl. 9, fig. 8; pl. 10, fig. 8; pl. 11, figs. 5, 6.

**Lophiostroma magnum**—Continued.

*Lophiostroma magnum* Parks, *ibid.*, 7, 1910, p. 29 (gen. ref.).

Niagaran: Tehkummah and Assiginack, Manitoulin Island, Point Detour, Lake Huron.

*Holotype*.—Cat. No. 36941, U.S.N.M.

**Lophiostroma romingeri** (Parks).

*Chalazodes romingeri* Parks, Univ. Toronto Studies, Geol. Ser., 5, 1908, p. 41, pl. 14, fig. 2.

*Lophiostroma romingeri* Parks, *ibid.*, 7, 1910, p. 29 (gen. ref.).

Niagaran: Drift at Ann Arbor, Michigan.

*Holotype*.—Cat. No. 36813, U.S.N.M.

**Lophiostroma spindicandum** (Parks).

*Chalazodes spindicandum* Parks, Univ. Toronto Studies, Geol. Ser., 5, 1908, p. 40, pl. 9, fig. 9; pl. 11, figs. 3, 4.

*Lophiostroma spindicandum* Parks, *ibid.*, 7, 1910, p. 29 (gen. ref.).

Niagaran (Louisville): Louisville, Kentucky.

*Holotype*.—Cat. No. 36936, U.S.N.M.

**LOPHOSPIRA** Whitfield.

Genotypes: *Murchisonia bicincta* Hall and *M. serrulata* Salter. *Murchisonia* and *Pleurotomaria* of authors.

*Lophospira* Whitfield, Amer. Mus. Nat. Hist., 1, 1886, p. 312.—Donald, Quart.

Jour. Geol. Soc. London, 43, 1887, p. 618.—Miller, N. A. Geol. Pal., 1889, p.

406.—Koken, Neues Jahrb. f. Min., Geol., Pal., 6, Beilage-Band, 1889, pp. 373,

478.—Donald, Quart. Jour. Geol. Soc. London, 51, 1895, p. 212.—Koken,

Neues Jahrb. f. Min., Geol., Pal., 1, 1898, pp. 17, 25.—Ulrich and Scofield,

Geol. Minnesota, 3, pt. 2, 1897, pp. 951-960.—Donald, Quart. Jour. Geol. Soc.

London, 58, 1902, p. 332.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res.

Indiana, 1908, p. 951.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p.

631.—Dall, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 525.

*Ruedemannia Foerste*, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 312. (Genotype: *Lophospira lirata* Ulrich.)

**Lophospira abbreviata** (Hall).

*Murchisonia uniangulata* var. *abbreviata* Hall, Pal. New York, 1, 1847, p. 304, pl. 83, figs. 2a-d.

*Lophospira uniangulata* var. *abbreviata* Whitfield and Hovey, Bull. Amer. Mus. Nat. Hist., 11, pt. 1, 1898, p. 52 (gen. ref.).

*Ruedemannia abbreviata* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 311. Cincinnati (Pulaski): Turin and Rome, New York.

**Lophospira abnormis** Ulrich.

*Lophospira abnormis* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 974, pl. 73, figs. 36-40.

Trenton (Upper): Covington, Kentucky.

*Cotypes*.—Cat. No. 45885, U.S.N.M.

**Lophospira acuminata** Ulrich and Scofield.

*Lophospira acuminata* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 973, pl. 73, fig. 8.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908,

p. 966, pl. 40, fig. 15.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 634,

fig. 859d.

*Murchisonia acuminata* Miller, N. A. Geol. Pal., 2d App., 1897, p. 768.

Richmond: Richmond, Indiana (Whitewater); Blanchester, Ohio; Spring Valley, Minnesota (Maquoketa).

*Holotype*.—Cat. No. 45886, U.S.N.M.



**Lophospira ampla** Ulrich.

*Lophospira ampla* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 981, pl. 73, figs. 52-54.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 966, pl. 41, figs. 1, 1b.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 635, figs. 860d-e.

*Murchisonia ampla* Miller, N. A. Geol. Pal., 2d App., 1897, p. 768 (gen. ref.).

Richmond: Richmond, Indiana; Boyle and Lincoln Counties, Kentucky.

*Cotypes*.—Cat. Nos. 45887, 45888, U.S.N.M.

**Lophospira augustina** (Billings).

*Murchisonia augustina* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1, 1865, p. 234, fig. 221.

*Lophospira augustina* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 987, pl. 71, figs. 1, 2.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 636, fig. 861.

Chazyan (Quebec—H-N): Pistolet Bay, Burnt Cape, Table Head, and Point Rich, Newfoundland.

Trenton (Stewartville): Stewartville, Minnesota.

*Plesiotype*.—Cat. No. 45889, U.S.N.M.

**Lophospira augustina minnesotensis** Ulrich and Scofield.

*Lophospira augustina* var. *minnesotensis* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 988, pl. 71, figs. 3, 4.

Trenton: Stewartville, Minnesota (Stewartville); Ottawa, Ontario.

*Cotypes*.—Cat. No. 45890, U.S.N.M.

**Lophospira? arachne** (Billings).

*Pleurotomaria Arachne* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 31, fig. 32 (adv. sheets 1862).

*Murchisonia Arachne* Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 145, fig. 94.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 426, fig.

Black River (Leray): Pointe Claire, Pauquettes Rapids, and Murray Bay, Canada.

**Lophospira aspera** (Billings).

*Murchisonia asper* Billings, Canadian Nat. Geol., 4, 1859, p. 458.

*Lophospira aspera* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 963.—Raymond, Ann. Carnegie Mus., 4, 1908, p. 189, pl. 55, fig. 2.

Chazyan (Mingan): Mingan Islands, Canada.

**Lophospira beatrice** Foerste.

*Lophospira beatrice* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 310, pl. 2, figs. 8a, b.

Richmond: Riviere des Hurons, near Vars, etc., Quebec.

**Lophospira bicincta** (Hall).

*Murchisonia bicincta* Hall (not McCoy, 1844), Pal. New York, 1, 1847, p. 177, pl. 38, figs. 5a-5f (?5g, 5h).—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 162, pl. 5, figs. 6a-c, 11.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 817, fig. 593.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 315.—Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 312.

*Pleurotomaria bicincta* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 122 (loc. occ.).

*Lophospira bicincta* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 964, pl. 72, figs. 1-5.—Ruedemann, Bull. New York State Mus., 49, 1901, p. 30.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 967, pl. 40, figs. 16-16b.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 632, figs. 856a-d.

**Lophospira blechneta**—Continued.

*Murchisonia milleri* Hall in Miller, Amer. Pal. Foss., 1897, p. 244.—Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 79, pl. 1, figs. 12, 12a-b; Amer. Jour. Sci. Arts, 3d ser., 35, 1888, p. 237, figs. 3, 4.—Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 312.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 430, fig.—Whiteaves, Canadian Rec. Sci., 5, 1893, p. 320 (loc. occ.).

Stones River-Richmond: Middleville, Turin, Watertown, etc., New York (Trenton); Murfreesboro, Tennessee (Stones River); Minnesota, Illinois, Wisconsin, and Kentucky (Black River); Spring Valley, etc., Minnesota (Richmond); Nevada (Pogonip), etc.

*Plesiotype*.—Cat. Nos. 46062, 47611, 47612, U.S.N.M.

**Lophospira billingsi** Raymond.

*Lophospira billingsi* Raymond, Amer. Jour. Sci., 4th ser., 20, 1905, p. 377; Ann. Carnegie Mus., 4, 1908, p. 186, pl. 69, figs. 1, 2.

Chazyan (Aylmer): Aylmer, Quebec.

**Lophospira bispiralis** (Hall).

*Pleurotomaria bispiralis* Hall, Pal. New York, 2, 1852, p. 348, pl. 84, figs. 2a, b.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 74; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 335.

*Lophospira bispiralis* Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 71, pl. 10, figs. 6-9.—Grabau, Michigan Geol. Surv., Geol., 1st ser., p. 190, pl. 23, fig. 16.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 636.

Niagaran (Guelph): Galt, etc., Ontario; Shelby and Rochester, New York.

Upper Monroan (Amherstburg): Detroit River region.

**Lophospira bowdeni** (Safford).

*Murchisonia bowdeni* Safford, Geol. Tennessee, 1869, pl. 3 (G), figs. 2a-2c.

*Lophospira bowdeni* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 986, pl. 72, figs. 40-43.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, pl. 41, figs. 4-4b.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 635, figs. 862a-c.

Trenton-Richmond: Hartsville, Nashville, etc., Tennessee (Catheys); Ohio Indiana, and Kentucky (Maysville and Richmond).

*Plesiotype*.—Cat. No. 45891, U.S.N.M.

**Lophospira calcifera** Whitfield.

*Lophospira Calcifera* Whitfield, Bull. Amer. Mus. Nat. Hist., 2, 1889, p. 55, pl. 9, figs. 8, 9.

*Murchisonia calcifera* Miller, N. A. Geol. Pal., 1889, p. 411 (gen. ref.).

Canadian (Beekmantown): Beekmantown, New York.

**Lophospira casii** (Meek and Worthen).

*Pleurotomaria casii* Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 359, pl. 5, fig. 5.—Nettelroth, Kentucky Foss. Shells, Geol. Surv. Kentucky, 1889, p. 171, pl. 26, fig. 11.

Niagaran: Bridgeport, near Chicago, Illinois (Racine); Louisville, Kentucky (Louisville).

*Plesiotype*.—Cat. No. 51341, U.S.N.M.

**LOPHOSPIRA CASSINA** Whitfield. See *Eotomaria? cassina*.

**Lophospira centralis** Ulrich.

*Lophospira centralis* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 979, pl. 73, fig. 9. *Murchisonia centralis* Miller, N. A. Geol. Pal., 2d App., 1897, p. 768 (gen. ref.).

Stones River (Murfreesboro): Murfreesboro, Tennessee.

*Holotype*.—Cat. No. 46063, U.S.N.M.

**Lophospira? chamberlini** (Whitfield).

Murchisonia Chamberlini Whitfield, Ann. Rep. Geol. Surv. Wisconsin for 1877, 1878, p. 84; Geol. Wisconsin, 4, 1882, p. 317, pl. 24, fig. 4.  
Niagaran (Guelph): Near Carlton, Wisconsin.

**Lophospira cicella** (Billings).

Murchisonia Cicella Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 233, fig. 219.—Koken, Neues Jahrb. f. Min., Geol. Pal., 6, Beilage-Band, 1889, p. 368.  
Lophospira cicella Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 963, (gen. ref.).  
Chazyan (Quebec—L): Table Head and Point Rich, Newfoundland.

**Lophospira? circe** (Billings).

Pleurotomaria circe Billings, Geol. Surv. Canada, Rep. Progr. for 1853-6, 1857, p. 303; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 17 (loc. ref.).  
Richmond (English Head): English Head, Anticosti.

**Lophospira concinnula** Ulrich and Scofield.

Lophospira concinnula Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 966, pl. 72, figs. 16-19.  
Black River (Decorah): Minneapolis and Cannon Falls, Minnesota.  
*Cotypes*.—Cat. Nos. 45892, 45893, U.S.N.M.

**Lophospira conoidea** Ulrich.

Lophospira conoidea Ulrich, Geol. Minnesota, 3, pt. 2, 1897, pl. 73, fig. 22, p. 976.  
Murchisonia conoidea Miller, N. A. Geol. Pal., 2d App., 1897, p. 768 (gen. ref.).  
Trenton (Cathays): Nashville, Tennessee.  
*Holotype*.—Cat. No. 45894, U.S.N.M.

**Lophospira conradana** Ulrich and Scofield.

Murchisonia ventricosa Whitfield (not Hall), Geol. Wisconsin, 4, 1882, p. 218, pl. 5, fig. 18.  
Lophospira conradana Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 979, pl. 72, figs. 29-32.  
Black River (Platteville): Minneapolis and St. Paul, Minnesota; Beloit, Wisconsin.  
*Cotypes*.—Cat. No. 45895, U.S.N.M.

**Lophospira conradi** (Hall).

Murchisonia conradi Hall, 20th Rep. New York State Cab. Hist., 1868, p. 344, pl. 15 (6), fig. 19; rev. ed., 1870, p. 396, pl. 15, fig. 19.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 193, fig.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 27; pl. 4, fig. 6; *ibid.*, 3, pt. 2, 1895, p. 80.—Teller, Trans. Wisconsin Acad. Sci. Arts and Letters, 16, pt. 2, 1910, p. 1287, pl. 150.  
Lophospira Conradi (Ulrich) Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 331, (gen. ref.).  
Niagaran: Racine, Wisconsin (Racine); Elora, Ontario (Guelph).

**Lophospira decursa** Ulrich.

Lophospira decursa Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 975, pl. 73, fig. 10.  
Trenton (Wilmore?): Burgin, Kentucky.  
*Holotype*.—Cat. No. 45896, U.S.N.M.

**Lophospira elevata** Ulrich and Scofield.

Lophospira elevata Ulrich and Scofield, Geol. Minnesota, 3, 1897, p. 977, pl. 73, figs. 11-14.

**Lophospira elevata**—Continued.

*Murchisonia elevata* Miller, N. A. Geol. Pal., 2d App., 1897, p. 768 (gen. ref.).

Trenton: Decorah, Iowa; Kenyon, etc., Goodhue County, Minnesota (Prosser); Mercer County, Kentucky (Flanagan).

*Cotypes*.—Cat. Nos. 45897, 45898, U.S.N.M.

**Lophospira fasciata** Savage.

*Lophospira fasciata* Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 97, pl. 6, figs. 7 and 8.

Upper Medinan (Edgewood): Pike County, Missouri.

**Lophospira fillmorensis** Ulrich and Scofield.

*Lophospira fillmorensis* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, pl. 72, figs. 20–24.

Trenton (Prosser): Wykoff and Fountain, Fillmore County, Minnesota.

*Cotypes*.—Cat. Nos. 45899, 45900, U.S.N.M.

**Lophospira guelphica** Whiteaves.

*Murchisonia* sp. Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 2, 1895, p. 79, pl. 12, fig. 3.

*Lophospira Guelphica* Whiteaves, *ibid.*, pt. 4, 1906, p. 331.

Niagaran (Guelph): Durham, Ontario.

**Lophospira hammelli** (Miller).

*Murchisonia hammelli* Miller, 18th Ann. Rep. Indiana Dep. Nat. Res., 1894, p. 319, pl. 9, figs. 41, 42 (adv. sheets, 1892).

*Lophospira hammelli* Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 969, pl. 41, figs. 3, 3a.

Richmond (Whitewater—Saluda): Madison, Indiana.

**Lophospira helicteres** (Salter).

*Murchisonia helicteres* Salter, Geol. Surv. Canada, dec. 1, 1859, p. 21, pl. 4, figs. 2–4.—Whitfield, Geol. Wisconsin, 4, 1882, p. 220, pl. 5, fig. 17.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 157, fig.—Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 312.

*Lophospira helicteres* Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 632, fig. 857.

Black River: Allumette Island, Ottawa River, Canada (Leray); Mercer County, Kentucky; Wisconsin.

**Lophospira helicteres wisconsinensis** Ulrich and Scofield.

*Lophospira helicteres* var. *wisconsinensis* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 971, pl. 72, figs. 25–28.—Grabau, Amer. Nat., 36, 1902, p. 939, fig. 14.

*Lophospira wisconsinensis* Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 633, fig. 858.

Black River (Platteville): Minneapolis, Minnesota; Beloit, Wisconsin; Dixon, Illinois.

*Cotypes*.—Cat. Nos. 45901, 45902, U.S.N.M.

Observation.—See *L. tricarinata* Hall.

**Lophospira? hermione** (Billings).

*Murchisonia Hermione* Billings, Pal. Foss., Geol. Surv. Canada, 1, 1865, p. 33, figs. 34, 35 (adv. sheets 1862).—Raymond, Ann. Carnegie Mus., 4, 1908, p. 217.

*Pleurotomaria Hermione* Koken, Neues Jahrb. f. Min., Geol., Pal., 6 Beilage-Band, 1889, p. 335.

Canadian(?): South point of Large Island, Mingan Islands, Canada.

**Lophospira hespelerensis** (Whiteaves).

Murchisonia Hespelerensis Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 24, pl. 4, fig. 3; *ibid.*, 3, pt. 2, 1895, p. 79 (loc. occ.).

Lophospira Hespelerensis (Ulrich) Whiteaves, *ibid.*, 3, pt. 4, 1906, p. 331 (gen. ref.).

Niagaran (Guelph): Hespeler and Glenelg, Ontario.

**Lophospira humilis** Ulrich.

Lophospira humilis Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 968, pl. 72, figs. 12-15.

Murchisonia humilis Miller, N. A. Geol. Pal., 2d App., 1897, p. 768 (gen. ref.).

Trenton: Mercer and Boyle Counties, Kentucky (Flanagan); Hartsville, Tennessee (Catheys).

*Cotypes*.—Cat. No. 45903, U.S.N.M.

**Lophospira jessica** (Billings).

Murchisonia Jessica Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 189, fig. 170.

Ozarkian? (Levis—erratics): Point Levis, Quebec.

**Lophospira(?) knoxvillensis** (Ulrich).

Lophospira(?) knoxvillensis Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 989, pl. 65, figs. 38-40.

Trochonema knoxvillensis Miller, N. A. Geol. Pal., 2d App., 1897, p. 770 (gen. ref.).

Chazyan (Lenoir): Near Knoxville, Tennessee

*Cotypes*.—Cat. No. 46064, U.S.N.M.

**Lophospira (?Seelya) lirata** Ulrich.

Lophospira (?Seelya) lirata Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 988, pl. 72, figs. 56-59.

Murchisonia lirata Miller, N. A. Geol. Pal., 2d App., 1897, p. 768 (gen. ref.).

Ruedemannia lirata Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 312.

Eden (Economy, Southgate): Cincinnati, Ohio, and vicinity.

*Holotype*.—Cat. No. 45904, U.S.N.M.

**Lophospira (?Seelya) lirata obsoleta** Ulrich.

Lophospira (?Seelya) lirata var. obsoleta Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 989.

Eden (Economy, Southgate): Cincinnati, Ohio, and vicinity.

*Holotype*.—Cat. No. 45905, U.S.N.M.

**Lophospira medialis** Ulrich and Scofield.

Lophospira medialis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 973, pl. 73, figs. 23-29.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 181, pl. 12, fig. 28.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 634, figs. 859e-h.—Bassler, Bull. Virginia Geol. Surv., 2a, 1909, p. 183, figs. 20, 1-4.

Murchisonia medialis Miller, N. A. Geol. Pal., 2d App., 1897, p. 768 (gen. ref.).

Trenton: St. Paul, Wykoff, etc., Minnesota (Prosser); Burgin and Danville, Kentucky (Flanagan); Tennessee; Virginia; New Jersey; etc.

*Cotypes*.—Cat. Nos. 45906, 45907, U.S.N.M.

**Lophospira medialis burginensis** Ulrich.

Lophospira medialis var. burginensis Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 974, pl. 73, figs. 30, 31.

Trenton (Flanagan): Burgin, Danville, Lexington, etc., Kentucky.

*Cotypes*.—Cat. No. 45908, U.S.N.M.

**Lophospira modesta** (Billings).

- Murchisonia modesta Billings, Geol. Surv. Canada, Rep. Progr. for 1853-6, 1857, p. 229; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 18 (loc. ref.).  
 Lophospira modesta Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 962 (gen. ref.).  
 Richmond (English Head, Charleton): English Head, etc., Anticosti.

LOPHOSPIRA MULTIGRUMA Ulrich and Scofield. See *Lophospira tropidophora*.

**Lophospira mylitta** (Billings).

- Murchisonia Mylitta Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 157, fig. 140.—Koken, Neues Jahrb. f. Min., Geol., Pal., 6, Beilage-Band, 1889, p. 368.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 79.  
 Lophospira Mylitta (Ulrich) Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 331 (gen. ref.).  
 Niagaran (Guelph): Elora, Ontario; Wisconsin.

**Lophospira(?) notabilis** Ulrich.

- Lophospira(?) notabilis Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 990, pl. 72, figs. 33-35.  
 Trochonema notabile Miller, N. A. Geol. Pal., 2d App., 1897, p. 770 (gen. ref.).  
 Black River (Lowville): Maury County, Tennessee; Mercer County, Kentucky; Watertown, New York.  
*Holotype*.—Cat. No. 45909, U.S.N.M.

**Lophospira obliqua** Ulrich.

- Murchisonia bicincta Salter (not Hall, 1847), Geol. Surv. Canada, Canada Org. Rem., dec. 1, 1859, p. 19.  
 Lophospira obliqua Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 965, pl. 72, figs. 6-8.  
 Black River: High Bridge, Kentucky; Watertown, New York (Lowville); Lincoln County, Missouri (Auburn).  
*Cotypes*.—Cat. No. 45910, U.S.N.M.

**Lophospira ohioensis** (James).

Not recognizable.

- Pleurotomaria trilineata James, Cat. Low. Sil. Foss. Cincinnati Group, 1875, p. 6 (nom. nud. preoccupied).  
 Pleurotomaria Ohioensis James, Paleontologist, No. 2, 1878, p. 12.  
 Lophospira ohioensis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 950 (gen. ref.).  
 Eden: Cincinnati, Ohio.

**Lophospira oweni** Ulrich and Scofield.

- Lophospira oweni Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 980, pl. 73, figs. 41-45.—Weller, Geol. Surv. New Jersey, Pal. 3, 1903, p. 181, pl. 12, fig. 34.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 634, fig. 860a-c.  
 Murchisonia oweni Miller, N. A. Geol. Pal., 2d App., 1897, p. 768 (gen. ref.).  
 Black River: High Bridge, Kentucky (Lowville); St. Paul, Cannon Falls, etc., Minnesota (Decorah); Poland and Watertown, New York; Lincoln County, Missouri; New Jersey.  
*Cotypes*.—Cat. Nos. 45911, 45912, U.S.N.M.

**Lophospira? papillosa** (Billings).

- Murchisonia papillosa Billings, Geol. Surv. Canada, Rep. Progr. for 1853-56, 1857, p. 301; Cat. Sil. Fossils, Anticosti, Geol. Survey Canada, 1866, p. 55 (loc. ref.).  
 Gamachian (Ellis Bay): Gamache Bay, Anticosti.

**Lophospira peracuta** Ulrich and Scofield.

*Lophospira peracuta* Ulrich and Scofield, Geol. Minnesota, 3, 1897, p. 976, pl. 73, figs. 15-17.

*Murchisonia peracuta* Miller, N. A. Geol. Pal., 2d App., 1897, p. 768 (gen. ref.).  
Stones River (Lebanon): Lebanon, Tennessee.

Black River (Decorah): St. Paul, Minnesota.

*Cotypes*.—Cat. Nos. 46065, 46066, U.S.N.M.

**Lophospira perangulata** (Hall).

*Murchisonia perangulata* Hall, Pal. New York, 1, 1847, p. 41, pl. 10, fig. 4 (not p. 179, pl. 38, figs. 7a, b).—Billings, Canadian Nat. Geol., 4, 1859, p. 458.—Koken, Neues Jahrb. f. Min., Geol. Pal., 6, Beilage-Band, 1889, p. 368.

*Murchisonia bicincta* var. *perangulata* Salter, Canadian Organic Remains, dec. 1, 1859, p. 19, pl. 4, fig. 7.

*Lophospira perangulata* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 972, pl. 63, figs. 1-7.—Ruedemann, Bull. New York State Mus., 49, 1901, p. 31.—Raymond, Ann. Carnegie Mus., 4, 1908, p. 188, pl. 49, figs. 7, 8.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 633, figs. 859a-c.—Bassler, Bull. Virginia Geol. Surv., 2a, 1909, pl. 3, figs. 9-13.

Black River: Watertown, New York; Minnesota; Kentucky; Tennessee; Virginia; Canada (Lowville); Lincoln County, Missouri (Auburn).

Stones River (Murfreesboro): Murfreesboro, Tennessee.

Chazy: Valcour Island and Chazy, New York.

*Plesiotypes*.—Cat. No. 46067, U.S.N.M.

**Lophospira perforata** Ulrich and Scofield.

*Murchisonia bicincta*? Meek and Worthen (not Hall, 1847), Geol. Surv. Illinois, 3, 1868, p. 317, pl. 3, fig. 4.

*Lophospira perforata* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 984, pl. 73, figs. 32-35.

Trenton: Jo Daviess and Carroll Counties, Illinois; Fountain, Minnesota; Jefferson County, New York.

*Cotypes*.—Cat. Nos. 45913, 45914, U.S.N.M.

**Lophospira perlamellosa** Ulrich.

*Lophospira perlamellosa* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 985, pl. 73, figs. 55, 56.

*Murchisonia perlamellosa* Miller, N. A. Geol. Pal., 2d App., 1897, p. 768 (gen. ref.).

Richmond (Waynesville): Hanover, Butler County, Ohio.

*Holotype*.—Cat. No. 45915, U.S.N.M.

**Lophospira procera** Ulrich.

*Lophospira procera* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 968, pl. 72, fig. 9.

Stones River (Murfreesboro): Murfreesboro, Tennessee.

*Holotype*.—Cat. No. 46068, U.S.N.M.

**Lophospira producta** Ulrich.

*Lophospira producta* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 976, pl. 73, fig. 21.

Trenton (Catheys): Nashville, Tennessee.

*Holotype*.—Cat. No. 45916, U.S.N.M.

**Lophospira pulchella** Ulrich and Scofield.

*Lophospira pulchella* Ulrich and Scofield, Geol. Minnesota, 3, 1897, p. 982, pl. 73, figs. 46-48.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 634, figs. 859i-k.

**Lophospira pulchella**—Continued.

Trenton (Flanagan): Burgin, Danville, etc., Kentucky. Black River (Decorah):  
Near Cannon Falls, Minnesota. Richmond: Spring Valley, Minnesota.  
*Cotypes*.—Cat. Nos. 45917, 45918, U.S.N.M.

**Lophospira quadrisulcata** Ulrich and Scofield.

*Lophospira quadrisulcata* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897,  
pl. 72, figs. 10–11.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 632,  
figs. 856e–f.  
*Murchisonia quadrisulcata* Miller, N. A. Geol. Pal., 2d App., 1897, p. 768  
(gen. ref.).  
Richmond (Maquoketa): Spring Valley, etc., Minnesota.  
*Holotype*.—Cat. No. 45919, U.S.N.M.

**LOPHOSPIRA RECTANGULARIS** Raymond. See *Trochonema rectangulare*.

**Lophospira rectistriata** Raymond.

*Lophospira subabbreviata* Raymond (not D'Orbigny), Ann. Carnegie Mus., 3,  
1906, p. 501.  
*Lophospira rectistriata* Raymond, *ibid.*, 4, 1908, p. 187, pl. 69, figs. 3–6.—Grabau  
and Shimer, N. A. Index Fossils, 1, 1909, p. 632, fig. 855.  
Chazyan (Day Point, Crown Point): Crown Point, Valcour Island, and Chazy,  
New York.

**Lophospira saffordi** Ulrich.

*Lophospira saffordi* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 982, pl. 73, figs.  
49–51.  
*Murchisonia saffordi* Miller, N. A. Geol. Pal., 2d App., 1897, p. 768 (gen. ref.).  
Trenton (Catheys): Near Nashville, Tennessee.  
*Cotypes*.—Cat. Nos. 45920, 45921, U.S.N.M.

**Lophospira seelyi** Raymond.

*Lophospira seelyi* Raymond, Ann. Carnegie Mus., 4, 1908, p. 190, pl. 55, fig. 3.  
Chazyan (Valcour): Isle La Motte, Vermont.  
*Holotype*.—Cat. No. 53632, U.S.N.M.

**Lophospira serrulata** (Salter).

*Murchisonia tricarinata* Hall, Pal. New York, 1, 1847, p. 178, pl. 38, fig. 6c  
(not 6a, b).—Whitfield, Geol. Wisconsin, 4, 1882, p. 219, pl. 5, fig. 16.  
*Murchisonia helicteres* (part) Whitfield (not Salter, 1859), Geol. Wisconsin, 4,  
1882, p. 220.  
*Murchisonia serrulata* Salter, Geol. Surv. Canada, dec. 1, 1859, p. 20, pl. 4, fig. 1.—  
Hall, Rep. Geol. Surv. Wisconsin, 1862, p. 439.—Billings, Geol. Canada,  
Geol. Surv. Canada, 1863, p. 145, fig. 93.—Lesley, Geol. Surv. Pennsylvania,  
Rep. P 4, 1889, p. 430, fig.  
*Lophospira serrulata* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 968,  
pl. 72, figs. 51–55; pl. 73, fig. 57.—Grabau and Shimer, N. A. Index Fossils,  
1, 1909, p. 636, figs. 862d–f.—Bassler, Bull. Virginia Geol. Surv., 2a, 1909,  
pl. 3, fig. 8.  
Black River: Mineral Point, etc., Wisconsin; St. Paul, etc., Minnesota; Dixon,  
Illinois (Platteville); Pauquette Rapids, etc., Canada; Virginia; Tennessee.  
*Plesiotypes*.—Cat. Nos. 45922–45925, U.S.N.M.

**Lophospira sororecula** (Billings).

*Murchisonia sororecula* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 233,  
fig. 220.



**Lophospira sororecula**—Continued.

*Lophospira sororecula* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 962 (gen. ref.).

Chazyan (Quebec—H-M): Table Head and Point Rich, Newfoundland.

**Lophospira spironema** Ulrich and Scofield.

*Lophospira spironema* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 983, pl. 72, figs. 44-47.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 165.

*Murchisonia spironema* Miller, N. A. Geol. Pal., 2d App., 1897, p. 768 (gen. ref.).

Black River: Chatfield and Cannon Falls, Minnesota (Decorah); Lincoln County, Missouri (Auburn); Baffin Land.

*Cotypes*.—Cat. Nos. 45926, 45927, U.S.N.M.

**Lophospira subabbreviata** (D'Orbigny).

Not recognized.

*Murchisonia abbreviata* Hall (not DeKoninck, 1841), Pal. New York, 1, 1847, p. 32, pl. 6, fig. 7.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 162, pl. 4, fig. 11; pl. 5, fig. 13; Man. Geol., 1860, p. 98, fig. 87.—Lesley, Geol. Surv. Penn-

sylvania, Rep. P 4, 1889, p. 424, fig.

*Murchisonia decurta* Hall in Miller's N. A. Pal. Foss., 1877, p. 244.

*Murchisonia subabbreviata* D'Orbigny, Prodrome Pal., 1, 1850, p. 8.

*Lophospira subabbreviata* Raymond, Ann. Carnegie Mus., 4, 1908, p. 186.

Chazyan: Chazy, New York.

**LOPHOSPIRA SUBABBEVIATA** Raymond. See *Lophospira rectistriata*.**Lophospira sumnerensis** (Safford).

*Murchisonia sumnerensis* Safford, Geol. Tennessee, 1869, pl. 3G, figs. 1a-f.

*Lophospira sumnerensis* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 978, pl. 73, figs. 18-20.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 635, figs. 860i-j.

Trenton: Nashville, etc., Tennessee (Cathcys); Mercer and Boyle Counties, Kentucky (Flanagan); Wykoff, Minnesota (Prosser).

*Cotypes* and *plesiotypes*.—Cat. No. 45928, U.S.N.M.

**Lophospira sybillina** (Billings).

*Pleurotomaria Sybillina* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 54, fig. 19.

Gamachian (Ellis Bay): Junction Cliff, Anticosti.

**Lophospira tenuistriata** Ulrich.

*Lophospira tenuistriata* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 983, pl. 72, figs. 48-50.

Eden (Southgate): Cincinnati, Ohio, and vicinity.

*Cotypes*.—Cat. No. 45929, U.S.N.M.

**Lophospira thebesensis** Savage.

*Lophospira thebesensis* Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 97, pl. 5, fig. 31.

Upper Medinan (Edgewood): Near Thebes, Illinois; Louisiana and near Edgewood, Missouri.

**Lophospira tricarinata** (Hall).

*Murchisonia tricarinata* Hall (part), Pal. New York, 1, 1847, p. 178, pl. 38, figs. 6a, 6b (not 6c).

*Murchisonia* cf. *tricarinata* Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 75.

**Lophospira tricarinata**—Continued.

*Lophospira tricarinata* Whitfield and Hovey, Bull. Amer. Mus. Nat. Hist., 11, pt. 1, 1898, p. 52 (gen. ref.).

Black River (Platteville): Mineral Point, Wisconsin.

Observation.—Probably the same as *L. helicteres wisconsinensis*.

**Lophospira(?) trochonemoides** Ulrich.

*Lophospira(?) trochonemoides* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 990, pl. 65, figs. 41-44.

Stones River (Murfreesboro): Murfreesboro, Tennessee.

*Holotype*.—Cat. No. 46069, U.S.N.M.

**Lophospira tropidophora** (Meek).

*Pleurotomaria* (Scalites?) *tropidophora* Meek, Amer. Jour. Sci., 3d ser., 4, 1872, p. 278; Geol. Surv. Ohio, Pal., 1, 1873, p. 154, pl. 13, figs. 6a-c.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 719, figs.

*Pleurotomaria tropidophora* Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 317.

*Lophospira tropidophora* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, pl. 72, figs. 36-39.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 969, pl. 41, figs. 2-2d.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 635, figs. 860f-h.

*Murchisonia multigruma* Miller, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 104, pl. 3, figs. 3-3a.

*Lophospira multigruma* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 978. Eden-Richmond: Cincinnati, Ohio, and vicinity; Richmond, etc., Indiana; Kentucky; Tennessee.

*Plesiotypes*.—Cat. Nos. 45930-45932, U.S.N.M.

**Lophospira uniangulata** (Hall).

*Murchisonia uniangulata* Hall, Pal. New York, 1, 1847, p. 179, pl. 28, fig. 8.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 162.

*Lophospira uniangulata* Whitfield and Hovey, Bull. Amer. Mus. Nat. Hist., 11, pt. 1, 1898, p. 52 (gen. ref.).

Trenton: Middleville, New York.

*LOPHOSPIRA UNIANGULATA ABBREVIATA* Whitfield and Hovey. See *Lophospira abbreviata*.

**Lophospira varians** (Billings).

*Murchisonia varians* Billings, Geol. Surv. Canada, Rep. Progr. for 1853-6, 1857, p. 300; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 18 (loc. ref.).

Richmond (English Head): English Head, Anticosti.

**Lophospira ventricosa** (Hall).

*Murchisonia ventricosa* Hall, Pal. New York, 1, 1847, p. 41, pl. 10, fig. 3.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 162.—Billings(?), Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, pp. 18, 55 (loc. ref.).

Black River (Amsterdam): Tribes Hill, Mohawk Valley, New York.

*LOPHOSPIRA WISCONSINENSIS* Grabau and Shimer. See *Lophospira helicteres wisconsinensis*.

**Lophospira xanthippe** (Billings).

*Murchisonia Xanthippe* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 155, fig. 137 (adv. sheets 1862).—Koken, Neues Jahrb. f. Min., Geol., Pal., 6 Beilage-Band, 1889, p. 368.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 80 (loc. occ.).

**Lophospira xanthippe**—Continued.

*Lophospira Xanthippe* (Ulrich) Whiteaves, *Geol. Surv. Canada, Pal. Foss.*, 3, pt. 4, 1906, p. 331 (gen. ref.).

Niagaran (Guelph): Galt, Ontario.

**LOXOCERAS** McCoy.

Genotype: *Orthoceras (Loxoceras) breynii* Martin.

*Loxoceras* McCoy, *Syn. Carb. Foss.*, 1844, p. 8.—Zittel, *Handb. Pal.*, 2, 1884, p. 369.—Hyatt, *Zittel-Eastman Textb. Pal.*, 1, 1900, p. 527; 2d ed., 1913, p. 608.—Ruedemann, *Bull. New York State Mus.*, 90, 1906, p. 486.—Grabau and Shimer, *N. A. Index Fossils*, 2, 1910, p. 113.

*Sactoceras* Hyatt, *Proc. Boston Soc. Nat. Hist.*, 22, 1884, p. 273—Foord, *Cat. Foss. Ceph. British Mus.*, 1, 1888, p. 207. (Genotype: *Orthoceras richteri* Barrande.)

**Loxoceras allumettense** (Billings).

*Orthoceras allumettense* Billings, *Geol. Surv. Canada, Rep. Progr. for 1853-56, 1857*, p. 331; *Canadian Nat. Geol.*, 4, 1859, p. 463; *Pal. Foss.*, 1, *Geol. Surv. Canada*, 1865, p. 254.—Barrande, *Syst. Sil. du Centre Boheme*, 2, pt. 3, 1874, p. 729, pl. 437, figs. 6-9.

*Actinoceras Allumettense* Whiteaves, *Trans. Roy. Soc. Canada*, 9, sec. 4, 1892, p. 85, pl. 10, figs. 3, 3a; *Pal. Foss.*, *Geol. Surv. Canada*, 3, pt. 3, 1897, p. 209.

Black River (Leray): Pauquette's Rapids, Ottawa River, etc., Canada.

Chazyan (Quebec—M, N): Table Head, Point Rich, and Pistolet Bay, Newfoundland.

**Loxoceras diffidens** (Billings).

*Orthoceras diffidens* Billings, *Pal. Foss.*, 1, *Geol. Surv. Canada*, 1865, p. 174.

Chazyan (Mingan): Mingan Islands, Canada.

Observation.—Probably the same as *Loxoceras moniliforme*.

**Loxoceras milleri** (Foerste).

*Orthoceras (Loxoceras) milleri* Foerste, *Bull. Sci. Lab. Denison Univ.*, 16, 1910, p. 76, pl. 1, 1910, fig. 5; pl. 2, figs. 24a, b.

Trenton (Perryville): Seven miles south of Frankfort, Kentucky.

**Loxoceras moniliforme** (Hall).

*Orthoceras moniliforme* Hall, *Pal. New York*, 1, 1847, p. 35, pl. 7, fig. 5.

*Ormoceras moniliforme* Hall, *Pal. New York*, 1, 1847, p. 315.

*Loxoceras moniliforme* Ruedemann, *Bull. New York State Mus.*, 90, 1906, p. 487, pl. 34, figs. 6-9.—Grabau and Shimer, *N. A. Index Fossils*, 2, 1910, p. 113, fig. 1346.

*Orthoceras subarcuatum* Hall, *Pal. New York*, 1, 1847, pl. 7, fig. 3 (apical part of type specimen) (see also *Spyroceras clintoni* Miller).

*Orthoceras subarcuatum* Emmons, *Amer. Geology*, 1, pt. 2, 1855, p. 149.—Billings, *Canadian Nat. Geol.*, 4, 1859, p. 462.

Chazyan (Crown Point, Valcour): Chazy and Plattsburg, New York.

**LOXONEMA** Phillips.

Genotype: *L. sinuata* Phillips.

*Loxonema* Phillips, *Pal. Foss. Cornwall, Devon and W. Somerset*, 1841, p. 98.—

Emmons, *Amer. Geology*, 1, pt. 2, 1855, p. 163.—Salter, *Geol. Surv. Canada*, dec. 1, 1859, p. 24, 30.—Meek and Worthen, *Proc. Acad. Nat. Sci. Philadelphia*, 1860, p. 464; *Geol. Surv. Illinois*, 2, 1866, p. 377.—Hall, *Pal. New York*, 5, pt. 2, 1879, p. 39.—Koninck, *Ann. Mus. Roy. Hist. Nat. de Belgique*, 6, 1881, p. 39.—Lindstrom, *Kongl. Sven Vet. Akad. Handl.*, 19, No. 6, 1881, p. 141.—Zittel, *Handb. Pal.*, 2, 1882, p. 238.—Walcott, *Mon. U. S. Geol. Surv.*, 8, 1884, p. 190.—Nettelroth, *Kentucky, Foss. Shells, Geol. Surv. Kentucky*, 1889, p. 177.—Koken, *Neucs Jahrb. Min., Geol. Pal.*, 6, Beiilage-

**LOXONEMA**—Continued.

Band, 1889, p. 440.—Miller, N. A. Geol. Pal., 1889, p. 406.—Whidborne, Mon. Dev. Fauna South England, 1, Pal. Soc., 1891, p. 172.—Koken, Die Leitfossilien, Leipzig, 1896, p. 108.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 275.—Pilsbry, Zittel-Eastman Textb. Pal., 1, 1900, p. 456.

**LOXONEMA ACULEATUM** Billings. See *Hormotoma? aculeata*.

**Loxonema boydii** Hall.

*Loxonema Boydii* Hall, Geol. New York, 4, 1843, p. 137, fig. 3; p. 138; tab. ill., 25, fig. 3.—Owen, Amer. Jour. Sci. Arts, 2d ser., 1, 1846, fig. 3.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 86.

*Murchisonia boydii* Hall, Pal. New York, 2, 1852, p. 346, pl. 83, fig. 3.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 339, fig. 345.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 193, fig.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 427, figs.

Niagaran (Guelph): Near Newark, Wayne County, New York; Galt, Hespeler, and Durham, Ontario.

**Loxonema fitchi** Hall.

*Loxonema fitchi* Hall, Pal. New York, 3, 1859, p. 296, pl. 54, figs. 9, 11a, 11b.—Ohern Geol. Surv. Maryland, Low. Dev., 1913, p. 467, pl. 79, fig. 7.—Holte-dahl, 2d Arct. Exp. "Fram", 1898-1902, No. 32, 1914, p. 31, pl. 8, fig. 10.

Cayugan (Manlius): Carlisle, Schoharie and Albany Counties, New York; Maryland.

Helderbergian (Lower beds): Southwestern Ellesmereland, Arctic America.

**Loxonema leda** Hall.

*Loxonema leda* Hall, 20th Rep. New York Mus. Nat. Hist., 1868, p. 367, pl. 15 (6), fig. 2; rev. ed., p. 398, pl. 15, fig. 2.

Niagaran (Racine): Wauwatosa, Wisconsin; Bridgeport, Illinois.

**LOXONEMA MAGNUM** Whiteaves. See *Hormotoma whiteavesii*.

**Loxonema?? magnum** Whitfield. •

*Loxonema magna* Whitfield, Ann. Rep. Geol. Surv. Wisconsin, 1878, p. 83; Geol. Wisconsin, 4, 1882, p. 317, pl. 24, fig. 1.

Niagaran (Guelph): Carlton Township, Wisconsin.

**Loxonema mcllntocki** Haughton.

*Loxonema McClintocki* Haughton, Jour. Geol. Soc. Dublin, 1, 1857, p. 239, pl. 5, figs. 2, 5.

Niagaran: Port Leopold, North East Cape, Arctic America.

**Loxonema? murrayanum** Salter.

*Loxonema Murrayana* Salter, Geol. Surv. Canada, dec. 1, 1859, p. 31, pl. 6, fig. 6. Black River (Leray): Pauquettes Rapids, Ottawa River, Canada.

**Loxonema parvum** Grabau.

*Loxonema parva* Grabau, Michigan Geol. Surv., Geol., 1st ser., 1909, p. 176, pl. 16, fig. 6.

Upper Monroan (Lucas): Salt shaft, Detroit, Michigan.

**Loxonema rossi** Haughton.

*Loxonema Rossi* Haughton, Jour. Geol. Soc. Dublin, 1, 1859, p. 239, pl. 5, figs. 6, 8-11.

Niagaran: Beechy Island, Arctic America.

**Loxonema rugosum** (Billings).

- Murchisonia rugosa Billings, Geol. Surv. Canada, Rep. Progr. for 1853-6, 1857, p. 299; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, pp. 18, 55 (loc. ref.).  
 Hormotoma rugosa Schuchert and Twenhofel, Bull. Geol. Soc. America, 21, 1910, p. 703.  
 Gamachian (Ellis Bay): Gamache Bay, Anticosti.

**Loxonema salteri** Houghton.

- Murchisonia sp. Salter, App. to Sutherland's Jour. Voyage Baffin Bay and Barrow Strait, 1852, pl. 5, fig. 18.  
 Loxonema salteri Houghton, Jour. Roy. Soc. Dublin, 3, 1860, p. 55.  
 Niagaran: Cornwallis Island, Assistance Bay, etc., Arctic America.

LOXONEMA SUBELONGATA Emmons. See Subulites elongatus.

LOXONEMA SUBFUSIFORMIS D'Orbigny. See Fusispira subfusiformis.

LOXONEMA SUBULATA Conrad. See Hormotoma subulata and Murchisonia sublata.

LOXONEMA VITTATA D'Orbigny. See Fusispira vittata.

**Loxonema winnipegense** Whiteaves.

- Loxonema Winnipegense Whiteaves, Canadian Rec. Sci., 5, 1893, p. 326, fig.; Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 200, fig. 12.  
 Black River or Richmond: Lake Winnipeg, Manitoba.

**LOXOPOLOCUS** Fischer.

Genotype: Murchisonia solutus Whiteaves.

- Loxoplocus Fischer, Manual Conch., 1885, p. 847.

**Loxoplocus solutus** (Whiteaves).

- Murchisonia soluta Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 28, pl. 4, figs. 8, 8a.  
 Murchisonia tropidophora Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 29, pl. 7, figs. 5, 5a.  
 Loxoplocus solutus Fischer, Manual Conch., etc., 1885, p. 847.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 2, 1895, p. 84, pl. 12, figs. 7, 8.  
 Niagaran (Guelph): Galt, Hespeler, etc., Ontario.

**LUMBRICONEREITES** Ehlers.

Genotype: L. deperditus Ehlers.

- Lumbriconereites Ehlers, Palæontographica, 17, 1868, p. 159.—Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 380.—Zittel, Handb. Pal., 1, 1880, p. 566.—Miller, N. A. Geol. Pal., 1889, p. 518.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 242.

**Lumbriconereites armatus** Hinde.

- Lumbriconereites armatus Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 383, pl. 20, fig. 6.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 242, fig. 1529c.  
 Upper Medinan (Cataract): Toronto, Ontario.

**Lumbriconereites austini** Foerste.

- Lumbriconereites austini Foerste, Amer. Geol., 2, 1888, p. 417, fig. 4; Geol. Surv. Ohio, Pal., 7, 1893, p. 517, fig. 4.  
 Richmond (Elkhorn): Todds Fork, near Wilmington, Ohio.

**Lumbriconereites basalis** Hinde.

*Lumbriconereites basalis* Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 383, pl. 19, fig. 22.—Grabau and Shimer, N. A. Index Fossils, 1910, 2, p. 242, fig. 1532b.

Upper Medinan (Cataract): Toronto, Ontario.

**Lumbriconereites dactylodus** Hinde.

*Lumbriconereites dactylodus* Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 380, pl. 18, fig. 20.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 242, fig. 1527b.

Cincinnati (Pulaski): Toronto, Ontario.

*LUMBRICONEREITES PERDENTATUS* Hinde. See *Eunicites perdentatus*.

**Lumbriconereites triangularis** Hinde.

*Lumbriconereites triangularis* Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 383, pl. 20, fig. 4.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 242, fig. 1529a.

Upper Medinan (Cataract): Toronto, Ontario.

*LUNULITES? DACTIOLOIDES* Owen. See *Cerionites dactyloides*.

**LYELLIA** Edwards and Haime. Genotype: *L. americana* Edwards and Haime.

*Lyellia* Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal., 1851 (Arch. du Mus. d'Hist. Nat., 5), pp. 150, 226.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 439.—Milne Edwards, Hist. Nat. d. Corall., 3, 1860, p. 242.—Duncan, Rep. 41st Meeting British Assoc. Adv. Sci., 1872, p. 127.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 15.—Nicholson, Tab. Corals Pal. Period, 1879, p. 249.—Zittel, Handb. Pal., 1, 1879, p. 213.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 514.—Miller, N. A. Geol. Pal., 1889, p. 195.—Sardeson, Neues Jahrb. f. Min., Geol., Pal., Beilage-Band 10, 1889, p. 280.—Lindström, Kongl. Sven. Vet.-Akad. Handl., 32, No. 1, p. 72.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 83.—Kiär, Palæontographica, 46, 1899, p. 56.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 96.

*Camptolithus* Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 32, No. 1, 1899, pp. 37, 74, 99.

**Lyellia affinis** (Billings).

*Heliolites affinis* Billings, Canadian Nat. Geol., n. s., 2, 1865, p. 427; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 5, fig. 12.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., p. 251.

*Lyellia affinis* Rominger, Geol. Surv. Michigan, 3, pt. 2, p. 17 (gen. ref.).—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 84, pl. 5, figs. 1, 1a.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 153.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 293.

*Propora affinis* Kiär, Vid.-Selsk. Skrifter, Math.-naturv. Kl., No. 10, 1903, p. 52. Early Silurian: Wreck Point, Junction Cliff, etc., Anticosti (Charleton—Chicotte); Lake Temiscaming; Thorold, Ontario; Bassin Land.

**Lyellia americana** Edwards and Haime.

*Lyellia americana* Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal., 1861 (Arch. du Mus. d'Hist. Nat., 5), p. 226, pl. 14, figs. 3, 3a.—Milne Edwards, Hist. Nat. d. Corall., 3, 1860, p. 243.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 15, pl. 2, figs. 1, 2.—James, Paleontologist, No. 2, 1878, p. 11.—White, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 381, pl. 47, fig. 5.—Hall, 12th Rep., *ibid.*, 1883, p. 252, pl. 2, figs. 4, 5; pl. 3, fig. 7.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 3,

**Lyellia americana**—Continued.

fig. 2.—Lesley, Geol. Surv. Pennsylvania, Rep. P. 4, 1889, p. 365, figs.—  
Miller, N. A. Geol. Pal., 1889, p. 195, fig. 188.—Lambe, Cont. Can. Pal.,  
Geol. Surv. Canada, 4, pt. 1, 1899, p. 85, pl. 5, figs. 2, 2a.—Grabau and Shimer,  
N. A. Index Fossils, 1, 1906, p. 96, figs. 154–155.

Niagaran: Drummonds Island, Lake Huron; Michigan; Iowa; Indiana; Ken-  
tucky; Tennessee; Anticosti, etc.

**Lyellia decipiens** Rominger.

*Lyellia decipiens* Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 17, pl. 3,  
fig. 1.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 86.

Niagaran: Point Detour and Drummond Island, Lake Huron.

**Lyellia discoidea** Davis.

*Lyellia discoidea* Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2,  
1885, pl. 4, figs. 2, 3.

*Plasmopora? discoidea* Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 32, No. 1,  
1899, p. 100.

Niagaran: Near Louisville, Kentucky (Louisville); Tennessee (Brownsport).

**Lyellia eminula** Foerste.

*Lyellia eminula* Foerste, Bull. Kentucky Geol. Surv., 7, 1906, p. 306, pl. 3, fig. 6;  
pl. 4, fig. 3.

Clinton (Waco): Near Waco and near Irvine, Kentucky.

**Lyellia exigua** (Billings).

*Heliolites exiguus* Billings, Canadian Nat. Geol., n. s., 2, 1865, p. 428; Cat. Sil.  
Foss. Anticosti, Geol. Surv. Canada, 1866, p. 31, fig. 14.—Nicholson and  
Etheridge, Mon. Sil. Foss. Girvan Dist., 1880, p. 250.—Roemer, Leth. geog.,  
pt. 1, Leth. Pal., 1883, p. 508.

*Lyellia exigua* Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 17 (gen. ref.).—  
Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, pl. 5, p. 86;  
figs. 3, 3a.

Gamachian (Ellis Bay) and Anticostian (Beesie River—Chicotte): Gamache Bay,  
etc., Anticosti.

**Lyellia glabra** (Owen).

*Sarcinula* (*Porites*) *glabra* Owen, Geol. Expl. Iowa, Wisconsin, Illinois, 2d ed.,  
1844, p. 70, pl. 13, fig. 11.

*Sarcinula costata* Owen, Geol. Expl. Iowa, Wisconsin, Illinois, 2d ed., 1844, p. 78,  
pl. 14, fig. 12.

*Propora glabra* Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 32, No. 1, 1899,  
p. 100.

*Lyellia glabra* Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal., 1851  
(Arch. du Mus. d'Hist. Nat., 5), p. 226, pl. 12, figs. 2–2c.—Milne Edwards,  
Hist. Nat. d. Corall., 3, 1860, p. 243.—Roemer, Lethæa geog., pt. 1, Leth.  
Pal., 1883, p. 514, fig. 132.—Davis, Kentucky Fossil Corals, Geol. Surv.  
Kentucky, pt. 2, 1885, pl. 2, fig. 1.—Calvin, Amer. Geol., 12, 1893, p. 111.

Niagaran: Iowa, Wisconsin, Illinois, Kentucky.

**Lyellia papillata** Rominger.

*Lyellia papillata* Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 16, pl. 2,  
fig. 3.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885,  
pl. 2, fig. 2; pl. 3, fig. 1; pl. 4, fig. 4.

*Camptolithus papillatus* Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 32, No. 1,  
1899, p. 101, pl. 10, figs. 25–30.

Niagaran: Point Detour and Drummond Island, Lake Huron; Louisville, Ken-  
tucky (Louisville).

***Lyellia parvituba* Rominger.**

*Lyellia parvituba* Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 17, pl. 2, fig. 4.

Niagaran: Drummond Island, Lake Huron; Louisville, Kentucky; Indiana.

***Lyellia puella* Davis.**

*Lyellia puella* Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885 pl. 2, fig. 3; pl. 51, fig. 5.

*Plasmopora puella* Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 32, No. 1, 1899, p. 100.

Niagaran: Near Louisville, Kentucky (Louisville); Decatur County, etc., Tennessee (Brownsport).

***Lyellia speciosa* (Billings).**

*Heliolites speciosus* Billings, Canadian Nat. Geol., n. s., 2, 1865, p. 426; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 30, fig. 13.—Nicholson and Etheridge, Mon. Sil. Girvan Dist., 1880, p. 251.

*Propora speciosa* Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 32, No. 1, 1899, p. 95, pl. 9, figs. 40-46; pl. 10, figs. 1-5.—Kiärer, Vid. Selsk. Skrifter, Math.-naturw. Kl., No. 10, 1903, p. 53.

*Lyellia speciosa* Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 17 (gen. ref.). Gamachian (Ellis Bay): Junction Cliff, Anticosti.

**LYELLIA STRIATA** James. See *Strombodes mamillare wilmingtensis*.

***Lyellia superba* (Billings).**

*Trematopora superba* Billings, Cat. Sil. Foss. Anticosti, 1866, p. 93.

*Lyellia superba* Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, p. 87, pl. 5, figs. 4, 5, 5a.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, p. 248.

Niagaran: Cabots Head, Georgian Bay, and Ekwon River, Canada.

***Lyellia thebesensis* Foerste.**

*Lyellia thebesensis* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 95, pl. 4, fig. 69.—Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 66, pl. 3, figs. 6, 7.

Upper Medinan (Edgewood): Near Thebes, Illinois; Edgewood, Louisiana, and Clarksville, Pike County, Missouri.

**LYONSIA ANADONTOIDES** Emmons. See *Modiolopsis sinnata*.

**LYONSIA ANATINIFORMIS** Emmons. See *Pterotheca anatifomis*.

**LYONSIA CURTA** Emmons. See *Modiolopsis curta*.

**LYONSIA DUBIA** Emmons. See *Ctenodonta dubia*.

**LYONSIA FABA** Emmons. See *Colpomya faba*.

**LYONSIA GIBBOSA** Emmons. See *Ctenodonta gibbosa*.

**LYONSIA NASUTA** Emmons. See *Ctenodonta nasuta*.

**LYONSIA NUCULIFORMIS** Emmons. See *Ctenodonta nuculiformis*.

**LYONSIA SANGUINOLAROIDES** D'Orbigny. See *Ctenodonta sanguinolaroidea*.

**LYONSIA SUBMODIOLARIS** D'Orbigny. See *Modiolopsis modiolaris*.

**LYONSIA SUBSPATULATUS** Emmons. See *Probellia subspatulata*.

**LYONSIA SUBTRUNCATA** D'Orbigny. See *Modiolodon truncatus*.



*LYONSIA TRENTONENSIS* Emmons. See *Endodesma trentonense*.

*LYONSIA TERMINALIS* Emmons. See *Modiolopsis terminalis*.

**LYOPORA** Nicholson and Etheridge. Genotype: *Palæopora? favosa* McCoy.  
*Lyopora* Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1878, p. 26, pl. 2, figs. 1-1e.—Nicholson, Tab. Corals Pal. Period, 1879, p. 187.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 466.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 88.—Lindström, Kongl. Sven. Vet.-Akad. Handl., 32, No. 1, 1899, p. 25.

**Lyopora goldfussi** (Billings).

*Columnaria Goldfussi* Billings, Canadian Nat. Geol., 3, 1858, p. 420; Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 166.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 9.  
*Lyopora Goldfussi* Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 88, pl. 5, figs. 6, 6a, 7.  
 Richmond: Snake Island and Traverse Point, Lake St. John, Canada; Wreck Point, Anticosti; Cape Smythe, Lake Huron.

**LYRIOCRINUS** Hall.

Genotype: *Marsupiocrinites? dactylus* Hall.

*Lyriocrinus* Hall, Pal. New York, 2, 1852, pp. 197, 355.—Pictet, *Traité de Pal.*, 2d ed., 4, 1857, p. 329.—Hall, 15th Rep. New York State Cab. Nat. Hist. for 1861, 1862, p. 126.—Dujardin and Hupé, *Hist. Natur. du Zooph. Echin.*, 1862, p. 149; 20th Rep. New York State Cab. Nat. Hist., 1867, p. 325; 28th Rep., *ibid.*, 1879, p. 139.—Zittel, *Handb. Pal.*, 1, 1879, p. 378.—Wachsmuth and Springer, *Proc. Acad. Nat. Sci. Philadelphia*, 1881, pp. 358, 377 (*Rev. Pal.*, pt. 2, pp. 184, 203); *ibid.*, 1885, p. 321.—Miller, *N. A. Geol. Pal.*, 1889, p. 258.—Wachsmuth and Springer, *Mem. Mus. Comp. Zool. Harvard*, 20, 1897, p. 261.—Weller, *Bull. Chicago Acad. Sci. Nat. Hist. Surv.*, 4, pt. 1, 1900, p. 90, fig. 42.—Bather, *Treatise on Zool.*, pt. 3, *Echinoderma*, London, 1900, p. 200.—Wachsmuth, *Zittel-Eastman Textb. Pal.*, 1, 1900, p. 146.—Grabau, *Bull. New York State Mus.*, 45, 1901, p. 156; *Bull. Buffalo Soc. Nat. Sci.*, 7, 1901, p. 156.—Zittel, *Grundzuge Pal.*, 1, 1910, p. 161.—Grabau and Shimer, *N. A. Index Fossils*, 2, 1910, p. 550.—Springer, *Zittel-Eastman Textb. Pal.*, 2d ed., 1913, p. 189.

**Lyriocrinus beecheri** Hudson.

*Lyriocrinus beecheri* Hudson, *Bull. New York State Mus.*, 80, 1905, pp. 277-280, figs. 4, 5, pl. 3, figs. 1-4.  
 Chazyan (Valcour): Valcour Island, New York.

**Lyriocrinus dactylus** (Hall).

*Marsupiocrinites(?) dactylus* Hall, *Geol. New York*, 4, 1843, p. 113, fig. 4; p. 114; tab. ill. 18, figs. 4, 5.  
*Melocrinus dactylus* D'Orbigny, *Prodr. de Pal.*, 1, 1849, p. 45 (gen. ref.).  
*Lyriocrinus dactylus* Hall, *Pal. New York*, 2, 1852, p. 197, pl. 44, figs. 1a-g.—Pictet, *Traite de Pal.*, 2d ed., 4, 1857, p. 329, pl. 101, fig. 12.—Miller, *N. A. Geol. Pal.*, 1889, p. 258, figs. 352, 353.—Lesley, *Geol. Surv. Pennsylvania*, Rep. P 4, 1889, p. 366, figs.—Wachsmuth and Springer, *Mem. Mus. Comp. Zool. Harvard*, 20, 1897, p. 262, pl. 11, figs. 5a-c.—Grabau, *Bull. Buffalo Soc. Nat. Sci.*, 7, 1901, p. 156, fig. 51; *Bull. New York State Mus.*, 45, 1901, p. 156, fig. 51.—Grabau and Shimer, *N. A. Index Fossils*, 2, 1910, p. 550, fig. 1880.  
*Rhodocrinus (Lyriocrinus) dactylus* Shumard, *Trans. Acad. Sci. St. Louis*, 2 (Cat. *Pal. Foss.*), 1866, p. 379.

**Lyriocrinus dactylus**—Continued.

*Lyriocrinus* (*Rhodocrinus*) *dactylus* Hall, 11th Rep. Geol. Nat. Hist. Indiana, 1882, p. 271.

Clinton (Rochester): Lockport, New York, and vicinity.

**Lyriocrinus melissa** (Hall).

*Rhodocrinus melissa* Hall, Trans. Albany Inst., 4, 1863, p. 198 (Abstract, p. 4); 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875, 1877, pl. 15, figs. 18–27.

*Rhodocrinus* (*Lyriocrinus*) *melissa* Hall, *ibid.*, mus. ed., 1879, p. 139, pl. 15, figs. 18–27.

*Lyriocrinus melissa* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 379 (Rev. Pal., pt. 2, p. 205).—Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., p. 269, pl. 14, figs. 18–27; pl. 15, fig. 11.—Miller, N. A. Geol. Pal., 1889, p. 259, fig. 354.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, pp. 366, 367, figs.—Keyes, Missouri Geol. Surv., 4, for 1894, 1895, pl. 21, fig. 6.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 263, pl. 11, figs. 4a–f.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 91, pl. 3, figs. 6–8.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 550.

Niagaran: Waldron, etc., Indiana; Newsom, Tennessee (Waldron); Bridgeport, Romeo, and Joliet, Illinois (Racine).

**Lyriocrinus sculptilis** (Hall).

*Rhodocrinus* (*Lyriocrinus*) *sculptilis* Hall, 20th Rep. New York State Cab. Nat. Hist., 1868 (extras, 1865), p. 325; rev. ed., 1870, p. 368.

*Lyriocrinus sculptilis* Miller, N. A. Geol. Pal., 1889, p. 259 (gen. ref.).

Niagaran (?Racine): Waukesha, Wisconsin.

*LYRIOCRINUS SCULPTILIS* Miller. See *Diaboloocrinus vesperalis*.

*LYRIOPECTEN ORBICULOIDES* Grabau. See *Amphicoelia orbiculoidea*.

**LYRODESMA** Conrad.

Genotype: *L. planum* Conrad.

*Lyrodesma* Conrad, Ann. Geol. Rep. New York, 1841, p. 51.—Hall, 1847, Pal. New York, 1, 1847, p. 302.—McCoy, British Pal. Rocks, Foss., 1854, p. 272.—Woodward, Man. Mollusca, pt. 2, 1854, p. 273.—Pictet, Traite de Pal., 2d ed., 3, 1855, p. 534.—Hall, Canadian Nat. Geol., 1, 1856, p. 394; 10th Rep. New York State Cab. Nat. Hist., 1857, p. 185 (Extr., p. 145); 15th Rep. New York State Cab. Nat. Hist., 1862, pl. 11, fig. 5; 24th Rep. New York State Cab. Nat. Hist., 1872, p. 227 (Extr. 1871, p. 4).—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 226.—Zittel, Handb. Pal., 2, Munich, 1881, p. 55.—Miller, N. A. Geol. Pal., 1889, p. 487.—Ulrich, Geol. Surv. Ohio, 7, 1893, p. 682; Geol. Minnesota, 3, 1894, pt. 2, p. 608.—Dall, Zittel-Eastman Textb. Pal., 1, 1900, p. 378.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 481.

**Lyrodesma acuminatum** Ulrich.

*Lyrodesma acuminatum* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 609, pl. 42, figs. 1–5.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 481, fig. 641e–f.

Black River (Decorah): Chatfield, and near Cannon Falls, Minnesota.

*Cotypes*.—Cat. Nos. 46214, 46215, U.S.N.M.

**Lyrodesma acuminatum intermedium** Ulrich.

*Lyrodesma acuminatum* var. *intermedium* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 610, pl. 42, figs. 3–4, fig. 45h.

Black River (Decorah): Chatfield, and near Cannon Falls, Minnesota.

Trenton: Near Burgin, Kentucky.

*Cotypes*.—Cat. Nos. 46216, 46217, U.S.N.M.

**Lyrodesma cannonense** Ulrich.

Nucula poststriata Hall, Pal. New York, 1, 1847, p. 151, pl. 34, figs. 2a-2b. (Not p. 301, pl. 82, figs. 10a, b.)

Lyrodesma cannonense Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 610, pl. 42, figs. 6-8.

Trenton: Cannon Falls, Minnesota (Prosser); Carlisle, Pennsylvania.

*Cotypes*.—Cat. Nos. 46218, 46219, U.S.N.M.

**Lyrodesma cincinnatiense** Hall.

Lyrodesma Cincinnatiensis Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 227, pl. 7, fig. 28 (Extr. 1871, p. 4).—Miller, Cincinnati Quart. Jour. Sci., 1874, p. 226.—Hall and Whitfield, Geol. Surv. Ohio, Pal. 2, 1875, p. 82, pl. 1, fig. 25.

Eden (Economy): Cincinnati, Ohio, and vicinity.

**Lyrodesma conradi** Ulrich.

Lyrodesma conradi Ulrich, Geol. Surv. Ohio, 7, 1893, p. 684, pl. 47, fig. 9.

Eden (Southgate): Cincinnati, Ohio, and vicinity.

*Holotype*.—Cat. No. 46220, U.S.N.M.

**Lyrodesma grande** Ulrich.

Lyrodesma grande Ulrich, Geol. Surv. Ohio, 7, 1893, p. 683, pl. 50, fig. 13.

Maysville (Bellevue): Cincinnati, Ohio, and vicinity.

*Holotype*.—Cat. No. 46221, U.S.N.M.

**Lyrodesma inornatum** Ulrich.

Lyrodesma inornatum Ulrich, Geol. Surv. Ohio, 7, 1893, p. 682, pl. 50, figs. 10, 12.

Maysville (Fairmount): Covington, Kentucky, and vicinity.

*Cotypes*.—Cat. No. 46222, U.S.N.M.

**Lyrodesma major** (Ulrich).

Cleidophorus major Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 25, pl. 7, fig. 23.

Lyrodesma major Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 611, fig. 45a-g.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 481, fig. 641a-d.

Maysville (Corryville): Cincinnati, Ohio, and vicinity.

Richmond: Clarksville, Ohio; Spring Valley, Minnesota.

*Holotype* and *plesiotypes*.—Cat. Nos. 46223, 46224, U.S.N.M.

**Lyrodesma planum** Conrad.

Lyrodesma plana Conrad, 5th Ann. Rep. Geol. Surv. New York, 1841, p. 51.—Hall, Pal. New York, 1, 1847, p. 302, pl. 82, figs. 11a, b.—Pictet, *Traité de Pal.*, 2d ed., 3, 1855, p. 534, pl. 79, fig. 17.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 226.

Leda plana Emmons, Amer. Geology, 1, pt. 2, 1855, p. 173.

Cincinnati (Pulaski): Pulaski, etc., New York.

**Lyrodesma poststriatum** (Emmons).

Nuculites post-striatus Emmons, Nat. Hist. New York, Geol., 2, 1842, p. 399, text fig. 4.—McCoy, British Pal. Rocks Foss., 1854, p. 286, pl. 1K, fig. 6.

Nucula postriata Hall, Pal. New York, 1, 1847, p. 151, pl. 34, figs. 2a, b; p. 301, pl. 82, figs. 10a, b.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 4, fig. 5.

Cardiomorpha postriata Emmons, Amer. Geology, 1, pt. 2, 1855, p. 175, pl. 17, fig. 22; Emmons, Man. Geol., 1860, p. 101, fig. 91.

Arca poststriata D'Orbigny, Prodr. de Pal., 1, 1849, p. 13 (gen. ref.).

**Lyrodesma poststriatum**—Continued.

- Lyrodesma poststriata* Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 176, figs. 167a, b.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 36, fig. 11b.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 368, figs.—Miller, N. A. Geol. Pal., 1889, p. 487, fig. 844.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 481.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 306.  
Cincinnati: Loraine, Pulaski, etc., New York (Pulaski); Cincinnati, Ohio, and vicinity (Maysville).

**LYRODESMA PULCHELLA** Hall. See *Ctenodonta pulchella*.

**Lyrodesma schucherti** Ruedemann.

- Lyrodesma schucherti* Ruedemann, Bull. New York State Mus., 62, 1912, p. 103, pl. 6, fig. 12.  
Trenton (Snake Hill): Snake Hill, Saratoga County, New York.

**Lyrodesma subplanum** Ulrich.

- Lyrodesma subplanum*, Ulrich, Geol. Surv. Ohio, 7, 1893, p. 683, pl. 47, fig. 8.—Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 136.  
Trenton (Upper): Covington, Rogers Gap, etc., Kentucky.  
*Holotype*.—Cat. No. 46225, U.S.N.M.

**LYSOCYSTIS** Bather. See *Lysocystites* Miller.

**LYSOCYSTITES** Miller.

Genotype: *Echinocystites nodosus* Hall.

- Echinocystites* Hall, 18th Rep. New York State Cab. Nat. Hist., 1864, p. 12 (adv. sheets); 20th Rep. New York State Cab. Nat. Hist., doc. ed., 1867, p. 316; rev. ed., 1870, p. 360.—Zittel, Handb. Pal., 1, 1879, p. 413.—Bather, Geol. Mag., dec. 4, 6, 1897, p. 381; Treatise on Zool. (Lankester), pt. 3, 1900, p. 70.  
*Echinocystis* Haeckel, Amphor. und Cystoid., 1896, p. 146, pl. 4, figs. 31–34.  
*Lysocystites* Miller, N. A. Geol. Pal., 1889, p. 259 (*Echinocystites* preoccupied).  
*Lysocystis* Bather, Geol. Mag., dec. 4, 4, 1897, p. 381.

**Lysocystites nodosus** (Hall).

- Echinocystites nodosus* Hall, 20th Rep. New York State Cab. Nat. Hist., 1868 (extras, 1864), p. 316, pl. 12 (3), figs. 10, 11; rev. ed., 1870, p. 361, pl. 12, figs. 10, 11.—Chamberlin, Geol. Wisconsin, 1883, 1, p. 191, fig.  
*Lysocystites nodosus* Miller, N. A. Geol. Pal., 1889, p. 259 (gen. rel.).  
Niagara (Racine): Racine, Wisconsin.

**MACLAIRODUS INCURVUS** Pander. See *Distacodus incurvus*.

**MACLUREA** of authors. See *Maclurites* Lesueur.

**MACLUREA CUNEATA** Whitfield. See *Maclurina cuneata*.

**MACLUREA LABIATUS** Emmons and Owen. See *Raphistoma stamineum*.

**MACLUREA MANITOBENSIS** Whiteaves. See *Maclurina manitobensis*.

**MACLUREA STRIATA** Emmons. See *Raphistoma striatum*.

**MACLUREA SUBROTUNDA** Whitfield. See *Maclurina subrotunda*.

**MACLURINA** Ulrich and Scofield. Genotype: *Maclurea manitobensis* Whiteaves.  
*Maclurina* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, pp. 1038–1041.—Koken, Neues Jahrb. Min., Geol. Pal., 1, 1898, p. 21.

**Maclurina cuneata** (Whitfield).

- Maclurea cuneata* Whitfield, Ann. Rep. Geol. Surv. Wisconsin, 1878, p. 75; Geol. Wisconsin, 4, 1882, p. 246, pl. 9, figs. 5–6.

**Maclurina cuneata**—Continued.

*Maclurina cuneata* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1042, pl. 36, figs. 1-3; pl. 82, fig. 46.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 167.

*Maclurea* (*Maclurina*) *cuneata* Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 666, fig. 922.

Trenton: Whitewater, Wisconsin; Stewartville, etc., Minnesota (Stewartville); Dubuque, Iowa, etc. (Galena); Baffin Land.

*Plesiotypic*.—Cat. No. 45939, U.S.N.M.

**Maclurina manitobensis** (Whiteaves).

*Maclurea manitobensis* Whiteaves, Trans. Roy. Soc. Canada, 7, sec. 4, 1890, p. 75, pl. 12; pl. 13, figs. 1, 2; Canadian Rec. Sci., 5, 1893, p. 324.

*Maclurina manitobensis* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1041, pl. 76, figs. 4, 5; pl. 82, fig. 45.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 166.

*Maclurea* (*Maclurina*) *Manitobensis* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, pp. 194, 196, fig. 11, pl. 20, fig. 11.

*Maclurea* (*Maclurina*) *manitobaensis* Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 666, fig. 921.

Trenton: Lake Winnipeg, etc., Manitoba; Goodhue and Fillmore Counties, etc., Minnesota (Stewartville); Baffin Land; Texas, etc.

*Plesiotypic*.—Cat. No. 45940, U.S.N.M.

**Maclurina manitobensis acuta** Parks.

*Maclurina manitobensis* var. *acuta* Parks in Tyrrell, 22d Rep. Ontario Bur. Mines, 1913, p. 32.

Mohawkian or Richmond: Shamattawa River, Manitoba.

**Maclurina subrotunda** (Whitfield).

*Maclurea subrotunda* Whitfield, Ann. Rep. Geol. Surv. Wisconsin for 1877, 1878, p. 75; Geol. Wisconsin, 4, 1882, p. 246, pl. 9, figs. 7, 8.

*Maclurina subrotunda* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1043.

Trenton (Stewartville): Whitewater, Wisconsin; Stewartville, Minnesota.

*Plesiotypic*.—Cat. No. 45941, U.S.N.M.

**MACLURITES** Lesueur.

Genotype: *M. magnus* Lesueur.

*Maclurites* Lesueur, Jour. Acad. Nat. Sci. Philadelphia, 1, 1818, p. 312.

*Maclurea* Woodward, Manual Mollusca, 1842, p. 202.—Emmons, Geol. Rep. New York, 2d Dist., 1842, pp. 107, 273, 276, fig. 1.—Roemer, Neues Jahrb. f. Min., etc., 1848, p. 172.—Woodward, Manual Mollusca, pt. 2, 1854, p. 202.—McCoy,

British Pal. Rocks Foss., 1854, p. 300.—Pictet, Traité de Pal., 2d ed., 3, 1855, p. 154.—Salter, Geol. Surv. Canada, Canadian Org. Rem., dec. 1, 1859, p. 7.—Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, pp. 235, 236, 310.—Waagen,

Mem. Geol. Surv. India, Pal. Indica, 13th ser., 1, 1880, p. 87.—Zittel, Handb. Pal., 2, 1882, p. 207.—Miller, N. A. Geol. Pal., 1889, p. 408.—Koken, Neues Jahrb. Min., Geol. Pal., 6, Beilage-Band, 1889, pp. 419, 432; Die Leitfossilien,

Leipzig, 1896, p. 396.—Ulrich and Scofield, Geol. Minnesota, 3, 1897, p. 1033.—Grabau and Shimer, N. A. Index Fossils, 2, 1909, p. 664.

*Lesueurilla* Koken, Neues Jahrb. Min., Geol. Pal., 1, 1898, p. 22.

**Maclurites acuminatus** (Billings).

*Maclurea acuminata* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 240, fig. 225.—Whitfield, Bull. Amer. Mus. Nat. Hist., 3, 1890, p. 32, pl. 2, figs. 1, 2.—Sardeson, Jour. Geol., 11, 1903, p. 479, figs. 10-12.—Secly, Rep. Vermont State Geol., 7, 1910, pl. 57, figs. 9, 10.

Canadian: Table Head and Point Rich, Newfoundland (Quebec—K, N); Fort Cassin, Vermont (Beckmantown).

**Maclurites affinis** (Billings).

*Maclurea affinis* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 238, figs. 224a, b.—Whitfield, Bull. Amer. Mus. Nat. Hist., 9, 1897, p. 180, pl. 4, figs. 8, 9.

*Lesueurilla affinis* Koken, Neues Jahrb. Min., Geol. Pal., 1, 1898, p. 22 (gen. ref.). Canadian: Keppel Island, Newfoundland (Quebec—F); Otter Creek, Vermont (Beekmantown).

**Maclurites annulatus** (Walcott).

*Maclurea annulata* Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 81, pl. 11, figs. 19, 19a.

Upper Pogonip: White Mountain, Eureka District, Nevada.

*Cotype*.—Cat. Nos. 17338, 17339, U.S.N.M.

**Maclurites atlanticus** (Billings).

*Maclurea atlantica* Billings, Canadian Nat. Geol., 4, 1859, p. 459.

*Maclurites atlanticus* Raymond, Ann. Carnegie Mus., 4, 1908, p. 201.

Chazyan (Mingan): Mingan Islands, Canada.

**Maclurites avellanedæ** (Kayser).

*Maclurea avellanedæ* Kayser, Beitr. Geol. Pal. Argentin. Republik, Pal. Suppl., 3, 1876, p. 15, pl. 4, figs. 1, 2; Zeit. d. Deutschen geol. Gesell., 49, 1897, p. 283.

Ordovician: Talacastrea, Argentina.

**Maclurites bigsbyi** (Hall).

*Maclurea bigsbyi* Hall, Rep. Geol. Surv. Wisconsin, 1861, p. 37.—Whitfield, Geol. Wisconsin, 4, 1882, p. 222, pl. 6, figs. 17, 18; Geol. Wisconsin, 1, 1883, p. 157, fig.; Mem. Amer. Mus. Nat. Hist., 1, 1895, p. 62, pl. 8, figs. 14, 15 (not 12, 13).—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1039, pl. 75, figs. 5–10.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 664, fig. 919.

Black River (Platteville): Mineral Point, Fulton, Janesville, etc., Wisconsin; Dixon, etc., Illinois.

*Plesiotypes*.—Cat. No. 45933, U.S.N.M.

**Maclurites bigsbyi dixonensis** (Ulrich).

*Maclurea bigsbyi* var. *dixonensis* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1039.

Black River (Platteville): Dixon, Illinois.

*Holotype*.—Cat. No. 45934, U.S.N.M.

**Maclurites carinatus** (Walcott).

*Maclurea carinata* Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 82, pl. 11, figs. 20, 20a.

Upper Pogonip: Lone Mountain, Eureka District, Nevada.

*Cotypes*.—Cat. No. 17342, U.S.N.M.

**Maclurites crassus** (Ulrich and Scofield).

*Maclurea crassa* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1040, pl. 75, figs. 12–14.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 167.

Trenton: Lime City, Stewartville, Wykoff, etc., Minnesota (Stewartville); Baffin Land.

*Cotype*.—Cat. No. 45935, U.S.N.M.

**Maclurites crassus macer** (Ulrich and Scofield).

*Maclurea crassa* var. *macra* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1041, pl. 75, figs. 15, 16.

Trenton (Prosser): Hader, Minnesota.

*Holotype*.—Cat. No. 45936, U.S.N.M.

**Maclurites crenulatus** (Billings).

*Maclurea crenulata* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 236, fig. 222a-c.—Miller, N. A. Geol. Pal., 1889, p. 408, fig. 683.

Chazyan (Quebec, I-N): Table Head and Point Rich, Newfoundland.

**Maclurites depressus** (Ulrich and Scofield).

*Maclurea depressa* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1040, pl. 75, figs. 1-4.

Black River (Platteville): Minneapolis, Minnesota.

*Cotype*.—Cat. No. 45937, U.S.N.M.

**Maclurites emmonsii** (Billings).

*Maclurea Emmonsii* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 242, fig. 227a-c.

*Lesueurilla Emmonsii* Koken, Neues Jahrb. Min., Geol. Pal., 1, 1898, p. 22 (gen. ref.).

Chazyan (Quebec, I-N): Point Rich and Table Head, Newfoundland.

**Maclurites knoxvillensis** (Ulrich).

*Maclurea knoxvillensis* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1039.

Chazyan (Lenoir): Knoxville, Tennessee.

*Cotype*.—Cat. No. 45938, U.S.N.M.

**Maclurites logani** (Salter).

*Maclurea logani* Salter, Rep. 21st Meeting British Assoc. Adv. Sci., Notes and Abstracts, 1852, p. 63.—Woodward, Man. Mollusca, pt. 2, 1854, p. 202, fig. 106.—Salter, Geol. Surv. Canada, dec. 1, 1859, p. 7, pl. 1, figs. 1-6.—Hitchcock, Geol. Vermont, 1, 1861, p. 296.—Chapman, Canadian Jour., n. s., 7, 1862, p. 119, fig. 117; *ibid.*, 8, 1863, p. 197, fig. 170; Expos. Min. Geol. Canada, 1864, p. 123, fig. 117; p. 169, fig. 170.—Roemer, Leth. geog., 1, Leth. Pal. Atlas, 1876, pl. 5, fig. 6.—Etheridge, Quart. Jour. Soc. London, 34, 1878, p. 606.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 664, fig. 920.

Black River: Allumette Island, Ottawa River (Leray), and Mingan Islands, Canada; Bessels Bay, Arctic America.

**Maclurites magnus** Lesueur.

*Maclurites magna* Lesueur, Jour. Acad. Nat. Sci. Philadelphia, 1, 1818, p. 312, pl. 13, figs. 1-3.—Raymond, Ann. Carnegie Mus., 4, 1908, p. 199, pl. 50, figs. 1, 2; pl. 51, figs. 1, 2; pl. 52, figs. 1-4.

*Straparollus magnus* D'Orbigny, Prodr. Pal., 1, 1849, p. 6 (gen. ref.).—Emmons, Amer. Geol., 1, pt. 2, 1855, p. 156, pl. 4, fig. 15; Man. Geol., 1860, p. 94, fig. 79.

*Maclurea magna* Emmons, Rep. 2d Dist., New York State Surv., 1842, p. 276, fig. 1.—Hall, Pal. New York, 1, 1847, p. 26, pl. 5, figs. 1a-e; pl. 5, (bis), figs. 1a-c.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 817, fig. 595.—Hitchcock, Geol. Vermont, 1, 1861, p. 278, fig. 177.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, p. 30, pl. 1, fig. 11.—Etheridge, Quart. Jour. Soc. London, 34, 1878, p. 605.—Whitfield, Amer. Jour. Sci. Arts, 3d ser., 18, 1879, p. 227.—Dwight, Proc. Poughkeepsie Soc. Nat. Sci., 1880, p. 18; Proc. Assoc. Adv. Sci., 31, 1883, p. 385.—Lesley, Geol. Surv. Pennsylvania Rep., P 4, 1889, p. 369, figs.—Keyes, Missouri Geol. Surv., 5, 1894, p. 163, pl. 52, fig. 9a, b.—Raymond, Bull. Amer. Pal., 3, 1902, p. 305, pl. 18, fig. 10.—Bassler, Bull. Virginia Geol. Surv., no. 2a, 1909, pl. 20, figs. 8, 9.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 664, fig. 918, a.

*Euomphalus maclurii* Troost, 5th Geol. Rep. Tennessee, 1840, p. 55.

Chazyan: Chazy, etc., New York; Isle la Motte, Vermont (Crown Point); East Tennessee (Lenoir); Virginia; Maryland; Pennsylvania; etc. (Middle Stones River).

**Maclurites matutinus** (Hall).

*Maclurea matutina* Hall, Pal. New York, 1, 1847, p. 10, pl. 3, fig. 3.—Billings Canadian Nat. Geol., 4, 1859, p. 357, fig. 7.—Hitchcock, Geol. Vermont, 1, 1861 p. 271, fig. 171.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 115 figs. 24a, b. (?25a, b, c).—Lesley, Geol. Surv. Pennsylvania, Rep., P 4, 1889 p. 370, figs.

*Straparollus matutina* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 156.  
Canadian (Tribes Hill): Canajoharie, etc., Mohawk Valley, New York.

**Maclurites minimus** (Hall and Whitfield).

*Maclurea minima* Hall and Whitfield, U. S. Geol. Expl. 40th Parall., 4, 1877, p. 235, pl. 1, figs. 17-19.

Pogonip: Ute Peak, Wasatch Range, Utah.

*Cotypes*.—Cat. No. 17352, U.S.N.M.

**Maclurites nitidus** (Ulrich and Scofield).

*Maclurea nitida* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1040, pl. 75, fig. 11.

Black River (Platteville): Mineral Point and Beloit, Wisconsin; Dixon, Illinois ?Stones River (Murfreesboro): Murfreesboro, Tennessee.

**Maclurites oceanus** (Billings).

*Maclurea oceana* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 237, figs. 223a, b.—Bassler, Bull. Virginia Geol. Surv., 2a, 1909, pl. 20, figs. 4, 5.

Canadian: Port aux Choix, Table Head, Cape Norman and Pistolet Bay, Newfoundland (Quebec, F—H); Virginia (Beekmantown).

**Maclurites ponderosus** (Billings).

*Maclurea ponderosa* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 239.

Chazyan (Quebec—P): Cow Head, Newfoundland; and Phillipsburg, Quebec.

**Maclurites psyche** (Billings).

*Maclurea Psyche* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 244.

Canadian (Quebec—G): Cape Norman, Newfoundland.

**Maclurites rotundatus** (Billings).

*Maclurea rotundata* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 245, figs. 231a, b.

Canadian (Quebec—G): Bonne Bay, Newfoundland.

**Maclurites sarmienti** (Kayser).

*Maclurea Sarmienti* Kayser, Beitr. Geol. Pal. Argentin. Republik, Pal. Suppl., 3, 1876, p. 16, pl. 4, figs. 4, 4c.

Ordovician: Talacastra, Argentina.

**Maclurites sordidus** (Hall).

*Maclurea sordida* Hall, Pal. New York, 1, 1847, p. 10, pl. 3, figs. 2, 2a.—Hitchcock Geol. Vermont, 1, 1861, p. 271.—Whitfield, Bull. Amer. Mus. Nat. Hist., 2, 1889, p. 49, pl. 8, figs. 1-4.—Secly, Rep. Vermont State Geol., 7, 1910, pl. 56, fig. 1.

*Straparollus sordidus* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 156, pl. 3, fig. 6.  
*Ophileta sordida* Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 500, figs.  
Canadian (Beekmantown): New York; Fort Cassin, Vermont.

**Maclurites speciosus** (Billings).

*Maclurea speciosa* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 240, fig. 226.

Canadian (Quebec, G—M): Point Rich, Table Head, Cape Norman, Schoone Island, Newfoundland.



**Maclurites(?) stelzneri** (Kayser).

*Maclurea(?) Stelzneri* Kayser, Beitr. Geol. Pal., Argentin. Republik, Pal. Suppl., 3, 1876, p. 17, pl. 4, figs. 5, 6.  
Ordovician: Talacastria, Argentina.

**Maclurites striata** Troost.

Not recognizable.

*Maclurites striata* Troost, 5th Rep. Geol. Tennessee, 1840, p. 55.  
"Grauwacke": Hawkins County, Tennessee.

**Maclurites subannulatus** (Walcott).

*Maclurea subannulata* Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 82, pl. 11, figs. 18, 18a, b.  
Upper Pogonip: White Mountain, Eureka District, Nevada.  
*Cotypes*.—Cat. No. 17346, U.S.N.M.

**Maclurites subovatus** (Parks).

*Maclurea subovata* Parks in Tyrrell, 22d Rep. Ontario Bur. Mines, 1913, p. 32.  
Mohawkian or Richmond: Shamattawa River, Manitoba.

**Maclurites sylpha** (Billings).

*Maclurea Sylpha* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 244.  
Canadian (Quebec—G): Cape Norman, Newfoundland.

**Maclurites transitionis** (Billings).

*Maclurea transitionis* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 241.  
Chazyan (Quebec—K, L): Table Head and Point Rich, Newfoundland.

**MACROCYPRIS** Brady.Genotype: *M. minna* Baird.

*Macrocypris* Brady, Intellectual Observer, 12, London, 1867, p. 119.—Jones and Kirby, Proc. Geol. Soc. London, 9, 1886, p. 510.—Jones, Ann. Mag. Nat. Hist., 5th ser., 19, 1887, p. 178.—Miller, N. A. Geol. Pal., 1st App., 1889, p. 709.—Ulrich, Zittel-Eastman Textb. Pal., 1, 1900, p. 646.—Bassler, *ibid.*, 2d ed., 1913, p. 740.

**Macrocypris? siliqua** (Jones).

*Cytheropsis siliqua* Jones, Ann. Mag. Nat. Hist., 3d ser., 1, 1858, p. 249, pl. 10, fig. 6; Geol. Surv. Canada, dec. 3, 1858, p. 99.  
*Macrocypris? siliqua* Jones, Geol. Surv. Canada, Cont. Micro-Pal., pt. 3, 1891, p. 99.  
Black River (Leray): Pauquette's Rapids, Ottawa River, Canada.

**Macrocypris? subcylindrica** Jones.

*Macrocypris? subcylindrica* Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 549, pl. 21, figs. 5a, b.  
Richmond (English Head): English Head, Anticosti.

**MACRONOTELLA** Ulrich.Genotype: *M. scofieldi* Ulrich.

*Macronotella* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 683.—Bonnema, Mitt. Min. Geol. Inst. Groningen, 2, 1909, p. 55.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 348.

**Macronotella fragaria** Ruedemann.

*Macronotella fragaria* Ruedemann, Bull. New York State Mus., 49, 1901, p. 85, pl. 6, figs. 3-5.  
Mohawkian (Rysedorph): Rysedorph Hill, Rensselaer County, New York.

**Macronotella scofieldi** Ulrich.

*Macronotella scofieldi* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 684, pl. 43, figs. 30-34.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 348, fig. 1657, u, v.

**Macronotella scofieldi**—Continued.

*Isochilina scofieldi* Miller, N. A. Geol. Pal., 2d App., 1897, p. 788 (gen. ref.).

Black River: Near Cannon Falls, Minnesota (Platteville); High Bridge, Kentucky (Lowville).

*Cotypes*.—Cat. Nos. 41848, 41849, U.S.N.M.

**Macronotella ulrichi** Ruedemann.

*Macronotella ulrichi* Ruedemann, Bull. New York State Mus., 49, 1901, p. 83, pl. 6, figs. 6–16; pl. 7, fig. 1.

Mohawkian (Rysedorph): Rysedorph Hill and Moordener kill, Rensselaer County, New York.

**MACROSTYLOCRINUS** Hall.

Genotype: *M. ornatus* Hall.

*Macrostylocrinus* Hall, Pal. New York, 2, 1852, p. 203.—Pictet, *Traité de Pal.*, 2d ed., 4, 1857, p. 329.—Dujardin and Hupe, *Hist. Natur. Zooph. Echin.*, 1862, p. 149.—Hall, *Trans. Albany Inst.*, 4, 1863, p. 207 (Abstract, p. 12); 28th Rep. New York State Mus. Nat. Hist., mus. ed., 1879, p. 128.—Zittel, *Handb. Pal.*, 1, 1879, p. 368.—Wachsmuth and Springer, *Proc. Acad. Nat. Sci. Philadelphia*, 1881, pp. 270, 276 (*Rev. Pal.*, pt. 2, pp. 96, 102); *ibid.*, 1885, p. 324.—Ringueberg, *Jour. Soc. Nat. Hist.*, 5, 1882, p. 119.—Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 256.—De Loriol, *Pal. Française*, 11, *Crin.*, 1882, p. 56.—Miller, N. A. Geol. Pal., 1889, p. 259.—Wachsmuth and Springer, *Mem. Mus. Comp. Zool.*, Harvard (N. A. Crin. Cam.), 20, 1897, p. 285.—Weller, *Bull. Chicago Acad. Sci., Nat. Hist. Surv.*, 4, pt. 1, 1900, p. 92, fig. 43.—Bather, *Treatise on Zool.*, pt. 3, *Echinoderma*, London, 1900, p. 162.—Wachsmuth, *Zittel-Eastman Textb. Pal.*, 1, 1900, p. 148.—Springer, *ibid.*, 2d ed., 1913, p. 191.—Zittel, *Grundzuge Pal.*, 1, 1910, p. 162.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 554.

**Macrostylocrinus fasciatus** (Hall).

*Cyathocrinus fasciatus* Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875, 1877, pl. 13, figs. 5, 6.

*Macrostylocrinus fasciatus*, Hall *ibid.*, mus. ed., 1879, p. 130, pl. 13, figs. 5, 6; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, pp. 258, 259, fig., pl. 12, figs. 5, 6.—Lesley, *Geol. Surv. Pennsylvania*, Rep. P 4, 1889, p. 378, figs.—Weller, *Bull. Chicago Acad. Sci., Nat. Hist. Surv.*, 4, pt. 1, 1900, p. 95.—Wachsmuth and Springer, *Mem. Mus. Comp. Zool.*, Harvard, 20, 1897, p. 288, pl. 22, fig. 13.

Niagaran (Waldron): Waldron and Hartsville, Indiana.

**Macrostylocrinus fusibrachiatus** Ringueberg.

*Macrostylocrinus fusibrachiatus* Ringueberg, *Jour. Cincinnati Soc. Nat. Hist.*, 5, 1882, p. 119, pl. 5, fig. 4.—Miller, N. A. Geol. Pal., 1889, p. 259, fig. 356.—Wachsmuth and Springer, *Mem. Mus. Comp. Zool.*, Harvard, 20, 1897, p. 291, pl. 23, figs. 9, 10.

Clinton (Rochester): Lockport, New York.

**Macrostylocrinus granulosus** (Hall).

*Macrostylocrinus striatus* var. *granulosus* Hall, 28th Rep. New York State Mus. Nat. Hist., mus. ed., 1879, p. 129; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 258.

*Macrostylocrinus granulosus* Wachsmuth and Springer, *Mem. Mus. Comp. Zool.* Harvard, 20, 1897, p. 289, pl. 22, fig. 15a, b.

Niagaran (Waldron): Waldron and Hartsville, Indiana.

**Macrostylocrinus indianensis** Miller and Gurley.

*Macrostylocrinus indianensis* Miller and Gurley, *Bull. Illinois State Mus. Nat. Hist.*, 6, 1895, p. 33, pl. 3, fig. 23.

Niagaran (Laurel): St. Paul, Indiana.

**Macrostylocrinus meeki** (Lyon).

Actinocrinus Meeki Lyon, Proc. Acad. Nat. Sci. Philadelphia, 1861, p. 411, pl. 4, figs. 4a, b.

Macrostylocrinus Meeki Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 277 (Rev. Pal., pt. 2, p. 103); Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 290, pl. 22, figs. 16a, b.

Niagaran (Louisville): Jefferson County, Kentucky.

**Macrostylocrinus obconicus** Weller.

Macrostylocrinus obconicus Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 95, pl. 4, figs. 6, 7.

Niagaran (Racine): Bridgeport, Illinois.

**Macrostylocrinus ornatus** Hall.

Macrostylocrinus ornatus Hall, Pal. New York, 2, 1852, p. 204, pl. 46, figs. 4a-g.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 286, pl. 23, figs. Sa-c.

Ctenocrinus ornatus Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 361 (gen. ref.).

Clinton (Rochester): Lockport, New York.

**Macrostylocrinus semiradiatus** (Hall).

Actinocrinus (Saccocrinus) semiradiatus Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 379, pl. 10(1), fig. 1; rev. ed., 1870, p. 370, pl. 10, fig. 1.

Periechocrinus semiradiatus Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 307 (Rev. Pal., pt. 2, p. 133).

Saccocrinus semiradiatus Miller, N. A. Geol. Pal., 1889, p. 279.

Macrostylocrinus semiradiatus Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 21, 1897, p. 521.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, 1900, p. 94, pl. 4, fig. 9.

Niagaran (Racine): Racine, Wisconsin; Bridgeport, Illinois.

**Macrostylocrinus striatus** Hall.

Macrostylocrinus striatus Hall, Trans. Albany Inst., 4, 1863, p. 207 (Abstract, p. 13); 20th Rep. New York State Cab. Nat. Hist. (extras, March, 1865), p. 327, pl. 10 (1), figs. 7, 8; rev. ed., 1870, p. 371, pl. 10, figs. 7, 8; 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1877, pl. 13, figs. 1-4; rev. ed., 1879, p. 129, pl. 13, figs. 1-4; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 257, pl. 12, figs. 1-4.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 378, figs.—Miller, N. A. Geol. Pal., 1889, p. 259, fig. 356.—Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 287, pl. 22, fig. 14.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 93, pl. 4, figs. 10, 11.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 555.

Ctenocrinus striatus Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 361 (gen. ref.).

Niagaran: Waldron and Hartsville, Indiana (Waldron); Racine, Wisconsin, and Bridgeport, Illinois (Racine).

**MACROSTYLOCRINUS STRIATUS** var. **GRANULOSUS** Hall. See *Macrostylocrinus granulosis*.

**Macrostylocrinus subglobosus** Weller.

Macrostylocrinus subglobosus Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 96, pl. 4, fig. 8.

Niagaran (Racine): Bridgeport, Illinois.

*MACROSTYLOCRINUS WALDRONENSIS* Wachsmuth and Springer. See *Dimerocrinus waldronensis*.

*MADREPORA INTERSTINCTA* Linnæus. See *Heliolites interstinctus*.

*MADREPORA ORGANUM* Linnæus. See *Syringophyllum organum*.

*MADREPORITES ARTICULATUS* WAHLENBERG. See *Cyathophyllum articulatum*.

**MELONOCERAS** Hyatt. Genotype: *Phragmoceras præmaturum* Billings.

*Melonoceras* Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 280.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 775.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 118.

*Meloceras* Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 262, footnote, p. 269.

*Meloceras* (*Melonoceras*) [subgenus of *Oncoceras*] Hyatt, Zittel-Eastman Textb. Pal., 1900, p. 530; 2d ed., 1913, p. 611.

**Mælonoceras arcticameratum** (Hall).

*Cyrtoceras arcticameratum* Hall, Pal. New York, 2, 1852, p. 349, pl. 84, figs. 7a-d.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 103.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 87, pl. 15, figs. 1, 2; pl. 16, figs. 1-7.

*Cyrtoceras* (*Meloceras*) *arcticameratum* Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 288.

*Mælonoceras arcticameratum* Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 119, fig. 1356.

Niagaran (Guelph): Galt, Ontario; Rochester, New York; Cedarburg, Wisconsin.

**Mælonoceras falx** (Billings).

*Cyrtoceras falx* Billings, Geol. Surv. Canada, Rep. Progr. for 1853-1856, 1857, p. 314.—Salter, Geol. Surv. Canada, dec. 1, 1859, p. 32, pl. 7, fig. 1-4.

*Cyrtoceras* (*Meloceras*) *falx* Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 270.

Black River (Leray): Pauquettes Rapids, Ottawa River, Canada.

**Mælonoceras metellus** (Billings).

*Cyrtoceras Metellus* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 191, fig. 175.

*Mælonoceras metellus* Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 280 (gen. ref.).

Canadian (Levis-Limestone): Point Levis, Quebec.

**Mælonoceras neleus** (Hall).

*Cyrtoceras neleus* Hall, Rep. Supt. Geol. Surv. Wisconsin, 1861, p. 40.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 65, pl. 9, figs. 10, 11.—Clarke Geol. Minnesota, 3, pt. 2, 1897, p. 804, pl. 59, figs. 17-20.

*Mælonoceras neleus* Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 118, fig. 1355.

Black River (Platteville): Beloit, Wisconsin; Cannon Falls, etc., Minnesota. Trenton (Prosser): Wykoff, Minnesota.

**Mælonoceras præmaturum** (Billings).

*Phragmoceras præmaturum* Billings, Canadian Nat. Geol., 5, 1860, p. 173, figs. 19, 20.—Chapman, Canadian Jour., n. s., 8, 1863, p. 22, fig. 133; p. 198, fig. 175; Expos. Min. Geol. Canada, 1864, p. 130, fig. 133; p. 170, fig. 175.

*Mælonoceras præmaturum* Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 280 (gen. ref.).

Black River: Le Cloche Island, Lake Huron; La Petite Chaudiere Rapids and Pauquette's Rapids, Ottawa River, Canada (Leray).

**MALOCYSTIS** HAECKEL. See *Malocystites* Billings.

**MALOCYSTITES** Billings.

Genotype: *M. murchisoni* Billings.

*Malocystites* Billings, Geol. Surv. Canada, dec. 3, 1858, p. 66.—Hall, Pal. New York, 3, 1859, p. 152.—Chapman, Expos. Min. Geol. Canada, 1864, p. 109.—Zittel, Handb. Pal., 1, 1879, p. 413.—Miller, N. A. Geol. Pal., 1889, p. 259.—Jaekel, Zeits. d. d. geol. Gesell., 53, 1900, p. 674.—Bather, Treatise on Zool. (Lanckester), pt. 3, 1900, p. 58.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 471.

*Malocystis* Haeckel, Amphor. und Cystoid., Leipzig, 1896, p. 105.

**MALOCYSTITES BARRANDI** Billings. See *Canadocystis barrandi*.

**MALOCYSTITES EMMONSI** Hudson. See *Canadocystis emmonsii*.

**Malocystites murchisoni** Billings.

*Malocystites Murchisoni* Billings, Geol. Surv. Canada, dec. 3, 1858, p. 66, pl. 7, figs. 1a-i.—Chapman, Expos. Min. Geol. Canada, 1864, p. 109.—Miller, N. A. Geol. Pal., 1889, p. 259, fig. 357.—Jaekel, Zeits. d. d. geol. Gesell., 52, 1900, p. 675, fig. 10.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 471, fig. 1782.

*Malocystis Murchisoni* Haeckel, Amphor. u. Cystoid., Leipzig, 1896, p. 105.

Chazyan: Caughnawaga and Island of Montreal, Canada.

**MARIACRINUS** Hall.

Genotype: *M. plumosus* Hall.

*Astrocrinites* Conrad, Cat. Ann. Geol. Rep. New York, 1841, p. 34. (Not defined; also preoccupied.)

*Mariacrinus* Hall, Amer. Jour. Sci. Arts, 2d ser., 25, 1858, p. 278; Pal. New York, 3, 1861, pp. 104, 139.—Salter, Cat. Camb. and Sil. Foss., 1873, p. 122.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, pp. 270, 288, 292, 407 (Rev. Pal., pt. 2, pp. 96, 114, 118, 233); *ibid.*, 1885, p. 326.—Miller, N. A. Geol. Pal., 1889, p. 259.—James, J. F. (part), Jour. Cincinnati Soc. Nat. Hist., 19, 1897, pp. 117, 118.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 281.—Whidborne, Mon. Dev. Fauna South England, 3, Pal. Soc., 1898, p. 219.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 98.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 147.—Springer, *ibid.*, 2d ed., 1913, p. 190.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 161, fig. 74, 1.—Talbot, Amer. Jour. Sci., 4th ser., 20, 1905, p. 25.—Zittel, Grundzuge Pal., 1, 1910, p. 163.

**Mariacrinus aureatus** Miller.

*Mariacrinus aureatus* Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 644, pl. 6, fig. 36 (adv. sheets, 1891, p. 34).—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 285.

Niaganan (Laurel): St. Paul, Indiana.

**Mariacrinus beecheri** Talbot.

*Mariacrinus beecheri* Talbot, Amer. Jour. Sci., 20, 1905, p. 25, pl. 1, fig. 3; fig. 2. Helderbergian (Manlius transition beds or Coeymans): North Litchfield, New York.

**Mariacrinus carleyi** (Hall).

*Glyptocrinus carleyi* Hall, Trans. Albany Inst., 4, 1863, p. 203.—Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 90.—Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875, 1877, pl. 14, figs. 7-10; mus. ed., 1879, p. 132, pl. 14, figs. 7-10; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 261, pl. 13, figs. 7-10; pl. 15, fig. 5.

**Mariacrinus carleyi**—Continued.

*Mariacrinus carleyi* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 290 (Rev. Pal., pt. 2, p. 116).—Miller, N. A. Geol. Pal., 1889, p. 260, fig. 358.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 282, pl. 22, figs. 2a-c.

Niagaran (Waldron): Waldron and Hartsville, Indiana; Newsom, Tennessee.  
*Plesiotype*.—Cat. No. 40893, U.S.N.M.

**Mariacrinus? granulosis** Miller.

*Mariacrinus granulosis* Miller, 17th Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 645, pl. 6, fig. 35 (adv. sheets, 1891, p. 35).

Niagaran (Laurel): St. Paul, Indiana.

**MARIACRINUS HARRISI** Wachsmuth and Springer. See *Compsocrinus harrisi*.

**MARIACRINUS NOBILISSIMUS** Hall. See *Melocrinus nobilissimus*.

**MARIACRINUS OBCONICUS** Wachsmuth and Springer. See *Melocrinus obconicus*.

**MARIACRINUS PACHYDACTYLUS** Hall. See *Melocrinus pachydactylus*.

**MARIACRINUS PAUCIDACTYLUS** Hall. See *Melocrinus pachydactylus*.

**Marlacrinus warreni** Ringuenberg.

*Mariacrinus warreni* Ringuenberg, Proc. Acad. Nat. Sci. Philadelphia, 1888, p. 133, pl. 7, fig. 4.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 283, pl. 22, fig. 1.

Clinton (Rochester): Lockport, New York.

**MARSIPOCRINUS** Bather. Genotype: *Marsupiocrinites cælatus* Phillips.

*Marsupiocrinites* Phillips, in Murchison's Sil. Syst., 1839, p. 672.—Austin, Ann. Mag. Nat. Hist., 10, 1842, p. 109.—Meek and Worthen, Geol. Surv. Illinois, 2, 1866, p. 172.

*Marsupiocrinus* McCoy, British Pal. Rocks and Foss., 1854, p. 54.—Pictet, *Traité de Pal.*, 2d ed., 4, 1857, p. 332.—Dujardin and Hupé, *Hist. Nat. des Zooph.*, 1860, p. 149.—Salter, *Cat. Camb. Sil. Foss.*, p. 119.—Angelin, *Icon. Crin.*, 1878, p. 2.—Zittel, *Handb. Pal.*, 1, 1879, p. 365.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, pp. 237, 404 (Rev. Pal., 2, pp. 63, 230); *ibid.*, 1888, p. 373; *ibid.*, 1890, p. 351.—Miller, N. A. Geol. Pal., 1889, p. 260.—Wachsmuth, *Zittel-Eastman Textb. Pal.*, 1896, p. 139.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 21, 1897, p. 730.—Weller, *Bull. Chicago Acad. Sci., Nat. Hist. Surv.*, 4, pt. 1, p. 137, fig. 50.

*Marsipocrinus* Bather, *Quart. Jour. Geol. Soc. London*, 45, 1889, p. 173; *Treatise on Zool.*, pt. 3, Echinoderma, London, 1900, p. 156, fig. 70.—Wood, *Bull. U. S. Nat. Mus.*, 64, 1909, p. 30.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 516.

*Cupellæcrinites* Troost, *Amer. Jour. Sci. Arts*, 2d ser., 8, 1849, p. 419; *Proc. Amer. Assoc. Adv. Sci.*, 2, 1850, p. 61 (not defined). (Genotype: *C. Verneuii* Troost.)

*Cupellæcrinus* Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1865, p. 161; *Geol. Surv. Illinois*, 2, 1866, p. 172.

*Cupellæcrinus* Shumard, *Trans. Acad. Sci. St. Louis*, 2, 1866, p. 361; p. 387, footnote.—Meek, *Amer. Jour. Sci. Arts*, 2d ser., 42, 1866, p. 118.—Zittel, *Handb. Pal.*, 1, 1879, p. 365.—Bather, *Treatise on Zool.* (Lankester), pt. 3, 1890, p. 156.

**Marsipocrinus chicagoensis** (Weller).

Marsipocrinus chicagoensis Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 138, pl. 14, figs. 2, 3.

Niagaran (Racine): Chicago, Illinois.

**Marsipocrinus corrugatus** (Troost).

Cupellæcrinites corrugatus Troost, Amer. Jour. Sci. Arts, 2d ser., 8, 1849, p. 419.—Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 61 (nom. nud.).

Cupellæcrinus corrugatus Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 361.

Marsipocrinus corrugatus Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 35, pl. 10, fig. 8.

Niagaran (Brownsport): Decatur County, Tennessee:

*Holotype*.—Cat. No. 39930, U.S.N.M.

**Marsipocrinus magnificus** (Troost).

Cupellæcrinites magnificus Troost, Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 61 (nom. nud.).

Cupellæcrinus magnificus Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 361.

Marsipocrinus magnificus Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 34, pl. 10, figs. 5, 6, 7.

Niagaran (Brownsport): Decatur County, Tennessee.

*Holotype*.—Cat. No. 39927, U.S.N.M.

**Marsipocrinus pentagonalis** (Troost).

Cupellæcrinites pentagonalis Troost, Amer. Jour. Sci. Arts, 2d ser., 8, 1849, p. 419 (nom. nud.); Proc. Amer. Assoc. Adv. Sci., 2, p. 61.

Cupellæcrinus pentagonalis Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 381.

Marsipocrinus pentagonalis Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 37.

Niagaran (Brownsport): Perry County, Tennessee.

*Holotype*.—Cat. No. 39931, U.S.N.M.

**Marsipocrinus præmaturus** (Hall and Whitfield).

Platycrinus præmaturus Hall and Whitfield, Geol. Surv. Ohio, Pal. 2, 1875, p. 124, pl. 6, figs. 3–6.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 689, figs.

Marsipocrinus præmaturus Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1885, p. 337 (Rev. Pal., pt. 3, sec. 1, p. 115); Mem. Mus. Comp. Zool. Harvard, 21, 1897, p. 734, pl. 72, fig. 11.

Marsipocrinus præmaturus Grabau and Shimer, N. A. Index Fossils, 2, p. 516, fig. 1838.

Niagaran (Guelph): Near Greenville and Cedarville, Ohio.

**Marsipocrinus rosæformis** (Troost).

Cupellæcrinites rosæformis Troost, Amer. Jour. Sci. Arts, 2d ser., 8, 1849, p. 419; Proc. Amer. Assoc. Adv. Sci., 2, p. 61 (nom. nud.).

Cupellæcrinus rosæformis Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 361.

Marsipocrinus rosæformis Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 37, pl. 13, figs. 5, 6.

Niagaran (Brownsport): Perry County, Tennessee.

*Holotype*.—Cat. No. 39932, U.S.N.M.

**Marsipocrinus stellatus** (Troost).

Cupellæcrinites stellatus Troost, Amer. Jour. Sci. Arts, 2d ser., 8, p. 419 (nom. nud.); Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 61 (nom. nud.).

Cupellæcrinus stellatus Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 361.

Marsipocrinus stellatus Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 36, pl. 10, figs. 1, 2.

Niagaran (Brownsport): Perry or Decatur County, Tennessee.

*Holotype*.—Cat. No. 39929, U.S.N.M.

**Marsipocrinus striatus** (Troost).

Cupellæcrinites striatus Troost, Amer. Jour. Sci. Arts, 2d ser., 8, 1849, p. 419; Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 61 (nom. nud.).

Cupellæcrinites inflatus Troost, Amer. Jour. Sci. Arts, 2d ser., 8, 1849, p. 420; Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 61 (nom. nud.).

Marsupiocrinus striatus Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 21, 1897, p. 732, pl. 75, figs. 17, 18.

Marsipocrinus striatus Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 33, pl. 9, figs. 13, 14.

Niagaran (Brownsport): Decatur County, Tennessee.

*Holotype* and *plesiotype*.—Cat. Nos. 39926, 39934, U.S.N.M.

**Marsipocrinus tennesseensis** (Roemer).

Platycrinus tennesseensis Roemer, Sil. Fauna West. Tennessee, Breslau, 1860, p. 35, pl. 3, fig. 4a-f.

Platycrinus (Cupellacrinus) tennesseensis Shumard, Trans. Acad. Sci. St. Louis, 1866, p. 362.

Marsupiocrinus tennesseensis Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 239 (Rev. Pal., pt. 2, p. 65); *ibid.*, 1888, p. 373, pl. 19, fig. 7; Mem. Mus. Comp. Zool., Harvard, 21, 1897, p. 731, pl. 75, fig. 16a, b.

Marsipocrinus tennesseensis Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 30, pl. 9, figs. 5, 6.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 516, 1837.

Cupellæcrinites Buchii Troost, Amer. Jour. Sci. Arts, 2d ser., 8, 1849, p. 419; Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 61 (nom. nud.).

Cupellæcrinites laevis Troost, Amer. Jour. Sci. Arts, 2d ser., 7, 1849, p. 419; Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 61 (nom. nud.).

Cupellæcrinus laevis Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 361 (gen. ref.).

Niagaran (Brownsport): Decatur County, Tennessee.

*Plesiotypes*.—Cat. Nos. 39925, 39928, U.S.N.M. (Troost's types of *C. laevis* and *C. buchi*.)

**Marsipocrinus verneuili** (Troost).

Cupellæcrinites Verneuili Troost, Amer. Jour. Sci. Arts, 2d ser., 8, 1849, p. 419; Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 61 (nom. nud.).

Marsipocrinus verneuili Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 32, pl. 9, figs. 10, 11, 12.

Niagaran (Brownsport): Decatur County, Tennessee.

*Holotype* and *plesiotype*.—Cat. No. 39914, U.S.N.M.

MARSUPIOCRINITES Phillips. See Marsipocrinus Bather.

MARSUPIOCRINITES(?) DACTYLUS Hall. See Lyriocrinus dactylus.

MARSUPIOCRINUS Phillips. See Marsipocrinus Bather.

**MASTIGOGRAPTUS** Ruedemann.

Genotype: *Dendrograptus tenuiramosus* Walcott.

*Mastigograptus* Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 210-216.

**Mastigograptus arundinaceus** (Hall).

Graptolithus arundinaceus Hall, Pal. New York, 1, 1847, pl. 74, figs. 8, 8a.

*Dicranograptus arundinaceus* Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 227; rev. ed., p. 261.



**Mastigograptus arundinaceus**—Continued.

*Dendrograptus arundinaceus* Gurley, Jour. Geol., 4, 1896, 84.

*Mastigograptus arundinaceus* Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 221, 222, pl. 12, fig. 6, fig. 119.

Utica: Turin, Lewis County, New York.

**Mastigograptus circinalis** Ruedemann.

*Dendrograptus* sp. Ruedemann, Bull. New York State Mus., 42, 1901, p. 528.

*Mastigograptus circinalis* Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 222, 223, pl. 10, fig. 3; pl. 12, figs. 7, 8.

Trenton (Canajoharie): Rural cemetery, near Albany, New York.

**Mastigograptus? flaccidus** Ruedemann.

*Mastigograptus? flaccidus* Ruedemann, Bull. New York State Mus., 133, 1909, p. 207, pl. 3, fig. 6.

Black River (Lowville): Glens Falls, New York.

**Mastigograptus gracillimus** (Lesquereux).

*Psilophyllum gracillimum* Lesquereux, Proc. Amer. Phil. Soc., 17, 1877, p. 164, pl. 1, fig. 2.

*Psilophyllum gracillimum* Miller, Proc. Davenport Acad. Sci., 2, 1878, p. 206.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 805, figs.

*Dendrograptus* (*Psilophyton*) *gracillimus* Walcott, Trans. Alb. Inst., 10, 1883, 21.

*Dendrograptus gracillimus* Ulrich, Cat. Foss. Cincinnati Group, 1880.—James, Jour. Cincinnati Soc. Nat. Hist., 1885, p. 160; pl. 9, figs. 5, 6; *ibid.*, 14, pt. 2, 1892, p. 149.—Gurley, Jour. Geol., 4, 1896, 95.—Nickles, Jour. Cincinnati Soc. Nat. Hist., 20, 1902, p. 68.

*Mastigograptus gracillimus* Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 219–221, figs. 116–118.

Eden and Maysville (Fairmount): Cincinnati, Ohio, and vicinity.

**Mastigograptus simplex** (Walcott).

*Dendrograptus simplex* Walcott, Trans. Alb. Inst., 10, 1883, p. 20; pl. 1, figs. 5, 5a, 5b, 6 (adv. sheets, 1879); Bull. Geol. Soc. Amer., 1, 1890, p. 347.—Ami, Can. Rec. Sci., 5, 1892.—Gurley, Jour. Geol., 4, 1896, p. 300.

*Mastigograptus simplex* Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 218, 219, pl. 9, fig. 1; pl. 12, figs. 3–5; fig. 115.

Utica: Holland Patent, Oneida County, New York; Canada.

**Mastigograptus tenuiramosus** (Walcott).

*Dendrograptus tenuiramosus* Walcott, Trans. Alb. Inst., 10, 1881, p. 21, pl. 1, fig. 4 (adv. sheets, 1879).—Ulrich, Cat. Foss. Cincinnati Group, 1880.—James, Cincinnati Soc. Nat. Hist., Man. Pal. Cincinnati Group, pt. 2, 1892, p. 152.—Gurley, Jour. Geol., 4, 1896, p. 300.—Ruedemann, Bull. New York State Mus., 8, 1901, p. 528, footnote.—Nickles, Jour. Cincinnati Soc. Nat. Hist., 20, 1902, p. 70.

*Mastigograptus tenuiramosus*, Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 216–218, pl. 9, figs. 2, 3; pl. 11, figs. 2–4; pl. 12, figs. 1, 2; fig. 114.

Utica: Holland Patent, New York; Covington, Kentucky, etc.

*Plesiotype*.—Cat. No. 54275, U.S.N.M.

**MATHERELLA** Walcott.

Genotype: *Trochus saratogensis* Walcott.

*Billingsia* Walcott (not DeKoninck, 1876), Bull. U. S. Geol. Surv., 30, 1886, pp. 5, 21, 6062; Bull. U. S. Geol. Surv., 81, p. 346.—Miller, N. A. Geol. Pal., p. 398.

*Matherella* Walcott, Smiths. Misc. Coll., 57, 1912, p. 263.

**Matherella saratogensis** (Walcott).

Trochus? *saratogensis* Walcott, Proc. U. S. Nat. Mus., 13, 1890, p. 268, pl. 20, fig. 3.

*Billingsia saratogensis* Walcott, Bull. U. S. Geol. Surv., 30, 1886, p. 21, *ibid.*, 81, 1891, p. 346.—Miller, N. A. Geol. Pal., 1889, p. 398, fig. 655.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 92, fig.

*Matherella saratogensis* Walcott, Smiths. Misc. Coll., 57, 1912, p. 264, pl. 41, figs. 18-21.

Ozarkian or Upper Cambrian (Hoyt): Four miles west of Saratoga Springs, New York.

*Cotypes*.—Cat. No. 23847 U.S.N.M.

**MATHERIA** Billings.

Genotype: *M. tenera* Billings.

*Matheria* Billings, Can. Nat. Geol., 3, 1858, p. 440; Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 188.—Miller, N. A. Geol. Pal., 1889, p. 488.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 563.

**Matheria brevis** Whiteaves.

*Matheria brevis* Whiteaves, Ottawa Nat., 17, 1903, p. 33, fig. 1, 1a; Geol. Mag., dec. 4, 10, 1903, p. 358, figs. 1, 1a; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 321, fig. 25.

Trenton: Ottawa, Ontario.

**Matheria recta** (Hall).

*Modiolopsis rectus* Hall, 20th Rep. New York State Cab. Hist., 1868 (extras, March, 1865), p. 338, pl. 14 (5), figs. 4, 5, p. 389; rev. ed., 1870, p. 386, pl. 14, figs. 4, 5.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 192, figs.

*Clidophorus m'chesneyanus* Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 96, pl. 3, fig. 3; p. 109.

Niagaran (Racine): Racine, Wisconsin; Bridgeport, Illinois.

**Matheria rugosa** Ulrich.

*Matheria rugosa* Ulrich, 19th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1892, p. 241, fig. 26; Geol. Minnesota, 3, pt. 2, 1894, p. 563, pl. 36, figs. 29, 30; fig. 35, 2 (p. 477).

Trenton (Prosser): Six miles south of Cannon Falls, Minnesota.

*Holotype*.—Cat. No. 46226, U.S.N.M.

**Matheria tenera** Billings.

*Matheria tenera* Billings, Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 188, fig. 18; Canadian Nat. Geol., 3, 1858, p. 440, fig. 18; Geol. Canada, Geol. Surv. Canada, 1863, p. 147, fig. 100, a-d.—Miller, N. A. Geol. Pal., 1889, p. 488, fig. 846.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 380, figs.

Trenton: Blue Point, Lake St. John, Canada.

**MATTHEVIA** Walcott.

Genotype: *M. variabilis* Walcott.

*Matthevia* Walcott, Amer. Jour. Sci. Arts, 3d ser., 30, 1885, pp. 17, 18; Bull. U. S. Geol. Surv., 30, 1886, p. 223.—Miller, N. A. Geol. Pal., 1889, p. 392.

**Matthevia variabilis** Walcott.

*Matthevia variabilis* Walcott, Amer. Jour. Sci., 3d ser., 30, 1885, p. 18, figs. 1-6, p. 20; Bull. U. S. Geol. Surv., 30, 1886, pp. 224-225, pl. 32, figs. 1-12; pl. 33, figs. 1, 1a, 1f.—Miller, N. A. Geol. Pal., 1889, p. 392, fig. 647.—Lesley, Geol. Surv. Pennsylvania, Rep., P 4, 1889, p. 381, fig.—Walcott, Smiths. Misc. Coll., 57, 1912, p. 265, pl. 42, figs. 1-15.

Ozarkian or Upper Cambrian (Hoyt): Four miles west of Saratoga Springs, New York.

*Cotypes*.—Cat. No. 24598, U.S.N.M.

**MEEKOCYSTIS** Jackel. See *Lepadocystis* Carpenter.

**MEEKOPORA** Ulrich.

Genotype: *Meekopora eximia* Ulrich.

*Meekopora* Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 383, 482.—(Ulrich, in press), Miller, N. A. Geol. Pal., 1889, p. 312.—Ulrich, Zittel's Textb. Pal. (Engl. ed.), 1896, p. 270.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, p. 538.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, p. 26.—Condra, Nebraska Geol. Surv., 2, pt. 1, p. 35.—Bassler, Bull. U. S. Geol. Surv., 292, p. 25; Zittel-Eastman Textb. Pal., 1913, p. 330.

**Meekopora bassleri** Foerste.

*Meekopora bassleri* Foerste, Bull. Kentucky Geol. Surv., 7, 1906, p. 297, pl. 6, figs. 1a, b.

Clinton (Waco): Near Estil Springs, north of Irvine, etc., Kentucky.

**Meekopora foliacea** (Hall).

*Ceramopora foliacea* Hall, Pal. New York, 2, 1852, p. 170, pl. 40E, figs. 3a-c.—Rominger, Proc. Acad. Nat. Sci. Philadelphia, p. 119.

*Meekopora foliacea* Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 312.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, pp. 25, 26, pl. 8, figs. 5, 6; pl. 9, figs. 5, 6.

Clinton (Rochester): Lockport, Rochester, etc., New York; Grimsby, Ontario. *Plesio*type.—Cat. No. 44116, U.S.N.M.

**MEEKOSPIRA** Ulrich.

Genotype: *Eulima? peracuta* Meek and Worthen.

*Meekospira* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1079.

**Meekospira planilateralis** (Foerste).

*Subulites* (*Polyphemopsis*) *plani-lateralis* Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 555, p. 37a, figs. 4a-c.

*Meekospira planilateralis* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1079 (gen. ref.). Upper Medinan (Bassfield): Soldiers' Home, near Dayton, Ohio.

**Meekospira subconica** Ulrich and Schofield.

*Meekospira subconica* Ulrich and Schofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1080, pl. 81, figs. 40, 41.

*Subulites subconicus* Miller, N. A. Geol. Pal., 2d App., 1897, p. 770 (gen. ref.). Richmond (Maquoketa): Spring Valley, Minnesota.

*Holotype*.—Cat. No. 45942, U.S.N.M.

**MEGACYSTIS** Angelin. See *Holocystites* Hall.

**MEGACYSTITES** Hall. See *Holocystites* Hall.

**MEGALASPIS** Angelin.

Genotype: *Megalaspis gigas* Angelin.

*Megalaspis* Angelin, Pal. Scandinavica, 3d ed., Holmiac, 1878, p. 15.—Salter, Mon. British Tril., Pal. Soc., 1866, p. 147.—Zittel, Handb. Pal., 2, M., 1885, p. 608.—Brögger, Bihang till K. Sven. Vet.-Akad. Handl., 11, No. 3, 1886, p. 40; Afh. Sveriges Geol. Unders., ser. C, No. 82, 1886, p. 40.—Miller, N. A. Geol. Pal., 1889, p. 555.—Koken, Die Leitfossilien, Leipzig, 1896, p. 26, text fig. 16, figs. 3, 6.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 8th ser., 6, 1898, pp. 11, 12, 35.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 34, No. 8, 1901, pp. 26, 60.—Slocum, Field Mus. Nat. Hist., Geol. Ser., 4, 3, 1913, p. 50.—Raymond, Trans. and Proc. Roy. Soc. Canada, 5, 3d ser., sec. 4, 1912, p. 117; Zittel-Eastman Textb. Pal., 1913, p. 718.

**Megalaspis? americana** Hoek.

*Megalaspis americana* Hoek, Neues Jahrb. Min., Geol., Pal., 34, 1912, p. 220, pl. 10, figs. 2-6.

Ordovician: Tarija, Bolivia.

**Megalaspis beckeri** Slocum.

*Megalaspis beckeri* Slocum, Field Mus. Nat. Hist., Geol. Ser., 4, 3, p. 50, pl. 14, fig. 5.

Richmond (Maquoketa): Clermont, and Postville Junction, Iowa.

**Megalaspis belemnurus** White.

*Megalaspis belemnurus* White, Rep. U. S. Geol. Surv. West 100th Merid., 4, War Dep., 1877, p. 58, pl. 3, fig. 9 (Rep. 1874, p. 11).—Miller, N. A. Geol. Pal., 1889, p. 556, fig. 1030.

Upper Pogonip: Queen Spring Hill, Schell Creek Range, Nevada.

*Holotype*.—Cat. No. 8562, U.S.N.M.

**Megalaspis? boliviensis** (D'Orbigny).

*Asaphus boliviensis* D'Orbigny, Voyage l'Amerique Merid., 3, pt. 4, 1847, p. 32, Atlas, pl. 1, figs. 8, 9.

Silurian: Rio Grande, Province de Vallegrande; Tacopaya and Cochabamba, Bolivia.

**Megalaspis brackenbuschi** Kayser.

*Megalaspis Brackenbuschi* Kayser, Zeit. d. deutsch. geol. Gesell, 50, 1898, p. 428, pl. 16, fig. 3.

Ordovician: Salta, Argentina.

**Megalaspis gonicercus** (Meek).

*Asaphus* (*Megalaspis*) *goniocercus* Meek, 6th Ann. Rep. U. S. Geol. Surv., Terr., 1873, p. 480.

Lower Ordovician: Near Malade City, Utah.

*Holotype*.—Cat. No. 11600, U.S.N.M.

**Megalaspis goniurus** (Billings).

*Asaphus goniurus* Billings, Canadian Nat. Geol., 5, 1860, p. 324; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 415.

*Megalaspis goniurus* Raymond, Trans. and Proc. Roy. Soc. Canada, 3d ser., 5, sec. 4, 1912, p. 119, pl. 2, fig. 6.

Ozarkian? (Levis-erratics): Point Levis, Quebec.

**Megalaspis? matacensis** Hoek.

*Megalaspis matacensis* Hoek, Neues Jahrb. Min., Geol., Pal., 84, 1912, p. 233, pl. 11, figs. 6, 7.

Ordovician: Near Mataca, Bolivia.

**MEGALOGRAPTUS** Miller.

Genotype: *M. welchi* Miller.

*Megalograptus* Miller, Cincinnati Quart. Jour. Sci., 1, 1874, pp. 343.—James, Jour. Cincinnati Soc. Nat. Hist., 14, pt. 2, 1892, p. 160.—Miller, N. A. Geol. Pal., 1889, p. 195.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 247.—Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 324.

**Megalograptus welchi** Miller.

*Megalograptus welchi* Miller, Cincinnati Quart. Jour. Sci., 1, 1874, pp. 343-346, figs. 35-37; N. A. Geol. Pal., 1889, p. 195, figs. 189, 190, 191.—James, Jour. Cincinnati Soc. Nat. Hist., 14, pt. 2, 1892, p. 161.—Foerste in Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 325, pl. 58, figs. 3-5.

Richmond (Liberty): Near Clarksville, Ohio.

**MEGALOMPHALA** Ulrich.

Genotype: *Bellerophon contortus* Eichwald.

*Megalomphala* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 850.—Koken, Neues Jahrb. Min., Geol. Pal., 1898, 1, 1898, p. 9.

**Megalomphala robusta** Whiteaves.

*Megalomphala robusta* Whiteaves, Ann. Rep. Geol. Surv. Canada, n. s., 14, App. F, 1904, p. 48; *ibid.*, Pal. Foss., 3, pt. 4, 1906, p. 257, pl. 28, figs. 9, 9a; pl. 29, fig. 1.

Niagaran: Ekwon River, Canada.

MEGALOMPHALA? ROTUNDATA Ulrich. See *Bucania sulcatina*.

**MEGALOMUS** Hall.

Genotype: *M. canadensis* Hall.

*Megalomus* Hall, Pal. New York, 2, 1852, p. 343.—Woodward, Man. Mollusca, pt. 2, p. 302.—Hall, 15th Rep. New York State Cab. Nat. Hist., 1861, p. 193; Prelim. Notice Lam., pt. 2, p. 25, 27.—Miller, N. A. Geol. Pal., 1889, p. 488.

**Megalomus canadensis** Hall.

*Megalomus canadensis* Hall, Pal. New York, 2, 1852, p. 343, pl. 80, fig. 1a-e, pl. 81, fig. 1a-f; pl. 82, fig. 1a-i.—Chapman, Canadian Jour., n. s., 7, 1862, p. 117, fig. 113, 113a; *ibid.*, 8, 1863, p. 215, fig. 225; Expos. Min. Geol. Canada, p. 120, figs. 113, 113a; p. 187, fig. 225.—Hall, 1st Rep. State Geol. New York, 1884, pl. 9, fig. 16.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 338, fig. 342.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 68, fig. 39.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 193, fig.—Hall, 1st Rep. State Geol. New York, 1884, pl. 9, fig. 16; Pal. New York, 5, pt. 1, 1885, pl. 52, fig. 10 (adv. copy, 1883).—Miller, N. A. Geol. Pal., 1889, p. 488, fig. 847.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 383, fig.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 66.—Norton, Proc. Iowa Acad. Sci., 2, 1895, p. 42.

*Cyrtodonta canadensis* Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 410, fig. 530.

Niagaran (Guelph): Galt, etc., Ontario; Ohio; Wisconsin; Alaska.

**Megalomus compressus** Nicholson and Hinde.

*Megalomus compressus* Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 143, fig. 6.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 69, fig. 40.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 10, fig. 1; *ibid.*, pt. 2, 1895, p. 67 (loc. occ.).

Niagaran (Guelph): Hespeler, Ontario.

**MEGAMBONIA** Hall.

Genotype: *M. cardiiformis* Hall.

*Megambonia* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 12; *ibid.*, 15th Rep., 1861, p. 193.—Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 137-8.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 225.—Zittel, Handb. Pal., 2, 1881, p. 51.—Hall, Pal. New York, 5, pt. 1, Lam., 2, 1885, p. 1v.—Miller, N. A. Geol. Pal., 1889, p. 488.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 411.

MEGAMBONIA Meek. See *Allonychia* Ulrich.

**Megambonia aviculoidea** Hall.

*Megambonia aviculoidea* Hall, Pal. New York, 3, 1859, p. 274, pl. 49, figs. 7a, 7b, 8; pl. 49A, fig. 8.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 387, fig.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 263, pl. 24, figs. 17, 18.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 411, fig. 531.

*Pterinea* cf. *aviculoidea* Høltedahl, 2d Arctic Exp. "Fram." 1898-1902, No. 32, 1914, p. 28, pl. 8, fig. 6.

Helderbergian: Helderberg Mountains, etc., New York (Coeymans and Manlius transition beds); New Jersey (Keyser—"Manlius"); Southwestern Ellesmereland, Arctic America.

**Megambonia cancellata** Hall.

Megambonia cancellata Hall, Can. Nat. Geol., 5, 1860, p. 153.—Dawson, Canadian Nat., n. s., 9, 1880, p. 342.

Silurian: Arisaig, Nova Scotia.

MEGAMBONIA JAMESI Meek. See Allonychia jamesi.

**Megambonia ovoidea** Hall.

Megambonia ovoidea Hall, Pal. New York, 3, 1859, p. 276, pl. 49A, figs. 4a, 4b.

Cayugan (Manlius): Schoharie County, New York.

**Megambonia striata** Hall.

Megambonia striata Hall, Can. Nat. Geol., 5, 1860, p. 153.—Dawson, Acadian Geol. 2d ed., 1868, p. 603.

Silurian: Arisaig, Nova Scotia.

MEGANTERIS MUTABILIS Hall. See Rensselaeria mutabilis.

MEGAPTERA Meek and Worthen. See Opisthoptera Meek.

MEGAPTERA ALATA White. See Anomalodonta alata.

MEGAPTERA CASEI Meek and Worthen. See Anomalodonta casei.

MEGISTOCRINUS CHRISTYI Hall. See Periechocrinus whitfieldi.

MEGISTOCRINUS INFELIX Winchell and Marcy. See Periechocrinus infelix.

MEGISTOCRINUS MARCOUANUS Winchell and Marcy. See Periechocrinus marcouanus.

MEGISTOCRINUS NECIS Winchell and Marcy. See Periechocrinus necis.

**Melia cancellatus** Emmons.

Not recognizable.

Melia cancellatus Emmons, Amer. Geology, 1, pt. 2, 1855, p. 153.

Lorraine shales: New York.

**Melia cincinnatiæ** D'Orbigny.

Not recognizable.

Melia cincinnatiæ D'Orbigny, Prod. Pal., 1, 1850, p. 4.

Blue limestone: Cincinnati, Ohio.

MELOCERAS Foord. See Mælonoceras Hyatt.

MELOCRINITES Goldfuss. See Melocrinus Goldfuss.

**MELOCRINUS** Goldfuss.

Genotype: *M. hieroglyphicus* Goldfuss.

Melocrinites Goldfuss, Petrefacta Germanica, 1826, p. 197; *ibid.*, 2d ed., pt. 1, 1862, p. 183.—Agassiz, Mem. Soc. Sci. Natur. Neuchatel, 1, 1835, p. 196.—Fischer de Waldheim, Oryct. Gouv. Moscou, 1837, p. 150.—Goldfuss, Nova Acta Physico Med., Acad. Caes. Leop.-Carol., 19, 1839, p. 339.—Muller, Monatsb. Berl. Akad., 1, 1841, p. 209.—Portlock, Rep. Geol. Londonderry, 1843, p. 346.—D'Orbigny, Prodr. Pal., 1, 1850, p. 103.—Hall, Pal. New York, 2, 1852, p. 227.—D'Orbigny, Course Element, 2, 1852, p. 140.

Melocrinus Agassiz, Ann. Nat. Hist., 1, 1838, p. 447.—Roemer, Archiv. fur Natur., Jahrg. 19, 1, 1853, p. 214.—Pictet, Traité de Pal., 2d ed., 4, 1857, p. 325.—Schultze, Denk. d. Kais. Akad. der Wiss., Math.-Naturw. Cl., 26, Abth. 2, 1867, p. 173, fig. 12; Mon. Echin. Eifel Kalk, 1867, p. 61.—Beyrich, Ann. Mag. Nat. Hist., 4th ser., 7, 1871, pp. 404, 405, fig.—Hall, Geol. Surv. Ohio, Pal., 2, 1875, p. 158.—Angelin, Icon. Crin. Succ., 1878, p. 19.—Zittel, Handb. Pal., 1, 1879, p. 371.—Miller, N. A. Geol. Pal., 1889, p. 261.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1890, p. 384.—Whidborne,

**MELOCRINUS**—Continued.

Mon. Dev. Fauna South England, 2, Pal. Soc., 1895, p. 200.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 35, fig. 23; p. 97, fig. 44.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 161, fig. 74, 2.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 147.—Talbot, Amer. Jour. Sci., 4th ser., 20, 1905, p. 26.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 555.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 190.

Mariacrinus Hall (part), Pal. New York, 3, 1859, p. 104.

Cytocrinus Roemer, Sil. Fauna West Tennessee, Breslau, 1860, p. 46.—Hall, Trans. Albany Inst., 4, 1863, p. 207.—Zittel, Handb. Pal., 1, 1879, p. 368.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, pp. 292, 404 (Rev. Pal., pt. 2, pp. 118, 230).—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 161.—Zittel, Grundzuge Pal., 1, 1910, p. 163. (Genotype: *C. laevis* Roemer.)

**Melocrinus aequalis** Miller.

*Melocrinus aequalis* Miller, 18th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1894, p. 302, pl. 5, figs. 11, 12 (adv. sheets, 1892).—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 304.

*Melocrinus parvus* Wachsmuth and Springer, Amer. Geol., 10, 1892, p. 144; Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 303, pl. 22, fig. 8.

Niagaran (Laurel): St. Paul, Indiana.

**MELOCRINUS DACTYLUS** Hall. See *Lyriocrinus dactylus*.

**MELOCRINUS LAEVIS** Wachsmuth and Springer. See *Melocrinus roemeri*.

**Melocrinus nobilissimus** (Hall).

*Mariacrinus nobilissimus* Hall, Pal. New York, 3, 1859, p. 105, pl. 2, figs. 1-4, pl. 2A, fig. 1.

*Melocrinus nobilissimus* Wachsmuth and Springer, Proc. Acad. Nat. Sci., Philadelphia 33, 1882, p. 296; Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 295; Atlas, pl. 23, figs. 1a, 2, 3.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 161, fig. 74, fig. 2.—Talbot, Amer. Jour. Sci., 4th ser., 20, 1905, p. 26, pl. 2.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 556.

Helderbergian (Manlius transition beds): Litchfield, New York.

**Melocrinus obconicus** Hall.

*Melocrinus obconicus* Hall, Trans. Albany Inst., 4, 1863, p. 206; 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1877, pl. 14, figs. 11-14; mus. ed., 1879, p. 138, pl. 14, figs. 11-14; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 269, pl. 13, figs. 11-14.—Miller, N. A. Geol. Pal., 1889, p. 261, fig. 363.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 390, figs.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1, 1897, p. 302, pl. 27, figs. 10a-c.

Niagaran (Waldron): Waldron and Hartsville, Indiana.

**Melocrinus oblongus** Wachsmuth and Springer.

*Melocrinus oblongus* Wachsmuth and Springer, Amer. Geol., 10, 1892, p. 143; Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 300, pl. 22, figs. 9, 12.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 555.—Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 45.

Niagaran: Near Louisville, Kentucky (Louisville); Decatur County, Tennessee (Brownspport); St. Paul, Indiana (Laurel).

**Melocrinus obpyramidalis** (Winchell and Marcy).

*Actinocrinus obpyramidalis* Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 87, pl. 2, fig. 4.

*Melocrinus obpyramidalis* Miller, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 174.—Wachsmuth and Springer, Rev. Pal., pt. 2, 1881, p. 122.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, 1900, p. 97, pl. 3, figs. 11, 12.

*Melocrinus verneuili* Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 327, pl. 10 (1), fig. 5, p. 390; rev. ed., 1868 (1870), p. 372, pl. 10, fig. 5. (Extras, 1865.)

Niagara (Racine): Bridgeport, Hawthorne, etc., Illinois.

**Melocrinus pachydaetylus** (Conrad).

*Astrocrinites pachydaetylus* Conrad, Annu. Rep. Pal. New York, 1841, p. 34.—Mather, Geol. Rep. New York, 1843, p. 347, fig. 6.

*Mariacrinus pachydaetylus* Hall, Pal. New York, 3, 1859, p. 107, pl. 3, figs. 1–4.

*Melocrinus pachydaetylus* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 33, 1882, p. 296; Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 296, pl. 23, figs. 4, 5; pl. 24, figs. 4a, b.—Talbot, Amer. Jour. Sci., 20, 1905, p. 27, pl. 1, fig. 1.

*Mariacrinus paucidaetylus* Hall, Pal. New York, 3, 1859, p. 109, pl. 3, fig. 5.

*Melocrinus paucidaetylus* Wachsmuth and Springer, Proc. Acad. Nat. Sci., 33, 1882, p. 296; Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 296.

*Actinocrinus polydaetylus* Bonny, Schenectady Reflector, 1835; Amer. Jour. Sci. Arts, 1838, p. 165.

*Melocrinus* (*Mariacrinus*) *pachydaetylus* Schultze, Monog. Echin., Eifel., 1866, p. 66.

*Melocrinus* (*Mariacrinus*) *paucidaetylus* Schultze, Monog. Echin. Eifel., 1866, p. 66.

Staghorn Encrinite Bonny, in Shepard's article in Amer. Jour. Sci., 26, 1835, p. 363.

Helderbergian (Manlius transition beds): Schoharie, Jerusalem Hill, and North Litchfield, New York.

**MELOCRINUS PARVUS** Wachsmuth and Springer. See *Melocrinus æqualis*.

**MELOCRINUS PAUCIDACTYLUS** Wachsmuth and Springer. See *Melocrinus pachydaetylus*.

**Melocrinus roemeri** Wachsmuth and Springer.

*Actinocrinites verneuili* Troost, Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 60 (nom. nud.).

*Turbincrinites verneuili* Troost MS., 1850.

*Melocrinus verneuili* Shumard, Trans. Acad. Sci. St. Louis, 2, p. 381 (gen. ref.).

*Cytocrinus lævis* Roemer (not Goldfuss), Sil. Fauna West. Tennessee, Breslau, 1860, p. 46, pl. 4, figs. 2a–c.

*Ctenocrinus lævis* Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 361 (gen. ref.).

*Melocrinus lævis* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 296 (Rev. Pal., pt. 2, p. 122).

*Melocrinus roemeri* Wachsmuth and Springer, Amer. Geol., 10, 1892, p. 142; Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 301, pl. 22, figs. 11a, b.—Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 44, pl. 10, figs. 11, 12.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 556, fig. 1888.

Niagara (Brownspport): Decatur County, Tennessee.

*Plesiotype*.—Cat. No. 39919, U.S.N.M. (Troost's type of *T. verneuili*).



**Melocrinus sculptus** (Hall).

Melocrinites sculptus Hall, Pal. New York, 2, 1852, p. 228, pl. 49A, figs. 2a-c.

Melocrinus sculptus Miller, N. A. Geol. Pal., 1889, p. 261 (gen. ref.).

Niagaran (Lockport): Lockport, New York.

**MELOCRINUS VERNEULI** Hall. See *Melocrinus obpyramidalis*.

**Melocrinus wittenbergensis** Rowley.

*Melocrinus wittenbergensis* Rowley, Amer. Geol., 34, 1904, p. 274, pl. 16, fig. 27.

Niagaran or Helderbergian: Near Wittenberg, Missouri.

**MENOCEPHALUS** Owen.

Genotype: *M. minnesotensis* Owen.

*Menocephalus* Owen, Rep. Geol. Surv. Wisconsin, Iowa, Minnesota, 1852, p.

577.—Barrande, Neues Jahrb. Min. Geol. and Pal., 1853, p. 336.—Billings,

Canadian Nat. Geol., 5, 1860, p. 313; Pal. Foss., 1, Geol. Surv. Canada, 1865,

p. 405.—Miller, N. A. Geol. Pal., 1889, p. 556.

**Menocephalus globosus** Billings.

*Menocephalus globosus* Billings, Canadian Nat. Geol., 5, 1860, p. 317, figs. 17-19;

Geol. Canada, Geol. Surv. Canada, 1863, p. 237, figs. 267 2-c; Pal. Foss., 1,

Geol. Surv. Canada, 1865, p. 408, figs. 388a-c.—Lesley, Geol. Surv. Pennsyl-

vania, Rep. P 4, 1889, p. 390, figs.

Ozarkian? (Levis-erratic): Point Levis, Quebec.

**Menocephalus salteri** Devine.

*Menocephalus Salteri* Devine, Canadian Nat. Geol., 8, 1862, p. 210, fig.—Billings,

Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 203, fig. 187.—Rominger, Proc.

Acad. Nat. Sci. Philadelphia, 1887, p. 16, pl. 1, fig. 6.—Walcott, Amer. Jour.

Sci., 3d ser., 36, 1888, p. 166.—Miller, N. A. Geol. Pal., 1889, p. 556, fig. 1032.

Ozarkian? (Levis-erratic): Point Levis, Quebec.

**Menocephalus sedgwicki** Billings.

*Menocephalus sedgwicki* Billings, Canadian Nat. Geol., 5, 1860, p. 316, fig. 19;

Geol. Canada, Geol. Surv. Canada, 1863, p. 237, fig. 266; Pal. Foss., 1, Geol.

Surv. Canada, 1865, p. 407, fig. 387.

Ozarkian? (Levis-erratic): Point Levis, Quebec.

**MERISTA** Suess.

Genotype: *Atrypa hercules* Barrande.

*Merista* Suess, Jahrb. Kongl. Kais. Geol. Reichs., 2, 1851, pp. 150, 160.—Hall,

13th Rep. New York State Cab. Nat. Hist., 1860, p. 73; 20th Rep. New York

State Cab. Nat. Hist., 1867, p. 258.—Dall, Bull. U. S. Nat. Mus., 8, 1877, p.

47.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 70, fig. 54; 13th Ann.

Rep. New York State Geol., 1895, p. 771.—Schuchert, Zittel-Eastman Textb.

Pal., 1913, p. 416.

*Camarium* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 42; Pal. New

York, 3, 1859, p. 486; 15th Rep. New York State Cab. Nat. Hist., 1862,

p. 176.

**MERISTA BISULCATA** Hall. See *Whitfieldella sulcata*.

**MERISTA CYLINDRICA** Hall. See *Whitfieldella cylindrica*.

**MERISTA INTERMEDIA** Hall. See *Whitfieldella intermedia*.

**MERISTA LEVIS** Hall. See *Whitfieldella levis*.

**MERISTA NITIDA** Hall. See *Whitfieldella nitida*.

**MERISTA NITIDA** var. **OBLATA** Hall. See *Whitfieldella oblata*.

*MERISTA NUCLEOLATA* Hall. See *Whitfieldella? nucleolata*.

*MERISTA SULCATA* Miller. See *Whitfieldella sulcata*.

*Merista tennesseensis* Hall and Clarke.

*Merista tennesseensis* Hall and Clarke, Pal. New York, 7, pt. 2, 1895, pp. 71, 365, pl. 42, figs. 1-6.

Niagaran (Brownsport): Perry County, Tennessee.

*Merista typa* (Hall).

*Camarium typum* Hall, Pal. New York, 3, 1859, p. 487, pl. 95a, figs. 2a, 3, 5, 6.

*Camarium clongatum*, *ibid.*, p. 488, pl. 95a, fig. 4.

*Merista typa* Hall, 13th Ann. Rep. New York State Cab. Nat. Hist., 1860, p. 93, figs. 10-13.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, pl. 42, figs. 7-12.—Schuchert and Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 449, pl. 74, figs. 20-24.

Helderbergian (Keyser): Devils Backbone, Cash Valley, etc., near Cumberland, Maryland.

**MERISTELLA** Hall.

Genotype: *Merista arcuata* Hall.

?*Meristella* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 78.

*Meristella* Hall, 13th Rep. New York State Cab. Nat. Hist., 1860, pp. 74-93; 16th Rep. *ibid.*, 1863, p. 50, figs. 27-34; Trans. Albany Inst., 4, 1863, p. 139; Amer. Jour. Sci., 2d ser., 35, 1863, p. 396; 36, p. 11; 20th Rep. New York State Cab. Nat. Hist., 1867, pp. 155, 258; Pal. New York, 4, 1867, p. 295.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 97.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 73, figs. 55, 56; 13th Ann. Rep. New York State Geol., 1895, p. 773.—Schuchert and Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 442.—Schuchert, Zittel-Eastman Textb. Pal., 1900, p. 341; *ibid.*, 2d ed., 1913, p. 415.

*Athyris* Billings, Proc. Portland Soc. Nat. Hist., 1863, p. 115.

*MERISTELLA BELLA* Whitfield. See *Hindella? (Greenfieldia) whitfieldi*.

*MERISTELLA (?MERISTINA) CYLINDRICA* Meek. See *Whitfieldella cylindrica*.

*MERISTELLA JULIA* Miller. See *Whitfieldella(?) julia*.

*MERISTELLA LEVIS* Hall and Clarke. See *Whitfieldella levis*.

*MERISTELLA LEVIS* Whitfield (1891). See *Whitfieldella prosseri*.

*MERISTELLA MARIA* Hall. See *Meristina maria*.

*MERISTELLA NAVIFORMIS* Hall. See *Whitfieldella(?) naviformis*.

*MERISTELLA NITIDA* Hall. See *Whitfieldella nitida*.

*MERISTELLA NUCLEOLATA* Whitfield. See *Whitfieldella(?) nucleolata*.

*Meristella prænuntia* Schuchert and Maynard.

*Meristella prænuntia* Schuchert and Maynard, Maryland Geol. Surv., Low Dev., 1913, p. 443, pl. 73, figs. 43-46; pl. 74, figs. 1-4.

Helderbergian (Keyser): Keyser, West Virginia; Dawson, Tonoloway, etc., Maryland.

*MERISTELLA PRINSTANA* Miller. See *Hindella prinstana*.

*MERISTELLA RECTIROSTRA* Hall. See *Meristina rectirostris*.

*MERISTELLA TUMIDA* Etheridge. See *Meristina maria*.

*MERISTELLA UMBONATA* Foerste. See *Hindella umbonata*.

**MERISTINA** Hall.

Genotype: *Meristella maria* Hall.

*Meristina* Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, p. 157; Pal. New York, 4, 1867, p. 299.—Zittel, Handb. Pal., 1, 1880, p. 686. Davidson, Mon. British Foss. Brach., 5, Sil. Suppl., Pal. Soc., 1882, p. 82; Suppl. p. 95.—Miller, N. A. Geol. Pal., 1889, p. 354.—Nettelroth (part), Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 101.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 65; 13th Ann. Rep. New York State Geol., 1895, p. 770.—Koken, Die Leitfossilien, Leipzig, 1896, p. 240, figs. 200, 5.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 351.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 415.

*Whitfieldia* Davidson, Suppl. British Sil. Brach., Pal. Soc., 1882, p. 107.—Beecher and Clarke, Mem. New York State Mus., 1, 1889, p. 73.—Miller, N. A. Geol. Pal., 1889, p. 388.—Koken, Die Leitfossilien, Leipzig, 1896, p. 240, figs. 201, 1, 2.

***Meristina(?) expansa*** Whiteaves.

*Meristina(?) expansa* Whiteaves, Ann. Rep. Geol. Surv. Canada, n. s., 14, App. F, 1904, p. 45; *ibid.*, Pal. Foss., 3, pt. 4, 1906, p. 245, pl. 27, figs. 6, 7.  
Niagaran: Ekwan and Attawapiskat Rivers, Canada.

***Meristina maria*** (Hall).

*Meristella maria* Hall, Trans. Albany Inst., 4, 1863, p. 212.—Hall and Whitfield, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 196.

*Meristina maria* Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, p. 157; Pal. New York, 4, 1867, p. 299.—Hall and Whitfield, Pal. Ohio, 2, 1875, p. 132, pl. 7, figs. 5, 6.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 101, pl. 29, figs. 7–10.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 67, pl. 41, figs. 1–17.—Kindle and Breger, 28th Rep. Dep. Geol. Nat. Hist. Surv. Indiana, 1904, p. 445, pl. 9, figs. 29–32.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 351, fig. 459.

*Meristina (Meristella) maria* Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 396, figs.

*Meristella tumida* Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 597.

*Meristella (Meristina) maria* Hall, 28th Rep. New York State Mus. Nat. Hist., 1879, p. 159, pl. 25, figs. 8–12; 11th Rep. State Geol. Indiana, 1882, p. 299, pl. 25, figs. 8–12.

*Whitfieldia maria* Beecher and Clarke, Mem. New York State Mus., 1, 1889, p. 73, pl. 7, figs. 1–3.—Miller, N. A. Geol. Pal., 1889, p. 388, fig. 639.

Niagaran: Waldron, Indiana (Waldron); Springfield, Ohio; Louisville, Kentucky; Bridgeport, Illinois; Racine, Wisconsin; Bessels Bay, Arctic America.

*Plesiotypes*.—Cat. No. 51315, U.S.N.M.

***Meristina maria roemeri*** Foerste.

*Athyris tumida* Roemer, Sil. Fauna West Tennessee, 1860, p. 70, pl. 5, fig. 12.

*Meristina maria-roemeri* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 88, pl. 2, fig. 29A, B.

Niagaran (Brownsport): Near Glenkirk, Brownsport Furnace, Pegram, Savannah, etc., Tennessee.

**MERISTINA NITIDA** Hall. See *Whitfieldella nitida*.

***Meristina profunda*** Grabau.

*Meristina profunda* Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 160, pl. 21, figs. 20–22.

Lower Monroan (Raisin River): Raisin River, Michigan.

**Meristina profunda sinosa** Grabau.

*Meristina profunda* mut. *sinosa* Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 161, pl. 21, figs. 14-16.

Lower Monroan (Raisin River): Claim 432, Monroe County, Michigan.

**Meristina rectirostris** Hall.

*Meristella rectirostra* Hall, Desc. n. sp. Fossils from Waldron, Indiana, 1879, p. 15; 11th Rep. State Geol. Indiana, 1882, p. 301, pl. 27, figs. 10-14; Trans. Albany Inst., 10, 1883, p. 71.—Beecher and Clarke, Mem. New York State Mus., 1, 1889, p. 67, pl. 7, figs. 4, 5, 11-13.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 394, figs.

*Meristina rectirostra* Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 68, figs. 52, 53, pl. 41, figs. 18-21.—Beecher, Amer. Jour. Sci., 3d ser., 44, 1892, p. 146.—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 445, pl. 9, figs. 21-24.

Niagaran: Waldron, Indiana (Waldron); Little Deer Creek, Carroll County, Indiana.

**Meristina trisinuata** (McChesney).

*Pentamerus trisinuatus* McChesney, Desc. New Pal. Fossils, 1861, p. 86.

*Athyris?* *trisinuatus* McChesney, Trans. Chicago Acad. Sci., 1, 1868, p. 33, pl. 8, fig. 2.

*Meristina trisinuata* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 270.

Niagaran (Racine): Milwaukee, Wisconsin.

**MERISTOSPIRA** Grabau.

Genotype: *M. michiganensis* Grabau.

*Meristospira* Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 158.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 415.

**Meristospira michiganensis** Grabau.

*Meristospira michiganense* Grabau, Michigan Geol. Surv., Geol. Ser. 1, 1909, p. 159, pl. 20, figs. 5, 6, 7-11; pl. 21, figs. 4-6.

Upper Monroan (Amherstburg): Woolmuth quarry, Monroe County, Michigan.

**MEROCRINUS** Walcott.

Genotype: *M. typus* Walcott.

*Merocrinus* Walcott, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 208, fig. (adv. sheets, 1883, p. 2).—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, pp. 115, 139 (Rev. Pal., pt. 3, sec. 2, pp. 191, 215); *ibid.*, 1890, p. 380.—Faber, Jour. Cincinnati Soc. Nat. Hist., 9, 1886, pp. 18, 19.—Miller, N. A. Geol. Pal., 1889, p. 262.—Bather, Geol. Mag., dec. 4, 6, 1899, p. 33, fig. 4; Ann. Mag. Nat. Hist., 6th ser., 5, 1890, p. 332, pl. 14, fig. 11; Geol. Mag., dec. 4, 3, 1896, p. 73; Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 178, fig. 96; Bull. Victoria Memorial Mus., 1, 1913, p. 1.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 215.

**Meroerinus corroboratus** Walcott.

*Meroerinus corroboratus* Walcott, 35th Rep. New York State Mus. Nat. Hist., 1882, p. 210, pl. 17, fig. 6.

Trenton: Trenton Falls, New York.

**Meroerinus curtus** (Ulrich).

*Dendroerinus curtus* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 18, pl. 7, fig. 14.

*Meroerinus curtus* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 140 (Rev. Pal., pt. 3, sec. 2, p. 216).—Faber, Jour. Cincinnati Soc. Nat. Hist., 9, 1886, p. 19, pl. 1, fig. 2.—Miller, N. A. Geol. Pal., 1889, p. 262, fig. 367.

Eden (Fulton): Cincinnati, Ohio, and vicinity.

*Holotype*.—Cat. No. 42103, U.S.N.M.

**Meroerinus typus** Walcott.

*Meroerinus typus* Walcott, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 209, pl. 17, fig. 5 (adv. sheets, 1883).

Trenton: Trenton Falls, New York; West Covington, Kentucky.

**MESOMPHALUS** Ulrich and Bassler. Genotype: *M. hartleyi* Ulrich and Bassler.

*Mesomphalus* Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 522.

**Mesomphalus hartleyi** Ulrich and Bassler.

*Mesomphalus hartleyi* Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 523, pl. 95, figs. 22-24; pl. 96, figs. 1-3.

Helderbergian (Keyser): Cumberland, Maryland; Keyser, West Virginia.

*Cotypes*.—Cat. No. 53304, U.S.N.M.

**Mesomphalus submarginata** Ulrich and Bassler.

*Mesomphalus submarginata* Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 523, pl. 96, figs. 4, 5.

Helderbergian (Keyser): Cumberland, Maryland.

*Holotype*.—Cat. No. 53308, U.S.N.M.

**MESOPALÆASTER** Schuchert.

Genotype: *Palæaster shæfferi* Hall.

*Palæaster* (part) of authors.

?Argaster Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 287; rev. ed., 1868-1870, p. 329 (nom. nud.).

*Mesopalæaster* Schuchert, in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 24; Bull. U. S. Nat. Mus., 88, 1915, p. 74.

**Mesopalæaster antiquus** (Troost).

*Asterias antiqua* Troost (not Hisinger, 1837), Trans. Geol. Soc. Pennsylvania, 1, 1835, p. 232, pl. 10, fig. 9; 5th Geol. Rep. Tennessee, 1840, pp. 11, 55; *ibid.*, 6th Rep., 1841, p. 176; Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 59.

*Petraster(?) antiqua* Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 386 (gen. ref.).

*Palæaster* (Argaster) *antiqua* Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 287; rev. ed., 1870, p. 329.

*Palæaster antiqua* James, Jour. Cincinnati Soc. Nat. Hist., 18, 1895, p. 133.—Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 105, pl. 8, fig. 1.

Argaster *antiqua* Gregory, Geol. Mag., dec. 4, 6, 1899, p. 345 (gen. ref.).

*Mesopalæaster antiquus* Schuchert, in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 24; Bull. U. S. Nat. Mus., 88, 1915, p. 86.

Trenton (Catheys): Harpeth River, Davidson County, Tennessee.

**Mesopalæaster bellulus** (Billings).

*Petraster bellulus* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 393, fig. 368.—Miller, N. A. Geol. Pal., 1889, p. 269, fig. 389.

*Mesopalæaster bellulus* Schuchert, in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 24; Bull. U. S. Nat. Mus., 88, 1915, p. 91, fig. 7.

Clinton (Rochester): Grimsby, Ontario.

**Mesopalæaster(?) cataractensis** Schuchert.

*Mesopalæaster(?) cataractensis* Schuchert, in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 25 (nom. nud.); Bull. U. S. Nat. Mus., 88, 1915, p. 89, pl. 9, fig. 2.

Upper Medina (Cataract): Hamilton, Ontario.

**Mesopalæaster dubius** (Miller and Dyer).

*Palæaster dubius* Miller and Dyer, Cont. to Pal., No. 2, 1878, p. 5, pl. 4, fig. 8.—James, Jour. Cincinnati Soc. Nat. Hist., 18, 1895, p. 130.

**Mesopalaester dubius**—Continued.

Mesopalaester(?) *dubius* Schuchert, in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 25; Bull. U. S. Nat. Mus., 88, 1915, p. 85.  
Trenton (Upper): West Covington, Kentucky.

**Mesopalaester finei** (Ulrich).

Palaester *finei* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 19, pl. 7, figs. 15, 15a, b.—James, *ibid.*, 18, 1895, p. 130.  
Mesopalaester *finei* Schuchert, in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 25; Bull. U. S. Nat. Mus., 88, 1915, p. 81, pl. 7, fig. 5; pl. 9, fig. 5.  
Eden (Fulton): Cincinnati, Ohio, and vicinity.

**Mesopalaester granti** (Spencer).

Palaester *granti* Spencer, Bull. Missouri State Mus., 1, 1884, p. 53, pl. 7, fig. 1; Trans. Acad. Sci. St. Louis, 4, 1884, p. 603, pl. 7, fig. 1.  
Mesopalaester *granti* Schuchert, in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 25; Bull. U. S. Nat. Mus., 88, 1915, p. 89, pl. 9, fig. 3.  
Upper Medinan (Cataract): Hamilton, Ontario.

**Mesopalaester intermedius** Schuchert.

Mesopalaester *intermedius* Schuchert, in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 25 (nom. nud.); Bull. U. S. Nat. Mus., 88, 1915, p. 79, pl. 9, fig. 4.  
Maysville: Cincinnati, Ohio.

**Mesopalaester(?) lanceolatus** Schuchert.

Mesopalaester(?) *lanceolatus* Schuchert, in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 25 (nom. nud.); Bull. U. S. Nat. Mus., 88, 1915, p. 82, pl. 4, fig. 3.  
Utica: Near Rome, New York.

**Mesopalaester parviusculus** (Billings).

Palaester *parviusculus* Billings, Canadian Nat. Geol., 5, 1860, p. 69, fig.—Dawson, *Acadian Geol.*, 2d ed., p. 594, fig. 197.—Lesley, *Geol. Surv. Pennsylvania*, Rep. P 4, 1889, p. 578, fig.—Hudson, *Bull. New York State Mus.*, 164, 1913, p. 110, pls. 1-4.  
Mesopalaester(?) *parviusculus* Schuchert, in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 25; Bull. U. S. Nat. Mus., 88, 1915, p. 87, pl. 9, fig. 1.  
Silurian: Arisaig, Nova Scotia.

**Mesopalaester proavitus** Schuchert.

Mesopalaester *proavitus* Schuchert, in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 25 (nom. nud.); Bull. U. S. Nat. Mus., 88, 1915, p. 83.  
Eden (Economy): Covington, Kentucky.

**Mesopalaester shæfferi** (Hall).

Palaester *shæfferi* Hall, 20th Rep. New York State Cab. Hist., p. 284; rev. ed., 1870, p. 326, pl. 9, fig. 1.—Meek, *Geol. Surv. Ohio*, Pal., 1, 1873, p. 66, pl. E(4), fig. 1.—Lesley, *Geol. Surv. Pennsylvania*, Rep. P 4, 1889, p. 578, fig.—James, *Jour. Cincinnati Soc. Nat. Hist.*, 18, 1895, p. 131.  
Mesopalaester *shæfferi* Schuchert, in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 25; Bull. U. S. Nat. Mus., 88, 1915, p. 77, pl. 8, figs. 1, 2.  
Maysville (Fairmount): Cincinnati, Ohio.  
Richmond (Waynesville): Waynesville, Ohio.

**Mesopalaester wilberanus** (Meek and Worthen).

Petraester *wilberanus* Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 13, 1861, p. 142.—James, *Jour. Cincinnati Soc. Nat. Hist.*, 18, 1895, p. 134.  
Palaester *wilberanus* Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 285; rev. ed., 1870, p. 328.

**Mesopalæaster wilberanus**—Continued.

*Mesopalæaster*(?) *wilberanus* Schuchert, in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 25; Bull. U. S. Nat. Mus., 88, 1915, p. 84.  
Richmond: Oswego, Kendall County, Illinois.

**MESOTRYPA** Ulrich.Genotype: *Diplotrypa infida* Ulrich.

*Diplotrypa* (in part) Nicholson, Paleozoic Tabulate Corals, 1879, p. 312; Genus *Monticulipora*, 1881, pp. 101, 155.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 153.—Foord, Contr. Micro-Pal. Cambro-Sil., 1883, p. 13.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 378.

*Mesotrypa* Ulrich, Geol. Minnesota, 3, 1893, p. 257.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, p. 30.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 27.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 130.—Hennig, Archiv. fur Zool., 4, No. 21, 1908, p. 29.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 196.

**Mesotrypa angularis** Ulrich and Bassler.

*Mesotrypa angularis* Ulrich and Bassler, Smiths. Misc. Coll., Quart., 47, 1904, p. 23, pl. 7, figs. 7-9.

Trenton: Frankfort, Burgin and Curdsville, Kentucky (Hermitage); Ottawa, etc., Ontario.

*Holotype*.—Cat. No. 43182, U.S.N.M.

**Mesotrypa discoidea** Ulrich.

*Mesotrypa discoidea* Ulrich, Geol. Minnesota, 3, 1893, p. 260, fig. 16.

*Dianulites discoidea* Miller, N. A. Geol. Pal., 2d App., 1897, p. 728 (gen. ref.).

Trenton (Prosser): Goodhue County, Minnesota.

*Holotype*.—Cat. No. 43544, U.S.N.M.

**Mesotrypa echinata** Ulrich and Bassler.

*Mesotrypa echinata* Ulrich and Bassler, Smiths. Misc. Coll., Quart., 47, 1904, p. 22, pl. 7, figs. 4-6.

Trenton (Hermitage): Nashville, Tennessee; Danville and Frankfort, Kentucky.

*Holotype*.—Cat. No. 44056, U.S.N.M.

**Mesotrypa infida** (Ulrich).

*Diplotrypa infida* Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 88.

*Mesotrypa infida* Ulrich, Geol. Minnesota, 3, 1893, p. 258, pl. 17, figs. 1-8; Zittel's Textb. Pal. (Engl. ed.), 1896, fig. 453 (p. 273).—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 333, fig. 479.

Black River (Decorah): Minneapolis, St. Paul, and Goodhue and Fillmore counties, Minnesota.

*Cotypes*.—Cat. Nos. 43542, 43543, U.S.N.M.

**MESOTRYPA MILLERI** Nickles and Bassler. See *Mesotrypa nummiformis*.**Mesotrypa nummiformis** (Hall).

*Callopora nummiformis* Hall, Pal. New York, 2, 1852, p. 148, pl. 40, figs. 5a, b.

*Callopora*? *nummiformis* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 416.

*Mesotrypa nummiformis* Bassler; Bull. U. S. Geol. Surv., 292, 1906, p. 27, pl. 10, figs. 1-4.

*Diplotrypa milleri* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 245, pl. 11, figs. 2-2c.

*Mesotrypa milleri* Nickles and Bassler, Bull. U. S. Geol. Surv. 173, 1900, p. 312.

Clinton: Lockport, Rochester, etc., New York; Grimsby, Hamilton, etc., Ontario (Rochester); Osgood, Indiana (Osgood).

*Plesiotypes*.—Cat. Nos. 35544, 43659, U.S.N.M. (*holotype* of *D. milleri*).

**Mesotrypa orbiculata** Cumings and Galloway.

Mesotrypa orbiculata Cumings and Galloway, 37th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1913, p. 80, pl. 14, figs. 1-1b.

Richmond (Arnheim): Big Four Railroad, near Harmon's Station, Indiana.

**Mesotrypa patella** (Ulrich).

Diplotrypa patella Ulrich, Geol. Surv. Illinois, 8, 1890, p. 458, pl. 33, figs. 2-2c.—

J. F. James, Jour. Cincinnati Soc. Nat. Hist., 16, 1894, p. 184.

Mesotrypa patella Ulrich, Geol. Minnesota, 3, 1893, p. 257.

Dianulites patella Miller, N. A. Geol. Pal., 2d App., 1897, p. 728 (gen. ref.).

Richmond (Whitewater): Oxford, Ohio; Richmond, Indiana.

*Holotype*.—Cat. No. 43306, U.S.N.M.

**Mesotrypa quebecensis** (Ami).

Diplotrypa Quebecensis Ami, Canadian Rec. Sci., 5, 1892, p. 101.

Mesotrypa quebecensis Ulrich, Geol. Minnesota, 3, 1893, p. 259, figs. 15, e, f.—

Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 130, fig. 186f.—Bassler, Bull. Virginia Geol. Surv., 2a, 1909, pl. 24, figs. 3, 4.

Dianulites quebecensis Miller, N. A. Geol. Pal., 2d App., 1897, p. 728 (gen. ref.).

Trenton: Quebec, etc., Quebec; Bridport, Vermont; Trenton Falls and Little Falls, New York; Frankfort, Burgin, and Danville, Kentucky (Hermitage); Decorah, Iowa (Prosser).

*Plesiotype*.—Cat. No. 43540, U.S.N.M.

**Mesotrypa regularis** (Foord).

Diplotrypa regularis Foord, Contr. Micro-Pal. Cambro-Sil., 1883, p. 13, pl. 1, figs. 3-3c.

Mesotrypa regularis Ulrich, Geol. Minnesota, 3, 1893, p. 257.

Trenton: Ottawa, Ontario.

**Mesotrypa? rotunda** Ulrich.

Mesotrypa? rotunda Ulrich, Geol. Minnesota, 3, 1893, p. 262, fig. 17.

Diannulites rotunda Miller, N. A. Geol. Pal., 2d App., 1897, p. 728 (gen. ref.).

Trenton (Prosser): Hader, Minnesota.

*Holotype*.—Cat. No. 43545, U.S.N.M.

**Mesotrypa selkirkensis** Whiteaves.

Mesotrypa selkirkensis Whiteaves, Pal. Foss., 3, 1897, p. 162, pl. 19, figs. 1, 1a.

Dianulites selkirkensis Miller, N. A. Geol. Pal., 2d App., 1897, p. 728 (gen. ref.).

Black River or Richmond: East Selkirk, Manitoba.

**Mesotrypa? spinosa** Ulrich.

Mesotrypa? spinosa Ulrich, Geol. Minnesota, 3, 1893, p. 259, pl. 17, figs. 9-12.

Black River (Decorah): Minneapolis and St. Paul, Minnesota.

*Cotypes*.—Cat. No. 43546, U.S.N.M.

**Mesotrypa whiteavesi** (Nicholson).

Chaetetes petropolitanus (part) Nicholson, Quar. Jour. Geol. Soc. London, 30,

1875, p. 510, pl. 30, figs. 5, 5c; Pal. Ohio, 2, 1875, p. 204, pl. 21, figs. 14-14b;

Geol. Mag., n. s., 2, 1875, p. 175; Ann. Mag. Nat. Hist., 4th ser., 18, 1876, p. 88, pl. 5, figs. 6a (not 6).

Monticulipora (Diplotrypa) whiteavesii Nicholson, Paleozoic Tabulate Corals, 1876, p. 316, pl. 13, figs. 4-4b (not pl. 14, 1); Genus Monticulipora, 1881, p. 160, fig. 31.

Monticulipora whiteavesii James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 169; J. F. James, *ibid.*, 16, 1894, p. 187.



**Mesotrypa whiteavesi**—Continued.

*Mesotrypa whiteavesii* Ulrich, Geol. Minnesota, 3, 1893, figs. 15g, h.

Trenton: Peterboro, etc., Ontario.

*Plesiotrypa*.—Cat. No. 43541, U.S.N.M.

**METABLASTUS SUBCYLINDRICA** Etheridge and Carpenter. See *Troostocrinus subcylindrica*.

**METOPIAS** Eichwald. See *Metopolichas* Gurich.

**METOPOLICHAS** Gurich.

Genotype: *M. hubneri* Eichwald.

*Metopias* Eichwald, Die Urwelt Russ., 1842, p. 62.—Loven, Ofvers. K. Vet.-Akad. Forhandl., 2, 1845, p. 53.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 7th ser., 33, 1885, pp. 30, 39.—Koken, Die Leitfossilien, Leipzig, 1896, p. 30.

*Metopolichas* Gurich, Neues Jahrb. Min., Geol. Pal., 14, Beilage-Band, 1901, p. 521, pl. 20, fig. 17.—Reed, Quart. Jour. Geol. Soc. London, 58, 1902, p. 61.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 311.

**Metopolichas breviceps** (Hall).

*Lichas breviceps* Hall, Trans. Albany Inst., 4, 1863, p. 222.—Hall and Whitfield, Pal. Ohio, 2, 1875, p. 156, pl. 6, fig. 17.—Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1877, pl. 34, figs. 1-7; mus. ed., 1879, p. 197, pl. 34, figs. 1-7; 11th Rep. Dep. Geol. and Nat. Hist., Indiana, 1882, p. 343, pl. 36, figs. 1-7.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 195, fig.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 337, figs.

*Metopolichas breviceps* Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 311. Niaganan (Waldron): Waldron, Indiana; Newsom, Tennessee.

**Metopolichas breviceps clintonensis** (Foerste).

*Lichas breviceps* Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 112, pl. 13, fig. 26a-d; *ibid.*, 2, 1887, p. 98, pl. 8, figs. 18, 19.

*Lichas breviceps clintonensis* Foerste, Geol. Surv. Ohio, 7, 1895, p. 529, pl. 25, figs. 26a-e; pl. 27, figs. 18, 19; Jour. Geol., 11, 1903, p. 706 (loc. occ.).

*Metopolichas breviceps clintonensis* Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 105, pl. 6, figs. 13, 14.

Upper Medinan: Dayton, etc., Ohio; Hanover, Indiana (Brassfield); near Thebes, Illinois; Edgewood and Louisiana, Missouri (Edgewood).

**Metopolichas ferrisi** Weller.

*Metopolichas ferrisi* Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 244, pl. 22, figs. 12-13.—Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 122, pl. 7, figs. 23, 24.

Upper Medinan (Channahon): Near Channahon, Will County, Illinois.

**Metopolichas pugnax** (Winchell and Marcy).

*Lichas pugnax* Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 103, pl. 3, figs. 10a-c.—Hall, 20th Rep. New York State Cab. Nat. Hist., rev. ed., 1870, p. 424, pl. 25, fig. 20; also p. 433.

*Metopolichas pugnax* Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 242, pl. 21, figs. 1-4.

Niaganan (Racine): Bridgeport, Illinois.

**METOPTOMA** Phillips.

Genotype: *M. oblonga* Phillips.

*Metoptoma* Phillips, Geol. Yorkshire, pt. 2, 1836, p. 223.—D'Orbigny, Prodr. de Pal., 1, 1849, p. 73.—Woodward, Man. Mollusca, pt. 1, 1851, p. 155.—McCoy, British Pal. Rocks and Foss., 1854, p. 523.—Billings, Pal. Foss., 1,

**METOPTOMA**—Continued.

Geol. Surv. Canada, 1862, p. 86.—Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1866, p. 266; Geol. Surv. Illinois, 3, 1868, p. 506.—Zittel, Handb. Pal., 2, 1882, p. 176.—Koninck, Ann. d. Mus. Royal d'Hist. Nat. de Belgique, 8, 1883, p. 187.—Koken, Neues Jahrb. Min. Geol. Pal., 6, Beilage-Band, 1889, p. 422.—Miller, N. A. Geol. Pal., 1889, p. 409.—Koken, Die Leitfossilien, Leipzig, 1896, p. 94, fig. 72, figs. 1, 2.—Berkey, Amer. Geol., 21, 1898, p. 278.—Pilsbry, Zittel-Eastman Textb. Pal., 1, 1900, p. 442.

Observation.—Although numerous species have been referred to *Metoptoma* by American authors, it is probable that none of them possesses the essential features of the genus. *Metoptoma* is apparently the European representative of the American Carboniferous genus *Lepetopsis* Whitfield.

**METOPTOMA** Billings, and other authors. See *Archinacella* Ulrich and Scofield, and *Triblidium* Lindström.

**Metoptoma?? alceste** Billings.

*Metoptoma Alceste* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 153, text figs. 133a, b (adv. sheets, 1862); Cat. Sil. Foss. Anticosti Geol. Surv. Canada, 1866, p. 18.

Richmond (English Head): English Head, Anticosti.

**METOPTOMA ALTA** Whitfield. See *Scenella?* *alta*.

**METOPTOMA? ANALOGA** Walcott. See *Scenella analoga*.

**Metoptoma?? augusta** Billings.

*Metoptoma Augusta* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 88. (Adv. sheets, 1862.)

Ozarkian? (Levis-erratics): Point Levis, Quebec.

**Metoptoma?? anomala** Billings.

*Metoptoma anomala* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 89, figs. 81a, b. (Adv. sheets, 1862.)

Ozarkian? (Levis-erratics): Point Levis, Quebec.

**METOPTOMA BARABUENSIS** Whitfield. See *Tryblidium barabuense*.

**METOPTOMA BILLINGSI** Walcott. See *Archinacella?* *billingsi*.

**METOPTOMA CANADENSIS** Miller. See *Priscochiton canadensis*.

**METOPTOMA CORNUTAFORME** Walcott. See *Tryblidium cornutaforme*.

**METOPTOMA DEFORMIS** Billings. See *Archinacella deformata*.

**METOPTOMA DUBIA** Hall. See *Archinacella deformata*.

**METOPTOMA ERATO** Billings. See *Tryblidium erato*.

**METOPTOMA ESTELLA** Billings. See *Archinacella estella*.

**METOPTOMA EUBULE** Billings. See *Tryblidium eubule*.

**METOPTOMA EXPLANATA** Sardeson. See *Archinacella perovalis*.

**METOPTOMA HYRIE** Billings. See *Tryblidium hyrie*.

**METOPTOMA INSTABILIS** Billings. See *Archinacella instabilis*.

**Metoptoma?? melissa** Billings.

Metoptoma Melissa Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 86 (adv. sheets, 1862).

Ozarkian? (Levis—erratics): Point Levis, Quebec.

METOPTOMA MONTREALENSIS Billings. See *Scenella montrealensis*.

METOPTOMA MONTREALENSIS Raymond. See *Archinacella propria*.

METOPTOMA NIOBE Billings. See *Tryblidium niobe*.

METOPTOMA NYCTEIS Billings. See *Tryblidium nycteis*.

METOPTOMA ORITHYIA Billings. See *Scenella orithyia*.

METOPTOMA ORPHYNE Billings. See *Palæacmæa orphyne*.

METOPTOMA PEROVALIS Whitfield. See *Archinacella perovalis*.

METOPTOMA PHILLIPSI Walcott. See *Archinacella phillipsi*.

METOPTOMA QUEBECENSIS Billings. See *Palæacmæa quebecensis*.

METOPTOMA RECURVA Whitfield. See *Hypseloconus recurvus*.

METOPTOMA RETRORSA Whitfield. See *Tryblidium retrorsum*.

METOPTOMA SIMILIS Whitfield. See *Archinacella similis*.

METOPTOMA SIMPLEX Billings. See *Archinacella simplex*.

METOPTOMA SUPERBA Billings. See *Scenella superba*.

METOPTOMA TRENTONENSIS Billings. See *Archinacella trentonensis*.

METOPTOMA VENILLIA Billings. See *Scenella? venillia*.

**MICHELINIA** Dekoninck.

Genotype: *Maon favosum* Goldfuss.

*Michelinia* Dekoninck, Desc. Animaux Fossiles, Liege, 1842, p. 29.—Dana, Wilkes U. S. Expl. Exped., 1838-42, 7, Zoophytes, 1846, p. 362.—Edwards and Haime, Compt. Rend. Acad. Sci., 29, 1849, p. 260; Mon. Polyp. Foss. Terr. Pal. (Arch. du Mus. d'Hist. Nat., 5), 1851, pp. 152, 249.—McCoy, British Pal. Rocks Foss., 1854, p. 80.—King, Ann. Mag. Nat. Hist., 2d ser., 17, 1856, p. 137.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 441.—Billings, Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 173; Canadian Nat. Geol., 3, 1858, p. 426; Canadian Jour., n. s., 4, 1859, p. 111.—Milne Edwards, Hist. Nat. Corall., 3, 1860, p. 259.—Rominger, Amer. Jour. Sci. Arts, 2d ser., 34, 1862, pp. 391, 399.—Koninck, Animaux Foss. Terr. Carb. Belgique (Mem. l'Acad. Royal Sci. de Belgique, 39), 1872, p. 130.—Nicholson, Rep. Pal. Prov. Ontario, pt. 1, 1874, p. 63.—Lindstrom, Ann. Mag. Nat. Hist., 4th ser., 18, 1876, p. 12.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 72.—Nicholson, Tab. Corals Pal. Period, 1879, p. 139, 151.—Zittel, Handb. Pal., 1, 1879, p. 235.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 429.—Waagen and Wenzel, Mem. Geol. Surv. India, Pal. Indica, 13th ser., 1, 1886, p. 848.—Hall and Simpson, Pal. New York, 6, 1887, p. 12.—Miller, N. A. Geol. Pal., 1889, p. 196.—Sardeson, Neues Jahrb. f. Min., Geol. Pal., Beilage-Band, 10, 1896, p. 294.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 37.—Zittel-Eastman Textb. Pal., 1, 1900, p. 101; *ibid.*, 2d ed., 1913, p. 115.

**Michelinia louisvillensis** Greene.

*Michelinia louisvillensis* Greene, Cont. Indiana Pal., pt. 3, 1899, p. 20, pl. 8, figs. 10-12.

Niagaran (Louisville): Near Louisville, Kentucky.

**Michelinia niagarensis** Davis.

*Michelinia niagarensis* Davis, Kentucky Foss. Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 39, fig. 2.

Niagaran (Louisville): Near Louisville, Kentucky.

**Michelinia prima** Davis.

*Michelinia prima* Davis, Kentucky Foss. Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 39, figs. 3-5; pl. 40, fig. 1.

Niagaran (Louisville): Louisville, Kentucky.

**MICROCERAS** Hall.

Genotype: *M. inornatum* Hall.

*Microceras* Hall, Amer. Jour. Sci., 48, 1845, p. 249.—Meek, Geol. Surv. Ohio, Pal. 1, 1873, p. 148.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 311.—Koninck, Ann. Mus. Royal d'Hist. Nat. de Belgique, 8, 1883, p. 123, footnote.—Miller, N. A. Geol. Pal., 1889, p. 410.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 847.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res., Indiana, 1908, p. 951.

*Discolites* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 234 (Genotype: *D. minutus* Emmons).

**Microceras inornatum** Hall.

*Microceras inornatus* Hall, Amer. Jour. Sci. Arts, 48, 1845, p. 294.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 312.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 970, pl. 40, figs. 9, 9a.

*Cyrtolites* (*Microceras*) *inornatus* Meek, Geol. Surv. Ohio, Pal. 1, 1873, p. 147, pl. 13, figs. 4a, b.

*Cyrtolites subcompressus* Meek, Geol. Surv. Ohio, Pal. 1, 1873, p. 147 (under *C. inornatus*).

*Discolites minutus* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 234.

Maysville and Richmond: Cincinnati, Ohio, and vicinity; Indiana; Kentucky; Tennessee; etc.

**Microceras minutissimum** Ulrich.

*Microceras minutissimum* Ulrich, Jour. Cin. Soc. Nat. Hist., 2, 1879, p. 13, pl. 7, fig. 8.

Maysville (Fairmount): Hamilton, and Cincinnati, Ohio.

*Cotypes*.—Cat. No. 46048, U.S.N.M..

**MICRODISCUS** Emmons. See *Ampyx* Dalman.

**MICROPORA** Eichwald. See *Stictoporella* Ulrich.

**MICROSPONGIA** Miller and Dyer. See *Hindia* Duncan.

**MILLEPORA REPENS** Fought. See *Alveolites repens*.

**MILLERIA** Davis. See *Dictyostroma* Nicholson.

**MIMULUS** Barrande.

Genotype: *M. perversus* Barrande.

*Mimulus* Barrande, Syst. Sil. du Centre Boheme, 5, pt. 1, 1879, p. 109, pl. 9 (Ext. *ibid.*, p. 173).—Zittel, Handb. Pal., 1, p. 684.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 272; 11th Ann. Rep. New York State Geol., 1894, p. 289.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 315; *ibid.*, 2d ed., 1913, p. 388.

**Mimulus waldronensis** (Miller and Dyer).

- Spirifera*(?) *waldronensis* Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 37, pl. 2, fig. 3.
- Triplesia putillus* Hall, Desc. New Sp. Foss., Waldron, Ind., 1879, p. 16; 11th Rep. State Geol. Indiana, 1882, p. 298, pl. 27, figs. 19-22; Trans. Albany Inst., 10, 1883, p. 72.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1226, figs.
- Streptis waldronensis* Beecher and Clarke, Mem. New York State Mus., 1, 1889, p. 301, pl. 3, figs. 9, 10.
- Mimulus waldronensis* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 273, pl. 11C, figs. 23-28.
- Niagaran (Waldron): Waldron, Indiana; Newsom, Tennessee.

**MITOCLEMA** Ulrich.Genotype: *M. cinctosum* Ulrich.

- Mitoclema* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 150, Geol. Surv. Illinois, 8, 1890, pp. 336, 369; Geol. Minnesota, 3, 1893, p. 122.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 13.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 598.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 22.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 18.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 120.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 69.

**Mitoclema cinctosum** Ulrich.

- Mitoclema cinctosum* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 159, pl. 6, figs. 7, 7a; Ulrich, Geol. Surv. Illinois, 8, 1890, pl. 53, figs. 8-8b.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, figs. 205, 206 (p. 599).
- Enallopora cinctosa*, Miller, N. A. Geol. Pal., 1889, p. 301 (gen. ref.).
- Stones River (Ridley): Bottom of gorge, High Bridge, Kentucky: Murfreesboro, Tennessee.
- Cotypes*.—Cat. No. 43270, U.S.N.M.

**Mitoclema? mundulum** Ulrich.

- Mitoclema? mundulum* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 12, 1890, p. 177, figs. 4a-c; Geol. Minnesota, 3, 1893, p. 123, pl. 2, figs. 4-6.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 121, figs. 178g, h.—Bassler, Bull. U. S. Nat. Mus. 77, 1911, pp. 70, 71, fig. 16.
- Trenton (Prosser): Cannon Falls, Minnesota.
- Middle Ordovician (Kuckers): Near Jewe, Esthonia, Russia.
- Cotypes and plesiotypes*.—Cat. Nos. 43297, 57187, U.S.N.M.

**Mitoclema sarlei** Bassler.

- Mitoclema sarlei* Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 18, pl. 5, figs. 10-12.
- Clinton (Rochester): Rochester, New York.
- Cotypes*.—Cat. No. 35460, U.S.N.M.

**MITROCERAS** Hyatt.Genotype: *Trochoceras gebhardi* Hall.

- Mitroceras* Hyatt, Proc. American Phil. Soc., 32, 1894, p. 503.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 775.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 74.
- Trochoceras* Hall (not Barrande, 1847) Nat. Hist. New York Pal., 2, 1852, p. 335; 15th Rep. New York State Cab. Nat. Hist., 1862, p. 64.—Miller, N. A. Geol. Pal., 1889, p. 455.—Grabau Bull. New York State Mus. 9, 1901, p. 217; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 217.

**Mitroceras gebhardi** (Hall).

*Trochoceras gebhardii* Hall, Pal. New York, 2, 1852, p. 335, pl. 77, fig. 2; pl. 77a, figs. 1a-d.—Grabau, Bull. Geol. Soc. Amer., 11, 1900, p. 371, pl. 21, figs. 3a-b; Bull. New York State Mus., 45, 1901, p. 217, fig. 149; *ibid.*, 92, 1906, p. 110, figs. 16, 17; Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 199, pl. 31, figs. 3a-b. *Mitroceras gebhardi* Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 75, figs. 1289, 1290.

Cayugan: Schoharie (Cobleskill), Buffalo and Williamsville, New York (Akron).

**MITROCRINUS** Miller and Gurley. Genotype: *M. wetherbyi* Miller and Gurley.

*Mitrocrinus* Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 5, 1894, p. 22.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 748.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 203.

**Mitrocrinus wetherbyi** Miller and Gurley.

*Mitrocrinus wetherbyi* Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 5, 1894, p. 22, pl. 2, figs. 4-6.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 748, fig. 1364.

Chazyan (Ottosee): Knox County, Tennessee.

**MODIOLA OBTUSA** Hall. See *Modiolopsis obtusa*.**MODIOLODON** Ulrich.

Genotype: *Modiolopsis oviformis* Ulrich.

*Cyrtodonta* (part) Safford, Geol. Tennessee, 1869, p. 287.

*Modiolopsis* (part) Ulrich, Amer. Geol., 5, 1900, p. 276.

*Modiolodon* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 521; Geol. Surv. Ohio, 7, 1893, p. 652.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 981.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 516.

**Modiolodon arcticus** Schuchert.

*Modiolodon arcticus* Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 161, pl. 13, figs. 18, 19.

Trenton: Head of Frobisher Bay, Baffin Land.

*Holotype*.—Cat. No. 28166, U.S.N.M.

**Modiolodon declivis** Ulrich.

*Modiolodon declivis* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 654, pl. 53, figs. 3 and 4.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1005, pl. 46, figs. 2, 2a.

Richmond (Whitewater): Richmond, Indiana.

*Holotype*.—Cat. No. 46227, U.S.N.M.

**Modiolodon ganti** (Safford).

*Cyrtodonta Gantii* Safford, Geol. Tennessee, 1869, p. 287, pl. 1 (E), figs. 1a-h.

*Modiolodon Gantii* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 521, fig. 40d.

*Cypricardites ganti* Miller, N. A. Geol. Pal., 1889, p. 476 (gen. ref.).

Trenton (Hermitage): Wilson County, Tennessee.

*Cotypes*.—Cat. No. 46228, U.S.N.M.

**Modiolodon(?) gibbus** Ulrich.

*Modiolodon(?) gibbus* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 522, pl. 35, figs. 28, 29.

*Modiolopsis gibba* Miller, N. A. Geol. Pal., 2d App., 1897, p. 782 (gen. ref.).

Black River: Near Cannon Falls, Minnesota (Decorah); Lincoln County, Missouri (Auburn).

*Holotype*.—Cat. No. 46229, U.S.N.M.

**Modiolodon obtusus** Ulrich.

Modiolopsis modiolaris Hall and Whitfield (not Hall), Pal. Ohio, 2, 1875, pl. 2, fig. 17.

Modiolodon obtusus Ulrich, Geol. Surv. Ohio, 7, 1893, p. 654, pl. 52, figs. 20 and 21.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1005, pl. 46, figs. 4, 4a.

Maysville (Bellevue): Cincinnati, Ohio, and vicinity.

*Cotypes*.—Cat. No. 46230, U.S.N.M.

**Modiolodon oviformis** (Ulrich).

Modiolopsis oviformis Ulrich, Amer. Geol., 5, 1890, p. 276, fig. 4a-c.

Modiolodon oviformis Ulrich, Geol. Surv. Ohio, 7, 1893, p. 652, pl. 53, figs. 7 and 8.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 521, fig. 40g.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 516, figs. 693, 694a.

Trenton (Hermitage): Boyle, Mercer, Anderson, and Franklin Counties, Kentucky; Wilson County, Tennessee.

*Holotype* and *plesiotype*.—Cat. Nos. 46231, 46232, U.S.N.M.

**Modiolodon oviformis amplus** Ulrich.

Modiolodon oviformis var. *amplus* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 653, pl. 53, figs. 1 and 2.

Trenton (Hermitage): Frankfort, Kentucky.

*Cotypes*.—Cat. No. 46233, U.S.N.M.

**Modiolodon patulus** Ulrich.

Modiolodon patulus Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 521, pl. 37, figs. 20-24.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 516, fig. 694b, c.

Modiolopsis patulus Miller, N. A. Geol. Pal., 2d App., 1897, p. 782 (gen. ref.).

Trenton: Kenyon, Goodhue County, Minnesota; Decorah, Iowa (Prosser); Danville, Kentucky.

*Cotypes*.—Cat. Nos. 46234, 46727, U.S.N.M.

**Modiolodon poststriatus** Foerste.

Modiolodon poststriatus Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 294, pl. 1, fig. 7.

Cincinnati (Pulaski): Near Vars, Quebec.

**Modiolodon subovalis** Ulrich.

Modiolodon subovalis Ulrich, Geol. Surv. Ohio, 7, 1893, p. 655, pl. 51, figs. 11-13.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1006, pl. 46, figs. 3-3b.

Richmond (Arnheim-Waynesville): Versailles, Indiana.

*Cotypes*.—Cat. No. 46236, U.S.N.M.

**Modiolodon subrectus** Ulrich.

Modiolodon subrectus Ulrich, Geol. Surv. Ohio, 7, 1893, p. 653, pl. 53, figs. 5, 6.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1007, pl. 46, figs. 5-5a.

Modiolopsis subrectus Miller, N. A. Geol. Pal., 2d App., 1897, p. 782 (gen. ref.).

Richmond (Whitewater): Richmond, Indiana.

*Holotype*.—Cat. No. 46237, U.S.N.M.

**Modiolodon subrhomboides** Branson.

Modiolodon subrhomboides Branson, Trans. Acad. Sci. St. Louis, 18, 1909, p. 41, pl. 7, fig. 1.

Black River (Auburn-Decorah): Lincoln County, Missouri.

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**Modiolodon truncatus** (Hall).

*Modiolopsis truncatus* Hall, Pal. New York, 1, 1847, p. 296, pl. 81, figs. 3a, b.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 217.—Hall and Whitfield, Geol. Surv. Ohio, Pal. 2, 1875, p. 86, pl. 2, fig. 13.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 412, fig.

*Eurymya?* *truncata* (changed to *Modiolodon truncata* on p. 628) Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 512 (gen. ref.).

*Modiolodon truncatus* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 656, pl. 51, figs. 9-10.—Cumings, 32d Ann. Rep. Dept. Geol. Nat. Res. Indiana, 1908, p. 1008, pl. 46, figs 6, 6a.

*Lyonsia subtruncata* D'Orbigny, Prodr. Pal., 1, p. 11 (proposed for *Modiolopsis truncatus* Hall, 1847; not *M. truncata* Agassiz, 1842).—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 171, pl. 17, fig. 4.

Cincinnati: Near Rome, New York (Pulaski); Cincinnati, Ohio, and vicinity (Fairmount-Corryville).

*Plesiotypes*.—Cat. Nos. 46238, 46239, U.S.N.M.

**Modiolodon winchelli** (Safford).

*Cyrtodonta winchelli* Safford, Geol. Tennessee, 1869, p. 287, pl. L (E), figs. 2a-i.

*Modiolodon winchelli* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 521, fig. 40e-f.

*Cypricardites winchelli* Miller, N. A. Geol. Pal. 1889, p. 477 (gen. ref.).

Trenton (Hermitage): Wilson County, Tennessee.

*Plesiotypes*.—Cat. No. 46240, U.S.N.M.

**MODIOLOPSIS** (part) of authors. See *Eurymya*, *Allodesma*, *Modiolodon*, and *Whiteavesia* Ulrich.

**MODIOLOPSIS** Hall.

Genotype: *Cypricardites modiolaris* Conrad.

*Modiolopsis* Hall, Pal. New York, 1, 1847, p. 157.—McCoy, British Pal. Rocks Foss., 1854, p. 265.—Woodward, Man. Mollusca, pt. 2, 1854, p. 266.—Pictet, Traité de Pal., 2d ed., 3, 1855, p. 533.—Hall, Pal. New York, 3, 1859, p. 14, 269 and 270, footnote; 12th Rep. New York State Cab. Nat. Hist., 1859, p. 9.—Hitchcock, Geol. Vermont, 1, 1862, p. 296.—Salter, Cat. Camb. Sil. Foss., 1873, p. 65.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 216.—Zittel, Handb. Pal., 2, 1881, p. 44.—Barrande, Syst. Sil. du Centre Boheme, 6, 1881, p. 107.—Miller, N. A. Geol. Pal., 1889, p. 489.—Barrois, Ann. Soc. Geol. du Nord., 19, Lille, 1891, p. 206.—Whidborne, Mon. Dev. Fauna South England, 1, Pal. Soc., 1892, p. 40.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 502.—Koken, Die Leitfossilien, Leipzig, 1896, p. 191.—Dall, Zittel-Eastman Textb. Pal., 1, 1900, p. 385; *ibid.*, 2d ed., 1913, p. 462.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 209; Bull. New York State Mus., 45, 1901, p. 209.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 981.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 511.

**Modiolopsis adrastia** Billings.

*Modiolopsis Adrastia* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 45. (Adv. sheets, 1862.)

Black River: St. Joseph's Island, Lake Huron.

**Modiolopsis affinis** Sardeson.

*Modiolopsis affinis* Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 73, pl. 2, fig. 9.

St. Peter: South St. Paul, Minnesota.

**MODIOLOPSIS ALATA** Ulrich. See *Eurymya alata*.



**Modiolopsis angustata** Ulrich.

*Modiolopsis angustata* Ulrich, Amer. Geol., 5, 1890, p. 283, fig. 10a-c.

Eden (Southgate): Covington, Kentucky.

*Holotype*.—Cat. No. 46241, U.S.N.M.

**Modiolopsis angustifrons** Whiteaves.

*Modiolopsis angustifrons* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 183, pl. 20, fig. 4.

Black River or Richmond: Lower Fort Garry, Lake Winnipeg, Manitoba.

**MODIOLOPSIS ANODONTOIDES** Hall. See *Modiolopsis sinuata*.

**Modiolopsis arcuata** Hall.

*Modiolopsis arcuatus* Hall, Pal. New York, 1, 1847, p. 159, pl. 35, fig. 8.

*Avicula subarcuata* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 176, pl. 13, fig. 31.

*Modiolopsis subarcuata* D'Orbigny, Prodr. Pal., 1, 1850, p. 13.

Trenton: Herkimer, New York.

**Modiolopsis arguta** Ulrich.

*Modiolopsis arguta* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 506, pl. 36, figs. 3-6.

Black River (Decorah): Minneapolis, St. Paul, Fountain, etc., Minnesota.

*Cotypes*.—Cat. Nos. 46242, 46243, U.S.N.M.

**MODIOLOPSIS AVICULOIDES** Hall. See *Prolobella aviculoides*.

**MODIOLOPSIS CANCELLATA** Walcott. See *Whiteavesia cancellata*.

**Modiolopsis capax** Miller.

*Modiolopsis capax* Miller, N. A. Geol. Pal., 1889, pp. 489, 490, fig. 851.

Richmond: Versailles, Indiana.

Observation.—Belongs to *M. pholadiformis* group. Not recognizable from description or figure.

**MODIOLOPSIS CARINATA** Hall. See *Goniophora carinata*.

**MODIOLOPSIS CARROLLENSIS** Worthen. See *Orthodesma subnasutum*.

**Modiolopsis chatfieldensis** Ulrich.

*Modiolopsis chatfieldensis* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 508, pl. 36, figs. 9-10.

Black River (Decorah): Chatfield, Minnesota.

*Holotype*.—Cat. No. 46244, U.S.N.M.

**MODIOLOPSIS CININNATIENSIS** Hall and Whitfield. See *Whiteavesia cincinnatiensis*.

**Modiolopsis concava** Ulrich.

*Modiolopsis concava* Ulrich, 19th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1892, p. 227, fig. 13; Geol. Minnesota, pt. 2, 1894, p. 509, pl. 36, figs. 15, 16, 16a.

Black River (Decorah): Near Cannon Falls, Minnesota.

*Holotype*.—Cat. No. 46246, U.S.N.M.

**Modiolopsis concentrica** Hall and Whitfield.

*Modiolopsis concentrica* Hall and Whitfield, Pal. Ohio, 2, 1875, p. 86, pl. 2, fig. 18.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 510, pl. 37, figs. 15 and 16.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1009, pl. 47, fig. 3.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 512, fig. 686a.—

Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 283.

Richmond (Waynesville): Waynesville, etc., Ohio; Indiana; Kentucky.

*Plesiotypes*.—Cat. No. 46245, U.S.N.M.

**Modiolopsis concinna** Savage.

*Modiolopsis concinna* Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 54, pl. 2, fig. 2.

Upper Medinan (Girardeau): Near Thebes, Illinois.

**Modiolopsis(?) consimilis** Ulrich.

*Modiolopsis(?) consimilis* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 505, pl. 42, figs. 17, 18.

Stones River (Murfreesboro): Murfreesboro, Tennessee.

*Holotype*.—Cat. No. 46247, U.S.N.M.

**Modiolopsis contigua** Sardeson.

*Modiolopsis contigua* Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 72, pl. 2, fig. 8.

St. Peter: South St. Paul, Minnesota.

*MODIOLOPSIS CORRUGATA* Miller and Faber. See *Whitcavesia corrugata*.

**Modiolopsis cuneiformis** James.

Not recognized.

*Modiolopsis cuneiformis* James, Paleontologist, No. 3, 1879, p. 23.

Maysville or Richmond: Near Lebanon, Ohio.

**Modiolopsis curta** Hall.

Not recognized.

*Modiolopsis curta* Hall, Pal. New York, 1, 1847, p. 297, pl. 81, fig. 4; pl. 82, figs. 2a-d.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 35, fig. 11a.

*Lyonsia curta* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 171.

Cincinnatian (Pulaski): Loraine, Rodman, Rome, etc., New York.

Observation.—Hall's figures, plate 81, fig. 4, and plate 82, fig. 2t, are apparently of *Ischyrodonta unionoides*; plate 82, fig. 2a, is of *Pterinea demissa* and plate 82, fig. 2c, is of a small *Cyrtodonta* from Mineral Point, Wisconsin.

**Modiolopsis depressa** Weller.

*Modiolopsis depressa* Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 171, pl. 11, fig. 8.

Trenton: Jacksonburg, New Jersey.

**Modiolopsis dictæus** Hall.

*Modiolopsis dictæus* Hall, 20th Rep. New York State Cab. Hist., 1868, p. 338, pl. 14 (5), fig. 7; rev. ed., 1870, p. 335, pl. 14, fig. 7.

Niagaran (Racine): Racine, Wisconsin; Bridgeport, Illinois.

*MODIOLOPSIS DUBIA* Hall. See *Goniophora dubia*.

**Modiolopsis dychii** Miller.

*Modiolopsis dychii* Miller, 18th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1894, p. 331, pl. 8, figs. 4, 5 (adv. sheets, 1892).

Richmond: Lebanon, Ohio.

Observation.—Not recognizable. Probably based on a crushed specimen.

**Modiolopsis excellens** Ulrich.

*Modiolopsis excellens* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 511, pl. 36, figs. 13 and 14.

Richmond (Maquoketa): Spring Valley and Granger, Minnesota.

**Modiolopsis exilis** Billings.

*Modiolopsis exilis* Billings, Pal. Foss., Geol. Surv. Canada, 2, pt. 1, 1874, p. 132, pl. 8, fig. 5, 5a.—Ami, Proc. Trans. Nova Scotia Inst. Sci., 8, 1895, p. 414 (loc. occ.).

Silurian: Arisaig, Nova Scotia.

**Modiolopsis expansa** Branson.

*Modiolopsis expansa* Branson, Trans. Acad. Sci. St. Louis, 18, No. 4, 1909, p. 42, pl. 7, figs. 5, 6.

Black River (Auburn—Decorah): Lincoln County, Missouri.

**MODIOLOPSIS FABAE** Hall. See *Colpomya faba* and *C. faba pusilla*.

**Modiolopsis fabæformis** Raymond.

*Modiolopsis fabæformis* Raymond, Amer. Jour. Sci. (4), 20, 1905, p. 374.—Whitceaves, Ottawa Nat., 22, 1903, p. 110, pl. 3, figs. 7-9.

Chazyan: Valcour Island, New York (Valcour); Hogback, near Ottawa, Ontario (Aylmer).

**Modiolopsis faberi** Miller.

*Modiolopsis faberi* Miller, N. A. Geol. Pal., 1889, p. 490, fig. 852, 853.

Maysville (Fairmount): Cincinnati, Ohio.

**Modiolopsis fountainensis** Sardeson.

*Modiolopsis fountainensis* Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 71, pl. 4, fig. 7.

St. Peter: Below Fountain, Minnesota.

**MODIOLOPSIS GESNERI** Billings. See *Endodesmia gesneri*.

**MODIOLOPSIS GIBBA** Miller. See *Modiolodon? gibbus*.

**Modiolopsis gregalis** Sardeson.

*Modiolopsis gregalis* Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 72, pl. 2, figs. 10-12.

St. Peter: South St. Paul and Daytons Bluff, Minnesota.

**Modiolopsis jerseyensis** Weller.

*Modiolopsis jerseyensis* Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 170, pl. 11, fig. 9.

Black River (Jacksonburg): Jacksonburg, New Jersey.

**Modiolopsis lata** Hall.

*Modiolopsis latus* Hall, Pal. New York, 1, 1847, p. 160, pl. 35, figs. 10a, b.

*Cypriocardites latus* Miller, N. A. Geol. Pal., 1889, p. 477 (gen. ref.).

*Palæarca lata* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 71 (gen. ref.).

Trenton: Watertown, New York.

**Modiolopsis leightoni** Williams.

*Modiolopsis leightoni* Williams, Proc. U. S. Nat. Mus., 45, 1913, p. 346, pl. 31, figs. 7-10.

Silurian (Pembroke): Leighton Cove, Washington County, Maine.

*Cotypes*.—Cat. No. 58974, U.S.N.M.

**Modiolopsis leightoni quadrata** Williams.

*Modiolopsis leightoni* var. *quadrata* Williams, Proc. U. S. Nat. Mus., 45, 1913, p. 347, pl. 31, figs. 12, 13.

Silurian (Pembroke): Leighton Cove, Washington County, Maine.

*Cotypes*.—Cat. No. 58975, U.S.N.M.

**Modiolopsis litoralis** Sardeson.

*Modiolopsis litoralis* Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 72, pl. 2, figs. 13-16.

St. Peter: South St. Paul and Highland Park, Minnesota.

**Modiolopsis longa** Miller and Faber.

*Modiolopsis longa* Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 15, 1892, p. 80, pl. 1, figs. 2, 3.

Maysville (Fairmount): Cincinnati, Ohio.

**Modiolopsis maia** Billings.

*Modiolopsis Maia* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 44, figs. 46a, b (adv. sheets, 1862); Geol. Canada, Geol. Surv. Canada, 1863, p. 143, figs. 80a, b.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 408, figs. 158.—Trenton: East of Blue Point, Lake St. John, Canada.

**Modiolopsis meyeri** Billings.

*Modiolopsis Meyeri* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 42, fig. 44 (adv. sheets, 1862); Geol. Canada, Geol. Surv. Canada, 1863, p. 173, fig. 158.—Lesley, Geol. Pennsylvania, Rep. P 4, 1889, p. 408, fig.

Trenton: Ottawa, Ontario.

**Modiolopsis? (Colpomya?) milleri** Ulrich.

*Modiolopsis milleri* Ulrich, Amer. Geol. 5, 1890, p. 274, fig. 3a-d.

Maysville (Fairmount): Cincinnati, Ohio.

*Cotypes*.—Cat. No. 46248, U.S.N.M.

**Modiolopsis modiolaris** (Conrad).

*Pterinea modiolaris* Conrad, 2d Ann. Rep. Geol. Surv. New York, 1838, p. 118.

*Cypricardites modiolaris* Emmons, Nat. Hist. New York Geol., 2, 1842, p. 403, fig. 4.

*Cypricardia modiolaris* Owen, Amer. Jour. Sci. Arts, 47, 1844, p. 379, fig. 4.

*Modiolopsis modiolaris* Mall, Pal. New York, 1, 1847, p. 294, pl. 81, figs. 1a-g; pl. 82, fig. 1; Geol. Lake Sup. Land Dist., Foster and Whitney's Rep., 1851, p. 214, pl. 31, figs. 2a-d.—McCoy, British Pal. Rocks and Foss., 1854, p. 267, pl. 1, figs. 17, 18.—Billings, Canadian Nat. and Geol., 1, 1856, p. 44, fig. 8.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 820, fig. 618.—Emmons, Man. Geol., 1860, p. 102, fig. 4.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 4, figs. 10, 11.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 213, fig. 217.—Chapman, Canadian Jour., n. s., 7, 1862, p. 117, fig. 111; *ibid.*, 8, 1863, p. 206, fig. 206; Expos. Min. Geol. Canada, 1864, p. 120, fig. 111; p. 178, fig. 206.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 149, fig. 17.—Roemer, Leth. geog., 1, Leth. Pal., Atlas, 1876, pl. 4, fig. 19.—Zittel, Handb. Pal., 2, 1881, p. 44, fig. 57.—Lesley, Geol. Surv. Pennsylvania, Rep., P 4, 1889, p. 409, figs.—Bigot, Bull. Soc. Geol. France, 3d ser., 17, 1889, p. 792.—Miller, N. A. Geol. Pal., 1889, p. 490, fig. 854.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 481, figs. 37a, b.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 512, figs. 687, 688.—Bassler, Bull. Virginia, Geol. Surv., 2a, 1909, pl. 14, fig. 8.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 281, pl. 3, fig. 1; pl. 5, figs. 1, 2.

*Cypricardites angustifrons* Conrad, 5th Ann. Rep. New York Geol. Surv., 1841, p. 52.—Emmons, Nat. Hist. New York, 2, 1842, p. 405, fig. 1.

*Cypricardites ovata* Conrad, 5th Ann. Rep. New York Geol. Surv., 1841, p. 52.—Emmons, Nat. Hist. Geol. New York, 2, 1842, p. 405, fig. 2.

*Lyonsia submodiolaris* D'Orbigny, Prod. Pal., 1, 1850, p. 11 (proposed for *Modiolopsis modiolaris* Hall, 1847; not *M. modiolaris* McCoy, 1844).—Emmons, Amer. Geol., 1, pt. 2, 1855, p. 171, pl. 17, fig. 8, 8a.

Cincinnati: Pulaski, Oswego County, etc., New York (Pulaski); Pennsylvania; Virginia; Cincinnati, Ohio, and vicinity.

*Plesiotype*.—Cat. No. 46249, U.S.N.M. (Ulrich)

**MODIOLOPSIS MODIOLARIS** Hall and Whitfield. See *Modiolodon obtusus*.

**MODIOLOPSIS MODIOLARIS** Meek and Worthen. See *Whiteavesia modioliformis*.

**Modiolopsis mytiloides** Hall.

*Modiolopsis mytiloides* Hall, Pal., New York, 1, 1847, p. 157, pl. 35, figs. 4a-b.—

Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 508, pl. 36, fig. 8.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 511, fig. 686b.

Trenton: Middleville, New York; Goodhue and Fillmore Counties, Minnesota (Prosser); Oshkosh, Wisconsin; etc.

*Plesiotype*.—Cat. No. 46250, U.S.N.M.

**Modiolopsis nais** Billings.

*Modiolopsis Nais* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 45, fig. 47a, b (adv. sheets, 1862); Geol. Canada, Geol. Surv. Canada, p. 143, fig. 81a, b.

Black River (Leray): Pauquettes Rapids, Ottawa River, Canada.

**Modiolopsis nana** Ulrich.

*Modiolopsis nana* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 507, pl. 36, fig. 7.

Trenton (Prosser): Near Cannon Falls, Minnesota.

*Holotype*.—Cat. No. 46251, U.S.N.M.

**MODIOLOPSIS NASUTUS** Hall. See *Orthodesma nasutum*.

**MODIOLOPSIS NILESI** Whitfield. See *Edmondia nilesi*.

**MODIOLOPSIS? NUCULIFORMIS** Hall. See *Ctenodonta nuculiformis*.

**Modiolopsis oblonga** James.

Not recognized.

*Modiolopsis subspatulata* James (not Hall, 1847), Paleontologist, No. 3, 1879, p. 23.

*Modiolopsis oblonga* James, *ibid.*, No. 6, 1882, p. 53.

Richmond: Clinton County, Ohio.

**MODIOLOPSIS OBLONGA** Ulrich. See *Whiteavesia oblonga*.

**Modiolopsis obsoleta** Ulrich.

*Modiolopsis obsoleta* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 509, pl. 36, figs. 11 and 12.

Black River (Decorah): Near Cannon Falls, Minnesota.

*Holotype*.—Cat. No. 46253, U.S.N.M.

**Modiolopsis obtusa** (Hall).

*Modiola obtusa* Hall, Pal. New York, 1, 1847, p. 40, pl. 10, fig. 1.

*Modiolopsis obtusa* Miller, N. A. Geol. Pal., 1889, p. 490 (gen. ref.).

Black River (Lowville): Watertown, New York.

**Modiolopsis occidentis** Walcott.

*Modiolopsis occidentis* Walcott, Mon. U. S. Geol. Surv., 8, 1894, p. 77, pl. 1, fig. 5; pl. 11, figs. 14, 14a.

Upper Pogonip: Fish Creek Mountains, and Lone Mountain, Nevada.

*Cotypes*.—Cat. Nos. 17287, 17288, U.S.N.M.

**Modiolopsis orthonota** (Conrad).

*Unio orthonotus* Conrad, 3d Ann. Rep. New York State Geol. Surv., 1839, p. 66.

*Cypricardia orthonota* Hall, Geol. Rep. 4th Dist., New York, 1843, p. 48, figs.

8, 9; tab. ill. 2, figs. 8, 9.—Owen, Amer. Jour. Sci. Arts, 48, 1845, p. 300, figs.

8, 9.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 176, figs.

**Modiolopsis orthonota**—Continued.

*Modiolopsis orthonota* Hall, Pal. New York, 2, 1852, p. 10, pl. 4a, figs. 1, a, b, c.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 5, figs. 8, 9.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 48 (loc. occ.).—Grabau, Bull. New York State Mus., 45, 1901, p. 209, fig. 137; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 290, fig. 137.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 512, fig. 689.

Upper Medinan: Lockport, Medina, etc., New York; Ontario.

*Plastotype*.—Cat. No. 46197, U.S.N.M.

**MODIOLOPSIS ORTHONOTA** Meek and Worthen. See *Endodesma orthonotum*.

**Modiolopsis ovata** Hall.

*Modiolopsis ovatus* Hall, Pal. New York, 2, 1852, p. 101, pl. 30, figs. 2a, b.

Upper Clinton: Mohawk, New York.

**MODIOLOPSIS OVIFORMIS** Ulrich. See *Modiolodon oviformis*.

**Modiolopsis oweni** Ulrich.

*Modiolopsis oweni* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 506, pl. 42, figs. 15 and 16.

Trenton (Prosser): Five miles south of Cannon Falls, Minnesota.

*Holotype*.—Cat. No. 46254, U.S.N.M.

**Modiolopsis parallela** (Conrad) Hall.

Not recognized.

*Modiolopsis parallela* Hall, Pal. New York, 1, 1847, p. 158, pl. 35, fig. 5.

Trenton: Locality unknown.

**Modiolopsis parva** Ulrich.

*Modiolopsis parva* Ulrich, Amer. Geol., 5, 1890, p. 281, fig. 9a-f.

Eden (Southgate): Covington, Kentucky.

*Cotypes*.—Cat. Nos. 46255, 46256, U.S.N.M.

**Modiolopsis parviuscula** Billings.

*Modiolopsis parviuscula* Billings, Canadian Nat. Geol., 1858, 4, p. 446; Hind's Narrative Canadian Red River Expl. Exped. of 1857 and Assiniboine and Saskatchewan Exped. of 1858, 1859, 2, p. 286.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 182; Ottawa Nat., 22, 1908, p. 106, pl. 3, figs. 1, 2.

Black River: Lake Winnipeg, Canada.

Chazyan: Montreal, near Cornwall (Aylmer), and Mingan Islands, Canada (Mingan).

**MODIOLOPSIS PATULUS** Miller. See *Modiolodon patulus*.

**Modiolopsis perlata** Hall.

*Modiolopsis perlatus* Hall, 28th Rep. New York State Mus. Nat. Hist., mus. ed., 1879, p. 172, pl. 27, figs. 3, 4; doc. ed., 1875, pl. 27, figs. 3, 4; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 315, pl. 28, figs. 3, 4.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 410, figs.

Niagaran (Waldron): Waldron, Indiana.

**MODIOLOPSIS PHOLADIFORMIS** Hall. See *Whiteavesia pholadiformis*.

**MODIOLOPSIS PLANA** Hall. See *Eurymya plana*.

**Modiolopsis pogonipensis** Walcott.

*Modiolopsis Pogonipensis* Walcott, Mono. U. S. Geol. Surv., 8, 1884, p. 78, pl. 1, figs. 6; pl. 11, figs. 13.

Upper Pogonip: Fish Creek Mountains and Lone Mountain, Nevada.

*Cotypes*.—Cat. Nos. 17292, 17293, U.S.N.M.

**Modiolopsis postica** Sardeson.

*Modiolopsis postica* Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 71, pl. 4, fig. 8.

St. Peter: Four miles below Dodgeville, Wisconsin.

**Modiolopsis postplicata** Foerste.

*Modiolopsis postplicata* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 284, pl. 1, fig. 4.

Cincinnati (Pulaski): Riviere des Hurons, near St. Jean Baptiste, and at Chambly, Quebec.

**Modiolopsis primigenia** (Conrad).

*Unio primigenius* Conrad, Ann. Rep. New York State Geol. Surv., 1838, p. 113; *ibid.*, 1839, p. 66.

*Modiolopsis?* *primigenius* Hall, Pal. New York, 2, 1852, p. 11, pl. 4 bis, figs. 2a-c (not d-e).—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 5, fig. 3.—Grabau, Bull. New York State Mus., 45, 1901, p. 209, fig. 138; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 209, fig. 138.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 512, fig. 690.

*Palaearca?* *primigenius* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 83.

*Cypricardia alata* Hall, Geol. Rep. 4th Dist. New York, 1843, p. 48, fig. 3; tab. ill. 2, fig. 3.—Owen, Amer. Jour. Sci. Arts, 48, 1845, p. 300, figs. 3.

*Avicula alata* Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 48 (loc. occ.).

*Modiomorpha alata* Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 412, figs. Upper Medinan: Medina, Lockport, etc., New York; Ontario.

**MODIOLOPSIS PULCHELLA** Ulrich. See *Whiteavesia pulchella*.

**MODIOLOPSIS RECTIFORMIS** Worthen. See *Endodesma orthonotum*.

**MODIOLOPSIS RECTUS** Hall. See *Matheria recta*.

**Modiolopsis rhomboidea** Hall.

*Modiolopsis rhomboidea* Hall, Canadian Nat. Geol., 5, 1860, p. 148.—Dawson, Acadian Geol., Suppl. Chap., p. 68, fig. 52; *ibid.*, 2d ed., p. 599, fig. 203.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, p. 410, figs.—Foerste, Geol. Surv. Ohio, Pal., 7, pl. 560, p. 37, figs. 8a.

Silurian: Arisaig, Nova Scotia; ?Dayton, Ohio (Brassfield).

**Modiolopsis rogersensis** Foerste.

*Modiolopsis rogersensis* Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 134, pl. 3, figs. 3a-d.

Trenton (Upper): Near Rogers Gap, Kentucky.

**Modiolopsis ruda** Billings.

*Modiolopsis ruda* Billings, Pal. Foss., Geol. Surv. Canada, 2, pt. 1, 1874, p. 133, pl. 8, fig. 6.

Silurian: Arisaig, Nova Scotia.

**MODIOLOPSIS SENECTA** Sardeson. See *Psiloconcha senecta*.

**Modiolopsis similis** Ulrich.

*Modiolopsis similis* Ulrich, 19th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1892, p. 225, fig. 11; Geol. Minnesota, 3, pt. 2, 1894, p. 504, pl. 36, figs. 1, 2; pl. 42, fig. 19.—Sardeson, Amer. Geol., 30, 1902, p. 44.

Black River (Decorah): Minneapolis, Minnesota.

*Holotype*.—Cat. No. 46257, U.S.N.M.

**Modiolopsis simulatrix** Ulrich.

*Modiolopsis simulatrix* Ulrich, Amer. Geol., 5, 1890, p. 277, fig. 5a-c.

Eden (Southgate): Covington, Kentucky.

*Holotype*.—Cat. No. 46258, U.S.N.M.

**Modiolopsis sinuata** (Emmons).

*Cypricardites sinuata* Emmons, Geol. New York, 2, 1842, p. 399, fig. 3.

*Modiolopsis sinuata* Miller, N. A. Geol. Pal., 1889, p. 491 (gen. ref.).—Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 446.

*Cypricardites anodontoides* Emmons, Man. Geol., 1860, p. 101, fig. 91.

*Modiolopsis anodontoides* Hall, Pal. New York, 1, 1847, p. 298, pl. 82, figs. 3a-c.—

Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 4, fig. 3.—

(?) Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 217.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 407, fig.

*Lyonsia anodontoides* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 171, pl. 17, fig. 14.

Cincinnati (Pulaski): Rodman and Lorraine, New York.

**Modiolopsis sowteri** Raymond.

*Modiolopsis sowteri* Raymond, Amer. Jour. Sci., 20, 1905, p. 374.

Chazy (Aylmer): Aylmer, Quebec.

*MODIOLOPSIS STRIATA* Billings. See *Pterinea striata*.

**Modiolopsis subalata** Hall.

*Modiolopsis subalatus* Hall, Pal. New York, 2, 1852, p. 84, pl. 27, figs. 5, 6a, b; p. 285, pl. 59, fig. 7.—Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, p.

109.—Hall, 20th Rep. New York State Cab. Hist., p. 339, 1868, p. 389; rev.

ed., 1870, p. 386; 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875,

pl. 27, figs. 5, 6; Mus. ed., 1879, p. 173, pl. 27, figs. 5, 6; 11th Ann. Rep.

Indiana Dep. Geol. Nat. Hist., 1882, p. 315, pl. 28, figs. 5, 6.—Lesley, Geol.

Surv. Pennsylvania, Rep. P 4, 1889, p. 410, figs.

*Cypricardia obsoleta* Hall, Geol. New York, 4, 1843, p. 76, fig. 3; tab. ill. 8, fig. 3.—

Owen, Amer. Jour. Sci. Arts, 48, 1845, p. 306, fig. 3.

*Cypricardites obsoletus* Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p.

178, fig.

Niagaran: Rochester, Sodus, Walcott, etc., New York (Lower Clinton); Waldron,

Indiana (Waldron).

*MODIOLOPSIS SUBARCUATA* D'Orbigny. See *Modiolopsis arcuata*.

**Modiolopsis subcarinata** Hall.

*Modiolopsis subcarinatus* Hall, Pal. New York, 2, 1852, p. 101, pl. 30, figs. 3a, b, c, d, 4a.

Upper Clinton: Near Mohawk, New York.

*MODIOLOPSIS SUBELLIPTICA* Ulrich. See *Allodesma subellipticum*.

**Modiolopsis subparallela** Ulrich.

*Modiolopsis subparallela* Ulrich, Amer. Geol., 5, 1890, p. 273, figs. 2a-c.

Maysville (Fairmount): Covington, Kentucky.

*Holotype*.—Cat. No. 46259, U.S.N.M.

**Modiolopsis subnasuta** Hall.

*Modiolopsis subnasutus* Hall, Canadian Nat. Geol., 5, 1860, p. 148.—Dawson, Acadian Geol., 2d. ed., 1868, p. 599.

Silurian: Arisaig, Nova Scotia.

*MODIOLOPSIS SUBNASUTA* Meek and Worthen. See *Orthodesma subnasutum*.



**Modiolopsis subquadrilateralis** Hudson.

*Modiolopsis subquadrilateralis* Hudson, Bull. New York State Mus., 80, 1905, p. 286, pl. 4, figs. 8 and 9.

Chazyan (Valcour): Valcour Island, New York.

**MODIOLOPSIS SUBRECTUS** Miller. See *Modiolodon subrectus*.

**Modiolopsis subrhomboidea** Simpson.

*Modiolopsis subrhomboidea* Simpson in Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 411, fig.—Simpson, Trans. Amer. Phil. Soc., n. s., 16, 1890, p. 450, fig. 17.—Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 560, pl. 37, fig. 7a.

Clinton: Seven miles northwest Lewistown, Mifflin County, Pennsylvania.

Upper Medinan (Brassfield): Dayton, Ohio.

**MODIOLOPSIS SUBSPATULATA** James. See *Modiolopsis oblonga*.

**MODIOLOPSIS SUBSPATULATUS** Hall. See *Prolobella subspatulata*.

**Modiolopsis subtruncata** Ulrich.

*Modiolopsis subtruncata* Ulrich, Amer. Geol., 5, 1890, p. 279, figs. 7a-c.

Eden (Economy): Cincinnati, Ohio.

*Holotype*.—Cat. No. 46676, U.S.N.M.

**MODIOLOPSIS SULCATA** Miller and Faber. See *Whiteavesia corrugata*.

**MODIOLOPSIS? SUPERBUS** Hall and Whitfield. See *Whiteavesia superba*.

**Modiolopsis? terminalis** Hall.

*Modiolopsis terminalis* Hall, Pal New York, 1, 1847, p. 318, pl. 33\*, figs. 5a, 5b.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 217.

*Lyonsia terminalis* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 172.

Maysville: Cincinnati, Ohio.

Observation.—Possibly the same as *Rhytimya mickelboroughi* (Whitfield).

**MODIOLOPSIS? TRENTONENSIS** Hall. See *Endodesma trentonensis*.

**MODIOLOPSIS TRUNCATUS** Hall. See *Modiolodon truncata*.

**MODIOLOPSIS? UNDULOSTRIATA** Hall. See *Cypricardinia undulostriata*.

**MODIOLOPSIS UNIONOIDES** Miller. See *Ischyrodonta unionoides*.

**Modiolopsis valida** Ulrich.

*Modiolopsis valida* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 521, fig. 40a.

Richmond (Waynesville): Waynesville, Ohio.

*Cotypes*.—Cat. No. 46260, U.S.N.M.

**Modiolopsis versaillesensis** Miller.

*Modiolopsis Versaillesensis* Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 150, figs. 18, 19; N. A. Geol. Pal. 1889, p. 491, figs. 855, 856.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 521, fig. 40a.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1010, pl. 46, figs. 7, 7a.

Richmond (Waynesville): Versailles, Indiana.

*Plesiotypes*.—Cat. No. 46261, U.S.N.M.

**MODIOMORPHA** Hall.

Genotype: *Pterinea concentrica* Conrad.

*Modiomorpha* Hall, Prelim. Notice Lamel., pt. 2, 1869, p. 72; 23d Rep. New York State Cab. Nat. Hist., 1873, pp. 14-16; Pal. New York, 5, pt. 1, Lam. 2, 1885, p. 13.—Nettelroth, Kentucky Foss. Shells, Geol. Surv. Kentucky, 1889, p. 215.—Miller, N. A. Geol. Pal., 1889, p. 491.—Koken, Die Leitfossilien, Leipzig, 1896, p. 521.—Grabau, Bull. Buffalo Soc. Nat. Sci., 4, 1899, p. 249.—Dall, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 462.

**Modiomorpha acuminata** Parks.

*Modiomorpha acuminata* Parks in Tyrrell, 22d Rep. Ontario Bur. Mines, 1913, p. 36.

Niagaran (Guelph): Severn River, Ontario.

**MODIOMORPHA ALTA** Lesley. See *Modiolopsis primigenia*.

*Monilipora macrostoma* Roemer.

Not recognized.

*Monilipora macrostoma* Roemer Leth. geog., pt. 1, Leth. Pal., 1883, p. 526.

"Kohlenkalke": Louisville, Kentucky.

**MONOBOLINA REFULGENS** Matthews. See *Obolus(?) refulgens*.

**MONOCRATERION** Torell

*Monocraterion* Torell, Lunds Univers. Arsskrift, 6, 1869, p. 13.—Miller, N. A.

Geol. Pal., 1889, p. 519.—Matthew, Trans. Royal Soc. Canada, 8, sec. 4, 1891,

p. 160; *The Irish Naturalist*, 1901, p. 135.

**Monocraterion lesleyi** Prime.

*Monocraterion lesleyi* Prime, Geol. Surv. Pennsylvania, Rep. PP, 1878, p. 79,

pl. 5, fig. 1.—Lesley, *ibid.*, Rep. P 4, 1889, p. 417, figs.

Calcareous?: Northampton, Lehigh, and Bucks Counties, Pennsylvania.

*Monograpsus* Emmons.

Genotype: *M. elegans* Emmons.

*Monograpsus* Emmons, Amer. Geol., 1, pt. 2, 1855, p. 106.

*Monograptus* Miller, N. A. Geol. Pal., 1889, p. 196.

Observation.—Not recognized. The types are lost and the species can not be identified.

*Monograpsus elegans* Emmons.

Not recognized.

*Monograpsus elegans* Emmons, Amer. Geol., 1, pt. 2, 1855, p. 106, pl. 1, fig. 27.

*Monograptus elegans* Elles and Wood, Mon. British Grapt. Pal. Soc., 1903, p. 38.

*Didymograptus? elegans* Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 255, 256.

"Taconic" (Middle Ordovician): Augusta County, Virginia.

*Monograpsus rectus* Emmons.

Not recognized.

*Monograpsus rectus* Emmons, Amer. Geol., 1, pt. 2, 1856, p. 107, fig. 28, pl. 1.

*Didymograptus rectus* Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 256.

"Taconic shales": Columbia County, New York.

**MONOGRAPTUS** Geinitz.

Genotype: *Graptolithus priodon* Bronn.

*Monograpsus* Geinitz, Bull. Soc. Geol. France, 2d ser., 9, 1852, p. 187; *Zeits. d. d. geol. Gesell.*, 3, 1852, p. 389; Amer. Jour. Sci. Arts, 2d ser., 14, 1852, p. 129.

*Monograptus* Hall, 20th Rep. New York State Cab. Hist., 1868, p. 217.—Lap-

worth, *Geol. Mag.*, 2d ser., 3, 1876, p. 314.—Zittel, *Handb. Pal.*, 1, 1879, p.

297.—Jaekel, *Zeits. d. d. geol. Gesell.*, 41, 1889, p. 660.—Perner, *Etudes sur*

*les Grapt. de Boheme*, pt. 1, Prague, 1894, p. 4.—Wiman, *Bull. Geol. Inst.*

*Univ. Upsala*, 2, pt. 2, 1896, p. 267.—Gurich, *Verh. d. Russ.-Kais. Mineral*

*Gesell. zu St. Petersburg*, 2d ser., 32, 1896, p. 109.—Koken, *Die Leitfossilien,*

*Leipzig*, 1896, p. 329, fig. 238.—Gurich, *Zeits. d. d. geol. Gesell.*, 48, 1896, p.

954.—Walther, *ibid.*, 49, 1897, p. 251.—Roemer and Frech, *Leth. geog.*, 1,

*Theil*, *Leth. Pal.*, 1, 3 Lief., 1897, p. 638.—Ruedemann, *Amer. Nat.*, 32, 1898,

p. 3; *Zittel-Eastman Textb. Pal.*, 1, 1900, p. 117.—Grabau and Shimer,

*N. A. Index Fossils*, 1, 1906, p. 34.—Ruedemann, *Mem. New York State Mus.*,

11, pt. 2, 1908, p. 449; *Zittel-Eastman Textb. Pal.*, 2d ed., 1913, p. 132.

**MONOGRAPTUS**—Continued.

- Lomatoceras Bronn, Leth. Geog., 1, 1834, pp. 55.—Gurley, Jour. Geol., 4, 1896, p. 79.  
 Monoprion Barrande, Grapt. de Boheme, 1850, p. 14.  
 Lagenograptus Hall, 20th Rep. New York State Cab. Nat. Hist. (rev. ed.), 1870, p. 261.

**Monograptus argutus** Lapworth.

- Monograptus argutus Lapworth, Geol. Mag., 2d ser., 3, 1876, p. 318, pl. 10, figs. 13a-c.—Elles and Wood, Mon. British Grapt., 8, 1911, p. 408, pl. 40, figs. 3a-e.  
 Silurian: Scotland and Wales (Llandovery-Birkhill); Blaylock Mountain, Montgomery County, Arkansas (Blaylock) [Ulrich].

**Monograptus capillaceus** Tullberg.

- Monograptus capillaceus Tullberg, Skanes Grapt., 2, 1883, p. 24, pl. 2, figs. 28, 29.—Elles and Wood, Mon. British Grapt., 8, 1911, p. 458, pl. 46, figs. 4a-d.  
 Silurian: Scotland, Wales, and England (Wenlock); Twelve miles northeast of Ketchum, Idaho [Ulrich].

**Monograptus clintonensis** (Hall).

- Graptolithus clintonensis Hall, Geol. New York, 4th Dist., 1843, pp. 74, 72, fig. 12, Pl. New York, 2, 1851, p. 39, pl. A 17, fig. 1; Can. Org. Rem., dec. 2, 1859, pp. 25, 27, 29; pl. B, figs. 1-4; 20th Ann. Rép. New York State Cab. Nat. Hist., 1867, pp. 195, 197; pl. 1, figs. 1-4.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 264, fig.  
 Lagenograptus clintonensis Hall, 20th Ann. Rep. New York State Cab. Nat. Hist., rev. ed., 1870, p. 261, pl. 1, figs. 1-4.  
 Monograptus clintonensis Geinitz, Die Graptolithen, 1852, p. 58.—Lapworth, Geol. Mag., 7, 1880, p. 68.—Geinitz, Mitth. kon. min.-geol. praeh. Mus. Dresden, 9 heft, 1890, p. 19.—Elles and Wood, Mon. British Grapt., Pal. Soc., 1903, p. 33.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 34, fig. 55b.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 450, pl. 29, fig. 1, figs. 425-431.  
 Lomatoceras clintonensis Gurley, Jour. Geol., 4, 1896, p. 308 (gen. ref.).  
 Monograptus pridon Bronn mut. clintonensis Frech, Leth. geog., 1, Theil, Leth. Pal., 1, 2 Lief., 1897, p. 641.  
 Lower and Upper Clinton: Sodus (Williamson), Rochester, etc., New York; Pennsylvania; Nova Scotia; etc.

**Monograptus communis** (Lapworth).

- Monograptus convolutus var. communis Lapworth, Geol. Mag., 2d ser., 3, 1876, p. 358, pl. 13, figs. 4a, b.  
 Monograptus communis Elles and Wood, Mon. British Grapt., 8, 1911, p. 480, pl. 49, figs. 1a-c.  
 Silurian: Scotland, Wales, and Ireland (Llandovery); twelve miles northeast of Ketchum, Idaho [Ulrich].

**Monograptus convolutus** (Hisinger).

- Prionotus convolutus Hisinger, Leth. Succ. Supp., 1837, p. 114, pl. 35, fig. 7.  
 Graptolithus convolutus Carruthers, Geol. Mag., 5, 1868, p. 127, pl. 5, fig. 1.  
 Monograptus convolutus Tullberg, Grapt. desc. by Hisinger, 1881, p. 14, pl. 2, figs. 13-16; Siljansomrad Grapt., 2, 1892, p. 30, pl. 3, figs. 5-11.—Perner, Grapt. de Boheme, 1897, p. 13, pl. 12, figs. 26-29; pl. 13, fig. 41, fig. 10.—Elles and Wood, Mon. British Grapt., 8, 1911, p. 467, pl. 47, figs. 1a-d.  
 Silurian: Ireland, Scotland, and Wales (Llandovery); twelve miles northeast of Ketchum, Idaho [Ulrich].

*MONOGRAPTUS CONVOLUTUS* var. *COMMUNIS* Lapworth. See *Monograptus communis*.

***Monograptus convolutus coppingeri*** Etheridge.

*Monograptus convolutus* var. *Coppingeri* Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 577, pl. 25, fig. 1.

*Lomatoceras convolutum coppingeri* Gurley, Jour. Geol., 4, 1896, p. 100 (gen. ref.).

Niagaran: Thank God Harbor, Arctic America.

***Monograptus delicatulus*** Elles and Wood.

*Monograptus delicatulus* Elles and Wood, Monog. British Grapt., 8, 1911, p. 478, pl. 47, figs. 2a and b.

Silurian: South Scotland (Llandoverly); twelve miles northeast of Ketchum, Idaho [Ulrich].

***Monograptus denticulatus*** Törnquist.

*Monograptus denticulatus* Törnquist, Mon. Scanian Rastrites beds, 1899, p. 18, pl. 3, figs. 19–23.—Elles and Wood, Monog. British Grapt., 8, 1911, p. 474, pl. 48, figs. 2a–f.

Silurian: South Scotland (Llandoverly); twelve miles northeast of Ketchum, Idaho [Ulrich].

***Monograptus distans*** (Portlock).

*Graptolithus* (*Prionotus*) *sedgwickii* var. *distans* Portlock, Geol. Rep. London-derry, 1843, p. 319, pl. 19, figs. 4a and b.

*Monograptus distans* Elles and Wood, Mon. British Grapt., 8, 1911, p. 433, pl. 43, figs. 6a–d.

Silurian: Scotland and Ireland (Upper Llandoverly); Blaylock Mountain, Montgomery County, Arkansas (Blaylock) [Ulrich].

*MONOGRAPTUS ELEGANS* Emmons. See *Monograptus?* *elegans*.

***Monograptus flemingi*** (Salter).

*Graptolithus Flemingii* Salter, Quart. Jour. Geol. Soc., 8, 1852, p. 390, pl. 21, figs. 5a, b, 6, 7a, b.

*Monograptus Flemingii* Lapworth, Geol. Mag., 2d ser., 3, 1876, p. 504, pl. 20, fig. 8.—Tullberg, Skanes Grapt., Svensk. Geol. Undersokn., ser. C, No. 55, 1883, p. 23, pl. 2, fig. 25.—Elles, Quart. Jour. Geol. Soc., 46, 1900, p. 402, figs. 11 and 14.—Elles and Wood, Mon. British Grapt., 8, 1911, p. 425, pl. 43, figs. 5a–d.

Silurian: England and Scotland (Upper Wenlock); twelve miles northeast of Ketchum, Idaho [Ulrich].

*MONOGRAPTUS GRACILIS* Whitfield. See *Nemagraptus gracilis*.

***Monograptus gregarius*** Lapworth.

*Graptolites Nilssoni* Harkness, Quart. Jour. Geol. Soc., 7, 1851, p. 61, pl. 1, figs. 7a–d.—Nicholson, Quart. Jour. Geol. Soc., 24, 1868, p. 537, pl. 20, fig. 19.

*Monograptus gregarius* Lapworth, Geol. Mag., dec. 2, 3, 1876, p. 317, pl. 10, figs. 12a–c; Cat. West Scott. Foss., 1876, pl. 1, fig. 7; Proc. Belfast Nat. Field Club, 1877, p. 131, pl. 5, fig. 4.—Törnquist, Siljansomr. Graptol. Acta Univ., Lund., 28, 1892, p. 8; Monograptidae of Scanian Rastrites Beds, Lunds Univ. Arssk., 35, pt. 2, 1899, p. 4, pl. 1, figs. 1–6.—Elles and Wood, Mon. British Grapt., 8, 1911, p. 365, pl. 36, figs. 3a–d.

Silurian: Scotland, Ireland, Wales (Llandoverly—Birkhill); Blaylock Mountain, Montgomery County, Arkansas (Blaylock) [Ulrich].

**Monograptus intermedius** (Carruthers).

*Graptolithus intermedius* Carruthers, *Geol. Mag.*, 5, 1868, p. 126, pl. 5, fig. 18.

*Graptolithus acutus* Hopkinson, *Geol. Mag.*, 9, 1872, p. 504, pl. 12, fig. 4.

*Monograptus intermedius* Lapworth, *Geol. Mag.*, 2d ser., 3, 1876, p. 316, pl. 10, figs. 10a-c.—Elles and Wood, *Mon. British Grapt.*, 8, 1911, p. 485, pl. 49, figs. 3a-c.

Silurian: Scotland, Ireland, and Wales (Llandovery); twelve miles northeast of Ketchum, Idaho [Ulrich].

**Monograptus priodon** (Bronn).

*Lomatoceras priodon* Bronn, *Leth. Geog.*, 1, 1835, p. 56, pl. 1, fig. 13.

*Graptolithus priodon* Barrande, *Grapt. de Boheme*, 1850, p. 38, pl. 1, figs. 3-9, 14.—Suess, *Bohm. Grapt.*, 1851, p. 25, pl. 8, fig. 5.

*Monograptus priodon* Geinitz, *Die Graptolithen*, 1852, p. 43, pl. 3, figs. 20-24, 26, 28-30.—Richter, *Aus. dem Thuring. Schiefergeb.*, 4, *Zeitschr., d. deutsch. geol. Gesell.*, 23, 1871, pl. 5, fig. 1; *ibid.*, 5, 27, 1875, p. 269, pl. 7, fig. 7.—Lapworth, *Scottish Monograptidae*, *Geol. Mag.*, 2d ser., 3, 1876, p. 21; *Grapt. Co. Down*, *Proc. Belfast Nat. Field Club*, 1877, p. 129, pl. 5, fig. 24.—Linnarsson, *Gotl. Grapt. K. Svensk. Vet. Akad. Forhandl.*, 1879, p. 24, pl. 10, figs. 1-12.—Tornquist, *Om Nagra fran Dalarne. Geol. Foren. i Stockholm Forhandl.*, 5, 1881, p. 737, pl. 17, fig. 3.—Linnarsson, *Grapt. med. M. turriculatus vid Klubbuden Geol. Foren. i Stockholm*, 5, 1881, p. 509, pl. 22, figs. 3 and 4.—Tullberg, *Skanes Graptoliter*, 2, 1881, p. 22, pl. 2, fig. 24.—Holm, *Gotl. Grapt.*, *Bihang till K. Svensk. Vet.-Akad., Handl.*, 16, 1890, p. 14, fig. 28.—Geinitz, *Grapt. Dresden Mus.*, 1890, p. 17, pl. A, fig. 16.—Tornquist, *Siljansomrad. Grapt.*, 2, 1892, p. 13, pl. 1, figs. 22-27.—Elles and Wood, *Monog. British Grapt.*, 8, 1911, p. 418, pl. 42, figs. 2a-c.

*Graptolites priodon* Nicholson, *Grapt. Coniston Flags*, *Quart. Journ. Geol. Soc.*, 24, 1868, p. 540, pl. 20, fig. 6; *Monog. British Grapt.*, 1872, p. 102, fig. 47.

Silurian: Scotland, Wales, and England (Bala—Tarannon to Lower Wenlock); twelve miles northeast of Ketchum, Idaho [Ulrich].

**MONOGRAPTUS PRIODON** Linnarsson. See *Monograptus clintonensis*.

**MONOGRAPTUS PRIODON** mut. **CLINTONENSIS**. See *Monograptus clintonensis*.

**MONOGRAPTUS PRIODON** Williams. See *Monograptus priodon chapmanensis*.

**Monograptus priodon chapmanensis** Ruedemann.

*Monograptus clintonensis* Dodge and Beecher, *Amer. Jour. Sci.*, 3d ser., 43, 1892, p. 412f.

*Monograptus (Graptolithus clintonensis) priodon* Williams, *Bull. U. S. Geol. Surv.*, 165, 1900, p. 46.

*Monograptus priodon* mut. *chapmanensis* Ruedemann, *Mem. New York State Mus.*, 11, pt. 2, 1908, p. 454, pl. 29, fig. 2; figs. 432, 433.

Clinton: Chapman plantation, Aroostook Bay County, Maine; Arisaig, Nova Scotia.

**MONOGRAPTUS SAGITARIUS** Whitfield. See *Didymograptus sagitticaulis*.

**Monograptus urceolus** Richter.

*Monograptus urceolus* Richter, *Zeitschr. d. deutsch. geol. Gesell.*, 5, 1853, p. 462, pl. 12, figs. 29, 30.—Elles and Wood, *Mon. British Grapt.*, 8, 1911, p. 470, pl. 48, figs. 1a-d.

*Rastrites urceolus* Eisel, *Die Zonenfolge d. ostthuring. u. vogtland, Grapt.*, 1899, p. 6.

**Monograptus urceolus**—Continued.

*Monograptus* cfr. *urceolus* Tornquist, Rastrites and allied species of *Monograptus*, Lund. Univ. Arsskr., n. s., afd. 2, 3, 5, 1907, p. 18, pl. 3, figs. 5–10.

*Demirastrites urceolus* Eisel, Ueber zonenweise Entwick. d. Rastriten u. Demirastriten i. d. mittelsil. Grapt. Thuringens u. Sachsens, 1911, p. 15, pl. 2, figs. 25–32.

Silurian: Scotland (Llandoverly); twelve miles northeast of Ketchum, Idaho [Ulrich].

**MONOMORELLA** Billings.

Genotype: *M. prisca* Billings.

*Monomorella* Billings, Canadian Nat. Geol., n. s., 6, 1871, p. 220; Amer. Jour. Sci., 3d ser., 3, 1872, p. 358.—Davidson and King, Ann. Mag. Nat. Hist., 4th ser., 10, 1872, p. 248; Geol. Mag., 9, 1872, p. 442; Quart. Jour. Geol. Soc. London, 30, 1874, p. 155.—Zittel, Handb. Pal., 1, 1880, p. 667.—Davidson, Mon. British Foss. Brach., 5, Sil. Suppl., 1883, Pal. Soc., p. 218.—Miller, N. A. Geol. Pal., 1889, p. 354.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 40, 46; 11th Ann. Rep. New York State Geol., 1894, p. 238.—Koken, Die Leitfossilien, Leipzig, 1896, p. 230, fig. 190, 191.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 190.—Sehuchert, Zittel-Eastman Textb. Pal., 1900, p. 306; *ibid.*, 1913, p. 373.

**Monomorella durhamensis** Whiteaves.

*Monomorella durhamensis* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 57, pl. 9, fig. 1; pl. 15, fig. 1.

Niagaran (Guelph): Edge Mills, near Durham, Ontario.

**Monomorella egani** Hall and Clarke.

*Monomorella egani* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 42, 175, pl. 4C, fig. 16; 48th Rep. New York State Mus., 2, for 1895, 1897, p. 330, pl. 2, fig. 3; 14th Rep. State Geol. New York for 1894, 1897, p. 330, pl. 2, fig. 3.

Niagaran (Guelph): Near Grafton, Wisconsin.

**Monomorella greenii** Hall and Clarke.

*Monomorella greenii* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 42, 174 pl. 4D, figs. 5–10; 48th Rep. New York State Mus., 2, for 1895, 1897, p. 328, pl. 1, figs. 9–14; 14th Rep. State Geol. New York for 1894, 1897, p. 328, pl. 1, figs. 9–14.

Niagaran (Guelph): Near Grafton, Wisconsin; Rising Sun, Ohio.

*Plastotype*.—Cat. No. 49973, U.S.N.M.

**Monomorella kingi** Hall and Clarke.

*Monomorella kingi* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 42, 174, pl. 4D, figs. 1, 2; 48th Rep. New York State Mus., 2, for 1895, 1897, p. 329, pl. 2, figs. 1, 2; 14th Rep. State Geol. New York for 1894, 1897, p. 329, pl. 2, figs. 1, 2.

Niagaran (Racine?): Near Cedarburg, Wisconsin; Hawthorne, Illinois.

**Monomorella newberryi** Hall and Whitfield.

*Monomorella newberryi* Hall and Whitfield, Pal. Ohio, 2, 1875, p. 131, pl. 7, figs. 1, 2.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 4C, figs. 1, 2.

Niagaran (Guelph): Genoa, Ohio.

**Monomorella noveboracum** Clarke and Ruedemann.

*Monomorella noveboracum* Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 39, pl. 2, figs. 1–6; pl. 3, figs. 1–7; pl. 4, fig. 38.

Niagaran (Guelph): Oak Orchard Creek, near Shelby, New York.

**Monomorella orbicularis** Billings.

*Monomorella orbicularis* Billings, Canadian Nat. Geol., n. s., 6, 1871, p. 221; Amer. Jour. Sci., 3d ser., 3, 1872, p. 359.—Davidson and King, Quart. Jour. Geol. Soc. London, 30, 1874, p. 158, pl. 17, fig. 10.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 56 (loc. occ.).

*Monomorella cf. orbicularis* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 4C, figs. 3-5.

Niagaran (Guelph): Hespelar, Ontario; near Grafton, Wisconsin.

**Monomorella ortonii** Hall and Clarke.

*Monomorella ortonii* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 42, 175, pl. 4C, figs. 14, 15; 48th Rep. New York State Mus., 2, for 1895, 1897, p. 330, pl. 2, figs. 4, 5; 14th Rep. State Geol. New York for 1884, 1897, p. 330, pl. 2, figs. 4, 5.

Niagaran (Guelph): Rising Sun, Wood County, Ohio.

**Monomorella ovata** Whiteaves.

*Monomorella ovata* Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, 1884, p. 5, pl. 2, fig. 1; pl. 8, fig. 1.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 42, pl. 4D, figs. 13-15.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 56 (loc. occ.).

Niagaran (Guelph): Durham, Ontario.

**Monomorella ovata lata** Whiteaves.

*Monomorella ovata* var. *lata* Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, 1884, p. 6, pl. 2, fig. 2; pl. 8, fig. 2.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 4, figs. 11, 12; pl. 4C, figs. 17, 18.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 56.

Niagaran (Guelph): Durham, Ontario; ?Hawthorne, Illinois.

**Monomorella prisca** Billings.

*Monomorella prisca* Billings, Canadian Nat. Geol., n. s., 6, 1871, p. 221; Amer. Jour. Sci., 3d ser., 3, 1872, p. 359.—Davidson and King, Quart. Jour. Geol. Soc. London, 30, 1874, p. 156, pl. 17, figs. 5-8.—Nicholson, Pal. Prov. Ontario, 1875, p. 68, fig. 38.—Zittel, Handb. Pal., 1, 1880, p. 668, fig. 492.—Miller, N. A. Geol. Pal., 1889, p. 354, fig. 585.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 4C, figs. 6-13.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 56 (loc. occ.).—Huene, Verh. d. Russ.-Kais. Mineral. Gesell. zu St. Petersburg., 2d ser., 38, 1900, p. 194, fig. 3.—Grabau and Shimer, N. A. Index Fossils, 1, p. 190, fig. 225b-c.

Niagaran (Guelph): Hespelar and Elora, Ontario; Rising Sun, Wood County, Ohio; Hawthorne, Port Byron, and Cicero, Illinois.

MONOPRION Barrande. See Monograptus Geinitz.

**MONOTRYPA** Nicholson.

Genotype: *Chatetes undulatus* Nicholson.

*Monotrypa* Nicholson, Pal. Tabulate Corals, 1879, p. 293.—Zittel, Handb. Pal., 1, 1880, p. 616.—Nicholson, Genus *Monticulipora*, 1881, pp. 102, 168.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 153.—Foord, Contr. Micro-Pal. Cambro-Sil., 1883, p. 14.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 472.—Waagen and Wentzel, Pal. Indica, 13th ser., 1886, pp. 875, 876.—Hall and Simpson, Pal. New York, 6, 1887, p. 13.—Miller, N. A. Geol. Pal., 1889, p. 196.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 379.—Rominger, Amer. Geol., 6, 1890, pp. 117, 119.—Ulrich, Geol. Minnesota, 3, 1893, p. 303; Zittel's Textb. Pal. (Eng. ed.), 1896, p. 104; *ibid.*, 1897, p. 275.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 581.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 136.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900,

**MONOTRYPA**—Continued.

p. 36.—Pocta, Syst. Sil. du Centre Boheme, 8, pt. 2, 1902, p. 319.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 137.—Hennig, Archiv. fur Zool., 4, 1908, p. 46.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 309, 310; Zittel-Eastman Textb. Pal., 1913, p. 339.

Ptychonema Hall and Simpson, Pal. New York, 6, 1887, pp. xiv, 14.—Miller, N. A. Geol. Pal., 1889, p. 201.—Simpson, 14th Rep. State Geol. New York for 1894, 1897, p. 583.

**Monotrypa benjamini** Bassler.

Monotrypa benjamini Bassler, Bull. U. S. Geol. Surv., 292, 1906, pp. 46, 47, pl. 16, figs. 6-9; pl. 26, fig. 11.

Clinton: Lockport, New York (Rochester); Osgood, Indiana (Osgood).  
*Cotypes*.—Cat. Nos. 35500, 44121, U.S.N.M.

**MONOTRYPA CORRUGATA** Weller. See *Cyphotrypa corrugata*.

**MONOTRYPA (CHLETETES) CUMULATA** Ulrich. See *Dianulites petropolitana*.

**MONOTRYPA? FILIASA** Ulrich. See *Amplexopora filiosa*.

**Monotrypa globosa** Weller.

Monotrypa globosa Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 142, pl. 8, figs. 4-6.

Trenton: Near Beaver Run, New Jersey.

**Monotrypa incerta** Ami.

Not recognizable.

Monotrypa incerta Ami, Canadian Rec. Sci., 5, 1892, p. 101.

Trenton: Quebec City, Quebec.

**Monotrypa intabulata** Ulrich.

Monotrypa intabulata Ulrich, Geol. Minnesota, 3, 1893, p. 305, fig. 20.

Trenton (Prosser): Goodhue and Fillmore counties, Minnesota.

*Holotype*.—Cat. No. 43553, U.S.N.M.

**MONOTRYPA IRREGULARIS** Ulrich. See *Stigmatella irregularis*.

**Monotrypa magna** Ulrich.

Monotrypa magna Ulrich, Geol. Minnesota, 3, 1893, pl. 304, p. 27, figs. 28, 29.—

Sardeson, Jour. Geol., 9, 1901, p. 5, pl. A, figs. 1, 2.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 338, fig. 495.

Black River (Platteville): Dixon, Illinois; Mineral Point and Beloit, Wisconsin.

*Holotype*.—Cat. No. 43555, U.S.N.M.

**Monotrypa? nodosa** Ulrich.

Monticulipora? Ortoni (not Nicholson) Whitfield, Geol. Surv. Wisconsin, 4, 1882, p. 251, pl. 11, figs. 7, 8.

Monotrypa nodosa Ulrich, Geol. Minnesota, 3, 1893, p. 306.

Richmond (Maquoketa): Iron Ridge and Delafield, Wisconsin; Savannah, Illinois.

*Cotypes*.—Cat. No. 43554, U.S.N.M.

**Monotrypa osgoodensis** Bassler.

?*Astrocerium constrictum* Hall, Pal. New York, 2, 1852, p. 123, pl. 34A, figs. 2a-c, 3a-e.

Monotrypa osgoodensis Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 46, pl. 16, figs. 1-5.

Clinton: Osgood, Indiana (Osgood); Lockport and Rochester, New York (Rochester).

*Cotypes*.—Cat. Nos. 35498, 44118, U.S.N.M.



MONOTRYPA PAVONIA Nicholson. See *Escharopora pavonia*.

**Monotrypa pediculata** Bassler.

*Monotrypa pediculata* Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 47, pl. 16, figs. 10-13.

Clinton: Rochester, New York (Rochester); Osgood, and near Waldron, Indiana (Osgood).

*Cotypes*.—Cat. No. 44119, U.S.N.M.

MONOTRYPA PETASIFORMIS Ulrich. See *Amplexopora petasiformis*.

MONOTRYPA QUADRATA Nicholson. See *Rhombotrypa quadrata*.

**Monotrypa rectimuralis** Ulrich.

*Monotrypa rectimuralis* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 462, fig. 3a (p. 308), fig. 4d (p. 309), pl. 38, figs. 1-1b.—J. F. James, Jour. Cincinnati Soc. Nat. Hist., 18, 1896, p. 124.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, figs. 151-153 (p. 581).

Upper Medinan (Girardeau): Alexander County, Illinois.

*Cotypes*.—Cat. No. 43779, U.S.N.M.

**Monotrypa?? spinosula** Hall and Simpson.

Species undetermined Hall, Rep. State Geol. New York for 1882, 1883, pl. 16, fig. 25.

*Monotrypa?* *spinosula* Hall and Simpson, Pal. New York, 6, 1887, p. 67, pl. 16, fig. 25.

Cayugan (Manlius): Schoharie, New York.

**Monotrypa subglobosa** (Ulrich).

*Chætetes subglobosa* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 129, pl. 12, figs. 11-11b.

*Monotrypa subglobosa* Ulrich, *ibid.*, 5, 1882, p. 256.

*Monotrypa turbinata* Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 316 (not *Chætetes turbinatum* James).

Eden (Economy): Cincinnati, Ohio, and vicinity.

*Cotypes*.—Cat. No. 43683, U.S.N.M.

MONOTRYPA TURBINATA Nickles and Bassler. See *Monotrypa subglobosa*.

**Monotrypa undulata** (Nicholson).

*Chætetes undulatus* Nicholson, Geol. Mag., n. s., 2, 1875, p. 176; Pal. Province Ontario, 1875, pp. 10, 33, pl. 4, fig. 1.

*Monticulipora* (*Monotrypa*) *undulata* Nicholson, Paleozoic Tabulate Corals, 1879, p. 321, pl. 14, figs. 3-3b, 4, 4a; Genus *Monticulipora*, 1881, p. 170, fig. 32 (not fig. 33=*M. undulata-hemispherica* (J. F. James)).

*Monotrypa undulata* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 256.

*Monticulipora undulata* James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 161; J. F. James, *ibid.*, 15, 1893, p. 157.

Trenton: Belleville and Peterboro, Ontario.

*Monotrypa undulata hemispherica* (J. F. James).

*Monticulipora* (*Monotrypa*) *undulata* (part) Nicholson, Genus *Monticulipora*, 1881, p. 170, fig. 33a-c.

*Monticulipora undulata* var. *hemispherica* James, Jour. Cincinnati Soc. Nat. Hist., 15, 1893, p. 157, fig. 10a-c.

*Monotrypa undulata hemispherica* Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 317.—Bassler, Proc. U. S. Nat. Mus., 30, p. 43.

Richmond?: Toronto and Weston, Ontario.

**Monotrypa undulata hemispherica**—Continued.

Observation.—Founded on Nicholson's figures of the "rounded or irregularly spheroidal form" of *M. undulata*. The varietal name is of no value until the originals of the figures or topotypes can be studied.

**MONOTRYPELLA** Ulrich.Genotype: *M. aequalis* Ulrich.

*Monotrypella* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 153.—Foord, Contr. Micro-Pal. Cambro-Sil., 1883, p. 15.—Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 171.—Hall and Simpson, Pal. New York, 6, 1887, p. xiii.—Miller, N. A. Geol. Pal., 1889, p. 196.—Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 377, 451; Zittel's Textb. Pal. (Eulg. ed.), 1896, p. 278.—Simpson, 14th Ann. Rep. State Geol. New York, for 1894, 1897, p. 531.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 30.—Pocta, Syst. Sil. du Centre Boheme, 8, pt. 1, 1902, p. 316.—Ulrich and Bassler, Smiths. Misc. Coll., Quart., 47, 1904, p. 43.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 131.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 749.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 336.

**Monotrypella aequalis** Ulrich.

*Monotrypella aequalis* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 247, pl. 11, figs. 3-3b; Geol. Surv. Illinois, 8, 1890, fig. 3b (p. 308), fig. 4a (p. 309).—J. F. James, Jour. Cincinnati Soc. Nat. Hist., 16, p. 201.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, figs. 154-156 (p. 582).—Ulrich and Bassler, Smiths. Misc. Coll., Quart., 47, 1904, p. 44.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 356, pl. 20, figs. 4-4c.

Eden (Economy): Covington, Kentucky.

*Holotype*.—Cat. No. 43684, U.S.N.M.

**Monotrypella? arbuscula** (Hall).

*Chetetes fruticosus* Hall, 32d Ann. Rep. New York State Mus., 1879, p. 148 (reprint, 1880, p. 10); Rep. State Geol. New York for 1882, 1883, pl. 9, figs. 1-8.

*Chetetes* (*Monotrypella*) *arbusculus* Hall and Simpson, Pal. New York, 6, 1887, p. 12, pl. 9, figs. 1-3 (?4, 5), 6-8.

*Monotrypella? arbusculus* Grabau, Bull. New York State Mus., 92, 1906, p. 117, fig. 26.

Helderbergian (Maclius transition beds): Scholarie, New York.

**MONOTRYPELLA BRIAREA** Ulrich. See *Eridotrypa briareus*.**MONOTRYPELLA CONFLUENS** Foerste. See *Homotrypa? confluens*.**Monotrypella? consimilis** (Hall).

*Chetetes? consimilis* Hall, 28th Ann. Rep. New York State Mus., doc. ed., 1876, pl. 9, figs. 7-14; 28th Ann. Rep. New York State Mus. (mus. ed.), 1879, p. 110, pl. 9, figs. 7-14; 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 230, pl. 8, figs. 7-14.

*Monotrypella consimilis* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 248. Niagaran (Waldron): Waldron, Indiana.

**MONOTRYPELLA CRASSIMURALIS** Ulrich. See *Rhombotrypa crassimuralis*.**MONOTRYPELLA MULTITABULATA** Ulrich. See *Hallopora multitabulata*.**MONOTRYPELLA QUADRATA** Ulrich. See *Rhombotrypa quadrata*.**MONOTRYPELLA SUBQUADRATA** Ulrich. See *Rhombotrypa subquadrata*.**MONOTRYPELLA TRENTONENSIS** Ulrich. See *Eridotrypa trentonensis*.

**MONTICULIPORA** D'Orbigny.Genotype: *M. mammulata* D'Orbigny.

*Monticulipora* D'Orbigny, Prodr. Pal., 1, 1850, p. 25.—Edwards and Haime, Mon. British Foss. Corals, Pal. Soc., 1854, p. 264, footnote.—Pictet, Traité de Pal., 2d ed., 4, 1857, p. 443.—Milne-Edwards, Hist. Nat. des Corall, 3, 1860, p. 272.—Eichwald, Leth. Rossica, 1, 1860, p. 492.—Salter, Cat. Camb. Sil. Foss., 1873, p. 108.—Dekoninck, Nouv. Rech. Anim. Foss. Terr. Carb. Belgique, 1872, p. 141.—Lindstrom, Ann. Mag. Nat. Hist., 4th ser., 18, 1876, p. 5.—Nicholson, Pal. Tabulate Corals, 1879, p. 269.—Zittel, Handb. Pal., 1, 1880, p. 614.—Nicholson, Genus *Monticulipora*, 1881, p. 99.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, pp. 153, 232.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 468.—Foord, Contr. Micro-Pal. Cambro-Sil., 1883, p. 7.—Frech, Zeits. d. d. geol. Gesell., 37, 1885, p. 951.—Waagen and Wentzel, Pal. Indica, 13th ser., 1886, p. 874.—James, Amer. Geol., 1, 1888, p. 386.—James and James, Jour. Cin. Soc. Nat. Hist., 10, 1888, p. 158.—Miller, N. A. Geol. Pal., 1889, p. 197.—Rominger, Amer. Geol., 6, 1890, pp. 102-121.—Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 370, 407; Amer. Geol., 10, 1892, p. 57; Ulrich, Geol. Minnesota, 3, 1893, p. 217.—James, Jour. Cincinnati Soc. Nat. Hist., 15, 1893, p. 155; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 103, 272.—Lindstrom, Kongl. Sven. Vet. Akad. Handl., 32, No. 1, 1899, p. 52.—Sardeson, Neues Jahrb. Min., Geol. Pal., Beilage-Band, 10, 1896, p. 347.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 577.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 28.—Poeta, Syst. Sil. du Centre Boheme, 8, pt. 2, 1902, p. 312.—Ulrich and Bassler, Smiths. Misc. Coll., Quart., 47, 1904, p. 15.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 127.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 750.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 179; Zittel-Eastman Textb. Pal., 1913, p. 331.

\* *Peronopora* (in part) Nicholson, Genus *Monticulipora*, 1881, p. 215.

Observation.—Many of the above citations, especially the earlier ones, refer to *Monticulipora* in a broader sense than employed at present.

**MONTICULIPORA ÆDILIS** Dybowski. See *Eridotrypa ædilis*.

**MONTICULIPORA ÆQUALIS** James. See *Monotrypella æqualis*.

**MONTICULIPORA AFFINIS** James. See *Heterotrypa affinis*.

**MONTICULIPORA (FISTULIPORA) ALTERNATA** James and James. See *Celoclema alternatum*.

**MONTICULIPORA ANDREWSII** James and James. See *Hallopora andrewsi*.

**MONTICULIPORA (CONSTELLARIA) ANTHELOIDEA** James and James. See *Stellipora antheloidea*.

**MONTICULIPORA APPROXIMATA** Hall. See *Hallopora dalei*.

***Monticulipora arborea*** Ulrich.

*Monticulipora arborea* Ulrich, Geol. Minnesota, 3, 1893, p. 220, pl. 20, figs. 1-9, 13, 14; Zittel's Textb. Pal. (Engl. ed.), 1896, fig. 449 (p. 272).—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 127, fig. 186a.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 331, fig. 474.

Trenton: Cannon Falls, Minnesota, and Decorah, Iowa (Prosser); Burgin and Frankfort, Kentucky (Wilmore).

*Cotypes*.—Cat. Nos. 43547, 43548, U.S.N.M.

**MONTICULIPORA AREOLATA** J. F. James. See *Aspidopora areolata*.

**Monticulipora? argentina** Kayser.

Monticulipora argentina Kayser. Beitr. Geol. Pal. Argentin. Republik, Pal. Suppl. 3, 1876, p. 13, pl. 5, figs. 8, 9.  
Ordovician: Talacastra, Argentina.

MONTICULIPORA ASPERA J. F. James. See Spatiopora aspera.

MONTICULIPORA ASPERULA James. See Petigopora asperula.

MONTICULIPORA (CHÆTETES) ATTRITUS Chamberlin. See Dekayia aspera.

MONTICULIPORA BILLINGSI FOORD. See Orbignyella billingsi.

MONTICULIPORA BRIAREA James and James. See Eridotrypa briareus.

MONTICULIPORA CALCEOLA Miller and Dyer. See Leptotrypa calceola.

MONTICULIPORA CALYCUA James and James. See Aspidopora calycula.

**Monticulipora? cannonensis** Ulrich.

Monticulipora? cannonensis Ulrich, Geol. Minnesota, 3, 1893, p. 221, pl. 20, figs. 10-12.  
Trenton (Prosser): Cannon Falls, Minnesota.  
*Holotype*.—Cat. No. 43549, U.S.N.M.

**Monticulipora cincinnatiensis** (James).

Chætetes cincinnatiensis James, Catal. Sil. Foss. Cincinnati Group, 1875, p. 2.  
Monticulipora (Peronopora) Cincinnatiensis Nicholson, Genus Monticulipora, 1881, p. 226, pl. 2, figs. 6-6c.  
Monticulipora cincinnatiensis Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 239.—James and James, *ibid.*, 10, 1888, p. 170.—J. F. James, *ibid.*, 16, 1894, p. 188.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 43.  
Maysville (Corryville): Cincinnati, Ohio, and vicinity.

MONTICULIPORA CIRCULARIS James. See Calloporrella circularis.

MONTICULIPORA CLAVACOIDEA James and James. See Leptotrypa clavacoidea.

**Monticulipora cleavelandi** James.

Monticulipora (Heterotrypa?) cleavelandi James, Paleontologist, No. 6, 1882, p. 49, pl. 1, fig. 7.  
Monticulipora cleavelandi James and James, Jour. Cincinnati Soc. Nat. Hist., 11, 1888, p. 15, pl. 1, fig. 4.—J. F. James, *ibid.*, 18, 1895, p. 68.—Ulrich and Bassler, Smiths. Misc. Coll., Quart., 47, 1904, p. 16, pl. 6, figs. 4-6.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 44.  
Richmond (Whitewater): Lynchburg and Wilmington, Ohio.  
*Plesiotype*.—Cat. No. 43170, U.S.N.M.

**Monticulipora?? clintonensis** James.

Monticulipora (Heterotrypa) clintonensis James, Paleontologist, No. 6, 1882, p. 45, pl. 1, fig. 9.  
Monticulipora clintonensis James and James, Jour. Cincinnati Soc. Nat. Hist., 11, 1888, p. 20, pl. 1, figs. 1, 1a.—J. F. James, *ibid.*, 18, 1895, p. 73.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 321.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 45.

Richmond: Clinton County, Ohio.

Observation.—The types of this species are lost, but it is almost certainly a synonym for Heterotrypa subramosa (Ulrich).

- MONTICULIPORA COMMUNIS James and James. See *Hallopora onealli communis*.
- MONTICULIPORA COMPRESSA James. See *Peronopora compressa*.
- MONTICULIPORA CONSIMILIS Ulrich. See *Monticulipora laevis consimilis*.
- MONTICULIPORA CONTEXTA James. See *Homotrypa contexta*.
- MONTICULIPORA CRASSIMURALIS James. See *Rhombotrypa crassimuralis*.
- MONTICULIPORA CRUSTULATA James and James. See *Chaetetes crustulatus*.
- MONTICULIPORA CUMULATA James. See *Nicholsonella cumulata*.
- MONTICULIPORA CURVATA James. See *Homotrypa curvata*.
- MONTICULIPORA DALEI MILNE-EDWARDS and Haime. See *Hallopora dalei*.
- Monticulipora Dalii White (not Milne-Edwards and Haime). Not recognized.  
*Monticulipora Dalii* White, Wheeler's Geogr. Geol. Explor. Sur., 4, 1875, p. 66,  
 pl. 4, fig. 5.  
 Trenton: Silver Canyon, Pahrangat Range, Nevada.
- MONTICULIPORA DALII Hall. See *Hallopora ramosa*.
- MONTICULIPORA DAWSONI James and James. See *Homotrypa dawsoni*.
- MONTICULIPORA DELICATULA James and James. See *Bythopora delicatula*.
- MONTICULIPORA DISCOIDEA James and James. See *Amplexopora? discoidea*.
- MONTICULIPORA DUBIA James. See *Diplotrypa dubia*.
- MONTICULIPORA DYCHEI James. See *Stigmatella dychei*.
- MONTICULIPORA ECCENTRICA James and James. See *Aspidopora eccentrica*.
- MONTICULIPORA ELEGANS James and James. See *Discotrypa elegans*.
- Monticullpora epidermata** Ulrich and Bassler.  
*Monticulipora epidermata* Ulrich and Bassler, Smiths. Misc. Coll., Quart., 47,  
 1904, p. 17.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908,  
 p. 857, pl. 20, figs. 5-5c; pl. 30, fig. 12.  
*Chaetetes mammulatus* Quenstedt (not *Monticulipora mammulata* D'Orbigny),  
 Roehren und Sternkorallen, 1881, p. 75, pl. 46, figs. 10, 11 (not 12).  
 Richmond (Whitewater): Richmond, Indiana; Oxford, Ohio.  
*Cotypes*.—Cat. No. 43172, U.S.N.M.
- MONTICULIPORA FALESI James. See *Prasopora falesi*.
- MONTICULIPORA FILIASA D'Orbigny. See *Amplexopora filiasa*.
- MONTICULIPORA FLABELLARIIS James. See *Homotrypa flabellaris*.
- MONTICULIPORA (PERONOPORA) FRONDOSA Nicholson. See *Peronopora decipiens*.
- MONTICULIPORA (CHAETETES) FUSIFORMIS Chamberlin. See *Lioclemella fusiformis*.
- MONTICULIPORA FUSIFORMIS James and James. See *Lioclemella subfusiformis*.
- MONTICULIPORA GELASINOSA J. F. James. See *Homotrypa gelasinosa*.
- MONTICULIPORA GRACILIS James and James. See *Bythopora gracilis*.

- MONTICULIPORA GRACILIS var. MEEKI Nicholson. See *Bythopora meeki*.
- MONTICULIPORA GRANDIS Ulrich. See *Prasopora grandis*.
- MONTICULIPORA (FISTULIPORA) GRANULIFERA J. F. James. See *Homotrypella granulifera*.
- MONTICULIPORA HOSPITALIS James and James. See *Homotrypella hospitalis*.
- MONTICULIPORA HOSPITALIS var. LAEVIS James and James. See *Monticulipora laevis*.
- Monticulipora hospitalis neglecta* James and James.  
*Monticulipora hospitalis* var. *neglecta* James and James, Jour. Cincinnati Soc. Nat. Hist., 11, 1888, p. 27, pl. 1, fig. 3.—J. F. James, *ibid.*, 18, 1896, p. 124.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 45.  
 Richmond: Waynesville, Ohio.  
 Observation.—Types lost and description and figure not sufficient for recognition.
- MONTICULIPORA IMPERFECTUM J. F. James. See *Hemiphragma imperfectum*.
- MONTICULIPORA IMPLICATUM J. F. James. See *Batostoma implicatum*.
- Monticulipora incompta** Ulrich.  
*Monticulipora incompta* Ulrich, Geol. Minnesota, 3, 1893, p. 219, pl. 15, figs. 9-12. Black River (Decorah); Minneapolis, Minnesota.
- MONTICULIPORA INFLECTA J. F. James. See *Heterotrypa inflecta*.
- Monticulipora? insularis** Seely.  
*Monticulipora insularis* Seely, Rep. Vermont State Geol., 1906, p. 185, pl. 43, 44. Chazyan: South Hero, Vermont.
- MONTICULIPORA IRREGULARIS James and James. See *Stigmatella irregularis*.
- MONTICULIPORA JAMESI Nicholson. See *Batostoma jamesi*.
- MONTICULIPORA KENTUCKIENSIS James. See *Hallopora multitalabulata*.
- Monticulipora laevis** Ulrich.  
*Monticulipora laevis* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 236, pl. 10, figs. 1-1b.—J. F. James, *ibid.*, 18, 1895, p. 85.  
*Monticulipora hospitalis* var. *laevis* James and James, Jour. Cincinnati Soc. Nat. Hist., 11, 1888, p. 27.  
 Richmond (Whitewater): Oxford, Ohio.  
*Cotypes*.—Cat. No. 43679, U.S.N.M.
- Monticulipora laevis consimilis** Ulrich.  
*Monticulipora consimilis* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 238, pl. 10, fig. 2.—J. F. James, *ibid.*, 16, 1894, p. 189.  
*Monticulipora laevis consimilis* Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 324.  
 Richmond (Whitewater): Oxford, Ohio.  
*Holotype*.—Cat. No. 43680, U.S.N.M.
- MONTICULIPORA LAMELLOSA Ulrich. See *Orbignyella lamellosa*.
- MONTICULIPORA LENS James and James. See *Callopora circularis*.
- MONTICULIPORA LYCOPERDON Roemer. See *Chaetetes lycoperdon*.
- MONTICULIPORA (DEKAYIA) MACULATA J. F. James. See *Dekayia maculata*.

MONTICULIPORA MAMMILLOSA Simpson. See *Monticulipora molesta*.

**Monticulipora mammulata** D'Orbigny.

*Monticulipora mammulata* D'Orbigny, Prodr. de Pal., 1, 1850, p. 25.—Milne-Edwards and Haime, British Foss. Corals, 1854, p. 265.—Milne-Edwards, Hist. Nat. des Corall., 3, 1860, p. 276.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 234, pl. 10, figs. 5, 5a; p. 130.—Hall, 12th Ann. Rep. Indiana Geol. Nat. Hist., 1883, p. 250, pl. 11, fig. 1.—Ulrich and Bassler, Smiths. Misc. Coll., 47, 1904, p. 16, pl. 6, figs. 1-3.—Nickles, Bull. Kentucky Geol. Surv., 5, 1905, p. 56, pl. 3, fig. 7.—Boule and Thevenin, Ann. Pal., 1, fasc. 1, 1906, p. 5, pl. 1, fig. 10, 11; pl. 2, fig. 1.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 127.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, p. 859, pl. 21, figs. 1-1c; pl. 31, figs. 1, 1a.

*Chaetetes mammulatus* Milne-Edwards and Haime, Pol. Foss. Terr. Pal., 1851, p. 267, pl. 19, figs. 1, 1a.

Maysville (Fairmount): Cincinnati, Ohio, and vicinity.

Fragment of *holotype* and *plesio*type.—Cat. Nos. 35114, 43682, U.S.N.M.

MONTICULIPORA MAMMULATA Nicholson. See *Monticulipora molesta*.

MONTICULIPORA MAMMULATA James and James. See *Heterotrypa frondosa*.

MONTICULIPORA MAMMULATA VAR. MOLESTA Ulrich. See *Monticulipora molesta*.

MONTICULIPORA MEEKI James and James. See *Bythopora meeki*.

MONTICULIPORA (FISTULIPORA) MILFORDENSIS James and James. See *Ceramoporella granulosa milfordensis*.

**Monticulipora molesta** Nicholson.

*Monticulipora* (*Peronopora*) *molesta* Nicholson, Genus *Monticulipora*, 1881, p. 224, pl. 6, figs. 2-2d.

*Monticulipora mammulata* var. *molesta* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 236.

*Monticulipora mammulata* Nicholson, Manual Pal., 1889, p. 355.

*Monticulipora molesta* J. F. James, Jour. Cincinnati Soc. Nat. Hist., 13, 1895, p. 68.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 325.—Hayes and Ulrich, U. S. Geol. Surv., folio 95, ill. sheet, 1903, fig. 13.

*Monticulipora mammilosa* (in error) Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 577, pl. 17, figs. 1-3.

Maysville: Cincinnati, Ohio, and vicinity (Bellevue); Maury County, etc., Tennessee (Leipers).

*Plesio*type.—Cat. No. 35405, U.S.N.M.

MONTICULIPORA MULTITUBERCULATA Whitfield. See *Rhombotrypa quadrata*.

MONTICULIPORA NEWBERRYI James and James. See *Aspidopora newberryi*.

MONTICULIPORA NEWPORTENSIS James and James. See *Atactoporella newportensis*.

MONTICULIPORA (FISTULIPORA) NICHOLSONI James and James. See *Ceramopora nicholsoni*.

MONTICULIPORA NODULOSA James and James. See *Hallopora nodulosa*.

MONTICULIPORA OHIOENSIS James. See *Dekayella ulrichi*.

MONTICULIPORA O'NEALLI James and James. See *Hallopora onealli*.

MONTICULIPORA (HETEROTRYPA) O'NEALLI Nicholson. See *Hallopora onealli sigillarioidea*.

- MONTICULIPORA (HETEROTRYPA) ONEALLI? var. COMMUNIS James. See *Hallopora onealli communis*.
- MONTICULIPORA ORTONI James and James. See *Atactoporella ortonii*.
- MONTICULIPORA? ORTONI Whitfield. See *Monotrypa nodosa*.
- MONTICULIPORA (PERONOPORA?) ORTONI Nicholson. See *Atactoporella ortonii*.
- MONTICULIPORA (FISTULIPORA) OWENI James and James. See *Cœloclema oweni*.
- Monticulipora papillata* Milne-Edwards. Not recognized.
- Monticulipora papillata* (not *Nebulipora papillata* McCoy) Milne-Edwards, Hist. Nat. des Corall., 3, 1860, p. 275.—James and James, Jour. Cincinnati Soc. Nat. Hist., 11, 1888, p. 23.—J. F. James, *ibid.*, 13, 1895, p. 81.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 45.
- Ordovician: Cincinnati, Ohio, etc.
- Monticulipora parasitica* Ulrich.**
- Monticulipora parasitica* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 238, pl. 10, figs. 3, 3a.—J. F. James, *ibid.*, 18, 1895, p. 81.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 862, pl. 21, figs. 2, 2b; pl. 31, fig. 2.
- Richmond (Whitewater): Oxford and Hanover, Ohio; Richmond, Indiana.
- Holotype*.—Cat. No. 43681, U.S.N.M.
- Monticulipora parasitica plana* Ulrich.**
- Monticulipora parasitica* var. *plana* Ulrich, Contr. Micro-Pal. Cambro-Sil., pt. 2, 1889, p. 29, pl. 8, figs. 3–3d.—Whiteaves, Pal. Foss., 3, 1895, p. 115.
- Richmond (Stony Mountain): Stony Mountain, Manitoba.
- Figured sections of *holotype*.—Cat. No. 43811, U.S.N.M.
- MONTICULIPORA (CONSTELLARIA) PARVA J. F. James. See *Constellaria parva*.
- MONTICULIPORA PAVONIA Milne-Edwards. See *Escharopora pavonia*.
- MONTICULIPORA (DEKAYIA) PELLICULATA James. See *Dekayia pelliculata*.
- MONTICULIPORA PETASIFORMIS James and James. See *Amplexopora petasiformis*.
- MONTICULIPORA PETASIFORMIS var. WELCHI James and James. See *Amplexopora petasiformis welchi*.
- MONTICULIPORA PETECHIALIS James and James. See *Petigopora petechialis*.
- MONTICULIPORA PETROPOLITANA of authors. See *Hindia sphaeroidalis* and *Chaetetes petropolitanus*.
- MONTICULIPORA (CONSTELLARIA) POLYSTOMELLA James and James. See *Constellaria florida* and *C. polystomella*.
- MONTICULIPORA PROLIFICA J. F. James. See *Heterotrypa subramosa prolifica*.
- MONTICULIPORA PUNCTATA Whitfield. See *Constellaria punctata*.
- MONTICULIPORA PUSTULOSA James. See *Amplexopora pustulosa*.
- MONTICULIPORA QUADRATA James and James. See *Rhombotrypa quadrata*.
- MONTICULIPORA QUADRATA var. SUBQUADRATA James. See *Rhombotrypa subquadrata*.
- MONTICULIPORA RAMOSA D'Orbigny. See *Hallopora ramosa*.



- MONTICULIPORA (HETEROTRYPA) RAMOSA var. DALEI Nicholson. See *Hallopora dalei*.
- MONTICULIPORA RAMOSA var. RUGOSA James and James. See *Hallopora rugosa*.
- MONTICULIPORA RECTANGULARIS Whitfield. See *Rhombotrypa quadrata*.
- MONTICULIPORA RUGOSA Milne-Edwards and Haime. See *Hallopora rugosa*.
- MONTICULIPORA (FISTULIPORA) RUSTICA J. F. James. See *Homotrypella rustica*.
- MONTICULIPORA (PRASOPORA) SELWYNII Nicholson. See *Prasopora selwyni*.
- MONTICULIPORA SELWYNII J. F. James. See *Prasopora simulatrix*.
- MONTICULIPORA (PRASOPORA) SELWYNII var. HOSPITALIS Nicholson. See *Homotrypella hospitalis*.
- MONTICULIPORA SEPTOSA James and James. See *Amplexopora septosa*.
- MONTICULIPORA SIMULATRIX J. F. James. See *Eridotrypa simulatrix*.
- MONTICULIPORA SINGULARIS Simpson. See *Dekayella singularis*.
- MONTICULIPORA STIDHAMI J. F. James. See *Cyphotrypa stidhami*.
- MONTICULIPORA SUBCYLINDRICA James. See *Amplexopora filiosa*.
- MONTICULIPORA (MONOTRYPA) SUBFUSIFORMIS James. See *Lioclemella subfusiformis*.
- MONTICULIPORA SUBPULCHELLA James and James. See *Heterotrypa subpulchella*.
- MONTICULIPORA (HETEROTRYPA) TRENTONENSIS Nicholson. See *Eridotrypa trentonensis*.
- MONTICULIPORA TUBERCULATA James and James. See *Spatiopora tuberculata*.
- MONTICULIPORA (MONOTRYPA) TUBERCULATA Nicholson. See *Spatiopora corticans*.
- MONTICULIPORA TURBINATA James and James. See *Chætetes turbinata*.
- MONTICULIPORA ULRICHI James and James. See *Dekayella ulrichi*.
- MONTICULIPORA (MONOTRYPA) UNDULATA Nicholson. See *Monotrypa undulata*.
- MONTICULIPORA UNDULATA var. HEMISPHERICA J. F. James. See *Monotrypa undulata hemispherica*.
- MONTICULIPORA UNIFORMIS J. F. James. See *Peronopora compressa*.
- MONTICULIPORA (CHÆTETES) VARIANS James. See *Batostoma varians*.
- MONTICULIPORA VAUPELI James and James. See *Nicholsonella vaupeli*.
- MONTICULIPORA (FISTULIPORA) VENUSTA James and James. See *Crepipora venusta*.
- MONTICULIPORA VERRUCOSA J. F. James. See *Calloporella? nodulosa*.
- MONTICULIPORA (MONOTRYPA) WELCHI James. See *Amplexopora petasiformis welchi*.
- Monticulipora westoni** Foord.  
*Monticulipora Westoni* Foord, Contributions Micro-Pal. Cambro-Sil., 1883, p. 7,  
 pl. 1, figs. 1-1b.  
 Trenton: Ottawa, Ontario.
- MONTICULIPORA WETHERBYI Ulrich. See *Orbignyella wetherbyi*.

- MONTICULIPORA WETHERBYI var. ASPERULA James and James. See *Petigopora asperula*.
- MONTICULIPORA (DIPLOTRYPA) WHITEAVESII of authors. See *Prasopora selwyni*, *P. simulatrix orientalis* and *Mesotrypa whiteavesii*.
- MONTICULIPORA WHITFIELDI James and James. See *Hemiphragma whitfieldi*.
- MONTICULIPORA WILMINGTONENSE J. F. James. See *Lioclema? wilmingtongense*.
- MONTICULIPORA (HETEROTRYPA) WINCHELLI James. See *Homotrypella hospitalis*.
- MONTICULIPORA (MONOTRYPA) WORTHENI James. See *Homotrypa wortheni*.
- MOOREA** Jones and Kirkby. Genotype: *M. obesa* Jones.  
*Moorea* Jones and Kirkby, *Quart. Jour. Geol. Soc. London*, 23, 1867, p. 494.—  
 Jones and Holl, *Ann. Mag. Nat. Hist.*, 4th ser., 3, 1869, p. 325.—Jones and  
 Kirkby, *Proc. Geol. Assoc. London*, 9, 1886, p. 508.—Jones, *Monthly Micros.*  
*Jour.*, 1870, p. 193.—Vogdes, *Ann. New York Acad. Sci.*, 5, 1889, p. 4.—  
 Grabau, *Bull. Buffalo Soc. Nat. Sci.*, 6, 1899, p. 309.—Miller, *N. A. Geol. Pal.*,  
 1st App., 1892, p. 709.—Ulrich, *Geol. Minnesota*, 3, pt. 2, 1894, p. 681.
- Moorea angularis** Ulrich.  
*Moorea angularis* Ulrich, *Geol. Minnesota*, 3, pt. 2, 1894, p. 682, pl. 43, fig. 89;  
 pl. 46, figs. 15, 16.  
 Black River (Decorah): Minneapolis and near Fountain, Minnesota.  
*Cotypes*.—Cat. Nos. 41685, 41800, U.S.N.M.
- Moorea? perplexa** Ulrich.  
*Moorea? perplexa* Ulrich, *Geol. Minnesota*, 3, pt. 2, 1894, p. 683, pl. 46, figs. 17, 18.  
 Black River (Decorah): Near Fountain, Minnesota.
- Moorea punctata** Ulrich.  
*Moorea punctata* Ulrich, *Geol. Minnesota*, 3, pt. 2, 1894, p. 682, pl. 43, figs. 84, 88.  
 Black River (Decorah): St. Paul, Minnesota.  
*Cotypes*.—Cat. No. 41684, U.S.N.M.
- MOURLONIA** Dekoninck. Genotype: *Helix carinatus* Sowerby.  
*Mourlonia* Dekoninck, *Ann. Mus. Royal Hist. Nat. Belg.*, 8, 1883, p. 75.—Koken,  
*Neues Jahrb. f. Min. Geol. Pal.*, 6, Beilage-Band, 1889, p. 328.—Burckhardt,  
*ibid.*, 1, 1897, p. 200, 201.
- Mourlonia racinensis** (Whitfield).  
*Pleurotomaria racinensis* Whitfield, *Ann. Rep. for 1877, Wisconsin Geol. Surv.*,  
 1878, p. 84; *Geol. Wisconsin*, 4, 1882, p. 296, pl. 18, figs. 7, 8.  
 Niagaran (Racine): Racine, Wisconsin.
- Mourlonia worthenana** (Miller).  
*Murchisonia worthenana* Miller, *Jour. Cincinnati Soc. Nat. Hist.*, 5, 1882, p. 225,  
 pl. 9, fig. 3.  
*Mourlonia worthenana* Ulrich and Scofield, *Geol. Minnesota*, 3, pt. 2, 1897, p.  
 955 (gen. ref.).  
 Niagaran (Racine): Bridgeport, Chicago, Illinois.
- MURCHISONIA of authors. See *Cælocaulus* Ehlert, *Ectomaria* Koken, *Fusispira* Hall,  
*Hormotoma* Salter, *Lophospira* Whitfield and *Omospira* Ulrich.

**MURCHISONIA** D'Archiac and Verneuil.Genotype: *M. bilineata* D'Archiac and Verneuil.*Murchisonia* D'Archiac and Verneuil, Bull. Geol. Soc. France, 12, 1841, p. 154.

Observation.—The numerous citations of American authors to this genus are omitted here because probably none of them refers to species congeneric with the type. *Murchisonia* like *Pleurotomaria* may not be represented in American Paleozoic strata, both genera being used as provisional places for species insufficiently described. See Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 959, for discussion of this subject.

*MURCHISONIA ABBREVIATA* Hall. See *Lophospira subabbreviata*.***Murchisonia aciculata*** Hall.

*Murchisonia aciculata* Hall, Canadian Nat. Geol., 5, 1860, p. 154.—Dawson, Acadian Geol., 2d ed., 1868, p. 605.

Silurian: Arisaig, Nova Scotia.

*MURCHISONIA ACREA* Billings. See *Turritoma acrea*.*MURCHISONIA ACUMINATA* Miller. See *Lophospira acuminata*.*MURCHISONIA ADA* Billings. See *Turritoma ada*.*MURCHISONIA ADELINA* Billings. See *Ectomaria adelina*.*MURCHISONIA AGILIS* Billings. See *Hormotoma?* *agilis*.*MURCHISONIA ALEXANDRA* Billings. See *Omospira alexandra*.*MURCHISONIA AMPLA* Miller. See *Lophospira ampla*.*MURCHISONIA ANGUSTATA* Hall. See *Hormotoma gracilis angustata*.*MURCHISONIA ANNA* Billings. See *Hormotoma anna*.*MURCHISONIA ARACHNE* Billings. See *Lophospira?* *arachne*.***Murchisonia arisaigensis*** Hall.

*Murchisonia Arisaigensis* Hall, Canadian Nat. Geol., 5, 1860, p. 154.—Dawson, Acadian Geol., 2d ed., 1868, p. 604.

Silurian: Arisaig, Nova Scotia.

*MURCHISONIA ARTEMESIA* Billings. See *Hormotoma artemesia*.*MURCHISONIA ASPER* Billings. See *Lophospira aspera*.*MURCHISONIA AUGUSTINA* Billings. See *Lophospira augustina*.*Murchisonia* (*Hormotoma*) *augustina ottawaensis* Ami.

*Murchisonia* (*Hormotoma*) *Augustina* var. *Ottawaensis* n. var. Ami, Geol. Surv. Canada, Ann. Rep., n. s., 12, App. G, 1901, p. 68 (nom. nud.).

Trenton: Ottawa, Ontario.

*MURCHISONIA BELLICINCTA* Hall. See *Hormotoma bellicincta* and *H. trentonensis*.*MURCHISONIA BELLICINCTA* Owen. See *Hormotoma major*.*MURCHISONIA BELLICINCTA* var. *TERETIFORMIS* Whiteaves. See *Hormotoma teretiformis*.*MURCHISONIA BICINCTA* Hall. See *Lophospira bicincta*.*MURCHISONIA BICINCTA* of authors. See *Lophospira obliqua* and *L. perforata*.

MURCHISONIA BICINCTA var. PERANGULATA Salter. See *Lophospira perangulata*.

**Murchisonia?? billingsana** Miller.

*Murchisonia hercyna* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 158, fig. 141 (adv. sheets, 1862).—Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 345; rev. ed., 1870, p. 397 (extras, 1865).—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 71, pl. 3, fig. 2; Quart. Jour. Geol. Soc. London, 31, 1875, p. 547, pl. 26, fig. 2.

*Pleurotomaria hercyna* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 76.

*Murchisonia billingsana* Miller, N. A. Geol. Pal., 1889, p. 411 (*M. hercyna*, Billings preoccupied).—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 335.

Niagaran (Guelph): Galt, etc., Ontario; Wisconsin.

MURCHISONIA BIVITTATA Hall. See *Cœlocaulus bivittatus*.

MURCHISONIA BOWDENI Safford. See *Lophospira bowdeni*.

MURCHISONIA BOYDI Hall. See *Loxonema boydi*.

MURCHISONIA BOYLEI Nicholson. See *Turritoma boylei*.

MURCHISONIA CALCIFERA Miller. See *Lophospira calcifera*.

MURCHISONIA CARINATA James. See *Pleurotomaria carinata*.

**Murchisonia?? carinifera** Shumard.

*Murchisonia carinifera* Shumard, Trans. Acad. Sci. St. Louis, 2, 1863, p. 106.—Keyes, Missouri Geol. Surv., 5, 1894, p. 145.

Canadian (Yellville): Ozark County, Missouri.

MURCHISONIA CASSANDRA Billings. See *Scelya cassandra*.

MURCHISONIA CASSINA Miller. See *Eotomaria? cassina*.

MURCHISONIA CASSINA Whitfield. See *Hormotoma? cassina*.

**Murchisonia?? catharina** Billings.

*Murchisonia Catharina* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 231, fig. 215.

Chazyan (Quebec—K): Table Head, Newfoundland.

MURCHISONIA CENTRALIS Miller. See *Lophospira centralis*.

MURCHISONIA CHAMBERLINI Whitfield. See *Lophospira? chamberlini*.

MURCHISONIA CICELIA Billings. See *Lophospira cicelia*.

MURCHISONIA? CONFUSA Whitfield. See *Hormotoma confusa*.

MURCHISONIA CONOIDEA of authors. See *Holopea conoidea* and *Lophospira conoidea*.

MURCHISONIA CONRADI Hall. See *Lophospira conradi*.

MURCHISONIA CONSTRICTA Whiteaves. See *Turritoma constricta*.

MURCHISONIA CENTRALIS Miller. See *Lophospira centralis*.

MURCHISONIA DECURTA Hall. See *Lophospira subabbreviata*.

MURCHISONIA ELEVATA Miller. See *Lophospira elevata*.

MURCHISONIA ESTELLA Billings. See *Cœlocaulus estella*.

- MURCHISONIA EXTENUATA Hall. See *Ectomaria extenuata*.
- MURCHISONIA FUNATA Billings. See *Hormotoma funata*.
- MURCHISONIA GIGANTEA Billings. See *Hormotoma gigantea*.
- MURCHISONIA GRACILENS Whitfield. See *Hormotoma gracilens*.
- MURCHISONIA GRACILIS Hall. See *Hormotoma gracilis*.
- MURCHISONIA (HORMOTOMA) GRACILIS Salter. See *Hormotoma salteri canadensis*.
- MURCHISONIA HAMMELLI Miller. See *Lophospira hammelli*.
- MURCHISONIA HELICTERES Salter. See *Lophospira helicteres*.
- MURCHISONIA HELICTERES (part) Whitfield. See *Lophospira serrulata*.
- MURCHISONIA HERCYNIA Billings. See *Murchisonia?? billingsana*.
- MURCHISONIA? HERMIONE Billings. See *Lophospira? hermione*.
- MURCHISONIA HESPELERENSIS Whiteaves. See *Lophospira hespelerensis*.
- MURCHISONIA HUMILIS Miller. See *Lophospira humilis*.
- MURCHISONIA HYALE Billings. See *Plethospira hyale*.
- MURCHISONIA INFREQUENS Billings. See *Hormotoma infrequens*.
- MURCHISONIA JESSICA Billings. See *Lophospira jessica*.
- MURCHISONIA LAPHAMI Hall. See *Turritoma laphami*.
- Murchisonia? latifasciata** Etheridge.  
*Murchisonia latifasciata* Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 600, pl. 27, fig. 1.  
 Niagaran: Ofley Island, Arctic America.
- MURCHISONIA LINEARIS Billings. See *Cœlocaulus linearis*.
- MURCHISONIA LIRATA Miller. See *Lophospira (?Seelya) lirata*.
- MURCHISONIA LOGANI Hall. See *Cœlocaulus macrospirus*.
- MURCHISONIA LONGISPIRA Hall. See *Cœlocaulus longispirus*.
- MURCHISONIA MACROSPIRA Hall. See *Cœlocaulus macrospirus*.
- MURCHISONIA MAJOR Hall. See *Hormotoma? major*.
- MURCHISONIA MAJOR Whitfield. See *Hormotoma trentonensis*.
- MURCHISONIA MEDIALIS Miller. See *Lophospira medialis*.
- MURCHISONIA MELANIAFORMIS Shumard. See *Hormotoma melaniaformis*.
- MURCHISONIA MILLERI of authors. See *Lophospira bicincta*.
- MURCHISONIA MINUTA Hall. See *Ectomaria minuta*.
- MURCHISONIA MISSISQUOI Billings. See *Ectomaria missisquoi*.
- MURCHISONIA MODESTA Billings. See *Lophospira modesta*.

**Murchisonia?? mohawkensis** Cleland.

Murchisonia mohawkensis Cleland, Bull. Amer. Pal., 3, 1900, p. 126 (254), pl. 15.  
fig. 13; *ibid.*, 4, 1903, p. 18.

Canadian (Tribes Hill): Near Fort Hunter, etc., New York.

MURCHISONIA MULTIGRUMA Miller. See *Lophospira tropidophora*.

MURCHISONIA MULTIVOLVIS Billings. See *Hormotoma multivolvus*.

MURCHISONIA MYLITTA Billings. See *Lophospira mylitta*.

MURCHISONIA (FUSISPIRA?) OBELISCA Whitfield. See *Hormotoma obelisca*.

MURCHISONIA OBTUSA Hall. See *Cœlocaulus obtusus*.

MURCHISONIA ŒHLERTI Miller. See *Cœlocaulus œhlerti*.

MURCHISONIA OWENI Miller. See *Lophospira oweni*.

**Murchisonia?? ozarkensis** Shumard.

Murchisonia ozarkensis Shumard, Trans. St. Louis Acad. Sci., 2, 1863, p. 106.

Canadian (Yellville): Ozark County, Missouri.

MURCHISONIA (EUNEMA?) PAGODA Whitfield. See *Ectomaria prisca*.

MURCHISONIA PAPILLOSA Billings. See *Lophospira? papillosa*.

MURCHISONIA PERACUTA Miller. See *Lophospira peracuta*.

MURCHISONIA PERANGULATA Hall. See *Lophospira perangulata*.

MURCHISONIA PERLAMELLOSA Miller. See *Lophospira perlamellosa*.

MURCHISONIA PETILA Hall. See *Cœlocaulus petilus*.

**Murchisonia?? placida** Billings.

Murchisonia placida Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 235.

Canadian (Quebec—G): Cape Norman, Newfoundland.

**Murchisonia?? prava** Whitfield.

Murchisonia? prava Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 316, pl.

24, fig. 22.—Seely, Vermont State Geol. Rep., 7, 1910, pl. 62, fig. 22.

Canadian (Beekmantown): Fort Cassin, Vermont.

MURCHISONIA PROCRIS Billings. See *Hormotoma procris*.

**Murchisonia?? putilla** Sardeson.

Murchisonia putilla Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 98,

pl. 5, figs. 5, 6; Jour. Geol., 11, 1903, p. 481, fig. 24.

Ozarkian (Oncota): Near Dresbach and at Stillwater, Minnesota; Blanchardsville, Wisconsin; near Rapidan, Minnesota (?Jordan).

MURCHISONIA QUADRISULCATA Miller. See *Lophospira quadrisulcata*.

MURCHISONIA RUGOSA Billings. See *Loxonema rugosum*.

MURCHISONIA SAFFORDI Miller. See *Lophospira saffordi*.

MURCHISONIA SERRULATA Salter. See *Lophospira serrulata*.

MURCHISONIA SIMULATRIX Billings. See *Hormotoma simulatrix*.

MURCHISONIA SOLUTA Whiteaves. See *Loxoplocus solutus*.

MURCHISONIA SORORCULA Billings. See *Lophospira sororcula*.

- MURCHISONIA SPIRONEMA Miller. See *Lophospira spironema*.
- MURCHISONIA SUBABBREVIATA D'Orbigny. See *Lophospira subabbreviata*.
- MURCHISONIA SUBFUSIFORMIS Hall. See *Fusispira subfusiformis*.
- MURCHISONIA SUBULATA Conrad. See *Hormotoma subulata*.
- MURCHISONIA SUMNERENSIS Safford. See *Lophospira sumnerensis*.
- Murchisonia?? sylvia** Billings.  
*Murchisonia Sylvia* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 190.  
 Ozarkian? (Levis—erratics): Point Levis, Quebec.
- MURCHISONIA? TEREBRALIS Hall. See *Cœlocaulus terebralis*.
- MURCHISONIA TERETIFORMIS Billings. See *Hormotoma teretiformis*.
- MURCHISONIA TEXTILIS Miller. See *Schizolopha textilis*.
- MURCHISONIA TRICARINATA Hall. See *Lophospira tricarinata* and *L. serrulata*.
- MURCHISONIA TROPIDOPHORA Whiteaves. See *Loxoplocus solutus*.
- Murchisonia?? turricula** Billings.  
*Murchisonia turricula* Billings, Geol. Surv. Canada, Rep. Progr. for 1853-56, 1857,  
 p. 301; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 55 (loc. ref.).  
 Anticostian (Jupiter River): The Jumpers, Anticosti.
- MURCHISONIA TURRITIFORMIS Hall. See *Cœlocaulus turritiformis*.
- MURCHISONIA UNIANGULATA Hall. See *Lophospira uniangulata*.
- MURCHISONIA UNIANGULATA var. ABBREVIATA Hall. See *Lophospira abbreviata*.
- MURCHISONIA VARIANS Billings. See *Lophospira varians*.
- Murchisonia?? varicosa** Hall.  
*Murchisonia? varicosa* Hall, Pal. New York, 1, 1847, p. 42, pl. 10, figs. 7a, b.  
*Pleurotomaria varicosa* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 161.  
 Black River (Lowville): Watertown, New York.
- MURCHISONIA VENTRICOSA Hall. See *Lophospira ventricosa*.
- MURCHISONIA VENTRICOSA Salter. See *Omospira alexandra*.
- MURCHISONIA VENTRICOSA Whitfield. See *Lophospira conradana*.
- MURCHISONIA VESTA BILLINGS. See *Hormotoma vesta*.
- MURCHISONIA VITELLIA Billings. See *Cœlocaulus vitellia*.
- MURCHISONIA VITTATA Hall. See *Fusispira vittata*.
- MURCHISONIA WINNIPEGENSIS Miller. See *Hormotoma winnipegensis*.
- MURCHISONIA WORTHENANA Miller. See *Mourlonia worthenana*.
- MURCHISONIA XANTHIPPE Billings. See *Lophospira xanthippe*.
- MYALINA MYTILIFORMIS Hall. See *Mytilarca mytiliformis*.

**MYELODACTYLUS** Hall.Genotype: *M. convolutus* Hall.

*Myelodactylus* Hall, Pal. New York, 2, 1852, p. 191.—Angelin, Icon. Crinoid. Suec., 1878, p. 11.—Zittel, Handb. Pal., 1, 1879, p. 354.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 369 (Rev. Pal., pt. 1, p. 146).—Miller, Jour. Cincinnati Soc. Nat. Hist., 3, 1880, p. 142.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1880, p. 330.—Miller, N. A. Geol. Pal., 1889, p. 262; 2d App., 1897, p. 749.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 45, 68.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 153.

*Herpetocrinus* Salter, Cat. Camb. and Sil. Foss., 1873, p. 118.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1880, p. 331.—Bather, Kongl. Sv. Vet. Akad. Handl., 25, No. 2, 1893, pp. 21, 36, pls. 1, 2, figs. 24–78; fig. 12; Amer. Geol., 16, 1895, p. 214; Nat. Sci., 12, 1898, p. 339; Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 146, fig. 49.—Zittel, Grundzuge Pal., 1, 1910, p. 151.—Springer, Zittel-Eastman Textb. Pal., 1, 1913, p. 212. (Genotype: *H. fletcheri* Salter).

***Myelodactylus brachiatus*** Hall.

*Myelodactylus brachiatus* Hall, Pal. New York, 2, 1852, p. 232, pl. 45, figs. 7a–e. Clinton (Rochester): Lockport, New York.

***Myelodactylus bridgeportensis*** Miller.

*Myelodactylus bridgeportensis* Miller, Jour. Cincinnati Soc. Nat. Hist., 3, 1880, p. 141, pl. 4, figs. 2, 2a–c; N. A. Geol. Pal., 1889, p. 262, fig. 368.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 69, pl. 15, figs. 1–2. Niaganan (Racine): Bridgeport, Illinois.

***Myelodactylus convolutus*** Hall.

*Myelodactylus convolutus* Hall, Pal. New York, 2, 1852, p. 193, pl. 42, figs. 5a, b; 6a–h.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1880, p. 331. Clinton (Rochester): Lockport, New York.

***Myelodactylus gorbyi*** Miller.

*Myelodactylus gorbyi* Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 682, pl. 11, figs. 6, 7 (adv. sheets, 1891, p. 72); N. A. Geol. Pal., 2d. App., 1897, p. 749, fig. 1365. Niaganan (Waldron): Near Nashville (Newsom), Tennessee.

**MYRIANITES** MacLeay.Genotype: *M. macleai* Murchison.

*Myrianites* MacLeay, Murchison's Sil. Syst., p. 700; Ann. Nat. Hist., 4 1840, p. 387.—Richter, Zeits. d. d. geol. Gesell., 1, 1849, p. 457; *ibid.*, 5, 1853, 450.—McCoy, British Pal. Rocks and Foss., 1854, p. 129.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1880, p. 305.—Miller, N. A. Geol. Pal., 1889, p. 519.

***Myrianites murchisoni*** Emmons.

*Myrianites murchisoni* Emmons, Nat. Hist. New York Agric., 1, 1846, p. 69, pl. 16, fig. 1. Ordovician(?): Waterville, Maine.

***Myrianites sillimani*** Emmons.

*Myrianites sillimani* Emmons, Nat. Hist. New York Agric., 1, 1846, p. 69, pl. 16, fig. 5. Ordovician(?): Waterville, Maine.



**MYTILARCA** Hall.Genotype: *Inoceramus chemungensis* Conrad.

*Mytilarca* Hall, Prelim. Notice Lam., pt. 2, dec. 1869, p. 19; 23d Rep. New York State Cab. Nat. Hist., 1873, pl. 14, figs. 11-13.—Zittel, Handb. Pal., 2, 1881, p. 43.—Hall, Rep. State Geol. New York, 1884, p. 15; Pal. New York, 5, pt. 1, Lam. 1, 1884, p. 14; 35th Rep. New York State Mus. Nat. Hist., 1884, p. 406d.—Miller, N. A. Geol. Pal., 1889, p. 493.

***Mytilarca acutirostra*** (Hall).

*Ambonychia acutirostra* Hall, 20th Rep. New York State Cab. Hist., 1868, (extras, 1865), pp. 336, 381, pl. 14 (5), fig. 2; p. 384; rev. ed., 1870, p. 383, pl. 14, fig. 2.—Meek and Worthen, Geol. Surv. Illinois, 3, p. 356, pl. 5, figs. 8a, b, 9c.—Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875, pl. 7, fig. 12; mus. ed., 1879, p. 171, pl. 7, fig. 12; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 314, pl. 27, figs. 28, 29.

*Mytilarca acutirostrum* Clarke and Ruedemann. Mem. New York State Mus., 5, 1903, p. 48, pl. 5, figs. 11, 12.

Niagaran: Wauwatosa, Wisconsin; Bridgeport, Illinois (Racine); Shelby, New York (Guelph); Waldron, Indiana (Waldron).

**MYTILARCA EDULIFORMIS** Clarke and Ruedemann. See *Streptomytilus eduliformis*.

***Mytilarca foerstei*** Clarke and Ruedemann.

*Mytilarca mytiliformis* Foerste (not Hall), Geol. Surv. Ohio Pal., 7, 1893, p. 559, pl. 37, figs. 11a-c.

*Mytilarca foerstei* Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 49.

Upper Medinan (Brassfield): Todds Fork, near Wilmington, Ohio.

***Mytilarca mytiliformis*** (Hall).

*Myalina mytiliformis* Hall, Pal. New York, 2, 1852, p. 100, pl. 30, figs. 1a, b, c, d.

*Mytilarca mytiliformis* Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 49 (gen. ref.).

Upper Clinton: Mohawk, New York.

**MYTILARCA MYTILIFORMIS** Foerste. See *Mytilarca foerstei*.

***Mytilarca nitida*** (Billings).

*Ambonychia nitida* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 50, pp. 17a-b.

(*Cleionychia?* *nitida* Ulrich, Amer. Geol., 10, 1892, p. 97 (gen. ref.).)

Anticostian (Jupiter River): Near Jupiter River, Anticosti.

***Mytilarca obliqua*** Weller.

*Mytilarca obliqua* Weller, Geol. Surv. New Jersey Pal., 3, 1903, p. 245, pl. 22, fig. 8.

Helderbergian (Decker Ferry): Two miles south of Tristates, New York.

**MYTILARCA PERNOIDES** Whiteaves. See *Streptomytilus pernoides*.

***Mytilarca sigilla*** Hall.

*Mytilarca sigilla* Hall, 28th Rep. New York State Mus. Nat. Hist., 1875, doc. ed., (1877), pl. 27, fig. 10; mus. ed., 1879, p. 174, pl. 27, fig. 10; 11th Ann. Rep.

Indiana Dep. Geol. Nat. Hist., 1882, p. 316, pl. 28, fig. 10.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 473, fig.

Niagaran (Waldron): Waldron, Indiana.

**NANNO** Clarke.Genotype: *N. aulema* Clarke.

*Nanno* Clarke, Amer. Geol., 14, 1894, pp. 205-208.—Bather, Nat. Sci., 5, 1894, p. 429.—Clarke, Amer. Geol., 15, 1895, p. 128.—Holm, Geol. Foren. Stockholm Forhandl., 18, 1896, p. 402; Sveriges Geol. Unders., Ser. C, No. 163, 1896, p. 11.—Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 769.—Hyatt, Zittel-Eastman Textb. Pal., 1, 1900, p. 515.—Ruedemann, Bull. New York State Mus., 80, 1904, p. 322; *ibid.*, 90, 1906, p. 427.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 44.—Hyatt, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 596.

**Nanno aulema** Clarke.

*Nanno aulema* Clarke, Amer. Geol., 15, 1894, p. 207, pl. 6, figs. 1-8.—Bather, Nat. Sci., 5, 1894, p. 430, fig. 3.—Hyatt, Amer. Geol., 16, 1895, pp. 1-11, pl. 1, figs. 1-4.—Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 770, pl. 47, figs. 4-11.—Ruedemann, Amer. Geol., 31, 1903, p. 213.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 45, fig. 1242.

*Endoceras aulema* Miller, N. A. Geol. Pal., 2d App., 1897, p. 773 (gen. ref.).

Black River (Decorah): Minneapolis and Chatfield, Minnesota.

*Cotypes*.—Cat. No. 48198, U.S.N.M.

**Nanno kingstonensis** Whiteaves.

*Nanno kingstonensis* Whiteaves, Amer. Geol., 35, 1905, p. 27, pl. 3.

Stones River (Pamelia): Near Kingston, Ontario.

**Nanno noveboracum** Ruedemann.

*Nanno noveboracum* Ruedemann, Bull. New York State Mus., 90, 1906, p. 427, pl. 9, figs. 6, 7.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 45.

Chazy (Valcour): Near Chazy, New York.

**Nanno primævus** Whiteaves.

*Nanno primævus* Whiteaves, Amer. Geol., 35, 1905, p. 26, pl. 2, figs. 3, 3a.

Canadian (Beekmantown): Marlborough, Ontario.

**NARTHECOCERAS** Hyatt. Genotype: *Endoceras crassisiphonatum* Whiteaves.

*Narthecoceras* Hyatt, Amer. Geol., 16, 1895, p. 2, footnote; Zittel-Eastman Textb.

Pal., 1, 1900, p. 515; *ibid.*, 2d ed., 1913, p. 596.

**Narthecoceras crassisiphonatum** (Whiteaves).

*Endoceras crassisiphonatum* Whiteaves, Trans. Royal Soc. Canada, 9, sec. 4, 1892, p. 79, pl. 6, figs. 1-4; pl. 7, fig. 1.—Ruedemann, Bull. New York State Mus., 80, 1905, p. 300, fig. 1.

*Endoceras* (*Narthecoceras*) *crassisiphonatum* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 204.

*Narthecoceras crassisiphonatum* Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 344 (gen. ref.).

*Narthecoceras* (*Endoceras*) *crassisiphonatum* Hyatt, Amer. Geol., 14, 1895, p. 3.

Black River or Richmond: Lower Fort Garry and East Selkirk, Manitoba.

**Narthecoceras simpsoni** (Billings).

*Orthoceras simpsoni* Billings in Hind, Narrative Canadian Red River Expl. Expd. of 1857 and Assiniboine and Saskatchewan Exped. of 1858, 2, 1860, p. 287, fig.—Whiteaves, Trans. Royal Soc. Canada, 9, sec. 4, 1892, p. 80, pl. 7, figs. 2, 3a, 3; pl. 8, fig. 1.

*Narthecoceras* (*Endoceras*) *simpsoni* Hyatt, Amer. Geol., 16, 1895, p. 3 (gen. ref.).

*Endoceras* (*Narthecoceras*) *simpsoni* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 205.

*Narthecoceras Simpsoni* Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 344 (gen. ref.).

Black River or Richmond: Cat Head, etc., Lake Winnipeg, Manitoba.

**NAUTILUS Breynius.**Genotype: *N. pompilius* Linnæus.

*Nautilus Breynius*, Dissert. Polyth., 1732, p. 11.—Linnæus, Syst. Nat., ed. 10, 1758, p. 709.—Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1883, p. 301; Proc. Amer. Phil. Soc., 32, 1894, p. 559.—Foord, Cat. Foss. Ceph. British Mus., 2, 1891, p. 179.—Zittel, Handb. Pal., 2, 1881, p. 382.—Hyatt, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 607.

***Nautilus?? avus* Barrande.**

*Nautilus avus* Barrande, Syst. Sil. du Boheme, 4, 1870, pl. 435, fig. 5.  
Lower Ordovician: Newfoundland.

**NAUTILUS CALCIFERUS Billings.** See *Tarphyceras calciferum*.***Nautilus?? cancellatus* McChesney.**

*Cyrtoceras giganteum* McChesney, Desc. New Species Fossils, 1860, p. 67.  
*Lituites cancellatum* McChesney, Desc. New Fossils, 1861, p. 96 (name proposed for *Cyrtoceras giganteum* preoccupied); Plates Illust. New Species Fossils, 1865, pl. 7, fig. 8; Trans. Chicago Acad. Sci., 1, 1868, p. 51, pl. 7, fig. 8.  
*Lituites occidentalis* Hall, Rep. Progr. Geol. Surv. Wisconsin, 1861.  
*Nautilus occidentalis* Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 363; rev. ed., 1870, p. 400.  
Niagaran (Racine): Joliet, Illinois.

***Nautilus?? capax* (Hall).**

*Lituites capax* Hall, Rep. Progress Geol. Surv. Wisconsin, 1860, p. 3.  
*Nautilus capax* Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 363; rev. ed., 1870, p. 400.  
Niagaran (Racine): Waukesha and Racine, Wisconsin.

**NAUTILUS? CHAMPLAINENSIS Whitfield.** See *Tarphyceras champlainense*.***Nautilus?? desertus* Billings.**

*Nautilus desertus* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 258.  
Chazyan (Quebec—L): Point Rich, Newfoundland.

***Nautilus?? ferox* Billings.**

*Nautilus ferox* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 351.  
Canadian (Romaine): Mingan Islands, Canada.

**NAUTILUS HERCULES Billings.** See *Litoceras hercules*.**NAUTILUS INSOLENS Billings.** See *Litoceras insolens*.**NAUTILUS JASON Billings.** See *Plectoceras jason*.**NAUTILUS KELLOGGI Whitfield.** See *Eurystomites kelloggi* and *E. rotundus*.**NAUTILUS NATATOR Billings.** See *Barrandoceras natator*.**NAUTILUS OCCIDENTALIS Hall.** See *Nautilus?? cancellatum*.***Nautilus?? oceanus* Hall.**

*Nautilus Oceanus* Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 325; Trans. Albany Inst., 10, 1883, p. 75.  
Niagaran (Waldron): Waldron, Indiana.

**NAUTILUS PERKINSI Whitfield.** See *Tarphyceras perkinsi*.***Nautilus?? pomponius* Billings.**

*Nautilus Pomponius* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 26 (adv. sheets, 1862).  
Canadian (Beekmantown): Phillipsburg, Quebec.

*NAUTILUS TYRANS* Billings. See *Plectoceras tyrans*.

*NAUTILUS VERSUTUS* Billings. See *Litoceras versutum*.

*Nebulipora* McCoy.

Genotype: *N. papillata* McCoy.

*Nebulipora* McCoy, Ann. Mag. Nat. Hist., 2d ser., 6, 1850, p. 282; British Pal. Foss., 1852, p. 22; Cont. British Pal., 1854, p. 168.—Salter, Cat. Camb. Sil. Foss., 1873, p. 108.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5 1882, p. 155.—Miller, N. A. Geol. Pal., 1889, p. 198.

Observation.—Nothing has been added to McCoy's original descriptions. The genus, apparently monticuliporoid in its structure, not having been characterized with the precision necessary for modern purposes, has not been used by recent writers.

*Nelimenia* Castelneau.

Genotype: *N. incognita* Castelneau.

*Nelimenia* Castelneau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 33.

Observation.—Not recognized. Based probably upon a fragment of *Phragmoceras* or *Oncoceras*.

*Nelimenia incognita* Castelneau.

Not recognized.

*Nelimenia incognita* Castelneau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 33, pl. 10, fig. 4.

Ordovician: Falls of Montmorency River, Canada.

Observation.—Probably the same as *Oncoceras constrictum* Hall.

*NEMAGRAPSUS CAPILLARIS* Emmons. See *Thamnograptus capillaris*.

*NEMAGRAPSUS ELEGANS* Emmons. See *Nemagraptus gracilis*.

**NEMAGRAPTUS** Emmons.

Genotype: *N. elegans* Emmons.

*Nemagraptus* Emmons, Amer. Geology, 1, pt 2, 1855, p. 109.

*Nemagraptus* Hall, Pal. New York, 3, 1859, p. 511, footnote; 13th Rep. New York State Cab. Nat. Hist., 1860, p. 56, footnote.—Zittel, Handb. Pal., 1, 1879, p. 298.—Miller, N. A. Geol. Pal., 1889, p. 198.—Wiman, Bull. Geol. Inst. Univ. Upsala, 2, pt. 2, 1896, p. 266.—Elles and Wood, Mon. British Grapt., Pal. Soc., 1903, pp. xxxviii, 125.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 274; Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 130.

*Cœnograptus* Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, footnote, p. 179, pp. 217, 236; rev. ed., 1870, p. 251.—Nicholson, Mon. British Grapt., 1872, p. 112.—Zittel, Handb. Pal., 1, 1879, p. 298.—Tullberg, Sveriges Geol. Unders., sec. C, No. 55, 1883, p. 12.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 668.—Wiman, Bull. Geol. Inst. Univ. Upsala, 2, pt. 2, 1896, p. 266.—Koken, Die Leitfossilien, Leipzig, 1896, p. 328.—Walther, Zeits. d. d. geol. Gesell., 49, 1897, p. 251.—Roemer and Frech, Leth. geog., 1 Theil, Leth. Pal., 1, 3 Lief., 1897, p. 584.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 28. (Genotype: *Graptolithus gracilis* Hall.)

*Helicograptus* Nicholson, Ann. Mag. Nat. Hist., 4th ser., 2, 1868, p. 23. (Genotype: *G. gracilis* Hall.)

*Stephanograptus* Geinitz, Neues Jahrb. Min., etc., 1866, p. 124. (Genotype: *G. gracilis* Hall.)

**Nemagraptus exilis** (Lapworth).

*Cœnograptus exilis* Lapworth, MS. Rep., 1890.

*Stephanograptus exilis* (Lapworth) Gurley, Jour. Geol., 4, 1896, p. 68, 101.

*Nemagraptus exilis* Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 287–290, pl. 17, figs. 3, 5, 8, 9, figs. 202, 203.

Chazyan (Normanskill): Glenmont and Stockport, New York.

*Plesiotypes*.—Cat. No. 54250, U.S.N.M.

**Nemagraptus exilis linearis** Ruedemann.

*Nemagraptus exilis* var. *linearis* Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 290, 291, pl. 17, figs. 10-12, figs. 204, 205.

Chazyau (Normanskill): Speigletown, Stockport, Kenwood, etc., New York.

**Nemagraptus gracilis** (Hall).

*Graptolithus gracilis* Hall, Pal. New York, 1, 1847, p. 274, pl. 74, figs. 6a-d; 12th Ann. Rep. New York State Cab. Nat. Hist., 1859, p. 58, fig. 10; Pal. New York, 3, 1859, p. 510, figs. 1-5; pl. 512, fig. 6; p. 513, fig. 7; 13th Ann. Rep. New York State Cab. Nat. Hist., 1860, p. 56, figs. 6, 7; Geol. Surv. Canada, dec. 2, 1865, pp. 13, 14, figs. 16-18.—Bailey, Mem. Geol. Surv. Ireland, sheet 133, 1866, p. 12, fig. 3; Dublin Quart. Jour. Sci., 2, 1862, p. 316, pl. 22; figs. 5a-c.—Walcott, Trans. Albany Inst., 10, 1883 (adv. sheets, 1879), p. 35.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 265, figs.

*Stephanograptus gracilis* Geinitz, Neues Jahrb. Min., etc., 1866, p. 124.—Walcott, Bull. Geol. Soc. Amer., 1, 1890, p. 338.

*Helicograptus* (*Graptolithus*) *gracilis* Nicholson, Ann. Mag. Nat. Hist., 4th ser., 1, 1868, p. 56, pl. 3, fig. 15.

*Helicograptus gracilis* Dodge, Amer. Jour. Sci., 3d ser., 40, 1890, p. 153.

*Cladograptus gracilis* Carruthers, Geol. Mag., 5, 1868, p. 130.

*Cœnograptus gracilis* Hall, New York State Cab. Nat. Hist., 20th Ann. Rep., 1868, pp. 179, 180, figs. 13-19; p. 226; rev. ed., p. 211, figs. 17-19.—Lapworth, Cat. West. Scott. Foss., 1876, p. 5, pl. 3, fig. 65; Belfast Nat. Field Club, Rep. and Proc., App., 1877, p. 142, pl. 7, fig. 11.—Zittel, Handb. Pal., 1, Munich, 1879, p. 293, fig. 198; p. 298, fig. 203.—Tullberg, Sver. Geol. Unders., ser. C, No. 50, 1882, p. 20.—Herrmann, Nyt. Mag. f. Naturvidensk., 27, 1885, p. 359, pl. 2, fig. 21.—Lapworth, Roy. Soc. Canada, Proc. and Trans., 4, 1887, p. 178f, p. 169.—Gurley, Geol. Surv. Ark. Ann. Rep., 3, 1892, p. 408.—Roemer and Frech, Leth. Geog., 1 Theil, Leth. Pal., 1, 1897, p. 584, fig. 155.—Hall, Geol. Mag., n. s., dec. 4, 6, 1899, p. 445.—Ruedemann, Bull. New York State Mus., 42, 1901, p. 528; *ibid.*, 52, 1902, p. 583, fig. 13.—Clark, Geol. Mag., 4th ser. 9, 1902, p. 498.—Weller, Geol. Surv. New Jersey, Pal., 3, 1902, p. 53; *ibid.*, 1903, p. 214, pl. 16, fig. 19.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 28, fig. 40.

*Cœnograptus* (*Helicograptus*) *gracilis* Nicholson, Monog. British Grapt., 1872, p. 45, fig. 14; p. 113, fig. 55; p. 66, fig. 35.

*Monograptus gracilis* Whitfield, Amer. Jour. Sci., 3d ser., 26, 1883, p. 380.

*Nemagraptus gracilis* Elles and Wood, Monogr. British Grapt., pt. 3, 1903, p. 127, pl. 19, figs. 1a-f; fig. 76a, b.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 277-282, pl. 16, figs. 1-4, 9; figs. 191, p. 276; 192-195, p. 279.

*Rastrites barrandi* Harkness, Geol. Soc. Quart. Jour., 11, 1855, p. 475.

*Nemagraptus elegans* Emmons, Amer. Geology, 1, pt. 2, 1856, p. 109, pl. 1, fig. 6.

Chazyau (Normanskill): Kenwood, Glenmont, Stockport, etc., New York; New Jersey; Maine; Canada; Tennessee; Arkansas.

Ordovician: Wales, Sweden, Scotland (Glenkill); Australia.

**Nemagraptus gracilis approximatus** Ruedemann.

*Nemagraptus gracilis* var. *approximatus* Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 287, pl. 16, figs. 5, 6.

Chazyau (Normanskill): Kenwood and Glenmont, New York.

**Nemagraptus gracilis crassicaulis** (Gurley).

*Stephanograptus crassicaulis* Gurley, Jour. Geol., 4, 1896, p. 68.

*Nemagraptus gracilis* var. *crassicaulis* Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 285, 286, fig. 199.

Chazyau (Normanskill): Stockport, New York.

**Nemagraptus gracilis distans** Ruedemann.

*Nemagraptus gracilis* var. *distans* Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 286, pl. 16, figs. 7, 8; figs. 200, 201.

Chazyan (Normanskill): Glenmont, New York.

**Nemagraptus gracilis surcularis** (Hall).

*Graptolithus gracilis* (part) Hall, 13th Ann. Rep. New York State Cab. Nat. Hist., 1860, p. 56, figs. 1-4; Can. Org. Rem., Geol. Surv. Canada, dec. 2, 1865, p. 13, figs. 12-15.

*Cœnograptus surcularis* Hall, 20th Ann. Rep. New York State Cab. Nat. Hist., 1868, p. 179, figs. 13-16; *ibid.*, rev. ed., 1870, p. 211, figs. 13-16.—Lapworth, Cat. West. Scott. Foss., 1876, pl. 3, fig. 64; Rep. and Proc. Belfast Nat. Field Club, 1877, p. 143, pl. 7, fig. 12.

*Stephanograptus surcularis* Walcott, Bull. Geol. Soc. Amer., 10, 1890, p. 338.

*Nemagraptus gracilis* var. *surcularis* Elles and Wood, Monogr. British Grapt., pt. 3, 1903, p. 129, pl. 19, figs. 2a-d; fig. 77a-c.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 282-285, pl. 17, figs. 1, 2; figs. 196, 197.

Chazyan (Normanskill): Kenwood, Stockport, and Glenmont, New York; Alabama; Great Britain.

*Plesiotype*.—Cat. No. 54263, U.S.N.M.

**NEMAPODIA** Emmons.

Genotype: *N. tenuissima* Emmons.

*Nemapodia* Emmons, Nat. Hist. New York, Agric., 1, 1846, p. 68.—Hall, Pal. New York, 1, 1847, p. 319; Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 258.—Miller, N. A. Geol. Pal., 1889, p. 519.

**Nemapodia tenuissima** Emmons.

*Nemapodia tenuissima* Emmons, Nat. Hist. New York, Agric., 1, 1846, p. 68, pl. 14, fig. 1.—Hall, Pal. New York, 2, 1852, p. 32, footnote.—Geinitz, Neues Jahrb. Min., etc., 1861, p. 66.

Cambrian or Ordovician: Salem, Washington County, New York.

**NEMATOPHYCUS** Carruthers.

Genotype: *Prototaxites logani* Dawson.

*Nematophycus* Carruthers, Micr. Jour. London, 8, 1872, p. 160.—Roemer, Leth. geog., 1 Theil., Leth. Pal., Erste Lief., 1880, p. 124.—Grabau, Bull. New York State Mus., 9, 1901, p. 132; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 132.

**Nematophycus crassus** (Penhallow).

*Nematophyton crassum* Penhallow, Trans. Royal Soc. Canada, 7, sec. 4, 1889, p. 23, pl. 1, figs. 2?, 3?, 5, 6; Proc. U. S. Nat. Mus., 16, 1893, p. 115, pl. 16, fig. 3; Canadian Rec. Sci., 7, 1896, p. 156, pl. 2, figs.; p. 155.—Grabau, Bull. Geol. Soc. America, 11, 1900, p. 363.

*Nematophycus crassus* Grabau, Bull. New York State Mus., 45, 1901, p. 132; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 132.

Devonian: Gaspe and New York.

Silurian (Akron): Buffalo, New York.

**NEMATOPHYTON CRASSUM** Penhallow. See *Nematophycus crassus*.

**NEMATOPORA** Ulrich.

Genotype: *N. ovalis* Ulrich.

*Nematopora* Ulrich, Amer. Geol., 1, 1888, p. 234.—Miller, N. A. Geol. Pal., 1889, p. 313.—Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 401, 644.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 17.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 553.—Ulrich, Zittel's Textb. Pal. (Engl. ed.), 1896, p. 281.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 43.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 58.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 153.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 155.—Zittel-Eastman Textb. Pal., 1913, p. 343.

**Nematopora alternata** Ulrich.

*Nematopora alternata* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 646, pl. 29, figs. 8, 8a.—Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 43, pl. 1, fig. 6.

Upper Medinan (Girardeau): Alexander County, Illinois.

**Nematopora conferta** Ulrich.

*Nematopora conferta* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 12, 1890, p. 198, fig. 22; Geol. Minnesota, 3, 1893, p. 206, pl. 3, figs. 21-23.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 343, fig. 501c.

Trenton (Prosser): Cannon Falls, Minnesota.

*Holotype*.—Cat. No. 43687, U.S.N.M.

**Nematopora consueta** Bassler.

*Nematopora delicatula* Ulrich (not Ulrich, 1890), Geol. Minnesota, 3, 1893, p. 206, pl. 3, figs. 26, 27.

*Nematopora consueta* Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 155, 156, fig. 76.

Trenton (Prosser): Near Cannon Falls, Minnesota.

Middle Ordovician (Kuckers): Near Jewe, Esthonia, Russia.

*Cotypes*.—Cat. No. 44100, U.S.N.M.

**Nematopora delicatula** Ulrich.

*Nematopora delicatula* Ulrich (not Ulrich, 1893), Geol. Surv. Illinois, 8, 1890, p. 646, pl. 29, figs. 11, 11b.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 553, figs. 124, 125.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 155, fig. 76a, b.—Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 43, pl. 1, fig. 4.

Upper Medinan (Girardeau): Alexander County, Illinois.

NEMATOPORA DELICATULA Ulrich (1893). See *Nematopora consueta*.

NEMATOPORA FORMOSA Billings. See *Helopora formosa*.

**Nematopora fragilis** Ulrich.

*Nematopora fragilis* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 646, pl. 29, figs. 10-10c.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 157, 158, fig. 78.—Savage, Bull. State Geol. Surv. Illinois, 23, 1913, p. 44, pl. 1, fig. 3.

Upper Medinan (Girardeau): Alexander County, Illinois.

Silurian (Lyckholm): Island of Dago, Baltic Sea.

**Nematopora granosa** Ulrich.

*Nematopora granosa* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 12, 1890, p. 196, fig. 20; Geol. Minnesota, 3, 1893, p. 205, pl. 3, figs. 17-20.

Trenton (Prosser): Cannon Falls, Minnesota.

*Cotypes*.—Cat. No. 43688, U.S.N.M.

**Nematopora lineata** (Billings).

*Helopora lineata* Billings, Cat. Sil. Foss. Anticosti, 1866, p. 36.

*Nematopora lineata* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 646, pl. 29, figs. 7-7e.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 158, 159, fig. 79.

Richmond (Charleton) and Gamachian (Ellis Bay): Junction Cliff, etc., Anticosti.

Early Silurian (Borkholm): Borkholm, Esthonia.

*Plesiotypes*.—Cat. No. 43384, U.S.N.M.

NEMATOPORA? LINEOPORA Ulrich. See *Helopora lineopora*.

**Nematopora macropora** (Hall).

*Trematopora?* (*Trachypora?*) *macropora* Hall, Trans. Albany Inst., 10, 1883, p. 60 (abstract, 1879, p. 4); 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 236.

Niagaran (Waldron): Waldron, Indiana.

**Nematopora minuta** (Hall).

Trematopora? (*Trachypora?*) *minuta* Hall, 28th Ann. Rep. New York State Mus. (doc. ed.), 1876, pl. 11, fig. 8.

*Trematopora minuta* Hall, 28th Ann. Rep. New York State Mus. (mus. ed.), 1879, p. 113, pl. 11, fig. 8; 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 234, pl. 10, fig. 8.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1201, fig.

*Nematopora minuta* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 645.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, pp. 58, 59, pl. 18, fig. 10; pl. 21, figs. 8–11.

Niagaran: Waldron, Indiana (Waldron); Lockport, etc., New York; and Grimsby, Ontario (Rochester).

*Plesiotypes*.—Cat. No. 35774, U.S.N.M.

**Nematopora ovalis** Ulrich.

*Nematopora ovalis* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 12, 1890, p. 197, fig. 21.—Ulrich, Geol. Minnesota, 3, 1893, p. 204, pl. 3, figs. 24, 25.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 153, fig. 208a.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 156, 157, fig. 77.

*Nematopora quadrata* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 644, pl. 29, figs. 12–12c.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, figs. 124, 125 (p. 553).

Trenton: Cannon Falls, Minnesota (Prosser); Trenton Falls, New York; Montreal, Quebec.

Middle Ordovician (Kuckers): Near Jewe, Esthonia, Russia.

*Cotypes*.—Cat. Nos. 43686, 43385, U.S.N.M.

**NEMATOPORA QUADRATA** Ulrich. See *Nematopora ovalis*.

**Nematopora raripora** (Hall).

*Stictopora raripora* Hall, Pal. New York, 2, 1852, p. 46, pl. 18, fig. 5a–c.

*Ptilodictya?* *raripora* Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 142.—Nicholson, Pal. Province Ontario, 1875, p. 45, fig. 19; figs. 4, 4a.

Upper Medinan (Cataract): Flamborough Head, Ontario.

Niagaran: Lockport, New York.

**Nematopora retrorsa** Ulrich.

*Nematopora retrorsa* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 645, pl. 29, figs. 9–9b.—Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 44, pl. 1, fig. 5.

Upper Medinan (Girardeau): Alexander County, Illinois.

**NEMATOPORA STRIATOPORA** Ulrich. See *Thamniscus striatopora*.

**NEMATOPORA STRIGOSA** Ulrich. See *Glaucanome strigosa*.

**NEREIDAVUS** Grinnell.

Genotype: *N. varians* Grinnell.

*Nereidavus* Grinnell, Amer. Jour. Sci., 3d ser., 14, 1877, p. 230.—Miller, N. A. Geol. Pal., 1889, p. 519.

**Nereidavus varians** Grinnell.

*Nereidavus varians* Grinnell, Amer. Jour. Sci., 3d ser., 14, 1877, p. 230, figs. 1, 2.—Miller, N. A. Geol. Pal., 1889, p. 519, fig. 939.

*Eunicites* (*Nereidavus*) *variens* Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 375, pl. 18, figs. 2, 3, 5.

*Eunicites varians* Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 241, figs. 1530b, c.

Eden and Maysville: Cincinnati, Ohio, and vicinity; Toronto, Ontario.



**NEREITES** MacLeay.Genotype: *N. cambrensis* MacLeay.

*Nereites* MacLeay, Murchison's Sil. Syst., 1839, p. 700; Ann. Nat. Hist., 4, 1840, p. 386.—Richter, Zeits. d. d. geol. Gesell., 1, 1849, p. 457; *ibid.*, 2, 1850, p. 70; *ibid.*, 5, 1853, p. 450.—McCoy, British Pal. Rocks and Foss., 1854, p. 128.—Hall, Amer. Jour. Sci. Arts, 2d ser., 19, 1855, p. 434.—Zittel, Handb. Pal., 1, 1880, p. 567.—Nicholson and Etheridge, Mon. Sil. Foss., Girvan Dist., 1880, p. 305.—Miller, N. A. Geol. Pal., 1889, p. 519.

***Nereites deweyi*** Emmons.

*Nereites deweyi* Emmons, Nat. Hist. New York, Agric., 1, 1846, p. 69, pl. 16, fig. 2; Man. Geology, 1860, p. 87, fig. 64.—Barrande, Bull. Soc. Geol. France, 2d, 18, 1861, p. 300, pl. 5, fig. 19.—Miller, N. A. Geol. Pal., 1889, p. 519, fig. 940.

*Nereograpsus Deweyi* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 110, pl. 2, fig. 3. Ordovician(?): Waterville, Maine.

***Nereites gracilis*** Emmons.

*Nereites gracilis* Emmons, Nat. Hist. New York, Agric., 1, 1846, p. 69, pl. 16, fig. 3. *Nereograpsus gracilis* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 111, pl. 2, fig. 6. Ordovician(?): Waterville, Maine.

***Nereites jacksoni*** Emmons.

*Nereites jacksoni* Emmons, Nat. Hist. New York, Agric., 1, 1846, p. 69, pl. 15, fig. 3.

*Nereograpsus Jacksoni* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 110, pl. 2, fig. 2.—Geinitz, Neues Jahrb. Min., etc., 1864, p. 6, pl. 2, fig. 4.

Ordovician(?): Waterville, Maine.

***Nereites lanceolatus*** Emmons.

*Nereites lanceolata* Emmons, Nat. Hist. New York, Agric., 1, 1846, p. 69, pl. 16, fig. 6.

*Nereograpsus lanceolata* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 11, pl. 2, fig. 4. Ordovician(?): Waterville, Maine.

***Nereites loomisi*** Emmons.

*Nereites loomisi* Emmons, Nat. Hist. New York, Agric., 1, 1846, p. 69, pl. 15, fig. 2.—Packard, Proc. Amer. Acad. Arts Sci., 36, 1900, p. 64, footnote.

*Nereograpsus Loomisi* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 110, pl. 2, fig. 5. Ordovician(?): Waterville, Maine.

***Nereites pugnus*** Emmons.

*Nereites pugnus* Emmons, Nat. Hist. New York, Agric., 1, 1846, p. 69, pl. 15, fig. 1; pl. 16, fig. 4.—Packard, Proc. Amer. Acad. Arts Sci., 36, 1900, p. 64, footnote.

*Nereograpsus pugnus* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 111.

Ordovician(?): Waterville, Maine.

***Nereites robustus*** (Emmons).

*Nereograpsus robustus* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 111, pl. 2, fig. 7.

*Nereites robustus* Miller, N. A. Geol. Pal., 1889, p. 519 (gen. ref.).

Ordovician(?): Columbia County, New York.

**NEREOGRAPSUS** Emmons. See *Nereites* MacLeay.

**NEWSOMELLA** Foerste. See *Rhombopteria* Jackson.

**NICHOLSONELLA** Ulrich.Genotype: *Nicholsonella ponderosa* Ulrich.

*Nicholsonella* Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 374, 421.—(Ulrich, in press) Miller, N. A. Geol. Pal., 1889, p. 313.—Ulrich, Geol. Minnesota, 3, 1893, p. 313; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 276.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 590.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 34.—Bassler, Bull. U. S. Geol. Surv., 292, p. 37.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 136.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 751.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 224; Zittel-Eastman Textb. Pal., 1913, p. 334.

***Nicholsonella cumulata*** Ulrich.

*Nicholsonella cumulata* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 423, pl. 33, figs. 6-6c.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, figs. 183-186 (p. 590).

*Monticulipora cumulata* J. F. James, Jour. Cincinnati Soc. Nat. Hist., 18, 1895, p. 74.

Richmond (Fernvale): Wilmington, Illinois.

*Cotypes*.—Cat. No. 43781, U.S.N.M.

***Nicholsonella florida*** (Hall).

*Callopora florida* Hall, Pal. New York, 2, 1852, p. 146, pl. 40, figs. 2a-f.

*Leioclema florida* Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 416, 425.

*Liolema florida* Grabau, Bull. New York State Mus., 45, 1901, p. 165, fig. 62; Bull. Buffalo Soc. Nat. Sci., 7, p. 165, fig. 62.

*Liolema* (?*Nicholsonella*) *floridum* Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 304.

*Nicholsonella florida* Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 38, pl. 14, figs. 10, 11; pl. 24, figs. 1, 2.

Clinton: Lockport, Rochester, etc., New York; Grimsby and Thorold, Ontario (Rochester); Osgood, Indiana (Osgood).

*Plesiotype*.—Cat. No. 35510, U.S.N.M.

***Nicholsonella laminata*** Ulrich.

*Nicholsonella laminata* Ulrich, Geol. Minnesota, 3, 1893, p. 315, pl. 21, figs. 15-19, 21.

Black River (Decorah): Minneapolis and St. Paul, Minnesota.

*Holotype*.—Cat. No. 43550, U.S.N.M.

***Nicholsonella peculiaris*** Cumings and Galloway.

*Nicholsonella peculiaris* Cumings and Galloway, 37th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1913, p. 80, pl. 12, fig. 2; pl. 24, figs. 2, 2a.

Richmond (Arnheim): Big Four Railroad, near Harman's Station, Indiana.

***Nicholsonella ponderosa*** Ulrich.

*Nicholsonella ponderosa* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 422, pl. 34, figs. 5-5d; Geol. Minnesota, 3, 1893, p. 316, pl. 21, figs. 13, 14, 20, 22.

Black River (Platteville): Dixon, Illinois; Minneapolis, Minnesota.

*Holotype* and *plesiotypes*.—Cat. Nos. 43392, 43551, U.S.N.M.

***Nicholsonella pulchra*** Ulrich.

*Nicholsonella pulchra* Ulrich, Geol. Minnesota, 3, 1893, p. 314, pl. 21, figs. 8-12; Zittel's Textb. Pal. (Engl. ed.), 1896, fig. 462 (p. 276).—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 136, figs. 1880, 1900.—Bassler, Zittel-Eastman

Textb. Pal., 1913, p. 334a-c.

Stones River (Pierce): Murfreesboro, Tennessee:

*Cotypes*.—Cat. No. 43552, U.S.N.M.

**Nicholsonella ringuebergi** Bassler.

*Nicholsonella ringuebergi* Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 39, pl. 14, figs. 12, 13.

Clinton (Rochester): Lockport, New York.

*Holotype*.—Cat. No. 35493, U.S.N.M.

**Nicholsonella vaupeli** (Ulrich).

*Heterotrypa vaupeli* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 85, pl. 1, figs. 2-2b.

*Monticulipora vaupeli* James and James, Jour. Cincinnati Soc. Nat. Hist., 11, 1888, p. 19.—J. F. James, *ibid.*, 18, 1895, p. 71.

*Nicholsonella vaupeli* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 421.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 136.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 863, pl. 21, figs. 3-3c; pl. 31, fig. 3.

Maysville (Bellevue): Cincinnati, Ohio, and vicinity.

*Cotypes*.—Cat. No. 43689, U.S.N.M.

**NICHOLSONIA** Waagen and Wentzel. See *Escharopora* Hall.

**NICHOLSONIA PAVONICA** Waagen and Wentzel. See *Escharopora pavonia*.

**NIDULITES** Salter.

Genotype: *N. favus* Salter.

*Nidulites* Salter, Quart. Jour. Geol. Soc. London, 1851, 7, p. 174.—Morris, Cat. British Foss., 1854, 2d ed., p. 362.—Bigsby, Thesaurus Sil., 1868, p. 4.—Salter, Cat. Camb. and Sil. Foss., Woodwardian Mus., Camb., 1873, p. 72.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1, 1878, p. 10.

**Nidulites favus** Salter.

*Nidulites favus* Salter, Quart. Jour. Geol. Soc. London, 7, 1851, p. 174, pl. 9, figs. 16, 17; Cat. Camb. and Sil. Foss., 1873, p. 72, figs.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1, 1880, p. 18, pl. 9, figs. 15-22.—Ami, Ottawa Nat., 8, No. 6, 1894, p. 2.

Middle Ordovician: England; Quebec, Canada.

**Nidulites gregarius** (Billings).

*Pasceolus gregarius* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 72.—Kayser, Zeits. d. d. geol. Gesell., 27, 1875, p. 780.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 144.

*Cyclocrinus gregarius* Stolley, Archiv. Anthrop. Geol. Schleswig-Holsteins, 1, Heft 2, 1896, p. 215 (gen. ref.).

Anticostian (Gun River): Reef Point, Anticosti.

**Nidulites intermedius** (Billings).

*Pasceolus intermedius* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 72.—Kayser, Zeits. d. d. geol. Gesell., 27, 1875, p. 780.

*Cyclocrinus intermedius* Stolley, Archiv. Anthrop. Geol. Schleswig-Holsteins, 1, Heft 2, 1896, p. 215 (gen. ref.).

Anticostian (Gun River): Three miles west of Jupiter River, Anticosti.

**Nidulites pyriformis** Bassler (new species).

*Nidulites* sp. Bassler, Bull. Virginia Geol. Surv., 2a, 1909, pl. 7, fig. 11.

Middle Ordovician (Chambersburg): Strasburg, etc., Virginia; Maryland; Pennsylvania.

**NIESZKOWSKIA** Schmidt.

Genotype: *Cyrtometopus tumidus* Angelin.

*Nieszkowskia* Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 7th ser., 30, 1881, pp. 124, 126, 130, 179.—Zittel, Handb. Pal., 2, 1885, p. 618.—Clarke, Geol.

**NIESZKOWSKIA**—Continued.

Minnesota, 3, pt. 2, 1894, pp. 737-738.—Reed, Geol. Mag., dec. 4, 3, 1896, pp. 118, 162.—Koken, Die Leitfossilien, Leipzig, 1896, p. 35, figs. 7, 7a.—Reed, Geol. Mag., dec. 4, 5, 1898, p. 208.—Raymond, Annals Carnegie Mus., 3, 1905, p. 376; Zittel-Eastman Textb. Pal., 1913, p. 725.

**Nieszkowskia billingsi** (Raymond).

*Cheirurus vulcanus* Billings, Pal. Foss. Canada, 1, 1865, p. 324, fig. 310a-c (not p. 271, figs. 271a-c).

*Pseudosphærexochus vulcanus billingsi* Raymond, Ann. Carnegie Mus., 3, 1905, p. 369, pl. 14, fig. 17, text fig. 11; 7th Rep. Vermont State Geol., 1910, p. 242, pl. 36, fig. 17.

Chazyan (Valcour): Sloop Bay and Valcour Island, New York; Stanbridge, Quebec.

**Nieszkowskia glaucus** (Billings).

*Cheirurus Glaucus* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 323, figs. 308a, b.

*Ceraurus* (*Nieszkowskia*) *glaucus* Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 738. Chazyan(?): Stanbridge, Quebec.

**Nieszkowskia mars** (Hudson).

*Cheirurus mars* Hudson, Bull. New York State Mus., 80, 1905, p. 205, pl. 5, figs. 1, 2.

*Nieszkowskia mars* Raymond, 7th Rep. Vermont State Geol., 1910, p. 244.

Chazyan (Valcour): Valcour Island, New York.

**Nieszkowskia perforator** (Billings).

*Cheirurus perforator* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 287, fig. 275.

*Ceraurus* (*Nieszkowskia*) *perforator* Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 738 (gen. ref.).

Chazyan (Quebec-N): Table Head, Newfoundland.

**Nieszkowskia satyrus** (Billings).

*Cheirurus Satyrus* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 324, fig. 309.

*Ceraurus* (*Nieszkowskia*) *satyrus* Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 738.

*Pseudosphærexochus* (*Nieszkowskia*) *satyrus* Raymond, Ann. Carnegie Mus., 3, 1905, p. 371, pl. 14, fig. 21.

*Nieszkowskia satyrus* Raymond, 7th Rep. Vermont State Geol., 1910, p. 224, pl. 36, fig. 21.

Chazyan (Valcour): Montreal, Quebec; Sloop Island, east of Valcour Island, New York.

**NILEUS** Dalman.

Genotype: *Asaphus* (*Nileus*) *armadillo* Dalman.

*Nileus* Dalman, Svenska Vet.-Akad. Handl., 1826, 1827, pp. 246, 276.—Dalman-Engelhart, Die Palaeaden, Nurnberg, 1828, p. 49.—Green, Mon. Tril. N. A., 1838, p. 18.—Eichwald, Zool. Specialis, pt. 2, Vilnae, 1830, p. 116.—Goldfuss, Neues Jahrb. Min., etc., 1843, pp. 540, 551.—Burmeister, Org. der Tril., Berlin, 1843, p. 123.—Rouault, Bull. Soc. Geol. France, 2d ser., 4, 1847, p. 318.—Hawle and Corda, Abh. d. k. böhmischen Gesell., d. Wiss., 5, 1847 (extract), p. 52, pl. 4, fig. 35.—Angelin, Pal. Scandinavica, 3d ed., Holmiae, 1878, p. 18.—Barrande, Neues Jahrb. Min., etc., 1850, p. 779.—Pictet, Traite de Pal., 2d ed., 2, 1854, p. 516.—Salter, Mon. British Tril., Pal. Soc., 1866, pp. 148, 171.—Zittel, Handb. Pal., 2, 1885, p. 610.—Brögger, Bihang till K. Sven. Vet.-Akad. Handl., 11, No. 3, 1886, p. 64; Afh. Sveriges Geol. Unders., Ser. C, No. 82, 1886, p. 64.—Miller, N. A. Geol. Pal., 1889, p. 557.—Koken,

**NILEUS**—Continued.

Die Leitfossilien, Leipzig, 1896, p. 28.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 8th ser., 6, 1898, pp. 11, 45.—Beecher, Zittel-Eastman, Textb. Pal., 1, 1900, p. 630.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 34, No. 8, 1901, pp. 26, 61.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 8th ser., 14, No. 10, 1904, p. 63.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 299.—Slocum, Field Mus. Nat. Hist., Geol. Serv., 4, No. 3, 1913, p. 52.—Raymond, Trans. and Proc. Roy. Soc. Canada, 5, 3d ser., sec. 4, 1912, p. 116; Zittel-Eastman Textb. Pal., 1913, p. 719.

**Nileus affinis** Billings.

*Nileus affinis* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 275, fig. 261.—Raymond, Trans. and Proc. Roy. Soc. Canada, 3d ser., 5, sec. 4, 1912, p. 120, pl. 3, fig. 4.  
Canadian: Cow Head, Newfoundland (Quebec—P); Isle of Orleans and Point Levis, Quebec.

**Nileus macrops** Billings.

*Nileus macrops* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 273, fig. 259.—Miller, N. A. Geol. Pal., 1889, p. 557, fig. 1034.  
Chazyan (Quebec—N): Table Head, Newfoundland.

**Nileus perkinsi** Raymond.

*Nileus perkinsi* Raymond, Ann. Carnegie Mus., 7, 1910, p. 69, pl. 18, figs. 7-8; 7th Rep. Vermont State Geol., 1910, p. 224, pl. 38, figs. 7-8.—Perkins, Rep. Vermont State Geol., 8th ser., 1912, pl. 18, figs. 7, 8.—Raymond, Trans. and Proc. Roy. Soc. Canada, 3d ser., 5, sec. 4, 1912, p. 119, pl. 2, fig. 8; pl. 3, fig. 1.  
Chazyan (Valcour): Isle La Motte, Vermont.

**Nileus scrutator** Billings.

*Nileus scrutator* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 274, fig. 260.  
Chazyan (Quebec—N, P): Table Head and P. Portland Creek, Newfoundland.

**Nileus striatus** Whitfield.

*Nileus striatus* Whitfield, Bull. Amer. Mus. Nat. Hist., 9, 1897, p. 184, pl. 5, figs. 5, 6.—Seely, Vermont State Geol., Rep. 7, 1910, pl. 55, figs. 5, 6.  
Canadian (Beekmantown): Fort Cassin, Vermont.

**Nileus vigilans** (Meek and Worthen).

*Asaphus* (*Isotelus*) *vigilans* Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1870, p. 53; Geol. Surv. Illinois, 6, 1875, p. 497, pl. 23, fig. 6.  
*Illænus* (*Nileus*) *minnesotensis* Foerste, 15th Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 478, fig. 1.  
*Nileus vigilans* Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 712, figs. 17-19.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 173.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 299, fig. 1610c, d.—Finch, Proc. Iowa Acad. Sci., 11, 1904, p. 179, pl. 14.—Slocum, Field Mus. Nat. Hist., Geol. Ser., 4, No. 3, 1913, p. 52, pl. 14, figs. 9-15.  
Richmond (Maquoketa): Carrol and Osage Counties, Illinois; Iowa.  
Black River and Trenton: Minnesota, Baffin Land, etc.  
*Plesiotypes*.—Cat. No. 41913, U.S.N.M. (Clarke).

**NIOBE MACCOYI** Frech. See *Dolichometopus maccoyi*.

**NIPTERELLA** Hinde.

Genotype: *Calathium? paradoxicum* Billings.

*Nipterella* Hinde, Quart. Jour. Geol. Soc. London, 45, 1889, p. 144.—Rauff, Palæontographica, 40, 1894, p. 241.

**Nipterella paradoxa** (Billings).

*Calathium?* *paradoxicum* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 358, fig. 345.—Bornemann, Verstein. Cambr. Sardin., N. Act. Leop. Car. Akad. Naturf., 51, 1886, p. 33.

*Nipterella paradoxa* Hinde, Quart. Jour. Geol. Soc. London, 45, 1889, p. 144, pl. 5, fig. 15; Canadian Rec. Sci., 3, 1889, p. 374.—Rauff, Palæontographica, 40, 1894, p. 241, pl. 1, figs. 11–14.

Canadian (Romaine): Mingan Island, Canada.

**NUCLEOSPIRA** Hall.Genotype: *Spirifer ventricosa* Hall.

*Nucleospira* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 24; Pal. New York, 3, 1859, p. 219; *ibid.*, 4, 1867, p. 278.—Zittel, Handb. Pal., 1, 1880, p. 685.—Davidson, Mon. British Foss. Brach., 5, Sil. Suppl.; Pal. Soc., 1882, pp. 82, 91.—Miller, N. A. Geol. Pal., 1889, p. 355.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 103.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 142; 13th Ann. Rep. New York State Geol., 1895, p. 806.—Koken, Die Leitfossilien, Leipzig, 1896, p. 240, fig. 200, 6, 7.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 222.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 349.—Schuchert, Zittel-Eastman Textb. Pal., 1900, p. 338; *ibid.*, 1913, p. 415.

**Nucleospira concentrica** Hall.

*Nucleospira concentrica* Hall, Pal. New York, 3, 1859, p. 223, pl. 28B, figs. 15–19.—Hall and Clarke, *ibid.*, 8, pt. 2, 1895, pl. 48, fig. 7.—Foerste, Jour. Geol., 11, 1903, p. 709 (loc. occ.).

Niagaran (Brownsport): Decatur County, Tennessee.

**Nucleospira elegans** Hall.

*Nucleospira elegans* Hall, Pal. New York, 3, 1859, p. 222, pl. 28B, figs. 10–15.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Survey, 1889, p. 104.—Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pl. 48, figs. 8–11.—Schuchert and Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 431, pl. 73, figs. 13, 14.

Helderbergian: Cherry Valley, New York (New Scotland); Cumberland, Cash Valley, etc., Maryland (Keyser); (?)Niagaran at Louisville, Kentucky.

*Plesiotypes*.—Cat. No. 51324, U.S.N.M. (Nettelroth).

**Nucleospira pisiformis** Hall.

*Orthis pisum* Hall (not Sowerby) Pal. New York, 2, 1852, p. 250, pl. 2, fig. 1.

*Nucleospira pisiformis* Hall, Pal. New York, 3, 1859, pl. 28B; Trans. Albany Inst., 4, 1863, p. 226; 28th Rep. New York State Mus. Nat. Hist., 1879, p. 160, pl. 25, figs. 22–28; 11th Rep. State Geol. Indiana, 1882, p. 301, pl. 25, figs. 22–28.—Davidson, Mon. British Foss. Brach., 5, Sil. Suppl., Pal. Soc., 1882, p. 92.—Kayser, Richthofens China, 4, 1883, p. 47, pl. 4, figs. 9–11.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 104, pl. 33, figs. 7–9.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 468, figs.—Miller, N. A. Geol. Pal., 1889, p. 355, fig. 587.—Keyes, Geol. Surv. Missouri, 5, 1895, p. 94, pl. 41, fig. 5.—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 444, pl. 8, fig. 29.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 349, fig. 453.

Niagaran: Wolcott, New York (Clinton); Waldron, etc., Indiana (Osgood and Waldron); Louisville, Kentucky; Tennessee; Missouri.

*Plesiotypes*.—Cat. No. 51367, U.S.N.M. (Nettelroth).

**NUCLEOSPIRA ROTUNDATA** Whitfield. See *Whitfieldella rotundata*.

**Nucleospira swartzii** Maynard.

*Nucleospira swartzii* Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 432, pl. 73, figs. 15-17.

Helderbergian (Keyser): Cookerly, Devils Backbone, and Cash Valley, Maryland; Keyser, West Virginia.

**Nucleospira ventricosa** (Hall).

*Spirifer ventricosa* Hall, 10th Ann. Rep. New York State Cab. Nat. Hist., 1857, p. 57.

*Nucleospira ventricosa* Hall, Pal. New York, 3, 1859, p. 220, pl. 14, fig. 1; pl. 28b, figs. 2-9, 14.—Schuchert and Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 430, pl. 73, figs. 10-12.

Helderbergian: Schoharie, etc., New York (New Scotland); Moorefield, West Virginia (Keyser).

**NUCULA** Hall. See *Ctenodonta* Salter.

**Nucula minuta** Owen

Not recognized.

*Nucula minuta* Owen, Geol. Expl. Iowa, Wisconsin, Illinois, 2d ed., 1844, p. 78, pl. 14, fig. 5.

Niagaran: Iowa and Wisconsin.

**NUCULA POSTRIATA** Hall. See *Lyrodesma cannonense* and *L. poststriatum*.

**NUCULITES** (part) Grabau and Shimer. See *Clidophorus* Hall.

**NUCULITES** Conrad. Genotypes: *N. oblongatus* and *N. cuneiformis* Conrad.

*Nuculites* Conrad, 5th Ann. Rep. New York Geol. Surv., 1841, p. 49.—Hall, Canadian Nat. Geol., 1, 1856, p. 394; Pal. New York, 5, pt. 1, Lam. 2, 1885, p. 26.—Miller, N. A. Geol. Pal., 1889, p. 496.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 254.

**Nuculites (Orthonota) carinatus** Dawson.

*Nuculites (Orthonota) carinata* Dawson, Acadian Geol. Suppl. Chap., 1860, p. 68, fig. 56.—Hall, Canadian Nat. Geol., 5, 1860, p. 151, fig. 10.—Dawson, Acadian Geol., 2d ed., 1868, p. 602, fig. 207.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 475, fig.

Silurian: Arisaig, Nova Scotia.

**Nuculites corrugatus** Williams.

*Nuculites corrugata* Williams, Proc. U. S. Nat. Mus., 45, 1913, p. 347, pl. 31, figs. 11, 14.

Silurian (Pembroke): Leighton Cove, Washington County, Maine.

*Cotypes*.—Cat. No. 58976, U.S.N.M.

**NUCULITES FABA** Emmons. See *Colpomya faba*.

**NUCULITES (CLIDOPHORUS) FERRUGINEUS** Foerste. See *Clidophorus ferrugineus*.

**NUCULITES INFLATA** Emmons. See *Cypricardites inflatus*.

**NUCULITES NEGLECTUS** Grabau and Shimer. See *Clidophorus neglectus*.

**NUCULITES PLANULATA** Conrad. See *Clidophorus planulatus*.

**NUCULITES POSTSTRIATA** Emmons. See *Lyrodesma poststriatum*.

**NUCULITES SCITULA** Emmons. See *Clidophorus planulatus*.

**NUCULITES YOLDIAFORMIS** Ulrich. See *Technophorus yoldiaformis*.

*NUTTAINIA* Eaton. See *Cryptolithus* Green.

*NUTTAINIA CONCENTRICA* Eaton. See *Cryptolithus tessellatus*.

**NYCTOPORA** Nicholson. Genotype: *N. billingsi* Nicholson.  
*Nyctopora* Nicholson, Tab. Corals Pal. Period, 1879, p. 182.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 423.—Miller, N. A. Geol. Pal., 1889, p. 198.—Lambe, Cont. Can. Pal. Geol. Surv. Canada, 4, pt. 1, 1889, p. 48.

**Nyctopora billingsi** Nicholson.

*Nyctopora Billingsii* Nicholson, Tab. Corals Pal. Period, 1879, p. 184, pl. 9, figs. 3-3c.—Lambe, Cont. Can. Pal. Geol. Surv. Canada, 4, pt. 1, 1889, p. 49, pl. 2, figs. 1, 1a.—Weller, Geol. Surv. New Jersey Pal., 3, 1903, p. 137, pl. 7, figs. 1, 2.

*Columnaria Goldfussi* Nicholson (not Billings, 1857), Pal. Ontario, 1875, p. 9. Trenton: Peterboro, Ontario; Jacksonburg, New Jersey.

*OBOLELLA* Hall and Clarke (part). See *Dicellomus* Hall.

*OBOLELLA?* *AMBIGUA* Walcott. See *Elkania ambigua*.

*OBOLELLA BELTI* Davidson. See *Acrotreta belti*.

*OBOLELLA DESIDERATA* Billings. See *Elkania desiderata*.

*OBOLELLA DISCOIDEA* Hall and Whitfield. See *Obolus discoidea*.

*OBOLELLA?* *GEMMULA* Matthew. See *Lingulella ferruginea*.

*OBOLELLA IDA* Billings. See *Elkania ida*.

*OBOLELLA?* *MINUTA* Walcott. See *Linnarssonella minuta*.

*OBOLELLA NANA* Meek and Hayden. See *Dicellomus nanus*.

*OBOLELLA PRETIOSA* Billings. See *Acrothele pretiosa*.

*OBOLELLA SALTERI* Hall. See *Obolus* (*Bröggeria*) *salteri*.

*OBOLELLINA* Billings. See *Dinobolus* Hall.

*OBOLELLINA GALTENSIS* Billings. See *Rhinobolus galtensis*.

**OBOLUS** Eichwald. Genotype: *O. apollinus* Eichwald.

*Obolus* Eichwald, Zoologia specialis, 1, 1829, p. 274.—Davidson *ibid.* (part), British Fossil Brach., 1, 1853, pp. 135-136; 3, pt. 7, 1866, p. 58.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 80, 81; *ibid.*, pp. 337-339.—Walcott, Smiths. Misc. Coll., 53, 1908, pl. 11, pp. 142 and 144; Mon. U. S. Geol. Surv., 51, pt. 1, 1912, p. 370. (See for complete bibliography.)—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 306; *ibid.*, 2d ed., 1913, p. 371.

*Lingulobolus* Matthew, Trans. Roy. Soc. Canada, 2d ser., 1, 1895, pp. 260-261.

*Sphaerobolus* Matthew, Trans. Roy. Soc. Canada, 2d ser., 1, 1895, p. 263.

*Obolus* (*Lingulobolus*) Walcott, Proc. U. S. Nat. Mus., 23, 1901, p. 683; Smiths. Misc. Coll., 53, 1908, pl. 11, pp. 142, 144.

*Lingulobolus* (subgenus of *Obolus*) Walcott, Mon. U. S. Geol. Surv., 51, pt. 1, 1912, p. 430. (Genotype: *Lingulella?* *affinis* Billings.)

*Obolus* (*Bröggeria*) Walcott, Proc. U. S. Nat. Mus., 25, 1902, p. 605; Smiths. Misc. Coll., 53, 1908, pl. 11, pp. 142, 144.

*Bröggeria* Walcott, Monog. U. S. Geol. Surv., 51, pt. 1, 1912, p. 424. (Genotype: *Obolella salteri* Hall.)



**OBOLUS**—Continued.

*Palæobolus* Matthew, Bull. Nat. Hist. Soc. New Brunswick, 4, pt. 3, 1899, pp. 201–202; Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, pp. 140–141.

*Obolus* (*Palæobolus*) Walcott, Smiths. Misc. Coll., 53, 1908, pl. 11, pp. 142, 144; U. S. Geol. Surv. Mon., 51, pt. 1, 1912, p. 426. (Genotype: *Palæobolus bretonensis* Matthew.)

*Obolus* (*Westonia*) Walcott, Proc. U. S. Nat. Mus., 23, 1901, pp. 683 and 691; Smiths. Misc. Coll., 53, 1908, pl. 11, and pp. 142 and 144; Mon. U. S. Geol. Surv., 51, pt. 1, 1912, p. 450.

*Westonia* Matthew, Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, p. 205. (Genotype: *Lingula aurora* Hall.)

**OBOLUS** (*LINGULEPIS*) *ACUMINATUS* Walcott. See *Lingulella* (*Lingulepis*) *acuminata*.

**Obolus** (*Lingulobolus*) *affinis* (Billings).

*Lingulella?* *affinis* Billings, Canadian Nat., 2d ser., 6, 1872, p. 468; fig. 4, p. 467; Geol. Surv. Canada, Pal. Foss., pt. 1, 1874, p. 67, fig. 35, p. 66; Geol. Surv. Newfoundland, Rep. Progr. 1881, App., 1882, p. 15.

*Lingulepis affinis* Walcott, Amer. Jour. Sci., 3d ser., 37, 1889, p. 381 (gen. ref.).

*Lingulobolus affinis* Matthew, Trans. Roy. Soc. Canada, 2d ser., 1, sec. 4, 1895, p. 261, pl. 1, figs. 4a, b.—Grabau, Boston Soc. Nat. Hist., 1, pt. 3, 1900, p. 621.

*Lingulobolus affinis cuneata* Matthew, Trans. Roy. Soc. Canada, 2d ser., 1, sec. 4, 1895, p. 262, pl. 1, figs. 4c, 4d.

*Obolus* (*Lingulobolus*) *affinis* Walcott, Amer. Jour. Sci., 4th ser., 6, 1898, p. 327; Mon. U. S. Geol. Surv., 51, 1912, p. 431.

Lower Ordovician: One mile north of Lance Cove, Great Bell Island, Conception Bay, Newfoundland; Limestone pebble in Carboniferous conglomerate, north of Fall River, Bristol County, Massachusetts.

*Plesiotype*.—Cat. No. 51679, U.S.N.M.

**Obolus** *anceps* Walcott.

*Obolus anceps* Walcott, Proc. U. S. Nat. Mus., 21, 1898, pp. 388–389; Mon. U. S. Geol. Surv., 51, 1912, p. 380, pl. 10, figs. 3, 3a–f.

Upper Cambrian and Lower Ordovician: Northeast of Adams Hill, Eureka District, Eureka County, Nevada.

*Holotype* and *paratypes*.—Cat. Nos. 27302, 51541, U.S.N.M.

**OBOLUS** *BELLI* Walcott. See *Lingula* (*Palæoglossa*) *belli*.

**OBOLUS** (*LINGULELLA*) *BELLUS* Walcott. See *Lingulella bella*, *L. lens* and *L. concinna*.

**Obolus** (*Palæobolus*) *bretonensis* (Matthew).

*Palæobolus bretonensis* Matthew, Bull. Nat. Hist. Soc. New Brunswick, 4, pt. 3, 1899, p. 202, pl. 2, figs. 2a–i; Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, pp. 141–143, pl. 9, figs. 2a–h.

*Obolus bretonensis* Matthew, Trans. Roy. Soc. Canada, 2d ser., 8, sec. 4, 1902, p. 95, pl. 1, figs. 5a–e.

*Obolus* (*Palæobolus*) *bretonensis* Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 426, pl. 32, figs. 5a–g.

Middle Cambrian and Canadian (Bretonian—Div. C3a): McAdams shore, East Bay, Cape Breton, Nova Scotia.

**OBOLUS** *CANADENSIS* Billings. See *Dinobolus magnificus* and *D. canadensis*.

**OBOLUS** (*LINGULELLA*) *CONCINNUS* Walcott. See *Lingulella concinna*.

**OBOLUS** *CONRADI* Hall. See *Dinobolus conradi*.

**Obolus cyane** (Billings).

*Lingula cyane* Billings, Geol. Surv. Canada, Pal. Foss., 1, 1865, p. 216, figs. 200a-d, p. 215.

*Glossina cyane* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 224.

*Obolus cyane* Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 388, pl. 27, figs. 4a-b. Chazyan (Quebec—P): Four miles northeast of Portland Creek, Newfoundland.

**OBOLUS (LINGULELLA) DESIDERATA** Walcott. See *Lingulella desiderata* and *Obolus rotundatus*.

**Obolus discoideus** (Hall and Whitfield).

*Obolella discoidea* Hall and Whitfield, U. S. Geol. Expl. 40th Par., 4, 1877, p. 205, pl. 1, figs. 1 and 2.—Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 14; Bull. U. S. Geol. Surv., 30, 1886, p. 111.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 69.

*Obolus* (*Lingulella*) *discoideus* Walcott, Proc. U. S. Nat. Mus., 23, 1901, p. 673.

*Obolus discoideus* Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 389, pl. 18, figs. 6a-d.

Lowest Ordovician: Blacksmith Fork Canyon, nine miles east of Hyrum, Cache County, Utah. Also Upper and Middle Cambrian of Nevada, etc.

*Plesiotypes*.—Cat. Nos. 24555, 51547, U.S.N.M.

**Obolus dolatus** (Sardeson).

*Lingula dolata* Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 95, pl. 6, fig. 12.

*Obolus dolatus* Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 390, figs. 35A-C. Ozarkian (Oneota): Stillwater, Washington County, Minnesota.

**OBOLUS (LINGULELLA) ELLSI** Walcott. See *Lingulella ellsi*.

**Obolus (Westonia) elongatus** Walcott.

*Obolus* (*Westonia*) *elongatus* Walcott, Smiths. Misc. Coll., 53, 1908, p. 68, pl. 7, fig. 12; Mon. U. S. Geol. Surv., 51, 1912, p. 459, pl. 63, figs. 8-8d.

Middle Ordovician: Wasatch Canyon, about five miles north of Brigham, Boxelder County, Utah.

*Holotype* and *plesiotypes*.—Cat. No. 51722, U.S.N.M.

**Obolus (Westonia) escasoni** (Matthew).

*Lingulella* (?) *escasoni* Matthew, Bull. Nat. Hist. Soc. New Brunswick, 4, pt. 4, 1901, pp. 270-273, pl. 5, figs. 1a-i.

*Obolus* (*Westonia*) *escasoni* Walcott, Proc. U. S. Nat. Mus., 23, 1901, p. 691; Mon. U. S. Geol. Surv., 51, pt. 1, 1912, p. 459, pl. 49, figs. 1a-f.

*Westonia escasoni* Matthew, Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, pp. 206-209, pl. 16, figs. 1a-i.

Canadian (Bretonian—Div. C3a, b): McAdam shore, East Bay, Cape Breton, Nova Scotia.

**OBOLUS GALTENSIS** Billings. See *Rhinobolus galtensis*.

**OBOLUS (LINGULEPIS) GREGWA** Walcott (part). See *Lingulella* (*Lingulepis*) *exigua*.

**Obolus (Westonia) iphis** Walcott.

*Obolus* (*Westonia*) *iphis* Walcott, Proc. U. S. Nat. Mus., 28, 1905, p. 336; Mon. U. S. Geol. Surv., 51, 1912, p. 462, pl. 49, figs. 4, 4a-d.

Lower Ordovician (Pogonip): East of Hamburg Ridge, Eureka District, Eureka County, Nevada; also Upper Cambrian of Nevada and Utah.

*Holotype* and *paratypes*.—Cat. Nos. 51720, 51542, U.S.N.M.

**OBOLUS (LINGULELLA) LENS** Walcott. See *Lingulella lens*.

**Obolus loperi** Walcott.

*Obolus loperi* Walcott, Proc. U. S. Nat. Mus., 21, 1898, pp. 389-390; Mon. U. S. Geol. Surv., 51, 1912, p. 395, pl. 9, figs. 4, 4a.

Upper Cambrian or Lower Ordovician: Cement Creek, southeast of Crested Butte, Ouray County, Colorado.

*Holotype* and *paratypes*.—Cat. No. 27303, U.S.N.M.

**Obolus maera** (Hall and Whitfield).

*Lingulepis maera* Hall and Whitfield, U. S. Geol. Expl., 40th Par., 4, 1877, p. 206, pl. 1, figs. 5-7.—Walcott, Mon. U. S. Geol. Surv., 8, 1884, pp. 12, 13.

*Lingulella?* *maera* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 61 (gen. ref.).—Walcott, Amer. Jour. Sci., 4th ser., 3, 1897, p. 404.

*Obolus (Lingulella) maera* Walcott, Mon. U. S. Geol. Surv., 32, pt. 2, 1899, p. 443 (gen. ref.).

*Obolus maera* Walcott, Mon. U. S. Geol. Surv., No. 51, 1912, p. 399, pl. 10, figs. 2, 2a-e.

Upper Cambrian or Lower Ordovician (Pogonip): Roundtop Mountain, Eureka District, Eureka County, Nevada; Garfield County, Colorado. Also Upper and Middle Cambrian of Nevada.

**Obolus matinalis** (Hall).

*Orbicula prima* Owen, Rep. Geol. Surv. Wisconsin, Iowa, and Minnesota, 1852, p. 583, pl. 1B, figs. 13 and 16-19.

*Lingulepis pinnaformis* Hall (not Owen), 16th Ann. Rep. New York State Cab. Nat. Hist., 1863, p. 129, pl. 6, figs. 12, 13 (not figs. 14-16); Trans. Albany Inst., 5, 1867, p. 107, pl. 1, figs. 12 and 13 (not figs. 14-16).

*Lingulepis matinalis* Hall, 16th Ann. Rep. New York State Cab. Nat. Hist., 1863, p. 130, pl. 6, figs. 12-13; Trans. Albany Inst., 5, 1867, p. 107, pl. 1, figs. 12 and 13 (not fig. 15).

*Lingulella?* *matinalis* Walcott, Amer. Jour. Sci., 4th ser., 3, 1897, p. 404 (gen. ref.).

*Obolus (Lingulella) matinalis* Walcott, Mon. U. S. Geol. Surv., 32, pt. 2, 1899, p. 443 (gen. ref.).

*Obolus matinalis* Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 400, pl. 8, figs. 1, 1a-k.

Lower Ordovician: Near Manitou, El Paso County, Colorado. Also Upper and Middle Cambrian of Wyoming, Minnesota, Montana, etc.

*Plesiotypes*.—Cat. Nos. 51563, 51564, etc., U.S.N.M.

**Obolus mcconnelli pelias** (Walcott).

*Obolus (Lingulella) pelias* Walcott, Proc. U. S. Nat. Mus., 28, 1905, p. 330.

*Obolus mcconnelli pelias* Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 398, pl. 22, figs. 3b, 3c.; pl. 39, figs. 5, 5a-c.

Middle Cambrian to Lower Ordovician: Various localities in Utah and Nevada.

*Holotype* and *paratypes*.—Cat. No. 51592, U.S.N.M.

**Obolus mollisonensis** Walcott.

*Obolus mollisonensis* Walcott, Smiths. Misc. Coll., 57, 1912, p. 231, pl. 35, figs. 10-12.

Lower Ordovician (Goodsir): West side Moose Creek Valley, Mount Mollison, British Columbia.

**Obolus? murrayi** Billings.

*Obolus? murrayi* Billings, Geol. Surv. Canada, Pal. Fossils, 1, 1865, p. 362.—Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 405, pl. 15, fig. 12.

Canadian(?): Maiden Arm, Hare Bay, east side of northern point of Newfoundland.

**Obolus (Westonia) notchensis** Walcott.

Obolus (Westonia) notchensis Walcott, *Smiths. Misc. Coll.*, 53, 1908, p. 69, pl. 7, fig. 13; *Mon. U. S. Geol. Surv.*, 51, 1912, p. 463.

Lower Ordovician: Notch Peak, House Range, Millard County, Utah.

*Holotype*.—Cat. No. 51731, U.S.N.M.

OBOLUS (LINGULELLA) PELIAS Walcott. See *Obolus mcconnelli pelias*.

OBOLUS (LINGULELLA) POGONIPENSIS Walcott. See *Lingulella pogonipensis*.

**Obolus refulgens** Matthew.

Obolus refulgens Matthew, *Trans. Roy. Soc. Canada*, 9, 1892, p. 44, pl. 12, figs. 6a-6d.—Mickwitz, *Mém. l'Acad. Imp. Sci. St. Pétersbourg*, 8, 1896, p. 23.—

Matthew, *Trans. Roy. Soc. Canada*, 2d ser., 8, sec. 4, 1890, p. 96, pl. op. p. 112, figs. 11a-b.—Walcott, *Mon. U. S. Geol. Surv.*, 51, 1912, p. 409, pl. 9, figs. 2a-d.

Obolus (Monobolina) refulgens Matthew, *Trans. Roy. Soc. Canada*, 2d ser., 8, sec. 4, 1902, p. 98.

Monobolina refulgens Matthew, *Geol. Surv. Canada, Rep. Cambrian Rocks Cape Bréton*, 1903, p. 210, pl. 16, figs. 2a, b; also pl. 11, fig. 4.—Hahn, *Ann. New York Acad. Sci.*, 22, 1912, p. 142.

Canadian (Bretonian—Div. C3c): Navy Island, St. John Harbor, New Brunswick; and McLeod Brook, Cape Breton, Nova Scotia.

**Obolus (Westonia) rogersi** (Walcott).

*Lingula prima* Rogers (not Conrad MS., Hall), *Proc. Boston Soc. Nat. Hist.*, 7, 1861, p. 390.

*Lingula antiqua* Rogers (not Emmons), *Proc. Boston Soc. Nat. Hist.*, 7, 1861, p. 390.

Obolus (Lingulella) rogersi Walcott, *Proc. U. S. Nat. Mus.*, 21, 1898, pp. 413-415.

*Lingulella rogersi* Grabau, *Occas. Papers Boston Soc. Nat. Hist.*, 1, pt. 3, 1900, p. 624, pl. 31, fig. 4.

Obolus (Westonia) rogersi Walcott, *Proc. U. S. Nat. Mus.*, 23, 1901, p. 691; *Mon. U. S. Geol. Surv.*, 51, 1912, p. 463, pl. 42, figs. 2, 2a-d.

Lower Ordovician: Limestone pebbles on beach at Marthas Vineyard, Massachusetts, and at Newport, etc., Rhode Island; also pebbles in Carboniferous conglomerate north of Fall River, Bristol County, Massachusetts.

*Holotype* and *paratypes*.—Cat. No. 27337, U.S.N.M.

**Obolus rotundatus** (Walcott).

Obolus (Lingulella) rotundatus Walcott, *Proc. U. S. Nat. Mus.*, 21, 1898, p. 415.

Obolus (Lingulella) desideratus Walcott, *Mon. U. S. Geol. Surv.*, 32, pt. 2, 1899, pp. 445-446, pl. 60, fig. 2a (not fig. 2).

Obolus rotundatus Walcott, *Mon. U. S. Geol. Surv.*, 51, 1912, p. 411, pl. 20, figs. 2, 2a-e.

Lower Ordovician: Schellbourne, Schell Creek Range, White Pine County, Nevada. Also Upper and Middle Cambrian of Nevada, Montana, etc.

*Holotype* and *paratypes*.—Cat. No. 27337, 27338, U.S.N.M.

**Obolus (Bröggeria) salteri** (Holl).

Obolella salteri Holl, *Quart. Jour. Geol. Soc. London*, 21, pt. 1, 1865, p. 102, figs. 9a-b.—Davidson, *British Foss. Brach.*, 3, pt. 7, 1866, pp. 61-62, pl. 4, figs. 28, 29.

Obolus (Bröggeria) salteri Walcott, *Proc. U. S. Nat. Mus.*, 1902, 25, pp. 605-606; *Mon. U. S. Geol. Surv.*, 51, 1912, p. 424, pl. 13, figs. 1a-n; pl. 15, figs. 4a-d.

**Obolus (Brüggeria) salterii**—Continued.

Lower Ordovician: Ceratopyge limestone, near Christiania, Norway; Bronsil shales, Worcestershire, etc., England; Dictyonema slate of Sweden.

Canadian (Bretonian—Div. C.3a): Various localities in Eastern Cape Breton, Nova Scotia.

**Obolus (Lingulobolus) spissus** (Billings).

Lingulella? spissa Billings, Canadian Nat., 2d ser., 6, 1872, pp. 468–469, figs. 5a–c, p. 467; Geol. Surv. Canada, Pal. Foss., 2, pt. 1, 1874, pp. 67–68, figs. 36a–c, p. 66; Geol. Surv. Newfoundland, Rep. Prog., 1881, App., 1882, p. 15, pl. 3, figs. 12a–c.

Sphærobolus spissus Matthew, Trans. Roy. Soc. Canada, 2d ser., 1, 1895, pp. 263–266, pl. 1, figs. 5a–c.—Grabau, Occas. Papers Boston Soc. Nat. Hist., 1, pt. 3, 1900, p. 622.

Obolus (Lingulobolus) spissus Walcott, Amer. Jour. Sci., 4th ser., 6, 1898, p. 327; Mon. U. S. Geol. Surv., 51, 1912, p. 432, pl. 16, figs. 2a–k; pl. 42, figs. 3, 3a.

Lower Ordovician: One mile north of Lance Cove, Great Bell Island, Conception Bay, New Foundland.

Also limestone pebbles in Carboniferous conglomerate, north of Fall River, Bristol County, Massachusetts.

*Plesiotypes*.—Cat. No. 51678, U.S.N.M.

**Obolus (Westonia) stoneanus** (Whitfield).

Lingula aurora var. Hall, 16th Ann. Rep. New York State Cab. Nat. Hist., 1863, pp. 127, 128, pl. 6, figs. 6–8; Trans. Albany Inst., 5, 1867, pp. 104–106, pl. 1, figs. 6–8; 23d Ann. Rep. New York State Cab. Nat. Hist., 1873, pp. 244–245, pl. 13, fig. 5.

Lingulella stoneana Whitfield, Geol. Wisconsin, 1882, 4, p. 344, pl. 27, figs. 6, 7.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 2, figs. 9–11.—Weller, Geol. Surv. New Jersey, Rep. Pal., 3, 1903, p. 112, pl. 1, fig. 6.

Obolus (Westonia) stoneanus Walcott, Proc. U. S. Nat. Mus., 23, 1901, p. 691; U. S. Geol. Surv., Mon. 51, 1912, p. 465, pl. 28, figs. 2, 2a–g; pl. 49, figs. 2, 2a.

Upper Cambrian: Wisconsin and New Mexico.

Upper Cambrian or Ozarkian (Kittatinny): Newton, Sussex County, New Jersey.

**OCTONARIA** Jones.

Genotype: *O. octoformis* Jones.

Octonaria Jones, Ann. Mag. Nat. Hist., 5th ser., 19, 1887, p. 404.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 709.—Ulrich, Zittel-Eastman Textb. Pal., 1900, p. 645.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 350.—Bassler, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 739.

**Octonaria? angulata** Ulrich and Bassler.

Octonaria? angulata Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 537, pl. 98, figs. 9–11.

Helderbergian (Keyser): Cumberland, Maryland; Keyser, West Virginia.

*Holotype*.—Cat. No. 53280, U.S.N.M.

**Octonaria curta** Ulrich.

Octonaria curta Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1891, p. 195, pl. 12, figs. 4a, 4b.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 351, figs. 1666, 1, 1'.

Clinton (Rochester): Lockport, New York.

*Holotype*.—Cat. No. 41674, U.S.N.M.

**Octonaria inæqualis** Ulrich and Bassler.

*Octonaria inæqualis* Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 538, pl. 98, figs. 12-18.

Helderbergian (Keyser): Cumberland, Maryland.

*Cotypes*: Cat. No. 53284, U.S.N.M.

**Octonaria simplex** (Krause).

*Thlipsura simplex* Krause, Zeits. deutsch. geol. Gesell., 43, p. 508, 1891, pl. 32, fig. 16.

*Octonaria simplex* Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 538, pl. 93, fig. 19.

Helderbergian (Keyser): Cumberland, Maryland.

*Plasiotype*.—Cat. No. 53285, U.S.N.M.

**ODONTOCAULIS** Lapworth.

Genotype: *Odontocaulis keepingi* Lapworth.

*Odontocaulis* Lapworth, Quart. Jour. Geol. Soc. London, 37, 1881, p. 176, pl. 7, figs. 7a, b.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 171.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 172.

**Odontocaulis granti** (Spencer).

*Callograptus granti* Spencer, Canadian Nat., 10, 1882, p. 165 (nom. nud.); Trans. Acad. Sci. St. Louis, 4, 1884, pp. 564, 571, 572, pl. 1, fig. 10; Bull. Mus. Univ. State Missouri, 1, 1884, pp. 14, 21, 22, pl. 1, figs. 10, 10a.—Gurley, Jour. Geol., 4, 1896, pp. 93, 308.

*Odontocaulis granti* Bassler, Bull. U. S. Nat. Mus. 65, 1909, p. 42, figs. 53, 54.

Niagaran dolomite: Hamilton, Ontario.

**Odontocaulis hepaticus** Ruedemann.

*Odontocaulis hepaticus* Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 174, 175, pl. 1, figs. 6, 7, text figs. 79-81.

Chazyan: Glenmont, Albany County, New York (Normanskill); Arkansas (Stringtown).

**Odontocaulis obpyriformis** Gurley.

*Odontocaulis obpyriformis* (Gurley MS.) Bassler, Bull. U. S. Nat. Mus., 65, 1909, pp. 43, 44, fig. 55.

Niagaran dolomite: Hamilton, Ontario.

**Odontocaulis occidentalis** Gurley.

*Odontocaulis occidentalis* (Gurley MS.) Bassler, Bull. U. S. Nat. Mus., 65, 1909, p. 44, fig. 56.

Niagaran dolomite: Hamilton, Ontario.

**ODONTOPLEURA** Emmrich.

Genotype: *O. ovata* Emmrich.

*Odontopleura* Emmrich, De Tril. Dissertatio, etc., 1839, p. 53.—Burmeister, Org. der Tril., Berlin, 1843, p. 71.—Goldfuss, Neues Jahrb. Min., etc., 1843, pp. 541, 556.—Beyrich, Untersuchungen uber Tril., 1846, p. 16.—Emmrich, Neues Jahrb. f. Min., etc., 1846, p. 44.—Hawle and Corda, Abh. d. k. bohmisches Gesell. d. Wiss., 5 (extract, 1847), p. 147, pl. 7, fig. 28.—Clarke, 10th Rep. State Geol. New York for 1890, 1891, pp. 64, 67; 44th Rep. New York State Mus., 1892, pp. 94, 97.—Etheridge and Mitchell, Proc. Linnæan Soc. New South Wales, 21, 1897, p. 695.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 313.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 722.

**Odontopleura arkansana** Van Ingen.

*Odontopleura arkansana* Van Ingen, School of Mines Quart., 23, 1901, p. 40, fig. 9, pl. fig. 2.

Niagaran (St. Clair): St. Clair Springs, Independence County, Arkansas.

**Odontopleura crosota** (Locke).

*Ceraurus crosotus* Locke, Amer. Jour. Sci., 44, 1843, p. 346, fig.; *ibid.*, 45, 1843, p. 222, figs. 2-4.

*Acidaspis crosotus* Gebhard, 9th Rep. New York State Cab. Hist., 1850, pp. 45, 46.—Meeke, Geol. Surv. Ohio, Pal., 1, 1873, p. 165, pl. 14, figs. 10a, b.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 129.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1055, pl. 54, figs. 5, 5a.—Ruedemann, Bull. New York State Mus., 162, 1912, p. 119, pl. 9, figs. 4, 5.

*Ceratocephala crosotus* Vogdes, Proc. Acad. Nat. Sci. Philadelphia, 1877, p. 140.

*Odontopleura crosota* Clarke, 10th Rep. State Geol. New York for 1890, 1891, pp. 69, 71; 44th Rep. New York State Mus., 1892, pp. 99, 101.

Eden: Cincinnati, Ohio, and vicinity; Albany County, New York (Indian Ladder).

**Odontopleura halli** (Shumard).

*Acidaspis halli* Shumard, 1st and 2d Ann. Rep. Geol. Surv. Missouri, pt. 2, 1855, p. 200, pl. B, fig. 7a-c.—Keyes, Missouri Geol. Surv., 4, 1894, p. 230, pl. 32, fig. 4.—Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 59, pl. 2, figs. 11 and 12.

*Ceratocephala Halli* Vogdes, Proc. Acad. Nat. Sci. Philadelphia, 1877, p. 140.

*Odontopleura Halli* Clarke, 10th Rep. State Geol. New York for 1890, 1891, p. 71; 44th Rep. New York State Mus., 1892, p. 101.

Upper Medinan (Girardeau): Cape Girardeau, Missouri.

**Odontopleura illinoisensis** Weller.

*Odontopleura illinoisensis* Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 253, pl. 23, figs. 5-6.

Niagaran (Racine): Near Joliet, Illinois.

**Odontopleura onealli** (Miller).

*Acidaspis O'Nealli* Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 86, fig. 9; N. A. Geol. Pal., 1889, p. 526, fig. 953.

*Odontopleura O'Nealli* Clarke, 10th Rep. New York State Geol. for 1890, 1891, p. 71; 44th Rep. New York State Mus., 1892, p. 101 (gen. ref.).

Richmond (Waynesville): Near Lebanon, Ohio.

**Odontopleura ortonii** (Foerste).

*Acidaspis* ——— Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 101, pl. 13, fig. 23.

*Acidaspis ortonii* Foerste, *ibid.*, 2, pt. 1, 1887, p. 90, pl. 8, fig. 1; Geol. Surv. Ohio, 7, 1893, p. 522, pl. 25, fig. 23, pl. 27, fig. 1.

*Odontopleura ortonii* Van Ingen, School of Mines Quart., 23, 1901, p. 39.—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 481, pl. 24, figs. 16-19.

Upper Medinan (Brassfield): Near New Carlisle, Ohio.

Niagaran: St. Clair Springs, Independence County, Arkansas (St. Clair); Georgetown and Pendleton, Indiana.

**Odontopleura parvula** (Walcott).

*Acidaspis parvula* Walcott, 31st Rep. New York State Mus. Nat. Hist., 1880 (adv. sheets, 1877), p. 69.

*Odontopleura parvula* Clarke, 10th Rep. State Geol. New York for 1890, 1891, p. 71; 44th Rep. New York State Mus., 1892, p. 101; Geol. Minnesota, 3, pt. 2, 1894, p. 744, fig. 61.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 201, pl. 15, figs. 21, 22.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 313, fig. 1624a.

Trenton: Trenton Falls, New York, St. Paul, Minnesota; Jacksonburg, New Jersey.

**Odontopleura trentonensis** (Hall).

*Acidaspis trentonensis* Hall, Pal. New York, 1, 1847, p. 240, pl. 64, figs. 4a-f.—  
Emmons, Amer. Geology, 1, pt. 2, 1855, p. 216, fig. 73.—Walcott, 28th Rep.  
New York State Mus. Nat. Hist., doc. ed., 1877, p. 89; *ibid.*, mus. ed., 1879,  
p. 89; Bull. Mus. Comp. Zool., 8, 1881, p. 192; p. 206, pl. 3, fig. 2; 31st Rep.  
New York State Mus. Nat. Hist., 1879, p. 62.

*Ceratocephala trentonensis?* Vogdes, Proc. Acad. Nat. Sci. Philadelphia, 1877,  
p. 141.

*Odontopleura Trentonensis* Clarke, 10th Rep. State Geol. New York for 1890,  
1891, p. 71; 44th Rep. New York State Mus., 1892, p. 101.

Trenton: Bay of Quinte, Lake Ontario, Canada.

**ENONITES** Hinde.

Genotype: *O. curvidens* Hinde.

*Enonites* Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 376.—Miller, N. A.  
Geol. Pal., 1889, p. 519.—Grabau and Shimer, N. A. Index Fossils, 2, 1910,  
p. 242.

**Enonites amplus** Hinde.

*Enonites amplus* Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 382, pl. 19,  
fig. 23.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 242, fig. 1532c.  
Upper Medinan (Cataract): Toronto, Ontario.

**Enonites? carinatus** Hinde.

*Enonites? carinatus* Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 377, pl.  
19, fig. 19.  
Cincinnatian (Pulaski): Toronto, Ontario.

**Enonites cuneatus** Hinde.

*Enonites cuneatus* Hinde, Quart. Jour. Geol. Soc. London, 1879, p. 377, pl. 18,  
fig. 11.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 242, fig. 1526c.  
Cincinnatian (Pulaski): Toronto, Ontario.

**Enonites curvidens** Hinde.

*Enonites curvidens* Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 376,  
pl. 18, fig. 7.  
Cincinnatian (Pulaski): Toronto, Ontario.

**Enonites decipiens** Foerste.

*Enonites decipiens* Foerste, Amer. Geol., 2, 1888, p. 417, fig. 2; Geol. Surv. Ohio,  
Pal., 7, 1893, p. 517, fig. 2.  
Richmond (Elkhorn): Todds Fork, near Wilmington, Ohio.

**Enonites fragilis** Hinde.

*Enonites fragilis* Hinde, Quart. Jour. Geol. Soc. London, 35, 1897, p. 382, pl. 20,  
fig. 3.  
Upper Medinan (Cataract): Toronto, Ontario.

**Enonites inæqualis** Hinde.

*Enonites inæqualis* Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 376,  
pl. 18, fig. 8.  
Cincinnatian (Pulaski): Toronto, Ontario

**Enonites? infrequens** Hinde.

*Enonites? infrequens* Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 382;  
pl. 20, fig. 2.  
Upper Medinan (Cataract): Toronto, Ontario.

**ENONITES MAJOR** Hinde. See *Eunicites major*.



**Enonites rostratus** Hinde.

*Enonites rostratus* Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 376, pl. 18, fig. 10.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 242, fig. 1526b.

Cincinnati (Pulaski): Toronto, Ontario.

**Enonites serratus** Hinde.

*Enonites serratus* Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 376, pl. 18, fig. 9.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 242, fig. 1526a.

Cincinnati (Pulaski): Toronto, Ontario.

**OGYGIA BARRANDI** Whitfield. See *Ptychopyge barrandi*.

**OGYGIA LATISSIMUS** Eaton. See *Homalonotus delphinocephalus*.

**OGYGIA LIQUENSIS** Hoek. See *Hemigyraspis liquensis*.

**OGYGIA? VETUSTA** Hall. See *Basilicus(?) vetustus*.

**OGYGITES** Tromelin and Lebesconte. Genotype: *Ogygia guettardi* Brongniart.

*Ogygia* (part) Brongniart, Hist. Nat. Crust. Foss., 1822, p. 26.

*Ogygites* Tromelin and Lebesconte (new name in place of *Ogygia* Brongniart, 1822, preoccupied by Hübner in 1816), Cat. Raisonné Foss. Sil., Assoc. French Avanc. Sci., Cong. Nantes, 1876, p. 631.—Raymond, Bull. Victoria Memorial Museum, 1, 1913, p. 43; Trans. and Proc. Roy. Soc. Canada, 5, 3d. ser., sec. 4, 1912, p. 115; Zittel-Eastman Textb. Pal., 1913, p. 719.

**Ogygites canadensis** (Chapman).

*Asaphus canadensis* Chapman, Canadian Jour., 1, 1856, p. 482; *ibid.*, 2, 1858, p. 47; *ibid.*, 3, 1858, pp. 231, 232, fig.; Ann. Mag. Nat. Hist., 3d ser., 3, 1858, pp. 10, 13, fig. 1; Canadian Jour., 4, 1859, p. 1, fig.; p. 142.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 204, fig. 201.—Chapman, Canadian Jour., n. s., 8, 1863, p. 29, fig. 141; p. 204, fig. 201; Expos. Min. and Geol., 1864, p. 136, fig. 141; p. 176, fig. 201.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 40.—Walcott, Trans. Albany Inst., 10, 1883, pp. 3, 12 (loc. occ.).—Vogdes, Bull. U. S. Geol. Surv., 63, 1890, p. 92.

*Basilicus canadensis* Raymond, Amer. Jour. Sci., 19, 4th ser., 1905, p. 62 (gen. ref.).

*Ogygites canadensis* Raymond, Roy. Soc. Canada, Trans. Proc., 3d ser., 5, sec. 4, 1912, p. 118, pl. 1, fig. 2; Bull. Victoria Memorial Mus., 1, 1913, p. 43, pl. 6, fig. 1.

*Asaphus halli* Chapman, Ann. Nat. Hist., 3d ser., 3, 1858, p. 14, fig. 2; Canadian Jour., 2d. ser., 3, 1858, p. 236, fig.

*Asaphus hincksi* Chapman, Canadian Jour., Industry Sci. Arts., 4, 1859, p. 2, fig.; p. 140.—Billings (not Salter), Canadian Nat. Geol., 4, 1859, p. 70.

Trenton (Collingwood): Whitby, Collingwood, etc., Ontario.

Observation.—See also *Asaphus latimarginatus* Hall.

**OHIOCRINUS** Wachsmuth and Springer. Genotype: *Heterocrinus laxus* Hall.

*Ohioocrinus* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 132, Rev. Pal., pt. 3, p. 208.—Miller, N. A. Geol. Pal., 1889, p. 263.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1890, pp. 378, 379.—Bather, Ann. Mag. Nat. Hist., ser. 6, 5, 1890, pl. 15, fig. 6; Kongl. Sv. Vet. Akad. Handl., 25, No. 2, 1893, p. 20.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 152.—Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 27; Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 212.

**Ohlocrinus bellevillensis** (W. R. Billings).

*Heterocrinus bellevillensis* W. R. Billings, Trans. Ottawa Field Nat. Club, 1, 1883, p. 49, pl. figs.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1890, p. 392, pl. 10, fig. 8.—Bather, Geol. Mag., dec. 4, 6, p. 33, fig. 5; Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 146, fig. 58, 2. *Stenocrinus bellevillensis* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 132 (Rev. Pal., pt. 3, sec. 2, p. 208).

*Ohlocrinus bellevillensis* Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 26. Trenton (Curdsville): Belleville and Kirkfield, Ontario.

**Ohlocrinus compactus** (Meek).

*Heterocrinus constrictus* var. *compactus* Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 4, pl. 1, fig. 11.

*Ohlocrinus constrictus* var. *compactus* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 133 (Rev. Pal., pt. 3, sec. 2, p. 209).

*Ohlocrinus compactus* Miller, N. A. Geol. Pal., 1889, p. 263, fig. 371.

*Heterocrinus constrictus* var. *contractus* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 293 (Rev. Pal., pt. 1, p. 70).

*Heterocrinus isodactylus* Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 279, fig. 21.—Bather, Geol. Mag., dec. 4, 6, 1899, p. 41, footnote, fig. 17.

Maysville (Corryville): Cincinnati, Ohio, and vicinity.

**Ohlocrinus constrictus** (Hall).

*Homocrinus constrictus* Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, p. 304 (nom. nud.).

*Heterocrinus constrictus* Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 210, pl. 5, figs. 13, 14 (adv. sheets, 1871).—Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 3, pl. 1, figs. 10a, b (and 11?).—Miller, Jour. Cincinnati Soc. Nat. Hist., 7, 1884, p. 18, pl. 4, figs. 4a-b.

*Ohlocrinus constrictus* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 133 (Rev. Pal., pt. 3, sec. 2, p. 209).—Miller, N. A. Geol. Pal., 1889, p. 263, fig. 372.

*Heterocrinus vaupeli* Wetherby, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 82, pl. 2, figs. 1, 1a.

*Ohlocrinus vaupeli* Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 27 (gen. ref.).

Maysville (Corryville): Cincinnati, Ohio, and vicinity.

*OHLOCRINUS CONSTRICTUS* var. *COMPACTUS* Wachsmuth and Springer. See *Ohlocrinus compactus*.

**Ohlocrinus exilis** Foerste.

*Ohlocrinus exilis* Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 125, pl. 1, fig. 7.

Trenton (Upper): Near Rogers Gap, Kentucky.

**Ohlocrinus laxus** (Hall).

*Homocrinus laxus* Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, p. 304 (nom. nud.).

*Heterocrinus laxus* Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 211, pl. 5, fig. 15 (adv. sheets, 1871).—Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 14, pl. 1, figs. 8a, b.

*Ohlocrinus laxus* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 133 (Rev. Pal., pt. 3, sec. 2, p. 209).

*Heterocrinus* (*Iocrinus*) *cehanus* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 175, pl. 5.

**Ohioerluus laxus**—Continued.

Heterocrinus oëhanus Miller, Cat. Amer. Pal. Foss. (ed. 2), 1883, p. 283.

Ohioerinus oëhanus Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 133 (Rev. Pal., pt. 3, sec. 2, p. 209).

Maysville (Fairmount): Cincinnati, Ohio, and vicinity.

*Plesiotype*.—Cat. No. 42304, U.S.N.M. (*cotype* of *H. oëhanus*).

OHIOCRINUS OËHANUS Wachsmuth and Springer. See *Ohioerinus laxus*.

OHIOCRINUS VAUPELI Springer. See *Ohioerinus constrictus*.

**OLDHAMIA** Forbes.

Genotype: *O. radiata* Forbes.

*Oldhamia* Forbes, Jour. Geol. Soc. Dublin, 4, 1848, p. 20.

OLDHAMIA FRUTICOSA Hall. See *Chætomorpha? prima* and *Callithamnopsis fruticosa*.

**Oldhamia (Murchisonites) occidens** Walcott.

*Oldhamia (Murchisonites) occidens* Walcott, Proc. U. S. Nat. Mus., 17, 1894, p. 314, fig. 1.—Ruedemann, Bull. New York State Mus., 133, 1909, p. 210, fig. 14.

Upper Cambrian or Lower Ordovician: Nassau Township, Rensselaer County, New York.

*Cotypes*.—Cat. No. 33669, U.S.N.M.

OLENUS ARCUATUS Goldfuss. See *Triarthrus becki*.

OLENUS (PARABOLINELLA) LIMITIS Brögger. See *Parabolinella limitis*.

OLENUS? LOGANI Devine. See *Loganellus logani*.

OLENUS (SPHÆROPTHALMUS) PECTEN Salter. See *Ctenopyge pecten*.

OLENUS (PARABOLINA) SPINULOSA Salter. See *Parabolina spinulosa*.

OLENUS TRIARTHURUS Goldfuss. See *Triarthrus becki*.

OLENUS UNDULOSTRIATUS Hall. See *Proetus undulostriatus*.

**OMOSPIRA** Ulrich.

Genotype: *O. laticincta* Ulrich.

*Murchisonia* (part) Hall, Salter and Billings

*Omospira* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, pp. 932-944.—Koken, Neues Jahrb. Min., Geol. Pal., 1, 1898, p. 15.

*Ormospira* Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 631.

**Omospira alexandra** (Billings).

*Murchisonia ventricosa* Salter (not Hall, 1847), Can. Org. Rem., Geol. Surv. Canada, dec. 1, 1859, p. 23; pl. 5, figs. 2, 2a, 3.

*Murchisonia Alexandra* Billings, Geol. Surv. Canada, Pal. Foss., 1, 1865, p. 172.

*Omospira alexandra* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 946, pl. 70, figs. 66 and 67.

*Ormospira alexandra* Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 631, fig. 854d.

Black River (Leray): Pauquette's Rapids, Ottawa River, Canada; Mercer County, Kentucky.

*Plesiotypes*.—Cat. Nos. 45943, 45944, U.S.N.M.

**Omospira laticincta** Ulrich.

*Omospira laticincta* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 945, pl. 70, figs. 64, 65.

**Omospira laticincta**—Continued.

*Omospira laticincta* Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 631, fig. 854b, c.

*Scalites laticinctus* Miller, N. A. Geol. Pal., 2d App., 1897, p. 770 (gen. ref.).

Black River (Lowville): Near Lebanon, Tennessee.

*Holotype*.—Cat. No. 45945, U.S.N.M.

**OMPHALOTROCHUS** Lindstrom. See *Poleumita* Clarke and Ruedemann.

**OMPHYMA** Rafinesque and Clifford. Genotype: *O. (Madrepora) turbinata* Fought.

*Omphyma* Rafinesque and Clifford, Ann. Sci. Phys. Bruxelles, 5, 1820, p. 234.—Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal., 1851 (Arch. Mus. Hist. Nat., 5), pp. 168, 400.—Pictet, Traité de Pal., 2d ed., 4, 1857, p. 456.—Milne-Edwards, Hist. Nat. Corall., 3, 1860, p. 394.—Lindstrom, Geol. Mag., 3, 1866, p. 359 (obiter), 411.—Salter, Cat. Camb. Sil. Foss., 1873, p. 113, 75.—Dybowski, Archiv. f. Naturf. Liv-, Ehst- und Kurl., 5, 1873, p. 337.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 117.—Zittel, Handb. Pal., 1, Munich, 1879, p. 230.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 341.—Miller, N. A. Geol. Pal., 1889, p. 198.—Sherzer, Amer. Geol., 7, 1891, pp. 290-295; Bull. Geol. Soc. Amer., 3, 1892, p. 277.—Nicholson, Rec. Geol. Surv. N. S. Wales, 4, 1894, p. 15.—Koken, Die Leitfossilien, Leipzig, 1896, p. 309.—Zittel-Eastman Textb. Pal., 1, 1900, p. 77; *ibid.*, 2d ed., 1913, p. 85.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 177.—Pocta, Syst. Sil. du Centre Boheme, 8, pt. 2, 1902, p. 137.

**Omphyma congregata** Billings.

*Omphyma congregata* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 93.

Niaganan: Huronia Point, Cockburn Island, Lake Huron.

**OMPHYMA DRUMMONDI** Billings. See *Omphyma verrucosa*.

**Omphyma eriphyle** (Billings).

*Cyathophyllum Eriphyle* Billings, Pal. Foss., Geol. Surv. Canada, 1, 1865, p. 111 (adv. sheets, 1862).

*Omphyma Eriphyle* Lambe, Ottawa Nat., 12, 1899, p. 243; Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 180, pl. 15, figs. 2, a, b.

?*Omphyma subturbinata* Milne-Edwards and Haime, British Foss. Corals, 1855, p. 288, pl. 68, figs. 1a-c.

Silurian: L'Anse a la Vieille, Bay of Chaleurs, Quebec.

**OMPHYMA STOKESI** Whitfield. See *Ptychophyllum stokesi*.

**OMPHYMA SUBTURBINATA** Milne-Edwards and Haime. See *Omphyma eriphyle*.

**Omphyma verrucosa** Rafinesque and Clifford.

*Omphyma verrucosa* Rafinesque and Clifford, Ann. des Sci. Phys. Bruxelles, 5, 1820, p. 125.—Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal., 1851 (Arch. du Mus. d'Hist. Nat., 5), p. 403.—Milne-Edwards, Hist. Nat. Corall., 3, 1860, p. 397.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 118, pl. 44, lower tier.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 104, figs. 8-11; pl. 105, fig. 11.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 178.

*Omphyma Drummondi* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 93.

**Omphyma verrucosa**—Continued.

Zaphrentis Bigsbyi Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 92.

Niagaran: Drummond's Island and Cockburn Island, Lake Huron; Louisville, Kentucky (Louisville); West Tennessee (Brownsport).

**ONCHOLICHAS** Schmidt. See *Arctinurus* Castelnau.

**ONCHOMETOPUS** Schmidt.

Genotype: *O. volborthi* Schmidt.

*Onchometopus* Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 8th ser., 6, 1898, pp. 11, 12, 28.—Raymond, Ann. Carnegie Mus., 7, 1910, p. 63; Trans. and Proc. Roy. Soc. Canada, 3d ser., 5, sec. 4, 1912, p. 115; Zittel-Eastman Textb. Pal., 1913, p. 719.

**Onchometopus emoryi** (Hall).

*Asaphus emoryi* Hall, Rep. U. S. Mexican Bound. Surv., Emory, 1857, pl. 20, fig. 5.

*Isotelus Emoryi* Walcott, Pal. Univ., 1st ser., fasc. 2, 1903, pl. 28.

Richmond: El Paso Texas.

*Holotype*.—Cat. No. 9824, U.S.N.M.

**Onchometopus obtusus** (Hall).

*Asaphus?* *obtusus* Hall, Pal. New York, 1, 1847, p. 24, pl. 4 (bis), fig. 14.—Emons, Amer. Geology, 1, pt. 2, 1855, p. 236, pl. 3, fig. 14.

*Isotelus obtusus* Raymond, Ann. Carnegie Mus., 3, 1905, p. 344, pl. 12, figs. 1, 2.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 291.

*Onchometopus obtusus* Raymond, 7th Rep. Vermont State Geol., 1910, p. 22, pl. 34, figs. 1, 2; pl. 38, figs. 2-4; Ann. Carnegie Mus., 7, 1910, p. 64, pl. 18, figs. 2-4.—Perkins, Rep. Vermont State Geol., 8th ser., 1912, pl. 18, fig. 2-4.—Raymond, Trans. and Proc. Roy. Soc. Canada, 3d ser., 5, sec. 4, 1912, p. 120, pl. 3, fig. 2.

Chazy (Day Point—Valcour): Chazy, Plattsburg, Valcour Island, etc., New York; Isle La Motte, Vermont.

**Onchometopus simplex** Raymond and Narraway.

*Onchometopus simplex* Raymond and Narraway, Ann. Carnegie Mus., 7, 1910, p. 51, pl. 16, figs. 6-8.

Black River: Straight River, Minnesota (Platteville); Franklin Forge, Pennsylvania.

**Onchometopus susæ** (Whitfield).

*Asaphus Susæ* (Calvin MS.) Whitfield, Geol. Wisconsin, 4, 1882, p. 236, pl. 5, fig. 3; pl. 10, fig. 8.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 160, fig.

*Asaphus* (*Isotelus*) *Susæ* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 231.

*Isotelus susæ* Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 708, text figs. 10, 11.

*Onchometopus susæ* Raymond, Proc. and Trans. Roy. Soc. Canada, 3d ser., 5, sec. 4, 1912, p. 118, pl. 2, fig. 1.

*Isotelus florencevillensis* Calvin, Ann. Rept. Geol. Surv. Iowa, 13, 1903, p. 46.

Richmond: Apple River, Illinois; East Selkirk, Manitoba; Iader and Spring Valley, Minnesota; Iowa.

*Plesiotypes*.—Cat. Nos. 1176, 41902, U.S.N.M.

**ONCHUS** Agassiz.

Genotype: *O. murchisoni* Agassiz.

*Onchus* Agassiz, Rech. Poissons Fossiles, 1837, p. 6. See Hay, Bull. U. S. Geol. Surv. No. 179, 1902, p. 326, for complete bibliography.

**Onchus clintoni** Claypole.

*Onchus clintoni* Claypole, Geol. Surv. Pennsylvania, Pref. to Rep. F 2, 1884, p. 12; Quart. Jour. Geol. Soc. London, 41, 1884, p. 61, fig. 6.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 495, figs.  
Cayugan (New Bloomfield): Perry County, Pennsylvania.

*ONCHUS DEWEYI* Hall. See *Ceratiocaris* (*Phasganocaris*?) *deweyi*.

**Onchus pennsylvanica** Claypole.

*Onchus pennsylvanicus* Claypole, Geol. Surv. Pennsylvania, Pref. to Rep. F 2, 1884, p. 12; Quart. Jour. Geol. Soc. London, 41, 1884, p. 61, fig. 5.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 495, figs.  
Cayugan (New Bloomfield): Perry County, Pennsylvania.

**ONCOCERAS** Hall.

Genotype: *O. constrictum* Hall.

*Oncoceras* Hall, Pal. New York, 1, 1847, p. 196.—D'Orbigny, Prodr. de Pal., 1, 1849, p. 5.—Woodward, Man. Mollusca, pt. 1, 1851, p. 90.—Saemann, Palæontographica, 3, 1852, pp. 157, 162.—Pictet, Traite de Pal., 2d ed., 2, 1854, p. 646.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 148.—Hall, Rep. Geol. Surv. Wisconsin, 1861, p. 43.—Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 86.—Barrande, Syst. Sil. du Centre Boheme, 2, pt. 1, 1867, p. 450.—Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 282.—Miller, N. A. Geol. Pal., 1889, p. 445.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 94.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 122.—Hyatt, Zittel-Eastman Textb. Pal., 1900, p. 530; 2d ed., 1913, p. 611.

**Oncoceras abruptum** Hall.

*Oncoceras abruptum* Hall, Rep. Supt. Geol. Surv. Wisconsin, 1861, p. 44.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 68, pl. 10, figs. 1-3.  
Black River (Platteville): Platteville and Beloit, Wisconsin.

**Oncoceras alceus** Hall.

*Oncoceras alceus* Hall, Rep. Sup. Geol. Surv. Wisconsin, 1861, p. 46.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 70, pl. 9, figs. 23-26.  
Black River (Platteville): Beloit, Wisconsin.

**Oncoceras amator** Billings.

*Oncoceras amator* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 59.  
Anticostian (Chicotte): Southwest Point, Anticosti.

**Oncoceras arcticum** Schuchert.

*Oncoceras arcticum* Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 172, pl. 14, figs. 4-7.  
Mohawkian: Head of Frobisher Bay.  
*Holotype*.—Cat. No. 28196, U. S. N. M.

**Oncoceras brevicurvatum** Whitfield.

*Oncoceras brevicurvatum* Whitfield, Ann. Rep. for 1879, Wisconsin, Geol. Surv., 1880, p. 59; Geol. Wisconsin, 4, 1882, p. 234, pl. 7, fig. 2 (*Cyrtoceras brevicurvatum* on plate).—Chamberlin, Geol. Wisconsin, 1, 1883, p. 159, fig.  
Black River (Platteville): near Beloit, Wisconsin.

**Oncoceras carveri** Clarke.

*Oncoceras carveri* Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 801, pl. 58, figs. 7-9.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 123, fig. 1366.  
Black River (Platteville): Minneapolis, Minnesota; Rockton, Illinois.

*Oncoceras constrictum* Billings. See *Poterioceras apertum*.

***Oncoceras constrictum* Hall.**

*Oncoceras constrictum* Hall, Pal. New York, 1, 1847, p. 197, pl. 41, figs. 6a-f, 7a-d; 3d Rep. New York State Cab. Nat. Hist., rev. ed., 1850, p. 180, pl. 3, fig. 3, doc. ed., p. 172.—Emmons, Amer. Geol., 1, pt. 2, 1855, p. 148, pl. 12, fig. 2.—Miller, N. A. Geol. Pal., 1889, p. 445, fig. 748.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 494, fig.

*Phragmoceras constrictum* Chapman, Expos. Min., Geol. Canada, 1864, p. 131, fig. 134.

*Poterioceras constrictum* Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 258.

*Cyrtoceras constrictum* Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 951 (gen. ref.).

Trenton: Middleville, Watertown, and Trenton Falls, New York.

Observation.—See *Nelimenia incognita* Castelnaud.

***Oncoceras douglassi* Clarke.**

*Oncoceras douglassi* Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 801, pl. 60, figs. 13-15.

Trenton (Prosser): Hader, Goodhue County, Minnesota.

***Oncoceras exiguum* (Billings).**

*Cyrtoceras exiguum* Billings, Can. Nat. Geol., 5, 1860, p. 172, figs. 17-18; Geol. Canada, Geol. Surv. Canada, 1863, p. 150, fig. 109.

*Clinoceras exiguum* Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 171.

*Oncoceras exiguum* Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 798, pl. 58, figs. 10, 11.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 124, fig. 1368.

Trenton: Near L'Original, Canada; Fountain, Minnesota; Baffin Land.

***Oncoceras expansum* Hall.**

*Oncoceras expansum* Hall, Pal. New York, 2, 1852, 2, p. 337, pl. 77A, figs. 2a, b. Cayugan (Cobleskill): Schoharie, New York.

***Oncoceras fragile* (Billings).**

*Cyrtoceras fragile* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 59.

Gamachian (Ellis Bay): Gamache Bay, Anticosti.

***Oncoceras futile* Billings.**

*Oncoceras futile* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 59. Anticostian (Jupiter River): East of Jupiter River, Anticosti.

***Oncoceras gibbosum* Hall.**

*Oncoceras gibbosum* Hall, Pal. New York, 2, 1852, p. 13, pl. 4 (bis.), figs. 6a, b, c. Upper Medinan: Lockport, New York.

*ONCOCERAS GIBBOSUM* Whiteaves. See *Oncoceras whiteavesi*.

***Oncoceras huronense* (Billings).**

*Cyrtoceras Huronense* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 176, text fig. 158a, b.

Black River: St. Joseph Island, Lake Huron.

***Oncoceras lycus* (Hall).**

*Orthoceras lycus* Hall, Rep. Supt. Geol. Surv. Wisconsin, 1861, p. 45.

*Oncoceras lycus* Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 69, pl. 9, figs. 13, 14.—Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 799, pl. 58, figs. 1-3.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 123, fig. 1365.

Black River (Platteville): Janesville, Wisconsin; Preston and Minneapolis, Minnesota.

**Oncoceras magnum** Whiteaves.

Oncoceras magnum Whiteaves, Trans. Royal Soc. Canada, 7, sec. 4, 1890, p. 79, pl. 15, fig. 1; Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 220.  
Black River or Richmond: East Selkirk, Manitoba.

**Oncoceras magnum intermedium** Whiteaves.

Oncoceras (magnum? var.) intermedium Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 221, fig. 13.  
Black River or Richmond: Little Black Island, Lake Winnipeg, Manitoba.

ONCOCERAS MANITOBENSE Clarke. See *Cyrtoceras manitobense*.

**Oncoceras minnesotense** Clarke.

Oncoceras minnesotense Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 798, pl. 58, figs. 16-18; fig. 10.  
Trenton (Prosser): Hader, Stewartville, etc., Minnesota.

ONCOCERAS MUMIAFORME Whitfield. See *Clinoceras mumiaforme*.

**Oncoceras orcas** (Hall).

Cyrtoceras orcas Hall, Rep. Sup. Geol. Surv. Wisconsin, 1862, p. 43.  
Oncoceras Orcas Chamberlin, Geol. Wisconsin, 1, 1883, p. 194, fig.—Hall, 20th Rep. New York State Cab. Nat. Hist., 1868 (extras, 1865), p. 350, pl. 17 (8), figs. 1, 2; rev. ed., 1870, p. 410, pl. 17, figs. 1, 2.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 124, fig. 1369.  
Niagaran (Racine): Racine and Waukesha, Wisconsin.

**Oncoceras ovooides** Hall.

Oncoceras ovooides Hall, Pal. New York, 3, 1859, p. 342, pl. 69, figs. 2a, 2b.  
Cayugan (Manlius): Herkimer County, New York.

**Oncoceras pandion** Hall.

Oncoceras pandion Hall, Rep. Supt. Geol. Surv. Wisconsin, 1861, p. 45; *ibid.*, 1862, p. 41, fig. 3.—Whitfield, Geol. Wisconsin, 4, 1882, p. 233, pl. 7, fig. 6.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 159, fig.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 69, pl. 9, figs. 20-22.—Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 802, pl. 58, figs. 4-6.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 123, fig. 1367.  
Black River (Platteville): Beloit and Janesville, Wisconsin; Cannon Falls, Minnesota.

**Oncoceras pettiti** Billings.

Oncoceras Pettiti Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 86, fig. 26.  
Niagaran (Lockport): Grimsby, Ontario.

**Oncoceras plebeium** Hall.

Oncoceras plebeium Hall, Rep. Sup. Geol. Surv. Wisconsin, 1861, p. 44.—Whitfield, Mem. Amer. Mus. Nat. Hist. 1, pt. 2, 1895, p. 68, pl. 9, figs. 15-19.  
Black River (Platteville): Beloit, Wisconsin.

**Oncoceras pristinum** Ruedemann.

Oncoceras pristinum Ruedemann, Bull. New York State Mus., 90, 1906, p. 503, pl. 34, figs. 1, 2.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 122, fig. 1364.  
Chazyan (Valcour): Chazy and Plattsburg, New York.



**Oncoceras subrectum** Hall.

Oncoceras subrectum Hall, Pal. New York, 2, 1852, p. 94, pl. 28, figs. 11a, b.  
Lower Clinton: Lockport, New York.

**Oncoceras teucer** Billings.

Oncoceras Teucer Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 86, fig. 25.

Niagaran (Lockport): Grimsby, Ontario.

**Oncoceras thales** Billings.

Oncoceras Thales Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 87.

Niagaran (Lockport): Grimsby, Ontario.

**ONCOCERAS TRENTONENSE** Lesley. See *Cyrtoceras trentonense*.

**Oncoceras tumidum** Schuchert.

Oncoceras tumidum Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 172, pl. 14, figs. 1-3.

Mohawkian: Head of Frobisher Bay, Baffin Land.

*Cotypes*.—Cat. No. 28120, U.S.N.M.

**Oncoceras vasiforme** Dwight.

Oncoceras vasiforme Dwight, Amer. Jour. Sci. Arts, 3d ser., 27, 1884, p. 257, pl. 7, figs. 10, 10a.

Canadian (Beekmantown): Rochdale, New York.

**Oncoceras whiteavesi** Miller.

Oncoceras gibbosum Whiteaves (not Hall, 1847), Trans. Roy. Soc. Canada, 7, sec. 4, 1890, p. 80, pl. 15, figs. 2, 3.

Oncoceras whiteavesi Miller, N. A. Geol. Pal., 1st App., 1892, p. 697.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 222.

Black River or Richmond: Lake Winnipeg, Manitoba.

**ONYCHOPTERUS** Clarke and Ruedemann. See *Eurypterus* subgenus *Onychopterus*.

**OOCERAS** Hyatt.

Genotype: *Cyrtoceras acinacies* Barrande.

Oonoceras Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1883, p. 280.

Ooceras Foord, Cat. Foss. Ceph. British Mus., 1, 1884, p. 262, footnote.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 125.—Hyatt, Zittel-Eastman Textb. Pal., 1900, p. 530; 2d ed., 1913, p. 610.

**Ooceras kirbyi** (Whitfield).

*Cyrtoceras* Kirby Whitfield, Bull. Amer. Mus. Nat. Hist., 2, 1889, p. 57, pl. 10, figs. 4-7.—Cleland, Bull. Amer. Pal., 3, 1900, p. 131 (259), pl. 17, figs. 3, 4.

Ooceras kirbyi Ruedemann, Bull. New York State Mus., 90, 1906, p. 495.

Canadian (Beekmantown): Beekmantown and Fort Hunter, New York.

**Ooceras(?) lativentrum** Ruedemann.

Ooceras(?) lativentrum Ruedemann, Bull. New York State Mus., 90, 14, 1906, p. 487, pl. 35, figs. 7-10, fig. 52.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 125, fig. 1370.

Chazyan (Valcour): Isle La Motte, Vermont; Valcour Island, New York.

**Ooceras(?) perkinsi** Ruedemann.

Ooceras(?) perkinsi Ruedemann, Bull. New York State Mus., 90, 1906, p. 499, pl. 34, figs. 4, 5, figs. 53-55.

Chazyan (Valcour): Isle La Motte, Vermont; Valcour Island and Chazy, New York.

**Ooceras(?) raei** (Whitfield).

*Cyrtoceras raei* Whitfield, Bull. Amer. Mus. Nat. Hist., 2, 1889, p. 58, pl. 10, figs. 8, 9.

*Ooceras(?) raei* Ruedemann, Bull. New York State Mus., 90, 1906, p. 496.

Canadian (Beekmantown): Beekmantown, New York.

**Ooceras seelyi** Ruedemann.

*Ooceras seelyi* Ruedemann, Bull. New York State Mus., 90, 1906, p. 496, pl. 38, figs. 7-11, fig. 51.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 125.

Chazy (Valcour): Isle La Motte, Vermont; near Chazy and Plattsburg, New York.

OPHILETA (part) of authors. See *Eccyliopterus Remele*.

**OPHILETA Vanuxem.**

Genotype: *O. complanata* Vanuxem.

*Ophileta Vanuxem*, Nat. Hist. New York, 3, 1842, p. 36.—Hall, Pal. New York, 1, 1847, p. 11.—Pictet, *Traité de Pal.*, 2d ed., 3, 1855, p. 154.—Salter, Geol. Surv. Canada, dec. 1, 1859, pp. 10, 16.—Hitchcock, Geol. Vermont, 1, 1861, p. 271.—Koken, *Neues Jahrb. Min., Geol. Pal.*, 6, Beilage-Band, 1889, p. 407; *ibid.*, 1, 1898, p. 23.—Miller, N. A. Geol. Pal., 1889, p. 413.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 656.

**Ophileta abdita** Billings.

*Ophileta abdita* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 189.

Canadian: Point Levis and Phillipsburg, Quebec.

**Ophileta alturensis** Sardeson.

*Ophileta alturensis* Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 98, pl. 5, figs. 3, 4.

Ozarkian (Oneota): Dresbach, Altura, and Mankato, Minnesota.

OPHILETA ANGULARIS Miller. See *Ophiletina angularis*.

**Ophileta bella** Billings.

*Ophileta? bella* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 310, fig. 301a-c.—Koken, *Neues Jahrb. Min., Geol. Pal.*, 6, Beilage-Band, 1889, p. 408.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 657, fig. 905.

*Helicotoma uniangulata* Billings, Canadian Nat. Geol., 4, 1859, p. 356 (loc. occ.).

*Ophileta uniangulata* Billings (not Hall), Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 246.

Canadian: Bedford, Stanbridge, etc., Quebec (Beekmantown): Cow Head, Newfoundland (Quebec—P).

**Ophileta compacta** Salter.

*Ophileta compacta* Salter, Quart. Jour. Geol. Soc. London, 15, 1859, p. 378, pl. 13, fig. 12.—Billings, Canadian Nat. Geol., 4, 1859, p. 356 (loc. occ.).—Salter, Geol. Surv. Canada, dec. 1, 1859, p. 16, pl. 3, figs. 1-3.—Chapman, Canadian Jour., n. s., 7, 1862, p. 120, fig. 121; *ibid.*, 8, 1863, p. 190, fig. 158.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 102, figs. 9a, b; p. 115, figs. 23 a, b.—Chapman, Expos. Min. Geol. Canada, 1864, p. 124, fig. 121; p. 162, fig. 158.—Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 246.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 499, figs.—Keyes, Missouri Geol. Surv., 5, 1894, p. 162.

Canadian (Beekmantown): Beauharnois, near Montreal, Quebec, etc.

Observation.—See *Ophileta complanata*.

**Ophileta complanata** Vanuxem.

*Ophileta complanata* Vanuxem, Nat. Hist. New York, Geol., 3, 1842, p. 36, fig. 2.—Emmons, *ibid.*, 2, 1842, p. 179, fig. 2.—Owen, Amer. Jour. Sci. Arts, 47, 1844, p. 357, 358, fig. 2.—Hall, Pal. New York, 1, 1847, p. 11, fig. 2, pl. 3, fig. 6.—Koken, Neues Jahrb. Min. Geol. Pal., 6, Beilage-Band, 1889, p. 477.—Whitfield, Bull. Amer. Mus. Nat. Hist., 2, 1889, p. 48, pl. 7, figs. 18–25.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 499, figs.—Cleland, Bull. Amer. Pal., 3, 1900, p. 124 (252).—Grabau and Shimer, N. A. Index Fossils, 1 (3), 1909, p. 656, fig. 904.—Bassler, Bull. Virginia Geol. Surv., 2a, 1909, pl. 3, figs. 1, 2.—Seely, Vermont State Geol. Rep., 7, 1910, pl. 60, figs. 1–3.—Cleland, Bull. Amer. Pal., 4, 1912, p. 15.

*Straparollus complanatus* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 157, pl. 5, fig. 2.

*Schizostoma complanatum* Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 561 (gen. ref.).

Canadian (Beekmantown): Mohawk Valley, Beekmantown, etc., New York; Pennsylvania, Maryland, Virginia, etc.

Observation.—The above synonymy and also that of *Ophileta compacta* is in need of revision, as several generic types are embraced under *O. compacta* alone.

**Ophileta complanata nana** Meek.

*Ophileta complanata* var. *nana* Meek, U. S. Geol. Expl., 40th Paral., 4, 1877, p. 17, pl. 1, figs. 1a–b.

Canadian: Ute Peak, south of Muddy Creek of Bear River, Utah.

**OPHILETA DISCUS** Cleland. See *Ophileta levata*.

**OPHILETA? DISJUNCTA** Billings. See *Eccyliopectus disjuncta*.

**Ophileta fausta** Sardeson.

*Ophileta fausta* Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 75, pl. 3, figs. 8, 9.

St. Peter: Highland Park, Minnesota.

**Ophileta levata** Vanuxem.

*Ophileta levata* Vanuxem, Nat. Hist. New York, Geol. 3, 1842, p. 36, fig. 1.—Emmons, *ibid.*, 2, 1842, p. 179, fig. 1.—Owen, Amer. Jour. Sci. Arts, 47, 1844, pp. 357, 358, fig. 1.—Hall, Pal. New York, 1, 1847, p. 11, fig. 1, pl. 3, figs. 4, 5.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 500, fig.—Cleland, Bull. Amer. Pal., 4, 1903, p. 16.

*Ophileta discus* Cleland, Bull. Amer. Pal., 3, 1900, p. 124 (252), pl. 15, figs. 5, 6. *Straparollus levatus* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 157, pl. 5, fig. 1. *Schizostoma levatum* Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 561 (gen. ref.).

Canadian (Little Falls): Canajoharie, Tribes Hill, Little Falls, etc., New York.

**Ophileta nerine** Billings.

*Ophileta Nerine* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 245, figs. 232a, b.—Miller, N. A. Geol. Pal., 1889, p. 414, fig. 689.

Canadian (Quebec—F): Bay of St. John, Newfoundland.

**OPHILETA OTTAWAENSIS** Billings. See *Eccyliopectus ottawaensis*.

**OPHILETA OWENANA** Meek and Worthen. See *Eccyliopectus owenanus*.

**Ophileta profunda** Billings.

*Ophileta profunda* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 188.

Ozarkian? (Levis—erratics): Point Levis, Quebec.

**OPHILETA SORDIDA** Lesley. See *Maclurites sordida*.

**OPHILETA SUBLAXA** Miller. See *Ophiletina sublaxa*.

**OPHILETA UNIANGULATA** Billings. See *Ophileta bella*.

**OPHILETINA** Ulrich and Scofield. Genotype: *O. sublaxa* Ulrich and Scofield.  
*Ophiletina* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1028.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 657.

**Ophiletina angularis** Ulrich and Scofield.

*Ophiletina angularis* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1031, pl. 74, figs. 43-46.

*Ophileta angularis* Miller, N. A. Geol. Pal., 2d App., 1897, p. 769 (gen. ref.).

Black River (Decorah): Near Cannon Falls, Minnesota.

*Holotype*.—Cat. No. 45946, U.S.N.M.

**Ophiletina sublaxa** Ulrich and Scofield.

*Ophiletina sublaxa* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1030, pl. 74, figs. 40-42 and 47.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 657, fig. 906a, b.

*Ophileta sublaxa* Miller, N. A. Geol. Pal., 2d App., 1897, p. 769 (gen. ref.).

Black River (Platteville): Minneapolis, Minnesota; Mineral Point, Wisconsin; Dixon, Illinois.

*Cotypes*.—Cat. No. 45947, U.S.N.M.

**Ophiletina sublaxa depressa** Ulrich and Scofield.

*Ophiletina sublaxa* var. *depressa* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1030, pl. 74, fig. 42.

Stones River (Murfreesboro): Murfreesboro, Tennessee.

*Holotype*.—Cat. No. 46070, U.S.N.M.

**Ophiletina sublaxa sequens** Ulrich and Scofield.

*Ophiletina sublaxa* var. *sequens* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1031.

Trenton (Prosser): Wykoff, Minnesota

*Holotype*.—Cat. No. 45948, U.S.N.M.

**OPISTHOPTERA** Meek.

Genotype: *Ambonychia* (*Megaptera*) *casei* Meek and Worthen.

*Opisthoptera* Meek, Proc. Acad. Nat. Sci. Philadelphia, 1872, p. 320, footnote; Geol. Surv. Ohio Pal., 1, 1873, p. 131, footnote.—White, Amer. Jour. Sci. Arts, 3d ser., 9, 1875, pp. 318-320.—Ulrich, Geol. Surv. Ohio, 7, 1893, p. 642.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 982.

*Megaptera* Meek and Worthen, Proc. Chicago Acad. Nat. Sci., 1, 1866, p. 22. (Not *Megaptera* Gray, 1846.)—White, Cincinnati Quart. Jour. Sci., 1, 1874, p. 326.—Zittel, Handb. Pal., 2, 1881, p. 36.

**Opisthoptera alternata** Ulrich.

*Opisthoptera alternata* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 644, pl. 49, figs. 9-11. Richmond (Waynesville): Waynesville, Ohio.

*Cotypes*.—Cat. No. 46262, U.S.N.M.

**Opisthoptera ampla** Ulrich.

*Opisthoptera ampla* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 647, pl. 47, fig. 7.

Maysville (Fairmount): Cincinnati, Ohio.

*Holotype*.—Cat. No. 46263, U.S.N.M.

**Opisthoptera casei** (Meek and Worthen).

*Ambonychia* (Megaptera) *casei* Meek and Worthen, Proc. Chicago Acad. Sci., 1, 1866, p. 23; Geol. Surv. Illinois, 3, 1868, p. 337.

*Opisthoptera casei* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 643, pl. 49, figs. 1-5.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1011, pl. 47, figs. 1, 1a.

Richmond: Richmond, etc., Indiana (Whitewater); Waynesville and Clarksville, Ohio; near Lebanon, Kentucky.

*Plesiotypes*.—Cat. Nos. 46264, 46265, U.S.N.M.

**Opisthoptera concordensis** Foerste.

*Opisthoptera concordensis* Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 70, pl. 1, fig. 9.

Richmond (Arnheim): East of Concord, Kentucky.

**Opisthoptera extenuata** Ulrich.

*Opisthoptera extenuata* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 645, fig. 2a-d.

Richmond (Waynesville): Warren County, Ohio.

*Holotype*.—Cat. No. 46266, U.S.N.M.

**Opisthoptera fissicosta** (Meek).

*Ambonychia* (Megaptera) *casei*? Meek, Ohio Pal., 1, 1873, p. 133. (*fissicosta* suggested.)

*Opisthoptera fissicosta* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 644, pl. 49, figs. 9 and 11; p. 645, fig.

Richmond (Waynesville): Waynesville, Clarksville, etc., Ohio.

*Plesiotype*.—Cat. No. 46267, U.S.N.M. (Ulrich).

**Opisthoptera laticostata** Ulrich.

*Opisthoptera laticostata* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 646, pl. 47, fig. 6.

Richmond (Waynesville): Warren County, Ohio.

*Holotype*.—Cat. No. 46268, U.S.N.M.

**Opisthoptera notabilis** Ulrich.

*Opisthoptera notabilis* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 648, pl. 49, fig. 16.

Maysville (Fairmount): Cincinnati, Ohio.

*Holotype*.—Cat. No. 46269, U.S.N.M.

**Opisthoptera obliqua** Ulrich.

*Opisthoptera obliqua* Ulrich, Geol. Surv. Ohio, 7, 1893, pl. 49, figs. 6-8.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1012, pl. 47, figs. 2, 2b.

Richmond (Whitewater): Richmond, Indiana.

*Holotype*.—Cat. No. 46270, U.S.N.M.

ORBICULA? DEFORMATA Hall. See *Archinacella deformata*.

**Orbicula? excentrica** Emmons.

*Orbicula excentrica* Emmons, Amer. Geol., 1, pt. 2, 1855, p. 112, pl. 1, fig. 4.—

Barrande, Bull. Soc. Geol. France, 2d ser., 18, 1861, p. 300, pl. 5, fig. 17.—

Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 502, fig.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 277.

*Crania excentrica* Miller, N. A. Geol. Pal., 1889, p. 341.

Lower Martinsburg: Augusta County, Virginia.

Observation.—Probably an *Archinacella*.

ORBICULA? FILOSA Hall. See *Schizocrania filosa*.

ORBICULA LAMELLOSA Hall. See *Orbiculoidea lamellosa*.

ORBICULA PARMULATA Hall. See *Orbiculoidea parmulata*.

ORBICULA PRIMA Owen. See *Obolus matinalis*.

ORBICULA? SQUAMIFORMIS Hall. See *Pholidops squamiformis*.

ORBICULA? SUBTRUNCATA Hall. See *Pholidops subtruncata*.

ORBICULA TENUILAMELLATA Hall. See *Schizotreta tenuilamellata*.

ORBICULA TERMINALIS Emmons. See *Trematis terminalis*.

ORBICULA TRUNCATA Emmons. See *Orbiculoidea lamellosa*.

**ORBICULOIDEA** D'Orbigny. Genotype: *Orbicula morrisoni* Davidson.

*Orbiculoidea* D'Orbigny, Compt. Rend. de l'Acad. Sci., 25, 1847, p. 269; Prodrome de Pal., 1, 1850, p. 44.—Davidson, British Foss. Brach., Pal. Soc., 1853, p. 129.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 200.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 70.—Davidson, Mon. British Sil. Brach. Pal. Soc., 1866, p. 72.—Dall, Bull. Mus. Comp. Zool., 3, 1871, p. 37; Amer. Journ. Conch., 7, 1871, p. 74.—Zittel, Handb. Pal., 1, 1880, p. 667.—Herrick, Bull. Sci. Lab. Denison Univ., 4, 1888, p. 12.—Miller, N. A. Geol. Pal., 1889, p. 356.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 125, fig. 64; p. 128, fig. 160; pp. 160, 168.—Beecher, Amer. Jour. Sci., 3d ser., 44, 1892, p. 148.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 363.—Beecher, Amer. Nat., 27, 1893, p. 600.—Hall and Clarke, 11th Ann. Rep. New York State Geol., 1894, p. 256.—Koken, Die Leitfossilien, Leipzig, 1896, p. 230, fig. 189, 3, 4.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 761.—Grabau, Bull. Buffalo Soc. Nat. Sc., 6, 1899, p. 183.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 204.—Schuchert, Zittel-Eastman Textb. Pal., 1900, p. 310; *ibid.*, 2d ed., 1913, p. 377.

*Discina* Hall (not Lamarck), Pal. New York, 3, 1859, p. 159; 16th Rep. New York State Cab. Nat. Hist., 1863, p. 130; 1867, p. 15.

ORBICULOIDEA CONICA Dwight. See *Schizotreta conica*.

ORBICULOIDEA FILOSA Emmons. See *Schizocrania filosa*.

**Orbiculoidea harti** Clarke.

*Orbiculoidea Hartii* Clarke, Arch. Mus. Nac. Rio de Janeiro, 10, author's Engl. ed., 1900, p. 7, pl. 1, figs. 5, 6.

Silurian: Rio Trombetas, Brazil.

**Orbiculoidea lamellosa** (Hall).

*Orbicula lamellosa* Hall (not Broderip, 1833), Pal. New York, 1, 1847, p. 99, pl. 30, fig. 10.

*Orbiculoidea lamellosa* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 4E, fig. 12.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 364, pl. 29, fig. 25.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 279.—Weller, Geol. Surv. New Jersey, Pal. 3, 1903, p. 147, pl. 9, figs. 1, 2.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 204.

*Discina lamellosa* Hitchcock, Geol. Vermont, 1, for 1861, 1862, p. 293, fig. 197.

*Orbicula truncata* Emmons, Amer. Geology, 3, 1855, p. 200, fig. 62.

*Discinia truncata* Emmons, Manual Geol., 1860, p. 99.

*Discina circe* Billings, Geol. Surv. Canada, Pal. Foss., 1, 1863, p. 51, fig. 55.—Miller, N. A. Geol. Pal., 1889, p. 344, fig. 561.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 209, fig.—Billings, Geol. Canada, 1863, p. 159, fig. 125.

**Orbiculoidea lamellosa**—Continued.

Trenton: Middleville, Lowville, etc., New York; Belleville and Ottawa, Ontario; Jacksonburg, New Jersey.

?Richmond (Maquoketa): Spring Valley, Minnesota.

**Orbiculoidea numulus** Hall and Clarke.

*Orbiculoidea numulus* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 178, pl. 4E, fig. 14; 48th Rep. New York State Mus., 2, 1895, p. 333, pl. 2, fig. 11; 14th Rep. State Geol. New York for 1894, 1897, p. 333, pl. 2, fig. 11.

Cayugan (Manlius): Marshall, New York.

ORBICULOIDEA (SCHIZOTRETA) OVALIS Hall and Clarke. See *Schizotreta ovalis*.

**Orbiculoidea parmulata** (Hall).

*Orbicula parmulata* Hall, Geol. New York; Rep. 4th Dist., 1843, p. 48, fig. 4.—Owen, Amer. Jour. Sci. Arts, 48, 1845, p. 300, fig. 4.—Hall, Pal. New York, 2, 1852, pl. 4, fig. 3.

*Discina parmulata* Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 5, fig. 4.

*Orbiculoidea parmulata* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 281.

Upper Median: Medina and Lockport, New York.

**Orbiculoidea schucherti** Swartz.

*Orbiculoidea schucherti* Swartz, Maryland Geol. Surv., Low. Dev., 1913, p. 292, pl. 53, figs. 6, 7.

Helderbergian (Keyser): Dawson, Maryland.

**Orbiculoidea subplana** (Hall).

*Discina tenuilamellata* var. *subplana* Hall, Canadian Nat. Geol., 5, 1860, p. 144.—Dawson, Acadian Geol., 3d ed., 1878, p. 595.

*Orbiculoidea subplana* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 281.

Silurian: Arisaig, Nova Scotia.

ORBICULOIDEA (SCHIZOTRETA?) TENUILAMELLATA Hall and Clarke. See *Schizotreta tenuilamellata*.

**Orbiculoidea tenuistriata** (Ulrich).

*Discina tenuistriata* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 96, pl. 4, fig. 10.

*Orbiculoidea tenuistriata* Schuchert, Bull. U. S. Geol. Surv., 87, p. 281.—Ruedemann, Bull. New York State Mus., 162, 1912, p. 91, pl. 4, fig. 2.

Eden: Covington, Kentucky (Economy); Frankfort Gulf, New York (Frankfort).

**Orbiculoidea truncata** Emmons.

*Orbiculoidea truncata* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 200, fig. 62.

Trenton: Middleville, New York.

Observation.—Not recognized. Probably a *Schizotreta*.

**Orbiculoidea vanuxemi** (Hall).

*Discina vanuxemi* Hall, Pal. New York, 3, 1859, p. 162, pl. 8, fig. 1.

*Orbiculoidea vanuxemi* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 282.

Cayugan (Manlius): Manlius-square, New York.

**ORBIGNYELLA** Ulrich and Bassler.

Genotype: *O. sublamellosa* Ulrich and Bassler.

*Orbignyella* Ulrich and Bassler, Smiths. Misc. Coll. (quart. issue), 47, 1904, p. 18.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 26; Bull. U. S. Nat. Mus., 77, 1911, pp. 181, 182.

*Monticulipora* (part) Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, pp. 153, 232; Geol. Surv. Illinois, 8, 1890, pp. 370, 407.

**Orbignyella billingsi** (Foord).

Monticulipora Billingsi Foord, Contr. Micro-Pal. Cambro-Sil., 1883, p. 8, pl. 1, figs. 2-2c.

Orbignyella? billingsi Ulrich and Bassler, Smiths. Misc. Coll., 47, 1904, p. 19 (gen. ref.).

Trenton: Ottawa, Ontario.

**Orbignyella expansa** (Ringueberg).

Chætetes expansus Ringueberg, Bull. Buffalo Soc. Nat. Hist., 5, 1886, p. 20, pl. 2, fig. 17.

Orbignyella? expansus Ulrich and Bassler, Smiths. Misc. Coll., 47, 1904, p. 19 (gen. ref.).—Bassler, Bull. U. S. Geol. Surv. 292, 1906, p. 26, pl. 10, figs. 5-8.

Clinton (Rochester): Lockport, Niagara Gorge, and Rochester, New York; Grimsby, Ontario.

*Plesiotypes*.—Cat. No. 35541, U.S.N.M.

**Orbignyella lamellosa** (Ulrich).

Monticulipora lamellosa Ulrich, Geol. Surv. Illinois, 8, 1890, p. 408, pl. 32, figs. 4-4b.—J. F. James, Jour. Cincinnati Soc. Nat. Hist., 18, 1895, p. 83.

Orbignyella lamellosa Ulrich and Bassler, Smiths. Misc. Coll., Quart., 47, 1904, p. 20, pl. 6, fig. 10.

Richmond (Fernvale): Wilmington, Illinois.

Fragment of *holotype*.—Cat. No. 43303, U.S.N.M.

**Orbignyella magnopora** Bassler.

Orbignyella magnopora Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 27, pl. 10, figs. 9-12.

Clinton (Rochester): Grimsby, Ontario; Lockport and Rochester, New York.

*Holotype*.—Cat. No. 35537, U.S.N.M.

**Orbignyella sublamellosa** Ulrich and Bassler.

Orbignyella sublamellosa Ulrich and Bassler, Smiths. Misc. Coll., Quart., 47, 1904, p. 19, pl. 6, figs. 7-9.

\* Stones River (Pierce): Murfreesboro, Tennessee.

*Holotype*.—Cat. No. 43174, U.S.N.M.

**Orbignyella wetherbyi** (Ulrich).

Monticulipora wetherbyi Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 239, pl. 10, figs. 4-4b; 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 129.—James and James, Jour. Cincinnati Soc. Nat. Hist., 11, 1888, p. 24.—Ulrich, Contr. Micro-Pal. Cambro-Sil., pt. 2, 1889, p. 30; Geol. Minnesota, 3, 1893, p. 213, pl. 15, figs. 7, 8.—Whiteaves, Pal. Foss., 3, 1897, p. 162.

Orbignyella wetherbyi Ulrich and Bassler, Smiths. Misc. Coll., 47, 1904, p. 19 (gen. ref.).

Black River: High Bridge, Kentucky (Lowville); Minneapolis, Minnesota (Platteville); St. Andrews, Manitoba.

*Cotypes*.—Cat. No. 43690, U.S.N.M.

ORBITULITES RETICULATA Owen. See *Ischadites iowensis*.

ORIOSTOMA (part) Lindström. See *Poleumita* Clarke and Ruedemann.

**ORMATHICHNUS** Miller.

Genotype: *O. moniliformis* Miller.

Ormathichnus Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1880, p. 222.—James, *ibid.*, 8, 1885, pp. 160, 161.—Miller, N. A. Geol. Pal., 1889, p. 414.



**Ormathichnus moniliformis** Miller.

*Ormathichnus moniliformis* Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1884, p. 222, pl. 14, figs. 4, 5.

Eden (Economy): Walker Mill Road, Cincinnati, Ohio.

ORMOCERAS Stokes. See *Actinoceras* Bronn.

ORMOCERAS ANCEPS Chapman. See *Gonioceras anceps*.

ORMOCERAS BRONGNIARTI Owen. See *Actinoceras richardsoni*.

ORMOCERAS LYONI Hector. See *Actinoceras bigsbyi*.

ORMOCERAS MONILIFORME Hall. See *Loxoceras moniliforme*.

**ORMOCRINUS** Springer.

Genotype: *Centrocrinus tennesseensis* Worthen.

*Ormocrinus* Springer, Mon. Crin. Flex., Smith. Inst. (in press).

**Ormocrinus tennesseensis** (Worthen).

*Centrocrinus tennesseensis* Worthen, Geol. Surv. Illinois, 8, 1890, p. 95, pl. 14, fig. 1.

*Idiocrinus?* *tennesseensis* Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 206, pl. 18, fig. 11.

*Ormocrinus tennesseensis* Springer, Mon. Crin. Flex., Smith. Inst. (in press).

Niagaran (Brownsport): Near Clifton, Wayne County, Tennessee.

ORMOSPIRA Grabau and Shimer. See *Omospira* Ulrich.

**ORTHIDIUM** Hall and Clarke.

Genotype: *Orthis gemmicula* Billings.

*Orthidium* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 244; 11th Ann.

Rep. New York State Geol., 1894, p. 276.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 762.

**Orthidium gemmicula** (Billings).

*Orthis gemmicula* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 75, fig. 68 (adv. sheets 1862).

*Orthidium gemmicula* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 217, 244, pl. 7A, figs. 22-25.

Ozarkian? (Levis—erratic): Point Levis, Quebec.

**Orthidium lamellosum** Raymond.

*Orthidium lamellosa* Raymond, Amer. Jour. Sci., 4th ser., 20, 1905, p. 371; Ann. Carnegie Mus., 7, 1911, p. 248, pl. 36, figs. 17, 18; fig. 24.

Chazyan (Crown Point, Valcour): Valcour and Sloop Islands, Chazy and Crown Point, New York.

**ORTHIS** Dalman (emend. Hall and Clarke).

Genotype: *O. calligramma* Dalman

*Orthis* Dalman, Kongl. Svenska Vet. Akad. Handl., 1828, pp. 93, 96.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 192.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 417.—Hall and Clarke, 11th Ann. Rep. State Geol. Surv., 1894, p. 265.—Wysogorski, Zeit. d. d. geol. Gesell., 52, 1900, p. 225.—Grabau, Bull. New York State Mus., 9, 1901, p. 185; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 185.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 250.—Schuchert, Zittel-Eastman Textb. Pal., 1900, p. 319; 2d ed., 1913, p. 381.

*Orthis* of authors.

*Orthis* Emmons, Amer. Geol., 1, pt. 2, 1855, p. 193.—Billings, Canadian Nat. Geol., 1, 1856, p. 133.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 55.—Chapman, Canadian Jour., n. s., 3, 1858, p. 160; *ibid.*, 7, 1862, p. 111.—Hitchcock, Geol.

## Orthis of authors—Continued.

Vermont, 1, 1862, p. 294.—Chapman, Expos. Min. Geol. Canada, 1864, p. 114.—Hall, Pal. New York, 4, 1867, p. 33.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, pp. 19, 20.—Winchell, 8th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1880, p. 63.—Zittel, Handb. Pal., 1, Munich, 1880, p. 674.—Shaler, Fossil Brachiopoda of Ohio Valley, 1887, p. 18.—Herrick, Bull. Sci. Lab. Denison Univ., 4, 1888, p. 14.—Nettelroth, Kentucky Foss. Shells, Mem. Geol. Surv. Kentucky, 1889, p. 34.—Hall, Bull. Geol. Soc. Amer., 1, 1889, p. 19.—Miller, N. A. Geol. Pal., 1889, p. 356.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 185, 186; 11th Ann. Rep. New York State Geol., 1894, p. 264.—Koken, Die Leitfossilien, Leipzig, 1896, p. 235, figs. 195, 5.

ORTHIS (group of *O. plicatella*) Hall. See *Plectorthis* Hall and Clarke.

ORTHIS (group of *O. testudinaria*) Hall. See *Dalmanella* Hall and Clarke.

ORTHIS (ORUSIA) Walcott. See *Eoorthis* Walcott.

ORTHIS (PLECTORTHIS) Walcott. See *Eoorthis* Walcott.

ORTHIS (PLATYSTROPHIA) ACUMINATA James. See *Platystrophia acuminata*.

**Orthis(?) acuminata** Billings.

*Orthis?* *acuminata* Billings, Canadian Nat. Geol., 4, 1859, p. 440, fig. 19; Geol. Canada, 1863, p. 130, fig. 59.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 507, figs.—Raymond, Ann. Carnegie Mus., 7, 1911, p. 246, fig. 21.  
Chazyan (Aylmer): Caughnawaga, Canada.

ORTHIS (PLATYSTROPHIA) ACUTILIRATA Meek. See *Platystrophia acutilirata*.

ORTHIS ACUTILOBA Ringueberg. See *Bilobites acutilobus*.

**Orthis acutiplicata** Raymond.

*Orthis acutiplicata* Raymond, Amer. Jour. Sci., 20, 1905, p. 370; Ann. Carnegie Mus., 7, 1911, p. 237, pl. 35, figs. 8–10.  
Chazyan (Day Point): Valcour Island, New York.

ORTHIS ÆQUIVALVA Shaler. See *Rhipidomella ubris*.

ORTHIS ÆQUIVALVIS Hall. See *Plectorthis æquivalvis*.

ORTHIS ALATA Shaler. See *Orthis flabellites*.

*Orthis?* *alternans* Castelnau.

Not recognized.

*Orthis alternans* Castelnau, Essai Syst. Sil. l'Amerique Septentrionale, 1843, p. 38, pl. 14, fig. 2.

“Erratic block, Lake of the Woods.”

ORTHIS AMCENA Winchell. See *Pianodema amcena*.

ORTHIS ANNIEANA James. See *Platystrophia annieana*.

ORTHIS ANTICOSTIENSIS Shaler. See *Dinorthis* (*Plæsiomys*) *porcata anticostiensis*.

**Orthis? apicalis** (Billings).

*Orthis?* *apicalis* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 301, fig. 291.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 217.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 283.

Ozarkian?: Point Levis (Levis-erratics) and Island of Orleans, Quebec.

ORTHIS (DALMANELLA) ARCUARIA Hall and Clarke. See *Dalmanella arcuaria*.

ORTHIS ARMANDA Billings. See *Syntrophia?* *armanda*.

ORTHIS (PLECTORTHIS) ATAVA Walcott. See *Eoorthis atava*.

ORTHIS BARABUENSIS Winchell. See *Syntrophia barabuensis*.

ORTHIS BATTIS Billings. See *Hebertella battis*.

ORTHIS BELLARUGOSA Conrad. See *Hebertella bellarugosa*.

ORTHIS BELLARUGOSA Hall. See *Hebertella insculpta*.

ORTHIS BELLULA Meek. See *Pianodema bellula*.

**Orthis benedicti** Miller.

*Orthis benedicti* Miller, 17th Rep. State Geol. Indiana, 1891, p. 78, pl. 13, figs. 7-9.  
Niagaran (Waldron): Hartsville, Indiana.

ORTHIS BICOSTATUS Vanuxem. See *Reticularia bicostata*.

ORTHIS BIFORATA Nicholson. See *Platystrophia lynx*.

ORTHIS (PLATYSTROPHIA) BIFORATA Foerste. See *Platystrophia daytonensis* and *P. reversata*.

ORTHIS (PLATYSTROPHIA) BIFORATA var. ACUTILIRATA Lesley. See *Platystrophia acutilirata*.

ORTHIS (PLATYSTROPHIA) BIFORATA var. DENTATA Lesley. See *Platystrophia crassa*.

ORTHIS (PLATYSTROPHIA) BIFORATA var. LATICOSTATA Lesley. See *Platystrophia laticosta*.

ORTHIS (PLATYSTROPHIA) BIFORATA var. LYNX Meek. See *Platystrophia lynx*.

ORTHIS BIFORATA var. LYNX forma DAYTONENSIS Foerste. See *Platystrophia daytonensis*.

ORTHIS BIFORATA var. LYNX forma REVERSATA Foerste. See *Platystrophia reversata*.

ORTHIS BIFORATUS Billings. See *Platystrophia biforata*.

ORTHIS BILOBA Hall. See *Bilobites bilobus*.

ORTHIS BISULCATA Emmons. See *Cyclospira bisulcata*.

ORTHIS BOREALIS Meek. See *Hebertella frankfortensis*.

ORTHIS BOREALIS Billings. See *Hebertella borealis*.

**Orthis callactis amazonica** Clarke.

*Orthis callactis* var. *amazonica* Clarke, Arch. Mus. Rio de Janeiro, 10, author's  
Engl. ed., June, 1900, p. 9, pl. 1, figs. 17-21.

Silurian: Rio Trombetas, Brazil.

**Orthis calligramma** Kayser.

*Orthis calligramma* Kayser (not Davidson), *Palaeontographica*, Suppl. 3, 1876,  
pp. 18, 26, pl. 3, figs. 9-18.

Ordovician: Cordillere San Juan, Argentina.

Observation.—These shells appear to be more closely related to *O. plicatella*  
than to *O. calligramma* (Schuchert).

ORTHIS CALLIGRAMMA Foerste. See *Orthis flabellites*.

ORTHIS CALIGRAMMA var. DAVIDSONI Nicholson and Hinde. See *Orthis davidsoni*.

ORTHIS CALIGRAMMA var. DINORTHIS Foerste. See *Orthis flabellites dinorthis*.

ORTHIS CALIGRAMMA var. EUORTHIS Foerste. See *Orthis flabellites euorthis*.

ORTHIS (DINORTHIS) CALIGRAMMA var. FISSIPPLICATA Foerste. See *Orthis flabellites fissiplicata*.

ORTHIS CANALIS Hall. See *Dalmanella elegantula*.

**Orthis carausii** Salter.

*Orthis carausii* (Salter, MS.) Davidson, Geol. Mag. London, 5, 1868, p. 315, pl. 16, fig. 23.—Hoek, Neues Jahrb. Min. Geol., Pal., 34, 1912, p. 222.

*Orthis carausii*? Matthew, Trans. Royal Soc. Canada, 10, 1893, p. 102, pl. 7, fig. 7. Lowest Ordovician: England; near St. John, New Brunswick (Bretonian—Div. C 3a); Bolivia.

ORTHIS CARLEYI Hall. See *Dinorthis carleyi*.

ORTHIS CENTRILINEATA Hall. See *Dalmanella centrilineata*.

ORTHIS CENTROSA Miller. See *Platystrophia crassa*.

ORTHIS CHARLOTTE Winchell. See *Dinorthis pectinella*.

ORTHIS CIRCULARIS Winchell. See *Pianodema subæquata circularis*.

ORTHIS CIRCULARIS Owen. See *Rhipidomella circularis*.

ORTHIS CIRCULUS Hall. See *Rhipidomella circulus*.

ORTHIS CININNATIENSIS Miller. See *Orthis(?) pumila*.

ORTHIS CLYTIE Hall. See *Heterorthis clytie*.

ORTHIS COLORADOENSIS Shumard. See *Billingsella coloradoensis*.

ORTHIS COLORADOENSIS Meek. See *Eoorthis desmopleura*.

ORTHIS CONCINNA Hall. See *Dalmanella concinna*.

ORTHIS CONRADI Winchell. See *Pianodema subæquata conradi*.

**Orthis corinna** Billings.

*Orthis corinna* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 302, fig. 292.

*Orthis? corinna* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 217.

Canadian (Beckmantown): Stanbridge, Quebec.

ORTHIS CORPULENTA Sardeson. See *Dalmanella corpulenta*.

**Orthis costalis** Hall.

*Orthis costalis* Hall, Pal. New York, 1, 1847, p. 20, pl. 4, fig. 4a (not 4b-4c); 2d Ann. Rep. New York State Geol., 1883, pl. 34, fig. 35.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 221, 228, pl. 5, figs. 16-17.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 512, figs.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 250, fig. 300a-b.—Raymond, Ann. Carnegie Mus., 7, 1911, p. 235, pl. 35, fig. 4.

Middle Chazy or Black River: Chazy, New York.

ORTHIS COSTATA Hall. See *Orthis(?) pumila*.

ORTHIS COSTATA Miller. See *Platystrophia crassa*.

ORTHIS (PLATYSTROPHIA) CRASSA James. See *Platystrophia crassa*.

ORTHIS CRISPATA Emmons. See *Hebertella (Glyptorthis) crispata*.

ORTHIS CYCLUS James. See *Dalmanella emacerata*.

ORTHIS (PLATYSTROPHIA) CYPHA James. See *Platystrophia cypha*.

**Orthis davidsoni** Verneuil.

*Orthis davidsoni* Verneuil, Bull. Soc. Géol. de France, 2d ser., 5, 1848, p. 341, pl. 4, fig. 9.—Billings, Geol. Canada, 1863, p. 312, fig. 318.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 192, 193, 221, 228, pl. 5, figs. 5-8.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 512, figs.

*Orthis calligramma* var. *davidsoni* Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 144.—Nicholson, Pal. Prov. Ontario, 1875, p. 47, fig. 21g.  
Silurian: Europe; Island of Anticosti.

ORTHIS DAYTONENSIS Foerste. See *Hebertella daytonensis*.

ORTHIS (DINORTHIS) DEFLECTA Winchell and Schuchert. See *Dinorthis (Plæsiomys) deflecta*.

ORTHIS DEFORMIS Hall. See *Schuchertella deformis*.

**Orthis(?) delicatula** Billings.

*Orthis delicatula* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 217.

Chazyan (Quebec—N, P): Table Head, Pistolet Bay, and near Portland Creek, Newfoundland.

ORTHIS (PLATYSTROPHIA) DENTATA Meek. See *Platystrophia crassa*.

ORTHIS DESMOPLEURA Meek. See *Eoorthis desmopleura*.

ORTHIS (PLECTORTHIS) DESMOPLEURA NYMPHA Walcott. See *Eoorthis desmopleura nympha*.

ORTHIS DICHOTOMA Hall. See *Plectorthis dichotoma*.

ORTHIS DISPARILIS Billings. See *Orthis ignicula*.

ORTHIS DISPARILIS Conrad. See *Orthis tricenaria*.

ORTHIS DISPARILIS Owen. See *Dalmanella testudinaria*.

**Orthis disparilis** Kayser.

*Orthis disparilis* Kayser (not Conrad), Palæontographica, Suppl., 3, 1876, p. 26, pl. 3, figs. 4-8.

Ordovician: Potrero de los Angulos, etc., Argentina.

ORTHIS ELECTRA Billings. See *Dalmanella electra*.

ORTHIS ELECTRA var. *LÆVIS* Matthew. See *Dalmanella electra lævis*.

ORTHIS ELECTRA var. *MAJOR* Matthew. See *Dalmanella electra major*.

ORTHIS ELEGANTULA Dalman. See *Dalmanella elegantula*.

ORTHIS ELEGANTULA var. *PARVA* Foerste. See *Dalmanella elegantula parva*.

ORTHIS ELLA Hall. See *Plectorthis (Encuclodema) sordida*.

ORTHIS EMACERATA Meek. See *Dalmanella mecki*.

ORTHIS EMACERATA Sardeson. See *Dalmanella macrior*.

ORTHIS EMACERATA Hall. See *Dalmanella emacerata* and *D. emacerata brevicula*.

ORTHIS EMACERATA var. MULTISECTA Meek. See *Dalmanella multisecta*.

ORTHIS EQUIVALVIS Foerste. See *Plectorthis æquivalvis*.

ORTHIS? ERRATICA Hall. See *Zygospira erratica*.

**Orthis(?) eudocia** Billings.

*Orthis Eudocia* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 83, fig. 76 (adv. sheets, 1862).

Ozarkian? (Levis—erratics): Point Levis, Quebec.

**Orthis euryone** Billings.

*Orthis Euryone* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 78, fig. 71 (adv. sheets, 1862).—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 221, 228, pl. 5, fig. 4.

*Orthis euryone?* Matthew, Trans. Royal Soc. Canada, 1893, p. 101, pl. 7, fig. 5.

Canadian: Point Levis, Quebec (Levis—erratics); near St. John, New Brunswick (Bretonian—Div. C 3d).

ORTHIS EVADNE Billings. See *Dalmanella(?) evadne*.

ORTHIS FASCIATA Hall. See *Orthostrophia (Schizoramma) fasciata*.

ORTHIS FAUSTA Foerste. See *Hebertella fausta*.

ORTHIS (HEBERTELLA) FAUSTA var. SQUAMOSA Foerste. See *Hebertella fausta*.

ORTHIS (DALMANELLA) FERTILIS Bassler. See *Dalmanella fertilis*.

ORTHIS FISSICOSTA Hall. See *Plectorthis fissicosta*.

ORTHIS FISSIPLICA Roemer. See *Orthostrophia (Schizoramma) fissiplica*.

ORTHIS FLABELLA Hall. See *Orthis flabellites*.

ORTHIS FLABELLA Foerste. See *Orthis flabellites militaris*.

**Orthis flabellites** Foerste.

*Orthis flabellulum?* Hall (not Sowerby), Geol. New York; Rep. 4th Dist., 1843, p. 105, fig. 5.

*Orthis flabellulum* var. Hall, Pal. New York, 2, 1852, pp. 254, 255, pl. 52, figs. 6, 7.

*Orthis flabellulum* Billings, Canadian Nat. Geol., 1, 1856, p. 136, pl. 2, fig. 6.

*Orthis flabella* Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 34, figs. 41, 42; p. 35, figs. 6-8.

*Orthis calligramma* Foerste (not Dalman), Proc. Boston Soc. Nat. Hist., 24, 1890, p. 308, pl. 6, figs. 4, 5.

*Orthis (Dinorthis) calligramma* Foerste, Geol. Ohio, 7, 1895, p. 570, pl. 25, figs. 12a, 12b; pl. 31, figs. 4, 5; pl. 37A, fig. 20.

*Orthis flabellites* Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 311.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 221, 227, pl. 5, figs. 37-41; pl. 20, fig. 1.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 286.—Grabau, Bull. New York State Mus., 45, 1901, p. 186, fig. 94; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 186, fig. 94.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 231, pl. 20, fig. 20.—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 432, pl. 2, figs. 3-6, 11.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 251, fig. 302.—Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 74, pl. 3, fig. 43.

**Orthis flabellites**—Continued.

*Platystrophia flabella* Hall, 36th Rep. New York State Mus. Nat. Hist., 1884, p. 75, pl. 3, fig. 5.

*Orthis alata* Shaler, Bull. Mus. Comp. Zool., 4, 1865, p. 66.

Niagaran: Lockport, Rochester, etc., New York; Ontario (Rochester); Osgood, etc., Indiana (Osgood); Island of Anticosti (Anticostian); Kentucky; Ohio; Wisconsin, etc.

*Plesiotype*.—Cat. No. 51349, U.S.N.M.

**Orthis flabellites dinorthis** (Foerste).

*Orthis calligramma* var. *dinorthis* Foerste, Geol. Surv. Ohio, 7, 1895, p. 572.

Upper Medinan (Brassfield): Dayton, Ohio.

**Orthis flabellites euorthis** (Foerste).

*Orthis calligramma* var. *euorthis* Foerste, Geol. Surv. Ohio, 7, 1895, p. 572.

Upper Medinan (Brassfield): Dayton, Ohio.

**Orthis flabellites fssiplicata** (Foerste).

*Orthis* (*Dinorthis*) *calligramma* var. *fssiplicata* Foerste, Ohio Geol. Surv., 7, 1895, pp. 572, 573, pl. 37a, figs. 20a, b.

*Orthis flabellites* var. *fssiplicata* Savage, Bull. Geol. Surv., Illinois, 23, 1913, p. 75, pl. 4, fig. 7.

Upper Medinan: Dayton, Ohio (Brassfield); Louisiana, near Buffalo Creek, Pike County, Missouri; Hamburg, Illinois (Edgewood).

**Orthis flabellites militaris** Foerste.

*Orthis flabella* Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 82, pl. 13, fig. 12.

*Orthis flabellites militaris* Foerste, *ibid.*, 14, 1909, p. 75.

Upper Medinan (Brassfield): Soldiers' Home, Dayton, Ohio.

**Orthis flabellites spania** Hall and Clarke.

*Orthis flabellites* var. *spania* Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pl.

84, figs. 10; 48th Rep. New York State Mus., 2, for 1895, 1897, p. 339, pl. 4,

fig. 4; 14th Rep. State Geol. New York for 1894, 1897, p. 339, pl. 4, fig. 4.

Niagaran (Racine): Near Milwaukee, Wisconsin.

ORTHIS FLABELLULUM? Hall. See *Orthis flabellites*.

ORTHIS FLABELLULUM Nettelroth. See *Orthis nettelrothi*.

ORTHIS FRANKFORTENSIS James. See *Hebertella frankfortensis*.

ORTHIS (DALMANELLA) FREITANA Clarke. See *Dalmanella freitana*.

ORTHIS FUTILIS Sardeson. See *Dalmanella futilis*.

ORTHIS GEMMICULA Billings. See *Orthidium gemmicula*.

ORTHIS GIBBOSA Billings. See *Pianodema subaequata gibbosa* and *Hebertella vulgaris*.

**Orthis(?) glypta** Hall and Clarke.

*Orthis?* *glypta* Hall and Clarke, Pal. New York, 8, pt. 2, 1895, p. 359, pl. 84, figs.

8, 9; 48th Rep. New York State Mus., 2, for 1895, 1897, p. 338, pl. 4, figs. 5, 6;

14th Rep. State Geol. New York for 1894, 1897, p. 338, pl. 4, figs. 5, 6.

Niagaran (Racine): Near Milwaukee, Wisconsin.

ORTHIS HAMBURGENSIS Walcott. See *Dalmanella hamburgensis*.

**Orthis hippolyte** Billings.

*Orthis hippolyte* Billings, Pal. Fossils, 1, 1865, p. 81, fig. 73; p. 218 (adv. sheets, 1862).—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 217, 221, 228.

*Orthis hippolyte?* Meek, 6th Ann. Rep. U. S. Geol. Surv. Terr., 1873, p. 464.

Canadian: Point Levis and Phillipsburg, Quebec; Cow Head, Newfoundland; near Malade City, Utah.

**Orthis(?) holstoni** Safford.

*Orthis? holstoni* (Safford MS.) Hall and Clarke, Pal. New York, 7, pt. 1, 1892, pp. 218, 340, pl. 5A, figs. 35-37; 48th Rep. New York State Mus., 2, for 1895, 1897, p. 339, pl. 4, figs. 19-21; 14th Rep. State Geol. New York for 1894, 1897, p. 339, pl. 4, figs. 19-21.—Wysogorski, Zeits. d. d. geol. Gesell., 52, 1900, p. 227, footnote.

Chazyan (Ottosee): Near Knoxville, Tennessee.

**Orthis humboldti** D'Orbigny.

*Orthis Humboldtii* D'Orbigny, Voyage l'Amerique Merid., 3, pt. 4, 1842, p. 27; ibid., 8, Atlas, 1847, pl. 2, figs. 16-20.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 287.

Silurian: Rio Grande, Province de Valle Grande, Bolivia.

ORTHIS HURONIENSIS Castelnau. See *Rafinesquina alternata*.

ORTHIS HYBRIDA Sowerby. See *Rhipidomella hybrida*.

**Orthis ignicula** Raymond.

*Orthis disparilis* Billings (not Conrad), Canadian Nat. Geol., 4, 1859, p. 440, figs. 20 a, b.

*Orthis ignicula* Raymond, Amer. Jour. Sci., 20, 1905, p. 369; Ann. Carnegie Mus., 7, 1911, p. 236, pl. 35, figs. 5-7, figs. 10, 11.

Chazyan (Crown Point): Valcour Island, New York.

ORTHIS IGNOTA Sardeson. See *Dalmanella ignota*.

ORTHIS IMPERATOR Billings. See *Hebertella imperator*.

ORTHIS INCURVATA Castelnau. See *Strophomena incurvata*.

ORTHIS INFLATA? James. See *Platystrophia acutilirata senex*.

ORTHIS INSCULPTA Hall. See *Hebertella insculpta*.

**Orthis interplicata** Foerste.

*Orthis interplicata* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 76, pl. 3, fig. 44.

Clinton (Osgood): New Marion, Indiana.

ORTHIS INTERSTRIATA Hall. See *Schuchertella interstriata*.

ORTHIS IPHIGENIA Billings. See *Dinorthis (Plæsiomys) iphigenia*.

ORTHIS JAMESI Hall. See *Plectorthis jamesi*.

ORTHIS (PLECTORTHIS) JOHANNENSIS Walcott. See *Eoorthis johannensis*.

ORTHIS JUGOSA James. See *Dalmanella meeki*.

ORTHIS KANKAKENSIS McChesney. See *Plectorthis (Austinella) kankakensis*.

ORTHIS KASSUBÆ Winchell. See *Pianodema subæquata perveta*.

ORTHIS KENNICOTTI McChesney. See *Dinorthis carleyi*.



**Orthis lamellosa** Twenhofel.

*Orthis lamellosa* Twenhofel, Bull. Victoria Mem. Mus., 3, 1914, p. 24, pl. 1, figs. 1-3.

Gamachian (Ellis Bay): Ellis Bay, Anticosti.

**ORTHIS LATICOSTA** Meek. See *Platystrophia laticosta*.

**Orthis laurentina** (Billings).

*Orthis laurentina* Billings, Geol. Surv. Canada, Rep. for 1856, 1857, p. 297; Pal. Foss., 1, 1865, Geol. Surv. Canada, p. 133, fig. 115 (adv. sheets 1862).—Shaler, Mem. Geol. Surv. Kentucky, 1, 3d Mem., 1876, p. 41.

*Billingsella? laurentina* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 194, 231, 238, pl. 7A, figs. 1-6.

Gamachian (Ellis Bay): Junction Cliff, Anticosti.

**ORTHIS LENTICULARIS** Davidson. See *Eoorthis (Orusia) lenticularis*.

**ORTHIS LENTICULARIS** var. **ATRYPOIDES** Matthew. See *Eoorthis (Orusia) lenticularis atrypoides*.

**ORTHIS LENTICULARIS** var. **LYNCIOIDES** Matthew. See *Eoorthis (Orusia) lenticularis lyncioides*.

**ORTHIS LENTICULARIS** **STROPHOMENOIDES** Matthew. See *Eoorthis (Orusia) lenticularis*.

**Orthis(?) leptænoides** Emmons.

*Orthis leptænoides* Emmons, Geol. New York, Rep. 4th Dist., 1842, p. 396, fig. 1.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 521.—Schuchert, Bull. U. S. Geol. Surv. 87, 1897, p. 288.

Trenton: New York.

Observation.—Undefined and figure too poor for identification.

**ORTHIS(?) LINNEYI** James. See *Orthorhynchula linneyi*.

**ORTHIS LONENSIS** Walcott. See *Hebertella lonensis*.

**ORTHIS (PLÆSIOMYS) LORICULA** Hall. See *Dinorthis (Plæsiomys) deflecta*.

**ORTHIS LUNATA** Sowerby. See *Dalmanella lunata*.

**ORTHIS LYNX** of authors. See *Platystrophia lynx* and *P. biforata*.

**ORTHIS MACLEODI** Whitfield. See *Dalmanella macleodi*.

**ORTHIS MACRIOR** Sardeson. See *Dalmanella macrior*.

**ORTHIS MARIA** Billings. See *Hebertella maria*.

**ORTHIS MEDIA** Shaler. See *Dalmanella elegantula media*.

**ORTHIS MEDIA** Winchell. See *Pianodema subæquata perveta*.

**ORTHIS MEEDSI** Winchell and Schuchert. See *Dinorthis meedsi*.

**ORTHIS (DINORTHIS) MEEDSI** var. **ARCTICA** Schuchert. See *Dinorthis meedsi arctica*.

**ORTHIS MEEDSI** var. **GERMANA** Winchell and Schuchert. See *Dinorthis meedsi germana*.

**ORTHIS MEEKI** Miller. See *Dalmanella meeki*.

**Orthis menaplae** Hicks.

*Orthis menaplae* (Hicks MS.) Davidson, Geol. Mag. London, 5, 1868, p. 314, pl. 16, figs. 24-28.—Matthew, Trans. Royal Soc. Canada, 10, 1893, p. 101, pl. 7, figs. 2-6.

Lower Ordovician: England; near St. Johns, New Brunswick (Bretonian—Div. C3d).

ORTHIS MEROPE Billings. See *Scenidium?* *merope*.

**Orthis(?) minna** Billings.

*Orthis minna* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 303, fig. 294. Canadian (Beekmantown): Stanbridge, Quebec.

ORTHIS MINNEAPOLIS N. H. Winchell. See *Pianodema subaequata*.

ORTHIS MINNESOTENSIS Sardeson. See *Dinorthis meedsi*.

ORTHIS MISSOURIENSIS Shumard. See *Schuchertella missouriensis*.

ORTHIS(?) MORROWENSIS James. See *Platystrophia morrowensis*.

ORTHIS MULTISECTA Sardeson. See *Dalmanella multisecta*.

**Orthis(?) mycale** Billings.

*Orthis Mycale* Billings, Pal. Fossils, 1, 1865, p. 82, text fig. 75 (Adv. sheets, 1862).—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 217, pl. 7A, figs. 10, 11.

Ozarkian? (Levis-erratics): Point Levis, Quebec.

ORTHIS NEGLECTA James. See *Plectorthis neglecta*.

**Orthis nettelrothi** Foerste.

*Orthis flabellulum* Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 38, pl. 34, fig. 30.

*Orthis nettelrothi* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 76. Niagaran (Louisville): Louisville, Kentucky.

ORTHIS NEWTONENSIS Weller. See *Eoorthis newtonensis*.

ORTHIS NISIS Hall and Whitfield. See *Orthostrophia* (*Schizoramma*) *nisis*.

*Orthis nitens* Vanuxem.

Not recognized.

*Orthis nitens* Vanuxem, Nat. Hist. New York Geol., 3, 1842, p. 90. Clinton: New York.

ORTHIS OBLATA EMARGINATA Hall. See *Rhipidomella emarginata*.

**Orthis obtusa** Pander.

*Orthis obtusa* (Pander) Kayser, Palaeontographica, Suppl., 3, 1876, p. 19, pl. 3, figs. 1, 2.

Ordovician: Europe; Cordillere San Juan, Argentina.

ORTHIS OCCIDENTALIS of authors. See *Hebertella occidentalis* and *H. alveata*.

ORTHIS OCCIDENTALIS VAR. *SINUATA* Meek. See *Hebertella occidentalis sinuata*.

ORTHIS ORBICULARIS Sowerby. See *Dalmanella lunata*.

ORTHIS ORTHAMBONITES Billings. See *Orthis panderiana*.

**Orthis pandermana** Hall and Clarke.

*Orthis orthambonites* Billings (not Murchison and Verneuil), Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 77, fig. 70 (Adv. sheets, 1862); Geol. Canada, 1863, p. 231, fig. 245.—Schuchert, 9th Ann. Rep. New York State Geol., 1890, p. 43.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 221, 228, pl. 5, figs. 1-3.—Matthew, Trans. Roy. Soc. Canada, 10, 1893, p. 101, pl. 7, fig. 4.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 526, figs.

*Orthis pandermana* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 5, footnote; 48th Rep. New York State Mus., 2, for 1895, 1897, p. 338, pl. 4, figs. 1-3; 14th Rep. State Geol. New York for 1894, 1897, p. 338, pl. 4, figs. 1-3.

Canadian: Point Levis, Quebec (Levis-erratics); St. John, New Brunswick (Bretonian-Div. C3d).

ORTHIS PARVA Billings. See *Dalmanella meeki*.

ORTHIS PECTINELLA Whitfield. See *Plectorthis (Austinella) whitfieldi*.

ORTHIS PECTINELLA Emmons. See *Dinorthis pectinella*.

ORTHIS PECTINELLA var. SEMIOVALIS Hall. See *Dinorthis pectinella*.

ORTHIS PEPINA Hall. See *Billingsella coloradoensis*.

ORTHIS PERVETA Billings. See *Hebertella vulgaris*.

ORTHIS PERVETA Conrad. See *Pianodema subæquata perveta*.

ORTHIS PERVETA Hall. See *Pianodema subæquata*.

ORTHIS PETRAE Sardeson. See *Dinorthis proavita*.

**Orthis(?) piger** Billings.

*Orthis piger* Billings, Canadian Nat. Geol., 4, 1859, p. 442.—Raymond, Ann. Carnegie Mus., 7, 1911, p. 247.

*Orthis(?) pigra* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 290.

*Clitambonites piger* Schuchert and Twenhofel, Bull. Geol. Soc. Amer., 21, 1910, p. 691.

Chazyan (Mingan): Mingan Islands, Canada.

ORTHIS PISUM HALL. See *Nucleospira pisiformis*.

ORTHIS PLANA Castelnau. See *Rafinesquina alternata*.

ORTHIS PLATYS Billings. See *Dinorthis (Plæsiomys) platys*.

ORTHIS PLICATELLA White. See *Orthis tricenaria*.

ORTHIS PLICATELLA Hall. See *Plectorthis plicatella*.

ORTHIS (PLECTORTHIS) PLICATELLA Winchell and Schuchert. See *Plectorthis plicatella trentonensis*.

ORTHIS PLICATELLA var. TRIPPLICATELLA Lesley. See *Plectorthis fissicosta triplicateLLa*.

ORTHIS? (DELTHYRIS) PLICATUS Hall. See *Spirifer vanuxemi*.

ORTHIS (DELTHYRIS) PLICATUS Hall. See *Spirifer (Delthyris) vanuxemi*.

ORTHIS POGONIPENSIS Hall and Whitfield. See *Pianodema pogonipensis*.

ORTHIS PORCATA Billings. See *Dinorthis (Plæsiomys) porcata anticostiensis*.

ORTHIS PORCIA Billings. See *Clitambonites porcia*.

ORTHIS PORRECTA Sardeson. See *Dalmanella porrecta*.

ORTHIS PROAVITA Winchell and Schuchert. See *Dinorthis proavita*.

**Orthis (Dalmanella?) pumila** Ulrich.

*Orthis costata* Hall (not Sowerby), Amer. Jour. Sci., 48, 1845, p. 295.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 33.

*Orthis pumila* Ulrich, Catalogue Cincinnati Foss., 1880, p. 14.

*Orthis cincinnatiensis* Miller, Amer. Pal. Foss., 2d ed., 1883, p. 296.

Maysville (Corryville): Cincinnati, Ohio.

**Orthis(?) punctostriata** Hall.

*Orthis punctostriata* Hall, Pal. New York, 2, 1852, p. 254, pl. 52, fig. 5.

*Orthis? punctostriata* Hall and Clarke, *ibid.*, 8, pt. 1, 1892, p. 217, pl. 20, figs. 2-4—Grabau, Bull. New York State Mus., 45, 1901, p. 186, fig. 95; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 186, fig. 95.

Clinton (Rochester): Lockport and Lewiston, New York.

ORTHIS PYRAMIDALIS Hall. See *Scenidium pyramidalis*.

ORTHIS RETRORSA Salter. See *Dinorthis (Plasiomys) retrorsa*.

ORTHIS RETRORSA Billings. See *Dinorthis carleyi*.

ORTHIS RHYNCHONELLIFORMIS Shaler. See *Rhipidomella uberis rhyntonelliformis*.

ORTHIS ROGATA Sardeson. See *Dalmanella rogata*.

**Orthis(?) rugiplicata** Hall and Whitfield.

*Orthis rugæplicata* Hall and Whitfield, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 182; 27th Rep., *ibid.*, 1875, pl. 9, figs. 1-3.—Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 34, figs. 25-27.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 44, pl. 27, figs. 1-3.

*Orthis rugiplicata*, Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 217.

Niagaran (Louisville): Louisville, Kentucky.

ORTHIS RUIDA Billings. See *Dalmanella? ruida*.

**Orthis(?) saffordi** Hall and Clarke.

*Orthis? saffordi* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 218, 340, pl. 5A, figs. 38-40; 48th Rep. New York State Mus., 2, for 1895, 1897, p. 340, pl. 4, figs. 10-12; 14th Rep. State Geol. New York for 1894, 1897, p. 340, pl. 4, figs. 10-12.

Chazyan (Ottosee): Near Knoxville, Tennessee.

**Orthis? saltensis** Kayser.

*Orthis saltensis* Kayser, Beitr. Geol. Pal. Argentin. Rep., Palæontographica Suppl., 3, 1896, p. 8, pl. 1, fig. 16; Zeits. Deutsch. Geol. Gesell., 49, 1897, p. 280.—Hoek, Neues Jahrb. Min., Geol. Pal., 34, 1912, p. 219.

Lowest Ordovician: Salta, etc., Argentina.

ORTHIS SCOVILLI Hall and Clarke. See *Plectorthis (Austinella) scovilli*.

ORTHIS(?) SECTOSTRIATA Ulrich. See *Plectorthis (Encuclodema) sectostriata*.

ORTHIS (SCHIZOPHORIA) SENECTA Hall and Clarke. See *Schizophoria senecta*.

ORTHIS SINUATA Hall. See *Hebertella occidentalis sinuata*.

ORTHIS (DALMANELLA) SMITHI Clarke. See *Dalmanella smithi*.

- ORTHIS SOLA Billings. See *Rhipidomella sola*.
- ORTHIS STONENSIS Safford. See *Pianodema stonensis*.
- ORTHIS STRIATELLA Dalman. See *Chonetes striatellus*.
- ORTHIS STRIATULA Emmons. See *Dalmanella testudinaria*.
- ORTHIS SUBÆQUATA Conrad. See *Pianodema subæquata*.
- \* ORTHIS SUBÆQUATA Billings. See *Hebertella vulgaris*.
- ORTHIS (DALMANELLA) SUBÆQUATA CIRCULARIS Winchell and Schuchert. See *Pianodema subæquata circularis*.
- ORTHIS (DALMANELLA) SUBÆQUATA CONRADI Winchell. See *Pianodema subæquata conradi*.
- ORTHIS (DALMANELLA) SUBÆQUATA VAR. GIBBOSA Winchell and Schuchert. See *Pianodema subæquata gibbosa*.
- ORTHIS (DALMANELLA) SUBÆQUATA VAR. PERVETA Winchell and Schuchert. See *Pianodema subæquata perveta*.
- ORTHIS SUBCIRCULA Simpson. See *Rhipidomella subcircula*.
- ORTHIS SUBJUGATA Hall. See *Hebertella subjugata*.
- Orthis(?) subnodosa** Hall.  
*Orthis subnodosa* Hall, Desc. New sp. Fossils from Waldron, Indiana, 1879, p. 14; 11th Rep. State Geol. Indiana, 1882, p. 286, pl. 27, fig. 17; Trans. Albany Inst., 10, 1883, p. 70.—Nettelroth, Kentucky Fossil Shells, Mem. Geol. Surv. Kentucky, 1889, p. 44.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 535, figs.—Kindle and Breger, Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 433, pl. 2, fig. 7.  
 Niagaran: Waldron, Indiana (Waldron); Louisville, Kentucky; Carroll County, Indiana.
- ORTHIS SUBQUADRATA Hall. See *Dinorthis (Plæsiomys) subquadrata*.
- ORTHIS SWEENEYI Winchell. See *Dinorthis pectinella sweeneyi*.
- Orthis(?) tenuidens** Hall.  
*Orthis tenuidens* Hall, Pal. New York, 2, 1852, p. 58, pl. 20, fig. 9.  
 Clinton: Oneida County, New York.
- ORTHIS TERSUS Sardeson. See *Dalmanella tersa*.
- ORTHIS TESTUDINARIA of authors. See *Dalmanella testudinaria*, *D. fertilis*, *D. rogata*, and *Orthis tricenaria*.
- ORTHIS (DALMANELLA) TESTUDINARIA VAR. EMACERATA Winchell and Schuchert. See *Dalmanella macrior*.
- ORTHIS (DALMANELLA) TESTUDINARIA VAR. MEEKI Winchell and Schuchert. See *Dalmanella corpulenta*.
- Orthis tricenaria** Conrad.  
*Orthis tricenaria* Conrad, Proc. Acad. Nat. Sci. Philadelphia, 1, 1843, p. 333.—Hall, Pal. New York, 1, 1847, p. 121, pl. 32, fig. 8.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 193, pl. 9, fig. 8.—Salter, Can. Org. Rem., 1, Geol. Surv.

**Orthis trieenaria**—Continued.

- Canada, 1859, p. 39, pl. 9, figs. 1-4.—Hall, Geol. Wisconsin, 1, 1862, p. 42, figs. 8-11.—Chapman, Canadian Jour., n. s., 6, 1862, p. 111, fig. 91; *ibid.*, 8, 1863, p. 199, fig. 184.—Billings, Geol. Canada, 1863, p. 167, fig. 151.—Chapman, Expos. Min. and Geol. Canada, 1864, p. 115, fig. 92; p. 171, fig. 184.—Safford, Geol. Tennessee, 1869, p. 275, fig. 9.—Shaler, Mem. Geol. Surv. Kentucky, 1, 3d Mem., 1876, p. 36.—Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 35, figs. 1-5.—Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 74, pl. 11, fig. 4.—Miller, N. A. Geol. Pal., 1889, p. 360, fig. 592.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 538, figs.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 191, 193, 221, 228, pl. 5, figs. 9-14.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 418, pl. 32, figs. 18-23.—Keyes, Geol. Surv. Missouri, 5, 1895, p. 60, pl. 39, fig. 4.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 3, 1897, p. 175.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 293; Proc. U. S. Nat. Mus., 22, 1900, p. 156.—Ruedemann, Bull. New York State Mus., 49, 1902, p. 24.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 151, pl. 9, figs. 18-21.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 250, fig. 301a-c.
- Orthis disparilis* Conrad, Proc. Acad. Nat. Sci. Philadelphia, 1, 1843, p. 333.—Hall, Pal. New York, 1, 1847, p. 119, pl. 32, fig. 4.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 194, pl. 9, fig. 4a-c.—Hall, Geol. Wisconsin, 1, 1862, p. 435.—Billings, Geol. Canada, 1863, p. 130, fig. 60.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 513, figs.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 191, 221, 228.
- Platystrophia tricenaria* Hall, 36th Rep. New York State Mus. Nat. Hist., 1884, p. 75, pl. 3, fig. 1.
- Orthis testudinaria?* Owen, Geol. Expl. Iowa, Wisconsin, and Illinois, 1844, pl. 15, fig. 11.
- Orthis plicatella* White (not Hall), Wheeler's Expl. and Survey west 100th Merid., 4, 1875, p. 72, pl. 4, fig. 10.
- Black River: Mineral Point, etc., Wisconsin; Iowa; Minnesota; Kentucky; Tennessee; New York; Canada; etc.
- Stones River: Central Tennessee.
- Plesiotypes*.—Cat. Nos. 8553, 17252, U.S.N.M. (White and Walcott).

**Orthis(?) trinucleus** Hall.

- Orthis trinucleus* Hall, Pal. New York, 2, 1852, p. 58, pl. 20, fig. 8.  
Clinton: Wayne County, New York.

ORTHIS TRIPlicateLLA Meek. See *Plectorthis fissicosta triplicateLLa*.

**Orthis(?) tritonia** Billings.

- Orthis Tritonia* Billings, Pal. Fossils, 1, 1865, p. 76, fig. 69 (adv. sheets 1862); Geol. Canada, 1863, p. 231, fig. 244.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 217, pl. 7A, figs. 12, 13.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 538, figs.
- Ordovician? (Levis—erratics): Point Levis, Quebec.

ORTHIS UBERIS Billings. See *Rhipidomella uberis*.

**Orthis vespertilio** Sowerby.

- Orthis vespertilio* (Sowerby) Kayser, Palaeontographica, Suppl. 3, 1876, p. 27, pl. 3, figs. 22, 23.
- Ordovician: Europe; Potrero de los Angulos, etc., Argentina.

ORTHIS WHITFIELDI Winchell. See *Plectorthis (Austinella) whitfieldi*.

ORTHIS (PLECTORTHIS) WICHITAENSIS Walcott. See *Eoorthis wichitaensis*.

ORTHISINA D'Orbigny. See *Clitambonites Pander*.

ORTHISINA ADSCENDENS Pander. See *Clitambonites adscendens*.

ORTHISINA DIVERSA Shaler. See *Clitambonites diversus*.

ORTHISINA GRANDEVA Billings. See *Billingsella? grandæva*.

ORTHISINA(?) JOHANNENSIS Matthew. See *Eoorthis johannensis*.

ORTHISINA VERNEULLI Billings. See *Clitambonites diversus*.

**ORTHO CERAS** Breynius.

*Orthoceras* Breynius, *Dissertatio Physica de Polythalamiis*, 1832, p. 12.—Eaton, *Geol. Textb.*, 2d ed., 1832, p. 28.—Quenstedt, *Neues Jahrb. f. Min., etc.*, 1840, p. 250.—Koninck, *Desc. Animaux Fossiles*, Liege, 1842, p. 497.—Castelnau, *Essai Syst. Sil. l'Amerique Septent.*, 1843, p. 24.—McCoy, *Syn. Char. Carb. Foss. Ireland*, 1844, p. 6.—Hall, *Pal. New York*, 1, 1847, p. 207.—Anthony, *Quart. Jour. Geol. Soc. London*, 3, 1847, p. 255.—Hall, *Quart. Jour. Geol. Soc. London*, 5, 1848, p. 107.—Anthony, *Amer. Jour. Sci. Arts.*, 2d ser., 6, 1848, p. 132, fig.—Woodward, *Man. Mollusca*, pt. 1, 1851, p. 88.—Saemann, *Palæontographica*, 3, 1852, pp. 134, 162.—Geinitz, *Die Verst. der Grauwack.*, Leipzig, 1853, p. 26.—McCoy, *British Pal. Rocks, Foss.*, 1854, p. 312.—Pictet, *Traité de Pal.*, 2d ed., 2, 1854, p. 632.—Barrande, *Neues Jahrb. Min., etc.*, 1854, p. 8, pl. 1, figs. 5a, b, 6a, b; *ibid.*, 1855, p. 258; *Bull. Soc. Geol. France*, 2d ser., 12, 1855, p. 158.—Emmons, *Amer. Geology*, 1, pt. 2, 1855, p. 148.—Billings, *Canadian Nat. Geol.*, 2, 1857, p. 136, pl. 2, fig. 2.—Barrande, *Neues Jahrb. Min., etc.*, 1859, p. 780.—Hitchcock, *Geol. Vermont for 1861, 1862*, p. 297.—Chapman, *Canadian Jour.*, n. s., 8, 1863, p. 20.—Barrande, *Syst. Sil. du Centre Boheme*, 2, pt. 1, 1867, p. 445; pt. 3, 1874, p. 1.—Chapman, *Expos. Min.*, *Geol. Canada*, 1864, pp. 127–128.—Miller, *Cincinnati Quart. Jour. Sci.*, 2, 1875, p. 124.—Barrande, *Cephalopodes: Ext. Syst. Sil. du Centre Boheme*, 1877, p. 99.—Hall, *Pal. New York*, 5, pt. 2, 1879, pp. 217, 227.—Waagen, *Mem. Geol. Surv. India, Pal. Indica*, 13th ser., 1, 1879, p. 66.—Koninck, *Ann. d. Mus. Royal d'Hist. Nat. de Belgique*, 5, 1880, p. 44.—Blake, *Mon. British Foss. Cephalopoda*, 1882, p. 48.—Hyatt, *Proc. Boston Soc. Nat. Hist.*, 22, 1884, p. 275.—Walcott, *Mon. U. S. Geol. Surv.*, 8, 1884, p. 200.—Zittel, *Handb. Pal.*, 2, 1884, p. 363.—James, J. F., *Jour. Cincinnati Soc. Nat. Hist.*, 8, 1886, p. 237.—Newell, *Proc. Boston Soc. Nat. Hist.*, 23, 1888, p. 466.—Foord, *Cat. Foss. Ceph. British Mus.*, 1, 1888, p. 1.—Holzapfel, *Palæontologische, Neue Folge*, 1, Heft 1, Jena, 1889, p. 45.—Miller, *N. A. Geol. Pal.*, 1889, p. 445.—Whidborne, *Mon. Dev. Fauna South England*, 1, *Pal. Soc.*, 1890, p. 120.—Bather, *Nat. Sci.*, 5, pp. 428, 430, text fig. 2.—Clarke, *Amer. Geol.*, 15, 1895, p. 126.—Hyatt, *ibid.*, 16, 1895, p. 11.—Holzapfel, *Abhandl. d. König. Preuss. geol. Landesanstalt, Neue Folge*, Heft 16, 1895, p. 148.—Koken, *Die Leitfossilien*, Leipzig, 1896, p. 48, fig. 20.—Clarke, *Geol. Minnesota*, 3, pt. 2, 1897, p. 783.—Grabau, *Bull. Buffalo Soc. Nat. Sci.*, 6, 1899, p. 286.—Holm, *Sveriges Geol. Unders.*, Ser. C, No. 179, 1899, p. 74.—Clarke, *Bull. New York State Mus.*, 13, 1900, p. 167.—Hyatt, *Zittel-Eastman Textb. Pal.*, 1, 1900, p. 518.—Grabau, *Bull. New York State Mus.*, 45, 1901, p. 215; *Bull. Buffalo Soc. Nat. Sci.*, 7, 1901, p. 215.—Jaekel, *Zeits. d. d. geol. Gesell.*, 54, *Protok.*, 1902, pp. 7, 67, 75.—Clarke, *Amer. Geol.*, 31, 1903, p. 216.—Jaekel in *Ruedemann, Amer. Geol.*, 31, 1903, p. 199.—Foord, *Mon. Carb. Ceph. Ireland*, pt. 5, *Pal. Soc.*, App. 1903, p. 210.—Ruedemann, *Bull. New York State Mus.*, 90, 1906, p. 432.—Cumings, 32d *Ann. Rep. Dep. Geol. Nat. Res. Indiana*, 1908, p. 1027.—Grabau and Shimer, *N. A. Index Fossils*, 2, 1910, p. 47.—Hyatt, *Zittel-Eastman Textb. Pal.*, 2d ed., 1913, p. 598.

**ORTHO CERAS**—Continued.

*Orthoceratites* Fischer de Waldheim, *Oryctographie Gouv. de Moscou*, 1830, p. 124.—Eichwald, *Zool. Specialis*, pt. 2, Vilnae, 1830, p. 31.—Steininger, *Mem. Soc. Geol. France*, 1, 1834, p. 368.—Troost, *Mem. Soc. Geol. France*, 3, 1838, p. 87.—D'Orbigny, *Prodr. de Pal.*, 1, 1849, p. 2.

**ORTHO CERAS ABNORME** Hall. See *Actinoceras abnorme*.

**Orthoceras?** *abruptum* Hall.

*Orthoceras abruptum* Hall, *Pal. New York*, 2, 1852, p. 97, pl. 29, fig. 4a, b.  
*Cyrtoceras?* *abruptum* Hall, *Pal. New York*, 5, pt. 2, 1879, p. 220 (gen. ref.).  
 Clinton (Irondequoit): Lockport, New York.

**Orthoceras** *æquale* (Emmons).

*Orthoceratites æqualis* Emmons, *Nat. Hist. New York, Geol.*, 2, 1842, p. 404, fig. 1.  
*Orthoceras æquale* Miller, *N. A. Geol. Pal.*, 1889, p. 446 (gen. ref.).—Lesley, *Geol. Surv. Pennsylvania, Rep. P 4*, 1889, p. 541, figs.  
 Trenton: New York.

**Orthoceras** *albersi* Miller and Faber.

*Orthoceras albersi* Miller and Faber, *Jour. Cincinnati Soc. Nat. Hist.*, 17, 1894, p. 140, pl. 8, figs. 1-4.—Miller, *N. A. Geol. Pal.*, 2d App., 1897, p. 776, fig. 1423.  
 Trenton (Upper): West Covington, Kentucky.

**Orthoceras** *alienum* Hall.

*Orthoceras alienum* Hall, 20th Rep. New York State Cab. *Nat. Hist.*, 1868, p. 354; rev. ed., 1870, p. 414, pl. 24, figs. 6-7.  
 Niagaran (Racine): Racine, Wisconsin.

**ORTHO CERAS ALLUMETTENSE** Billings. See *Loxoceras allumettense*.

**Orthoceras** *amplicameratum* Hall.

*Orthoceras amplicameratum* Hall, *Pal. New York*, 1, 1847, p. 205, pl. 51, figs. 1a-g.—Emmons, *Amer. Geology*, 1, pt. 2, 1855, p. 150.—Hitchcock, *Geol. Vermont*, 1, for 1861, 1862, p. 298, fig. 210.—James, J. F., *Jour. Cincinnati Soc. Nat. Hist.*, 8, 1886, p. 237.—Grabau and Shimer, *N. A. Index Fossils*, 2, 1910, p. 48, fig. 1247.  
*Orthoceras* cf. *amplicameratum* Clarke, *Geol. Minnesota*, 3, pt. 2, 1897, p. 790, pl. 47, fig. 19.  
 Trenton: Middleville, New York; Preston, Minnesota.  
 ?Black River (Platteville): Mineral Point, Wisconsin.

**ORTHO CERAS AMYCUS** Hall. See *Cycloceras amycus*.

**ORTHO CERAS ANCEPS** Billings. See *Gonioceras anceps*.

**ORTHO CERAS ANGULATUM** Hall. See *Kionoceras cancellatum*.

**ORTHO CERAS ANELLUS** Conrad. See *Spyroceras anellus*.

**ORTHO CERAS ANNULATA** Eaton. See *Dawsonoceras annulatum*.

**ORTHO CERAS ANNULATUM** var. *AMERICANUM* Whiteaves. See *Dawsonoceras annulatum*.

**Orthoceras** *antenor* Billings.

*Orthoceras Antenor* Billings, *Canadian Nat. Geol.*, 4, 1859, p. 463.  
 Chazyan: Mingan Islands, Canada.

**ORTHO CERAS ANTICOSTIENSE** Billings. See *Actinoceras anticostiense*.



**Orthoceras arcticum** Foorde.

Cyrtoceras sp. Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 608.

Orthoceras arcticum Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 38, fig. 3.

Niaganan: Offley Island, Kennedy Channel, Arctic America.

**Orthoceras arcuolineatum** Ruedemann.

Orthoceras arcuolineatum Ruedemann, Bull. New York State Mus., 162, 1912, pl. 8, figs. 1, 2.

Trenton (Canajoharie): Fort Edward, New York.

**Orthoceras arcuoliratum** Hall.

Orthoceras arcuoliratum Hall, Pal. New York, 1, 1847, p. 198, pl. 42, figs. 7a-c.—

Emmons, Amer. Geology, 1, pt. 2, 1855, p. 149, pl. 12, fig. 4.—Foord, Cat.

Foss. Ceph. British Mus., 1, 1888, p. 10.—Keyes, Missouri Geol. Surv., 5, for

1894, 1895, p. 227.—Lesley, Geol. Surv. Pennsylvania, Rep. P. 4, 1889, p. 542, fig.

Trenton: Middleville and Watertown, New York.

ORTHOCERAS ATLANTICUM Barrande. See Endoceras atlanticum.

**Orthoceras atticus** Billings.

Orthoceras Atticus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 312.

Canadian (Beekmantown): Stanbridge, Quebec.

**Orthoceras autolyceus** Billings.

Orthoceras Autolyceus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 91, (adv. sheets, 1862.)

Ozarkian? (Levis—erratics): Point Levis, Quebec.

ORTHOCERAS (ORMOCERAS) BACKII Barrande. See Actinoceras beloitense and A. whitei.

ORTHOCERAS BALTEATUM Billings. See Spyroceras balteatum.

ORTHOCERAS BARTONENSIS Spencer. See Dawsonoceras annulatum.

ORTHOCERAS (ORMOCERAS) BAYFIELDI Zittel. See Actinoceras (Ormoceras) bayfieldi.

ORTHOCERAS BEAUPORTENSE Whiteaves. See Spyroceras beauportense.

**Orthoceras becki** Billings.

Orthoceras becki Billings, Canadian Nat. Geol., 4, 1859, p. 362, fig. 11a; Geol.

Canada, Geol. Surv. Canada, 1863, p. 121, fig. 35.—Lesley, Geol. Surv.

Pennsylvania, Rep. P. 4, 1889, p. 543, fig.

Canadian (Romaine): Mingan Islands, Quebec.

ORTHOCERAS BELLATULUM Billings. See Kionoceras bellatulum.

ORTHOCERAS (ACTINOCERAS) BELOITENSE Whitfield. See Actinoceras beloitense.

**Orthoceras beltrami** Clarke.

Orthoceras beltrami Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 789, pl. 55, fig. 10.

Trenton (Prosser): Wykoff, Minnesota.

ORTHOCERAS (ACTINOCERAS) BIGSBYI of authors. See Actinoceras bigsbyi and A. beloitense.

ORTHOCERAS BILINEATUM Whitfield. See Protocycloceras whitfieldi.

ORTHOCERAS BILINEATUM Clarke. See Spyroceras bilineatum.

ORTHO CERAS (SPYRO CERAS) BILINEATUM FRANKFORTENSIS. See *Spyroceras bilineatum frankfortense*.

**Orthoceras bolivianum** Hoek.

*Orthoceras bolivianum* Hoek, Neues Jahrb. Min., Geol., Pal., 34, 1912, p. 229.  
Ordovician: Bolivia.

ORTHO CERAS BRAINERDI Seely. See *Cameroceras (Proterocameroceras) brainerdi*.

**Orthoceras brongniartii** (Troost).

*Conotubularia Brongniartii* Troost, 5th Geol. Rep. Tennessee, 1840, p. 49; *ibid.*, 6th Rep., 1841, p. 176 (nom. nud.); Mem. Soc. Geol. France, 3, 1833, p. 89, pl. 9, fig. 2.

*Orthoceras Brongniarti* Giebel, Fauna der Vorwelt, 3, 1851, p. 242.

Trenton: Vicinity of Nashville, Tennessee.

**Orthoceras brontes** Billings.

*Orthoceras brontes* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 83.

Niagaran (Lockport): Grimsby, Ontario.

**Orthoceras bucklandii** Billings.

*Orthoceras bucklandii* Billings, Geol. Surv. Canada, Rep. Progr. for 1853-1856, 1857, p. 330; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 57.

Anticostian (Chicotte): Near Southwest Point, Anticosti.

**Orthoceras byrnesi** Miller.

*Orthoceras Byrnesi* Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 126, fig. 13; Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 319, pl. 8, fig. 8; N. A. Geol. Pal., 1889, p. 446, fig. 750.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1034, pl. 51, fig. 4.

Maysville (Fairmount): Cincinnati, Ohio.

ORTHO CERAS CADMUS Billings. See *Kionoceras cancellatum*.

**Orthoceras cameolare** McChesney.

*Orthoceras cameolare* McChesney, Desc. New Fossils, 1861, p. 93.

Niagaran (Racine): Milwaukee, Wisconsin; Chicago, Illinois.

ORTHO CERAS CANADENSE Billings. See *Huronnia vertebralis*.

ORTHO CERAS CANADENSE Miller. See *Actinoceras (Paractinoceras) canadense*.

ORTHO CERAS CANCELLATUM Hall. See *Kionoceras cancellatum*.

ORTHO CERAS CAPITOLINUM Safford. See *Actinoceras cuvieri*.

**Orthoceras carleyi** Hall and Whitfield.

*Orthoceras Carleyi* Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 98, pl. 4, fig. 19.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 8, 1886, p. 241.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 544, fig.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1034, pl. 52, fig. 1.

Richmond: Fayetteville, Ohio.

**Orthoceras carltonense** Whitfield.

*Orthoceras Carltonense* Whitfield, Ann. Rep. for 1877, Wisconsin Geol. Surv., 1878, p. 85; Geol. Wisconsin, 4, 1882, p. 318, pl. 24, fig. 5.

Niagaran (Guelph): Carlton and Ozaukee, Wisconsin.

**Orthoceras castelnaui** Verneuil.

*Orthoceras conicum* Castelnaui (not Hisinger), *Essai Syst. Sil. l'Amerique Septent.*, 1843, p. 29, pl. 10, fig. 3.

*Orthoceras Castelnaui* Verneuil, in Castelnaui, *ibid.*, p. 29.

Niaganan: Drummond Island, Lake Huron.

**Orthoceras cataline** Billings.

*Orthoceras Cataline* Billings, *Pal. Foss.*, 1, *Geol. Surv. Canada*, 1865, p. 315.

Canadian (Beekmantown): Phillipsburg, Quebec.

**Orthoceras cato** Billings.

*Orthoceras Cato* Billings, *Pal. Foss.*, 1, *Geol. Surv. Canada*, 1865, p. 314.

Canadian (Beekmantown): Phillipsburg, Quebec.

**Orthoceras catulus** Billings.

*Orthoceras Catulus* Billings, *Pal. Foss.*, 1, *Geol. Surv. Canada*, 1865, p. 313.

*Orthoceras* cf. *Catulus* Matthew, *Trans. Roy. Soc. Canada*, 10, sec. 4, 1893, p. 106, pl. 7, fig. 14a-d.

Canadian: Phillipsburg, Quebec (Beekmantown); St. John, New Brunswick (Bretonian—Div. C3d).

**Orthoceras cincinnatiense** Miller.

*Orthoceras Cincinnatiensis* Miller, *Cincinnati Quart. Jour. Sci.*, 2, 1875, p. 127; *Jour. Cincinnati Soc. Nat. Hist.*, 4, 1881, p. 319, pl. 8, figs. 5, 5a.

Maysville (Fairmount): Cincinnati, Ohio.

**Orthoceras clathratum** Hall.

*Orthoceras clathratum* Hall, *Pal. New York*, 1, 1847, p. 201, pl. 43, figs. 4a-c.—Emmons, *Amer. Geology*, 1, pt. 2, 1855, p. 150.

Trenton: Middleville, New York.

**Orthoceras? clavatum** Hall.

*Orthoceras clavatum* Hall, *Pal. New York*, 2, 1852, p. 104, pl. 31, fig. 4a, b.

*Orthoceras* (*Actinoceras*) *clavatum* Foerste, *Geol. Surv. Ohio, Pal.*, 7, 1893, p. 538, pl. 33, fig. 2; pl. 36, figs. 5a-c.

Upper Clinton: Near Mohawk, New York.

Upper Medinan (Brassfield): Near Carlisle, Ohio.

ORTHO CERAS CLINTONI Miller. See *Spyroceras clintoni*.

**Orthoceras colon** White.

*Orthoceras colon* White, *Geogr. Geol. Expl. West 100th Merid.*, *Prel. Rep.*, 1874, p. 10.

*Orthoceras* (*Cameroeras*) *colon* White, *Rep. U. S. Geogr. Surv. West. 100th Merid.*, 4, *War Dep.*, 1879, p. 56, pl. 3, figs. 5a-d.

Canadian: Fish Spring, House Range, Utah.

*Holotype*.—Cat. No. 17392, U.S.N.M.

ORTHO CERAS COLUMNARE Hall. See *Kionoceras cancellatum*.

ORTHO CERAS CONICUM Castelnaui. See *Orthoceras castelnaui*.

ORTHO CERAS (DISCOSORUS) CONOIDEUS Barrande. See *Discosorus conoideus*.

**Orthoceras coralliferum** Hall.

*Orthoceras coralliferum* Hall, *Pal. New York*, 1, 1847, p. 312, pl. 85, fig. 3; pl. 86, figs. 1a-d.

Utica: Turin, New York.

ORTHO CERAS CORNU-ORYX Whitfield. See *Orygoceras cornuoryx*.

**Orthoceras cornuum** Billings.

*Orthoceras cornuum* Billings, Geol. Surv. Canada, Rep. Progr. for 1853-56, 1857, p. 329.

Chazyan (Mingan): Mingan Island, Canada.

ORTHO CERAS (KIONOCERAS) CRAWFORDI Foerste. See *Kionoceras crawfordi*.

ORTHO CERAS CREBESCENS Hall. See *Protokionoceras crebescens*.

ORTHO CERAS CREBESCENS Hall and Whitfield. See *Orthoceras rectum*.

ORTHO CERAS CREBRISEPTUM Billings. See *Actinoceras crebriseptum*.

**Orthoceras crebristriatum** Meek and Worthen.

*Orthoceras crebristriatum* Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1865, p. 255; Geol. Surv. Illinois, 6, 1875, p. 503, pl. 26, fig. 2.

Niagaran (Racine): Joliet, Illinois.

ORTHO CERAS CROCUS Billings. See *Cycloceras crocus*.

ORTHO CERAS CUVIERI Miller. See *Actinoceras cuvieri*.

ORTHO CERAS DARWINI Billings. See *Kionoceras darwini*.

ORTHO CERAS (ACTINOCERAS) DAYTONENSIS Foerste. See *Actinoceras daytonense*.

**Orthoceras decrescens** Billings.

*Orthoceras decrescens* Billings, Geol. Surv. Canada, Rep. Progr. for 1853-56, 1857, p. 337.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 9.

Black River (Leray): Chaudiere Rapids, St. Josephs Island, and Island of Montreal, Canada.

**Orthoceras defrancii** (Troost).

*Conotubularia defrancii* Troost, Mus. Soc. Geol. France, 3, 1838, p. 90.

*Orthoceratites Defrancii* Troost, *ibid.*, p. 93, pl. 9, figs. 7, 7b; 5th Geol. Rep. Tennessee, p. 49; 6th Rep., 1841, p. 178.

*Orthoceras defrancii* Miller, N. A. Geol. Pal., 1889, p. 447 (gen. ref.).

Niagaran: Perry County, Tennessee.

ORTHO CERAS (KIONOCERAS) DELPHIENSIS Kindle and Breger. See *Kionoceras delphiense*.

**Orthoceras deparcum** Billings.

*Orthoceras deparcum* Billings, Canadian Nat. Geol., 4, 1859, p. 363, fig. 111; Geol. Canada, Geol. Surv. Canada, 1863, p. 121, fig. 40.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 547, fig.—Whitfield, Bull. Amer. Mus. Nat. Hist., 3, 1890, p. 34.

Canadian (Romaine): Mingan Islands, Quebec.

ORTHO CERAS DIFFIDENS Billings. See *Loxoceras diffidens*.

**Orthoceras drummondi** Billings.

*Orthoceras Drummondi* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 173, fig. 156.

Black River: Near Kingston, Ontario.

**Orthoceras duseri** Hall and Whitfield.

*Orthoceras Duseri* Hall and Whitfield, Geol. Surv. Ohio, Pal. 2, 1875, p. 97, pl. 3, figs. 2-4.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 8, 1886, p. 241.—

**Orthoceras duseri**—Continued.

Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 14.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 548, figs.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res., Indiana, 1908, p. 1036, pl. 52, fig. 2-2b.

Orthoceras Fosteri Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 127; Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 319, pl. 8, figs. 7, 7a.

Richmond (Waynesville): Waynesville, etc., Ohio; Indiana.

**Orthoceras dyeri** Miller.

Orthoceras Dyeri Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 125, text fig. 11; Jour. Cincinnati Soc. Nat. Hist., 3, 1880, p. 236, pl. 7, fig. 7.—James, J. F., ibid., 8, 1886, p. 238.—Foord, Cat. Foss. Ceph. British Mus. 1, 1888, p. 15.—Miller, N. A. Geol. Pal., 1889, p. 447, fig. 751.

Maysville (Corryville): Cincinnati, Ohio.

**Orthoceras edax** Billings.

Orthoceras edax Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 349.

Canadian (Beekmantown): Township of Oxford, Ontario.

**Orthoceras ekwanense** Whiteaves.

Orthoceras Ekwanense Whiteaves, Geol. Surv. Canada, Ann. Rep., n. s., 14, App. F., 1904, p. 56; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 265, pl. 33, figs. 1, 1a.

Niaganan: Ekwan River, Canada.

**Orthoceras elegantulum** Dawson.

Orthoceras elegantulum Dawson, Canadian Nat. Geol., 5, 1860, p. 155, footnote; Acadian Geol., Suppl. Chap., 1860, p. 68, fig. 62; ibid., 2d ed., 1868, p. 606, fig. 213.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 548, figs.

Silurian: Arisaig, Nova Scotia.

**Orthoceras erraticum** Foerste.

Orthoceras erraticum Foerste, Amer. Geol., 12, 1893, p. 235, fig. 1-3.

Orthoceras (Eu-Orthoceras) erraticum Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 541, figs. 1-3, on p. 540.

Upper Medinan (Brassfield): Huffman's Quarry, near Dayton, Ohio.

**Orthoceras exornatum** Dawson.

Orthoceras exornatum Dawson, Canadian Nat. Geol., 5, 1860, p. 298.

Silurian: Pictou, Nova Scotia.

**Orthoceras explorator** Billings.

Orthoceras explorator Billings, Pal. Foss. 1, Geol. Surv. Canada, 1865, p. 253, text. fig. 238a, b.

Canadian (Quebec): Pistolet Bay, Schooner Island, Newfoundland.

ORTHO CERAS EXPLORATOR Whitfield. See Cameroceras (Proterocameroceras) brainardi.

ORTHO CERAS FERUM Billings. See Spyroceras ferum.

**Orthoceras filiforme** Castelnau.

Orthoceras filiforme Castelnau, Essai Syst. P'Amerique Septent., 1843, p. 30, pl. 10, fig. 2.

Niaganan: Drummond Island, Lake Huron.

**Orthoceras flavius** Billings.

Orthoceras Flavius Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 255.

Chazyan (Quebec—I) Point Rich, Newfoundland.

**Orthoceras formosum** Billings.

*Orthoceras formosum* Billings, Geol. Surv. Canada, Rep. Progr. for 1853-56, 1857, p. 317; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, pp. 22, 58 (loc. ref.).

Richmond (English Head): English Head, Anticosti.

**ORTHO CERAS FOSTERI** Miller. See *Orthoceras duseri*.

**Orthoceras foxense** Safford.

*Orthoceras Foxense* Safford, Geol. Tennessee, 1869, p. 290 (nom. nud.).  
Stones River: Tennessee.

**Orthoceras franklinense** Miller.

*Orthoceras franklinensis* Miller, 18th Rep. Dep. Geol. Nat. Res., Indiana, 1894, p. 322, pl. 10, fig. 3 (adv. sheets, 1892).

Niagaran: Franklin County, Indiana.

**ORTHO CERAS FULGUR** Billings. See *Actinoceras fulgur*.

**ORTHO CERAS FURTIVUM** Billings. See *Protocycloceras(?) furtivum*.

**Orthoceras fusiforme** Hall.

*Orthoceras fusiforme* Hall (not Sowerby, 1828), Pal. New York, 1, 1847, p. 60, pl. 20, fig. 1.—Hyatt, Mem. Mus. Comp. Zool., 16, 1889, p. 35, footnote.

*Gomphoceras hallii* D'Orbigny, Prod. Pal., 1, 1850, p. 3.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 151.

Black River: Watertown, New York.

**Orthoceras glaucus** Billings.

*Orthoceras glaucus* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 350.  
Canadian (Beekmantown): Township of Oxford, Ontario.

**Orthoceras goldfussi** (Troost).

*Conotubularia Goldfussi* Troost, Mem. Soc. Geol. France, 3, 1838, p. 90, pl. 9, fig. 3; 5th Geol. Rep. Tennessee, 1840, p. 49; 6th Rep., 1841, p. 176 (nom. nud.).

Ordovician: Vicinity of Nashville, Tennessee.

**Orthoceras gorbyi** Miller.

*Orthoceras gorbyi* Miller, 18th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1894, p. 322, pl. 10, fig. 2 (Adv. sheets, 1892).—Cumings, 32d Ann. Rep. Dep. Geol.

Nat. Res. Indiana, 1908, p. 1037, pl. 52, fig. 3.

Richmond(?): Franklin County, Indiana.

**ORTHO CERAS GREGARIUM** Hall. See *Orthoceras sociale*.

**Orthoceras griffithi** Houghton.

*Orthoceras Griffithi* Houghton, Jour. Geol. Soc. Dublin, 1, 1859, p. 239, pl. 5, fig. 1.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 41.

Niagaran: Griffiths Island, Barrow Strait, Arctic America.

**Orthoceras hæsitans** Billings.

*Orthoceras hæsitans* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 254.  
Chazyan (Quebec-I): Point Rich and Table Head, Newfoundland.

**Orthoceras hageri** Hall.

*Orthoceras hageri* Hall, Geol. Vermont, 1861, p. 718.

Canadian (Beekmantown): West Haven, near Whitehall, Vermont.

**Orthoceras hallanum** Miller.

Orthoceras Halli Miller (not Barrande), Cincinnati Quart. Jour. Sci., 2, 1875, p. 128, fig. 14.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 15.

Orthoceras hallanum Miller, N. A. Geol. Pal., 1889, p. 448, fig. 752.  
Richmond: Clinton County, Ohio.

ORTHO CERAS HALLI Miller. See Orthoceras hallanum.

ORTHO CERAS (DAWSONOCERAS) HAMMELLI Foerste. See Dawsonoceras hammelli.

**Orthoceras hanoverense** Foerste.

Orthoceras (Eu-orthoceras) hanoverensis Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 280, pl. 7, fig. 6; Geol. Surv. Ohio Pal., 7, 1893, p. 543, p. 32, fig. 6, pl. 35, fig. 5.

Upper Medinan (Brassfield): Hanover, Indiana; Dayton and Todds Fork, near Wilmington, Ohio.

**Orthoceras harperi** Miller.

Orthoceras Harperi Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 128; Jour.

Cincinnati Soc. Nat. Hist., 4, 1881, p. 319, pl. 8, figs. 6, 6a.

Maysville (Corryville): Cincinnati, Ohio.

ORTHO CERAS HASTATUM Billings. See Triptoceras hastatum.

**Orthoceras henrietta** Dwight.

Orthoceras Henrietta Dwight, Amer. Jour. Sci. Arts, 3d ser., 27, 1884, p. 256, pl. 7, figs. 13, 14, 14a.

Canadian (Beekmantown): Rochdale, New York.

**Orthoceras herculeus** Verneuil.

Not recognized.

Orthoceras Herculeus Verneuil, Bull. Soc. Geol. France, 2d ser., 4, 1847, p. 559.

Trenton: Galena, Illinois.

**Orthoceras hercules** Castelnau.

Not recognized.

Orthoceras Hercules Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 29.

Niaganan: Drummond Island, Lake Huron.

**Orthoceras hindei** James.

Orthoceras Hindei James, Paleontologist, No. 1, 1878, p. 6.—James, J. F., Cincinnati Soc. Nat. Hist., 8, 1886, p. 240, pl. 4, figs. 4a-d.

Eden: Cincinnati, Ohio.

Observation.—Not recognized. Founded on fragments of several species.

**Orthoceras (Ormoceras?) hitzi** Foerste.

Orthoceras (Ormoceras?) hitzi Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 77, pl. 1, fig. 3; pl. 2, fig. 22.

Richmond (Whitewater-Saluda): Madison, Indiana, and northern Kentucky.

ORTHO CERAS HOYI McChesney. See Kionoceras cancellatum.

**Orthoceras hudsonicum** Ruedemann.

Orthoceras hudsonicum Ruedemann, Bull. New York State Mus., 162, 1912, pl. 8, figs. 3-10.

Trenton (Canajoharie): Alplans Creek, Saratoga County, New York.

**Orthoceras huronense** Billings.

Orthoceras Huronense Billings, Geol. Surv. Canada, Rep. Progr. for 1853-1856, 1857, p. 337.

Trenton(?): St. Josephs Island, Lake Huron.

**Orthoceras ignotum** Foerste.

*Orthoceras* (*Eu-orthoceras*) *ignotum* Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 279, pl. 7, fig. 4; Geol. Surv. Ohio, 7, 1893, p. 539, pl. 32, fig. 4; pl. 36, figs. 6a-c; figs. 5-7, p. 540.

*Orthoceras ignotum* Foerste, Amer. Geol., 12, 1893, p. 236, figs. 5-7; Geol. Surv. Ohio, Pal., 7, 1893, p. 541, figs. 5-7 on p. 540.

Upper Medinan (Brassfield): Hanover, Indiana; near Dayton, Ohio.

**Orthoceras imbricatum** (Wahlenberg).

*Orthoceratites imbricatus* Wahlenburg, Nova Acta Upsal., 1827, p. 89.

*Orthoceras imbricatum* Sowerby in Murchison's Sil. Syst., 1839, p. 620, pl. 9, fig. 2.—Hall, Pal. New York, 2, 1852, p. 291, pl. 61, figs. 4a-c; pl. 62, figs. 1-3.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 823, fig. 636.—Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 607.

Silurian: Europe; Lockport and Rochester, New York; Cape Louis Napoleon, Arctic America.

ORTHO CERAS INCEPTUM Foerste. See *Cycloceras inceptum*.

ORTHO CERAS INCEPTUM var. ACCELERATUM Foerste. See *Cycloceras inceptum acceleratum*.

**Orthoceras indagator** Billings.

*Orthoceras indagator* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 349. Canadian (Romaine): Mingan Islands, Quebec.

ORTHO CERAS INFELIX Billings. See *Actinoceras infelix*.

ORTHO CERAS INSULARE Barrande. See *Endoceras insulare*.

ORTHO CERAS IRREGULARE McChesney. See *Kionoceras cancellatum*.

ORTHO CERAS JAMESI Hall and Whitfield. See *Spyroceras jamesi*.

**Orthoceras jolietense** Meek and Worthen.

*Orthoceras jolietense* Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1865, p. 256; Geol. Surv. Illinois, 6, 1875, p. 465, pl. 26, fig. 5.—Keyes, Missouri Geol. Surv., 5, 1894, p. 227.

Niagaran (Racine): Joliet, Illinois.

**Orthoceras junceum** Hall.

*Orthoceras junceum* Hall, Pal. New York, 1, 1847, p. 204, pl. 47, figs. 3a-f.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 158, fig.—J. F. James, Jour. Cincinnati Soc. Nat. Hist., 8, 1886, p. 238.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 10.—Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 790.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1037, pl. 51, figs. 5, 5c.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 48, fig. 1246.

Trenton: Watertown, New York.

Black River: Minneapolis and Fountain, Minnesota (Decorah); Janesville, Wisconsin (Platteville).

ORTHO CERAS (KIONOCERAS) KENTLANDENSIS Kindle and Breger. See *Kionoceras kentlandense*.

ORTHO CERAS LÆVE Hall. See *Orthoceras sublæve*.

ORTHO CERAS LAMARCKI Billings. See *Protocycloceras lamarcki*.



**Orthoceras lamellosum** Hall.

*Orthoceras lamellosum* Hall, Pal. New York, 1, 1847, p. 312, pl. 86, figs. 2a-e.—Chapman, Canadian Jour., n. s., 8, 1863, p. 20, fig. 127; Expos. Min., Geol. Canada, 1864, p. 128, fig. 127; p. 172, fig. 192.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 36, fig. 12b.—Ami, Trans. Ottawa Field Nat. Club, 1, 1882, p. 65.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 14.  
Cincinnatian (Pulaski): Near Pulaski, Turin, etc., New York.

ORTHO CERAS LAPHAMI McChesney. See *Dawsonoceras annulatum*.

ORTHO CERAS LAQUEATUM Hall. See *Kionoceras laqueatum*.

ORTHO CERAS (ACTINOCERAS) LATA-NUMMULATUS Foerste. See *Actinoceras lato-nummulatum*.

**Orthoceras latiannulatum** Hall.

*Orthoceras latiannulatum* Hall, Nat. Hist. New York, Pal., 1, 1847, p. 204, pl. 54, figs. 1a, b.  
Trenton: Middleville, New York.

**Orthoceras lentum** Ruedemann.

*Orthoceras lentum* Ruedemann, Bull. New York State Mus., 90, 1906, p. 433, pl. 14, figs. 1-3, text fig. 12.  
Chazyan (Valcour): East shore of Valcour Island, New York.

**Orthoceras lepidodendroides** Parks.

*Orthoceras lepidodendroides* Parks in Tyrrell, 22d Rep. Ontario Bur. Mines, 1913, p. 32.  
Mohawkian or Richmond: Shamattawa River, Manitoba.

ORTHO CERAS LESUEURI Clarke. See *Cycloceras lesueuri*.

ORTHO CERAS LINEOLATUM McChesney. See *Kionoceras cancellatum*.

**Orthoceras lineolatum** (Hall).

*Endoceras proteiforme* var. *lineolatum* Hall, Pal. New York, 1, 1847, p. 211, pl. 45, figs. 4a-e; pl. 46, figs. 1a, b, c, 2a, b, 3; pl. 47, figs. 4a-e; pl. 59, figs. 3, 3a.  
*Orthoceras lineolatum* Clarke and Ruedemann (not Phillips, 1841), Bull. New York State Mus., 65, 1903, p. 628 (gen. ref.).  
Trenton: Middleville, etc., New York.

ORTHO CERAS (ENDOCERAS) LONGISSIMUM Roemer. See *Vaginoceras longissimum*.

**Orthoceras loxias** Hall.

*Orthoceras loxias* Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 380, pl. 19 (10), fig. 7 (rev. ed., 1870).  
?Silurian: Green Bay, Wisconsin.

**Orthoceras ludlowense** Miller and Faber.

*Orthoceras ludlowense* Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 17, 1894, p. 139, pl. 7, figs. 1, 2.  
Trenton (Upper): West Covington, Kentucky.

ORTHO CERAS LYCUS Hall. See *Oncoceras lycus*.

**Orthoceras lyelli** Billings.

*Orthoceras Lyelli* Billings, Geol. Surv. Canada, Rep. Progr. for 1853-1856, 1857, p. 320.—Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 22 (loc. ref.).  
Richmond (Charleton): East of Salmon River, Anticosti.

**ORTHO CERAS MAGNISULCATUM** Billings. See *Kionoceras magnisulcatum*.

**Orthoceras marginale** Owen. Not recognized.  
*Orthoceras marginale* Owen, Geol. Expl. Iowa, Wisconsin, Illinois, 2d ed., 1844,  
 p. 70, pl. 16, fig. 6.  
 Black River (Platteville): Wisconsin.

**ORTHO CERAS MARO** Billings. See *Spyroceras maro*.

**Orthoceras medon** Billings.  
*Orthoceras Medon* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866,  
 p. 57.  
 Anticostian (Chicotte): Southwest Point, Anticosti.

**ORTHO CERAS MEDULLARE** Hall. See *Protokionoceras medullare*.

**Orthoceras meeki** Miller.  
*Orthoceras meeki*, Miller, Quart. Jour. Sci., 2, 1875, p. 126, text fig. 12; N. A.  
 Geol. Pal., 1889, p. 449, fig. 753.  
 Maysville (Fairmount): Cincinnati, Ohio.

**Orthoceras menelaus** Billings.  
*Orthoceras Menelaus* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 26.  
 (Adv. sheets, 1862.)  
 Black River: Wolfe Island, near Kingston and Pointe Claire, Island of Montreal,  
 Canada.

**ORTHO CERAS (LOXOCERAS) MILLERI** Foerste. See *Loxoceras milleri*.

**Orthoceras minganense** Billings.  
*Orthoceras minganense* Billings, Geol. Surv. Canada, Rep. Progr. for 1853-1856,  
 1857, p. 319; Canadian Nat. Geol., 4, 1859, p. 463 (loc. occ.).  
 Chazyan (Mingan): Mingan Islands, Canada.

**Orthoceras minnesotense** Sardeson.  
*Orthoceras minnesotense* Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p.  
 77, pl. 3, figs. 11, 12.  
 St. Peter: South St. Paul, Minnesota.

**ORTHO CERAS MISSISQUOI** Billings. See *Cyrtoceras missisquoi*.

**Orthoceras modestum** Ruedemann.  
*Orthoceras modestum* Ruedemann, Bull. New York State Mus., 90, 1906, p. 436,  
 fig. 14, pl. 12, figs. 1-3.—Grabau and Shimer, N. A. Index Fossils, 2, 1910,  
 p. 48.  
 Chazyan (Valcour): Valcour Island and near Chazy, New York; Isle La Motte,  
 Vermont.

**Orthoceras mohri** Miller.  
*Orthoceras Mohri* Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 124, fig. 10.—  
 James, J. F., Jour. Cincinnati Soc. Nat. Hist., 8, 1886, p. 238.—Foord, Cat.  
 Foss. Ceph. British Mus., 1, 1888, p. 15.—Miller, N. A. Geol. Pal., 1889, p.  
 449, fig. 564.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908,  
 p. 1038, pl. 51, fig. 3.  
 Richmond: Versailles, Indiana.

**ORTHO CERAS MONILIFORME** Hall. See *Loxoceras moniliforme*.

**ORTHO CERAS MONTREALENSIS** Billings. See *Endoceras montrealense*.

**Orthoceras multicameratum** Emmons.

*Orthoceras multicameratum* (Conrad MS.) Emmons, Nat. Hist. New York Geol., 2d Dist., 1842, p. 382, fig. 93.—Hall, Pal. New York, 1, 1847, p. 45; pl. 11, figs. 1a-c.—Emmons, Amer. Geol., 1, pt. 2, 1855, p. 150, pl. 4, fig. 8.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 817, text fig. 596.—Billings, Canadian Nat. Geol., 4, 1859, p. 363, text fig. 11b.—Billings, Canadian Nat. Geol., 4, 1859, p. 462 (loc. occ.).—Emmons, Man. Geol., 1860, p. 95, text fig. 82.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, p. 41, pl. 2, fig. 12.—Hitchcock, Geol. Vermont, 1, for 1861, 1862, p. 298, text fig. 212.—Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 86, pl. 12, fig. 3.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 16.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 553, figs.—Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 789.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 48, fig. 1245.

Black River: Watertown, etc., New York; Minneapolis, Fountain, etc., Minnesota; Mineral Point, Wisconsin; Rockton, Illinois.

*Plesiotype*.—Cat. No. 17381, U.S.N.M. (Walcott).

**Orthoceras multilineatum** (Emmons).

*Orthoceratites multilineatus* Emmons, Nat. Hist. New York Geol., 2, 1842, p. 397, fig. 7.

*Orthoceras multilineatum* Owen, Amer. Jour. Sci. Arts, 47, 1844, p. 369, fig. 7; p. 368, fig.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 553, fig.

Trenton: New York.

**Orthoceras multiseptum** Hall.

*Orthoceras multiseptum* Hall, Pal. New York, 2, 1852, p. 14, pl. 4 (bis), figs. 8a, b.—Grabau, Bull. New York State Mus., 45, 1901, p. 215, fig. 146; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 215, fig. 146.

Upper Medinan: Lockport and Medina, New York.

ORTHO CERAS MURRAYI Billings. See *Jovellania murrayi*.

**Orthoceras niagarensis** Hall.

*Orthoceras niagarensis* Hall, 20th Rep. New York State Cab. Hist., 1868, pl. 20, fig. 3; rev. ed., 1870, p. 416, pl. 20, fig. 3.

*Orthoceras* (*Geisonoceras*) *niagarensis* Kindle and Breger, 23th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 471.

Niagan: Waukesha and Pewaukee, Wisconsin (Racine); near Anderson, Indiana.

ORTHO CERAS NICOLLETI Clarke. See *Cycloceras nicolleti*.

ORTHO CERAS NODOCOSTATUM McChesney. See *Dawsonoceras annulatum*.

ORTHO CERAS (CYCLOCERAS) NOVA-CARLISENSIS Foerste. See *Cycloceras novacarlise* Foerste.

ORTHO CERAS NUMMULARIUM Etheridge. See *Actinoceras backi*.

**Orthoceras oberon** Billings.

*Orthoceras oberon* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 82.

Niagan (Lockport): Grimsby Township, Ontario.

**Orthoceras obstructum** Newell.

*Orthoceras obstructum* Newell, Proc. Boston Soc. Nat. Hist., 23, 1866, pp. 467, 468, fig.

Niagan: Wabash City, Indiana.

*Orthoceras olorus* Hall. See *Cycloceras olorus*.

*Orthoceras olorus baffinensis* Schuchert. See *Cycloceras olorus baffinensis*.

*Orthoceras ommaneyi* Salter. See *Endoceras ommaneyi*.

***Orthoceras oneidaense* Walcott.**

*Orthoceras Oneidaense* Walcott, Trans. Albany Inst. 10, 1883 (adv. sheets, 1879), p. 22, pl. 1, figs. 7, 7a.

Utica: Trenton, Oneida County, New York.

***Orthoceras ordinatum* Billings.**

*Orthoceras ordinatum* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 350. Canadian (Beekmantown): St. Anne and Township of Oxford, Ontario.

***Orthoceras ortoni* Meek.**

*Orthoceras Ortoni* Meek, Proc. Acad. Nat. Sci. Philadelphia, 1872, p. 330; Pal. Ohio, 1, 1873, p. 155, pl. 13, fig. 8.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 130.—James, J. F., Cincinnati Soc. Nat. Hist., 8, 1886, p. 239.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 555, fig.

Eden (Southgate?): Cincinnati, Ohio.

*Orthoceras orus* Hall. See *Kionoceras cancellatum*.

***Orthoceras ottawaense* Billings.**

*Orthoceras ottawaense* Billings, Geol. Surv. Canada, Rep. Progr. for 1853-1856, 1857, p. 331.

Black River (Leray): La Petite Chaudiere Rapids, Ottawa River, Canada.

***Orthoceras ozarkense* Shumard.**

*Orthoceras Ozarkense* Shumard, Trans. Acad. Sci. St. Louis, 2, 1863, p. 107.—Keyes, Missouri Geol. Surv., 5, 1894, 1895, p. 226.

Canadian (Yellville): Ozark County, Missouri.

*Orthoceras perannulatum* Billings. See *Cycloceras crocus*.

***Orthoceras perparvum* Billings.**

*Orthoceras perparvum* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 27 (adv. sheets 1862).

Black River: Pallideau Islands, Lake Huron.

*Orthoceras perroti* Clarke. See *Cycloceras perroti*.

***Orthoceras perseus* Billings.**

*Orthoceras perseus* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 313.

Canadian (Beekmantown): Phillipsburg, Quebec.

*Orthoceras persiphonatum* Billings. See *Huronina persiphonatum*.

***Orthoceras pertinax* Billings.**

*Orthoceras pertinax* Billings, Canadian Nat. Geol., 5, 1860, p. 175.

Black River (Leray): Pauquettes Rapids, Ottawa River, Canada.

***Orthoceras pictoense* Dawson.**

*Orthoceras Pictoense* Dawson, Canadian Nat., n. s., 9, 1880, p. 343.

Silurian: Pictou, Nova Scotia.

***Orthoceras pileolum* Billings.**

*Orthoceras pileolum* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 58.

Anticostian (Chicotte): Near Jupiter River, Anticosti.

**Orthoceras piscator** Billings.

Orthoceras piscator Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 251, fig. 237.

Chazyan (Quebec—I-N): Table Head and Point Rich, Newfoundland.

**Orthoceras piso** Billings.

Orthoceras Piso Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 168 (adv. sheets, 1862).

Richmond: Cape Smyth, Manitoulin Island, Lake Huron.

ORTHO CERAS PLANO CONVEXUM Hall. See *Tripteroceras planoconvexum*.

**Orthoceras porteri** Schuchert.

Orthoceras porteri Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 169, pl. 12, figs. 23-25.

Mohawkian: Head of Frobisher Bay, Baffin Land.

*Holotype*.—Cat. No. 28194, U.S.N.M.

ORTHO CERAS (HURONIA) PORTLOCKI Barrande. See *Huronia portlocki*.

**Orthoceras priamus** Billings.

Orthoceras Priamus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 253, figs. 239a, b.

Orthoceras cf. Priamus Matthew, Trans. Roy. Soc. Canada, 10, sec. 55, 1893, p. 106, pl. 7, figs. 13a, b.

Chazyan (Quebec—L, M): Point Rich and Table Head, Newfoundland.

?Canadian (Bretonian—Div. C3d): St. John, New Brunswick.

**Orthoceras? primigenium** Vanuxem.

Orthoceras primigenium Vanuxem, Geol. New York, 3d Dist., 1842, p. 36, fig. 4.—Emmons, Nat. Hist. New York, Geol., 2d Dist., 1842, p. 179, fig. 4.—Owen, Amer. Jour. Sci. Arts, 47, 1844, pp. 357, 358, fig. 4.—Hall, Pal. New York, 1, 1847, p. 13, pl. 3, fig. 11, 11a.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 148.—Whitfield, Bull. Amer. Mus. Nat. Hist., 2, 1889, p. 56, pl. 10, fig. 1.—Lesley Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 556, figs.—Calvin, Bull. Lab. Nat. Hist. State Univ. Iowa, 2, 1892, p. 193; Amer. Geol., 10, 1892, p. 147.—Cleland, Amer. Pal., Bull. 13, 1900, p. 20; *ibid.*, 4, 1903, p. 14, pl. 3, figs. 8, 9.—Ruedemann, Bull. New York State Mus., 90, 1906, p. 504.—Seely, Vermont State Geol., Rep. 7, 1910, p. 301, fig. 29.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 47.

Canadian (Beekmantown): Near Fort Plain, Beekmantown, Fort Hunter, etc., New York; Iowa.

**Orthoceras progressum** Ruedemann.

Orthoceras progressum Ruedemann, Bull. New York State Mus., 90, 1906, p. 434, pl. 12, figs. 5, 6; fig. 13.

Chazyan (Valcour): Valcour Island, New York.

ORTHO CERAS PROPINQUUM Billings. See *Actinoceras fulgur*.

**Orthoceras punctostriatum** Hall.

Orthoceras punctostriatum Hall, Canadian Nat. Geol., 5, 1860, p. 154, fig. 15.—Dawson, Acadian Geol., Suppl. Chap., p. 68, fig. 61; 2d ed., 1868, p. 605, fig. 212.

Silurian: Arisaig, Nova Scotia.

**Orthoceras pylades** Billings.

Orthoceras Pylades Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 84.

Niagaran (Lockport): Grimsby, Ontario.

ORTHOCERAS PYTHON Billings. See Actinoceras (Deiroceras) python.

ORTHOCERAS RAPAX Billings. See Endoceras rapax.

**Orthoceras raptor** Billings.

Orthoceras raptor Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 57.

Anticostian (Jupiter River): Near Jupiter River, Anticosti.

**Orthoceras recedens** Barrande.

Orthoceras recedens Barrande, Syst. Sil. du Boheme, 4me ser., 2, 1870, pl. 433, figs. 3, 4.

Ordovician: Newfoundland.

ORTHOCERAS RECTIANNULATUM Hall. See Cycloceras? rectiannulatum.

**Orthoceras reticameratum** Hall.

Orthoceras reticameratum Hall, Pal. New York, 1847, p. 46, pl. 11, fig. 1d.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 48.

Black River (Lowville): Watertown, etc., New York.

**Orthoceras rectum** Worthen.

Orthoceras rectum Worthen, Geol. Surv. Illinois, 6, 1875, p. 504, pl. 26, fig. 3.—

Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 78, pl. 12, fig. 9.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 48.

Orthoceras crebescens Hall and Whitfield, Geol. Ohio, 2, 1875, p. 148, pl. 9, fig. 2. Niagaran: Joliet, Illinois (Racine); Shelby, New York, and Cedarville, Ohio (Guelph).

**Orthoceras rectum junius** Foerste.

Orthoceras (Eu-orthoceras) rectum var. junius Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 278, pl. 7, figs. 1, 2.

Orthoceras (Eu-orthoceras) rectum var. junius Foerste, Geol. Surv. Ohio, Pal. 7, 1893, p. 32, figs. 1, 2.

Upper Medinan (Brassfield): Hanover, Indiana.

**Orthoceras remus** Billings.

Orthoceras remus Billings, Cat. Sil. Foss. Anticosti Geol. Surv. Canada, 1866, p. 85.

Niagaran (Lockport): Grimsby, Ontario.

**Orthoceras repens** Billings.

Orthoceras repens Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 312.

Canadian (Beekmantown): Phillipsburg, Quebec.

**Orthoceras rhythmoides** (Foerste).

Orthoceras (Eu-orthoceras) rhythmoides Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 279, pl. 8, fig. 2.

Upper Medinan (Brassfield): Near Carlisle, Ohio.

ORTHOCERAS RICHARDSONI Barrande. See Actinoceras richardsoni.

**Orthoceras rigidum** Hall.

*Orthoceras rigidum* Hall, Pal. New York, 3, 1861, p. 344, pl. 70, figs. 3a-d.—Billings, Proc. Portland Soc. Nat. Hist., 1, 1863, p. 119.—Newell, Proc. Boston Soc. Nat. Hist., 23, 1888, p. 467.—Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 488, pl. 88, fig. 5

Helderbergian: Herkimer County, New York (Manlius transition); Devil's Backbone, Maryland (Keyser).

?Niagaran: Peru, Indiana.

**Orthoceras rogersense** Foerste.

*Orthoceras rogersensis* Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 143, pl. 1, figs. 17a, b.

Trenton (Upper): Rogers Gap, Kentucky.

**ORTHO CERAS ROTTERMUNDI** Barrande. See *Endoceras rottermundi*.

**ORTHO CERAS ROTULATUM** Billings. See *Actinoceras rotulatum*.

**Orthoceras sayi** Billings.

*Orthoceras Sayi* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 315.

Canadian (Beekmantown): Phillipsburg, Quebec.

**Orthoceras scalariforme** Schuchert.

*Orthoceras scalariformis* Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 170, pl. 12, figs. 17, 18.

Mohawkian: Head of Frobisher Bay, Baffin Land.

*Holotype*.—Cat. No. 28195, U.S.N.M.

**ORTHO CERAS SCAMMONI** McChesney. See *Kionoceras cancellatum*.

**Orthoceras schucherti** Maynard.

*Orthoceras schucherti* Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 487, pl. 88, fig. 4.

Helderbergian (Keyser): Cumberland, Maryland.

**ORTHO CERAS SEDGWICKI** Billings. See *Actinoceras sedgwicki*.

**Orthoceras selkirkense** Whiteaves.

*Orthoceras Selkirkense* Whiteaves, Trans. Royal Soc. Canada, 9, sec. 4, 1892, p. 82, pl. 8, figs. 2, a, b; Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 123 (loc. occ.); *ibid.*, pt. 3, 1897, p. 212.

Black River or Richmond: East Selkirk, Manitoba.

**Orthoceras selwyni** Billings.

*Orthoceras selwyni* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 161 (adv. sheets, 1862).—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 98.

Niagaran (Guelph): Galt, Ontario.

**ORTHO CERAS SEMIPLANATUM** Whiteaves. See *Jovellania semiplanata*.

**ORTHO CERAS SERVILE** Billings. See *Tripteroceas servile*.

**ORTHO CERAS SHUMARDI** Billings. See *Geisonoceras shumardi*.

**Orthoceras sieboldi** Billings.

*Orthoceras Sieboldi* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, pp. 23, 58.

Richmond (English Head) and Gamachian: Near West End Light House and Gamache Bay, Anticosti.

ORTHO CERAS SIMPSONI Billings. See *Narthecoceras simpsoni*.

**Orthoceras simulator** Hall.

*Orthoceras simulator* Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1877, pl. 27, figs. 11, 12; mus. ed., 1879, p. 179, pl. 27, figs. 11, 12; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 322, pl. 28, figs. 11, 12; pl. 33, figs. 1, 2.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 557, figs.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 49.

Niagaran (Waldron): Waldron, Indiana.

**Orthoceras sociale** Hall.

*Orthoceras gregarium* Hall (not Sowerby, 1839), Rep. Supt. Geol. Surv. Wisconsin, 1861, p. 46.

*Orthoceras sociale* Hall in Miller N. A. Pal. Foss., 2d ed., 1877, p. 245.—J. F. James, Amer. Geol., 5, 1890, p. 355.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 71, pl. 8, figs. 16–23.—Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 789, pl. 55, fig. 7.

*Orthoceras* (*Geisonoceras*) *sociale* Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 48, fig. 1248.

Richmond (Maquoketa): Maquoketa Creek, etc., Iowa; Scales Mound, etc., Illinois.

**Orthoceras sordidum** Billings.

*Orthoceras sordidum* Billings, Canadian Nat. Geol., 4, 1859, p. 363, fig. 11i, k; Geol. Canada, Geol. Surv. Canada, 1863, p. 121, fig. 39a, b.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 558, figs.

Canadian (Romaine): Mingan Islands, Quebec.

ORTHO CERAS SORDIDUM Billings. See *Endoceras montrealense*.

ORTHO CERAS (HURONIA) SPHEROIDALE Stokes. See *Actinoceras sphaeroidale*.

**Orthoceras spissiseptum** Dwight.

*Orthoceras spissiseptum* Dwight, Amer. Jour. Sci. Arts, 3d ser., 27, 1884, p. 256, pl. 7, fig. 12.

Canadian (Beekmantown): Rochdale, New York.

**Orthoceras** (*Spyroceras*?) *spyroceroides* Foerste.

*Orthoceras* (*Spyroceras*?) *spyroceroides* Foerste, Geol. Surv. Ohio, Pal. 7, 1893, p. 545.

Upper Medinan (Brassfield): Near New Carlisle, Ohio.

**Orthoceras strialinearum** McChesney.

*Orthoceras strialinearum* McChesney, Desc. New Fossils, 1861, p. 94.

Niagaran (Racine): Chicago, Illinois.

**Orthoceras strigatum** Hall.

*Orthoceras strigatum* Hall, Pal. New York, 1, 1847, p. 205, pl. 56, figs. 1a–f.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 150.—Hitchcock, Geol. Vermont, 1, 1861, 1862, p. 298, fig. 211.

Trenton: Middleville, New York.

ORTHO CERAS STRIX Hall and Whitfield. See *Kionoceras strix*.

ORTHO CERAS SUBARCUATUM HALL. See *Loxoceras moniliforme* and *Spyroceras clintoni*.



**Orthoceras subbaculum** Meek and Worthen.

*Orthoceras subbaculum* Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1865, p. 256.

Niagaran: (Racine): Joliet, Illinois.

**ORTHO CERAS SUBCANCELLATUM** Hall. See *Kionoceras cancellatum*.

**Orthoceras sublæve** D'Orbigny.

*Orthoceras læve* Hall (not Fleming), Geol. New York, 4, 1843, p. 137, fig. 2; p. 138; tab. ill. 25, fig. 2.—Owen, Amer. Jour. Sci. Arts., 2d ser., 1, 1846, p. 46, fig. 2.

*Orthoceras sublæve* D'Orbigny, Prodr. Pal., 1, 1850, p. 28.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 559, fig.

Niagaran (Guelph): Newark, Wayne County, New York.

**Orthoceras tenerum** Billings.

*Orthoceras tener* Billings, Canadian Nat. Geol., 5, 1860, p. 174.

Black River (Leray): Pauquettes Rapids, Ottawa River, Canada.

**ORTHO CERAS (ORMOCERAS) TENUIFILUM** James. See *Actinoceras tenuifilum*.

**ORTHO CERAS TENUISEPTUM** Hall. See *Cameroceras tenuiseptum*.

**Orthoceras tenuisiphonatum** Foerste.

*Orthoceras tenui-siphonatum* Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 278.

*Orthoceras* (Eu-*Orthoceras*?) *virgulatum* Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 276, pl. 7, fig. 5; Geol. Surv. Ohio, Pal., 7, 1893, p. 543, pl. 32, fig. 5; pl. 35, fig. 3.

Upper Medinan (Brassfield): Soldiers' Home, Dayton, Ohio.

**Orthoceras tenuistriatum** (Hall).

*Endoceras proteiforme* var. *tenuistriatum* Hall, Pal. New York, 1, 1847, p. 209, pl. 45, figs. 1a, b; pl. 47, figs. 1a, b; 2a-e; pl. 59, figs. 2a, b.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, p. 217, figs.

*Orthoceras tenuistriatum* Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 788, pl. 55, figs. 4, 6.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 188, pl. 13, figs. 1, 2.

Trenton: Middleville, etc., New York; Jacksonburg, New Jersey.

Black River (Platteville): Cannon Falls, Minnesota.

**Orthoceras tenuitextum** (Hall).

*Endoceras proteiforme* var. *tenuitextum* Hall, Pal. New York, 1, 1847, p. 210, pl. 45, figs. 2a, b, 3a, b, 5a-c; pl. 48, figs. 2a-c; pl. 59, figs. 1a, b.

*Orthoceras tenuitextum* Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 189, pl. 13, figs. 3, 4.

Trenton: Middleville, etc., New York; Jacksonburg, New Jersey.

**ORTHO CERAS TERETIFORME** Hall. See *Cycloceras teretiforme*.

**Orthoceras textile** Hall.

*Orthoceras textile* Hall, Pal. New York, 1, 1847, p. 199, pl. 43, figs. 1a, b.—Emons, Amer. Geology, 1, pt. 2, 1855, p. 150.

Trenton: Watertown, New York.

**Orthoceras tityrus** Billings.

*Orthoceras Tityrus* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 316.

Canadian (Beekmantown): Phillipsburg, Quebec.

**Orthoceras transversum** Miller.

*Orthoceras transversum* Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 129.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 8, 1886, p. 239.—Ulrich, Amer. Geol., 1, 1888, p. 325.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 15.—Miller, N. A. Geol. Pal., 1889, p. 452, fig. 755.  
Eden: Cincinnati, Ohio, and vicinity.

ORTHO CERAS TRUSITUM Clarke and Ruedemann, See *Protokionoceras trusitum*.

**Orthoceras turbidum** Hall and Whitfield.

*Orthoceras turbidum* Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 100, pl. 3, fig. 1.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 8, 1886, p. 240.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 560, fig.  
Maysville (Fairmount): Cincinnati, Ohio, and vicinity.

ORTHO CERAS (ACTINOCERAS) TURGIDO-NUMMULATUM Foerste. See *Actinoceras turgidonummulatum*.

**Orthoceras tyronense** Foerste.

*Orthoceras tyronensis* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, p. 139, pl. 10, figs. 5a, b.  
Black River (Lowville): High Bridge, Kentucky.

ORTHO CERAS UNDULATUM Hall. See *Dawsonoceras annulatum*.

**Orthoceras undulostriatum** Hall.

*Orthoceras undulostriatum* Hall, Pal. New York, 1, 1847, p. 202, pl. 43, figs. 7a-k.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 150.—Salter, Quart. Jour. Geol. Soc. London, 15, 1859, p. 375, pl. 13, figs. 25, 26.  
Trenton: Middleville, New York.

**Orthoceras unionense** Worthen.

*Orthoceras Unionensis* Worthen, Geol. Surv. Illinois, 6, 1875, p. 505, pl. 26, fig. 4.—Newell, Proc. Boston Soc. Nat. Hist., 23, 1888, p. 467.  
Niagaran: Union County, Illinois; Wabash, Indiana.

**Orthoceras(?) vagum** Ruedemann.

*Orthoceras(?) vagum* Ruedemann, Bull. New York State Mus., 90, 1906, p. 435, pl. 13, figs. 1-3; pl. 9, fig. 9.  
Chazyan (Valcour): Valcour Island, New York; Isle La Motte, Vermont.

**Orthoceras varro** Billings.

*Orthoceras varro* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 84.  
Niagaran (Lockport): Rockwood and Grimsby, Ontario.

ORTHO CERAS VELOX Billings. See *Cameroceras velox*.

ORTHO CERAS VERTEBRALE Hall. See *Cycloceras olorus*.

ORTHO CERAS (ORMOCERAS) VERTEBRATUM Barrande. See *Actinoceras vertebratum*.

**Orthoceras veterator** Billings.

*Orthoceras veterator* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 350.  
Canadian (Beekmantown): Township of Oxford, Ontario.

ORTHO CERAS VIRGATUM? Hall. See *Kionoceras cancellatum*.

**Orthoceras virgulatum** Hall.

*Orthoceras virgulatum* Hall, Pal. New York, 2, 1852, p. 96, pl. 29, fig. 2a, b, c.  
Lower Clinton: Reynale's Basin and Lockport, New York.

*Orthoceras* (*Euorthoceras*?) *virgulatum* Foerste. See *Orthoceras tenuisiphonatum*.

***Orthoceras vulgatum* Billings.**

*Orthoceras vulgatum* Billings, Geol. Surv. Canada, Rep. Progr. for 1853-56 1857, p. 337.

Trenton: Ottawa, Ontario.

***Orthoceras wauwatosense* Whitfield.**

*Orthoceras wauwatosense* Whitfield, Ann. Rep. for 1879, Wisconsin Geol. Surv., 1880, p. 66; Geol. Wisconsin, 4, 1882, p. 297, pl. 19, fig. 2.

Niagaran (Racine): Near Wauwatosa, Wisconsin.

***Orthoceras westoni* Whiteaves.**

*Orthoceras westoni* Whiteaves, Ottawa Nat., 12, 1893, p. 117; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 324.

Trenton: Mile End, Montreal, Quebec.

Observation.—Species dropped by author, who in 1906 regarded specimen as a siphuncle of *Endoceras*.

***Orthoceras winnipegense* Whiteaves.**

*Orthoceras Winnipegense* Whiteaves, Trans. Roy. Soc. Canada, 9, sec. 4, 1892, p. 82, pl. 6, figs. 4, 4a, b; Pal. Foss. Geol. Surv. Canada, 3, pt. 3, 1897, p. 212.

Black River or Richmond: Lake Winnipeg, Manitoba.

**ORTHO CERAS WOODSWORTHI** McChesney. See *Kionoceras cancellatum*.

***Orthoceras xerxes* Billings.**

*Orthoceras Xerxes* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 316.

Canadian (Beekmantown): Phillipsburg, Quebec.

**ORTHO CERAS XIPHIAS** Billings. See *Tripteroce ras xiphias*.

**ORTHO CERAS (ACTINOCERAS) YOUNGI** Foerste. See *Actinoceras youngi*.

**ORTHO CERATTES** Waldheim. See *Orthoceras Breynius*.

**ORTHODESMA** Hall and Whitfield. Genotype: *O. rectum* Hall and Whitfield.

*Orthodesma* Hall and Whitfield, Pal. Ohio, 2, 1875, p. 93.—Zittel, Handb. Pal., 2, 1881, p. 219.—Miller, N. A. Geol. Pal., 1889, p. 497.—Ulrich, Geol. Surv. Ohio, 7, 1893, p. 660; Geol. Minnesota, 3, pt. 2, 1894, p. 516.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 932.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 379.

**ORTHODESMA** (part) of authors. See *Rhytinaya* and *Cymatonota* Ulrich.

***Orthodesma affine* Whiteaves.**

*Orthodesma affine* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 184, pl. 20, fig. 5.

Black River or Richmond: Selkirk Island, Lake Winnipeg, Manitoba.

***Orthodesma antiquum* Whiteaves.**

*Orthodesma antiquum* Whiteaves, Ottawa Nat., 22, 1908, p. 111, pl. 3, fig. 10.

Black River (Lowville): Hog Back near Ottawa, Ontario; Aylmer, Quebec.

***Orthodesma approximatum* Foerste.**

*Orthodesma approximatum* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 285, pl. 1, fig. 5.

Cincinnati (Pulaski): Chambly, Quebec.

ORTHODESMA ASHMANI Miller and Faber. See *Rhytimya radiata*.

ORTHODESMA BYRNESEI Miller. See *Rhytimya byrnei*.

**Orthodesma canaliculatum** Ulrich.

*Orthodesma canaliculatum* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 520, pl. 37 figs. 7-11.—Weller, Geol. Surv. New Jersey Pal., 3, 1903, p. 171, pl. 11, fig. 5.—Cumings, 32d Ann. Rep. Geol. Nat. Res. Indiana, 1908, p. 1012, pl. 47, figs. 4, 4b.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 330, figs. 482d-e.

Richmond: Spring Valley, Minnesota; Ohio and Indiana.

?Trenton: Jacksonburg, New Jersey.

*Cotypes*.—Cat. Nos. 46271, 46272, U.S.N.M.

**Orthodesma contractum** (Hall).

*Orthonota contracta* Hall, Pal. New York, 1, 1847, p. 300, pl. 82, figs. 8a, b.—Pictet, *Traite de Pal.*, 2d ed., 3, 1855, p. 571, pl. 80, fig. 27.—Emmons, *Amer. Geol.*, 1, pt. 2, 1855, p. 174.—Miller, *Cincinnati Quart. Jour. Sci.*, 1, 1874, p. 222.

*Orthodesma contractum* Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 96, pl. 2, figs. 4, 5.—Lesley, Geol. Surv. Pennsylvania, P 4, 1889, p. 563, figs. Maysville: Cincinnati, Ohio.

*Plastotype*.—Cat. No. 46751, U.S.N.M.

Observation.—Possibly the same as *Rhytimya mickelboroughi* (Whitfield).

ORTHODESMA CUNEIFORME Miller. See *Sphenolium cuneiforme*.

**Orthodesma curtum** (Hall).

*Orthonota curta* Hall (not Hall, 1852), Geol. Rep. 4th Dist., New York, 1843, p. 76, fig. 1, tab. ill. 8, fig. 1.—Owen, *Amer. Jour. Sci. Arts*, 48, 1845, p. 306, fig. 1.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 567, fig.

*Orthodesma curtum* Whitfield and Hovey, Bull. Amer. Mus. Nat. Hist., 11, pt. 2, 1899, p. 160 (gen. ref.).

Clinton: Walcott, New York.

**Orthodesma curvatum** (Hall and Whitfield).

*Orthodesma curvata* Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 95, pl. 2, fig. 6.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 563, fig.

Richmond (Waynesville): Near Waynesville, Ohio.

ORTHODESMA CYLINDRICUM Miller and Faber. See *Cymatonota cylindrica*.

ORTHODESMA CYMBULA Miller and Faber. See *Rhytimya mickleboroughi*.

ORTHODESMA ELLIPTICUM Miller. See *Psiloconcha elliptica*.

ORTHODESMA FABERI Miller. See *Rhytimya faberi*.

ORTHODESMA GRANDE Miller. See *Psiloconcha grandis*.

ORTHODESMA MICKLEBOROUGHII Whitfield. See *Rhytimya mickleboroughi*.

ORTHODESMA MINIMUM Miller. See *Psiloconcha minima*.

ORTHODESMA MINNESOTENSE Miller. See *Psiloconcha minnesotensis*.

**Orthodesma minnesotense** Ulrich.

*Orthodesma minnesotense* Ulrich, 19th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1892, p. 228, fig. 14; Geol. Minnesota, 3, pt. 2, 1894, p. 517, pl. 37, figs. 12 and 14.

Black River (Decorah): St. Paul, Minnesota.

*Holotype*.—Cat. No. 46273, U.S.N.M.

*ORTHODESMA MUNDUM* Miller and Faber. See *Rhytimya mundum*.

***Orthodesma nasutum*** (Conrad).

*Cypricardites nasuta* Conrad, 5th Ann. Rep. New York Geol. Surv., 1841, p. 52.—  
Emmons, Geol. Rep. New York, 1842, p. 403, fig. 4.

*Modiolopsis nasutus* Hall, Pal. New York, 1, 1847, p. 159, pl. 35, fig. 7; p. 296, pl. 81, fig. 2.

*Orthodesma nasutum* Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 468 (gen. ref.).—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 286, pl. 3, fig. 5; pl. 5, fig. 3.

Cincinnati (Pulaski): Near Romo, Loraine, etc., New York.

Trenton: Carlisle, Pennsylvania.

***Orthodesma occidentale*** Miller.

*Orthodesma occidentale* Miller, Jour. Cincinnati Soc. Nat. Hist., 3, 1881, p. 316, pl. 8, figs. 6, 6a.

Eden (Southgate): Cincinnati, Ohio.

*ORTHODESMA PARALLELA* of authors. See *Cymatonota parallela*.

***Orthodesma parvum*** Ulrich.

*Orthodesma parvum* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 660, pl. 55, figs. 19–20. Maysville (Corryville): Cincinnati, Ohio.

*Holotype*.—Cat. No. 46274, U.S.N.M.

*ORTHODESMA PRODUCTIFRONS* Miller. See *Cymatonota productifrons*.

***Orthodesma prolatum*** Foerste.

*Orthodesma prolatum* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 289, pl. 1, fig. 15.

Cincinnati (Pulaski): St Lawrence River, below Becancour River, Quebec.

***Orthodesma pulaskiense*** Foerste.

*Orthodesma pulaskiensis* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 288, pl. 3, fig. 6.

Cincinnati (Pulaski): Near Pulaski, New York.

***Orthodesma rectum*** Hall and Whitfield.

*Orthodesma rectum* Hall and Whitfield, Pal. Ohio, 2, 1875, p. 94, pl. 2, figs. 7, 8.—  
Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 565, figs.—Miller, N. A. Geol. Pal., 1889, p. 497, fig. 874.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1014, pl. 47, figs. 6, 6a.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 379, fig. 484.

Richmond (Waynesville): Waynesville, etc., Ohio; Indiana.

*ORTHODESMA SAFFORDI* Ulrich. See *Whiteavesia saffordi*.

*ORTHODESMA SCAPHULA* Miller and Faber. See *Rhytimya scaphula*.

***Orthodesma schucherti*** Ulrich.

*Orthodesma schucherti*, Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 518, pl. 36, figs. 25, 26.

Trenton (Prosser): Near Spring Valley, Minnesota.

*ORTHODESMA SEMISTRATUM* Miller. See *Cymatonota semistriata*.

*ORTHODESMA SINUATUM* Miller. See *Rhytimya sinuata*.

**Orthodesma subangulatum** Ulrich.

*Orthodesma subangulatum* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 660, pl. 55, figs. 21-23.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res., Indiana, 1908, p. 1015, pl. 47, figs. 7, 7a.

Richmond (Whitewater): Richmond, Indiana.

*Cotypes*.—Cat. No. 46275, U.S.N.M.

**Orthodesma subcarinatum** Ruedemann.

*Orthodesma?* *subcarinatum* Ruedemann, Bull. New York State Mus., 162, 1912, p. 96, pl. 5, figs. 5-8.

Trenton (Snake Hill): Snake Hill, Saratoga County, New York.

**Orthodesma subnasutum** (Meek and Worthen).

*Modiolopsis subnasuta* Meek and Worthen (not Hall, 1860), Proc. Philadelphia Acad. Nat. Sci., 1870, p. 41; Geol. Surv. Illinois, 6, 1875, p. 494, pl. 23, fig. 9a-b.

*Orthodesma subnasutum* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 518, pl. 36, figs. 23 and 24.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 380, fig. 482b-c.

*Orthodesma* cf. *subnasutum* Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 135, pl. 1, fig. 11.

*Modiolopsis carrollensis* Worthen, Bull. Illinois State Mus. Nat. Hist., 1, 1882, p. 38.

Trenton: Carroll County and Dixon, Illinois (Galena); Rogers Gap, Kentucky(?).

*Plesiotype*.—Cat. No. 46276 U.S.N.M. (Ulrich).

ORTHODESMA SUBOVALE Ulrich. See *Psiloconcha subovalis*.

ORTHODESMA TENUISTRATUM Miller. See *Psiloconcha tenuistriata*.

ORTHODONTISCUS Meek. See *Cycloconcha* Miller.

ORTHOGRAPTUS AMI Lapworth. See *Glossograptus* (*Orthograptus*) *quadrimucronatus*.

ORTHOGRAPTUS BASILICUS Lapworth. See *Diplograptus basilicus*.

ORTHOGRAPTUS QUADRIMUCRONATUS Ami. See *Glossograptus* (*Orthograptus*) *quadrimucronatus*.

ORTHONEMA NEWBERRYI Meek. See *Acanthonema newberryi*.

ORTHONOMEA Hall. See *Zygospira* Hall.

ORTHONOTA (part) Conrad. See *Cymatonota* Ulrich.

**ORTHONOTA** Conrad.

Genotype: *O. undulata* Conrad,

*Orthonota* Conrad, 5th Ann. Rep. New York Geol. Surv., 1841, p. 50.—Salter.

Mem. Geol. Surv. Great Britain, 2, pt. 1, 1848, p. 359.—D'Orbigny, Prodr.

Pal., 1, 1849, p. 12.—Pictet, Traite de Pal., 2d ed., 3, 1855, p. 571.—Emmons,

Amer. Geology, 1, pt. 2, 1855, p. 173.—Conrad, Amer. Jour. Conch., 2, 1866,

p. 103.—Hall, Prelim. Notice Lam., pt. 2, 1870, p. 85.—Miller, Cincinnati

Quart. Jour. Sci., 1, 1874, p. 221.—Zittel, Handb. Pal., 2, 1881, p. 129.—

Barrande, Acephales (Extraits Syst. Sil. Centre Boheme, 6), 1881, p. 198;

p. 125.—Hall, Pal. New York, 5, pt. 1, Lam. 2, 1885, p. xlv.—Bigot, Bull.

Soc. Geol. France, 3d ser., 1889, 17, p. 799.—Miller, N. A. Geol. Pal., 1889,

p. 497.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 267.—Hind, Mon.

British Carb. Lam., 1, 1900, Pal. Soc., p. 363.

*Orthonotus* McCoy, British Pal. Rocks Foss., 1854, p. 274.—Salter, Cat. Camb. and Sil. Foss., 1873, p. 65.—Woodward, Man. Mollusca, pt. 2, 1854, p. 266.

**Orthonota angulifera** McCoy.

Orthonota angulifera McCoy, British Pal. Rocks, 1850, p. 276.—Billings, Pal. Foss., Geol. Surv. Canada, 2, pt. 1, 1874, p. 132, pl. 8, fig. 13, 13a.  
Silurian: England; Arisaig, Nova Scotia.

ORTHONOTA CONTRACTA Hall. See Orthodesma contractum.

ORTHONOTA CURTA Hall. See Orthodesma curtum and Cuneamya alveata.

**Orthonota incerta** Billings.

Orthonota incerta Billings, Pal. Foss., Geol. Surv. Canada, 2, pt. 1, 1874, p. 120, pl. 8, fig. 2.  
Silurian: Arisaig, Nova Scotia.

ORTHONOTA PARALLELA Hall. See Cymatonota parallela.

ORTHONOTA PHOLADIS Hall. See Cymatonota pholadis.

**Orthonota simulans** Billings.

Orthonota simulans Billings, Pal. Foss., Geol. Surv. Canada, 2, pt. 1, 1874, p. 131, pl. 8, fig. 4.  
Silurian: Arisaig, Nova Scotia.

**Orthonota speciosa** Billings.

Orthonota? speciosa Billings, Pal. Foss., Geol. Surv. Canada, 2, pt. 1, 1874, p. 130, pl. 8, fig. 3.  
Silurian: Arisaig, Nova Scotia.

ORTHONOTA TRIANGULATA Salter. See Grammysia triangulata.

**Orthonota venusta** Billings.

Orthonota venusta Billings, Pal. Foss., Geol. Surv. Canada, 2, pt. 1, 1874, p. 129, pl. 8, fig. 1.  
Silurian: Arisaig, Nova Scotia.

**ORTHONOTELLA** Miller.

Genotype: *O. faberi* Miller.

Orthonotella Miller, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 117; N. A. Geol. Pal., 1889, p. 498.

**Orthonotella faberi** Miller.

Orthonotella faberi Miller, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 117, pl. 5, figs. 7, 7a, 7b; N. A. Geol. Pal., 1889, p. 498, fig. 876.

Maysville (Fairmount): Cincinnati, Ohio.

Observation.—Probably not a pelecypod, possibly a crustacean.

**ORTHONYCHIA** Hall.

Genotype: *Platyceras subrectum* Hall.

Orthonychia Hall, Nat. Hist. New York, 4, 1843, p. 172, fig. 3; p. 173; tab. ill. 36, fig. 3.—Owen, Amer. Jour. Sci. Arts, 2d ser., 1, 1846, p. 67, fig. 3.—Hall, 12th Rep. New York State Cab. Nat. Hist., p. 18; Pal. New York, 3, 1859, p. 330; 15th Rep. New York State Cab. Nat. Hist., 1861, p. 30.—Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1866, p. 263; Geol. Surv. Illinois, 3, 1868, pp. 385, 387.—Hall, Pal. New York, 5, pt. 2, p. 2.—Zittel, Handb. Pal., 2, 1882, p. 217.—Koken, Neues Jahrb. f. Min., Geol. and Pal., 6, Beiilage-Band, 1889, p. 466.—Whidborne, Mon. Dev. Fauna South England, Pal. Soc., 1891, p. 222.—Keyes, Amer. Geol., 10, 1892, p. 275; Missouri Geol. Surv., 5, 1894, p. 187.—Koken, Die Leitfossilien, Leipzig, 1896, p. 133.—Pilsbry, Zittel-Eastman Textb. Pal., 1, 1900, p. 460.—Dall, *ibid.*, 2d ed., 1913, p. 54.

**Orthonychia obtusa** Whiteaves.

*Orthonychia obtusa* Whiteaves, Geol. Surv. Canada, Ann. Rep., n. s., 14, App. F, 1904, p. 51; Pal. Foss., 3, pt. 4, 1906, p. 260, pl. 29, figs. 5, 5a.  
Niagaran: Ekwan River, Canada.

**ORTHORHYNCHULA** Hall and Clarke. Genotype: *Orthis*(?) *linneyi* James.

*Orthorhynchula* Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 181; 13th Ann. Rep. New York State Geol., 1895, p. 824.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 83.—Williams, Bull. U. S. Geol. Surv., 165, 1900, p. 59.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 396.

**Orthorhynchula linneyi** (James).

*Orthis*? *linneyi* James, Paleontologist, 5, 1881, p. 41.—Nettelroth, Kentucky Foss. Shells, Mem. Kentucky Geol. Surv., 1889, p. 41, pl. 34, figs. 7-18.  
*Orthorhynchula linneyi* Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 181, pl. 56, figs. 10-13, 19.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 281, figs. 342d-e.—Bassler, Virginia Geol. Surv., Bull. 2a, 1909, pl. 14, figs. 10-12.—Foerste, Bull. Sci. Lab. Denison Univ., 14, 1910, p. 24, pl. 3, fig. 10; Bull. 17, 1912, p. 132, pl. 11, fig. 5.  
Trenton: Boyle County, etc., Kentucky (Perryville-Cynthiana); Tennessee (Catheys).  
Maysville: Ohio, Kentucky (Fairmount); Tennessee (Leipers); Virginia; etc.  
*Plesiotypes*.—Cat. No. 51186, U.S.N.M.

**ORTHOSTOMA** Conrad. See *Eccyliomphalus* subgenus *Orthostoma*.**ORTHOSTROPHIA** Hall.Genotype: *Orthis strophomenoides* Hall.

*Orthostrophia* Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 36, figs. 32-34.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 199, 223, 253; 11th Ann. Rep. New York State Geol., 1894, p. 267.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 256.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 382.  
*Shizonema* (subgenus of *Hebertella*) Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 77.  
*Shizoramma* (*Schizonema* preoccupied) Foerste, *ibid.*, 17, 1912, p. 139. (Genotype: *S. fissistriata* Foerste).

**Orthostrophia dixonii** Foerste.

*Orthostrophia dixonii* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 74, pl. 4, fig. 65.  
Niagaran (Brownsport): Glade southwest of Dixon Spring, Tennessee.

**Orthostrophia (Schizoramma) fasciata** (Hall).

*Orthis fasciata* Hall, Pal. New York, 2, 1852, p. 255, pl. 52, fig. 8.  
*Orthostrophia*? *fasciata* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 200, 223.—Grabau, Bull. New York State Mus., 45, 1901, p. 187, fig. 96.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 256, fig. 307.  
*Hebertella* (*Schizonema*) *fasciata* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 77, pl. 4, fig. 71.  
Clinton: Rochester and Lockport, New York (Rochester); New Marion, Indiana (Osgood).

**Orthostrophia (Schizoramma) fissiplica** (Roemer).

*Orthis fissiplica* Roemer, Die silurische Fauna West. Tennessee, 1860, p. 64, pl. 5, fig. 5; Cincinnati Quart. Jour. Sci., 1, 1874, p. 252.  
*Dalmanella fissiplica* Foerste, Jour. Geol., 11, 1903, p. 711.



**Orthostrophia (Schizoramma) fissiplica**—Continued.

*Hebertella (Schizonema) fissiplica* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 79, pl. 3, fig. 54.

Niagaran (Brownspout): Dixon Spring, Clifton, Bath Springs, Wells Creek Basin, etc., Tennessee.

**Orthostrophia (Schizoramma) fissistriata** (Foerste).

*Hebertella (Schizonema) fissistriata* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 76, pl. 3, figs. 45A, B.

Clinton (Osgood): New Marion, Indiana.

**Orthostrophia newsomensis** Foerste.

*Orthostrophia newsomensis* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 73, pl. 4, fig. 64.

Niagaran (Waldron): Newsom, Tennessee.

**Orthostrophia (Schizoramma) nisis** (Hall and Whitfield).

*Orthis nisis* Hall and Whitfield, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 181; 27th Rep. *ibid.*, 1875, pl. 9, fig. 4-8.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 42, pl. 27, figs. 4, 5.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 217.

*Hebertella (Schizonema) nisis* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 78.

Niagaran (Louisville): Beargrass Creek, Louisville, Kentucky.

*Plesiotype*.—Cat. No. 51347, U.S.N.M.

ORTHOTHETES of authors. See *Schuchertella Girty*.

ORTHOTHETES HYDRAULICUS Grabau. See *Schuchertella interstriata*.

**ORTHOTROPIA** Hall and Clarke. Genotype: *O. dolomitica* Hall and Clarke.

*Orthotropia* Hall and Clarke, Pal. New York, 8, pt. 2, 1895, explanation sheet to pl. 84, figs. 3-7; 13th Ann. Rep. New York State Geol., 1895, p. 943.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 395.

**Orthotropia dolomitica** Hall and Clarke.

*Orthotropia dolomitica* Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pl. 84, figs. 3-7; 48th Rep. New York State Mus., 2, for 1895, 1897, p. 343, pl. 6, figs. 4-8; 14th Rep. State Geol. New York for 1894, 1897, p. 343, pl. 6, figs. 4-8.

Niagaran (Racine?): Near Milwaukee, Wisconsin.

**ORTONELLA** Ulrich. Genotype: *Cypricardites hainesi* Miller.

*Cypricardites (part)* Miller (not Conrad), Cincinnati Quart. Jour. Sci., 1, 1874, p. 147; N. A. Geol. Pal., 1889, p. 476.

*Ortonella* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 669.—Cummings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 983.—Grabau and Shimer, N. A. Index Fossils 1, 1909, p. 412.

**Ortonella hainesi** (Miller).

*Cypricardites hainesi* Miller, Cincinnati Quar. Jour. Sci., 1, 1874, p. 147, figs. 12, 13, p. 218; N. A. Geol. Pal., 1889, p. 476, figs. 814, 815.—Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 17, 1894, p. 29.

*Ortonella hainesi* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 670, pl. 53, figs. 9-18.—Cummings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1017, pl. 47, figs. 9-9d.—Grabau and Shimer, N. A. Index Fossils 1, 1909, p. 412, fig. 534.

Richmond (Whitewater): Richmond, Indiana.

*Plesiotypes*.—Cat. No. 46277, U.S.N.M.

**ORTONIA** Nicholson. See *Cornulites* Schlotheim.

**ORUSIA** Walcott. See *Eoorthis* subgenus *Orusia*.

**ORYGOCERAS** Ruedemann. Genotype: *Orthoceras cornuoryx* Whitfield.  
*Orygoceras* Ruedemann, Bull. New York State Mus., 90, 1906, p. 449.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 62.

**Orygoceras cornuoryx** (Whitfield).

*Orthoceras cornu-oryx* Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 320, pl. 27, figs. 1, 2, 6.—Seely, Vermont State Geol. Rep., 7, 1910, pl. 56, fig. 3.

*Orygoceras cornu-oryx* Ruedemann, Bull. New York State Mus., 90, 1906, p. 450, pl. 14, figs. 5-8, figs. 19-20.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 63, fig. 1268.

Canadian (Beekmantown): Fort Cassin, Vermont; Valcour, New York.

**OTTAWACRINUS** W. R. Billings. Genotype: *O. typus* W. R. Billings.

*Ottawacrinus* W. R. Billings, Ottawa Nat., 1, 1887, p. 49.—Miller, N. A. Geol. Pal., 1889, p. 265.—Bather, Ann. Mag. Nat. Hist., 6th ser., 5, 1890, p. 332, pl. 14, fig. 12.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1890, pp. 378, 380.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 178, fig. 96.—Springer, Mem. Geol. Surv. Canada, 15 P, 1911, p. 39.—Bather, Bull. Victoria Mem. Mus., 1, 1913, pp. 1-10—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 215.

**Ottawacrinus billingsi** Springer.

*Ottawacrinus billingsi* Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 40, pl. 4, figs. 1-3.

Trenton (Curdsville): Kirkfield, Ontario.

**Ottawacrinus typus** W. R. Billings.

*Ottawacrinus typus* W. R. Billings, Ottawa Nat., 1, 1887, p. 49.—Miller, N. A. Geol. Pal., 1889, p. 265, fig. 378.—Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 37, pl. 4, figs. 5-7.—Bather, Bull. Victoria Mem. Bull. 1, 1913, p. 2, pl. 1.

Trenton (Curdsville): Hull, Quebec; Kirkfield, Ontario.

**OXOPLECIA** Wilson. See *Triplecia* subgenus *Cliftonia* Foerste.

**OXYDISCUS** Koken.

Genotype: *Oxydiscus imitator* Koken.

*Bellerophon*, *Cyrtolites*, *Porcellia*, and *Euomphalus* (part) of authors.

*Oxydiscus* Koken, Neues Jahrb. Min., Geol. Pal., Beilageband, 6, 1889, p. 390; *ibid.*, 1898, p. 8; *Die Leitfossilien*, Leipzig, 1896, p. 100.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, pp. 852-912.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, p. 951.—Grabau and Shimer, N. A. Index Fossils, 1, p. 616.

**Oxydiscus acutus** (?Sowerby) Billings.

*Bellerophon acutus* Sowerby, Murchison's Sil. Syst., 1839, p. 643.—Billings, Cat. Sil. Fossils Anticosti, Geol. Surv. Canada, 1866, p. 18, 56.

*Oxydiscus acutus* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 852 (gen. ref.).

Gamachian (Ellis Bay): Gamache Bay, Anticosti.

**Oxydiscus argo** (Billings).

*Bellerophon Argo* Billings, Canadian Nat. Geol., 5, 1860, p. 167, figs. 12, 13; Geol. Canada, Geol. Surv. Canada, 1863, p. 146, fig. 99a, b.

**Oxydiscus argo**—Continued.

*Oxydiscus argo* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 913.  
Black River: Pauquettes Rapids, Ottawa River (Leray), and Lake St. John,  
Canada.

**Oxydiscus catilloides** (Raymond).

*Bucania catilloides* Raymond, Ann. Cranegie Mus., 3, 1906, p. 576.  
*Oxydiscus catilloides* Raymond, *ibid.*, 4, 1908, p. 197, pl. 55, figs. 9, 10.  
Chazyan (Crown Point): Valcour Island, New York.

**Oxydiscus cristatus** (Safford).

*Cyrtolites cristatus* Safford, Geol. Tennessee, 1869, p. 289.  
*Oxydiscus cristatus* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 914,  
pl. 82, figs. 26–28.—Hayes and Ulrich, U. S. Geol. Surv., folio 95, illust. sheet,  
1903, fig. 27.  
Trenton (Catheys): Nashville, etc., Tennessee.  
*Cotypes*.—Cat. Nos. 45949–45951, U.S.N.M.

**Oxydiscus disculus** (Billings).

*Bellerophon disculus* Billings, Canadian Nat. and Geol., 5, 1860, p. 168, fig. 11;  
Geol. Canada, Geol. Surv. Canada, 1863, p. 146, fig. 98.  
*Oxydiscus disculus* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 852  
(gen. ref.).  
Black River: Blue Point, Lake St. John, Canada.

**Oxydiscus macer** (Billings).

*Bellerophon macer* Billings, Pal. Foss., 1, Geol. Surv., Canada, 1865, p. 347, text  
fig. 335.  
*Oxydiscus macer* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 913 (gen.  
ref.).  
Canadian (Beekmantown): Leeds and Grenville Counties, Canada.

**Oxydiscus magnus** (Miller).

*Cyrtolites magnus* Miller, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 103, pl. 3,  
fig. 10.  
*Oxydiscus magnus* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 859  
(gen. ref.).—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p.  
970, pl. 41, fig. 5.  
Richmond: Near Richmond, Indiana.

**Oxydiscus palinurus** (Billings).

*Bellerophon Palinurus* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 311,  
fig. 302.—Miller, N. A. Geol. Pal., 1889, p. 397, fig. 654.  
*Oxydiscus palinurus* Ulrich and Scofield, Geol. Minnesota, 1897, p. 913 (gen. ref.).  
Canadian (Beekmantown): Stanbridge, Quebec.

**OXYDISCUS STRONGI** Koken. See *Sinuopea strongi*.

**Oxydiscus subacutus** Ulrich.

*Oxydiscus subacutus* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 913, pl. 62, figs.  
62–65; pl. 82, figs. 23–25.—Weller, Geol. Surv. New Jersey, Pal. 3, 1903, p.  
179, pl. 12, figs. 8, 9.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 616,  
fig. 826.  
*Cyrtolites subacutus* Miller, N. A. Geol. Pal., 2d App., 1897, p. 766 (gen. ref.).  
Trenton: Near Danville, Kentucky (Flanagan); Minnesota (Prosser); near Spring-  
dale, New Jersey.  
*Cotypes*.—Cat. No. 45952, U.S.N.M.

**PACHYDICTYA** Ulrich.Genotype: *P. robusta* Ulrich.

*Pachydietya* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 152.—Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 162.—Miller, N. A. Geol. Pal., 1889, p. 313.—Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 390, 522; Geol. Minnesota, 3, 1893, p. 145.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 15.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 530.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 48.—Hennig, Archiv. fur Zool., K. Sven. Vet.-Akad. Stockholm, 2, No. 10, 1905, p. 25.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 57.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 159.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 751.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 137, 138.

**Pachydietya acuta** (Hall).

*Stictopora? acuta* Hall, Pal. New York, 1, 1847, p. 74, pl. 26, figs. 3a-b.—Billings, Canadian Nat. Geol., 1, 1856, p. 317.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1063, figs.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 168, pl. 8, figs. 1-1b.

*Ptilodietya acuta* Nicholson, Pal. Province Ontario, 1875, p. 12, fig. 3.—Billings, Canadian Nat. Geol., 1, 1856, p. 318, fig. 5; Geol. Canada, Geol. Surv. Canada, 1863, p. 158, fig. 121.—Emmons, Amer. Geology, 1, pt. 2, 1855, pl. 7, figs. 3a-c;

*Pachydietya acuta* Ulrich, 14th Ann. Rep. Geol. Minnesota, 1886, pp. 75, 76; Contr. Micro-Pal. Cambro-Sil., pt. 2, 1889, p. 44, Geol. Minnesota, 3, 1893, p. 155, pl. 8, figs. 11-17; pl. 9, fig. 7.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 159.—Whiteaves, Pal. Foss., 3, 1897, p. 161.

Trenton: Trenton Falls, etc., New York; Ontario; Kentucky; Iowa; Minnesota. Manitoba; etc.

*Plesiotypes*.—Cat. Nos. 43721, 44099, U.S.N.M. (Ulrich).

**PACHYDICTYA ALCYONE** Billings. See *Pachydietya crassa*.

**PACHYDICTYA ARGUTA** Ulrich. See *Pachydietya crassa*.

**Pachydietya bifurcata** (Hall).

*Eschara bifurcata* Van Cleve (MS.).

*Stictopora bifurcata* Hall, 12th Ann. Rep. Indiana Geol. Nat. Hist., 1883, p. 267, pl. 13, figs. 3, 4.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1063, fig.

*Pachydietya bifurcata* Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 163; *ibid.*, 3, 1888, pl. 15, fig. 9; Geol. Surv. Ohio, 7, 1895, p. 599, pl. 28, fig. 9.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 143-145, figs. 67, 68.

*Stictopora scalpellum* Eichwald (not Lonsdale), Lethaea Rossica, 1, 1860, p. 390, pl. 24, fig. 15a-c.

*Rhindietya? Borkholmiensis* Wiman, Bull. Geol. Inst. Univ. Upsala, 5, pt. 2, 1901, p. 180, pl. 6, figs. 1-7.

Silurian: Dayton, Fairhaven, etc., Ohio; Kentucky (Brassfield); various localities in Esthonia, Russia (Lyckholm and Borkholm).

*Plesiotypes*.—Cat. No. 57240, U.S.N.M. (Bassler).

**Pachydietya bifurcata instabilis** Foerste.

*Pachydietya bifurcata* var. *instabilis* Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 164; *ibid.*, 3, 1888, pl. 15, fig. 10; Geol. Surv. Ohio, 7, 1895, p. 599, pl. 28, fig. 10.

Upper Medina (Brassfield): Near New Carlisle, Ohio.

**PACHYDICTYA CONCLATRIX** Ulrich. See *Trigonodietya conciliatrix*.

**Pachydietya crassa** Hall.

- Stictopora crassa Hall, Pal. New York, 2, 1852, p. 45, pl. 18, figs. 4a-c.  
 Ptilodictya crassa Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 142;  
 Pal. Prov. Ontario, 1875, p. 45.  
 Pachydietya crassa Ulrich, Geol. Minnesota, 3, 1893, p. 147.—Nickles and Bassler,  
 Bull. U. S. Geol. Surv., 173, 1900, p. 338.—Bassler, *ibid.*, 292, 1906, p. 57, pl.  
 18, figs. 11, 12; pl. 21, figs. 14-16.—Grabau and Shimer, N. A. Index Fossils,  
 1, 1907, p. 160.  
 Ptilodictya rustica Billings, Cat. Sil. Foss. Anticosti, 1866, p. 36.  
 Pachydietya rustica Ulrich, Geol. Minnesota, 3, 1893, p. 146 (gen. ref.).  
 Ptilodictya arguta Billings, Cat. Sil. Foss. Anticosti, 1866, p. 36.  
 Pachydietya arguta Ulrich, Geol. Minnesota, 3, 1893, p. 146 (gen. ref.).  
 Stictopora scitula Hall and Simpson, Pal. New York, 6, 1887, pl. 61, figs. 24, 25.  
 Pachydietya scitula Ulrich, Geol. Minnesota, 3, 1893, p. 147 (gen. ref.).  
 Ptilodictya farctus Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 328, pl. 6,  
 fig. 31.  
 Pachydietya farctus Foerste, Geol. Surv. Ohio, 7, 1895, p. 599, pl. 31, fig. 31.  
 Ptilodictya alcyone Billings, Cat. Sil. Foss. Anticosti, 1866, p. 36.  
 Pachydietya alcyone Ulrich, Geol. Minnesota, 3, 1893, p. 146 (gen. ref.).  
 Ptilodictya tenera Billings, Cat. Sil. Foss. Anticosti, 1866, p. 33.  
 Ptilodictya rudis Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 329, pl. 6,  
 fig. 33.  
 Pachydietya (Rhinidictya) rudis Foerste, Geol. Surv. Ohio, 7, 1895, p. 599, pl.  
 31, figs. 32, 33.  
 Early and Middle Silurian: An abundant and widespread species in New York,  
 Canada, Ohio, Kentucky, Tennessee, etc.  
*Plesiotype*.—Cat. No. 35754, U.S.N.M.

**Pachydietya elegans** Ulrich.

- Pachydietya elegans Ulrich, Geol. Minnesota, 3, 1893, p. 154, pl. 8, figs. 18, 19;  
 pl. 9, figs. 8, 9.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 138, 139, figs.  
 61, 62.  
 Trenton (Prosser): St. Paul, etc., Minnesota; Decorah, Iowa.  
 Middle Ordovician (Wesenberg): Wesenberg, Esthonia, Russia.  
*Cotypes* and *plesiotypes*.—Cat. Nos. 43583, 57234, U.S.N.M.

**Pachydietya emacolata** Foerste.

- Pachydietya emaciata Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 62;  
*ibid.*, 3, 1888, pl. 15, fig. 8; Geol. Surv. Ohio, 7, 1895, p. 599, pl. 28, fig. 8.  
 Upper Medinan (Brassfield): Dayton, Ohio.

PACHYDIETYA EMARCESCENS Foerste. See Ptilodictya expansa emarcescens.

**Pachydietya everetti** Ulrich.

- Pachydietya everetti Ulrich, Geol. Surv. Illinois, 8, 1890, p. 523, pl. 33, figs. 1-1f.  
 Black River (Platteville): Dixon, Illinois.  
*Holotype*.—Cat. No. 43429, U.S.N.M.

**Pachydietya? famelica** (Foerste).

- Ptilodictya famelicus Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 329, pl.  
 6, fig. 32.  
 Upper Medinan (Brassfield): Eaton and Belfast, Ohio.

PACHYDIETYA FARCTUS Foerste. See Pachydietya crassa.

**Pachydietya fenestelliformis** (Nicholson).

*Ptilodictya fenestelliformis* Nicholson, Ann. Mag. Nat. Hist., 4th ser., 15, 1875, p. 181, pl. 14, figs. 5-5b; Pal. Ohio, 2, 1875, p. 263, pl. 25, figs. 8-8b; Pal. Prov. Ontario, 1875, p. 14.—Lesley, Geol. Surv. Pennsylvania, Report P 4, 1889, p. 827, figs.

*Phænopora?* fenestelliformis Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, pl. 8, fig. 8.

*Pachydietya fenestelliformis* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 256.

Richmond: Blanchester and other localities in Ohio; Wilmington, Illinois; ?Peterborough, Canada (Nicholson).

**Pachydietya fenestelliformis corticula** Ulrich.

*Pachydietya fenestelliformis* var. *corticula* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 526, pl. 31, fig. 1.

Richmond (Fernvale): Wilmington, Illinois.

**Pachydietya fimbriata** Ulrich.

*Pachydietya fimbriata* Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 75; Geol. Minnesota, 3, 1893, p. 152, pl. 8, figs. 28-34; pl. 9, figs. 13, 14.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 159, fig. 214.

Black River (Decorah): Minneapolis and St. Paul, Minnesota.

*Cotypes*.—Cat. No. 43581, U.S.N.M.

**Pachydietya?** *firma* Ulrich.

*Pachydietya firma* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 525, pl. 31, figs. 2-2f.

Richmond: Wilmington, Illinois (Fernvale); Island of Anticosti (Charleton).

Figured sections of *cotype*.—Cat. No. 43783, U.S.N.M.

**Pachydietya foliata** Ulrich.

*Pachydietya foliata* Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 73; Geol. Minnesota, 3, 1893, p. 149, pl. 9, figs. 1-5; pl. 10, figs. 5-10; Zittel's Textb. Pal. (Engl. ed.), 1896, fig. 470 (p. 283).—Sardeson, Jour. Geol., 9, 1901, p. 151, pl. B, figs. 1-3.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 346, fig. 506.

Black River (Decorah): Minneapolis, St. Paul, Cannon Falls, etc., Minnesota.

*Cotypes*.—Cat. No. 43584, U.S.N.M.

**Pachydietya gigantea** Ulrich.

*Pachydietya gigantea* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 524, pl. 31, figs. 3-3e.

Richmond (Fernvale): Wilmington, Illinois.

Figured sections of *cotype*.—Cat. No. 43784, U.S.N.M.

**Pachydietya hexagonalis** Ulrich.

*Pachydietya hexagonalis* Ulrich, Contr. Micro-Pal. Cambro-Sil., pt. 2, 1889, p. 42, pl. 9, figs. 2-2c.—Whiteaves, Pal. Foss., 3, 1895, p. 118.

Richmond: Stony Mountain, Manitoba (Stony Mountain); Island of Anticosti (Charleton).

Fragment of *holotype*.—Cat. No. 43473, U.S.N.M.

**Pachydietya magnipora** Ulrich.

*Pachydietya magnipora* Ulrich, Contr. Micro-Pal. Cambro-Sil., pt. 2, 1889, p. 43.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, 1897, p. 161.

Trenton: St. Andrews, Manitoba; Kenyon, Minnesota (Prosser).

**Pachydietya obesa** Foerste.

*Pachydietya obesa* Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 165; *ibid.*, 3, 1888, pl. 15, fig. 12; Geol. Surv. Ohio, 7, 1895, p. 599, pl. 28, fig. 12.

Upper Medina (Brassfield): Dayton, Ohio.

**Pachydietya occidentalis** Ulrich.

*Pachydietya occidentalis* Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 75; Geol. Minnesota, 3, 1893, p. 151, pl. 8, figs. 20-27; pl. 9, figs. 6-10.

Black River (Decorah): St. Paul and Goodhue County, Minnesota.

*Cotypes*.—Cat. No. 43582, U.S.N.M.

**Pachydietya pumila** Ulrich.

*Pachydietya pumila* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 12, 1890, p. 186, fig. 11; Geol. Minnesota, 3, 1893, p. 157, pl. 10, figs. 1-4; pl. 8, figs. 4, 5.

*Rhinidictya humilis* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 12, 1890, p. 185, fig. 10.

Trenton: Cannon Falls, Minnesota (Prosser); Trenton Falls, New York.

*Cotypes*.—Cat. No. 43702, U.S.N.M.

**Pachydietya pumila sublata** Ulrich.

*Pachydietya pumila* var. *sublata* Ulrich, Geol. Minnesota, 3, 1893, p. 158.

Trenton (Prosser): Cannon Falls, Minnesota.

*Cotypes*.—Cat. No. 43585, U.S.N.M.

**Pachydietya robusta** Ulrich.

*Pachydietya robusta* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 173, pl. 8, figs. 10a-c.

Chazyan (Ottosee): Knoxville, Tennessee.

*Cotypes*.—Cat. No. 43701, U.S.N.M.

PACHYDIETYA (RHINIDIETYA) RUDIS Foerste. See *Pachydietya crassa*.

PACHYDIETYA RUSTICA Ulrich. See *Pachydietya crassa*.

PACHYDIETYA SCITULA Ulrich. See *Pachydietya crassa*.

**Pachydietya? splendens** Ulrich.

*Pachydietya splendens* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 523, pl. 31, fig. 2g; pl. 32, figs. 1-1b.

Richmond (Fernvale): Wilmington, Illinois.

Figured section of *cotype*.—Cat. No. 43785, U.S.N.M.

**Pachydietya triserialis** Ulrich.

*Pachydietya triserialis* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 12, 1890, p. 187, fig. 12; Geol. Minnesota, 3, 1893, p. 159, pl. 10, figs. 11-14.

Trenton: Montreal, Quebec.

*Cotypes*.—Cat. No. 43703, U.S.N.M.

**Pachydietya turgida** Foerste.

*Pachydietya turgida* Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 164; *ibid.*, 3, 1888, pl. 15, fig. 11; Geol. Surv. Ohio, 7, 1895, p. 599, pl. 28, fig. 11.

Upper Medinan (Brassfield): Dayton and Fair Haven, Ohio.

**PACHYDOMELLA** Ulrich.

Genotype: *P. tumida* Ulrich.

*Pachydomella* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1891, pp. 197, 198.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 710.

**Pachydomella longula** Ulrich and Bassler.

*Pachydomella longula* Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 542, pl. 98, figs. 29-31.

Helderbergian (Keyser): Cumberland, Maryland.

*Holotype*.—Cat. No. 53289, U.S.N.M.

**PACHYOOCRINUS** Billings.Genotype: *P. crassibasalis* Billings.

*Pachyocrinus* Billings, Geol. Surv. Canada, dec. 4, 1859, p. 22.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 319 (Rev. Pal., pt. 1, p. 145).—Miller, N. A. Geol. Pal., 1889, p. 265.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 203.

***Pachyocrinus crassibasalis*** Billings.

*Pachyocrinus crassibasalis* Billings, Geol. Surv. Canada, dec. 4, 1859, p. 22, pl. 1, figs. 3a, b.—Hudson, Bull. New York State Mus., 107, 1907, p. 120, fig. 4, pl. Chazyan (Aylmer): Caughnawaga, and Islands of Montreal, Jesus, and Bizard, Canada.

**PACHYFORA (PLATYAXUM)** Foerste. See *Platyaxum*.**PACHYSTROMA** Nicholson and Murie. See *Stromatopora* Goldfuss.**PAGODIA** Walcott.Genotype: *P. lotos* Walcott.

*Pagodia* Walcott, Proc. U. S. Nat. Mus., 29, 1905, p. 63; Cambrian Faunas of China, 3, Carnegie Inst., 1913, p. 160.

***Pagodia seelyi*** Walcott.

*Pagodia seelyi* Walcott, Smiths. Misc. Coll., 57, 1912, p. 269, pl. 44, figs. 12–14a. Ozarkian or Upper Cambrian (Potsdam): Near Port Henry, Essex County, New York.

*Cotypes*.—Cat. Nos. 58582–58584, U.S.N.M.

**PALÆACMÆA** Hall and Whitfield.Genotype: *P. typica* Hall and Whitfield.

*Palæacmæa* Hall and Whitfield, 23d Rep. New York Mus. Nat. Hist., 1873, p. 242 (extract, 1872, p. 21).—Lindstrom, Kongl. Sven. Vet. Akad. Handl., 19, No. 6, 1881, p. 58.—Barrois, Mem. Soc. Geol. du Nord., 3, Lille, 1889, p. 184; Mem. Soc. Agriculture et Arts de Lille, 4th ser., 17, p. 184.—Miller, N. A. Geol. Pal., 1889, p. 414.—Barrois, Ann. Soc. Geol. du Nord, 19, Lille, 1891, p. 213.—Koken, Die Leitfossilien, Leipzig, 1896, p. 96.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, pp. 826–836.—Berkey, Amer. Geol., 11, p. 278.—Koken, Bull. de l'Acad. Imp. Sci. St. Petersburg, 7, 1897, p. 113.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 606.

***Palæacmæa humilis*** Ulrich and Scofield.

*Palæacmæa humilis* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 837, pl. 61, figs. 45–48.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 607, fig. 809a–b.

Black River: Minneapolis (Platteville) and Goodhue County (Decorah), Minnesota.

***Palæacmæa irregularis*** Raymond.

*Palæacmæa irregularis* Raymond, Amer. Jour. Sci., 4th ser., 20, 1905, p. 376; Ann. Carnegie Mus., 4, 1908, p. 174, pl. 54, figs. 10–12.

Chazyan (Day Point): Chazy, New York.

***Palæacmæa orphyne*** (Billings).

*Metoptoma Orphyne* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 88 (adv. sheets, 1862).

*Palæacmæa orphyne* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 836 (gen. ref.).

Ozarkian? (Levis—erratics): Point Levis, Quebec.

***Palæacmæa quebecensis*** (Billings).

*Metoptoma Quebecensis* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 303, fig. 300.



**Palæacmæa quebecensis**—Continued.

*Palæacmæa quebecensis* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 31 (gen. ref.).—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 607, fig. 808.

Canadian (Levis—Limestone): Point Levis, Quebec.

**Palæacmæa typica** Hall and Whitfield.

*Palæacmæa typica* Hall and Whitfield, 23d Rep. New York State Cab. Nat. Hist., 1873, pl. 11, figs. 4, 5.—Walcott, Smiths. Misc. Coll., 57, 1912, p. 264, pl. 43, figs. 1 and 2.

Upper Cambrian or Ozarkian (Hoyt): Essex and Washington Counties, New York.

**PALÆARCA** Hall. See *Cyrtodonta Billingsi*.

**PALÆARCA? AMYGDALINA** Hall. See *Ambonychia amygdalina*.

**PALÆARCA LATA** Hall. See *Modiolopsis latus*.

**PALÆARCA PRIMIGENIUS** Hall. See *Modiolopsis primigenia*.

**PALÆARCA SUBSPATULATA** Hall. See *Prolobella subspatulata*.

**PALÆARCA VENTRICOSA** Hall. See *Cyrtodonta huronensis*.

**PALÆASPIS** Clappole.

Genotype: *P. americana* Clappole.

*Palæaspis* Clappole, Amer. Nat., 18, 1884, p. 1224; Proc. Amer. Assoc. Adv. Sci., 33d meeting, Philadelphia, 1884, p. 426; Rep. British Assoc. Adv. Sci., 54th meeting, Montreal, 1884, pp. 733-734; Quart. Jour. Geol. Soc. London, 61, 1885, pp. 50, 62; *ibid.*, 48, 1892, pp. 542.—Miller, N. A. Geol. Pal., 1889, p. 604.—Woodward, Cat. Foss. Fishes in British Mus., pt. 3, 1891, p. 169.—Lesley, Rep. Geol. Surv. Pennsylvania, 2, 1892, p. 775.—Collinge, Proc. Birmingham Philos. Soc., 9, pt. 1, p. 3.—Traquair, Geol. Magazine, 4th ser., 7, 1900, p. 467.

**Palæaspis americana** Clappole.

*Palæaspis americana* Clappole, Geol. Surv. Pennsylvania, Pref. to Rep. F 2, 1885, p. 12; Quart. Jour. Geol. Soc. London, 1885, 41, p. 62.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 575, fig.—Clappole, Quart. Jour. Geol. Soc. London, 1892, 48, p. 561, fig. 8.

*Palæaspis bitruncata* Clappole, Geol. Surv. Pennsylvania, Pref. to Rep. F 2, 1885, p. 12; Quart. Jour. Geol. Soc. London, 1885, 41, p. 65.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 575, fig.

*Palæaspis elliptica* Clappole, Proc. Amer. Assoc. Adv. Sci., 1885, 33d meeting, Philadelphia, p. 462.

Cayugan (New Bloomfield): Perry County, Pennsylvania.

**PALÆASPIS BITRUNCATA** Clappole. See *Palæaspis americana*.

**PALÆASPIS ELLIPTICA** Clappole. See *Palæaspis americana*.

**PALÆASTER** (part) of authors. See *Mesopolæaster* Schuchert, *Hudsonaster* Stürtz, *Promopalæaster* Schuchert, and *Petraster* Billings.

**PALÆASTER** Hall.

Genotype: *P. niagarensis* Hall.

*Palæaster* Hall, Pal. New York, 2, 1852, p. 247; 20th Rep. New York State Cab. Hist., 1868, p. 282; rev. ed., 1868 (1870), p. 324.—Zittel, Handb. Pal., 1, 1879, p. 452.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1880, p. 318.—Schuchert, Bull. U. S. Nat. Mus. 88, 1915, p. 67.

**PALÆASTER**—Continued.

*Palæaster* (part) Salter, Ann. Mag. Nat. Hist., 2d ser., 20, 1857, p. 323; Rep. 26th Meeting British Assoc. Adv. Sci., 1857, p. 76.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 265.—Salter, Canadian Jour., n. s., 3, 1858, p. 158.—Stürtz, Palæontographica, 32, 1886, p. 91.—Miller, N. A. Geol. Pal., 1889, p. 265.—Stürtz, Verh. naturh. Ver. preuss. Rheinl., etc., 1893, pp. 41, 58.—James, Jour. Cincinnati Soc. Nat. Hist., 18, 1895, pp. 126, 127.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 714.

- PALÆASTER ANTIQUA* Troost. See *Mesopalæaster antiquus*.
- PALÆASTER ANTIQUATA* Hall. See *Promopalæaster speciosus*.
- PALÆASTER CLARKANA* Miller. See *Hudsonaster incomptus*.
- PALÆASTER CLARKII* Miller. See *Hudsonaster incomptus*.
- PALÆASTER DUBIUS* Miller and Dyer. See *Mesopalæaster(?) dubius*.
- PALÆASTER DYERI* Meek. See *Promopalæaster dyeri*.
- PALÆASTER EXCULPTUS* Miller. See *Promopalæaster exculptus*.
- PALÆASTER FINEI* Ulrich. See *Mesopalæaster finei*.
- PALÆASTER GRANTII* Spencer. See *Mesopalæaster grantii*.
- PALÆASTER GRANULOSUS* Hall. See *Promopalæaster granulatus*.
- PALÆASTER GRANULOSUS* Meek. See *Promopalæaster speciosus*.
- PALÆASTER HARRISI* Miller. See *Urasterella grandis*.
- PALÆASTER INCOMPTUS* Meek. See *Hudsonaster incomptus*.
- PALÆASTER JAMESI* Dana. See *Petraster americana*.
- PALÆASTER LONGIBRACHIATUS* Miller. See *Promopalæaster spinulosus*.
- PALÆASTER MAGNIFICUS* Miller. See *Promopalæaster magnificus*.
- PALÆASTER MATUTINA* Hall. See *Hudsonaster matutina*.
- PALÆASTER MIAMIENSIS* Miller. See *Anorthaster miamiensis*.
- Palæaster niagarensis* Hall.**  
*Palæaster niagarensis* Hall, Pal. New York, 2, 1852, p. 247, pl. 51, figs. 21-23.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 265, pl. 98, fig. 2.—Billings, Geol. Surv. Canada, dec. 3, 1858, p. 78, fig.—Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 282; rev. ed., p. 324.—Quenstedt, Petrefactenkunde Deutschlands, 1, 4, 1876, p. 73, pl. 92, figs. 32, 33.—Hudson, Bull. New York State Mus. 164, 1913, p. 130, pls. 9, 10, 12, 13.—Schuchert, Bull. U. S. Nat. Mus. 88, 1915, p. 69, pl. 7, figs. 1-4.  
 Clinton (Rochester): Lockport, New York; Grimsby, Ontario.
- PALÆASTER PARVIUSCULUS* Billings. See *Mesopalæaster parviusculus*.
- PALÆASTER FULCHELLUS* Billings. See *Urasterella pulchella*.
- PALÆASTER SHÆFFERI* Hall. See *Mesopalæaster shæfferi*.
- PALÆASTER SIMPLEX* Miller and Dyer. See *Hudsonaster incomptus*.
- PALÆASTER SPECIOSA* Meek. See *Promopalæaster speciosus*.

- PALÆASTER SPINULOSUS** Miller and Dyer. See *Promopalæaster spinulosus*.
- PALÆASTER WILBERANUS** Hall. See *Mesopalæaster(?) wilberanus*.
- PALÆASTER? WILSONI** Raymond. See *Promopalæaster wilsoni*.
- PALÆASTERINA ANTIQUATA** Shumard. See *Promopalæaster speciosus*.
- PALÆASTERINA APPROXIMATA** Miller and Dyer. See *Petraster speciosus*.
- PALÆASTERINA JAMESI** Dana. See *Petraster americanus*.
- PALÆASTERINA RIGIDUS** Billings. See *Petraster rigidus*.
- PALÆASTERINA RUGOSUS** Billings. See *Hudsonaster rugosus*.
- PALÆASTERINA SPECIOSA** Miller and Dyer. See *Petraster speciosus*.
- PALÆASTERINA WYKOFFI** Miller and Gurley. See *Promopalæaster wykoffi*.
- PALÆOBOLUS** Matthew. See *Obolus* subgenus *Palæobolus*.
- PALÆOCARDIA** Hall. Genotype: *P. cordiformis* Hall.  
*Palæocardia* Hall, 20th Rep. New York State Cab. Hist., 1868, p. 341 (Extras, 1865); rev. ed., 1870, p. 389.—Miller, N. A. Geol. Pal., 1889, p. 493.
- Palæocardia cordiformis** Hall.  
*Palæocardia cordiformis* Hall, 20th Rep. New York State Cab. Hist., 1868, p. 341 (Extras, 1865); rev. ed., 1870, p. 389, pl. 14, figs. 11, 12.  
 Niagaran (Racine): Wauwatosa, Wisconsin.
- PALÆOCHONIA CYATHIFORMIS** Fromental. See *Ischadites cyathiformis*.
- PALÆOCLYMENIA** Foord. See *Trocholites* Conrad.
- PALÆOCOMA CYLINDRICA** Billings. See *Tæniaster cylindricus*.
- PALÆOCOMA SPINOSA** Billings. See *Tæniaster spinosus*.
- PALÆOCONCHA** Miller. See *Ctenodonta* Salter.
- PALÆOCONCHA FABERI** Miller and Faber. See *Ctenodonta obliqua*.
- PALÆOCRINUS** Billings. Genotype: *P. striatus* Billings.  
*Palæocrinus* Billings, Geol. Surv. Canada, dec. 4, 1859, p. 24.—Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 29, footnote.—Zittel, Handb. Pal., 1, 1879, p. 352.—Miller, N. A. Geol. Pal., 1889, p. 267.—Bather, Treatise on Zool., pt. 3, Echinodermata, London, 1900, p. 172, fig. 85.—Zittel, Grundzuge Pal., 1, 1910, p. 152.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 217.
- Palæocrinus angulatus** (Billings).  
*Dendrocrinus angulatus* Billings, Geol. Surv. Canada, 1857, p. 269.  
*Cyathocrinus angulatus* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 308 (Rev. Pal., pt. 1, p. 85).  
*Palæocrinus angulatus* Billings, Canadian Oreg. Rem. (Geol. Surv. Canada), dec. 4, p. 45, pl. 3, fig. 6a, b.—Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 41 (loc. occ.).  
 Trenton (Curdsville): Ottawa and Kirkfield, Ontario.
- Palæocrinus chapmani** (Billings).  
*Palæocystites chapmani* Billings, Geol. Surv. Canada, dec. 3, 1858, pp. 71, 72.  
*Palæocrinus chapmani* Hudson, Bull. New York State Mus., 149, 1911, p. 244, fig. 20.  
 Chazyan (Aylmer): Lot 26, Front Concession of Clarence, Canada.

**Palæocrinus pulchellus** Billings.

Palæocrinus pulchellus Billings, Geol. Surv. Canada, dec. 4, 1859, p. 46.

Cyathocrinus pulchellus Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 310 (Rev. Pal., pt. 1, p. 87).

Trenton (Curdsville): Ottawa, Ontario.

**Palæocrinus rhombiferus** Billings.

Palæocrinus rhombiferus Billings, Geol. Surv. Canada, dec. 4, 1859, p. 45.

Cyathocrinus rhombiferus Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 310 (Rev. Pal., pt. 1, p. 87).

Trenton (Curdsville): Ottawa, Ontario.

**Palæocrinus striatus** Billings.

Palæocrinus striatus Billings, Geol. Surv. Canada, dec. 4, 1859, p. 25, pl. 1, figs.

5a, 5b.—Miller, N. A. Geol. Pal., 1889, p. 267, figs. 383, 384.—Hudson, Bull. New York State Mus., 149, 1911, pl. 5-6, figs. 1-4; figs. 4-10, 12-19.

Cyathocrinus striatus Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 310 (Rev. Pal., pt. 1, p. 87), (gen. ref.).

Chazyan (Aylmer): Caughnawaga and Island of Montreal, Canada.

**Palæocrinus sulcatus** Safford.

Palæocrinus sulcatus Safford, Geol. Tennessee, 1869, p. 286. (Not defined.)

Stones River (Pierce): Central Tennessee.

**PALEOCYCLUS** Edwards and Haime.

Genotype: *P. porpita* (Linnæus).

Palæocyclus Edwards and Haime, Compt. Rend. de l'Acad. Sci., 29, 1849, p. 70;

Mon. Polyp. Foss. Terr. Pal., 1851 (Arch. du Mus. d'Hist. Nat., 5), p. 203.—

Milne-Edwards, Hist. Nat. d. Corall., 3, 1860, p. 47.—Duncan, Phil. Trans.

Roy. Soc. London, 157, 1867, p. 651, pl. 32, figs. 6a-e; Proc. Roy. Soc.

London, 1867, p. 460.—Dybowski, Archiv. f. Naturf. Liv.-Ehst. und Kurl.,

5, 1873, pp. 334, 360.—Zittel, Handb. Pal., 1, 1879, p. 227.—Roemer, Leth.

geog., pt. 1, Leth. Pal., 1883, p. 345.—Miller, N. A. Geol. Pal., 1889, p. 199.—

Sherzer, Amer. Geol., 7, 1891, pp. 278-283.—Koken, Die Leitfossilien,

Leipzig, 1896, p. 308.—Grabau and Shimer, N. A. Index Fossils, 1, 1906,

p. 64.—Zittel-Eastman Textb. Pal., 1, 1913, p. 74.

**Palæocyclus rotuloides** (Hall).

Cyclolites rotuloides Hall, Pal. New York, 2, 1852, p. 42 pl. 17, figs. 4a-e.

Palæocyclus rotuloides Miller, N. A. Geol. Pal., 1889, p. 199, fig. 203.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 65.

Upper Clinton: Near Clinton, Oneida County, New York; Pennsylvania; Maryland.

**PALEOCYSTIS** Haeckel. See Palæocystites Billings.**Palæocystis pentolena** Haeckel.

Not recognized.

Palæocystis pentolena Haeckel, Amphorideen u. Cystoideen Leipzig, 1896, p. 69, pl. 1, figs. 5, 5b.

“Lower Silurian: Canada.”

**PALEOCYSTITES** Billings.

Genotype: *Actinocrinus tenuiradiatus* Hall

Palæocystites Billings, Geol. Surv. Canada, dec. 3, 1858, p. 68.—Chapman, Expos.

Min. Geol., 1864, p. 109.—Zittel, Handb. Pal., 1, 1879, p. 418.—Miller, N. A.

Geol. Pal., 1889, p. 267.—Haeckel, Amphor. und Cystoid., 1896, p. 69.—

Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 54.—Zittel-

Eastman Textb. Pal., 1, 1900, p. 184.—Grabau and Shimer, N. A. Index

Fossils, 2, 1910, p. 462.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913,

p. 152.

Palæocystis Haeckel, Amphorideen u. Cystoideen, Leipzig, 1896, p. 69.

**PALÆOCYSTITES CHAPMANI** Billings. See *Palæocrinus chapmani*.

**Palæocystites dawsoni** Billings.

*Palæocystites Dawsoni* Billings, Geol. Surv. Canada, dec. 3, 1858, p. 70.—Hudson, Bull. New York State Mus., 149, 1911, p. 247, figs. 21-34.

Chazyan (Aylmer): Montreal, Quebec.

**Palæocystites pulcher** Billings.

*Palæocystites pulcher* Billings, Canadian Nat. Geol., 4, 1859, p. 430.

Chazyan (Mingan): Mingan Islands, Canada.

**Palæocystites tenuiradiatus** (Hall).

*Actinocrinus tenuiradiatus* Hall, Pal. New York, 1, 1847, p. 18, pl. 4, figs. 8, 9.

*Palæocystites tenuiradiatus* Billings, Canadian Org. Rem., Geol. Surv. Canada, dec. 3, 1858, p. 69, figs. 1-3; Amer. Jour. Sci. Arts, 2d ser., 48, 1869, p. 78; Canadian Nat., n. s., 4, 1869, p. 287; Ann. Mag. Nat. Hist., 4th ser., 5, 1870, p. 260; Pal. Foss., Geol. Surv. Canada, 2, pt. 1, 1874, p. 99.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 462.

Chazyan: Chazy, etc., New York; Quebec.

**PALÆODICTYOTA** Whitfield. Genotype: *Inocaulis anastomotica* Ringuenberg.

*Palæodictyota* Whitfield, Bull. Amer. Mus. Nat. Hist., 16, 1902, p. 399.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 198.

**Palæodictyota anastomotica** (Ringuenberg).

*Inocaulis anastomotica* Ringuenberg, Proc. Acad. Nat. Sci. Philadelphia, 39, 1888, pp. 131, 132, pl. 7, fig. 2.

*Palæodictyota ramulosa* Whitfield, Bull. Amer. Mus. Nat. Hist., 16, 1902, p. 399, pl. 53, figs. 1, 2.

*Palæodictyota anastomotica* Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 200, pl. 6, fig. 4, figs. 102, 103.

Niagaran: Lockport and Middleport, New York (Rochester); Hamilton, Ontario.

**Palæodictyota bella** (Hall and Whitfield).

*Inocaulis bella* Hall and Whitfield, Geol. Surv. Ohio Pal. 2, 1875, p. 122, pl. 6., fig. 2.—Spencer, Canadian Nat., 8, 1875, p. 458; 10, 1882, p. 65; Bull. Mus. Univ. State Missouri, 1, 1884, pp. 14, 35; Trans. Acad. Sci. St. Louis, 4, 1884, pp. 564, 585.—Gurley, Jour. Geol., 4, 1896, pp. 99, 308.

*Palæodictyota bella* Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 203, pl. 3, fig. 7; text figs. 105-107.

Niagaran: Yellow Springs, Ohio; Hamilton, Ontario (Rochester).

*Plesiotype*.—Cat. No. 54279, U.S.N.M.

**Palæodictyota bella recta** Ruedemann.

*Palæodictyota bella* mut. *recta* Ruedemann, Mem. New York State Mus., 11, 1908, p. 204, pl. 6, fig. 6; pl. 7, fig. 6.

Upper Clinton: Clinton, New York.

**Palæodictyota clintonensis** Ruedemann.

*Palæodictyota clintonensis* Ruedemann, Mem. New York State Mus., 11, 1908, pt. 2, p. 203, pl. 6, fig. 5; pl. 7, fig. 5; pl. 8, fig. 3, text fig. 104.

Upper Clinton: Clinton, New York.

**PALÆODICTYOTA RAMULOSA** Spencer. See *Palæodictyota anastomotica*.

**PALÆOGLOSSA** Cockerell. See *Lingula* subgenus *Palæoglossa*.

**PALÆOMANON** Roemer.Genotype: *Siphonia cratera* Roemer.

*Palæomanon* Roemer, Sil. Fauna West. Tennessee, Breslau, 1860, p. 12; Cincinnati Quart. Jour. Sci., 1, 1874, pp. 247, 248.—Zittel, Neues Jahrb. Min. Geol. Pal., 1877, p. 354; Ann. Mag. Nat. Hist., 4th ser., 20, 1877, p. 501; Abh. math.-phys. Classe d. k. bay. Akad. d. Wiss., 13, 1 Abth., 1878, p. 45.—Roemer, Leth. geog., 1 Theil. Leth. Pal., Erste Lief, 1880, p. 310.—Zittel, Neues Jahrb. Min. Geol. Pal., 2, 1884, p. 75; Ann. Mag. Nat. Hist., 5th ser., 14, 1884, p. 271.—Miller, N. A. Geol. Pal., 1889, p. 161; Zittel-Eastman Textb. Pal., 1, 1900, p. 50; Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 56.

*Astylomanon* Rauff, Palæontographica, 40, 1894, p. 313.

**Palæomanon bursa** (Hall).

*Astylospongia* (*Palæomanon*) *bursa* Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875, 1877, pls. 15, 16; mus. ed., 1879, p. 105, pl. 3, figs. 15, 16; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 234, pl. 1, fig. 4; pl. 2, figs. 15, 16.—Rauff, Palæontographica, 40, 1894, p. 309.

Niagaran (Waldron): Waldron, Indiana.

**Palæomanon cratera** (Roemer).

*Siphonia cratera* Roemer, Leonh. and Bronn. Jahr., 1848, p. 685.

*Palæomanon cratera* Roemer, Sil. Fauna West. Tennessee, Breslau, 1860, p. 13, pl. 1, figs. 4, 4a; Cincinnati Quart. Jour. Sci., 1, 1874, p. 192.—Zittel, Ann. Mag. Nat. Hist., 5th ser., 14, 1884, p. 272, fig. 2; Neues Jahrb. f. Min. Geol. Pal., 12, 1884, pl. 1, fig. 2.—Miller, N. A. Geol. Pal., 1889, p. 161, fig. 111.

*Astylomanon cratera cratera* Rauff, Palæontographica, 40, 1894, p. 314, pl. 11, figs. 7-12; pl. 12, fig. 3.

*Astylomanon cratera prototypum* Rauff, *ibid.*, p. 317, figs. 64A, A; pl. 13, fig. 1.

*Astylomanon cratera aryballium* Rauff, *ibid.*, p. 317, figs. 64C-E, G, H; pl. 11, fig. 7.

*Astylomanon cratera balantium* Rauff, *ibid.*, p. 317, figs. 64B1, B2, 65; pl. 11, figs. 8, 9.

*Astylomanon cratera lecythium* Rauff, *ibid.*, p. 318, fig. 64F; pl. 11, figs. 10, 11.

*Astylomanon cratera promiscuum* Rauff, *ibid.*, p. 318, figs. 64J-L, M, N, P-R; 66, pl. 13, fig. 2.

*Astylomanon cratera potrium* Rauff, *ibid.*, p. 319, fig. 64O; pl. 12, fig. 3.

*Astylomanon cratera cantharium* Rauff, *ibid.*, p. 319, figs. 64S-W; pl. 13, figs. 3, 4.

*Astylomanon cratera cylix* Rauff, *ibid.*, p. 319, figs. X, Y, 67, 68; pl. 13, fig. 5.

*Astylomanon cratera patera* Rauff, *ibid.*, p. 320, fig. 64Z.

*Astylomanon* (*Palæomanon*) *cratera* Foerste, Jour. Geol., 11, 1903, p. 713.

Niagaran (Brownsport): Numerous localities in Perry, Decatur, and other counties, west Tennessee.

**Palæomanon pleuriexcavatum** (Rauff).

*Astylomanon pleuriexcavatum* Rauff, Palæontographica, 40, 1894, p. 323, fig. 73; pl. 13, fig. 8.

Niagaran (Brownsport): Decatur and Hardin Counties, Tennessee.

**Palæomanon verrucosum** (Rauff).

*Astylomanon verrucosum* Rauff, Palæontographica, 40, 1894, p. 320, figs. 69, 70; pl. 13, figs. 6, 7.—Foerste, Jour. Geol., 11, 1903, p. 714.

*Astylospongia præmorsa* (part) Roemer, Sil. Fauna Tennessee, 1860, p. 8, pl. 1, fig. 1b.

Niagaran (Brownsport): Decatur and Hardin Counties, Tennessee.

**Palæomanon verrucosum bullifera** (Rauff).

*Asstylomanon verrucosum* var. *bullifera* Rauff, *Palæontographica*, 40, 1894, p. 321, figs. 71, 72.

Niagaran (Brownsport): Decatur and Hardin Counties, Tennessee.

**PALEONAUTILUS** Remele. See *Trocholites* Conrad.

**PALEONAUTILUS PLANORBIFORMIS** Remele. See *Trocholites canadensis*.

**PALEOPECTEN** Williams.

Genotype: *P. cobscooki* Williams.

*Palæopecten* Williams, *Proc. U. S. Nat. Mus.*, 45, 1913, p. 331.

**Palæopecten cobscooki** Williams.

*Palæopecten cobscooki* Williams, *Proc. U. S. Nat. Mus.*, 45, 1913, p. 332, pl. 29, fig. 13.

Silurian (Edmunds): Cobscook River, Washington County, Maine.

*Holotype*.—Cat. No. 58953, U.S.N.M.

**Palæopecten danbyi** (McCoy).

*Avicula danbyi* McCoy, *Ann. Nat. Hist.*, 2d ser., 7, 1851, p. 59; *British Pal. Foss.*, 1855, p. 258, pl. 2, figs. 11 and 13.

*Palæopecten danbyi* Williams, *Proc. U. S. Nat. Mus.*, 45, 1913, p. 332.

Silurian (Edmunds): Eastport quadrangle, Washington County, Maine.

**Palæopecten transversalis** Williams.

*Palæopecten transversalis* Williams, *Proc. U. S. Nat. Mus.*, 45, 1913, p. 333, pl. 29, figs. 17 and 18.

Silurian (Edmunds): Cobscook River, Trescott, Eastport quadrangle, Maine.

*Holotype*.—Cat. No. 58954, U.S.N.M.

**PALEOPHONUS OSBORN**I Whitfield. See *Proscorpius osborni*.

**PALEOPHYCUS** Hall.

Genotype: *P. tubulare* Hall.

*Palæophycus* Hall, *Pal. New York*, 1, 1847, p. 7.—Nathorst, *Oüvers. K. Vet.-Akad.*

*Forhandl.*, 30, 1873, p. 46.—Roemer, *Leth. geog.*, 1, Theil, *Leth. Pal.*, Erste

Lief, 1880, p. 131.—Nathorst, *Kongl. Sven. Vet.-Akad. Handl.*, 18, No. 7,

1881, p. 38, 90.—James, *Jour. Cincinnati Soc. Nat. Hist.*, 7, 1885, p. 157.—

Hinde, *Geol. Mag.*, dec. 3, 4, 1887, p. 228.—Miller, *N. A. Geol. Pal.*, 1889, p.

130.

**Palæophycus beauharnoisense** Billings.

*Palæophycus Beauharnoisensis* Billings, *Pal. Foss.*, 1, *Geol. Surv. Canada*, 1865, p. 98 (adv. sheets, 1862).

Canadian (Beekmantown): Beauharnois, Quebec.

**Palæophycus beverlyense** Billings.

*Palæophycus Beverlyensis* Billings, *Pal. Foss.*, 1, *Geol. Surv. Canada*, 1865, p.

97, fig. 86 (adv. sheets, 1862).—Roemer, *Leth. geog.*, *Leth. Pal.*, 1, Atlas,

1876, pl. 2, fig. 1.—Rauff, *Neues Jahrb. Min., Geol. Pal.*, 2, 1891, p. 103.

Canadian (Beekmantown): Beverly, Quebec.

**Palæophycus flexuosus** James.

*Palæophycus flexuosus* James, *Paleontologist*, No. 3, 1879, p. 18; *Jour. Cincinnati*

*Soc. Nat. Hist.*, 7, 1884, p. 129, pl. 6, fig. 1; 14, 1891, p. 46.

Eden: Near Milford, Ohio.

**Palæophycus funiculus** Billings.

*Palæophycus funiculus* Billings, *Pal. Foss.*, 1, *Geol. Surv. Canada*, 1865, p. 98

(adv. sheets, 1862).

Canadian (Beekmantown): Edwardstown and L'Original, Canada.

**Palaeophycus irregulare** Hall.

Palaeophycus irregularis Hall, Pal. New York, 1, 1847, p. 8, pl. 2, fig. 3.—Lesley,  
Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 587, fig.

Canadian (Beekmantown): Near Chazy, near Keeseville, etc., New York.

**Palaeophycus obscurum** Billings.

Palaeophycus obscurus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 98  
(adv. sheets, 1862).

Trenton: Ottawa, Ontario.

**Palaeophycus rugosum** Hall.

Palaeophycus rugosus Hall, Pal. New York, 1, 1847, p. 63, pl. 21, fig. 2.—James,  
Jour. Cincinnati Soc. Nat. Hist., 7, 1885, p. 157.

Trenton: Middleville, etc., New York.

**Palaeophycus simplex** Hall.

Palaeophycus simplex Hall, Pal. New York, 1, 1847, p. 63, pl. 22, figs. 1a-d.—  
James, Jour. Cincinnati Soc. Nat. Hist., 7, 1885, p. 158.—Lesley, Geol. Surv.  
Pennsylvania, Rep. P 4, 1889, p. 587, figs.

Trenton: Middleville, New York.

**Palaeophycus striatum** Hall.

Palaeophycus striatus Hall, Pal. New York, 2, 1852, p. 22, pl. 10, fig. 1a-d, 2.

Clinton: Clinton, New York.

**Palaeophycus tortuosum** Hall.

Palaeophycus tortuosus Hall, Pal. New York, 2, 1852, p. 6, pl. 3, figs. 2a, b.

Richmond (Queenston): Irondequoit Bay, and mouth of Genesee River, New  
York.

**Palaeophycus tubulare** Hall.

Palaeophycus tubularis Hall, Pal. New York, 1, 1847, p. 7, pl. 2, figs. 1, 2, 4, 5.—  
Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 588, fig.

Canadian (Tribes Hill): Amsterdam, Canajoharie, etc., New York.

**PALAEOPHYLLUM** Billings. See Columnaria subgenus Palaeophyllum.

**PALAEOPHYLLUM DIVARICANS** Nicholson. See Streptelasma divaricans.

**PALAEOPHYLLUM RUGOSUM** Billings. See Columnaria (Palaeophyllum) stokesi.

**PALAEOPORA INTERSTINCTA** var. **SUBTUBULATA** McCoy. See Heliolites subtubulatus.

**PALAEOPORA MEGASTOMA** McCoy. See Heliolites megastoma.

**PALEOPTERIA** Whiteaves.

Genotype: *P. parvula* Whiteaves.

Palaeopteria Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 181.

**Palaeopteria parvula** Whiteaves.

Palaeopteria parvula Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p.  
181, pl. 20, figs. 1-3.

*Pterinea parvula* Miller, N. A. Geol. Pal., 2d App., 1897, p. 784 (gen. ref.).

Black River or Richmond: Inmost Island, Lake Winnipeg, Canada.

**PALAEOSACCUS** Hinde.

Genotype: *P. dawsoni* Hinde.

Palaeosaccus Hinde, Geol. Mag., dec. 3, 10, 1893, p. 57.—Dawson, Trans. Roy.  
Soc. Canada, 2d ser., 2, sec. 4, 1896, p. 112.—Miller, N. A. Geol. Pal., 2d App.,  
1897, p. 722.



**Palaeosaccus dawsoni** Hinde.

*Palaeosaccus Dawsoni*, Hinde, *Geol. Mag.*, dec. 3, 10, 1883, p. 58, pl. 4.—Rauff, *Palaeontographica*, 40, 1894, p. 254.—Dawson, *Trans. Roy. Soc. Canada*, 2d ser., 2, sec. 4, 1896, p. 112, figs. 22, 23, pl. 3, fig. 9, pl. 4.  
Canadian? (Levis?): Little Metis, Quebec.

**PALEOSPONGIA** D'Orbigny. See *Ischadites* Murchison.

**PALEOSPONGIA TRENTONENSIS** Miller. See *Zittella trentonensis*.

**PALASTERINA** Billings (part). See *Schuchertella* Gregory.

**PALEOFAVOSITES** Twenhofel. Genotype: *Favosites aspera* D'Orbigny.  
*Paleofavosites* Twenhofel, *Bull. Victoria Mem. Mus.*, 13, 1914, p. 24.

**Paleofavosites asper** D'Orbigny.

*Favosites alveolaris* Lonsdale (not Goldfuss), *Murch. Sil. Syst.*, 1839, p. 681, pl. 15, bis. figs. 1, 2.

*Favosites aspera* D'Orbigny, *Prodr. de Pal.*, 1, 1850, p. 49.—Milne-Edwards and Haime, *Polyp. Foss. des Terr. Palaeoz.*, 1851, p. 234; *British Foss. Corals*, 1855, p. 257, pl. 60, figs. 3, 3a.—McCoy, *British Palaeoz. Foss.*, 1855, p. 20.—Nicholson, *Canadian Jour.*, n. s., 16, 1873, p. 40; *Geol. Surv. Ohio, Pal.*, 2, 1875, p. 225.—Lebedeff, *Obersil. fauna Timan*, 1892, p. 8, pl. 1, figs. 1a-c.—Weissermel, *Zeits. d. d. geol. Gesell.*, 46, 1894, p. 648, pl. 51, fig. 9.—Lambe, *Cont. Can. Pal.*, *Geol. Surv. Canada*, 4, pt. 1, 1899, p. 4, pl. 1, fig. 2.—Whiteaves, *Geol. Surv. Canada, Pal. Foss.*, 3, pt. 4, 1906, p. 280.—Parks in Tyrrell, 22d *Rep. Ontario Bur. Mines*, 1913, p. 32.

*Favosites? capax* Billings, *Cat. Sil. Foss. Anticosti*, 1866, p. 6.

*Favosites Niagaransis* Rominger (not Hall), *Geol. Surv. Michigan, Foss. Corals*, 1876, p. 22, pl. 5, fig. 1.

*Favosites prolificus* Billings, *Canadian Nat. Geol.*, n. s., 2, 1865, p. 429; *Cat. Sil. Foss. Anticosti, Geol. Surv. Canada*, 1866, pp. 6, 32.—Whiteaves, *Geol. Surv. Canada, Rep. Progr. for 1878-79*, 1880, p. 45c; *Pal. Foss. Geol. Surv. Canada*, 3, pt. 2, 1895, p. 113; *ibid.*, pt. 3, 1897, p. 156.

*Paleofavosites aspera* Twenhofel, *Bull. Victoria Mem. Mus.*, 3, 1914, p. 24.

Early and Middle Silurian: Europe; Island of Anticosti, Canada (English Head—Chicotte); Manitoba; Wyoming, etc.

**PALEOPUPA** Foerste. Genotype: *P. abrupta* Foerste.  
*Paleopupa* Foerste, *Geol. Surv. Ohio, Pal.*, 7, 1893, p. 556.

**Paleopupa abrupta** Foerste.

*Paleopupa abrupta* Foerste, *Geol. Surv. Ohio, Pal.*, 7, 1893, p. 556, pl. 37a, fig. 21a-b.

Upper Medinan (Brassfield): Huffmans Quarry, near Dayton, Ohio.

**PALESCHARA** Hall. Genotype: *P. incrustans* Hall.

*Paleschara* Hall, 26th *Ann. Rep. New York State Mus.*, 1874, p. 107.—Zittel, *Handb. Pal.*, 1, Munich, 1880, p. 604.—Ulrich, *Jour. Cincinnati Soc. Nat. Hist.*, 5, 1882, p. 157.—Hall and Simpson, *Pal. New York*, 6, 1887, p. xviii.—Miller, *N. A. Geol. Pal.*, 1889, p. 313.—Pocta, *Syst. Sil. Centro Boheme*, 8, pt. 1, 1894, p. 9.—Grabau, *Bull. Buffalo Soc. Nat. Sci.*, 6, 1899, p. 170.—Nickles and Bassler, *Bull. U. S. Geol. Surv.*, 173, 1900, p. 54.—Cumings, *Amer. Jour. Sci.*, 4th ser., 17, 1904, pp. 49, 74.—Grabau and Shimer, *N. A. Index Fossils*, 1, 1907, p. 166.

**PALESCHARA? ASPERA** Hall. See *Spatiopora maculata*.

**Paleschara beani** (James).

Ceramopora? beani James, Paleontologist, No. 1, 1878, p. 5; Jour. Cincinnati Soc. Nat. Hist., 7, 1884, p. 23, fig. 3-3b; James and James, *ibid.*, 11, 1888, p. 37.

Paleschara beani Ulrich, Amer. Geol. 1, 1888, p. 186.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 46.

Richmond (Waynesville): Warren and Clinton Counties, Ohio.

**Paleschara? incrassata** Hall.

Paleschara incrassata Hall, 28th Ann. Rep. New York State Mus., mus. ed., 1879, p. 121; 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 246.

Niaganan (Waldron): Waldron, Indiana.

**PALESCHARA MACULATA** Hall. See *Spatiopora maculata*.**Paleschara? offula** Hall.

Paleschara offula Hall, 28th Ann. Rep. New York State Mus. (doc. ed.), 1876, pl. 8, figs. 7, 8; mus. ed., 1879, p. 120, pl. 8, figs. 7, 8; 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 245, pl. 7, figs. 7, 8.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 591, fig.

Leptotrypa offula Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 158.

Niaganan (Waldron): Waldron, Indiana.

**PALESCHARA? SPHERION** Hall. See *Leptotrypa? sphaerion*.**Paleschara ulrichi** Ruedemann.

Paleschara ulrichi Ruedemann, Bull. New York State Mus., 162, 1912, p. 90.

Trenton (Snake Hill): Snake Hill, New York.

**PANENKA** Barrande.

Genotype: *P. bohemia* Barrande.

Paneka Barrande, Syst. Sil. du Centre Boheme, 6, 1881, p. 128; Acephales, Extr. Syst. Sil. du Centre Boheme, 1881, pp. 11, 204.—Hall, Pal. New York, 5, pt. 1, Lam. 2, 1885, p. xxv.—Miller, N. A. Geol. Pal., 1889, p. 500.—Whidborne, Mon. Dev. Fauna South England, 3, Pal. Soc., 1896, p. 72.—Whiteaves, Ottawa Nat., 15, 1902, p. 263.

**Paneka canadensis** Whiteaves.

Paneka canadensis Whiteaves, Ottawa Nat., 15, 1902, p. 265, pl. 15, figs. 1, 2.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 389.—Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 163, pl. 22, figs. 1-2.

Upper Monroan (Amherstburg): Detroit River, opposite Amherstburg, Ontario.

**PARABOLINA** Salter.

Genotype: *Entomostracites spinulosus* Wahlenberg.

Parabolina Salter, Mem. Geol. Surv. United Kingdom, dec. 2, 1849, pl. 9, p. 2.—Angelin, Pal. Scandinavica, 3d ed., Holmiae, 1878, p. 45.—Koken, Die Leitfossilien, Leipzig, 1896, p. 20, fig. 11.—Moberg and Moller, Geol. Foren. Stockholm Forhandl., 20, 1898, p. 229.—Lindstrom, Kongl. Sven. Vet.-Akad. Hand., 34, No. 8, 1901, pp. 18, 22.—Lake, Paleontographical Soc., 1908, p. 61.

**Parabolina dawsoni** Matthew.

Parabolina Dawsoni Matthew, Bull. Nat. Hist. Soc. New Brunswick, No. 19, 1901, p. 282, pl. 5, figs. 6a-f; Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, p. 223, pl. 17, fig. 6.

Canadian (Bretonian—Div. C3b): East Bay, east of Bras d'Or Lake, Cape Breton, Nova Scotia.

**Parabolina grandis** (Matthew).

Parabolina heres var. grandis Matthew, Trans. Royal Soc. Canada, 9, sec. 4, 1892, p. 52, pl. 13, fig. 7.

Canadian (Bretonian—Div. C3b): Navy Island, St. John Harbor, New Brunswick.

*Parabolina heres* var. *grandis* Matthew. See *Parabolina grandis*.

***Parabolina heres lata* Matthew.**

*Parabolina heres* var. *lata* Matthew, Trans. Royal Soc. Canada, 9, sec. 4, 1892, p. 51, pl. 13, figs. 6a-f.

Canadian (Bretonian—Div. C3b): Navy Island, St. John Harbor, New Brunswick.

***Parabolina spinulosa* (Wahlenberg).**

*Entomostracites spinulosus* Wahlenberg, Petr. Tell. Suec., 1821, p. 38, pl. 1, fig. 3. *Olenus spinulosus* Dalman, K. Vet.-Akad. Handl., for 1826, 1827, p. 256; *Über die Palæaden*, 1828, p. 56, pl. 6, fig. 4.

*Paradoxides spinulosus* Milne Edwards, Hist. Nat. d. Crust., 3, 1840, p. 342.—Burmeister, Org. der Tril., Berlin, 1843, p. 80; *ibid.*, 1846, p. 68.

*Olenus* (*Parabolina*) *spinulosa* Salter, Cat. Camb. Sil. Foss., 1873, p. 11.—Brogger, Die sil. Etagen 2-3, Kristiania, 1882, p. 100, pl. 1, fig. 12a-e (cites bib.).

*Parabolina spinulosa* Angelin, Pal. Scandinavica, 1854, p. 46, pl. 25, fig. 9.—Matthew, Trans. Royal Soc. Canada, 9, sec. 4, 1892, p. 51, pl. 13, figs. 5a-d.—Tornquist, Geol. Mag., dec. 4, 3, 1896, p. 567.—Koken, Die Leitfossilien, Leipzig, 1896, p. 18, fig. 11.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 34, No. 8, 1901, p. 33, pl. 5, fig. 31.—Lake, Paleontographical Soc. 1908, p. 62, pl. 6, figs. 8-11.

Lower Ordovician: Europe; St. John, New Brunswick (Bretonian—Div. C3a).

***PARABOLINELLA* Brögger.**

Genotype: *P. limitis* Brögger.

*Parabolinella* Brögger, Die sil. Etagen 2-3, Kristiania, 1882, p. 102.—Zittel, Handb. Pal., 2, 1885, p. 595.—Koken, Die Leitfossilien, Leipzig, 1896, p. 20.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 34, No. 8, 1901, p. 22.—Lake, Paleontographical Soc., 1908, p. 63.

***Parabolinella andina* Hoek.**

*Parabolinella andina* Hoek, Neues Jahrb. Min., Geol. Pal., 34, 1912, p. 214, pl. 7, figs. 7-9.

Lowest Ordovician: Salitre, Argentina-Bolivia boundary.

***Parabolinella limitis* (Brögger).**

*Olenus* (*Parabolinella*) *limitis* Brogger, Die sil. Etagen, 2-3, Kristiania, 1882, p. 102, pl. 3, fig. 2a, b, 4a.

*Parabolinella limitis* Frech, Leth. geog., 1, Leth. Pal., 2, 1 Leif., 1897, pl. 1b, fig. 10.

*Parabolinella* cf. *limitis* Matthew, Bull. Nat. Hist. Soc. New Brunswick, No. 20, 1902, p. 412; Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, p. 226.

Lower Ordovician: Europe; McLeod Brook, near Boisdale, Cape Breton, Nova Scotia (Bretonian—Div. C 3c2).

***Parabolinella posthuma* Matthew.**

*Parabolinella posthuma* Matthew, Trans. Roy. Soc. Canada, 10, sec. 4, 1893, p. 107, pl. 7, figs. 15a, F.

Canadian (Bretonian—Div. C 3d): Suspension Bridge, St. John, New Brunswick.

***Parabolinella quadrata* Matthew.**

*Parabolinella quadrata* Matthew, Bull. Nat. Hist. Soc. New Brunswick, No. 20, 1902, p. 411, pl. 18, fig. 7; Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, p. 225, pl. 18, fig. 7.

Canadian (Bretonian—Div. C 3c2): McLeod Brook, near Boisdale, Cape Breton, Nova Scotia.

**PARABOLINOPSIS** Hoek.Genotype: *P. mariana* Hoek.*Parabolinopsis* Hoek, Neues Jahrb. Min. Geol. Pal., 34, 1912, p. 226.**Parabolinopsts mariana** Hoek.*Parabolinopsis mariana* Hoek, Neues Jahrb. Min. Geol. Pal., 34, 1912, p. 226, pl. 7, figs. 1-3.

Ordovician: Tarija, Bolivia.

**PARACTINOCERAS** Hyatt. See *Actinoceras* Bronn.**PARADOXIDES ARCUATUS** Harlan. See *Triarthrus becki*.**PARADOXIDES BECKII** Green. See *Triarthrus becki*.**PARADOXIDES BOLTONI** Bigsby. See *Arctiniurus boltoni*.**PARADOXIDES EATONI** Hall. See *Triarthrus becki*.**PARADOXIDES SPINULOSUS** Burmeister. See *Parabolina spinulosa*.**PARADOXIDES TETRAGONOCEPHALUS** Emmrich. See *Asaphus(?) tetragonocephalus*.**PARADOXIDES TRIARTHURUS** Harlan. See *Triarthrus becki*.**PARALICHAS** Reed. See *Amphilichas* Raymond.**PARALLELODUS** Branson.Genotype: *P. obliquus* Branson.*Parallelodus* Branson, Trans. Acad. Sci. St. Louis, 18, 1909, p. 43.**Parallelodus obliquus** Branson.*Parallelodus obliquus* Branson, Trans. Acad. Sci. St. Louis, 18, 1909, p. 43, pl. 7, figs. 9, 10.

Black River (Auburn—Decorah): Lincoln County, Missouri.

**PARALLELOPORA** Hortedahl.Genotype: *P. favositiformis* Hortedahl.*Parallelopora* Hortedahl, Second Arct. Exp. "Fram," 1898-1902, No. 32, 1914, p. 13.**Parallelopora favositiformis** Hortedahl.*Parallelopora favositiformis* Hortedahl, Second Arct. Exp. "Fram," 1898-1902, No. 32, 1914, p. 13, pl. 4, figs. 3, 4; pl. 5, figs. 1-5.

Helderbergian (Lower beds): Near Borgen, Southwestern Ellesmereland, Arctic America.

**PARASTROPHIA** Hall and Clarke.Genotype: *Atrypa hemiplicata* Hall.*Parastrophia* Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 221; 13th Ann.

Rep. New York State Geol., 1895, p. 839.—Schuchert, Zittel-Eastman Textb.

Pal., 1, 1900, p. 321; 2d ed., 1913, p. 394.—Grabau and Shimer, N. A. Index

Fossils, 1, 1907, p. 271.

**Parastrophia divergens** Hall and Clarke.*Parastrophia divergens* Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pp. 222, 366, pl. 63, figs. 4-7; 48th Rep. New York State Mus., 2, for 1895, 1897, p. 364;

pl. 10, figs. 11-14; 14th Rep. State Geol. New York for 1894, 1897, p. 364,

pl. 10, figs. 11-14.

Richmond (Fernvale): Wilmington, Illinois.

**Parastrophia greenii** Hall and Clarke.*Parastrophia greenii* Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pp. 222, 367,

pl. 63, figs. 17-20, 22; 48th Rep. New York State Mus., 2, for 1895, 1897,

p. 364, pl. 10, figs. 1-5; 14th Rep. State Geol. New York for 1894, 1897, p. 364,

pl. 10, figs. 1-5.

Niagaran (Racine): Milwaukee, Wisconsin.

**Parastrophia hemiplicata** Hall.

*Atrypa hemiplicata* Hall, Pal. New York, 1, 1847, p. 144, pl. 33, fig. 10.—Billings, Canadian Nat. Geol., 1, 1856, p. 208, figs. 20-23.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 190, pl. 10, fig. 10.

*Pentamerus hemiplicatus* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 66.—Billings, Canadian Jour., 4, 1859, p. 316.

*Camarella hemiplicata* Billings, Geol. Canada, 1863, p. 168, fig. 154.—Chapman, Canadian Jour., n. s., 7, 1862, p. 114, fig. 106; Expos. Min. and Geol. Canada, 1864, p. 118, fig. 106; p. 171, fig. 188.—Miller, N. A. Geol. Pal., 1889, p. 338, fig. 545.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 112, figs.

*Anastrophia?* *hemiplicata* Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 382, pl. 30, figs. 29-31.—Whiteaves, Pal. Foss., 3, pt. 3, 1897, p. 167.

*Parastrophia hemiplicata* Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 221, pl. 63, figs. 1-3.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 158.—Ruedemann, Bull. New York State Mus., 49, 1902, p. 26.—Weller, Geol. Surv. New Jersey, Pal. 3, 1903, p. 158, pl. 10, figs. 11-14.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 271, fig. 327.—Wilson, Bull. Canada Geol. Surv., Mus., 2, 1914, pp. 1-10, pl. 4, figs. 1-34.

*Atrypa circulus* Hall, Pal. New York, 1, 1847, p. 142, pl. 33, fig. 7; 12th Rep. New York State Cab. Nat. Hist., 1859, p. 65.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 190, pl. 10, fig. 7.

*Camarella circulus* Miller, Amer. Pal. Foss., 1877, p. 107.

*Camarella bernensis* Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, 1892, p. 328, pl. 4, figs. 4-6.

Trenton: Middleville, Watertown, etc., New York; Pennsylvania; Wisconsin; Minnesota; New Jersey; Ontario; Manitoba; Baffin Land.

**Parastrophia hemiplicata rotunda** (Winchell and Schuchert).

*Anastrophia?* *hemiplicata* var. *rotunda* Winchell and Schuchert, Minnesota Geol. Surv., 3, 1893, p. 383, pl. 30, figs. 32-35.

Trenton (Prosser): Cannon Falls, Minnesota; Decorah, Iowa.

**Parastrophia latiplicata** Hall and Clarke.

*Parastrophia latiplicata* Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pp. 222, 368, pl. 63, figs. 23-27; 48th Rep. New York State Mus., 2, for 1895, 1897, p. 365, pl. 10, figs. 6-10; 14th Rep. State Geol. New York for 1894, 1897, p. 365, pl. 10, figs. 6-10.

Niagaran (Racine): Milwaukee, Wisconsin.

**Parastrophia lenticularis** (Billings).

*Camarella lenticularis* Billings, Cat. Sil. Foss. Anticosti, 1866, p. 45.

Richmond (English Head, Charleton): Gamachian and Anticostian (Beesie River); Reef Point, etc., Anticosti.

**Parastrophia multiplicata** Hall and Clarke.

*Parastrophia multiplicata* Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pp. 222, 367, pl. 63, figs. 15, 16, 21; 48th Rep. New York State Mus., 2, for 1895, 1897, p. 365, pl. 10, figs. 15-17; 14th Rep. State Geol. New York for 1894, 1897, p. 365, pl. 10, figs. 15-17.

Niagaran (Racine?): Milwaukee, Wisconsin.

**Parastrophia(?) obscura** (Hall and Whitfield).

*Porambonites obscurus* Hall and Whitfield, King's U. S. Geol. Expl., 40th Parl., 4, 1877, p. 234, pl. 1, fig. 16.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 228.

**Parastrophia(?) obscura**—Continued.

Parastrophia(?) obscura Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 300.

Pogonip: Pogonip Mountain, White Pine District, Nevada.

*Holotype*.—Cat. No. 17277, U.S.N.M.

Observation.—Based upon a single ventral valve, which is insufficient to determine whether it belongs to Parastrophia or some rhynchonelloid. It is not a Porambonites (Schuchert).

**Parastrophia ops** (Billings).

Camarella ops Billings, Geol. Surv. Canada, Pal. Foss., 1, 1865, p. 148, fig. 128 (adv. sheets, 1862).

Parastrophia ops Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 300.

Anticostian (Chicotte): The Jumpers, Anticosti.

**Parastrophia reversa** (Billings).

Pentamerus reversus Billings, Geol. Survey Canada, Rep. Progr. for 1856, 1857, p. 295; Canadian Jour., 4, 1859, p. 316.

Brachymerus reversus Shaler, Bull. Mus. Comp. Zool., 1, 1865, p. 69.

Anastrophia reversa Miller, Amer. Pal. Foss., 1877, p. 104.

Parastrophia reversa Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pl. 63, figs.

8-14.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 301.—Wilson, Canadian Bull. Geol. Surv. Mus., 2, 1914, p. 9, pl. 4, figs. 35-39.

Gamachian (Ellis Bay): Junction Cliff, Anticosti.

**Parastrophia scofieldi** (Winchell and Schuchert).

Anastrophia? scofieldi Winchell and Schuchert, Minnesota Geol. Surv., 3, 1893, p. 383, pl. 30, figs. 24-28.

Parastrophia scofieldi Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 301.

Trenton (Prosser): Near Cannon Falls, Minnesota.

**PASCEOLUS** Billings.

Genotype: *P. globosus* Billings.

Pasceolus Billings, Geol. Surv. Canada, Rep. Progr. for 1853-1856, 1857, p. 342;

Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 390; Cat. Sil. Foss. Anticosti, Geol.

Surv. Canada, 1866, p. 69.—Meek and Worthen, Geol. Surv. Illinois, 3, 1868,

p. 346.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, pp. 4, 5.—Kayser, Zeits.

d. d. geol. Gesell., 27, 1875, pp. 776-779.—Nicholson and Etheridge, Mon.

Sil. Foss. Girvan Dist., 1878, p. 13.—Zittel, Handb. Pal., 1, 1880, p. 728.—

Roemer, Leth. geog., 1, Theil, Leth. Pal., Erste Lief, 1880, p. 295.—James,

Jour. Cincinnati Soc. Nat. Hist., 9, 1886, p. 248, 246; 14, 1891, p. 58.—Roemer,

Neues Jahrb. Min. Geol. Pal., 1, 1888, p. 74.—Miller, N. A. Geol. Pal., 1889,

p. 162.—Tschernyschew, Mem. du Comite Geol. Russia, 4, No. 3, 1893, p. 103.

Observation.—See Cyclocrinites Eichwald, of which Pasceolus is probably a synonym.

**Pasceolus camdenensis** Foerste.

Pasceolus camdenensis Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 85, pl. 2, fig. 6.

Richmond: Camden, Ohio.

**Pasceolus claudeni** Miller.

Pasceolus claudeni Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 6, fig. 3; N. A. Geol. Pal., 1889, p. 162, fig. 114.

Cyclocrinus Claudii Stolley Archiv. Anthrop. Geol. Schleswig-Holsteins, 1, Heft 2, 1896, p. 215 (gen. ref.).

Maysville (Bellevue): Near Maysville, Kentucky.

**PASCEOLUS?** *DACTYLOIDES* Meek and Worthen. See *Cerionites dactyloides*.

**Pasceolus darwini** Miller.

*Pasceolus darwini* Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 5, figs. 1, 2.—James, Jour. Cincinnati Soc. Nat. Hist., 9, 1886, p. 248; 14, 1891, p. 59.—Miller, N. A. Geol. Pal., 1889, p. 162, figs. 115, 116.—Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 303, pl. 8, figs. 1a, b.

*Cyclocrinus Darwinii* Stolley, Archiv. Anthrop. Geol. Schleswig-Holsteins, 1, Heft 2, 1896, p. 215 (gen. ref.).

*Astylospongia tumidus* James, Paleontologist, 1, 1878, p. 1.—J. F. James, Jour. Cincinnati Soc. Nat. Hist., 9, 1886, p. 247.

*Pasceolus(?) tumidus* James, Jour. Cincinnati Soc. Nat. Hist., 14, pt. 1, 1891, p. 59, fig. 3.

Maysville (Bellevue): Two miles southeast of Maysville, Kentucky; Cincinnati, Ohio, and vicinity.

**Pasceolus globosus** Billings.

*Pasceolus globosus* Billings, Geol. Surv. Canada, Rep. Progr. for 1853–1856, 1857, p. 343; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 391, fig. 367; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 70.—Kayser, Zeits. d. d. geol. Gesell., 27, 1875, pp. 777, 780.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1878, p. 14, fig. 1b.—James, Jour. Cincinnati Soc. Nat. Hist., 9, 1886, p. 248; 14, 1891, p. 58.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, pl. 4, fig. 4.

*Cyclocrinus globosus* Stolley, Archiv. Anthrop. Geol. Schleswig-Holsteins, 1, Heft 2, 1896, p. 215 (gen. ref.).

Trenton: Ottawa, Ontario; Ohio; Kentucky.

**PASCEOLUS GREGARIUS** Billings. See *Nidulites gregarius*.

**Pasceolus halli** Billings.

*Pasceolus halli* Billings, Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, p. 342; Geol. Canada, Geol. Surv. Canada, 1863, p. 309, fig. 312; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 390, fig. 366; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, pp. 69, 72.—Niles, Proc. Boston Soc. Nat. Hist., 10, 1865, p. 19.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 5.—Kayser, Zeits. d. d. geol. Gesell., 1875, pp. 779, 780.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1878, p. 14, fig. 1a.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 603, fig.—Miller, N. A. Geol. Pal., 1889, p. 162, fig. 117.

*Cyclocrinus Halli* Stolley, Archiv. Anthrop. Geol. Schleswig-Holsteins, 1, Heft 2, 1896, p. 215 (gen. ref.).

Gamachian (Ellis Bay) and Anticostian (Beesie River): White Cliff, Gamache Bay, etc., Anticosti.

*Plastotype*.—Cat. No. 58718, U.S.N.M.

**PASCEOLUS INTERMEDIUS** Billings. See *Nidulites intermedius*.

**PASCEOLUS(?) TUMIDUS** James. See *Pasceolus darwini*.

**PATERULA** Barrande.

Genotype: *P. bohémica* Barrande.

*Paterula* Barrande, Système Sil. du Centre de la Bohême, 5, 1879, p. 110.—Zittel, Handb. Pal., 1, 1880, p. 667.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 78, 165; 11th Ann. Rep. New York State Geologist, 1894, p. 242.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 372.

**Paterula amii** Schuchert.

*Paterula species* Hall and Clarke, 8, pt. 1, p. 78, pl. 4K, fig. 1.

*Paterula amii* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 301.—Ruedemann, Bull. New York State Mus., 42, 1901, p. 569, pl. 1, fig. 2.

Ordovician: South of St. Johns Market, Quebec, Canada; Mount Moreno, near Hudson, New York (Normanskill).

**PATTERSONIA** Miller.Genotype: *P. difficilis* Miller.

*Pattersonia* Miller, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 43.—James, J. F., *ibid.*, 9, 1886, pp. 246, 247; 14, 1891, pp. 68, 69.—Miller, N. A. Geol. Pal., 1889, p. 163.—Rauff, *Palæontographica*, 40, 1894, p. 267.

*Strobilospongia* Beecher, Mem. Peabody Mus., Yale University, 2, 1889, p. 14. (Genotype: *S. tuberosa* Beecher.)

*Chirospongia* Miller, N. A. Geol. Pal., 1889, p. 156.—J. F. James, Jour. Cincinnati Soc. Nat. Hist., 14, 1891, p. 65. (Genotype: *C. wenti* Miller.)

***Pattersonia aurita*** (Beecher).

*Strobilospongia aurita* Beecher, Mem. Peabody Mus., Yale Univ., 2, 1889, p. 28, pl. 5, fig. 1.

*Pattersonia aurita* Miller, N. A. Geol. Pal., 1889, p. 163 (gen. ref.).—Rauff, *Palæontographica*, 40, 1894, p. 271.

*Chirospongia wenti* Miller, N. A. Geol. Pal., 1889, p. 157, fig. 98.

Trenton (Bigby): Benson Creek, Franklin County, Kentucky.

***Pattersonia difficilis*** Miller.

*Pattersonia difficilis* Miller, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 43, pl. 2, figs. 3, 3a.—James, J. F., *ibid.*, 9, 1886, p. 247; 14, 1891, p. 69.—Miller, N. A. Geol. Pal., 1889, p. 163, fig. 118.—Rauff, *Palæontographica*, 40, 1894, p. 268, pl. 6, figs. 17-20.

Maysville (Corryville): Cincinnati, Ohio.

*Plesiotype*.—Cat. No. 46565, U.S.N.M.

***Pattersonia tuberosa*** (Beecher).

*Strobilospongia tuberosa* Beecher, Mem. Peabody Mus., Yale Univ., 2, 1889, p. 26, pl. 5, fig. 5; pl. 6, 3-7.

*Pattersonia tuberosa* Miller, N. A. Geol. Pal., 1889, p. 163 (gen. ref.).—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 14, pt. 1, 1891, p. 69.—Rauff, *Palæontographica*, 40, 1894, p. 269, fig. 51.

Maysville (Bellevue): Turners Station, Kentucky.

***Pattersonia ulrichi*** Rauff.

*Pattersonia Ulrichi* Rauff, *Palæontographica*, 40, 1894, p. 271, pl. 6, figs. 21-25.

Maysville (Corryville): Cincinnati, Ohio.

*Holotype*.—Cat. No. 46566, U.S.N.M.

**PELAGIELLA** Matthew.Genotype: *Cyrtolites atlantoides* Matthew.

*Pelagiella* Matthew, Trans. New York Acad. Sci., 14, 1895, p. 131.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 769.

***Pelagiella hoyti*** (Walcott).

*Platyceras hoyti* Walcott, Proc. U. S. Nat. Mus., 13, 1890, p. 268, pl. 20, fig. 8.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 668, fig.

*Pelagiella hoyti* Walcott, Smiths. Misc. Coll., 57, 1912, p. 266, pl. 41, fig. 17.

Upper Cambrian or Ozarkian (Hoyt): Near Saratoga Springs, New York.

*Holotype*.—Cat. No. 23846, U.S.N.M.

***Pelagiella minutissima*** (Walcott).

*Platyceras minutissimum* Walcott, 32d Rep. New York State Mus. Nat. Hist., 1879, p. 129.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 671, figs.

*Pelagiella minutissima* Walcott, Smiths. Misc. Coll., 57, 1912, p. 266, pl. 41, figs. 15, 16.

Upper Cambrian or Ozarkian (Hoyt): Near Saratoga Springs, New York.

*Plesiotypes*.—Cat. Nos. 58551, 58552, U.S.N.M.



**PELTURA** Milne-Edwards. Genotype: *Entomostracites scarabæoides* Wahlenberg.  
*Peltura* Milne-Edwards, *Hist. Nat. Crust.*, 3, 1840, p. 344.—Hawle and Corda, *Abh. d. k. böhmischen Gesell. d. Wiss.*, 5, 1847, (extract), pp. 119, 127, pl. 6, fig. 68.—Angelin, *Pal. Scandinavica*, 3d ed., *Holmiae*, 1854, p. 44.—Barrande, *Neues Jahrb. f. Min.*, etc., 1850, p. 779.—Pictet, *Traité de Pal.*, 2d ed., 2, 1854, p. 492.—Brogger, *Die sil. Etagen 2-3*, *Kristiania*, 1882, p. 105, 106.—Zittel, *Handb. Pal.*, 2, *Munich*, 1885, p. 595.—Koken, *Die Leitfossilien*, *Leipzig*, 1896, p. 19, fig. 11; figs. 3, 4, 8.—Moberg and Moller, *Geol. Foren. Stockholm*, *Forhandl.* 20, 1898, p. 229.—Lindstrom, *Kongl. Sven. Vet.-Akad. Handl.*, 34, 1901, pp. 27, 29.—Raymond, *Zittel-Eastman Textb. Pal.*, 1913, p. 715.

*Anthes Goldfuss*, *Neues Jahrb. f. Min.*, etc., 1843, p. 544.—Emmrich, *Neues Jahrb. f. Min.*, etc., 1845, p. 43. (Genotype: *E. scarabæoides* Wahlenberg).

**Peltura scarabæoides** (Wahlenberg).

*Entomostracites scarabæoides* Wahlenberg, *Petr. Tell. Suec.*, 1821, p. 41, pl. 1, fig. 2.

*Olenus scarabæoides* Dalman, *K. Vet.-Akad. Handl.*, 1827, p. 257; *Über die Pal.*, 1828, p. 57.—Burmeister, *Org. Tril.*, *London*, 1846, p. 71.—Mackie, *The Geol.*, 2, 1859, p. 426, fig. 14.—Salter, *Mem. Geol. Surv. Great Britain*, 2, 1866, pt. 1; *ibid.*, 3, 2d ed., 1881, p. 494, pl. 5, figs. 2-5.

*Peltura scarabæoides* Pictet, *Traité de Pal.*, 2d ed., 2, p. 492, pl. 44, fig. 7.—Angelin, *Pal. Scand.*, 3d ed., *Holmiae*, 1878, p. 45, pl. 25, fig. 8.—Linnarsson, *Geol. For. Stockholm Forhandl.*, 5, 1880, p. 134; *Afh. Sveriges Geol. Unders.*, ser. C, No. 43, 1880, p. 4, pl. 1, figs. 1-5.—Brogger, *Die sil. Etagen 2-3*, *Kristiania*, 1882, p. 107, pl. 2, figs. 9, 12 (bibliography cited).—Pompeckj, *Beit. Phys.-Oekon. Gesell.*, *Konigsberg*, 1890, p. 89, pl. 4, fig. 28.—Matthew, *Trans. Royal Soc. Canada*, 9, sec. 4, 1892, p. 53, pl. 13, figs. 9a, b.—Koken, *Die Leitfossilien*, *Leipzig*, 1896, p. 18, figs. 3, 4, 8, 11.—Lindstrom, *Kongl. Sven. Vet.-Akad. Handl.*, 34, No. 8, 1901, p. 64, pl. 3, fig. 42.—Matthew, *Geol. Surv. Canada*, *Rep. Cambrian Rocks Cape Breton*, 1903, p. 230.

*Olenus (Peltura) scarabæoides* Roemer, *Leth. geog.*, 1, *Leth. Pal. Atlas*, 1876, pl. 1, fig. 5.

Lower Ordovician: Europe; McNeil Brook, Cape Breton, Nova Scotia (Bretonian—Div. C 3b).

**PENDULOCRINUS** Salter. See *Calceocrinus* Hall.

**PENNIRETEPORA** D'Orbigny. See *Glanconome* Goldfuss.

**Pentacrinites hamptoni** Emmons.

Not recognized.

*Pentacrinites hamptoni* Emmons, *Geol. New York*, 2, 1842, p. 402, fig. 3.—Vanuxem, *Nat. Hist. New York Geol.*, 3, 1842, pp. 64, 65, fig. 3.—Owen, *Amer. Jour. Sci. Arts*, 47, 1844, p. 376, fig. 3.

Lorraine: New York.

Observation.—Merely a crinoid plate.

**PENTAMERELLA** Hall.

Genotype: *Atrypa arata* Conrad.

*Pentamerella* Hall, 20th Rep. *New York State Cab. Nat. Hist.*, 1867, p. 163; *Pal. New York*, 4, 1867, pp. 373, 375.—Zittel, *Handb. Pal.*, 1, p. 694.—Nettelroth, *Kentucky Fossil Shells*, *Mem. Kentucky Geol. Surv.*, 1889, p. 49.—Miller, *N. A. Geol. Pal.*, p. 360.—Hall and Clarke, *Pal. New York*, 8, pt. 2, 1893, p. 245; 13th Ann. Rep. *New York State Geol.*, 1895, p. 845.—Koken, *Die Leitfossilien*, *Leipzig*, p. 244.

**Pentamerella(?) compressa** Ringuenberg.

*Pentamerella compressa* Ringuenberg, Bull. Buffalo Soc. Nat. Sci., 5, 1886, p. 15, pl. 2, fig. 4.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 302.

Clinton (Rochester): Lockport, New York.

Observation.—May be a pathologic or compressed specimen of *Spirifer crispus* or *S. sulcatus* (Schuchert).

**PENTAMEROCERAS** Hyatt.Genotype: *Gomphoceras mirum* Barrande.

*Pentameroceras* Barrande, Sil. Syst. Boheme, 2, 1867, p. 265.

*Pentameroceras* Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1883, p. 278.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 245.—Newell, Proc. Boston Soc. Nat. Hist., 23, 1888, p. 483.

**Pentameroceras mirum** (Barrande).

*Gomphoceras mirum* Barrande, Syst. Sil. Boheme, 2, 1867, p. 310, pls. 82 and 91.

*Pentameroceras mirum* Newell, Proc. Boston Soc. Nat. Hist., 1888, p. 483.

Silurian: Bohemia; (?)Delphi, Indiana.

**PENTAMERUS** Sowerby.Genotype: *P. laevis* Sowerby.

*Pentamerus* Sowerby, Mineral Conch., 1, 1813, p. 76.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 52.—Chapman, Canadian Jour., n. s., 3, 1858, p. 162; 7, 1862, p. 115; Expos. Min. and Geol. Canada, 1864, p. 118.—Zittel, Handb. Pal., 1, 1880, p. 693.—Miller, N. A. Geol. Pal., 1889, p. 361.—Hall and Clarke, Pal. New York, 8, pt. 2, 1895, p. 236.—Koken, Die Leitfossilien, Leipzig, 1896, p. 244.—Hall and Clarke, 13th Ann. Rep. New York State Geol., 1895, p. 844.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 190; Bull. New York State Mus., 45, 1901, p. 190.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 275.—Schuchert, Zittel-Eastman Textb. Pal., 1900, p. 321; 2d. ed., 1913, p. 395.

**PENTAMERUS ARCUOSUS** McChesney. See *Clorinda arcuosa*.

**PENTAMERUS BARRANDI** Billings. See *Virgiana barrandei*.

**PENTAMERUS BEAUMONTI** Castelnau. See *Pentamerus oblongus*.

**PENTAMERUS BISINUATUS** McChesney. See *Pentamerus oblongus bisinuatus*.

**PENTAMERUS BREVIROSTRIS** Hall. See *Anastrophia brevirrostris*.

**Pentamerus circularis** Weller.

*Pentamerus circularis* Weller, Geol. Surv. New Jersey, Pal. 3, 1903, p. 233, pl. 20, figs. 17-19.

Helderbergian (Decker Ferry): Two miles south of Tristates, New York.

**PENTAMERUS CHICAGOENSIS** Winchell and Marcy. See *Clorinda ventricosa*.

**PENTAMERUS COLLETTI** Miller. See *Conchidium colletti*.

**PENTAMERUS COMPLANATUS** Nettelroth. See *Conchidium tenuicostatum*.

**PENTAMERUS CONCHIDIUM** Emerson. See *Conchidium biloculare*.

**PENTAMERUS COPPINGERI** Etheridge. See *Gypidula coppingeri*.

**PENTAMERUS CRASSORADIUS** McChesney. See *Conchidium crassoradius*.

**PENTAMERUS DECUSSATUS** Whiteaves. See *Conchidium decussatum*.

**Pentamerus divergens** Foerste.

*Pentamerus divergens* Foerste, Cincinnati Soc. Nat. Hist. Jour., 21, 1909, p. 28, pl. 1, figs. 5A-E; pl. 2, figs. 17A, B.  
Cayugan (Kokomo): Kokomo, Indiana.

PENTAMERUS FORNICATUS Hall. See *Clorinda fornicata*.

PENTAMERUS GALEATUS Roemer. See *Gypidula roemeri*.

PENTAMERUS GALEATUS Hall. See *Gypidula (Sieberella) galeata*.

PENTAMERUS GALEATUS Hall and Whitfield. See *Gypidula nucleus*.

PENTAMERUS GLOBULOSUS Nettelroth. See *Gypidula globulosa*.

PENTAMERUS HEMPLICATUS Hall. See *Parastrophia hemiplicata*.

PENTAMERUS INTERPLICATUS Hall. See *Anastrophia interplicata*.

PENTAMERUS KNAPPI Hall and Whitfield. See *Conchidium knappi*.

PENTAMERUS KNIGHTI Nettelroth. See *Conchidium nettelrothi*.

PENTAMERUS KNOTTI Nettelroth. See *Gypidula knotti*.

PENTAMERUS LAQUEATUS Conrad. See *Conchidium laqueatum*.

PENTAMERUS LITTONI Hall. See *Conchidium littoni*.

PENTAMERUS MULTICOSTATUS Hall. See *Conchidium multicostatum*.

PENTAMERUS NOBILIS Emmons. See *Conchidium laqueatum*.

PENTAMERUS NUCLEUS Hall and Whitfield. See *Gypidula nucleus*.

PENTAMERUS NYSIUS Hall. See *Conchidium nysius*.

PENTAMERUS NYSIUS VAR. CRASSICOSTA Hall and Whitfield. See *Conchidium nysius*.

PENTAMERUS NYSIUS VAR. TENUICOSTA Hall and Whitfield. See *Conchidium tenuicostatum*.

PENTAMERUS NYSIUS VAR. TENUISCOSTATUS Nettelroth. See *Conchidium nysius*.

**Pentamerus oblongus** Sowerby.

*Pentamerus oblongus* Sowerby, Murchison's Sil. Syst., 1839, p. 641, pl. 19, fig. 10.—Hall, Geol. New York Rep. 4th Dist., 1843, p. 70, figs. 1-5.—Owen, Geol. Expl. Iowa, Wisconsin, and Illinois, 1844, pl. 14, fig. 10; Amer. Jour. Sci. Arts, 48, 1845, p. 304, figs. 1-5.—Hall, *ibid.*, 2d ser., 20, 1849, p. 227; Pal. New York, 2, 1852, p. 79, pl. 25, fig. 1.—Marcou, Geol. Map United States and British Prov., etc., 1853, p. 27, pl. 2, fig. 3.—Billings, Canadian Nat. Geol., 1, 1856, p. 58, pl. 1, figs. 2, 3; Geol. Canada, 1863, p. 316, fig. 326.—Chapman, Canadian Jour., n. s., 7, 1862, p. 115, figs. 107, 107a; *ibid.*, 8, 1863, p. 210, fig. 213; Expos. Min. and Geol. Canada, 1864, p. 118, figs. 107, 107a; p. 182, fig. 213.—Davidson, Mon. British Sil. Brach., Pal. Soc., 1867, p. 151, pl. 18, figs. 1-12; pl. 19, figs. 1, 2.—Billings, Geol. Mag., 5, 1868, pl. 4, fig. 3.—Hall and Whitfield, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 183; Geol. Surv. Ohio Pal., 2, 1875, p. 137, pl. 7, fig. 9.—Whitfield, Geol. Wisconsin, 4, 1882, p. 288, pl. 17, figs. 4-9.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 192.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 617, figs.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 60, pl. 33, figs. 15-17.—Hall and Clarke, Pal. New York, 8, pt. 2, 1895, p. 237,

**Pentamerus oblongus**—Continued.

figs. 169-171; pl. 67, fig. 20; pl. 68, figs. 1-5; pl. 69, figs. 1, 4-7, 13, 14; pl. 70, figs. 1-4.—Whiteaves, Pal. Foss. Geol. Surv. Canada, 3, pt. 2, 1895, p. 63.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 190, fig. 103; Bull. New York State Mus., 45, 1901, p. 190, fig. 103.—Foerste, Bull. Kentucky Geol. Surv., 7, 1906, p. 323, pl. 1, fig. 2.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 275, fig. 344.

*Pentamerus beaumonti* Castelnau, Essai Syst. Sil. l' Amer. Septent., 1843, p. 38, pl. 13, fig. 9.

Niagaran: England; New York (Walcott); Ohio (Dayton and Springfield); Indiana; Kentucky (Louisville); Illinois; Wisconsin; Iowa; Ontario; Anticosti, etc.

*Plectotypes*.—Cat. No. 51310, U.S.N.M. (Nettelroth).

**Pentamerus oblongus bisinuatus** (McChesney).

*Pentamerus bisinuatus* McChesney, New Pal. Foss., Extr. No. 2, 1861, p. 85; Illus. New Species Foss., 1865, pl. 9, figs. 1a-b.—Whitfield, Geol. Wisconsin, 4, 1882, p. 290, pl. 17, fig. 3.

*Pentamerus oblongus* var. *bisinuatus* Hall, Pal. New York, 8, pt. 2, fasc. 2, 1893, pp. 238 and 239.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 64.

Niagaran: Milwaukee, Cato, and Wauwatosa, Wisconsin (Racine, Waukesha); Durham, Ontario (Guelph).

**Pentamerus oblongus compressus** Kindle and Breger.

*Pentamerus oblongus* var. *compressa* Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 437, pl. 7, figs. 1-5.

Niagaran: Delphi, Indiana.

**Pentamerus oblongus corrugatus** Weller and Davidson.

*Pentamerus oblongus* var. *corrugatus* Weller and Davidson, Jour. Geol., 4, 1896, p. 171, pl. 7, figs. 1-4.

Niagaran: Jones County, Iowa.

**Pentamerus oblongus cylindricus** Hall and Whitfield.

*Pentamerus oblongus* var. *cylindrica* Hall and Whitfield, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 183; 27th Rep., *ibid.*, 1875, pl. 10, figs. 13, 14.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 61, pl. 30, figs. 2-4.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 237, fig. 172; pl. 68, figs. 7, 8; pl. 69, figs. 11, 12.—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 436, pl. 6, figs. 6-10; pl. 7, fig. 6.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 276.

Niagaran: Louisville, Kentucky (Louisville); Delphi, Indiana.

*Plectotype*.—Cat. No. 51311, U.S.N.M.

**Pentamerus oblongus maquoketa** Hall and Clarke.

*Pentamerus oblongus* (partim) Whitfield, Geol. Wisconsin, 4, 1882, pp. 288, 291, pl. 17, figs. 8, 9.

*Pentamerus oblongus* var. *maquoketa* Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 239, pl. 67, figs. 11-13; 48th Rep. New York State Mus., 2, for 1895, 1897, p. 368, pl. 11, figs. 12-14; 14th Rep. State Geol. New York for 1894, 1897, p. 368, pl. 11, figs. 12-14.

Niagaran: Ashford, Wisconsin; near Dubuque and Hopkinton, Iowa.

**Pentamerus oblongus subrectus** Hall and Clarke.

*Pentamerus oblongus* var. *subrectus* Hall and Clarke, Pal. New York, 8, pt. 2, 1893, pp. 238, 239, pl. 68, figs. 2, 3, 8-10; pl. 70, fig. 5; 48th Rep. New York State Mus., 2, for 1895, 1897, p. 368, pl. 12, figs. 1-6; 14th Rep. State Geol. New York for 1894, 1897, p. 368, pl. 12, figs. 1-6.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 275.

Niagaran: Earlville, Iowa.

**PENTAMERUS OCCIDENTALIS** Hall. See *Conchidium occidentale*.

**Pentamerus ovalis** Hall.

*Pentamerus ovalis* Hall, Pal. New York, 2, 1852, p. 103, pl. 31, fig. 1.—Foerste Proc. Boston Soc. Nat. Hist., 24, 1890, p. 324, pl. 5, figs. 17, 18.

Clinton: New Hartford, Oneida County, New York; Cumberland Gap, Tennessee; Collinsville, Alabama.

**Pentamerus parvulus** Savage.

*Pentamerus parvulus* Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 78, pl. 5, figs. 18-21.

Upper Median (Edgewood—Noix): Near Louisiana and Clarksville, Missouri; Hamburg, Illinois.

**Pentamerus pergibbosus** Hall and Whitfield.

*Pentamerus pergibbosus* Hall and Whitfield, Pal. Ohio, 2, 1875, p. 139, pl. 7, figs. 10, 11.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 162.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 239, pl. 67, figs. 10, 14-19.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 618, figs.

Niagaran: Greenfield, Ohio; Louisville, Kentucky; Wisconsin.

*Plesiotype*.—Cat. No. 51355, U.S.N.M.

**Pentamerus pesovis** Whitfield.

*Pentamerus pesovis* Whitfield, Ann. New York Acad. Sci., 2, 1882, p. 195; 5, 1891, p. 513, pl. 5, figs. 11-22; Geol. Ohio, 7, 1895, p. 414, pl. 1, figs. 18-22.—Sherzer, Michigan Geol. Surv., 7, pt. 1, 1900, p. 224, pl. 17, figs. 18-22.—Grabau, Michigan Geol. Surv., Geol., 1st ser., 1909, p. 127, pl. 30, figs. 18-22.

Lower Monroan (Greenfield?): Adams County, Ohio.

**PENTAMERUS REVERSUS** Billings. See *Parastrophia reversa*.

**PENTAMERUS SIMILIOR** Hall. See *Spirifer? similior*.

**PENTAMERUS TRISINUATUS** McChesney. See *Meristina trisinuata*.

**PENTAMERUS UNIPLICATUS** Nettelroth. See *Gypidula uniplicata*.

**PENTAMERUS VENTRICOSA** Hall. See *Clorinda ventricosa*.

**PENTAMORION** Barrande. See *Pentameroceras Hyatt*.

**PENTATREMATITES REINWARDTHI** Roemer. See *Troostocrinus reinwardti*.

**PENTREMITES REINWARDTHI** Troost. See *Troostocrinus reinwardti*.

**PENTREMITES SUBCYLINDRICA** Hall and Whitfield. See *Troostocrinus subcylindrica*.

**PERIECHOCRINITES** Austin. See *Periechocrinus* Austin.

**PERIECHOCRINUS** Austin. Genotype: *Actinocrinus moniliformis* J. S. Miller.

*Periechocrinites* Austin, Ann. Mag. Nat. Hist., 10, 1842, p. 109; *ibid.*, 11, 1843, p. 203.

**PERIECHOCRINUS**—Continued.

*Geocrinus* D'Orbigny, Prodr. de Pal., 1, 1849, p. 46. (Genotype: *Actinocrinites moniliformis* Phillips.)

*Periechocrinus* McCoy, Syn. British Pal. Foss., 1855, p. 56.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 323.—Dujardin and Hupe, Hist. Natur. des Zooph. Echin., 1862, p. 137.—Salter, Cat. Camb. Sil. Foss., 1873, p. 121.—Angelin, Icon. Crinoid., 1878, p. 6.—Zittel, Handb. Pal., 1, 1879, p. 369.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 270, 301 (Rev. Pal., pt. 2, pp. 96, 127); 1886, p. 328.—Keyes, Missouri Geol. Surv., 4, for 1894, 1895, p. 154.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 519.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, pp. 166, 168.—Weller, Chicago Acad. Sci., Nat. Hist. Surv. Bull. 4, pt. 1, 1900, p. 36, fig. 24; p. 129, text fig. 49.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 144.—Zittel, Grundzuge Pal., 1, 1910, p. 158.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 536.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 194.

*Trochocrinites* Portlock, Geol. Londonderry, 1848, p. 345.

*Saccocrinus* Hall, Pal. New York, 2, 1852, p. 205.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 323.—Roemer, Sil. Fauna West. Tennessee, Breslau, 1860, p. 44.—Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 347; Proc. Acad. Nat. Sci. Philadelphia, 1869, p. 165; Geol. Surv. Illinois, 5, 1873, p. 394; also p. 395.—Hall, 28th Rep. New York State Mus. Nat. Hist., 1879, rev. ed., p. 127.—Zittel, Handb. Pal., 1, 1879, p. 369.—Miller, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, pp. 166, 167; N. A. Geol. Pal., 1889, p. 278.—Springer, Zittel-Eastman Textb. Pal., 1, 1913, p. 194. (Genotype: *S. speciosus* Hall.)

*Crumenæcrinites* Troost, Amer. Jour. Sci. Arts, 2d ser., 8, 1849, p. 420 (nom. nud.).

**PERIECHOCRINUS CHICAGOENSIS** Weller. See *Habrocrinus benedicti*.

**PERIECHOCRINUS CHRISTYI** Hall. See *Periechocrinus whitfieldi*.

**Periechocrinus dubius** Wood.

*Actinocrinites tennessecae* (part) Troost, MS., 1850.

*Gilbertsocrinites* (?) *dubius* Troost, MS., 1850.

*Saccocrinus speciosus* Roemer (not Hall, 1852), Sil. Fauna West. Tennessee, 1860, p. 42, pl. 3, figs. 3a-c.

*Periechocrinus speciosus* (part) Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 521.

*Periechocrinus dubius* Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 77.

Niagaran (Brownsport): Perry and Decatur Counties, Tennessee.

*Cotypes*.—Cat. No. 39967, U.S.N.M.

**Periechocrinus egani** (Miller).

*Saccocrinus egani* Miller, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 173, pl. 4, figs. 4, 4a.

*Periechocrinus egani* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1885, p. 328 (Rev. Pal., pt. 3, sec. 1, p. 106).—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, pp. 130, 136, pl. 13, fig. 9.

Niagaran (Racine): Cicero and Bridgeport, Illinois.

**Periechocrinus gorbyi** (Miller).

*Saccocrinus gorbyi* Miller, 17th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1892, p. 667, pl. 9, fig. 2, 3 (adv. sheets, 1891, p. 57).

Niagaran (Brownsport): Adams, Decatur County, Tennessee.

**PERIECHOCRINUS HOWARDI** Wachsmuth and Springer. See *Habrocrinus howardi*.

**Periechocrinus infelix** (Winchell and Marcy).

*Megistocrinus infelix* Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 110, pl. 2, fig. 7.

*Saccocrinus infelix* Meek and Worthen, Geol. Surv. Illinois, 2, 1866, p. 210, footnote (gen. ref.).—Miller, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 260, pl. 6, figs. 2, 2a, 2b.

*Saccocrinus* (*Megistocrinus*) *inflexus* Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 349.

*Periechocrinus infelix* Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard (N. A. Crin. Cam.), 21, 1897, p. 525, pl. 50, fig. 2a-d.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 134, pl. 13, figs. 1, 2.

Niagaran (Racine): Bridgeport and Romeo, Illinois.

**Periechocrinus marcouanus** (Winchell and Marcy).

*Megistocrinus Marcouanus* Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 87, fig., pl. 2, fig. 5.

*Saccocrinus Marcouanus* Meek and Worthen, Geol. Surv. Illinois, 2, 1866, p. 210, footnote (gen. ref.).—Miller, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 167, pl. 4, figs. 1, 1a.

*Periechocrinus marcouanus* Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 21, 1897, p. 523, pl. 50, figs. 7a-b; pl. 51, fig. 5.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, pp. 130, 131, pl. 12, figs. 2-4.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 536.

Niagaran (Racine): Bridgeport, Lemont, and Joliet, Illinois.

**Periechocrinus necis** (Winchell and Marcy).

*Megistocrinus necis* Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 110, pl. 2, fig. 6.

*Saccocrinus necis* Miller, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 172, pl. 4, figs. 3, 3a.

*Periechocrinus necis* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1885, p. 328 (Rev. Pal., pt. 3, sec. 1, p. 106); Mem. Mus. Comp. Zool., Harvard (N. A. Crin. Cam.), 21, 1897, p. 524, pl. 50, fig. 1, a, b.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, pp. 130, 133, pl. 13, figs. 5, 6.

Niagaran (Racine): Bridgeport, Hawthorne, and Cicero, Illinois.

**Periechocrinus ornatus** (Hall and Whitfield).

*Saccocrinus ornatus* Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 126, pl. 6, figs. 7-9.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 917, figs.

*Periechocrinus ornatus* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 306 (Rev. Pal., pt. 2, p. 132); Mem. Mus. Comp. Zool., Harvard, 21, 1897, p. 527, pl. 50, figs. 3a, b; pl. 51, fig. 7.

*Periechocrinus* (*Saccocrinus*) *ornatus* Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 537, fig. 1865.

*Habrocrinus ornatus* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1890, p. 368.—Slocum, Field Columbian Mus., Geol., 2d ser., 1908, p. 296.

Niagaran: Yellow Springs, Ohio; St. Paul, Indiana (Laurel).

**PERIECHOCRINUS SEMIRADIATUS** Wachsmuth and Springer. See *Macrostylocrinus semiradiatus*.

**PERIECHOCRINUS SPECIOSUS** Wachsmuth and Springer (part). See *Periechocrinus dubius*.

**Periechocrinus speciosus** (Hall).

- Saccocrinus speciosus* Hall, Pal. New York, 2, 1852, p. 205, pl. 46, figs. 1a-n, 2.  
*Actinocrinus* (*Saccocrinus*) *speciosus* Hall, Trans. Albany Inst., 4, 1864, p. 197.  
*Periechocrinus speciosus* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 307 (Rev. Pal., pt. 2, p. 133); Mem. Mus. Comp. Zool., Harvard, 21, 1897, p. 521, pl. 50, fig. 6.  
 Niagaran (Lockport): Lockport, New York.

**Periechocrinus tennesseensis** (Hall).

- Crumenæcrinites ovalis* Troost, Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 62 (nom. nud.).  
*Actinocrinites tennesseæ* (part) Troost MS.  
*Saccocrinus tennesseensis* Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 125, pl. 6, fig. 10.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 917, fig.  
*Periechocrinus tennesseensis* Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 21, 1897, p. 528, pl. 1, fig. 4.—Foerste, Jour. Geol., 11, 1903, p. 712.—Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 76, pl. 6, fig. 10.  
*Periechocrinus* (*Saccocrinus*) *tennesseensis* Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 537, fig. 1865.  
 Niagaran: Perry and Decatur Counties, Tennessee (Brownsport); Yellow Springs, Ohio.  
*Plesiotypes*.—Cat. Nos. 39915 and 39916, U.S.N.M. (Troost's types of *C. ovalis* and *A. tennesseæ*.)

**Periechocrinus umbrosus** (Miller and Gurley).

- Saccocrinus umbrosus* Miller and Gurley, Bull. 6, Illinois State Mus. Nat. Hist., 1895, p. 24, pl. 2, figs. 13, 14.  
 Niagaran (Laurel?): St. Paul, Indiana.

**Periechocrinus urniformis** (Miller).

- Saccocrinus urniformis* Miller, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 170, pl. 4, figs. 2, 2a.  
*Periechocrinus urniformis* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1885, p. 328 (Rev. Pal., pt. 3, sec. 1, p. 106); Mem. Mus. Comp. Zool. Harvard, 21, 1897, p. 526, pl. 50, figs. 5a, b.—Weller, Bull. Chicago Acad. Sci. Nat. Hist. Surv., 4, pt. 1, 1900, pp. 130, 135, pl. 12, fig. 1; pl. 13, figs. 3, 4.  
*Saccocrinus pyriformis* Miller, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 81, pl. 3, figs. 3, 3a.  
*Periechocrinus pyriformis* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1885, p. 328 (Rev. Pal., pt. 3, sec. 1, p. 106).  
 Niagaran (Racine): Bridgeport and Cicero, Illinois.

**Periechocrinus whitfieldi** (Hall).

- Actinocrinus Christyi* Hall (not Shumard, 1855), Trans. Albany Inst., 4, 1863, p. 196.  
*Megistocrinus christyi* Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 89.  
*Saccocrinus Christyi* Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 347, pl. 5, fig. 1.—Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1877, pl. 13, figs. 12-20; mus. ed., 1879, p. 127, pl. 13, figs. 12-20; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 254, pl. 12, figs. 12-20; pl. 15, figs. 3, 4.—Miller, N. A. Geol. Pal., 1889, p. 278, fig. 422.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 915, figs.  
*Periechocrinus christyi* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 305 (Rev. Pal., pt. 2, p. 132).—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 536.



**Perlechoerinus whitfieldi**—Continued.

*Actinocrinus* (*Saccocrinus*) *Whitfieldi* Hall, 20th Rep. New York State Cab. Nat. Hist. (extras, 1865), 1868, pp. 326, 391; rev. ed., 1870, pp. 370, 430.

*Actinocrinus Whitfieldi* Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 350.

*Periechoerinus whitfieldi* Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 21, 1897, p. 522, pl. 51, figs. 1-4.

*Actinocrinus waldronensis* Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, pp. 343, 350, footnote. (Proposed in place of *A. christyi*, 1863. Canceled in note, p. 350.)

*Saccocrinus sacculus* Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 349. (Proposed in case Chicago specimens should be different.)

Niagaran: Waldron, Indiana, and Newsom, Tennessee (Waldron); Chicago, Illinois (Racine).

**PERIGLYPTOCRINUS** Wachsmuth and Springer.

Genotype: *P. billingsi* Wachsmuth and Springer.

*Periglyptocrinus* Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 277.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 552.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 190.

**Periglyptocrinus billingsi** Wachsmuth and Springer.

*Periglyptocrinus Billingsi* Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 277, pl. 21, fig. 1a, b.—Springer, Geol. Surv. Canada, Mem. 15P, 1911, p. 11 (loc. occ.).

*Glyptocrinus billingsi* Miller, 2d App., N. A. Geol. Pal., 1897, p. 746.

Trenton (Curdsville): Ottawa and Kirkfield, Ontario.

**Periglyptocrinus priscus** (Billings).

*Glyptocrinus priscus* Billings, Geol. Surv. Canada, Rep. Progr. 1853-1856, 1857, p. 257; Geol. Surv. Canada, dec. 4, 1859, p. 56, pl. 7, figs. 1a-1f.—Miller, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 225.

*Ptychoerinus priscus* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 301. (Rev. Pal., pt. 3, p. 225.)

*Periglyptocrinus priscus* Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 278, pl. 21, fig. 2.—Parks, Ottawa Naturalist, 23, 1909, pp. 153-155, pl. 3.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 552.—Springer, Geol. Surv. Canada, Mem. 15P, 1911, p. 11 (loc. occ.).

Trenton (Curdsville): Renfrew County, Kirkfield, and Balsam Lake, Ontario.

**PERIFLOMA PLANULATA** D'Orbigny. See *Clidophorus planulatus*.**PERONOPORA** (part) Nicholson. See *Atactoporella Ulrich* and *Monticulipora* D'Orbigny.**PERONOPORA** Nicholson. Genotype: *Monticulipora frondosa* Nicholson (not D'Orbigny)=*Chaetetes decipiens* Rominger.

*Peronopora* Nicholson, Genus *Monticulipora*, 1881, pp. 102, 215.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 153.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 472.—Waagen and Wentzel, Pal. Indica, 13th Ser., 1886, p. 875.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 370.—Zittel's Textb. Pal. (Engl. ed.), 1896, p. 104.—Ulrich, *ibid.*, p. 272.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 729.—Nickles and Basler, Bull. U. S. Geol. Surv., 173, 1900, p. 29.—Cummings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 752.—Basler, Zittel-Eastman Textb. Pal., 1913, p. 332.

**Peronopora compressa** (Ulrich).

*Chaetetes compressus* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 27, pl. 7, figs. 25-25b.

*Peronopora compressa* Ulrich, *ibid.*, 5, 1882, p. 244.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 344.

*Monticulipora compressa* J. F. James, Jour. Cincinnati Soc. Nat. Hist., 18, 1894, p. 75.

*Peronopora uniformis* Ulrich, *ibid.*, 5, 1882, p. 244, pl. 10, figs. 8, 8a.

*Monticulipora uniformis* J. F. James, *ibid.*, 18, 1895, p. 76.

Maysville (McMillan): Cincinnati, Ohio, and vicinity.

*Cotypes*.—Cat. No. 43694, U.S.N.M.

**Peronopora decipiens** (Röminger).

*Chaetetes decipiens* Rominger, Proc. Acad. Nat. Sci. Philadelphia, 1866, p. 116.

*Peronopora decipiens* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 244.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 344.—Cumings, Amer. Geol., 29, 1902, pl. 12, fig. 3.

*Chaetetes frondosus* Nicholson (not D'Orbigny), Quart. Jour. Geol. Soc. London, 30, 1874, p. 508, pl. 30, figs. 2-2b; Pal. Ohio, 2, 1875, p. 208, pl. 22, figs. 1-1b; Ann. Mag. Nat. Hist., 4th ser., 18, 1876, p. 91, pl. 5, figs. 11, 11a.—Quenstedt, Roehren- und Sternkorallen, 1881, p. 73, pl. 146, figs. 3-5 (not 8).

*Monticulipora* (*Peronopora*) *frondosa* Nicholson, Genus *Monticulipora*, 1881, p. 216, figs. 46, 47, pl. 4, 4a, 5, 5a.—James and James, Jour. Cincinnati Soc. Nat. Hist., 11, 1888, p. 17.—James, *ibid.*, 18, 1895, p. 72.

*Ptilodictya pavonia* Boule and Thevenin, Ann. de Pal., 1, fasc. 1, 1906, p. 5, pl. 2, figs. 2-4.

*Peronopora pavonia* Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 866, pl. 22, figs. 1-1c; pl. 31, figs. 4, 4a.

Maysville and Richmond: Madison and other localities in Indiana; Ohio; Kentucky; Tennessee; Illinois.

Observation.—Boule and Thevenin in refiguring D'Orbigny's so-called types of *Ptilodictya pavonia* have paid no attention to D'Orbigny's original description which clearly refers to an *Escharopora*, or to Edwards and Haime's work.

**Peronopora milleri** Nickles.

*Peronopora milleri* Nickles, Bull. Kentucky Geol. Surv., No. 5, 1905, p. 43, pl. 1, fig. 6.

Trenton (Cynthiana): Lexington, etc., Kentucky.

PERONOPORA PAVONIA Cumings. See *Peronopora decipiens*.

PERONOPORA UNIFORMIS Ulrich. See *Peronopora compressa*.

**Peronopora vera** Ulrich.

*Peronopora vera* Ulrich, Amer. Geol., 2, 1888, p. 40.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 345.—Nickles, Bull. Kentucky Geol. Surv., No. 5, 1905, p. 46, pl. 2, fig. 1.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 867, pl. 22, figs. 2-2b; pl. 31, fig. 5.

Eden and Maysville (Fairview): Cincinnati, Ohio, and vicinity.

*Cotypes*.—Cat. No. 43943, U.S.N.M.

PERONOPORELLA Cumings and Galloway. See *Homotrypella* Ulrich.

**PERONOSPORITES** Smith.

Genotype: *P. antiquarius* Smith.

*Peronosporites* Smith, Gardeners' Chronicle, n. s., 8, 1877, p. 499.

**Peronosporites globosus** Loomis.

*Peronosporites globosus* Loomis, Bull. New York State Mus., 39, 1900, p. 225, pl. 16, fig. 4.

Clinton (Wolcott): Rochester, New York.

**Peronosporites minutus** Loomis.

*Peronosporites minutus* Loomis, Bull. New York State Mus., 39, 1900, p. 225, pl. 16, figs. 5, 6.

Clinton (Wolcott): Rochester, New York.

**Peronosporites ramosus** Loomis.

*Peronosporites ramosus* Loomis, Bull. New York State Mus., 39, 1900, p. 225, pl. 16, fig. 1-3.

Clinton (Wolcott): Rochester, New York.

**PETALICHNUS** Miller.

Genotype: *P. multipartitus* Miller.

*Petalichnus* Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1880, pp. 221, 222; N. A. Geol. Pal., 1889, p. 452.

**Petalichnus multipartitus** Miller.

*Petalichnus multipartitus* Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1880, p. 222, pl. 14, fig. 2.

Eden (Economy): Walker Mill Road, Cincinnati, Ohio.

**PETALOCRINUS** Weller and Davidson.

Genotype: *P. mirabilis* Weller and Davidson.

*Petalocrinus* Weller and Davidson, Jour. Geol., 4, 1896, p. 167.—Weller, Jour. Geol., 6, 1898, p. 700.—Bather, Geol. Mag., dec. 4, 5, 1898, p. 284.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 20.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 175, fig. 91.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 216.

**Petalocrinus inferior** Bather.

*Petalocrinus inferior* Bather, Quart. Jour. Geol. Soc. London, 1899, pp. 54, 426, pl. 26, fig. 57; fig. 10.

Niagaran: Near Monticello, Jones County, Iowa.

**Petalocrinus longus** Bather.

*Petalocrinus longus* Bather, Quart. Jour. Geol. Soc. London, 1898, pp. 54, 431, pl. 26, figs. 58-65; figs. 11, 12, p. 432.

Niagaran (Laurel): St. Paul, Indiana.

**Petalocrinus(?) major** Weller and Davidson.

*Petalocrinus(?) major* Weller and Davidson, Jour. Geol., 4, 1896, p. 170, pl. 6, fig. 1.

Niagaran: Jones County, Iowa.

**Petalocrinus mirabilis** Weller and Davidson.

*Petalocrinus mirabilis* Weller and Davidson, Jour. Geol., 4, 1896, p. 167, figs. 1, 2, pl. 6, figs. 2-5.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 19, fig. 4.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 175, fig. 91.

Niagaran: Jones County, Iowa.

**PETIGOPORA** Ulrich.

Genotype: *P. gregaria* Ulrich.

*Petigopora* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 155; Contr. Micro-Pal. Cambro-Sil., pt. 2, 1889, p. 34.—Miller, N. A. Geol. Pal., 1889, p. 314.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 372; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 274.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897,

**PETIGOPORA**—Continued.

p. 563.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 31.—  
Ulrich and Bassler, Smiths. Misc. Coll., Quart., 47, 1904, pp. 24, 32.—Cumings,  
32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 752.

**Petigopora asperula** Ulrich.

*Petigopora asperula* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 157, pl. 6,  
figs. 4-4c; 14th Ann. Rep. Geol. Nat. Hist. Sur. Minnesota, 1886, p. 130.—  
Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 345.—Cumings,  
32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 868, pl. 22, figs. 3-3c.  
*Monticulipora wetherbyi* var. *asperula* James and James, Jour. Cincinnati Soc.  
Nat. Hist., 11, 1888, p. 24.

*Monticulipora asperula* J. F. James, *ibid.*, 18, 1895, p. 81.

*Petigopora gregaria* (part) Simpson, 14th Ann. Rep. State Geol. New York for  
1894, 1897, fig. 129 (part) (p. 564).

Maysville (Bellevue): Cincinnati, Ohio, and vicinity.

*Cotypes*.—Cat. No. 43699, U.S.N.M.

**Petigopora gregaria** Ulrich.

*Petigopora gregaria* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 155, pl. 7,  
figs. 3-3c.—J. F. James, *ibid.*, 18, 1896, p. 124.—Simpson, 14th Ann. Rep.  
State Geol. New York for 1894, 1897, fig. 129 (part) (p. 564).—Cumings,  
32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 869, pl. 22, figs. 4, 4c.

Maysville (Fairmount—Corryville): Cincinnati, Ohio, and vicinity.

*Cotypes*.—Cat. No. 43700, U.S.N.M.

**PETIGOPORA GREGARIA** (part) Simpson. See *Petigopora asperula*.

**Petigopora offula** Ulrich and Bassler.

*Petigopora offula* Ulrich and Bassler, Smiths. Misc. Coll., Quart., 47, 1904, p. 32.  
Richmond (Arnheim): Middletown, Lebanon, etc., Ohio.

*Cotypes*.—Cat. No. 43194, U.S.N.M.

**Petigopora petechialis** (Nicholson).

*Chætetes petechialis* Nicholson, Pal. Ohio, 2, 1875, p. 213, pl. 22, figs. 5, 5a.

*Petigopora petechialis* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 156;  
14th Ann. Rep. Geol. Nat. Hist. Sur. Minnesota, 1886, p. 103.—Miller, N. A.  
Geol. Pal., 1889, fig. 496 (p. 314).—Cumings, 32d Ann. Rep. Dep. Geol. Nat.  
Res. Indiana, 1908, p. 870, pl. 22, figs. 5, 5a.

*Monticulipora petechialis* James and James, Jour. Cincinnati Soc. Nat. Hist., 11,  
1888, p. 24.—J. F. James, *ibid.*, 18, 1895, p. 85.

Maysville: Cincinnati, Ohio, and vicinity.

**Petigopora scabiosa** Ulrich.

*Petigopora scabiosa* Ulrich, Contr. Micro-Pal. Cambro Sil., pt. 2, 1889, p. 34.—  
Whiteaves, Pal. Foss., 3, 1897, p. 116.

Richmond (Stony Mountain): Stony Mountain, Manitoba.

**PETIGURUS** Raymond.

Genotype: *Bathyurus nero* Billings.

*Petigurus* Raymond, Bull. Victoria Mem. Mus., 1, 1913, p. 58.

**Petigurus cybele** (Billings).

*Bathyurus Cybele* Billings, Canadian Nat. Geol., 4, 1859, p. 366, fig. 12c; Geol.  
Canada, Geol. Surv. Canada, 1863, p. 122, fig. 43; Pal. Foss., 1, Geol. Surv.  
Canada, 1865, p. 353, fig. 341c.

*Petigurus cybele* Raymond, Bull. Victoria Mem. Mus., 1, 1913, p. 59.

**Petigurus cybele**—Continued.

Canadian: Mingan Islands, Beauharnois, and counties of Leeds and Grenville, Canada; Orwell, Vermont, and Comstocks Landing, New York (Beekmantown).

**Petigurus? ellipticus** (Cleland).

Bathyurus ellipticus Cleland, Bull. Amer. Pal., 3, 1900, p. 129 (257), pl. 16, figs. 5, 6; *ibid.*, 4, 1903, p. 11, pl. 3, fig. 3.

Canadian (Little Falls): Near Fort Hunter, New York.

**Petigurus nero** (Billings).

Bathyurus Nero Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 260, fig. 243a-d.

Petigurus nero Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 59, pl. 7, fig. 8.

Canadian (Quebec—F-N): Keppel Island, Pistolet Bay, Table Head, etc., Newfoundland.

PETRAIA Zittel. See *Streptelasma* Hall.

PETRAIA CALICULA Hall. See *Enterolasma caliculum*.

PETRAIA CANADENSIS Billings. See *Streptelasma rusticum*.

PETRAIA FANNINGANA Safford. See *Ditoeholasma fanningana*.

PETRAIA MINGANENSIS Billings. See *Archæoscyphia minganensis*.

PETRAIA OTTAWAENSIS Billings. See *Streptelasma corniculum*.

PETRAIA PULCHELLA Billings. See *Streptelasma selectum*.

PETRAIA PYGMÆA var. OCCIDENTALIS Whiteaves. See *Streptelasma occidentale*.

PETRAIA WAYNENSIS Safford. See *Enterolasma waynense*.

**PETRASTER** Billings.

Genotype: *Palæasterina rigidus* Billings.

*Petraster* Billings, Geol. Surv. Canada, dec. 3, 1858, p. 79.—Chapman, Canadian Jour., n. s., 6, 1861, p. 517; Expos. Min. and Geol. Canada, 1864, p. 111.—Hall, 20th Rep. New York State Cab. Hist., 1868, p. 294; rev. ed. 1870, p. 337.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1880, p. 322.—Miller, N. A. Geol. Pal., 1889, p. 269.—James, Jour. Cincinnati Soc. Nat. Hist., 18, 1895, pp. 126, 134.—Schuchert, Bull. U. S. Nat. Mus., 88, 1915, p. 138.

*Palæaster* (part) Zittel, Handb. Pal., 1, 1879, p. 452.

**Petraster? americanus** (D'Orbigny).

Fossil *Asterias* Graham, Anthony and James, Amer. Jour. Sci. Arts, 2d ser., 1, 1846, p. 441, fig.

*Cœlaster americanus* D'Orbigny, Prod. de Pal., 1, 1849, p. 22.

*Asterias anthonii* Dana, Manual Geol., 1st ed., 1863, p. 221, fig.

*Palasterina jamesi* Dana, Amer. Jour. Sci., 2d ser., 25, 1863, p. 295; Manual Geol., 2d ed., 1864, p. 221, fig.

*Palæaster jamesi* Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, footnote, p. 284; rev. ed. 1870, p. 329.—Meeck, Geol. Surv. Ohio Pal., 1, 1873, p. 62, pl. 4, fig. 4.—James, Jour. Cincinnati Soc. Nat. Hist., 18, 1895, p. 127.

*Palæaster* (*Palæasterina*?) *jamesi* Lesley, Geol. Surv. Pennsylvania, Rep., P 4, 1889, p. 577, fig.

*Petraster*(?) *americanus* Schuchert, in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 32; Bull. U. S. Nat. Mus., 88, 1915, p. 146, pl. 26, fig. 2.

Maysville (Fairmount): Cincinnati, Ohio.

**PETRASTER(?) ANTIQUA** Shumard. See *Palæaster antiquus*.

**PETRASTER BELLULUS** Billings. See *Mesopalæaster bellulus*.

**PETRASTER JAMESI** Schuchert. See *Petraster americanus*.

***Petraster rigidus*** (Billings).

*Palæasterina rigidus* Billings, Geol. Surv. Canada, Rep. Progr. for 1853-1856, 1857, p. 291.

*Petraster rigidus* Billings, Geol. Surv. Canada, dec. 3, 1858, p. 80, pl. 10, fig. 3a.—Wright, Mon. British Foss. Echinod., Oolitic, 2, pt. 1, 1862 (Pal. Soc. for 1861), p. 29.—Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 294; rev. ed., 1870, p. 337.—James, Jour. Cincinnati Soc. Nat. Hist., 18, 1895, p. 134.—Springer, Geol. Surv. Canada, Mem., 15P, 1911, p. 46 (loc. occ.).—Schuchert, in Frech, Foss. Cat., 1, Anim., 1914, p. 32; Bull. U. S. Nat. Mus., 88, 1915, p. 141, pl. 27, fig. 5.

Trenton (Curdsville): Ottawa and Kirkfield, Ontario.

**PETRASTER RIGIDUS** Billings (part). See *Hudsonaster matutinus*.

***Petraster speciosus*** (Miller and Dyer).

*Palæasterina speciosa* Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 30, pl. 1, fig. 7.—Miller, N. A. Geol. Pal., 1889, p. 266, fig. 381.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 731, pl. 3, fig. 8.

*Petraster speciosus* Schuchert in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 33; Bull. U. S. Nat. Mus., 88, 1915, p. 142, pl. 23, fig. 5-7; pl. 26, fig. 1; pl. 27, figs. 1-4.

*Palæasterina approximata* Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 30, pl. 1, fig. 8.

Richmond: Near Winchester, Ohio, and Richmond, Indiana.

**PETRASTER WILBERANUS** Meek and Worthen. See *Mesopalæaster wilberanus*.

**PETROCRANIA** Raymond.

Genotype: *Craniella meduanensis* Ehlert.

*Craniella* Ehlert (not Schmidt, 1870), Bull. Soc. Études Scientif. d'Angers, 1888, p. 37.—Hall and Clarke, Pal. New York, 7, pt. 1, 1892, pp. 153, 170.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 687.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 374.—Hall and Clarke, 11th Ann. Rep. New York State Geol., 1894, p. 262.—Huene, Verh. d. Russ.-Kais. Mineral. Ges. zu St. Petersburg., 2d ser., 36, 1899, pp. 297, 315; Neues Jahrb. Min. Geol. Pal., 1, 1899, p. 147.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 186.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 311.

*Petrocrania* Raymond, Ann. Carnegie Mus., 7, 1911, p. 229.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 378.

***Petrocrania? clintonensis*** (Foerste).

*Craniella? clintonensis* Foerste, Geol. Ohio, 7, 1895, p. 565, pl. 37, figs. 3a, 3b.  
Upper Medinan (Brassfield): Todds Fork, Ohio.

***Petrocrania? prona*** Raymond.

*Crania prona* Raymond, Ann. Carnegie Mus., 3, 1906, p. 594; 7, 1911, p. 229, pl. 34, figs. 26-31.

Chazyan: Valcour Island and Chazy (Valcour), New York.

***Petrocrania ulrichi*** (Hall and Clarke).

*Craniella ulrichi* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 153, 181, pl. 4, figs. 1, 2; 48th Rep. New York State Mus., 2, for 1895, 1897, p. 336, pl. 3, figs. 15, 16; 14th Rep. State Geol. New York for 1894, 1897, p. 336, pl. 3, figs. 15, 16.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 375, pl. 29, figs. 38, 39.

**Petrocrania ulrichi**—Continued.

- Petrocrania ulrichi* Raymond, Ann. Carnegie Mus., 7, 1911, p. 230 (gen. ref.).  
*Crania halli* Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, 1892, p. 328, pl. 4, figs. 8-10.  
 Black River (Decorah) and Trenton (Prosser): Minneapolis, St. Paul, Fountain, etc., Minnesota.

**PHACELOPORA** Ulrich.Genotype: *P. pertenuis* Ulrich.

- Phacelopora* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 368.—(Ulrich, in press), Miller, N. A. Geol. Pal., 1889, p. 314.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 16.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 600.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 22.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 121.

*Phacelopora constricta* Ulrich.

- Phacelopora constricta* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 406, pl. 29, fig. 2.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, fig. 209 (p. 600).—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 346.

Trenton: Burgin, Kentucky.

Observation.—Now regarded as the interior cast of some undetermined species of *Helopora* or *Arthroclema*.

*Holotype*.—Cat. No. 43271, U.S.N.M.

**Phacelopora pertenuis** Ulrich.

- Phacelopora pertenuis* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 406, pl. 29, figs. 1-1c.—Keyes, Missouri Geol. Surv., 5, 1894, p. 13, pl. 33, fig. 3.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, figs. 207, 208 (p. 600).—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 121, fig. 178i.

Upper Medinan (Girardeau): Thebes, Illinois.

Richmond (English Head): Island of Anticosti.

*Cotypes*.—Cat. No. 43272, U.S.N.M.

**PHACOPIDELLA** Reed.Genotype: *Phacops glockeri* Barrande.

- Acaste* Goldfuss (not Leach, 1811), Neues Jahrb. Min., etc., 1843, pp. 541, 563.—Salter, Mem. Geol. Surv. U. King., dec. 7, 1853, pl. 1; Mon. British Tril., Pal. Soc., 1864, p. 14.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersb., 7th ser., 30, 1881, pp. 61, 67.—Zittel, Handb. Pal., 2, 1885, p. 614.—Vogdes, Cal. Acad. Sci., Occ. Papers, 4, 1893, p. 333.—Koken, Die Leitfossilien, Leipzig, 1896, p. 32.—Beecher, Amer. Jour. Sci., 4th ser., 3, 1897, p. 105, pl. 3, fig. 32.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 34, No. 8, 1901, p. 27.

*Phacopidella* Reed, Geol. Mag., n. s., dec. 5, 2, 1905, p. 173.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 726.

**Phacopidella downingiae** (Murchison).

- Phacops downingiae* Murchison, Silurian System, 2d ed., 1839, pl. 18, fig. 5.—Salter, Mon. British, Tril., 1862, pl. 2, figs. 17-25.

Silurian: England; Arisaig, Nova Scotia.

**Phacopidella orestes** (Billings).

- Phacops Orestes* Billings, Canadian Nat. Geol., 5, 1860, p. 65, fig. 10; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 61 (loc. occ.).

*Acaste orestes* Schuchert and Twenhofel, Bull. Geol. Soc. Amer., 21, 1890, p. 710.  
 Anticostian (Gun River, Jupiter River): East Point, etc., Anticosti.

**PHACOPS** Emmrich.Genotype: *P. latifrons* Bronn.

- Phacops* Emmrich, Neues Jahrb. Min., etc., 1845, p. 38.—Hawle and Corda, Abh. d. k. bohmischen Gesel. d. Wiss., 1 (extract), 1847, p. 96, pl. 5, fig. 57.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 214.—Pictet, Traité de Pal., 2d ed.,

**PHACOPS**—Continued.

2, 1854, p. 499.—Salter, Cat. Camb. and Sil. Foss., 1873, p. 51.—Angelin, Pal. Scandinavica, 3d ed., Holmiae, 1878, p. 8.—Salter, Mon. British Tril., Pal. Soc., 1864, p. 14.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 7th ser., 30, 1881, pp. 61, 66.—Zittel, Handb. Pal., 2, 1885, p. 614.—Hall and Clarke, Pal. New York, 7, 1888, p. xxvii, fig., p. xxix.—Miller, N. A. Geol. Pal., 1889, p. 560.—Whidborne, Mon. Dev. Fauna South England, 1, Pal. Soc., 1889, p. 2.—Miller, N. A. Geol. Pal., 1st, App., 1892, p. 710.—Koken, Die Leitfossilien, Leipzig, 1896, p. 31, fig. 21, figs. 3, 4.—Beecher, Amer. Jour. Sci., 4th ser., 3, 1897, p. 105, pl. 3, fig. 33.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 313.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 321.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 726.

**PHACOPS CALLICEPHALUS** Hall. See *Pterygometopus callicephalus*.

**Phacops handwerki** Weller.

*Phacops handwerki* Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 271, pl. 24, figs. 6, 7.

Niagaran (Racine): Near Lemont, Illinois.

**PHACOPS LIMULURUS** Hall. See *Dalmanites limulurus*.

**PHACOPS ORESTES** Billings. See *Phacopidella orestes*.

**Phacops pulchellus** Foerste.

*Arionellus* ——— Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 114, pl. 14, fig. 3.

*Phacops pulchellus* Foerste, *ibid.*, 2, 1887, p. 99, pl. 8, figs. 4, 20, 21; Proc. Bost. Soc. Nat. Hist., 24, 1890, p. 268, pl. 6, figs. 20–21.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 322.

*Phacops trisulcatus* Foerste, Geol. Surv. Ohio, 7, 1893, p. 529, pl. 26, fig. 3; pl. 27, figs. 4, 20, 21; pl. 31, figs. 20, 21.

*Phacops cf. pulchellus* Kindle, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 484, pl. 24, figs. 9, 12.

Upper Medinan (Brassfield): Dayton, Ohio; Cumberland Gap, Tennessee.

Niagaran: Connor's Mill, Georgetown and Pendleton, Indiana.

**PHACOPS STOKESII** Dawson. See *Proetus stokesi*.

**Phacops trisulcatus** (Hall).

*Calymene?* *trisulcata* Hall, Geol. New York, pt. 4, 1843, p. 74, fig. 9, p. 72; tab. org. rem. 8, fig. 9.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 110, fig.

*Phacops trisulcatus* Hall, Pal. New York, 2, 1852, p. 300, pl. 66, figs. 3a–b.

Clinton (Williamson): Rochester, etc., New York.

**PHACOPS TRISULCATUS** Foerste. See *Phacops pulchellus*.

**PHÆNOPORA** (Hall).

Genotype: *P. explanata* Hall.

*Phænopora* Hall, Pal. New York, 2, 1852, p. 46; Amer. Jour. Sci. Arts, 2d ser., 11, 1851, p. 399.—Pictet, *Traité de Pal.*, 2d ed., 4, 1857, p. 169.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 152.—Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 157.—Miller, N. A. Geol. Pal., 1889, p. 314.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 392; Geol. Minnesota, 3, 1893, p. 173.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 8.—Ulrich, Zittel's Textb. Pal. (Engl. ed.), 1896, p. 279.—Simpson, 14th Ann. Rep. State Geol. New York for 1894,



**PHÆNOPORA**—Continued.

1897, p. 511.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 46.—Hennig, Archiv. fur Zool., K. Sven. Vet. Akad., Stockholm, 2, No. 10, 1905, p. 10.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 55; Bull. U. S. Nat. Mus., 77, 1911, p. 118; Zittel-Eastman Textb. Pal., 1913, p. 345.

**Phænopora constellata** Hall.

*Phænopora constellata* Hall, Pal. New York, 2, 1852, p. 47, pl. 18, figs. 7a-e.—Miller, N. A. Geol. Pal., 1889, fig. 497 (p. 314).—Ulrich, Geol. Surv. Illinois, 8, 1890, fig. 12a, b (p. 392).—Newland and Hartnagel, Bull. New York State Mus., 123, 1908, pl. 3.

Early Silurian: Wayne County, New York (Clinton); Hamilton, etc., Ontario (Cataract).

**Phænopora ensiformis** Hall.

*Phænopora ensiformis* Hall, Pal. New York, 2, 1852, p. 48, pl. 18, figs. 8a-c.—Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 142.—Nicholson, Pal. Province Ontario, 1875, p. 45, fig. 19, 2, 2a.—Foerste, Geol. Surv. Ohio, 7, 1895, p. 598.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 55, pl. 27, figs. 8, 9; Bull. U. S. Nat. Mus., 77, 1911, p. 118, fig. 45.

*Ptilodictya ensiformis* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 172.

Silurian: Flamborough, Dundas, Hamilton, etc., Ontario (Cataract); New York and Ontario (Rochester); Indiana (Osgood); Ohio (Brassfield); Anticosti (Ellis Bay, Bessie River); Gotland (Borkholm drift).

*Plesiotype*.—Cat. No. 35752, U.S.N.M.

**Phænopora excellens** (Billings).

*Ptilodictya excellens* Billings, Catal. Sil. Foss. Anticosti, 1866, p. 34.

*Stictoporella? excellens* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 169.

*Phænopora excellens* Miller, N. A. Geol. Pal., 1889, p. 314.

Gamachian (Ellis Bay) and Anticostian (Gun River): East Point, Gamache Bay, etc., Anticosti.

**Phænopora expansa** Hall and Whitfield.

*Eschara bipunctata* Van Cleve (MS.), 1853.

*Ptilodictya bipunctata* Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 825, figs.—Hall, 12th Ann. Rep. Indiana Geol. Nat. Hist., 1883, p. 266, pl. 13, fig. 5.

*Phænopora (Ptilodictya) expansa* Hall and Whitfield, Pal. Ohio, 2, 1875, p. 114, pl. 5, fig. 1.

*Ptilodictya expansa* (part) Hall, 12th Ann. Rep. Indiana Geol. Nat. Hist., 1883, p. 266.

*Phænopora expansa* Ulrich, Geol. Surv. Illinois, 8, 1890, fig. 12c, p. 392.—Foerste, Geol. Surv. Ohio, 7, 1895, p. 598, pl. 29, fig. 1.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 347.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 46.

*Phænopora platyphylla* Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 157; *ibid.*, 3, 1888, pl. 16, fig. 1.—Weller, Geol. Surv. New Jersey, Pal. 3, 1903, pl. 19, figs. 5-7.

*Ptilodictya platyphylla* James, Paleontologist, No. 3, 1879, p. 21.

Upper Medinan (Brassfield): Dayton, and Clinton County, Ohio.

**Phænopora explanata** Hall.

*Phænopora explanata* Hall, Pal. New York, 2, 1852, p. 46, pl. 18, figs. 6a-e.

Upper Medinan (Cataract): Flamborough Head and Hamilton, Ontario.

**PHÆNOPORA? FENESTELLIFORMIS** Ulrich. See *Pachydictya fenestelliformis*.

**Phænopora fimbriata** (James).

*Eschara ramosa* Van Cleve (MS.), 1853.

*Ptilodictya fimbriata* James, *Paleontologist*, No. 1, 1878, p. 8.

*Phænopora fimbriata* Foerste, *Bull. Sci. Lab. Denison Univ.*, 2, 1887, p. 161; *ibid.*, 3, 1888, pl. 15, fig. 7; *Proc. Boston Soc. Nat. Hist.*, 24, 1889, p. 330;

*Geol. Surv. Ohio*, 7, 1895, p. 599, pl. 28, fig. 7.—Nickles and Bassler, *Bull.*

*U. S. Geol. Surv.*, 173, 1900, p. 348.—Bassler, *U. S. Geol. Surv.*, No. 292, 1906, pl. 21, fig. 20; *Proc. U. S. Nat. Mus.*, 30, 1906, p. 47, pl. 7, figs. 11, 12.

*Stictopora vancelevii* Hall, 12th Ann. Rep. Indiana Geol. Nat. Hist., 1883, p. 268, pl. 13, figs. 1, 2.—Lesley, *Geol. Surv. Pennsylvania*, Rep. P 4, 1890, p. 1071, figs.

Upper Medinan (Brassfield): Clinton County, Belfast and Dayton, Ohio.

**Phænopora fimbriata canadensis** Bassler.

*Phænopora fimbriata* var. *canadensis* Bassler, *Bull. U. S. Geol. Surv.*, 292, 1906, p. 55, pl. 21, figs. 17-19.

Clinton (Rochester): Lockport and Clinton, New York; Grimsby, Ontario.

*Holotype*.—Cat. No. 35753, U.S.N.M.

**Phænopora incipiens** Ulrich.

*Phænopora incipiens* Ulrich, *Geol. Minnesota*, 3, 1893, p. 174, pl. 13, figs. 14-17. Trenton: Montreal, Quebec; Chimney Point, Vermont; St. Paul, Minnesota

(Prosser).

*Cotypes*.—Cat. Nos. 43599, 43600, U.S.N.M.

**Phænopora keewatinensis** Whiteaves.

*Phænopora Keewatinensis* Whiteaves, *Geol. Surv. Canada, Ann. Rep.*, n. s., 14, App. F, 1904, p. 40; *Geol. Surv. Canada, Pal. Foss.*, 3, pt. 4, 1906, p. 268,

pl. 24, figs. 6, 6a.

Niagaran: Sutton Mill Lake, Canada.

**Phænopora magna** (Hall and Whitfield).

*Eschara compressa* Van Cleve (MS.), 1853.

*Stictopora magna* Hall and Whitfield, *Pal. Ohio*, 2, 1875, p. 112, pl. 5, figs. 5, 6.—Lesley, *Geol. Surv. Pennsylvania*, Rep. P 4, 1890, p. 1067, figs.

*Phænopora magna* Foerste, *Bull. Sci. Lab. Denison Univ.*, 2, 1887, p. 159; *ibid.*, 3, 1888, pl. 15, fig. 6; pl. 16, fig. 2; *Proc. Boston Soc. Nat. Hist.*, 24, 1889,

p. 331; *Geol. Surv. Ohio*, 7, 1895, p. 599, pl. 28, fig. 6; pl. 29, figs. 2a-c.—Nickles and Bassler, *Bull. U. S. Geol. Surv.*, 173, 1900, p. 348.

*Stictopora compressa* Hall, 12th Ann. Rep. Indiana Geol. Nat. Hist., 1883, p. 267, pl. 14, fig. 3.—Lesley, *Geol. Surv. Pennsylvania*, Rep. P 4, 1890, p. 1064, fig.

Upper Medinan (Brassfield): Dayton and Belfast, Ohio.

**Phænopora multifida** (Hall).

*Eschara multifida* Van Cleve (MS.), 1853.

*Ptilodictya* sp.(?) James, *Paleontologist*, No. 1, 1878, p. 8. (Name *P. Welshi* suggested.)

*Stictopora multifida* Hall, 12th Ann. Rep. Indiana Geol. Nat. Hist., 1883, p. 268, pl. 14, fig. 4.—Lesley, *Geol. Surv. Pennsylvania*, Rep. P 4, p. 1068, fig.

*Phænopora multifida* Foerste, *Bull. Sci. Lab. Denison Univ.*, 2, 1887, p. 160; *ibid.*, 3, 1888, pl. 16, fig. 3; *Geol. Surv. Ohio*, 7, 1895, p. 599, pl. 29, fig. 3.

*Ptilodictya welshi* Bassler, *Proc. U. S. Nat. Mus.*, 30, 1906, p. 52.

Upper Medinan (Brassfield): Dayton, and Clinton County, Ohio; Hanover, Indiana.

*PHENOPORA MULTIPORA* Hall. See *Eurydictya multipora*.

*PHENOPORA PLATYPHYLLA* Foerste. See *Phænopora expansa*.

***Phænopora punctata*** (Nicholson and Hinde).

*Ptilodictya?* *punctata* Nicholson and Hinde, Canadian Jour., n. s., 14, 1874,

p. 143, fig. 1a-b.—Nicholson, Pal. Province Ontario, 1874, p. 46, fig. 20.

*Phænopora punctata* Ulrich, Geol. Minnesota, 3, 1893, p. 174.

Upper Medinan (Cataract): Dundas, Ontario.

***Phænopora superba*** (Billings).

*Ptilodictya superba* Billings, Catal. Sil. Foss. Anticosti, 1866, p. 35.

*Phænopora superba* Ulrich, Geol. Minnesota, 3, 1893, p. 174.

Anticostian (Becsie River, Gun River): Walls Cove and Becsie River Bay, Anticosti.

***Phænopora wilmingttonensis*** Ulrich.

*Phænopora wilmingttonensis* Ulrich, Geol. Minnesota, 3, 1893, p. 175, pl. 13, figs. 22-26.

Richmond (Fernvale): Wilmington, Illinois.

*Cotypes*.—Cat. No. 43601, U.S.N.M.

**PHANEROTREMA** Fischer.

Genotype: *Pleurotomaria labiosa* Hall.

*Phanerotrema* Fischer, Man. Conch., 1885, p. 851.—Ulrich and Scofield, Geol.

Minnesota, 3, pt. 2, 1897, p. 952.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 638.

***Phanerotrema occidens*** (Hall).

*Pleurotomaria labiosa* var. *occidens* Hall, 20th Rep. New York State Cab. Hist., 1868, p. 343 (extras, 1865).—Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 289, pl. 5, fig. 14.

*Pleurotomaria occidens* Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, p. 364, pl. 15, figs. 11, 12.—Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 142, pl. 8, fig. 2.—Whiteaves, Pal. Foss. Geol. Surv. Canada, 3, pt. 1, 1884, p. 23 (loc. occ.).—Koken, Neues Jahrb. Min. Geol. Pal., 6, Beilage-Band, 1889, p. 335.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 713, fig.—Whiteaves, Pal. Foss. Geol. Surv. Canada, 3, pt. 2, 1895, p. 77.

*Phanerotrema occidens* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 952 (gen. ref.).—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 296.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 638, fig. 866.

Niagaran: Racine, Wisconsin (Racine); Yellow Springs, Ohio; Elora, Saskatchewan River, etc., Canada (Guelph).

**PHILHEDRA SCABIOSA** Huene. See *Crania scabiosa*.

**PHOLADOMORPHA** Foerste. See *Whiteavesia* Ulrich.

**PHOLIDOPS** Hall.

Genotype: *Orbicula squamiformis* Hall.

*Pholidops* Hall, Pal. New York, 3, 1859, p. 489; 13th Rep. New York State Cab. Nat. Hist., 1860, p. 92; 15th Rep., *ibid.*, 1862, p. 195; Pal. New York, 4, 1867, pp. 31, 413.—Dall, Bull. Mus. Comp. Zool., 3, 1871, p. 27; Amer. Jour. Conch., 7, 1871, p. 72.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 13; N. A. Geol. Pal., 1889, p. 362.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 155.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 376.—Hall and Clarke, 11th Rep. New York State Geol., 1894, p. 262.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 80.—Huene, Neues Jahrb. Min. Geol. Pal., 1, 1899, p. 144.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 186.—Huene, Verh. Russ.-Kais. Mineral Ges. zu St. Petersburg, 36, 1899, p. 265; *ibid.*,

**PHOLIDOPS**—Continued.

38, 1900, p. 192.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 179; Bull. New York State Mus., 45, 1901, p. 179.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 208.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 379. Craniops Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 84.—Ehlert, Fischer's Manuel de Conch., 1887, p. 1272.

**Pholidops cincinnatiensis** Hall.

Pholidops cincinnatiensis Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, pl. 7, fig. 10; Pal. Ohio, 1, 1873, p. 130, pl. 5, fig. 2.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 14; Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 107.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 636, figs.—Miller, N. A. Geol. Pal., 1889, p. 362, fig. 597.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 157, pl. 41, fig. 18.—Crane, Geol. Mag., dec. 4, 2, 1895, pl. 5, fig. 19. Eden and Maysville (Fairview): Cincinnati, Ohio, and vicinity.

**Pholidops ovalis** Hall.

Pholidops ovalis Hall, Trans. Albany Inst., 4, 1863, p. 209; Pal. New York, 4, 1867, pl. 3, figs. 1, 2; 28th Rep. New York State Mus. Nat. Hist., 1879, p. 149, pl. 21, figs. 1, 2; 11th Rep. State Geol. Indiana, 1882, p. 284, pl. 21, figs. 1, 2.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 637, figs.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 157, pl. 41, fig. 20.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 307.

Niagaran: Waldron, Indiana, and Newsom, Tennessee (Waldron); Nova Scotia.

**Pholidops ovata** Hall.

Pholidops ovata Hall, Pal. New York, 3, 1859, p. 490, pl. 103B, figs. 7a-b.—Weller, Pal. New Jersey, 3, 1903, p. 226, pl. 20, figs. 27-29, p. 300.—Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 119, pl. 17, fig. 13.—Schuchert and Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 294, pl. 53, figs. 10-12.

Helderbergian: Albany County, New York (New Scotland); Keyser, West Virginia, and Tonoloway, Maryland (Keyser); New Jersey (Decker Ferry).

Lower Monroan (Raisin River): Monroe County, Michigan.

**Pholidops squamiformis** (Hall).

Orbicula? squamiformis Hall, Geol. New York, Rep. 4th Dist., 1843, p. 108, fig. 1; Pal. New York, 2, 1852, p. 250, pl. 53, fig. 4.

Craniops squamiformis Hall, 12th Rep. New York State Cab. Nat. Hist. 1859, p. 84.

Pholidops squamiformis Hall, Pal. New York, 3, 1859, p. 490, pl. 103B, fig. 6.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 637, figs.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 156, pl. 41, fig. 21.—Grabau, Bull. New York State Mus., 45, 1901, p. 179, fig. 82.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 179, fig. 82.

Clinton (Rochester): Lockport, Rochester, etc., New York; Hamilton, etc., Ontario.

**Pholidops subelliptica** Savage.

Pholidops subelliptica Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 111, pl. 7, fig. 5.

Upper Medinan (Channahon): Will County, Illinois.

**Pholidops subtruncata** (Hall).

Orbicula? subtruncata Hall, Pal. New York, 1, 1847, p. 290, pl. 79, fig. 7.

Pholidops subtruncata Hall, Desc. n. sp. of Crinoidea and other Fossils, 1866, p. 14; 24th Rep. New York State Cab. Nat. Hist., 1872, p. 221, pl. 7, fig. 9.—

**Pholidops subtruncata**—Continued.

Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 41, fig. 19.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 256.

Cincinnati (Pulaski): Lorraine, Turin, etc., New York; Chambly, etc., Quebec.

**Pholidops trentonensis** Hall.

*Pholidops trentonensis* Hall, Desc. n. sp. of Crinoidea and other Fossils, 1866, p. 14; 24th Rep. New York State Cab. Nat. Hist., 1872, p. 221, pl. 7, fig. 8.—

Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 157, pl. 41, fig. 17.—Ruedemann, Bull. New York State Mus., 49, 1902, p. 15.

Trenton: Middleville, etc., New York.

**Pholidops trentonensis minor** Winchell and Schuchert.

*Pholidops trentonensis* var. *minor* Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 376, pl. 29, fig. 40.

Trenton (Prosser): St. Paul and Cannon Falls, Minnesota.

**Pholidops trombetana** Clarke.

*Pholidops trombetana* Clarke, Archivos Mus. Nac. Rio de Janeiro, 10, author's Engl. ed., 1900, p. 8, pl. 1, figs. 7-11.

Silurian: Rio Trombetas, Brazil.

**PHOLIDOSTROPHIA** Hall and Clarke.

Genotype: *Strophodonta naerea* Hall=*Chonetes* (?) *iowensis* Owen.

*Pholidostrophia* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 287; 11th Ann. Rep. New York State Geol., 1894, p. 281.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 308.

**Pholidostrophia niagarensis** Kindle and Breger.

*Pholidostrophia niagarensis* Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 430, pt. 2, figs. 13-15.

Niagaran: Little Deer Creek, Carroll County, Indiana.

**PHRAGMOCERAS** Broderip.

Genotype: *P. arcuatum* Sowerby.

*Phragmoceras* Broderip, Murchison's Sil. Syst., 1839, p. 621.—Portlock, Rep. Geol. Londonderry, 1843, p. 381.—McCoy, Syn. Char. Carb. Foss. Ireland, 1844, p. 11.—Woodward, Man. Mollusca, pt. 1, 1851, p. 90.—Saemann, Palæontographica, 3, 1852, p. 139.—Geinitz, Die Verst. der Grauwack, Leipzig, 1853, p. 26.—McCoy, British Pal. Rocks Foss., 1854, p. 322.—Barrande, Neues Jahrb. Min., etc., 1854, p. 10, pl. 1, fig. 12; *ibid.*, 1855, p. 258; Bull. Soc. Geol. France, 2d ser., 12, 1855, p. 158, pl. 5, fig. 5.—Billings, Canadian Nat. Geol., 2, 1857, p. 136, pl. 2, fig. 4.—Chapman, Canadian Jour., n. s., 8, 1863, p. 22; Expos. Min. Geol. Canada, 1864, p. 130.—Barrande, Syst. Sil. du Centre Boheme, 2, pt. 1, 1867, p. 187.—Blake, Mon. British Foss. Cephalopoda, 1882, p. 59.—Zittel, Handb. Pal., 2, 1884, p. 375.—Miller, N. A. Geol. Pal., 1889, p. 452.—Whidborne, Mon. Dev. Fauna South England, 1, Pal. Soc., 1890, p. 111.—Koken, Die Leitfossilien, Leipzig, 1896, p. 49.—Hyatt, Zittel-Eastman Textb. Pal., 1, 1900, p. 532; 2d ed., 1913, p. 612.—Jaekel, Zeits. d. d. geol. Gesell., 54, Protok., 1902, pp. 8, 68, 80.—Jaekel in Ruedemann, Amer. Geol., 31, 1903, p. 200.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 131.

**Phragmoceras angustum** (Newell).

*Gomphoceras angustum* Newell, Proc. Boston Soc. Nat. Hist., 23, 1888, p. 475, fig. *Phragmoceras angustum* Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res.

Indiana, 1904, p. 477, pl. 18, fig. 1.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 132, fig. 1383.

Niagaran: Wabash City and Grant County, Indiana.

**Phragmoceras byronense** Worthen.

Phragmoceras Byronensis Worthen, Geol. Surv. Illinois, 6, 1875, p. 506, pl. 24, fig. 6.

Niagaran: Rock Island, Illinois. (Drift probably from Port Byron, Illinois.)

PHRAGMOCERAS CONSTRICTUM Chapman. See *Oncoceras constrictum*.

**Phragmoceras ellipticum** Hall and Whitfield.

Phragmoceras ellipticum Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 152, pl. 8, fig. 11.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 637, fig.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 133, fig. 1384.

Phragmoceras cf. ellipticum Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 477, pl. 19, fig. 5.

Niagaran: Highland County, Ohio; Huntington, Indiana.

*Plesiotypes*.—Cat. No. 52949, U.S.N.M. (Kindle and Breger).

**Phragmoceras hector** Billings.

Phragmoceras Hector Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865 (adv. sheets, 1862), p. 163, fig. 147a, b.—Miller, N. A. Geol. Pal., 1889, p. 452, fig. 756, p. 453; fig. 757.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 104.

Niagaran (Guelph): New Hope, Ontario.

**Phragmoceras hoyi** Whitfield.

Phragmoceras Hoyi Whitfield, Ann. Rep. for 1877, Wisconsin Geol. Surv., 1878, p. 86; Geol. Wisconsin, 4, 1882, p. 300, pl. 19, figs. 4, 5.—Chamberlin, *ibid.*, 1, 1883, p. 194, fig.

Niagaran (Racine): Near Wauwatosa, Wisconsin.

**Phragmoceras hoyi compressum** Whitfield.

Phragmoceras Hoyi var. compressum Whitfield, Ann. Rep. for 1877, Wisconsin Geol. Surv., 1878, p. 86; Geol. Wisconsin, 4, 1882, p. 301, pl. 20, fig. 3.

Niagaran (Racine): Near Wauwatosa and Racine, Wisconsin.

**Phragmoceras labiatum** Whitfield.

Phragmoceras labiatum Whitfield, Ann. Rep. for 1877, Wisconsin Geol. Surv., 1878, p. 86.—Geol. Wisconsin, 4, 1882, p. 302, pl. 20, figs. 1, 2.

Niagaran (Waukesha): Ashford, Wisconsin.

**Phragmoceras lineolatum** Whiteaves.

Phragmoceras lineolatum Whiteaves, Geol. Surv. Canada, Ann. Rep., n. s., 14, App. F, 1904, p. 57; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 265, pl. 34, figs. 1, 1a, 2, 3.

Niagaran: Ekwan River, Canada.

PHRAGMOCERAS NATATOR Lesley. See *Barrandeoceras natator*.

**Phragmoceras nestor** Hall.

Phragmoceras nestor Hall, 20th Rep. New York State Cab. Nat. Hist., 1868 (extras, Jan., 1865), pp. 347, 363, figs. 7, 8; rev. ed., 1870, p. 405, figs. 3, 4.—Day, Trans. Wisconsin Acad. Sci., Arts, Letters, 4, 1879, p. 115.—Whitfield, Geol. Wisconsin, 4, 1882, p. 301, pl. 19, fig. 3.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 132, fig. 1380, 1381.

Gomphoceras Nestor Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 232.

Niagaran (Racine): Wauwatosa and Waukesha, Wisconsin.

**Phragmoceras nestor canadense** Whiteaves.

Phragmoceras Nestor var. Canadense Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 39, pl. 7, figs. 1, 1a, b; Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 105 (loc. occ.).

Niagaran (Guelph): Hespeler, Elora, and Durham, Ontario.

**Phragmoceras parvum** Hall and Whitfield.

Phragmoceras parvum Hall and Whitfield, Geol. Surv. Ohio, Pal. 2, 1875, p. 151, pl. 8, fig. 10.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 41, pl. 7, fig. 2.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 639, fig.—Whiteaves, Pal. Fossils, Geol. Surv. Canada, 3, pt. 2, 1895, p. 105 (loc. occ.).—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 99, pl. 21, figs. 1-8.—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 477, pl. 25, figs. 3, 4.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 132, fig. 1382.

Niagaran (Guelph): Cedarville, Ohio; Rochester, New York; Durham, Ontario; Huntington, Indiana.

**PHRAGMOCERAS PRÆMATURUM** Billings. See *Mælonoceras preaturum*.**Phragmoceras ventricosum** (? Sowerby) Owen.

Not recognized.

Phragmoceras ventricosum? Owen, Geol. Expl. Iowa, Wisconsin, Illinois, 2d ed., 1844, p. 76, pl. 13, fig. 9.

Niagaran: Iowa and Wisconsin.

**Phragmoceras whitneyi** Parks.

Phragmoceras whitneyi Parks in Tyrrell, 22d Rep. Ontario Bur. Mines, 1913, p. 36.

Niagaran (Guelph): Severn River, Ontario.

**PHRAGMOLITES** Conrad.

Genotype: *P. compressus* Conrad.

Phragmolites Conrad, Ann. Geol. Rep. New York, 1838, p. 119.

Phragmolithes, Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 617.

Conradella Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, pp. 851; 904.—Koken, Neues Jahrb. f. Min., Geol., Pal., 1, 1898, p. 8.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 949. (Genotype: *C. obliqua* Ulrich and Scofield.)

**Phragmolites bellulus** (Ulrich).

Conradella bellula Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 910, pl. 67, figs. 23-26.

Maysville (Fairmount): Covington, Kentucky.

*Holotype*.—Cat. No. 45751, U.S.N.M.

**Phragmolites compressus** Conrad.

Phragmolites compressus Conrad, 2d Ann. Rep. New York Geol. Surv., 1838, p. 119.—Weller, Geol. Surv. New Jersey, Pal. 3, 1903, p. 178, pl. 12, figs. 16, 17.

Phragmolithes compressus Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 617.

Cyrtolites compressus Hall, Pal. New York, 1, 1847, p. 188, pl. 40A, figs. 2a-f.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 167, pl. 12, fig. 10a, b; Man. Geol., 1860, p. 96, fig. 85.—Hall, Rep. Geol. Surv. Wisconsin, 1862, p. 40, fig. 4.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 158, fig.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 182, fig.—Whiteaves, Canadian Rec. Sci., 5, 1893, p. 323; Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 124 (loc. occ.).

Conradella compressa Ruedemann, Bull. New York State Mus., 49, 1901, p. 30.

Trenton: Middleville, Watertown, etc., New York; New Jersey; Ontario; etc.

**Phragmolites desideratus** (Billings).

*Cyrtolites desideratus* Billings, Cat. Sil. Fossils, Anticosti, Geol. Surv. Canada, 1866, p. 21,  
Richmond (English Head) and Gamachian: Macasty Bay, etc., Anticosti.

**Phragmolites dyeri** (Hall).

*Cyrtolites dyeri* Hall, 24th Rep. Regents New York State Cab. Nat. Hist., 1872, p. 230, pl. 8, figs. 7, 8 (adv. sheets, 1871).—Meek, Pal. Ohio, 1, 1873, p. 149, pl. 13, figs. 2a, b, c (not 2d and e=P. elegans Miller).—Miller, Cin. Quart. Jour. Sci., 1, 1874, p. 309.

*Conradella dyeri* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 909, pl. 67, figs. 30-33.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 957, pl. 39, figs. 8-8c.

*Phragmolithes dyeri* Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 618, fig. 828e, f.

Richmond: Richmond and Versailles, Indiana; Oxford, Waynesville, etc., Ohio; near Maysville, Kentucky; Spring Valley, Minnesota.

*Plesiotype*.—Cat. No. 45752, U.S.N.M.

**Phragmolites dyeri cellulosa** (Ulrich and Scofield).

*Conradella dyeri* var. *cellulosa* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 910, pl. 67, figs. 27-29.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, pl. 39, fig. 9.

Trenton (Prosser): St. Paul and Cannon Falls, Minnesota.

*Holotype*.—Cat. No. 45753, U.S.N.M.

**Phragmolites elegans** (Miller).

*Cyrtolites dyeri* (part) Meek, Pal. Ohio, 1, 1873, p. 149, pl. 13, figs. 2d, 2e.

*Cyrtolites elegans* Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 310, fig. 31.—Miller, N. A. Geol. Pal., 1889, p. 402, fig. 668.

*Conradella elegans* Ulrich and Scofield, Geol. Minnesota, 3, 1897, p. 911, pl. 67, figs. 12-15.

Maysville (Corryville): Cincinnati, Ohio, and vicinity.

*Plesiotypes*.—Cat. No. 45754, U.S.N.M.

**Phragmolites fimbriatus** (Ulrich and Scofield).

*Conradella fimbriata* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 907, pl. 62, fig. 66; pl. 67, figs. 7-10.

*Phragmolithes fimbriatus* Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 617, fig. 828c, d.

*Cyrtolites fimbriatus* Miller, N. A. Geol. Pal., 2d ed., 1897, p. 767 (gen. ref.).

Black River: Minneapolis, Minnesota, and Dixon, Illinois (Platteville); Lincoln County, Missouri (Decorah).

*Cotypes*.—Cat. No. 45755, U.S.N.M.

**Phragmolites grandis** (Ulrich).

*Conradella grandis* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 908, pl. 62, fig. 67; pl. 67, figs. 16-18.

Stones River (Lebanon): Lebanon, Tennessee.

*Cotypes*.—Cat. No. 45756, U.S.N.M.

**Phragmolites imbricatus** (Meek and Worthen).

*Cyrtolites imbricatus* Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 340, pl. 4, fig. 12.

*Conradella imbricata* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 911, pl. 67, fig. 11.

Upper Medinan (Girardeau): Alexander County, Illinois.

*Plesiotype*.—Cat. No. 45757, U.S.N.M.



**Phragmolites obliquus** (Ulrich and Scofield).

Conradella obliqua Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 906, pl. 67, figs. 1-6.

Black River (Decorah): St. Paul, Cannon Falls, etc., Minnesota.

*Cotypes*.—Cat. Nos. 45758, 45759, U.S.N.M.

**Phragmolites pannosus** (Billings).

Cyrtolites pannosus Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 20.

Conradella pannosa Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 859 (gen. ref.).

Richmond (English Head and Charleton): Charleton Point, etc., Anticosti.

**Phragmolites similis** (Ulrich).

Conradella similis Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 906.

Black River (Lowville): Mercer and Boyle Counties, Kentucky.

*Cotypes*.—Cat. No. 47568, U.S.N.M.

**Phragmolites triangularis** (Ulrich and Scofield).

Conradella triangularis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 908, pl. 67, figs. 19-22.

Phragmolithes triangularis Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 617, fig. 828a, b.

Black River (Platteville): Minneapolis, Minnesota; Janesville and Beloit, Wisconsin; Dixon, Illinois.

*Cotypes*.—Cat. Nos. 45760-45762, U.S.N.M.

**PHRAGMOSTOMA** Hall. See Carinaropsis Hall.

**PHRAGMOSTOMA NATATOR** Hall. See Carinaropsis cymbula.

**Phycograptus** Gurley.

Genotype: *P. brachymera* Gurley.

Phycograptus Gurley, Jour. Geol., 4, 1896, p. 89.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 729.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 244.

Observation.—Genus not recognized as valid. The genotype is based on the frontal view of a *Dicellograptus* and the second species is not a graptolite.

**Phycograptus brachymera** Gurley.

Not recognized.

Phycograptus brachymera Gurley, Jour. Geol., 4, 1896, p. 89, pl. 5, fig. 6.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 245, fig. 150.

Chazyan (Normanskill): Stockport, New York.

**Phycograptus lævis** (Hall).

Graptolithus? lævis Hall, Pal. New York, 1, 1847, p. 274, pl. 74, fig. 7.—Chapman, Canadian Jour., n. s., 1, 1856, p. 390.

Phycograptus lævis Gurley, Jour. Geol., 4, 1896, pp. 89, 100 (gen. ref.).—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 246.

Utica: Turin, Lewis County, New York.

Observation.—Hall's type shows no structure and a second specimen appears to be made up of slender sponge spicules. Name should be dropped. (Ruedemann, 1908.)

**PHYLLODICTYA** Ulrich.

Genotype: *P. frondosa* Ulrich.

Phyllodictya Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 153.—Miller, N. A. Geol. Pal., 1889, p. 315.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 390; Geol. Minnesota, 3, 1893, p. 141.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 15.—Ulrich, Zittel's Textb. Pal. (Engl. ed), 1896, p. 280.—Simpson,

**PHYLLODICTYA**—Continued.

14th Ann. Rep. State Geol. New York for 1894, 1897, p. 531.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 49.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 159.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 135; Zittel-Eastman Textb. Pal., 1913, p. 346.

**Phyllodictya frondosa** Ulrich.

*Phyllodictya frondosa* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 174, pl. 8, figs. 11–11b; Geol. Minnesota, 3, 1893, p. 142.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, fig. 88 (p. 531).—Bassler, Bull. Virginia Geol. Surv., 2a, 1909, pl. 23, figs. 6–8.

Black River (Lowville): High Bridge and Frankfort, Kentucky; Central Tennessee; Southwestern Virginia.

*Cotypes and plesiotypes*.—Cat. Nos. 43705, 43598, U.S.N.M.

**Phyllodictya varia** Ulrich.

*Phyllodictya varia* Ulrich, Geol. Minnesota, 3, 1893, p. 144, pl. 14, figs. 1–8.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 159, fig. 208j.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 136, 137, fig. 60.

Black River (Decorah): Minneapolis and Cannon Falls Minnesota; Lake Nipissing, Ontario.

Middle Ordovician (Wassalem): Uxnorn, Esthonia, Russia.

*Cotypes*.—Cat. No. 43597, U.S.N.M.

**PHYLLOGRAPTUS** Nicholson. See *Phyllograptus* Hall.**PHYLLOGRAPTUS** Hall.

Genotype: *P. typus* Hall.

*Phyllograptus* Hall, Geol. Surv. Canada, Rep. Progr. for 1857, 1858, pp. 135, 137; Canadian Nat. Geol., 3, 1858, p. 168–170; Pal. New York, 3, 1859, p. 504; 12th Rep. New York State Cab. Nat. Hist., 1859, p. 52; Geol. Surv. Canada, dec. 2, 1865, p. 118, figs. 1–3.—Carruthers, Geol. Mag., 5, 1868, p. 73, 132.—Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 217, rev. ed., p. 252.—Zittel, Handb. Pal., 1, 1879, p. 301.—Tullberg, Sveriges Geol. Unders., ser. C, No. 55, 1883, p. 12.—Spencer, Bull. Mus. Univ. State Missouri, 1, 1884, p. 15; Trans. Acad. Sci. St. Louis, 4, 1884, p. 565.—Miller, N. A. Geol. Pal., 1889, p. 200.—Holm, Geol. Mag., dec. 4, 2, 1895, pp. 433, 487; Geol. Foren. Stockholm Forhandl., 17, 1895, p. 343.—Wiman, Nat. Sci., 9, 1896, p. 191.—Koken, Die Leitfossilien, Leipzig, 1896, p. 328.—Walther, Zeits. d. d. geol. Gesell., 49, 1897, p. 252.—Roemer and Frech, Leth. geog., 1 Theil, Leth. Pal., 1, 3 Lief, 1897, p. 603.—Ruedemann, Amer. Nat., 32, 1898, p. 5.—Zittel-Eastman Textb. Pal., 1, 1900, p. 119.—Elles and Wood, Mon. British Grapt., Pal. Soc., 1902, p. 98.—Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 703–706.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 29.—Ruedemann, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 129.

*Phyllograptus* Nicholson, Quart. Jour. Geol. Soc. London, 24, 1868, p. 9, 132; Mon. British Grapt., 1872, p. 124.

**Phyllograptus angustifolius** Hall.

*Phyllograptus angustifolius* Hall, Geol. Surv. Canada, Rep. for 1857, 1858, p. 139; Canadian Nat. Geol., 3, 1858, p. 172.—Salter, Quart. Jour. Geol. Soc. London, 19, 1863, p. 137, fig. 7a, b.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 228, fig. 237.—Hall, Geol. Surv. Canada, dec. 2, 1865, p. 125, pl. 16, figs. 17–21; p. 16, fig. 22; 20th Rep. New York State Cab. Nat. Hist., 1868, p. 183, fig. 23; rev. ed., p. 213, fig. 23; p. 224.—Nicholson, Quart. Jour. Geol. Soc., 24, 1868, p. 132.—Linnarsson, Sver. Geol. Und., Afh. och upps., ser. C, no. 31,

**Phyllograptus angustifolius**—Continued.

1879, p. 5.—Brogger, Die sil. Etagen 2 and 3, 1882, p. 41.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 639, figs.—Ami, Geol. Surv. Canada, Rep. 3, pt. 2, 1889, p. 50k ff.—Holm, Sveridges Geol. Unders., ser. C, No. 150, 1895, p. 29, pl. 3, figs. 1–12; pl. 4, fig. 6; Geol. For. Forh., 17, Heft 3, 1895, p. 319, pl. 3; p. 345, pl. 13, figs. 1–12; pl. 14, figs. 1–10; pl. 15, figs. 1–15; pl. 16, figs. 1–20; Geol. Mag., dec. 4, 2, 1895, p. 488, pl. 14, figs. 1–12.—Wiman, Bull. Geol. Inst. Upsala, 4, pt. 2, 1895, p. 39, pl. 9, fig. 8.—Frech, Leth. geog., 1 Theil, Leth. Pal., 1, 3 Lief, 1897, p. 559, fig. 135.—Roemer and Frech, ibid., 1897, p. 606, figs. 168, 172.—Elles, Quart. Jour. Geol. Soc. London, 54, 1898, p. 496.—Elles and Wood, Mon. British Grapt., pt. 1, Pal. Soc., 1902, p. 100, pl. 13, figs. 7a–f, fig. 59.—Ruedemann, New York State Pal., Ann. Rep., 1902, pp. 554, 556, 570; Mem. New York State Mus., 7, pt. 1, 1904, pp. 711–714, pl. 15, figs. 31–34, fig. 94, on p. 704; fig. 97, p. 713.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 30, fig. 46.

*Phyllograptus* cf. *angustifolius* Tullberg, Sver. Geol. Und., Afh. och upps., ser. C, No. 50, 1882, p. 22.

*Phyllograptus angustifolius* Nicholson, Mon. British Grapt., 1872, p. 51, fig. 18.

Canadian: Point Levis, Quebec (Levis); Deep Kill, Rensselaer County, and Mount Moreno, near Hudson, New York (Deep Kill, Tetragraptus, Didymograptus, and Diplograptus zones); Sweden; England (Skiddaw).

**Phyllograptus auna** Hall.

*Phyllograptus auna* Hall, Geol. Surv. Canada, Canadian Org. Rem., dec. 2, 1865, p. 124, pl. 16, figs. 11–16; 20th Rep. New York State Cab. Nat. Hist., 1868, pl. 4, figs. 6, 7; rev. ed., 1870, pl. 4, figs. 6–7.—Lapworth, Proc. and Trans. Roy. Soc. Canada, 4, 1886, p. 168.—Ami, Geol. Surv. Canada, Rep., 2d ser., 3, pt. 2, 1889, p. 116k.—Gurley, Jour. Geol., 4, 1896, p. 294.—Elles, Quart. Jour. Geol. Soc. London, 54, 1898, p. 494, fig. 16.—Elles and Wood, Mon. British Grapt., Pal. Soc., 1902, p. 101, pl. 13, figs. 6a–f, fig. 60a, b.—Ruedemann, New York State Pal. Ann. Rep., 1902, pp. 566, 571; Mem. New York State Mus., 7, pt. 1, 1904, pp. 714–716, pl. 15, figs. 23–30, figs. 98, 99.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 30.

Canadian: Point Levis, Quebec (Levis, Didymograptus zone); Deep Kill, Rensselaer County, and Mount Moreno, near Hudson, New York (Deep Kill, Tetragraptus, and Didymograptus bifidus zones); Arkansas; Nevada; England (Skiddaw).

*Phyllograptus*(?) *dubius* Spencer.

*Phyllograptus*(?) *dubius* Spencer, Trans. Acad. Sci. St. Louis, 4, 1884, p. 565, pl. 1, fig. 1; Bull. Mus. Univ. Missouri, 1, 1884, p. 15, pl. 1, fig. 1.

Niagaran dolomite: Near Hamilton, Ontario.

Observation.—Not a graptolite (Ruedemann).

*PHYLLOGRAPTUS FOLIUM* var. *TYPUS* Hall. See *Phyllograptus typus*.

**Phyllograptus ilicifolius** Hall.

*Phyllograptus ilicifolius* Hall, Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 139; Canadian Nat. Geol., 3, 1858, p. 171; Geol. Surv. Canada, Can. Org. Rem., dec. 2, 1858, p. 121, pl. 16, figs. 1–10; 20th Rep. New York State Cab. Hist., 1868, p. 195, pl. 4, figs. 1–5; rev. ed., 1870, p. 225, pl. 4, figs. 1–5; p. 224.—Roemer and Frech, Leth. geog., 1 Theil, Leth. Pal., 1, 3 Lief, 1897, p. 606, fig. 171.—Ruedemann, Bull. New York State Mus., 52, 1902, p. 590, fig. 19; Ann. Rep. New York State Pal., 1902, pp. 554, 556; Mem. New York State Mus., 7, pt. 1, 1904, pp. 706, 708, pl. 15, figs. 15–22; figs. 95, 96.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 30, fig. 19.

**Phyllograptus illeifolius**—Continued.

Canadian: Point Levis, Quebec (Levis, Clonograptus, Didymograptus, and Diplograptus zones); Deep Kill, Rensselaer County, New York (Deep Kill, Tetragraptus and Didymograptus zones); England (Skiddaw).

**Phyllograptus loringi** White.

Phyllograptus loringi White, Rep. U. S. Geogr. Surv., West 100th Merid., 4, War Dep., 1877, p. 51, pl. 3, fig. 1a, b (Prelim. Rep., 1874, p. 9).

Canadian: Fish Spring, House Range, Utah.

PHYLLOGRAPTUS SIMILIS Hall. See Tetragraptus similis.

PHYLLOGRAPTUS STELLA Hopkinson. See Didymograptus (Isograptus) caduceus.

**Phyllograptus typus** Hall.

Phyllograptus typus Hall, Geol. Surv. Canada, Rep. for 1857, 1858, p. 137; *ibid.*, dec. 2, 1858, p. 119, pl. 15, figs. 1-12; p. 16, fig. 23; Canadian Nat. Geol., 3, 1858, p. 170; 12th Rep. New York State Cab. Nat. Hist., 1859, p. 54, figs. 1, 2; Pal. New York, 3, 1859, p. 505, figs. 1, 2.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 228, fig. 238.—Chapman, Canadian Jour., n. s., 8, 1863, p. 191, fig. 160a; Expos. Min. Geol. Canada, p. 163, fig. 160a.—Billings, Geol. Surv. Canada, Pal. Foss., 1, 1865, pp. 366, 375.—Tornquist, Lunds. Univ. Arsskrift, 1, pt. 3, 1865, p. 16, pl. 1, figs. 9, 10.—Hall, 20th Rep. New York State Cab. Hist., 1868, p. 183, fig. 24; rev. ed., p. 213, fig. 24; p. 224.—Nicholson, Quart. Jour. Geol. Soc. London, 24, 1868, p. 133, pl. 5, fig. 16.—Etheridge, Ann. Mag. Nat. Hist., 4th ser., 14, 1874, p. 3, pl. 3, figs. 9, 10.—Zittel, Handb. Pal., 1, Munich, 1879, p. 301, fig. 209.—Brogger, Die Sil. Etagen 2, 3, 1882, p. 41.—Malaise, Ann. Soc. Geol. Belgium, 15, 1888, p. 42.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 640, figs.—Ami, Geol. Surv. Canada, Rep. 3, pt. 2, 1889, p. 50.—Miller, N. A. Geol. Pal., 1889, p. 200, fig. 206.—Gurley, Jour. Geol., 4, 1896, p. 294.—Roemer and Frech, Leth. Geog., 1, Theil, Leth. Pal., 1, 1897, p. 605.—Elles, Quart. Jour. Geol. Soc. London, 54, 1898, p. 494f.—Ruedemann, New York State Pal., Ann. Rep., 1902, p. 566; Mem. New York State Mus., 7, pt. 1, 1904, pp. 708-711, pl. 15, figs. 35-37.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 29, fig. 44.

Phyllograptus typus Nicholson, Mon. British Grapt., Pal. Soc., 1872, p. 125, fig. 64.

Phyllograptus cf. typus Tullberg, Skanes Grapt. in Sver. Geol. Und. Afh. och upps., ser. C, No. 50, 1882, p. 21.—Elles and Wood, Mon. British Grapt., pt. 1, Pal. Soc., 1902, p. 99, pl. 13, figs. 5a, b; fig. 58.

Phyllograptus folium var. typus McCoy, Geol. Surv. Victoria, Prodr. Pal. Victoria, dec. 1, 1874, p. 7f, pl. 1, figs. 1-4.

Canadian: Point Levis, Quebec (Levis, Phyllograptus typus zone); Deep Kill, Rensselaer County, New York (Deep Kill, Didymograptus bifidus zone); Newfoundland; Arkansas; Great Britain (Skiddaw); Sweden; Belgium; Australia.

PHYLLOPORA (part) Ulrich. See Chasmatopora Eichwald.

PHYLLOPORINA Ulrich. See Chasmatopora Eichwald.

PHYLLOPORINA TRENTONENSIS Ulrich. See Chasmatopora fenestrata.

**PHYSETOMYA** Ulrich.

Genotype: *P. acuminata* Ulrich.

Physetomya Ulrich, Geol. Surv. Ohio, 7, 1893, p. 693.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 784.

**Physetomya acuminata** Ulrich.

Physetomya acuminata Ulrich, Geol. Surv. Ohio, 7, 1893, p. 693, pl. 49, figs. 12-14. Maysville (Fairmount): Cincinnati, Ohio.

**PHYTOPSIS** Hall.Genotype: *P. tubulosa* Hall.

*Phytopsis* Hall, Pal. New York, 1, 1847, pp. 38, 315.—Hitchcock, Geol. Vermont, 1, 1861, p. 277.—Miller, N. A. Geol. Pal., 1889, p. 134.

**PHYTOPSIS CELLULOSUM** Hall. See *Tetradium cellulorum*.

**Phytopsis tubulosa** (Hall).

*Phytopsis tubulosum* Hall, Pal. New York, 1, 1847, p. 38, p. 315, pl. 8, figs. 1a-c.—Emmons, Man. Geology, 1860, p. 95, fig. 81.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 11, fig. 13.—Hitchcock, Geol. Vermont, 1, 1861, p. 277, fig. 175.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 644, figs.—Miller, N. A. Geol. Pal., 1889, p. 134, fig. 62.—Clarko and Ruedemann, Bull. New York State Mus., 65, 1903, p. 9.

*Fucoides demissus* Vanuxem, Geol. New York, 3, 1842, p. 39, fig.—Emmons, Geol. New York, 2, 1842, p. 108; p. 109, figs. 35, 36; also pp. 383, 384, fig. 94, 95, 96.—Hall, Pal. New York, 1, 1847, p. 38, footnote.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 232, fig. 84, pl. 4; figs. 12, 13.

Black River (Lowville): Near Amsterdam, etc., New York.

**PIANODEMA** Foerste.Genotype: *Orthis subæquata* Conrad.

*Bathycælia* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 221.

*Pianodema* Foerste (*Bathycælia* preoccupied), Bull. Sci. Lab. Denison Univ., 17, 1912, p. 139.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 382.

**Pianodema amœna** (N. H. Winchell).

*Orthis amœna* Winchell, 8th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1880, p. 65.

*Orthis* (*Dalmanella*) *amœna* Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 453, pl. 33, figs. 48-50.

*Dalmanella amœna* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 200.

Trenton(?): Spring Valley, Minnesota.

Observation.—Closely related to *P. subæquata* *perveta*. The types were probably derived from the Black River of southern Minnesota.

**Pianodema bellula** (Meek).

*Orthis bellula* James, Cat. L. Sil. Foss. Cincinnati Group, 1871, p. 10 (nom. nud.).—Meek, Pal. Ohio, 1, 1873, p. 103, pl. 8, fig. 5.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 31.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 507, figs.

*Dalmanella bellula* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 224.

*Dalmanella* (*Bathycælia*) *bellula* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 221.

Maysville (Fairmount): Cincinnati, Ohio, and vicinity.

**Pianodema pogonipensis** (Hall and Whitfield).

*Orthis pogonipensis* Hall and Whitfield, King's U. S. Geol. Expl. 40th Parl., 4, 1877, p. 232, pl. 1, figs. 9, 10.

*Strophomena nemea* Hall and Whitfield, *ibid.*, 1877, p. 233, pl. 1, fig. 15.—Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 71.

Upper Pogonip: Pogonip Mountain, White Pine District, Nevada.

*Cotypes*.—Cat. Nos. 17220, 17242, U.S.N.M.

**Pianodema stonensis** (Safford).

*Orthis stonensis* Safford, Geol. Tennessee, 1869, p. 286.

*Dalmanella stonensis* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 224, pl. 5C, figs. 4, 5.

Stones River (Pierce): Central Tennessee.

***Pianodema subæquata* (Conrad).**

- Orthis subæquata* Conrad, Proc. Acad. Nat. Sci. Philadelphia, 1, 1843, p. 333.—Hall, Pal. New York, 1, 1847, p. 118, pl. 32, fig. 2; Geol. Wisconsin, 1, 1862, p. 42, figs. 1-3, and p. 436; 2d Ann. Rep. New York State Geol., 1883, pl. 34, figs. 19-24.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 194, pl. 9, f. 2.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 533, figs.
- Orthis minneapolis* N. H. Winchell, 8th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1880, p. 63.
- Orthis perveta* Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 34, figs. 17, 18 (?16).
- Dalmanella subæquata* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 194, 207, 224, pl. 5C, figs. 6-11.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 156, pl. 10, figs. 3, 4.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 261, fig. 311f-h.
- Dalmanella perveta* Hall and Clarke, *ibid.*, 1892, p. 224, pl. 5C, figs. 13, 14.
- Orthis* (*Dalmanella*) *subæquata* Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 446, pl. 33, figs. 30-36.
- Black River: Mineral Point, Wisconsin; Minneapolis, St. Paul, Cannon Falls, Fountain, etc., Minnesota; Decorah and McGregor, Iowa; Auburn, Lincoln County, Missouri; Montreal, Canada; New Jersey; Kentucky; etc.
- Stones River (Pierce—Lebanon): Central Tennessee.

***Pianodema subæquata circularis* (N. H. Winchell).**

- Orthis circularis* N. H. Winchell, 8th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1880, p. 66.
- Orthis* (*Dalmanella*) *subæquata* var. *circularis* Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 452, pl. 33, figs. 46, 47.
- Black River: Minneapolis, Cannon Falls, etc., Minnesota (Decorah); High Bridge, Kentucky (Lowville).

***Pianodema subæquata conradi* N. H. Winchell.**

- Orthis conradi* N. H. Winchell, 8th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1880, p. 68.
- Orthis* (*Dalmanella*) *subæquata* var. *conradi* Winchell and Schuchert, Minnesota Geol. Surv., 3, 1893, p. 449, pl. 33, figs. 37-39.
- Black River: Minneapolis, Minnesota; Decorah, Iowa; Janesville and Beloit, Wisconsin (Platteville); Montreal, Canada.

***Pianodema subæquata gibbosa* (Billings).**

- Orthis gibbosa* Billings, Geol. Surv. Canada; Rep. Progr. for 1856, 1857, p. 296. (Not Billings, 1859=Hebertella vulgaris Raymond.)
- Dalmanella gibbosa* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 224.
- Orthis* (*Dalmanella*) *subæquata* var. *gibbosa* Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 451, pl. 33, figs. 43-45.
- Black River: Near Ottawa and Bellville, Canada; Minneapolis, Cannon Falls, etc., Minnesota; Decorah, Iowa; Mineral Point, Wisconsin; Island of Montreal; and Pallideau Islands, Lake Huron.

***Pianodema subæquata perveta* (Conrad).**

- Orthis perveta* Conrad, Proc. Acad. Nat. Sci. Philadelphia, 1, 1843, p. 333.—Hall, Pal. New York, 1, 1847, p. 120, pl. 32, fig. 5.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 194, pl. 9, fig. 5.—Hall, Geol. Wisconsin, 1, 1862, p. 42, fig. 7.—Billings, Geol. Canada, 1863, p. 130, fig. 57.—Hall, 36th Rep. New York State Mus. Nat. Hist., 1884, p. 75, pl. 3, fig. 6.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 529, 6 figs.

**Pianodema subaequata perveta**—Continued.

- Orthis media* N. H. Winchell, 8th Ann. Rep. Nat. Hist. Surv. Minnesota, 1880, p. 64.  
*Orthis kassubae* N. H. Winchell, *ibid.*, 1880, p. 65.  
 ?*Orthis perveta* Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 72, pl. 11, fig. 3.  
*Dalmanella perveta* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 5C, fig. 12.  
*Orthis (Dalmanella) subaequata var. perveta* Winchell and Schuchert, Geol. Minnesota, 3, 1893, pl. 33, figs. 40–42.  
*Dalmanella subaequata var. pervetus* Ruedemann, Bull. New York State Mus., 49, 1902, p. 26.  
 Black River: Mineral Point, etc., Wisconsin; Minneapolis, St. Paul, Cannon Falls, etc., Minnesota; Decorah, Iowa; Dixon, Illinois; Tennessee.  
*Plesiotypes*.—Cat. No. 17235, U.S.N.M.

**PILOCERAS** Salter.Genotype: *P. invaginatum* Salter.

- Piloceras* Salter, Quart. Jour. Geol. Soc. London, 15, 1859, p. 376.—Billings, Canadian Nat. Geol., 4, 1859, p. 364; *ibid.*, 5, 1860, p. 170.—Chapman, Canadian Jour., n. s., 8, 1863, p. 22; Expos. Min. Geol. Canada, 1864, p. 130.—Barrande, Syst. Sil. du Centre Boheme, 2, pt. 1, 1867, p. 452.—Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1881, p. 27, fig. 4.—Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 266.—Zittel, Handb. Pal., 2, 1884, p. 362.—Foord, Geol. Mag., dec. 3, 4, 1887, pp. 541, 545; Rep. 57th Meeting British Assoc. Adv. Sci., 1888, p. 717; Cat. Foss. Ceph. British Mus., 1, 1888, p. 157.—Miller, N. A. Geol. Pal., 1889, p. 453.—Bather, Nat. Sci., 5, 1894, pp. 429, 433, fig. 5.—Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 769.—Hyatt, Zittel-Eastman Textb. Pal., 1, 1900, p. 515; 2d ed., 1913, p. 596.—Ruedemann, Bull. New York State Mus., 80, 1905, pp. 326, 329.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 45.  
*Proteropiloceras* Ruedemann, Bull. New York State Mus., 80, 1905, pp. 326, 330.

**Piloceras amplum** Dawson.

- Piloceras amplum* Dawson, Canadian Nat., 10, 1883, pp. 1–4, figs. 1, 2.—Foord, Geol. Mag., dec. 3, 4, 1887, p. 543, fig. 2, p. 544; Cat. Foss. Ceph. British Mus., 1, 1888, p. 159, fig.—Ruedemann, Bull. New York State Mus., 80, 1905, p. 329, fig. 21.  
 Canadian (Beekmantown): Lachute, Canada.

**Piloceras canadense** Billings.

- Piloceras Canadense* Billings, Canadian Nat. Geol., 5, 1860, p. 171, fig. 16; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 256.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 162.  
 Canadian: Mingan Islands; Cape Norman and Port Aux Choix, Newfoundland (Quebec, F–H).

**Piloceras corniculum** Sardeson.

- Piloceras corniculum* Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 103, pl. 6, figs. 5–7.  
 Ozarkian (Oncota): Near Dresbach, Winona County, Minnesota.

**Piloceras explanator** Whitfield.

- Piloceras explanator* Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 323, pl. 28, figs. 1–4.—Foord, Cat. Foss. Ceph. British Mus., pt. 1, 1888, p. 162.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 650, figs.—Clarke, Geol. Minnesota, 3, 1897, p. 769, pl. 2.—Ruedemann, Bull. New York State Mus., 80, 1905, p. 329, pl. 10–13, pl. 9, fig. 3; *ibid.*, 90, 1906, p. 429, pl. 10, 11.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 45, fig. 1243.—Seely, Vermont State Geol., Rep. 7, 1910, pl. 57, fig. 11.  
 Canadian (Beekmantown): Fort Cassin, Vermont, and Valcour, New York.

***Piloceras gracile* Billings.**

*Piloceras gracile* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 257.  
Canadian (Quebec-H): Schooner Island, Pistolet Bay, Newfoundland.

**PILOCERAS NEWTON-WINCHELLI** Clarke. See *Clarkoceras newton winchelli*.

***Piloceras triton* Billings.**

*Piloceras Triton* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 257.  
Canadian (Quebec, G-H): West side Pistolet Bay, Newfoundland.

**PILOCERAS WINCHELLI** Miller. See *Clarkoceras newton winchelli*.

***Piloceras wortheni* Billings.**

*Piloceras wortheni* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 256, fig. 240a-d.—Miller, N. A. Geol. Pal., 1889, p. 453, fig. 758.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 46, fig. 1244.  
Canadian (Quebec-H): Port aux Choix, Newfoundland.

**PINNAPORELLA** Simpson. See *Ptiloporella* Hall.

**PINNAPORINA** Simpson. See *Ptiloporella* Hall.

**PISOCRINUS** Dekoninck.

Genotype: *P. pilula* Dekoninck.

*Pisocrinus* Dekoninck, Bull. Acad. Roy. Belgique, 2d ser., 4, 1858, p. 93.—Salter, Cat. Camb. Sil. Foss., 1873, p. 128.—Angelin, Icon. Crin., 1878, p. 20.—Zittel, Handb. Pal., 1, Munich, 1879, p. 348.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 172 (Rev. Pal., 3, p. 96); *ibid.*, 1888, p. 350.—Miller, N. A. Geol. Pal., 1889, p. 269.—Bather, Kongl. Sven. Vet.-Akad. Handl., 25, No. 2, 1893, pp. 21, 22, pl. 1, figs. 1-23; p. 25, figs. 1-2; Nat. Sci., 12, 1898, p. 343.—Jaekel, Zeits. d. d. geol. Gesell., 52, 1900, p. 482.—Sollas, Quart. Jour. Geol. Soc. London, 56, 1900, p. 270.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 149, fig. 62.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 135.—Slocum, Field Columbian Mus., 2, Geol. Ser., 1908, p. 278.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 498.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 208.  
*Triacrinus* Ringueberg (not Münster), Proc. Acad. Nat. Sci. Philadelphia, 1884, p. 144. (Genotype: *T. pyriformis* Ringueberg.)

***Pisocrinus baccula* Miller and Gurley.**

*Pisocrinus baccula* Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 7, 1895, p. 79, pl. 5, figs. 23-26.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 749, fig. 1368.

Niagaran (Laurel): Near St. Paul, Indiana.

***Pisocrinus benedicti* Miller.**

*Pisocrinus benedicti* Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 639, pl. 6, figs. 13-16 (adv. sheets, 1891, p. 29); N. A. Geol. Pal., 1st App., 1892, p. 681, fig. 1242.—Slocum, Field Columbian Mus., 2, Geol. Ser., 1908, p. 279, pl. 84, figs. 8-11.

Niagaran: Marion, Wabash, etc., Indiana; Lemont, Illinois.

***Pisocrinus campana* Miller.**

*Pisocrinus campana* Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 642, pl. 11, figs. 4, 5 (adv. sheets, 1891, p. 32).

Niagaran: Wabash, Indiana.

***Pisocrinus gemmiformis* Miller.**

*Pisocrinus gemmiformis* Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 113, pl. 9, figs. 6, 6a, 6b, 6c; N. A. Geol. Pal., 1889, p. 269, fig. 391; 17th Ann.



**Pisocrinus gemmiformis**—Continued.

Rep. Dep. Geol. Nat. Res. Indiana, 1892, p. 636, pl. 6, figs. 10–12, 24, 25 (adv. sheets, 1891, p. 26).—Slocum, Field Columbian Mus., 2, Geol. Ser. 1908, p. 278, pl. 84, figs. 1–4.

Niagaran: Osgood, St. Paul, etc., Indiana (Osgood and Laurel); Romeo and Lemont, Illinois (Racine).

**Pisocrinus glabellus** Rowley.

*Pisocrinus glabellus* Rowley, Amer. Geol., 34, 1904, p. 270, pl. 16, figs. 10–12.  
Niagaran (Bainbridge): Near St. Marys, Ste. Genevieve County, Missouri.

**Pisocrinus globosus** (Ringueberg).

*Triacrinus globosus* Ringueberg, Proc. Acad. Nat. Sci. Philadelphia, 1884, p. 146, pl. 3, fig. 2.

*Pisocrinus globosus* Miller, N. A. Geol. Pal., 1889, p. 269.—Rowley, Amer. Geol., 34, 1904, p. 270, pl. 16, figs. 8, 9.

Clinton (Irondequoit): Lockport, New York.

?Niagaran (Bainbridge): Near St. Marys, Ste. Genevieve County, Missouri.

**PISOCRINUS GORBYI** Miller (part). See *Pisocrinus quinquelobus*.

**Pisocrinus gorbyi** Miller.

*Pisocrinus gorbyi* Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 640, pl. 6, figs. 17–20 (adv. sheets, 1891, p. 30); N. A. Geol. Pal., 1st App., 1892, p. 681, fig. 1243.—Rowley, Amer. Geol., 34, 1904, p. 269, pl. 16, figs. 4–7.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 498.

Niagaran: Wabash, Marion, etc., Indiana; St. Marys, Ste. Genevieve County, Missouri (Bainbridge).

**Pisocrinus granulatus** Rowley.

*Pisocrinus granulatus* Rowley, Amer. Geol., 34, 1904, p. 269, pl. 16, figs. 1–3.  
Niagaran (Bainbridge): Near St. Marys, Ste. Genevieve County, Missouri.

**PISOCRINUS MILLIGANÆ** Miller and Gurley. See *Pisocrinus quinquelobus*.

**Pisocrinus pyriformis** (Ringueberg).

*Triacrinus pyriformis* Ringueberg, Proc. Acad. Nat. Sci., Philadelphia, 1884, p. 145, pl. 3, fig. 1.

*Pisocrinus pyriformis* Miller, N. A. Geol. Pal., 1889, p. 270.

Clinton (Irondequoit): Lockport, New York.

**Pisocrinus quinquelobus** Bather.

*Haplocrinites hemisphericus* Troost, Amer. Jour. Sci. Arts, 2d ser., 8, 1849, p. 420; Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 61 (nom. nud.).

*Pisocrinus gorbyi* (in part) Miller, 17th Rep. Indiana Geol. Nat. Res., 1892, p. 640, pl. 6, figs. 21–23.

*Pisocrinus quinquelobus* Bather, Crin. Gotland, pt. 1, 1893, p. 27; Amer. Geol., 17, 1896, p. 184.—Slocum, Field Columbian Mus., 2, Geol. Ser., 1908, p. 280, pl. 84, figs. 5–7.

*Pisocrinus milliganæ* Miller and Gurley, Bull. 7, Illinois State Mus. Nat. Hist., 1895, p. 80, pl. 5, figs. 27, 28.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 749, figs. 1369, 1370.—Foerste, Jour. Geol., 11, 1903, p. 712.—Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 23.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 498, fig. 1807.

Niagaran: Decatur County, Tennessee (Brownsport): Romeo, Illinois (Racine).  
*Plesiotype*.—Cat. No. 39941, U.S.N.M. (Troost's type of *H. hemisphericus*.)

- PIZARROA** Hoek. Genotype: *P. quickuana* Hoek.  
Pizarroa Hoek, Neues Jahrb. Min. Geol. Pal., 34, 1912, p. 246.
- Pizarroa quickuana** Hoek.  
Pizarroa quickuana Hoek, Neues Jahrb. Min. Geol. Pal., 34, 1912, p. 246, pl. 8, figs. 14, 15.  
Ordovician: Totorapampa, Bolivia.
- PLACENTULA** Jones and Holl. Genotype: *Primitia excavata* Jones and Holl.  
Placentula Jones and Holl, Ann. Mag. Nat. Hist., 5th ser., 17, 1886, p. 407.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 710.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 351.
- Placentula inornata** Ulrich.  
Placentula inornata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 124, pl. 10, figs. 14a, b.  
Eden (Economy): Covington, Kentucky.
- Placentula marginata** Ulrich.  
Placentula marginata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 124, pl. 10, figs. 13a-c.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 351, figs. 1666d, d'.  
Maysville (Corryville): Cincinnati, Ohio.  
*Holotype*.—Cat. No. 41364, U.S.N.M.
- PLACOCYSTIS BALANOIDES** Haeckel. See *Ateleocystites balanoides*.
- PLACOCYSTIS CRUSTACEA** Haeckel. See *Ateleocystites balanoides*.
- PLÆSIOMYS** Hall and Clarke. See *Dinorthis* Hall and Clarke.
- PLÆSIOMYS LORICULA** Hall and Clarke. See *Dinorthis* (*Plæsiomys*) *deflecta*.
- PLÆSIOMYS PORCATA** Hall and Clarke. See *Dinorthis* (*Plæsiomys*) *porcata anticostiensis*.
- PLÆSIOMYS RECTA** Hall and Clarke. See *Dinorthis* (*Plæsiomys*) *deflecta*.
- PLÆSIOMYS RETRORSA** Hall and Clarke. See *Dinorthis carleyi*.
- PLANOLITES** Nicholson. Genotype: *P. vulgaris* Nicholson.  
Planolites Nicholson, Proc. Roy. Soc. London, 21, 1873, p. 289.—Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 138.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 41.—Miller, N. A. Geol. Pal., 1889, p. 520.—Walcott, Proc. U. S. Nat. Mus., 12, 1890, p. 34.
- PLANOLITES VIRGATUS** Walcott. See *Palæophycus virgatum*.
- Planolites vulgaris** Nicholson.  
Planolites vulgaris Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 139.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 42.  
Upper Medinan (Cataract): Dundas, Ontario.
- PLANORBIS TRILOBATUS** Conrad. See *Bucanella trilobata*.
- PLASMOPORA** Edwards and Haime. Genotype: *Porites petaliformis* Lonsdale.  
Plasmopora Edwards and Haime, Compt. Rend. de l'Acad. Sci., 29, 1849, p. 262; Mon. d. Polyp. Foss. d. Terr. Pal., 1851 (Arch. du Mus. d'Hist. Nat., 5), pp. 150, 221.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 438.—Milne-Edwards, Hist. Nat. d. Corall., 3, 1860, p. 239.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 13.—Nicholson, Tab. Corals Pal. Period, 1879, p. 245.—Zittel,

**PLASMOPORA**—Continued.

Handb. Pal., 1, 1879, p. 212.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1880, pp. 263, 264.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 510.—Koch, Palæontographica, 29, 1883, pp. 334, 343.—Miller, N. A. Geol. Pal., 1889, p. 200.—Koken, Die Leitfossilien, Leipzig, 1896, p. 314.—Sardeson, Neues Jahrb. Min. Geol. Pal., Beilage-Band, 10, 1896, p. 252.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 82.—Kiär, Palæontographica, 46, 1899, p. 26.—Lindström, Kongl. Sven. Vet. Akad. Handl., 32, 1899, pp. 36, 72, 74, 75; Zittel-Eastman Textb. Pal., 1, 1900, p. 108; 2d. ed., 1913, p. 112.—Pocta, Syst. Sil. du Centre Bohème, 8, pt. 2, 1902, p. 300.—Kiär, Vid.-Selsk. Skrifter, Math.-naturw. Kl., No. 10, 1903, pp. 34, 54.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 98.

**PLASMOPORA ASTRAFORMIS** Calvin. See *Plasmopora follis*.

**PLASMOPORA? DISCOIDEA** Lindstrom. See *Lyellia discoidea*.

**PLASMOPORA ELEGANS** Hall. See *Heliolites elegans*.

**Plasmopora follis** Edwards and Haime.

?*Porites?* *astraformis* Owen, Geol. Expl. Iowa, Wisconsin, Illinois, 2d ed., 1844, p. 76, pl. 13, fig. 8.

*Plasmopora follis* Edwards and Haime, Mon. Polyp. Foss. d. Terr. Pal., 1851 (Arch. du Mus. d'Hist. Nat., 5), p. 223, pl. 16, fig. 3, 3a.—Milne-Edwards, Hist. Nat. d. Corall., 3, 1860, p. 240.—Roemer, Sil. Fauna West Tennessee, Breslau, 1860, p. 24, pl. 2, figs. 6, 6a.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 14, pl. 3, fig. 2.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 1, figs. 9, 10.—Miller, N. A. Geol. Pal., 1889, p. 200, figs. 207.—Lindström, Kongl. Sven. Vet.-Akad. Handl., 32, No. 1, 1899, p. 82, pl. 7, figs. 19–20.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 82, pl. 2, figs. 8, 8a.—Kiär, Vid.-Selsk. Skrifter, Math.-naturw. Kl., No. 10, 1903, p. 54.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. fig. 157c, d.—Lambe, Cruise of the "Neptune," App. 4, 1906, p. 326.

*Plasmopora astraformis* Calvin, Amer. Geol., 12, 1893, p. 111.

Niagaran: Perry County, etc., Tennessee (Brownsport); Louisville, Kentucky (Louisville); St. Paul, Indiana (Laurel); Baie de Chaleurs, Quebec; Southampton Island; Hudson Bay, etc.

Observation.—Calvin adopts Owen's specific name "*astraformis*" for this species, but the original figure of *Porites astraformis* is not sufficient for recognition.

*Plesiotype*.—Cat. No. 52660, U.S.N.M. (Davis).

**Plasmopora lambii** Schuchert.

*Plasmopora lambii* Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 154.

Mohawkian: Head of Frobisher Bay, Baffin Land.

*Cotypes*.—Cat. No. 28140, U.S.N.M.

**Plasmopora petaliformis** (Lonsdale).

*Porites petaliformis* Lonsdale, Murchison's Sil. Syst., 1839, p. 687, pl. 16, figs. 4, 4a.

*Plasmopora petaliformis* Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal., 1851 (Arch. du Mus. d'Hist. Nat., 5), p. 221; British Foss. Corals, 1855, p. 253, pl. 59, figs. 1, 1a–c.—Lambe, Contr. Canadian Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 83, pl. 2, figs. 9, 9a.

*Heliolites sparsus* Billings, Canadian Nat. and Geol., n. s., 2, 1865, p. 428; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 31.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1880, p. 249.

**Plasmopora petaliformis**—Continued.

Silurian: England (Wenlock); Drummonds Island, Lake Huron (Niagaran); Two miles west of Chicotte River, Anticosti (Anticostian—Jupiter River—Chicotte); Baie des Chaleurs, Quebec.

PLASMOPORA PUELLA Lindstrom. See *Lyellia puella*.

**PLATYAXUM** (Davis) Foerste. Genotype: *Pachypora frondosa* Nicholson.  
*Platyaxum* Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, expl. pl. 60.—Foerste, Bull. Sci. Denison Univ., 14, 1909, p. 105.

**Platyaxum pegramense** (Foerste).

*Pachypora* (*Platyaxum*) *pegramensis* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 103, pl. 3, fig. 57.

*Alveolites pegramensis* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 104.  
 Niagaran (Brownsport): Two miles west of Pegram, Tennessee.

**Platyaxum planostiolatum** (Foerste).

*Pachypora* (*Platyaxum*) *planostiolata* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 106, pl. 3, fig. 55.

Niagaran (Brownsport): Two miles west of Pegram, Tennessee.

**Platyaxum platys** Foerste.

*Platyaxum platys* Foerste, Jour. Geol., 11, 1903, p. 713.

*Pachypora* (*Platyaxum*) *platys* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 104, pl. 1, fig. 16a-c.

Niagaran (Brownsport): Brownsport Furnace and near Linden, Tennessee.

**PLATYCERAS** Conrad.

Genotype: *P. dumosum* Conrad.

*Platyceras* Conrad, 4th Ann. Rep. New York Geol. Surv., 1840, p. 205.—Woodward, Man. Mollusca, pt. 1, 1851, p. 153.—Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, pp. 15, 16; Pal. New York, 3, 1859, pp. 308, 309, p. 468.—Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1866, pp. 262, 263; Geol. Surv. Illinois, 3, 1868, pp. 384, 387; Proc. Acad. Nat. Sci. Philadelphia, 1868, p. 331; Geol. Surv. Illinois, 5, 1873, p. 334.—Nicholson, Rep. Pal. Prov. Ontario, pt. 1, 1874, p. 115.—Wetherby, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 6, footnote.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 19, No. 6, 1881, p. 59.—Zittel, Handb. Pal., 2, 1882, p. 217.—Ehlerlert, Bull. Soc. Geol. France, 3d ser., 11, 1883, p. 603.—Koninck, Ann. d. Mus., Royal d'Hist. Nat. de Belgique, 8, 1883, p. 169.—Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 182.—Keyes, Amer. Nat., 22, 1888, p. 925; Amer. Jour. Sci., 3d ser., 36, 1888, p. 269; Proc. Amer. Phil. Soc., 25, 1888, p. 231.—Nettelroth, Kentucky Foss. Shells, Geol. Surv. Kentucky, 1889, p. 160.—Miller, N. A. Geol. Pal., 1889, p. 415.—Keyes, Amer. Geol., 6, 1890, pp. 6-9; Proc. Iowa Acad. Sci., 1, pt. 2, 1892, p. 24; Amer. Geol., 10, 1892, p. 273.—Frech, Zeits. d. d. Geol. Gesell., 46, 1894, p. 469.—Koken, Die Leitfossilien, Leipzig, 1896, pp. 106, 128, 133, fig. 115.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1068.—Koken, Bull. de l'Acad. Imp. Sci. St. Petersburg, 7, 1897, p. 195.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 271.—Girty, Mon. U. S. Geol. Surv., 32, pt. 2, 1899, p. 574, pl. 66, figs. 12a-c, 11a-d.—Pilsbry, Zittel-Eastman Textb. Pal., 1, 1900, p. 461.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 211; Bull. New York State Mus., 45, 1901, p. 211.—Girty, U. S. Geol. Surv., Prof. Pap. 16, 1903, p. 310.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 680.—Dall, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 54.

**PLATYCERAS**—Continued.

*Acroculia* Phillips, Pal. Foss. Cornwall, Devon and W. Somerset, 1841, p. 93.—  
Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 77.—Ehlerl, Bull.  
Soc. Geol. France, 3d ser., 11, 1883, p. 602.

**Platyceras angulatum** (Hall).

*Acroculia* angulata Hall, Pal. New York, 2, 1852, p. 289, pl. 60, figs. 4a-d.  
*Platyceras* angulatum Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 211, fig.  
140; Bull. New York State Mus., 45, 1901, p. 211, fig. 140.  
Clinton (Rochester): Lockport, New York.

**PLATYCERAS BROWNSPORTENSIS** Foersto. See *Diaphorostoma brownsportense*.

**PLATYCERAS CAMPANULATUM** Winchell and Marcy. See *Diaphorostoma campanulatum*.

**Platyceras? columbianum** Weller.

*Platyceras?* columbiana Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 131,  
pl. 4, figs. 7, 8.  
Canadian (Beekmantown): Columbia, New Jersey.

**Platyceras compactum** Whiteaves.

*Platyceras* compactum Whiteaves, Geol. Surv. Canada, Ann. Rep., n. s., 14,  
App. F, 1904, p. 52; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 260,  
pl. 29, fig. 6.  
Niagaran: Ekwan River, Canada.

**PLATYCERAS (DIAPHOROSTOMA) CORNUTUM** Hisinger. See *Diaphorostoma niagarense*.

**Platyceras depressum** Ulrich and Scofield.

*Platyceras* depressum Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p.  
1069, pl. 61, figs. 55, 56.  
Black River (Decorah): Six miles south of Cannon Falls, Minnesota.  
*Holotype*.—Cat. No. 45954, U.S.N.M.

**Platyceras ellesmerelandi** Hortedahl.

*Platyceras* ellesmerelandi Hortedahl, 2d Arct. Exp. "Fram," 1898-1902, No. 32,  
1914, p. 32, pl. 8, fig. 20.  
Helderbergian (Lower beds): Southwestern Ellesmereland, Arctic America.

**PLATYCERAS HOYTI** Walcott. See *Pelagiella hoyti*.

**Platyceras lacinosum** Ringueberg.

*Platyceras* lacinosum Ringueberg, Buffalo Soc. Nat. Hist., 5, 1886, p. 14, pl. 2,  
fig. 1.  
Clinton (Rochester): Lockport, New York.

**Platyceras? membranaceum** Ringueberg.

*Platyceras* membranaceum Ringueberg, Buffalo Soc. Nat. Hist., Bull. 5, 1886,  
p. 15, pl. 2, fig. 3.  
Clinton (Rochester): Lockport, New York.

**PLATYCERAS MINUTISSIMUM** Walcott. See *Pelagiella minutissima*.

**Platyceras naticoides** Etheridge.

*Platyceras* naticoides Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 603,  
pl. 27, figs. 4, 4a.  
Niagaran: Bessels Bay, Arctic America.

**Platyceras niagarensis** (Hall).

*Acroculia niagarensis* Hall, Pal. New York, 2, 1852, p. 288, pl. 60, fig. 3.—Roemer, Sil. Fauna West. Tennessee, Breslau, 1860, p. 76, pl. 5, fig. 16.

*Platyceras niagarensis* Hall, 20th Rep. New York State Cab. Hist., 1868, p. 341; rev. ed., 1870, p. 390.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 211, fig. 139; Bull. New York State Mus., 45, 1901, p. 211, fig. 139; Amer. Nat., 36, 1902, p. 939.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 680, fig. 954.

Niagaran: Lockport, Rochester, etc., New York; Ontario (Rochester); West Tennessee (Brownsport); etc.

**PLATYCERAS NIAGARENSE** var. **CLINTONENSE** Foerste. See *Diaphorostoma niagarensis clintonense*.

**PLATYCERAS (PLATYSTOMA) NIAGARENSIS** Foerste. See *Diaphorostoma niagarensis*.

**Platyceras proclive** Ringeberg.

*Platyceras proclive* Ringeberg, Buffalo Soc. Nat. Hist., Bull. 5, 1886, p. 14, pl. 2, fig. 2.

Clinton (Rochester): Lockport, New York.

Observation.—Apparently a *Crania*.

**Platyceras pronum** Foerste.

*Platyceras pronum* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 65, pl. 3, fig. 40.

Clinton (Osgood): Clifton, Tennessee.

**Platyceras senex** (Winchell and Marcy).

*Porcellia senex* Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 111, pl. 3, fig. 6.

*Platyceras senex* Miller, N. A. Geol. Pal., 1889, p. 417 (gen. ref.).

Niagaran (Racine): Chicago, Illinois.

**Platyceras tenuiliratum** Hall.

*Platyceras tenuiliratum* Hall, Pal. New York, 3, 1859, p. 317, pl. 48, figs. 1-5; pl. 49, figs. 6a, b.—Maynard, Maryland Geol. Surv., Lower Dev., 1913, p. 476, pl. 85, figs. 1, 2.

Helderbergian: Albany County, New York (New Scotland); Cash Valley, Maryland (Keyser).

**Platyceras unguiforme** Hall.

*Platyceras unguiforme* Hall, Pal. New York, 3, 1859, p. 322, pl. 59, figs. 1-4.—Nettelroth, Kentucky Foss. Shells, Geol. Surv. Kentucky, 1889, p. 168.

Helderbergian (New Scotland): Albany and Schoharie Counties, New York.

?Niagaran (Louisville): Louisville, Kentucky (Nettelroth).

*Plesiotype*.—Cat. No. 51342, U.S.N.M. (Nettelroth).

**Platyceras vetulum** Sardeson.

*Platyceras vetulum* Sardeson, Bull. Minnesota Soc. Nat. Sci., 4, 1896, p. 76, pl. 4, fig. 1.

St. Peter: South St. Paul, Minnesota.

**Platyceras(?) wisconsinense** Ulrich and Scofield.

*Platyceras(?) wisconsinensis* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1068, pl. 61, figs. 49-54.

Black River (Platteville): Beloit, Wisconsin.

*Cotypes*.—Cat. No. 45955, U.S.N.M.

**PLATYCOLPUS** Raymond.Type: *Bathyrurus capax* Billings.*Platycolpus* Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 63.**Platycolpus affinis** (Billings).*Dikelocephalus affinis* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 197, figs. 183a, b.*Dicelloccephalus affinis* Matthew, Trans. Royal Soc. Canada, 10, sec. 4, 1893, p. 11, footnote.*Platycolpus affinis* Walcott, Smiths. Misc. Coll., 57, No. 13, 1914, p. 349 (gen. ref.).

Ozarkian? (Levis—erratics): Point Levis, Quebec.

**Platycolpus barabuensis** (Whitfield).*Dicelloccephalus Barabuensis* Whitfield, Ann. Rep. for 1877, Wisconsin Geol. Surv., 1878, p. 63.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 141, fig.*Dikelocephalus Barabuensis* Whitfield, Geol. Wisconsin, 4, 1882, p. 201, pl. 4, figs. 6-9.*Platycolpus barabuensis* Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 64. Ozarkian (Mendota): East of Baraboo, Wisconsin.**Platycolpus capax** (Billings).*Bathyrurus capax* Billings, Canadian Nat. Geol., 5, 1860, p. 318, fig. 20; Geol. Canada, Geol. Surv. Canada, 1863, p. 238, fig. 271a (fig. only); Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 409, fig. 389.*Platycolpus capax* Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 63, pl. 7, figs. 20 and 21.

Ozarkian? (Levis—erratics): Point Levis, Quebec.

**Platycolpus dubius** (Billings).*Bathyrurus dubius* Billings, Canadian Nat. Geol., 5, 1860, p. 319, fig. 21; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 410, fig. 390.*Platycolpus dubius* Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 64.

Ozarkian or Canadian: Point Levis, Quebec (Levis—erratics); Cow Head, Newfoundland.

**Platycolpus eatoni** (Whitfield).*Dikelocephalus eatoni* Whitfield, Ann. Rep. Geol. Surv. Wisconsin for 1877, 1878, p. 65; Geol. Wisconsin, 4, 1882, p. 202, pl. 4, figs. 11-17; pl. 10, figs. 4, 5.*Platycolpus eatoni* Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 63.

Ozarkian (Mendota): Baraboo, Wisconsin.

**PLATYCRINITES** Miller. See *Platycrinus* Miller.**PLATYCRINITES ANN DIXONI** Troost. See *Cococrinus bacca*.**PLATYCRINUS** Miller.Genotype: *P. lævis* Miller.*Platycrinites* Miller, Nat. Hist. Crin., 1821, p. 15, 74.—Goldfuss, Petrefacta, 1826, p. 188.—Fischer de Waldheim, Oryct. Gouv. de Moscou, 1830, p. 151.—Goldfuss, Nova Acta Physico Med., Acad. Caes. Leop.-Carol., 19, 1839, p. 343.—Austin and Austin, Mono. Recent and Fossil Crin., 1843, p. 6; Ann. Mag. Nat. Hist., 11, 1843, p. 199.—Goldfuss, Petrefacta, 2d ed., pt. 1, 1862, p. 175.*Platycrinus* Agassiz, Ann. Nat. Hist., 1, 1838, p. 447.—McCoy, Syn. Char. Carb. Foss. Ireland, 1844, p. 175.—Koninck, Desc. Animaux Fossiles, Leige, 1842, p. 41.—Austin, Quart. Jour. Geol. Soc. London, 4, 1848, p. 291.—D'Orbigny, Prodr. de Pal., 1, 1849, p. 103.—McCoy, British Pal. Rocks Foss., 1854, p. 118.—Koninck and Le Hon, Mem. l'Acad. Royale Sci., 28, 1854, p. 155, fig.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 330.—Hall, Rep. Geol. Surv. Iowa, 1,

**PLATYCRINUS**—Continued.

pt. 2, 1858, pp. 525, 526, fig. 55.—White, Boston Jour. Nat. Hist., 7, 1863, p. 489, footnote; pp. 491, 493, 495.—Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1865, pp. 160, 161; Geol. Surv. Illinois, 2, 1866, p. 170, 172.—Beyrich, Ann. Mag. Nat. Hist., 4th ser., 7, 1871, p. 400, 401, fig.—Meek and Worthen, Geol. Surv. Illinois, 5, 1873, p. 329.—Austin, Ann. Mag. Nat. Hist., 4th ser., 16, 1875, p. 90.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1878, p. 243; *ibid.*, 1881, p. 240; *ibid.*, 1887, p. 93; *ibid.*, 1888, p. 342.—Zittel, Handb. Pal., 1, 1879, p. 364.—Etheridge and Carpenter, Ann. Mag. Nat. Hist., 5th ser., 7, 1881, p. 294.—Miller, N. A. Geol. Pal., 1889, p. 270.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 144.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 156, 157, fig. 71, 1-3.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 139, fig. 51.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 199.

**Platycrinus augusta** Slocum.

*Platycrinus augusta* Slocum, Field Columbian Mus., Geol. Ser., 2, 1908 (10, 292, pl. 86, figs. 5-7).

Niagaran (Racine): Drainage Canal near Lemont, Illinois.

**Platycrinus corporiculus** Ringueberg.

*Platycrinus corporiculus* Ringueberg, Bull. Buffalo Soc. Nat. Sci., 5, 1886, p. 12, pl. 1, fig. 9.

Clinton (Rochester): Lockport, New York.

**Platycrinus? dubius** Weller.

*Platycrinus? dubius* Weller, Bull. Chicago Acad. Sci. Nat. Hist. Surv., 4, pt. 1, 1900, p. 140, pl. 14, fig. 4.

Niagaran (Racine): Bridgeport, Illinois.

**PLATYCRINUS PARVUS** Hall. See *Cordylocrinus plumosus*.

**PLATYCRINUS PLUMOSUS** Hall. See *Cordylocrinus plumosus*.

**PLATYCRINUS PRÆMATURUS** Hall and Whitfield. See *Marsipocrinus præmaturus*.

**Platycrinus siluricus** Hall.

*Platycrinus siluricus* Hall, Trans. Albany Inst., 10, 1883, p. 65 (adv. sheets, 1879, p. 9); 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 256, pl. 15, fig. 15.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 690, figs.

Niagaran (Waldron): Waldron, Indiana.

**PLATYCRINUS TENNESSEENSIS** Roemer. See *Marsipocrinus tennesseensis*.

**PLATYCYSTIS** Bather. See *Platycystites* Miller.

**PLATYCYSTITES** Miller.

Genotype: *P. faberi* Miller.

*Platycystites* Miller, N. A. Geol. Pal., 1889, p. 272.

*Platycystis* Bather, Treatise on Zool., pt. 3, Echinoderma, 1900, p. 51.

**Platycystites faberi** Miller.

*Platycystites faberi* Miller, N. A. Geol. Pal., 1889, p. 272, fig. 398.—Bather, Treatise on Zool., pt. 3, 1900, Echinoderma, p. 51; Trans. Roy. Soc. Edinburgh, 49, pt. 2, 1913, p. 371, fig. 5.

Chazyan (Ottosee) (Silurian in error): Southwestern Virginia.

*Platotype*.—Cat. No. 35396, U.S.N.M.

**PLATYMERELLA** Foerste.

Genotype: *P. manniensis* Foerste.

*Platymerella* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 71.



**Platyerella manniensis** Foerste.

*Platyerella manniensis* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 70, pl. 1, fig. 1A-D.

Upper Medinan (Brassfield): Near Riverside, Cedar Point, etc., Tennessee.

PLATYMETOPUS Angelin. See *Amphilichas* Raymond.

PLATYNOTUS Reed. See *Arctinurus* Castelnau.

PLATYNOTUS TRENTONENSIS Hall. See *Amphilichas halli* and *A. trentonensis*.

PLATYOSTOMA Conrad. See *Diaphorostoma* Fischer.

PLATYOSTOMA NIAGARENSIS var. TRIGONOSTOMA Meek. See *Diaphorostoma trigonostoma*.

**PLATYSCHISMA** McCoy.

Genotype: *Trochus helicites* Sowerby.

*Platyschisma* McCoy, Syn. Carb. Foss. Ireland, 1844, p. 388.—Dall, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 527.

**Platyschisma helicites** (Sowerby).

*Trochus helicites* Sowerby, Sil. Syst., 1839, p. 603, pl. 3, figs. 1e and 5.

*Platyschisma helicites* Etheridge, Foss. British Isl., 1, 1888, Paleozoic, p. 114.—

Williams, Proc. U. S. Nat. Mus., 45, 1913, p. 348, pl. 31, figs. 15, 16, 18.

Silurian: England; Hersey Cove, Washington County, Maine (Pembroke).

*Plesiotype*.—Cat. No. 58977, U.S.N.M.

**PLATYSTROPHIA** King.

Genotype: *Terebratulites biforata* Schlotheim.

*Platystrophia* King, Mon. Permian Fossils of England, Pal. Soc., 1850, p. 116.—

Zittel, Handb. Pal., 1, 1880, p. 675.—Waagen, Mem. Geol. Surv. India, Pal.

Indica, 13th ser., 1, 1884, p. 549.—Hall, Geol. Soc. Amer., 1, 1889, pp. 19, 20.—

Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 200.—Winchell and

Schuchert, Geol. Minnesota, 3, 1893, p. 454.—Hall and Clarke, 11th Ann.

Rep. New York State Geol., 1894, p. 268.—Koken, Die Leitfossilien, Leipzig,

1896, p. 235, fig. 195, 1.2.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p.

308.—Wysogorski, Zeit. d. d. geol. Gesell., 52, 1900, p. 234.—Cumings

and Mauck, Amer. Jour. Sci., 4th ser., 14, 1902, p. 9.—Cumings, Amer. Jour.

Sci., 4th ser., 15, 1903, p. 1.—Grabau and Shimer, N. A. Index Fossils, 1, 1907,

p. 257.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p.

891.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 381.

**Platystrophia acuminata** (James).

*Orthis* (*Platystrophia*) *acuminata* James, Palæontologist, 1, 1878, p. 7.

*Platystrophia acuminata* Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, pl. 6, fig. 13.

Maysville (Mount Auburn): Cincinnati, Ohio, and vicinity.

**Platystrophia acutilirata** (Conrad).

*Delthyris acutilirata* Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1842, p. 260, pl. 14, fig. 15.

*Orthis* (*Platystrophia*) *acutilirata* Meek, Pal. Ohio, 1, 1873, p. 119, pl. 10, fig. 5.

*Orthis biforata* var. *acutilirata* White, 2d Ann. Rep. Indiana Bur. of Stat. and Geol., 1880, p. 487, pl. 2, figs. 5-9; 10th Rep. State Geol. Indiana, 1881, p. 119, pl. 2, figs. 5-9.

*Orthis acutilirata* Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 28.

*Orthis* (*Platystrophia*) *biforata* var. *acutilirata* Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 508, figs.

**Platystrophia acutilirata**—Continued.

- Platystrophia acutilirata* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 223.—Foerste, Amer. Geol., 31, 1903, p. 340 (loc. occ.).—Cumings, Amer. Jour. Sci., 4th ser., 15, 1903, p. 32, fig. 17; p. 33, 35, fig. 18; p. 36, fig. 19; p. 48, fig. 25; p. 122, fig. 26, 11, 12, 13.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 258, fig. 308e-i.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 912, pl. 35, figs. 3-3d.—Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 65, pl. 3, figs. 6, 7, 8a-b; pl. 4, fig. 9.
- Platystrophia acutilirata senex* Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 913, pl. 35, fig. 4 (not 4a-c).
- ?*Spirifer shephardi* Castelnau, Essai Syst. Sil. Amer. Sept., 1843, p. 42, pl. 14, fig. 15.
- Richmond: Richmond, etc., Indiana; Oxford, Ohio (Whitewater); Wilmington, Illinois (Fernvale); Delafield, Wisconsin (Maquoketa).
- Placiotypes*.—Cat. No. 41167, U.S.N.M. (Cumings).

*PLATYSTROPHIA ACUTILIRATA INFLATA* Foerste. See *Platystrophia acutilirata senex*.

**Platystrophia acutilirata prolongata** Foerste.

- Platystrophia acutilirata prolongata* Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 67, pl. 3, figs. 8a, b.
- Richmond (Whitewater): Richmond, Indiana, etc.

**Platystrophia acutilirata senex** Cumings.

- Orthis inflata?* James, Cat. Low. Sil. Fossils Cincinnati Group, 1871, p. 10 (nom. nud.).
- Platystrophia acutilirata* var. *senex* (part) Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 913, pl. 35, figs. 4a-c (not fig. 4=P. *acutilirata*).
- Platystrophia acutilirata inflata* Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, pl. 4, fig. 8.
- Richmond (Whitewater): Richmond, Indiana.

**Platystrophia annieana** Foerste.

- Orthis annieana* James, Cat. Low. Sil. Fossils Cincinnati Group, 1871, p. 10 (nom. nud.).
- Platystrophia annieana* Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, pl. 6, fig. 14.
- Richmond (Waynesville): Blanchester, Ohio.

**Platystrophia biforata** (Schlotheim).

- Terebratulites biforatus* Schlotheim, Petrefactenkunde, 1820, p. 265.
- Delthyris brachynota* Hall, Geol. New York, Rep. 4th Dist., 1843, p. 70, fig. 6.—Owen, Amer. Jour. Sci. Arts, 48, 1845, p. 303, fig. 6.
- Orthis* and *Delthyris* Owen, Geol. Expl. Iowa, Wisconsin, Illinois, 1844, pl. 15, figs. 3, 7.
- Delthyris lynx* Hall (part; not Eichwald), Pal. New York, 1, 1847, p. 133, pl. 32D, fig. 1.
- Spirifer biforata* var. *lynx* Hall, *ibid.*, 2, 1852, p. 65, pl. 22, fig. 1.
- Orthis biforatus* Billings, Canadian Nat. Geol., 1, 1856, p. 206, figs. 6-10.—Davidson, Mon. British Sil. Brach., Pal. Soc., 1871, p. 268, pl. 38, figs. 11-25.—Nicholson and Hinde, Canadian Jour., 14, 1874, p. 158.—White, Rep. U. S. Geogr. Geol. Surv. west 100th Meridian, 4, 1874, p. 74, pl. 4, fig. 9.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 35, pl. 29, figs. 18-22.—Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 312.—Dennis, Proc. Indiana Acad. Sci., 1899, p. 289.

**Platystrophia biforata**—Continued.

*Orthis lynx* Billings, Geol. Canada, 1863, p. 167, fig. 149.—Miller (part), Cincinnati Quart. Jour. Sci., 2, 1875, p. 25.

*Orthis* (*Platystrophia*) *biforata* Meek, Pal. Ohio, 1, 1873, p. 112.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 508, figs.

*Orthis* (*Platystrophia*) *biforata* var. *lynx* Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 35, figs. 11–14 (not figs. 9, 10, 15 of pl. 35 and fig. 30, pl. 34).

*Platystrophia lynx* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 202, 223, pl. 5B, fig. 10.—Keyes, Geol. Surv. Missouri, 5, 1895, p. 64, pl. 39, fig. 5.

*Platystrophia biforata* Hall, 36th Rep. New York State Mus., 1884, p. 75, pl. 3, fig. 2.—Beecher, Amer. Jour. Sci. Arts, 3d ser., 42, 1891, p. 55, figs. 2a, b.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 455, pl. 33, figs. 51–54.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 309.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 3, 1897, p. 177.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 158.—Ruedemann, Bull. New York State Mus., 49, for 1901, 1902, p. 25.—Cumings, Amer. Jour. Sci., 4th ser., 15, 1903, p. 18; p. 41; p. 42, figs. 21, 22, 23; p. 122, fig. 26; 14, fig. 27.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 153, pl. 9, figs. 25–28.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 258.

Ordovician-Silurian: Various North American localities.

*Plesiotype*.—Cat. No. 51348, U.S.N.M. (Nettelroth).

Observation.—The above references are to various undetermined species of *Platystrophia*.

**PLATYSTROPHIA BIFORATA** var. **CRASSA** Winchell and Schuchert. See *Platystrophia crassa*.

**PLATYSTROPHIA BIFORATA** var. **LATICOSTA** Hall and Clarke. See *Platystrophia laticosta*.

**PLATYSTROPHIA BIFORATA** var. **LYNX** Hall and Clarke. See *Platystrophia lynx*.

**Platystrophia clarksvillensis** Foerste.

*Platystrophia clarksvillensis* Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 65, pl. 3, figs. 4, 3.

Richmond (Waynesville and Liberty): Fort Ancient, Clarksville, etc., Ohio.

**Platystrophia colbiensis** Foerste.

*Platystrophia colbiensis* Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 55, pl. 4, figs. 2A–B.

*Platystrophia* cf. *colbiensis* Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 131.

Trenton (Cynthiana): Between Colby and Winchester, Paris, Lexington, etc., Kentucky.

**Platystrophia colbiensis mutata** Foerste.

*Platystrophia colbiensis mutata* Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 56, pl. 4, figs. 3a–b.

Trenton (Cynthiana): Pleasant Valley and near Winchester, Kentucky.

**Platystrophia colbiensis precursor** Foerste.

*Platystrophia colbiensis precursor* Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 57, pl. 4, fig. 1.

Trenton (Cynthiana): Between Colby and Winchester, and also between Millersburg and Pleasant Valley, Kentucky.

**PLATYSTROPHIA COSTATA** Cumings. See *Platystrophia crassa*.

**Platystrophia crassa** (James).

- Orthis* (*Platystrophia*) *dentata*?? Meek (not Pander), Pal. Ohio, 1, 1873, p. 117, pl. 10, fig. 3.
- Orthis dentata* Miller, Cincinnati Quart. Jour. Sci., 1875, p. 27, 2.
- Orthis* (*Platystrophia*) *biforata dentata* Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 508, figs.
- Orthis costata* Miller (not Pander), Cincinnati Quart. Jour. Sci., 2, 1875, p. 33.
- Platystrophia costata* Cumings and Mauck, Amer. Jour. Sci., 4th ser., 14, 1902, p. 14, footnote.—Cumings, *ibid.*, 15, 1903, p. 38; p. 122, figs. 26, 27; 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 914, pl. 35, figs. 6, 6a.
- Orthis centrosa* Miller, N. A. Geol. Pal., 1889, p. 356.
- Orthis* (*Platystrophia*) *crassa* James, Cincinnati Quart. Jour. Sci., 1, 1874, p. 20.
- Platystrophia biforata* var. *crassa* Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 458, pl. 33, figs. 55, 56.—Whiteaves, Pal. Foss., 3, pt. 3, Geol. Surv. Canada, 1897, p. 178.
- Platystrophia crassa* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 223.—Grabau and Shimer, N. A. Index Fossils 1, 1907, p. 258, figs. 308a-b.—Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 59, pl. 4, figs. 5a, b.
- Maysville (Fairmount-Corryville): Cincinnati, Ohio, and vicinity.

**Platystrophia cypha** (James).

- Orthis* (*Platystrophia*) *cypha* James, Cincinnati Quart. Jour. Sci., 1, 1874, p. 20.
- Platystrophia cypha* Cumings, Amer. Jour. Sci., 4th ser., 15, 1903, p. 39, footnote.—Foerste, Amer. Geol., 31, 1903, p. 341; Bull. Sci. Lab. Denison Univ., 16, 1910, p. 61, pl. 4, fig. 10a-b; pl. 5, fig. 11; pl. 4, fig. 12; Ohio Nat., 12, 1912, p. 453, pl. 22, fig. 5.
- Platystrophia lynx* var. *cypha* Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 917.
- Maysville (Bellevue and Corryville): Warren County, etc., Ohio; Madison, Vevay, etc., Indiana.

**Platystrophia cypha conradi** Foerste.

- Platystrophia cypha conradi* Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, pl. 4, fig. 7; Ohio Nat., 12, 1912, p. 453, pl. 22, fig. 3.
- Platystrophia cypha* var. Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, pl. 3, fig. 5.
- Richmond (Arnheim): Near Smithville and Summit, Kentucky.

**Platystrophia cypha versaillesensis** Foerste.

- Platystrophia cypha versaillesensis* Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, pl. 4, fig. 11, 13.
- Richmond: Versailles, Indiana (Liberty); north of Hogan Creek, Indiana (Waynesville).

**Platystrophia daytonensis** (Foerste).

- Orthis biforata* var. *lynx* forma *daytonensis* Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 81, pl. 13, figs. 1-8.
- Orthis* (*Platystrophia*) *biforata* (part) Foerste, Geol. Surv. Ohio, 7, 1895, p. 579, pl. 25, fig. 8.
- Platystrophia daytonensis* Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 76, pl. 4, fig. 8.
- Upper Medinan: Dayton, Ohio; Hanover, Indiana; Cumberland Gap, Tennessee; Collinsville, Alabama (Brassfield); near Edgewood and Louisiana, Missouri; Thebes, Illinois (Edgewood).

**PLATYSTROPHIA FLABELLA** Hall. See *Orthis flabellites*.

PLATYSTROPHIA INFLATA James. See *Orthis acutilirata* senex.

**Platystrophia laticosta** (Meek).

*Orthis laticostata* James, Cat. Sil. Foss. Cincinnati Group, 1871, p. 10 (nom. nud.).—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 27.

*Orthis* (*Platystrophia*) *laticosta* Meek, Pal. Ohio, 1, 1873, p. 116, pl. 10, fig. 4.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 918, pl. 35, figs. 2, 2b.

*Orthis* (*Platystrophia*) *biforata* var. *laticosta* Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 509, figs.

*Platystrophia biforata* var. *laticosta* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 223, pl. 5B, figs. 5-9.

*Platystrophia lynx* var. *laticosta* Cumings and Mauck, Amer. Jour. Sci., 4th ser., 14, 1902, p. 14.—Cumings, *ibid.*, 15, 1903, p. 28, footnote p. 29, fig. 15a-e.

*Platystrophia laticosta* Cumings, Amer. Jour. Sci., 4th ser., 15, p. 30, fig. 16a-c, p. 122, fig. 26, 7, fig. 27.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 258.—Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, pl. 3, figs. 1a, b, 2. Maysville (Fairmount-Corryville): Cincinnati, Ohio, and vicinity.

?Richmond (Waynesville): Waynesville, Ohio.

**Platystrophia lynx** (Eichwald).

?*Terebratula lynx* Eichwald, Skizze von Podolis, 1830, p. 202.

*Delthyris lynx* (part) Hall, Pal. New York, 1, 1847, p. 133, pl. 32D, fig. 1.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 820, fig. 616.

*Orthis lynx* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 196, pl. 14, fig. 9a-p.—Hitchcock, Geol. Vermont, 1, 1862, p. 295, fig. 203.—Chapman, Canadian Jour., n. s., 7, 1862, p. 112, fig. 93; *ibid.*, 8, 1863, p. 199, fig. 185; Expos. Min. and Geol. Canada, 1864, p. 115, fig. 93; p. 171, fig. 185.—Safford, Geol. Tennessee, 1869, p. 275, fig. 12, 13.—Miller, Cincinnati Jour. Sci., 2, 1875, p. 25.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 155, fig.—Miller, N. A. Geol. Pal., 1889, p. 358, fig. 591.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 523, figs.

*Orthis biforata* Nicholson, Pal. Prov. Ontario, 1875, p. 16, fig. 5.

*Orthis* (*Platystrophia*) *lynx* Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 34, fig. 30.

*Platystrophia lynx* Roemer, Leth. geog., 1, Leth. Pal., Atlas, 1876, pl. 4, figs. 7a, b.—Shaler, Mem. Geol. Surv. Kentucky, 3d Mem., 1876, p. 43.—Zittel, Handb. Pal., 1, Munich, 1880, p. 675, fig. 505.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 310.—Cumings and Mauck, Amer. Jour. Sci., 4th ser., 14, 1902, p. 9, pls. 2, 3.—Cumings, Amer. Jour. Sci., 4th ser., 15, 1903, p. 8, fig. 3; p. 10, fig. 4a-c; p. 12, fig. 5; p. 13; p. 18; p. 19, figs. 7a-d''; p. 20; p. 21, fig. 8; p. 22, fig. 9; p. 24, fig. 10; p. 25, fig. 11; p. 26, fig. 12; p. 27, fig. 13; p. 28, figs. 14, 27.—Foerste, Amer. Geol., 31, 1903, p. 334 (loc. occ.).

Middle and Upper Ordovician: Various localities in the United States and Canada.

Observation.—The above references are to various undetermined species of *Platystrophia*.

PLATYSTROPHIA LYNX Cumings. See *Platystrophia moritura*.

PLATYSTROPHIA LYNX Hall and Clarke. See *Platystrophia biforata*.

PLATYSTROPHIA LYNX var. *CYPHA* Cumings. See *Platystrophia cypha*.

PLATYSTROPHIA LYNX var. *LATICOSTA* Cumings. See *Platystrophia laticosta*.

*PLATYSTROPHIA LYNX* var. *MORITURA* Cumings. See *Platystrophia moritura*.

*PLATYSTROPHIA LYNX* var. *PAUCIPLICATA* Cumings. See *Platystrophia pauciplicata*.

***Platystrophia moritura* (Cumings).**

*Platystrophia lynx* Cumings, Amer. Jour. Sci., 4th ser., 15, 1903, p. 24.

*Platystrophia lynx* var. *moritura* Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 920, pl. 35, fig. 5, 5a.

Richmond (Elkhorn): Near Richmond, Indiana.

***Platystrophia morrowensis* (James).**

*Orthis*(?) *morrowensis* James, Cincinnati Quart. Jour. Sci., 1, 1874, p. 21.

*Platystrophia morrowensis* Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 60, pl. 6, figs. 11a-e, 12a, b.

Maysville (Corryville): Morrow, Cincinnati, etc., Ohio.

*PLATYSTROPHIA OCCIDENTALIS* Hall. See *Hebertella alveata*.

***Platystrophia pauciplicata* (Cumings).**

*Platystrophia lynx* var. *pauciplicata* Cumings, Amer. Jour. Sci., 4th ser., 15, 1903, p. 23, fig. 9 bis.

Maysville (Fairmount): Cincinnati, Ohio.

*PLATYSTROPHIA PAUCIPLICATA* Foerste. See *Platystrophia unionensis*.

***Platystrophia ponderosa* Foerste.**

*Platystrophia ponderosa* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 225, pl. 4, fig. 14; Ohio Nat., 12, 1912, p. 453, pl. 22, fig. 11.

Maysville (McMillan) and Richmond (Arnheim, Waynesville): Cincinnati, Ohio, and neighboring localities in Ohio, Indiana, and Kentucky; central Tennessee; southwest Virginia, etc.

***Platystrophia ponderosa auburnensis* Foerste.**

*Platystrophia ponderosa auburnensis* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 226, pl. 4, fig. 15.

*Orthis* (*Platystrophia*) *biforata* var. *lynx* Meek, Pal. Ohio, 1, 1873, p. 144, pl. 10, fig. 1.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 509, figs.

*Platystrophia biforata* var. *lynx* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 202, 223, pl. 5B, figs. 1-4.

*Platystrophia lynx* Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 258, fig. 308c-d, 309.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 914, pl. 35, figs. 1, 1g, 7, 7c.—Hayes and Ulrich, U. S. Geol. Surv., folio 95, illustr. sheet, 1903, figs. 21, 22.

Maysville (Mount Auburn): Cincinnati, Ohio, and vicinity.

*Plesiotype*.—Cat. No. 35408, U.S.N.M. (Hayes and Ulrich).

***Platystrophia ponderosa stevensoni* Grabau.**

*Platystrophia ponderosa* var. *stevensoni* Grabau, Bull. Geol. Soc. Amer., 24, 1913, p. 453, pl. 12.

Cincinnati (Bays): Big Walker Mountain, Virginia.

Observation.—In all probability the same as *Orthorhynchula linneyi*.

***Platystrophia profundosulcata* (Meek).**

*Orthis* (*Platystrophia*) *laticosta* var. *profundosulcata* (James) Meek, Pal. Ohio, 1, 1873, p. 117, pl. 10, figs. 2a-d.

*Platystrophia profundosulcata* Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 58, pl. 6, figs. 15a-c.

Maysville (Mount Hope, Fairmount): Cincinnati, Ohio, and vicinity.

**Platystrophia regularis** Shaler.

*Platystrophia regularis* Shaler, Bull. Mus. Comp. Zool., 4, 1865, p. 67.

Gamachian (Ellis Bay) and Anticostian (Gun River): Junction Cliff, etc., Anticosti.

**Platystrophia reversata** (Foerste).

*Orthis biforata* var. *lynx* forma *reversata* Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 81, pl. 13, fig. 7.

*Orthis* (*Platystrophia*) *biforata* (part) Foerste, Geol. Ohio, 7, 1895, p. 579, pl. 25, fig. 7.

Upper Medinan (Brassfield): Dayton, Ohio.

**PLATYSTROPHIA SUBQUADRATA** Hall. See *Dinorthis* (*Plæsiomys*) *subquadrata*.

**PLATYSTROPHIA TRICENARIA** Hall. See *Orthis* *tricenaria*.

**Platystrophia unicostata** Cumings.

*Platystrophia unicostata* Cumings, Amer. Jour. Sci., 4th ser., 15, 1903, p. 31; p. 122, fig. 26, 8.—Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, pl. 4, fig. 6.

Maysville (Bellevue): Ohio County, Indiana.

**Platystrophia unionensis** Bassler (new name).

*Platystrophia pauciplicata* Foerste (not Cumings, 1903), Cincinnati Soc. Nat. Hist. Jour., 21, 1909, p. 25, pl. 1, fig. 15.

Clinton (West Union): West Union, Ohio.

**Platystrophia wallowayi** Foerste.

*Platystrophia wallowayi* Foerste, Ohio Nat., 12, 1912, p. 453, pl. 22, fig. 6.

Richmond (Arnheim): Walloway Creek, Marion County, Kentucky.

**PLECTAMBONITES** Pander.

Genotype: *P. planissima* Pander.

*Plectambonites* Pander, Beitrage zur Geognosie des Russ. Reiches, 1830, p. 90, pl. 3, figs. 8, 16; pl. 28, fig. 19.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 236, 295.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, pp. 413.—Hall and Clarke, 11th Ann. Rep. New York State Geol., 1894, p. 290.—Sardeson, Amer. Geol., 19, 1897, p. 181.—Grabau, Bull. New York State Mus., 45, 1901, p. 182; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 182.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 227.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, p. 892.

**PLECTAMBONITES** Ehlert. See *Leptæna* Dalman.

**PLECTAMBONITES ARCA** Shaler. See *Stropheodonta* (*Brachyprion*) *leda*.

**Plectambonites centricarinatus** Ruedemann.

*Plectambonites centricarinatus* Ruedemann, Bull. New York State Mus., 162, 1912, pl. 4, fig. 7.

Eden (Indian Ladder): Indian Ladder, Albany County, New York.

**Plectambonites curdsvillensis** Foerste.

*Plectambonites curdsvillensis* Foerste, Bull. Sci. Lab. Denison Univ., 1912, p. 122, pl. 10, figs. 15a, b.

Trenton (Curdsville): Glenn Creek Station, Woodford County, Kentucky.

**Plectambonites gibbosus** Winchell and Schuchert.

*Plectambonites gibbosa* Winchell and Schuchert, Amer. Geol., 9, 1892, p. 288; Geol. Minnesota, 3, 1893, p. 416, pl. 32, figs. 13–17.

*Leptæna gibbosa* Miller, N. A. Geol. Pal., 2d App., 1897, p. 761 (gen. ref.).

Trenton (Prosser): Mantorville, Old Concord, and near Cannon Falls, Minnesota.

**Plectambonites glaber** Shaler.

*Plectambonites glabra* Shaler, Bull. Mus. Comp. Zool., 1, 1865, p. 64.

*Plectambonites glaber* Shaler, Mem. Geol. Surv. Kentucky, 1, 1876, p. 29.

*Leptaena glabra* Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 294.

Anticostian: Island of Anticosti.

**Plectambonites minnesotensis** (Sardeson).

*Leptaena minnesotensis* Sardeson, Minnesota Acad. Nat. Sci., 3, 1892, p. 329, pl. 4, figs. 24, 25.

Trenton (Prosser): Goodhue County, etc., Minnesota.

**Plectambonites pisum** Ruedemann.

*Plectambonites pisum* Ruedemann, Bull. New York State Mus., 49, 1902, p. 19, pl. 1, figs. 8-20.—Bassler, Bull. Virginia Geol. Surv., 2a, 1909, pl. 3, figs. 17, 18.

Mohawkian: Rysedorph Hill and Moordener Kill, New York (Rysedorph); Pennsylvania, Maryland, and Virginia (Chambersburg).

**Plectambonites plicatellus** (Ulrich).

*Leptaena plicatella* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 1, 1879, p. 15, pl. 7, fig. 12.

*Plectambonites plicatella* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 15A, figs. 34, 35.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, p. 122, pl. 1, figs. 8a, b.

Eden: Cincinnati, Ohio, and vicinity (Fulton); New York (Indian Ladder).

**Plectambonites precosis** (Sardeson).

*Leptaena precosis* Sardeson, Minnesota Acad. Nat. Sci., 3, 1892, p. 329, pl. 4, figs. 26-28.

Richmond (Maquoketa): Fillmore County, Minnesota.

**Plectambonites productus** Hall and Clarke.

*Plectambonites producta* Hall and Clarke, Pal. New York, 8, pt. 2, 1895, p. 360, pl. 84, figs. 23-25; 48th Rep. New York State Mus., 2, p. 354, pl. 6, figs. 11, 12; 14th Rep. State Geol. New York for 1894, p. 354, pl. 6, figs. 11, 12.

Niagaran: Yellow Springs, Ohio.

**Plectambonites recedens** (Sardeson).

*Leptaena recedens* Sardeson, Minnesota Acad. Nat. Sci., 3, 1892, p. 330, pl. 4, figs. 29-32; Amer. Geol., 19, 1897, p. 182.

Richmond (Maquoketa): Fillmore County, Minnesota.

**PLECTAMBONITES RHOMBOIDALIS** Keyes. See *Leptaena rhomboidalis*.

**Plectambonites rugosus** (Meek).

*Leptaena rugosa* James, Cat. Cincinnati Group, 1871.

*Leptaena sericea* var. *rugosa* Meek, Pal. Ohio, 1, pt. 2, 1873, pl. 5, figs. 3f, g, h.

*Plectambonites rugosa* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, p. 123, pl. 1, figs. 7a-c; pl. 10, figs. 7a-d.

*Leptaena aspera* James, Cincinnati Quart. Jour. Sci., 1, 1874, p. 151.

*Plectambonites sericeus* var. *asper* Ruedemann, Bull. New York State Mus., 49, 1901, p. 18, pl. 1, figs. 6, 7; *ibid.*, 8, p. 525.

Eden: Cincinnati, Ohio, and vicinity.

**Plectambonites rugosus clarksvillensis** Foerste.

*Plectambonites rugosus clarksvillensis* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, p. 127.

Richmond (Waynesville and Liberty): Ohio, Indiana, and Kentucky.



**Plectambonites saxeus** (Sardeson).

*Leptæna saxea* Sardeson, *Minnesota Acad. Nat. Sci.*, 3, 1892, p. 330, pl. 4, figs. 33-35.

Richmond (Maquoketa): Bristol, Minnesota.

**Plectambonites sericeus** (Sowerby).

*Leptæna sericea* Sowerby, *Murchison's Sil. Sys.*, 1839, pl. 19, figs. 1, 2.—Hall, *Pal. New York*, 1, 1847, pp. 110, 287, pl. 31B, fig. 2; pl. 79, fig. 3; *ibid.*, 2, 1852, p. 59, pl. 21, fig. 1.—Billings, *Canadian Nat. Geol.*, 1, 1856, p. 41, fig. 2.—Rogers, *Geol. Pennsylvania*, 2, pt. 2, 1858, p. 818, fig. 599.—Emmons, *Man. Geology*, 1860, p. 99, fig. 88.—Hitchcock, *Geol. Vermont*, 1, 1861, p. 294, fig. 200.—Chapman, *Canadian Jour.*, n. s., 7, 1862, p. 112, fig. 97; *ibid.*, 8, 1863, p. 205, fig. 204.—Billings, *Geol. Canada*, 1863, p. 163, fig. 139.—Chapman, *Expos. Min. Geol. Canada*, 1864, p. 166, fig. 97; p. 177, fig. 204.—Safford, *Geol. Tennessee*, 1869, p. 275, fig. 1.—Davidson, *Mon. British Sil. Brach.*, *Pal. Soc.*, 1871, p. 323, pl. 48, figs. 10-19.—Meek, *Pal. Ohio*, 1, 1873, p. 70, pl. 5, fig. 3.—Miller, *Cincinnati Quart. Jour. Sci.*, 2, 1875, p. 57.—?White, *Wheeler's Expl. Surv. west of 100th Merid.*, 4, 1875, p. 70, pl. 4, fig. 7.—Kayser, *Pal. Suppl.*, 3, 1876, p. 21, pl. 3, fig. 19.—Hall, 2d Ann. Rep. *New York State Geol.*, 1883, pl. 46, figs. 25-29.—Chamberlin, *Geol. Wisconsin*, 1, 1883, p. 155, fig.—Hall, 35th Rep. *New York State Mus. Nat. Hist.*, 1884, pl. 22, fig. 3.—Lesley, *Geol. Surv. Pennsylvania*, Rep. P 4, 1889, p. 328, figs.—Miller, *N. A. Geol. Pal.*, 1889, p. 348, fig. 570.—Foerste, *Proc. Boston Soc. Nat. Hist.*, 24, 1889, p. 293.—Keyes, *Geol. Surv. Missouri*, 5, 1895, p. 75, pl. 39, fig. 9.—Kayser, *Zeit. d. d. geol. Gesell.*, 49, 1897, p. 283.

*Strophomena sericea* Conrad, 3d Ann. Rep. *Geol. Surv. New York*, 1840, p. 201.—Emmons, *Geol. New York*, Rep. 2d Dist., 1842, p. 294.—Owen, *Amer. Jour. Sci. and Arts*, 47, 1844, p. 366, fig. 1, p. 369; *Geol. Expl. Iowa, Wisconsin, Illinois*, 2d ed., 1844, p. 84, pl. 17, fig. 5.—Emmons, *Amer. Geology*, 1, pt. 2, 1855, p. 199, pl. 11, figs. 6a-f.

*Strophomena semiovalis* Vanuxem, *Geol. New York*, Rep. 3d Dist., 1842, p. 47.

*Plectambonites sericea* Shaler, *Mem. Surv. Kentucky*, 1, 1876, p. 28.—Hall and Clarke, *Pal. New York*, 8, pt. 1, 1892, pl. 15, figs. 25-29.—Winchell and Schuchert, *Minnesota Geol. Surv.*, 3, 1893, p. 414, pl. 32, figs. 10-12.—Whiteaves, *Pal. Foss.*, 3, pt. 3, 1897, p. 174.—Grabau, *Bull. Buffalo Soc. Nat. Sci.*, 7, 1901, p. 183, fig. 89; *Bull. New York State Mus.*, 45, 1901, p. 183, fig. 89.—Weller, *Geol. Surv. New Jersey*, *Pal.*, 3, 1903, p. 149, pl. 9, figs. 14, 15; p. 216, pl. 16, figs. 2, 3.—Grabau and Shimer, *N. A. Index Fossils*, 1, 1907, p. 227, fig. 274a-b.—Cumings, 32d Ann. Rep. *Dep. Geol. Nat. Res. Indiana*, 1908, p. 922, pl. 36, figs. 1-1c.—Bassler, *Bull. Virginia Geol. Surv.*, 2a, 1909, pl. 14, figs. 1, 2.

*Plectambonites cf. sericeus* Kindle and Breger, 28th Ann. Rep. *Dep. Geol. Nat. Res. Indiana*, 1904, p. 431, pl. 2, fig. 22.

*Plectambonites sericeus typus* Ruedemann, *Bull. New York State Mus.*, 162, 1912, pl. 4, figs. 3-6 (var. *jugata* suggested in case distinct).

Mohawkian and Cincinnati: England; various localities in the United States and Canada.

Observation.—The above citations undoubtedly refer to several distinct species. *Plesiotypes*.—Cat. No. 8552, U.S.N.M. (White).

**PLECTAMBONITES SERICEUS** var. **ASPER** Ruedemann. See *Plectambonites rugosus*.

**PLECTAMBONITES SERICEUS** **TYPUS** Ruedemann. See *Plectambonites sericeus*.

**PLECTAMBONITES TENERA** Shaler. See *Plectambonites transversalis*.

**Plectambonites tennesseensis** Foerste.

*Plectambonites tennesseensis* Foerste, Jour. Geol., 11, 1903, p. 708; Bull. Sci. Lab. Denison Univ., 14, 1909, p. 83, pl. 1, figs. 5 A-E.  
Niagaran (Waldron): Iron City, Newsom, etc., Tennessee.

**Plectambonites transversalis** (Wahlenberg).

*Anomites transversalis* Wahlenberg, Act. Soc. Upsaliensis, 3, 1821, p. 64.  
*Strophomena elegantula* Hall, Geol. New York, Rep. 4th Dist., 1843, p. 72, fig. 1.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 1126, fig.  
*Strophomena transversalis* Hall, *ibid.*, 1843, p. 105, fig. 4.—Owen, Amer. Jour. Sci. Arts, 48, 1845, p. 312, fig. 4.  
*Leptæna transversalis* Dalman, Kongl. Vet.-Akad. Handl., 1828, p. 109, pl. 1, fig. 4.—Hall, Pal. New York, 2, 1852, p. 256, pl. 53, fig. 5.—Billings, Canadian Nat. Geol., 1, 1856, p. 138, pl. 2, figs. 14, 15.—Safford, Geol. Tennessee, 1869, p. 315, fig. 12.—Davidson, Mon. British Sil. Brach. Pal. Soc., 1871, p. 318, pl. 48, figs. 1-9.—Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 46, figs. 34-36.

*Plectambonites tenera* Shaler, Bull. Mus. Comp. Zool., 4, 1865, p. 64.

*Leptæna transversalis* var. *elegantula* Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 294, pl. 6, fig. 6.

*Plectambonites transversalis* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 298, pl. 15, figs. 34-36.—Foerste, Geol. Ohio, 7, 1895, p. 566, pl. 25, fig. 5; pl. 30, fig. 13; pl. 31, fig. 6.—Grabau, Bull. New York State Mus., 45, 1901, p. 183, fig. 98; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 183, fig. 90.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 251.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 227, fig. 275.

Clinton-Niagaran: Europe; New York, Indiana, Wisconsin, Tennessee, etc.; Ontario; New Brunswick and Anticosti; South America.

**Plectambonites transversalis alabamensis** (Foerste).

*Leptæna transversalis* var. *alabamensis* Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 296, pl. 5, fig. 9.

*Plectambonites transversalis alabamensis* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 311.

Clinton: Collinsville, Alabama.

**Plectambonites transversalis prolongatus** (Foerste).

*Leptæna prolongata* Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 79, pl. 13, fig. 5.

*Leptæna transversalis* var. *prolongata* Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 297, pl. 5, fig. 13.

*Plectambonites transversalis prolongatus* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 311.

Upper Medinan (Brassfield): Dayton, Ohio; Wildwood Station, Georgia.

**PLECTOCERAS** Hyatt.

Genotype: *Nautilus jason* Billings.

*Plectoceras* Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1883, p. 268; Amer. Phil. Soc. Proc., 32, 1894, p. 499.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 776.—Whiteaves, Geol. Surv. Canada Pal. Foss., 3, pt. 4, 1906, p. 299.—Ruedemann, Bull. New York State Mus., 90, 1906, p. 482.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 72.

**Plectoceras blekmoreanum** (Whitfield).

*Lituites Bickmoreanus* Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1885, p. 191, pl. 21, figs. 1-3.—Newell, Proc. Boston Soc. Nat. Hist., 23, p. 485 (loc. occ.).—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 355, figs.

**Plectoceras bickmoreanum**—Continued.

- Lituities (Ophidioceras) bickmoreanus Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 473, pl. 25, fig. 1.  
 Plectoceras bickmoreanum Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 73.  
 Niagaran: Wabash, Delphi, Huntington, etc., Indiana.  
*Plesiotype*.—Cat. No. 52946, U.S.N.M.

**Plectoceras bondi** (Safford).

- Cyrtoceras Bondi Safford, Geol. Tennessee, 1869, p. 290, pl. 4 (G. 3), fig. 3a-d.  
 Plectoceras bondi Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 73.  
 Stones River (Murfreesboro): Central Tennessee.

**Plectoceras halli** (Foord).

- Inachus undatus (part) Conrad, in Emmon's Geology, New York, pt. 2, Surv. 2d Geol. Dist., 1842, p. 394, No. 104, "fig. 2, edge view."  
 Lituities undatus (part) Hall, Pal. New York, 1, 1847, p. 52, pl. 13, figs. 1a, 1b.—Emmons, Amer. Geol., pt. 2, 1855, p. 146, pl. 5, fig. 14a.—Billings, Geol. Canada, 1863, pp. 156, 951.  
 Cryptoceras undatum Chapman, Canadian Jour., n. s., 2, 1857, p. 267; Ann. Mag. Nat. Hist., 2d ser., 20, p. 107.  
 Trocholites undatus (part) Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1883, p. 267.  
 Trochoceras halli Foord, Cat. Sil. Foss. Ceph. British Mus., pt. 2, 1891, p. 42, figs. 4a-b.  
 Plectoceras halli Whiteaves, Ottawa Nat., 17, 1903, p. 119, 120, 161; Geol. Surv. Canada Pal. Foss., 3, pt. 4, 1906, p. 302, pl. 35, figs. 3, 4, 4a.  
 Plectoceras obscurum Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 445.  
 Black River: Lorette, near Quebec, and near Ottawa, Canada.

**Plectoceras jason** (Billings).

- Nautilus Jason Billings, Canadian Nat. Geol., 4, 1859, p. 464.  
 Plectoceras Jason Hyatt, Boston Soc. Nat. Hist. Proc. 22, 1884, p. 268; Amer. Phil. Soc. Proc., 32, 1894, p. 499.—Whiteaves, Ottawa Nat., 17, 1903, p. 120.—Ruedemann, Bull. New York State Mus., 90, 1906, p. 484, pl. 24, fig. 1; pls. 29-31, figs. 42-44.—Whiteaves, Geol. Surv. Canada Pal. Foss., 3, pt. 4, 1906, p. 301, pl. 36, figs. 1, 2.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 73, fig. 1285.—Ruedemann, Bull. New York State Mus., 158, 1912, p. 141, pl. 1.  
 Chazyan: Mingan Islands Canada (Mingan); Valcour Island, New York (Crown Point).

**PLECTOCERAS OBSCURUM** Hyatt. See *Plectoceras halli*.

**Plectoceras tyrans** (Billings).

- Nautilus tyrans Billings, Canadian Nat. Geol., 4, 1859, p. 465.  
 Plectoceras tyrans Schuchert and Twenhofel, Bull. Geol. Soc. Amer., 21, 1910, p. 691.  
 Chazyan (Mingan): Mingan Islands, Canada.

**Plectoceras? undatum** (Conrad).

- Inachus undatus (pars) (Conrad MS.) Emmons, Nat. Hist. New York, Geol., 2, 1842, p. 394, fig. 104.  
 Lituities undatus Hall (part), Pal. New York, 1, 1847, p. 52, pl. 13, fig. 1; pl. 13 (bis).—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 146, pl. 5, fig. 14; Man. Geol., 1860, p. 97, fig. 86.—Chapman, Canadian Jour., n. s., 8, 1863, p. 23, fig. 135; p. 198, fig. 173; Expos. Min. Geol. Canada, 1864, p. 131, fig. 135; p. 170, fig. 173.

**Plectoceras? undatum**—Continued.

*Trocholites undatus* (part) Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1883, p. 267.  
*Eurystomites undatum* Hyatt, Proc. Amer. Philos. Soc., 22, 1894, p. 445.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 69, fig. 1279.

*Plectoceras undatum* Whiteaves, Ottawa Nat., 17, 1903, p. 121; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 305, pl. 37.

*Euomphalus catilloides* Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 230, figs.

Black River: Watertown, New York (Watertown); Kingston, Ontario.

**Plectoceras undatum occidentale** (Hall).

*Lituites undatus* var. *occidentalis* Hall, Rep. Supt. Geol. Surv. Wisconsin, 1861, p. 38.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 63, pl. 10, fig. 7; pl. 11; pl. 12, fig. 3.

Black River (Platteville): Beloit, Wisconsin; Dixon and Rockton, Illinois; Minneapolis, etc., Minnesota.

**PLECTORTHIS** Grabau and Shimer (part). See *Eoorthis* Walcott.

**PLECTORTHIS** Hall and Clarke.

Genotype: *Orthis plicatella* Hall.

*Orthis* (group of *O. plicatella*) Hall, Bull. Geol. Soc. Amer., 1, 1889, p. 20.

*Plectorthis* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 194, 221.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 435.—Hall and Clarke, 11th Ann. Rep. New York State Geol., 1894, p. 266.—Cumings, Amer. Jour. Sci., 4th ser., 15, 1903, p. 11.—Walcott, Proc. U. S. Nat. Mus., 28, 1905, p. 257.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 893.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 251.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 381.

*Austinella* (new subgenus of *Dinorthis*) Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 225. (Genotype: *Orthis kankakensis* McChesney.)

*Cyclocœlia* Foerste (not Dujardin), Bull. Sci. Lab. Denison Univ., 14, 1909, p. 227.

*Encuclodema* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, p. 139. (Genotype: *Orthis sordida* Hall.)

**Plectorthis æquivalvis** (Hall).

*Orthis æquivalvis* Hall (not Davidson, 1847), Pal. New York, 1, 1847, p. 120, pl. 32, fig. 6.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 196, pl. 9, figs. 6a-c.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 507, figs.

*Plectorthis æquivalvis* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 194-221.—Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 46, pl. 2, figs. 13a, b; pl. 6, figs. 17a, b.

Maysville (Fairmount): Cincinnati, Ohio, and vicinity.

**Plectorthis æquivalvis latior** Foerste.

*Plectorthis æquivalvis latior* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1910, pl. 6, fig. 3, p. 46.

Maysville (Fairmount): Cincinnati, Ohio.

**Plectorthis æquivalvis pervagata** Foerste.

*Plectorthis æquivalvis-pervagata* Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, pl. 6, fig. 2, p. 46.

Maysville (Fairmount): Cincinnati, Ohio.

**Plectorthis (Encuclodema) crassiplicata** (Foerste).

*Cyclocœlia crassiplicata* Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 36, pl. 3, figs. 16a-c; pl. 6, figs. 9a-c, 10a-c.

Maysville (Fairmount): Cincinnati, Ohio.

*Plectorthis dichotoma* Hall and Clarke. See *Plectorthis neglecta*.

*Plectorthis dichotoma* Hall.

*Orthis dichotoma* Hall, Pal. New York, 1, 1847, p. 125, pl. 32, fig. 13.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 195, pl. 9, fig. 13.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 513, figs.

*Plectorthis dichotoma*(?) Foerste, Bull. Sci. Lab. Denison Univ., 14, 1910, pl. 5, fig. 16; Bull. 16, p. 49.

Maysville: Cincinnati, Ohio.

Observation.—This species may be the same as *Plectorthis neglecta*, but as the type is lost the name may as well be abandoned.

*Plectorthis ella* Hall and Clarke. See *Plectorthis* (*Encyclodema*) *sordida*.

*Plectorthis exfoliata* (Raymond).

*Hebertella exfoliata* Raymond, Amer. Jour. Sci., 20, 1905, p. 370.

*Plectorthis exfoliata* Raymond, Ann. Carnegie Mus., 7, 1911, p. 238, pl. 35, figs. 11, 12.

Chazy (Day Point): Chazy, Valcour, and Valcour Island, New York; Isle la Motte, Vermont.

*Plectorthis fissicosta* (Hall).

*Orthis fissicosta* Hall, Pal. New York, 1, 1847, p. 121, pl. 32, fig. 7.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 195, pl. 9, fig. 7a, b.—Meek, Pal. Ohio, 1, 1873, p. 106, pl. 8, fig. 6.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 30.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 516, figs.

*Plectorthis fissicosta* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 194, 221.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 252, fig. 300c-d.—Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 221, pl. 4, figs. 5a, 5b; *ibid.*, 16, 1910, p. 48, pl. 6, fig. 4; *ibid.*, 17, 1912, p. 130, pl. 8, fig. 4.

Maysville (Fairview): Cincinnati, Ohio, and vicinity.

*Plectorthis fissicosta triplicatella* (Meek).

*Orthis triplicatella* Meek, American Jour. Sci., 4, 1872, p. 281; Pal. Ohio, 1, 1873, p. 109, pl. 8, fig. 8.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 31.

*Orthis plicatella* var. *triplicatella* Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 531, figs.

*Plectorthis triplicatella* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 194, 221.

*Plectorthis plicatella* var. *triplicatella* Cumings, 32d Ann. Rep., Dep. Geol. Nat. Res. Indiana, 1908, p. 925, pl. 36, figs. 4-4b.

*Plectorthis fissicosta* var. *triplicatella* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 222.

Maysville (Fairmount): Cincinnati, Ohio, and vicinity.

*Cotypes*.—Cat. No. 15945, U.S.N.M.

*Plectorthis jamesi* (Hall).

*Orthis jamesi* Hall, 14th Rep. New York State Cab. Nat. Hist., 1861, p. 89.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 33.—Hall and Whitfield, Pal. Ohio, 2, 1875, p. 77, pl. 1, figs. 21, 22.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 521, figs.

*Plectorthis jamesi* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 194, 221.—Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 50, pl. 2, figs. 9a, b.

Maysville (Corryville): Cincinnati, Ohio, and vicinity.

*Plectorthis* (*Austinella*) *kankakensis* (McChesney).

*Orthis kankakensis* McChesney, New Pal. Fossils, 1861, p. 77; Trans. Chicago Acad. Sci., 1, 1868, p. 29, pl. 9, fig. 3.

**Plectorthis (Austinella) kankakensis**—Continued.

*Plectorthis kankakensis* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 221, pl. 5, figs. 24, 25.

*Austinella kankakensis* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 224 (gen. ref.).

Richmond (Fernvale): Wilmington, Illinois.

**Plectorthis neglecta** (James).

*Orthis neglecta* James, Paleontologist, 4, 1879, p. 26.

*Plectorthis dichotoma* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 221, pl. 5, fig. 21.

*Plectorthis neglecta* Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 52, pl. 6, figs. 1a-e.

Maysville (Mount Hope): Cincinnati, Ohio, and vicinity.

Observation.—See *Plectorthis dichotoma* for a possible synonym.

PLECTORTHIS (ERIDORTHIS) NICKLESI Foerste. See *Hebertella (Eridorthis) nicklesi*.

**Plectorthis plicatella** (Hall).

*Orthis plicatella* Hall, Pal. New York, 1, 1847, p. 122, pl. 32, fig. 9.—Billings(?), Geol. Canada, 1863, p. 165, fig. 145.—Meek, Pal. Ohio, 1, 1873, p. 108, pl. 8, fig. 7.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 30.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 193, pl. 9, figs. 9a, b.—Shaler, Mem. Geol. Surv. Kentucky, 1, 1876, p. 34.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 155.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 530, figs.

*Orthis (Plectorthis) plicatella* Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 156.

*Plectorthis plicatella* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 221, pl. 5, figs. 18-20.—Ruedemann, Bull. New York State Mus., 49, 1901, p. 25.—Raymond, Bull. Amer. Pal., 3, 1902, p. 304, pl. 19, figs. 5, 6.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 152, pl. 9, figs. 22-24; p. 216, pl. 16, fig. 6.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 252, fig. 301d-f.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 925, pl. 36, figs. 3-3f.—Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 49, pl. 6, fig. 5a-b.

Maysville (Fairmount): Cincinnati, Ohio, and vicinity.

Observation.—Some of the above citations may include the Trenton variety of the species.

**Plectorthis plicatella trentonensis** Foerste.

*Orthis (Plectorthis) plicatella* Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 436, pl. 33, figs. 5-7.

*Plectorthis plicatella* var. *trentonensis* Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 49.

Trenton (Prosser): Kenyon, etc., Minnesota.

PLECTORTHIS PLICATELLA VAR. TRIPlicateLLA Cumings. See *Plectorthis fissicosta triplicatella*.

PLECTORTHIS (ERIDORTHIS) ROGERSSENSIS Foerste. See *Hebertella (Eridorthis) rogersensis*.

**Plectorthis (Austinella) scovillei** (Miller).

*Orthis scovilli* Miller, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 40, pl. 1, fig. 5.

*Hebertella scovilli* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 222.

*Dinorthis scovillei* Foerste, Amer. Geol., 31, 1903, p. 340.

*Austinella scovillei* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 224; 17, 1912, p. 130, pl. 8, figs. 8a-c.

Richmond (Waynesville): Oregonia, Ohio.

**Plectorthis (Encucloclodema) sectostriata** (Ulrich).

Orthis(?) sectostriata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 15, pl. 7, fig. 11.

Plectorthis? sectostriata Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 221.

Cyclococlia sectostriata Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 227 (gen. ref.); 16, 1910, p. 37, pl. 3, fig. 15a, b.

Maysville (Fairmount): Cincinnati, Ohio, and vicinity.

**Plectorthis (Encucloclodema) sordida** (Hall).

Orthis sordida Hall, Pal. New York, 1, 1847, p. 148.

Cyclococlia sordida Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 227; 16, 1910, p. 36, pl. 2, fig. 10; pl. 6, fig. 8a, b.

Orthis ella Hall, 13th Rep. New York State Cab. Nat. Hist., 1861, p. 121.

Orthis? ella Hall, 15th Rep., *ibid.*, 1862, pl. 2, figs. 6-8; 24th Rep., *ibid.*, 1872, pl. 7, fig. 21.—Meek, Pal. Ohio, 1, 1873, p. 105, pl. 8, fig. 9.—Hall and Whitfield, *ibid.*, 2, 1875, p. 76, pl. 1, fig. 20.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 32.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 514, figs.

Plectorthis? ella Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 221, pl. 5, figs. 22, 23.

Plectorthis ella Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, p. 924, pl. 36, figs. 2-2c.

Cyclococlia ella Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 227; 16, 1910, pl. 2, figs. 11, 12.

Maysville (Fairmount): Cincinnati, Ohio, and vicinity.

**Plectorthis (Encucloclodema) sordida multiplicata** Foerste.

Cyclococlia sordida multiplicata Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 36, pl. 6, figs. 6a-d, 7a-d.

Maysville (Fairmount): Cincinnati, Ohio.

**PLECTORTHIS TRIPlicateLLA** Hall and Clarke. See *Plectorthis fissicosta triplicatella*.

**Plectorthis (Austinella) whitfieldi** (N. H. Winchell).

Orthis whitfieldi N. H. Winchell, 9th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1881, p. 115.

Orthis pectinella Whitfield (part), Geol. Wisconsin, 4, 1882, p. 259, pl. 12, fig. 8.

Plectorthis whitfieldi Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 221, pl. 5, fig. 26.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 252, fig. 301g-i.

Orthis (Plectorthis) whitfieldi Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 437, pl. 33, figs. 8-13.

Austinella whitfieldi Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 244 (gen. ref.); 17, 1912, p. 131, pl. 8, fig. 9.

Plectorthis sp. cf. whitfieldi Ruedemann, Bull. New York State Mus., 163, 1912, pl. 4, fig. 8.

Richmond (Maquoketa): Spring Valley and Granger, Minnesota; Delafield, Wisconsin; Lattners, Iowa; Savannah, Illinois.

**PLETHOCARDIA** Ulrich.

Genotype: *P. umbonata* Ulrich.

Plethocardia Ulrich, 19th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1892, p. 243.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 701.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 575.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 416.

**Plethocardia? cordiformis** (Billings).

*Cyrtodonta cordiformis* Billings, Canadian Nat. Geol., 3, 1858, p. 437; Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 185; Geol. Canada, Geol. Surv. Canada, 1863, p. 147, fig. 103a, b.

*Plethocardia? cordiformis* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 577 (gen. ref.).  
*Cypricardites cordiformis* Miller, N. A. Geol. Pal., 1889, p. 476 (gen. ref.).  
 Black River: St. Josephs Island, Lake Huron.

**Plethocardia suberecta** Ulrich.

*Plethocardia suberecta* Ulrich, 19th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1892, p. 245, fig. 29; Geol. Minnesota, 3, pt. 2, 1894, p. 577, pl. 40, figs. 25-27.  
 Trenton (Prosser): Near Cannon Falls, Minnesota.  
*Holotype*.—Cat. No. 46278, U.S.N.M.

**Plethocardia umbonata** Ulrich.

*Plethocardia umbonata* Ulrich, 19th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1892, p. 244, fig. 28; Geol. Minnesota, 3, pt. 2, 1894, p. 576, pl. 40, figs. 22-24.—  
 Miller, N. A. Geol. Pal., 1st App., 1892, p. 701, fig. 1259.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 416, fig. 537.  
 Black River: Six miles south of Cannon Falls, Minnesota (Decorah); Mercer County, Kentucky (Lowville).  
*Holotype*.—Cat. No. 46279, U.S.N.M.

**PLETHOMYTILUS** Hall.Genotype: *P. ponderosa* Hall.

*Plethomytilus* Hall, Pal. New York, 5, pt. 1, Lam., 1883, p. 4; 1st Rep. State Geol. New York, 1884, p. 15.—Frech, Zeits. d. d. geol. Gesell., 40, 1888, p. 364.—Miller, N. A. Geol. Pal., 1889, p. 503.—Whidborne, Mon. Dev. Fauna South England, 2, Pal. Soc., 1892, p. 52.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 218.

**Plethomytilus euneatus** Kindle and Breger.

*Plethomytilus euneatus* Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 451, pl. 10, fig. 9.  
 Niagara: Georgetown, Indiana.

**PLETHOPELTIS** Raymond.Genotype: *Agraulos saratogensis* Walcott.

*Plethopeltis* Raymond, Bull. Victoria Mem. Mus., 1, 1913, p. 64.

**Plethopeltis armatus** (Billings).

*Bathyurus armatus* Billings, Canadian Nat. Geol., 5, 1860, p. 319, fig. 23; Geol. Canada, Geol. Surv. Canada, 1863, p. 238, fig. 273; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 411, fig. 392.  
*Plethopeltis armatus* Raymond, Bull. Victoria Mem. Mus., 1, 1913, p. 65, pl. 7, fig. 18.  
 Ozarkian? (Levis—erratics): Point Levis, Quebec.

**Plethopeltis saratogensis** (Walcott).

*Bathyurus armatus* Walcott, 32d Ann. Rep. New York State Mus., 1879, p. 131.  
*Ptychoparia saratogensis* Dwight, Trans. Vassar Bros. Inst., 4, 1887, pp. 207-208.  
*Ptychoparia (Agraulos) saratogensis* Walcott, Bull. U. S. Geol. Surv., 30, 1886, p. 21.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 844, figs. 14.—Weller, Geol. Surv. New Jersey, Rep. Pal., 3, 1903, pp. 118-119, pl. 1, figs. 7-9.—Walcott, Smiths. Misc. Coll., 57, 1912, p. 269, pl. 43, figs. 11-15a.  
*Plethopeltis saratogensis* Raymond, Bull. Victoria Mem. Mus., 1, 1913, p. 64.  
 Upper Cambrian or Ozarkian: Saratoga Springs and south of Poughkeepsie, New York (Hoyt); Blairstown, New Jersey (Kittatinny).  
*Cotypes*.—Cat. No. 23863, U.S.N.M.



- PLETHOSPIRA** Ulrich. Genotype: *Holopea cassina* Whitfield.  
*Plethospira* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, pp. 958, 1008.
- Plethospira arenaria*** (Billings).  
*Murchisonia arenaria* Billings, Canadian Nat. Geol., 4, 1859, p. 359, fig. 9; Geol. Canada, 1863, p. 120, fig. 33.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 426, fig.  
*Holopea arenaria* Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 310, pl. 25, fig. 5.—Seely, Vermont State Geol. Rep., 7, pl. 59, 1910, fig. 5.  
*Plethospira arenaria* Ulrich, Geol. Minnesota, 3, 1897, pt. 2, p. 1009 (gen. ref.).  
 Canadian (Beekmantown): Godmanchester, Canada; Fort Cassin, Vermont.
- Plethospira cassina*** (Whitfield).  
*Holopea Cassina* Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 310, pl. 25, figs. 6, 7.—Seely, Vermont State Geol. Rep., 7, 1910, pl. 59, figs. 6, 7.  
*Plethospira cassina* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1009, fig. 7a.  
 Canadian (Beekmantown): Fort Cassin, Vermont.  
*Plesiotype*.—Cat. No. 28137, U.S.N.M. (Ulrich).
- Plethospira hyale*** (Billings).  
*Murchisonia hyale* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 33 (adv. sheets, 1862).  
*Plethospira hyale* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1009 (gen. ref.).—Raymond, Ann. Carnegie Mus., 4, 1908, p. 217.  
 Chazyan or Black River: Phillipsburg, Quebec.
- Plethospira semele*** (Hall).  
*Pleurotomaria semele* Hall, Geol. Rep. Wisconsin, 1861, p. 36.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 61, pl. 8, figs. 8-10.  
*Plethospira semele* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1010, pl. 70, figs. 8-10.  
 Richmond (Maquoketa): Maquoketa Creek and Graf, Iowa.  
*Plesiotype*.—Cat. No. 45956, U.S.N.M. (Ulrich and Scofield).
- Plethospira striata*** Ulrich.  
*Plethospira striata* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1011, pl. 70, fig. 7.  
*Pleurotomaria striata* Miller, N. A. Geol. Pal., 2d App., 1897, p. 769 (gen. ref.).  
 Richmond (Waynesville): Hanover, Butler County, Ohio.  
*Holotype*.—Cat. No. 45957, U.S.N.M.
- PLEURACANTHUS** Milne-Edwards. See *Dalmanites* Barrande.
- PLEUROCYSTIS** Haeckel. See *Pleurocystites* Billings.
- PLEUROCYSTITES** Billings. Genotype: *P. squamosus* Billings.  
*Pleurocystites* Billings, Canadian Jour., 2, 1854, p. 251; Geol. Surv. Canada, Rep. Progr. for 1853-1856, 1857, p. 284.—Chapman, Canadian Jour., n. s., 2, 1857, p. 303.—Billings, Geol. Surv. Canada, dec. 3, 1858, p. 46.—Hall, Pal. New York, 3, 1859, p. 152.—Chapman, Expos. Min. Geol. Canada, 1864, p. 109.—Billings, Amer. Jour. Sci. Arts, 2d ser., 48, 1869, p. 77; Canadian Nat., n. s., 4, 1869, p. 288, fig. 5; Ann. Mag. Nat. Hist., 4th ser., 5, 1870, p. 260; Pal. Foss., Geol. Surv. Canada, 2, pt. 1, 1874, p. 97, figs. 54, 55; p. 98.—Zittel, Handb. Pal., 1, 1879, p. 422.—Miller, N. A. Geol. Pal., 1889, p. 272.—Jaekel, Stammesg. Pelmat., 1, Thecoida u. Cystoidea, Berlin, 1899, p. 231.—Zittel-Eastman Textb. Pal., 1, 1900, p. 186.—Zittel, Grundzuge Pal., 1, 1910, p. 187.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 465.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 154.

**PLEUROCYSTITES**—Continued.

*Pleurocystis* Carpenter, Jour. Linn. Soc. Zool., 24, 1891, p. 12.—Haeckel, Amphor. u. Cystoid, 1896, p. 44, pl. 2, figs. 15, 16.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 64, fig. 34.

***Pleurocystites anticostiensis*** Billings.

*Pleurocystites anticostiensis* Billings, Geol. Surv. Canada, Rep. Progress for 1853–1856, 1857, p. 288; Geol. Surv. Canada, dec. 3, 1858, p. 52, pl. 1, fig. 3; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 8.

*Pleurocystites squamosus* var. *anticostiensis* Jaekel, Stammesgesch. d. Pelmat., 1899, p. 234.

*Pleurocystis anticostiensis* Bather, Trans. Roy. Soc. Edinburgh, 49, pt. 2, 1913, p. 468.

Richmond (Charleton): Charleton Point, Anticosti.

***Pleurocystites elegans*** Billings.

*Pleurocystites elegans* Billings, Geol. Surv. Canada, Rep. Progr. for 1853–1856, 1857, p. 287; Geol. Surv. Canada, dec. 3, 1858, p. 51, pl. 2, figs. 2a–c.—Chapman, Canadian Jour., n. s., 4, 1859, p. 45.—Billings, Trans. Ottawa Field Nat. Club, 1, 1881, p. 34.—Jaekel, Stammesgesch. d. Pelmat., 1899, p. 234.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 466.

*Pleurocystis elegans* Bather, Trans. Roy. Soc. Edinburgh, 49, 1913, p. 466, fig. 67. Trenton: Ottawa, Ontario.

***Pleurocystites exornatus*** Billings.

*Pleurocystites exornatus* Billings, Geol. Surv. Canada, Rep. Progr. for 1853–1856, 1857, p. 287; Geol. Surv. Canada, dec. 3, 1858, p. 52.—Chapman, Canadian Jour., n. s., 4, 1859, p. 45.

*Pleurocystites filitextus* var. *exornata* Jaekel, Stammesgesch. Pelmat., 1, 1899, p. 235.

*Pleurocystis exornata* Bather, Trans. Roy. Soc. Edinburgh, 49, pt. 2, 1913, p. 467. Trenton: Near Montreal, Quebec.

***Pleurocystites filitextus*** Billings.

*Pleurocystites filitextus* Billings, Canadian Jour., 2, 1854, p. 252, figs. 13, 14; Geol. Canada, Rep. Progr. for 1853–1856, 1857, p. 286; Geol. Surv. Canada, dec. 3, 1858, p. 50, pl. 2, figs. 1a, 1b.—Chapman, Expos. Min. Geol. Canada, 1864, p. 109.—Billings, Trans. Ottawa Field Nat. Club, 1, 1881, p. 34.—Jaekel, Stammesgesch. Pelmat., 1, Thecoidea u. Cystoidea, Berlin, 1899, p. 232, fig. 45; p. 234, pl. 12, figs. 3–5.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 466.

*Pleurocystis filitextus* Haeckel, Amphoridcen und Cystoideen, 1896, p. 44, pl. 2, figs. 15, 16.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 65, fig. 34.—Kirk, Proc. U. S. Nat. Mus., 41, 1911, pl. 2, fig. 4; pl. 3, fig. 3.

Trenton (Curdsville): Ottawa, Ontario; Hull, Quebec.

**PLEUROCYSTITES FILITEXTUS** var. **EXORNATA** Jaekel. See *Pleurocystites exornatus*.

***Pleurocystites mercerensis*** Miller and Gurley.

*Pleurocystites mercerensis* Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 6, 1895, p. 60, pl. 5, figs. 25, 26.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 751, fig. 1379.—Jaekel, Stammesgesch. Pelmat., 1, Thecoidea u. Cystoidea, Berlin, 1899, p. 234.

*Pleurocystis mercerensis* Bather, Trans. Roy. Soc. Edinburgh, 49, pt. 2, 1913, p. 468.

Trenton (Curdsville): Mercer County, Kentucky.

**PLEUROCYSTITES ROBUSTUS** Billings. See *Pleurocystites squamosus robustus*.

**Pleurocystites squamosus** Billings.

- Pleurocystites squamosus* Billings, Canadian Jour., 2, 1854, p. 251, figs. 9-12; Geol. Surv. Canada, Rep. Progr. for 1853-1856, 1857, p. 286; Geol. Surv. Canada, dec. 3, 1858, p. 49, pl. 1, figs. 1a-d.—Chapman, Expos. Min. Geol. Canada, 1864, p. 109.—Roemer, Leth. geog., 1, Leth. Pal., Atlas, 1876, pl. 11, fig. 6.—Zittel, Handb. Pal., 1, Munich, 1879, p. 422, fig. 298.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 154, fig.—Miller, N. A. Geol. Pal., 1889, p. 272, fig. 399.—Jaekel, Stammes. Pelmat., 1, Thecoidea u. Cystoidea, Berlin, 1899, p. 234.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 465, fig. 1774.
- Pleurocystis squamosa* Haeckel, Amph. und Cyst., 1, 1896, pp. 37, 44.—Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 45 (loc. occ.).—Bather, Trans. Roy. Soc. Edinburgh, 49, pt. 2, 1913, p. 464, figs. 63-65.
- Trenton (Curdsville): Ottawa and Kirkfield, Ontario.

**Pleurocystites squamosus robustus** (Billings).

- Pleurocystites robustus* Billings, Canadian Jour., 2, 1854, p. 252, fig. 15; Geol. Surv. Canada, Rep. Progr. for 1853-1856, 1857, p. 287; Geol. Surv. Canada, dec. 3, 1858, p. 49, pl. 1, fig. 2a; Ann. Mag. Nat. Hist., 4th ser., 5, 1870, p. 260; Pal. Foss. Geol. Surv. Canada, 2, pt. 1, 1874, p. 98.—Jaekel, Stammes. Pelmat., 1899, p. 234.
- Pleurocystis robustus* Springer, Geol. Surv. Canada, Mem. 15P, 1911, p. 45 (loc. occ.).
- Pleurocystis squamosa* var. *robusta* Bather, Trans. Roy. Soc. Edinburgh, 49, pt. 2, 1913, p. 465, fig. 66.
- Trenton (Curdsville): Ottawa and Kirkfield, Ontario.

**PLEUROGRAPSUS** Nicholson. See *Pleurograptus* Nicholson.**PLEUROGRAPTUS** Nicholson. Genotype: *Cladograpsus linearis* Carruthers.

- Pleurograpsus* Nicholson, Geol. Mag., 4, 1867, p. 257; Quart. Jour. Geol. Soc. London, 24, 1868, p. 9; Trans. Edinburgh Geol. Soc., 1, 1868, p. 58; Mon. British Grapt., 1872, p. 110.
- Pleurograptus* Zittel, Handb. Pal., 1, 1879, p. 298.—Tullberg, Sveriges Geol. Unders. Ser. C, No. 55, 1883, pp. 12, 14.—Hermann, Geol. Mag., dec. 3, 3, 1886, p. 18.—Wiman, Bull. Geol. Inst. Univ. Upsala, 2, pt. 2, 1896, p. 266.—Koken, Die Leitfossilien, Leipzig, 1896, p. 328.—Roemer and Frech, Leth. geog., 1, Theil, Leth. Pal., 1, 3 Lief., 1897, p. 586.—Elles and Wood, Mon. British Grapt. Pal. Soc., 1903, p. 119.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 268.

**Pleurograptus linearis** (Carruthers).

- Cladograpsus linearis* Carruthers, Trans. Roy. Phys. Soc. Edinburgh, 1858, p. 467, fig. 1; Ann. Mag. Nat. Hist., 3d ser., 3, 1859, p. 24, fig. 3.
- Cladograptus linearis* Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 235, fig.; rev. ed., p. 270, fig.
- Dendrograpsus linearis* Carruthers, Geol. Mag., 4, 1867, p. 70.
- Pleurograpsus linearis* Nicholson, Geol. Mag., 4, 1867, p. 257, pl. 15, figs. 1-5.
- Pleurograptus linearis* Lapworth, Cat. West. Scotland Foss., 1876, p. 5, pl. 3, fig. 69.—Clark, Geol. Mag., 4th ser., 9, 1902, p. 498.—Elles and Wood, Mon. British Grapt., pt. 3, 1903, p. 119, pl. 14, fig. 7; pl. 17, fig. 1.—Olin, Kongl. Fysiogr. Sallsk. Handl. N. F., 17, 1906.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 269, pl. 15, fig. 1, text fig. 186.
- Cænograptus* (*Pleurograptus*) *linearis* Roemer and Frech, Leth. Pal., 1, 1897, p. 586, fig. 158.
- Ordovician: Scotland (Hartfell); Holland Patent, New York (Utica).

- PLEURONOTUS** Hall. Genotype: *Euomphalus decewi* Billings.  
*Pleuronotus* Hall, Nat. Hist. New York, Pal., 5, pt. 2, 1879, p. 138.—Koken, Neues Jahrb. Min. Geol. Pal., 6, Beilage-Band, 1889, p. 408.—Miller, N. A. Geol. Pal., 1889, p. 419.—Koken, Die Leitfossilien, Leipzig, 1896, p. 105, figs. 87, 4-6.
- Pleuronotus subangulatus*** Grabau.  
*Pleuronotus subangulata* Grabau, Michigan Geol. Surv., Geol. Ser. 1, 1909, p. 185. Upper Monroan (Lucas): Salt shaft, Detroit, Michigan.
- PLEURORHYNCHUS ANTIQUA** Owen. See *Conocardium antiquum*.
- PLEUROTOMARIA** DeFrance. Genotype: *P. anglica* DeFrance.  
*Pleurotomaria* DeFrance, Tableau Corps Organisés Fossiles, 1824, p. 114; Dict. Sci. Nat., 41, p. 381.  
 Observation.—Many references to this genus have been made by American authors, but it seems useless to cite them since none of them probably refers to *Pleurotomaria* in a strict sense. See Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 960, for a discussion of this subject.
- PLEUROTOMARIA** of authors. See *Clathrospira* Ulrich and Scofield, *Cyclonema* Hall, *Eotomaria* Ulrich and Scofield, *Lophospira* Whitfield, *Plethospira* Ulrich, *Raphistoma* Hall, *Raphistomina* Ulrich and Scofield, and *Seelya* Ulrich.
- Pleurotomaria abrupta*** Billings.  
*Pleurotomaria abrupta* Billings, Canadian Nat. Geol., 4, 1859, p. 354. Chazyan (Mingan): Mingan Islands, Canada.
- Pleurotomaria agarista*** Billings.  
*Pleurotomaria Agarista* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 230. Canadian (Quebec—H): Table Head, Newfoundland.
- Pleurotomaria agave*** Billings.  
*Pleurotomaria Agave* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 170, text fig. 153. Trenton: Naquareau River, above Red River, Canada.
- Pleurotomaria aiens*** Sardeson.  
*Pleurotomaria aiens* Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 76, pl. 3, figs. 16, 17. St. Peter: Highland Park and South St. Paul, Minnesota.
- Pleurotomaria* (*Trochonema*?) *ambigua*** (Hall).  
*Pleurotomaria ambigua* Hall, Pal. New York, 1, 1847, p. 176, pl. 38, figs. 3a-b.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 161. Trenton: Adams, Jefferson County, New York.
- PLEUROTOMARIA AMERICANA** Billings. See *Liospira americana*.
- PLEUROTOMARIA AMPHITRITE** Billings. See *Euconia amphitrite*.
- Pleurotomaria angulata*** Conrad. Not recognized.  
*Pleurotomaria angulata* Conrad (not Sowerby), Proc. Acad. Nat. Sci. Philadelphia, 1843, p. 330.—Owen, Geol. Expl. Iowa, Wisconsin, Illinois, 2d ed., 1844, p. 86, pl. 17, fig. 5. Trenton: Lewis County, New York; Iowa; Wisconsin.

**Pleurotomaria antiquata** Hall.

*Pleurotomaria antiquata* Hall, Pal. New York, 1, 1847, p. 31, pl. 7, fig. 1.—  
Emmons, Amer. Geology, 1, pt. 2, 1855, p. 161.—Raymond, Ann. Carnegie  
Mus., 4, 1908, p. 218.  
Chazyan: Chazy, New York.

PLEUROTOMARIA APERTA Billings. See *Raphistoma apertum*.

**Pleurotomaria arabella** Billings.

*Pleurotomaria Arabella* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1868, p. 343,  
fig. 330.  
Canadian (Beekmantown): Leeds and Grenville Counties, Canada.

PLEUROTOMARIA ARACHNE Billings. See *Lophospira? arachne*.

PLEUROTOMARIA (RAPHISTOMA) ATTELBOROENSIS Shaler and Foerste. See *Raphis-  
toma attleboroense*.

**Pleurotomaria axion** Hall.

*Pleurotomaria axion* Hall, 20th Rep. New York State Cab. Hist, 1868, p. 344,  
pl. 15 (6), fig. 17; rev. ed., 1870, p. 394, pl. 15, fig. 17.—Kindle and Breger,  
23th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 457, pl. 12, fig. 4.  
Niagaran: Bridgeport, Illinois (Racine); Huntington, Indiana.

PLEUROTOMARIA BEEKMANENSIS Whitfield. See *Euconia beekmanensis*.

PLEUROTOMARIA BIANGULATA Hall. See *Trochonema biangulatum*.

PLEUROTOMARIA BICINCTA Lindstrom. See *Lophospira bicincta*.

PLEUROTOMARIA BILEX of authors. See *Cyclonema bilex*.

PLEUROTOMARIA BISPIRALIS Hall. See *Lophospira bispiralis*.

**Pleurotomaria calcifera** Billings.

*Pleurotomaria calcifera* Billings, Canadian Nat. Geol., 4, 1859, p. 352, fig. 5; Geol.  
Canada, Geol. Surv. Canada, 1863, p. 177, text figs. 27a-c.—Lesley, Geol.  
Surv. Pennsylvania, Rep. P 4, 1889, p. 704, figs.  
Canadian (Beekmantown): Near Beauharnois, Canada.

**Pleurotomaria (Trochonema?) calphurnia** (Billings).

*Pleurotomaria? Calphurnia* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p.  
230, figs. 214a, b.  
Canadian (Quebec—G): Cape Norman, Newfoundland.

PLEUROTOMARIA CALYX of authors. See *Raphistoma stamineum*.

**Pleurotomaria canadensis** Billings.

*Pleurotomaria Canadensis* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p.  
342, text figs. 328a-c, 329.  
*Pleurotomaria Laurentina* Billings, Geol. Canada, Geol. Surv. Canada, 1863, p.  
117, fig. 28d (not 28a-c).  
Canadian: Leeds and Grenville Counties and Mingan Islands, Canada.

PLEUROTOMARIA CANALIFERA Miller. See *Eotomaria canalifera*.

**Pleurotomaria carinata** (James).

Not recognized.

*Murchisonia carinata* James, Cat. Low. Sil. Foss. Cincinnati Group, 1871, p. 8  
(nom. nud.).

**Pleurotomaria carinata**—Continued.

*Pleurotomaria carinata* James, Cat. Low. Sil. Foss. Cincinnati Group, 1875, p. 6 (nom. nud.); Paleontologist, No. 2, 1878, p. 12; *ibid.*, No. 6, 1882, p. 53.  
Cincinnati: Clinton County, Ohio.

PLEUROTOMARIA CASII Meek and Worthen. See *Lophospira casii*.

PLEUROTOMARIA CIRCE Billings. See *Lophospira? circe*.

**Pleurotomaria clipeiformis** Spencer.

*Pleurotomaria clipeiformis* Spencer, Trans. Acad. Sci. St. Louis, 4, 1884, p. 607, pl. 7, figs. 6, 6a; Bull. Mus. Univ. State Missouri, 1, 1884, p. 57, pl. 7, figs. 6, 6a.

Niagaran dolomite: Hamilton, Ontario.

PLEUROTOMARIA CLIVOSA Sardeson. See *Trochonema? (Eunema) clivosum*.

PLEUROTOMARIA CREVIERI Billings. See *Raphistoma stamineum*.

**Pleurotomaria cryptata** Billings.

*Pleurotomaria cryptata* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 54.

Anticostian (Gun River, Jupiter River): Near Chaloupe River, etc., Anticosti.

**Pleurotomaria cyclonemoides** Meek and Worthen.

*Pleurotomaria cyclonemoides* Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 360, pl. 5, fig. 4.

Niagaran (Racine): Bridgeport, near Chicago, Illinois.

**Pleurotomaria cyclostoma** Whiteaves.

*Pleurotomaria cyclostoma* Whiteaves, Pal. Foss. Geol. Surv. Canada, 3, pt. 1, 1884, p. 23, pl. 3, figs. 12, 12a.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 707, figs.—Whiteaves, Pal. Foss. Geol. Surv. Canada, 3, pt. 2, 1895, p. 77 (loc. occ.); Geol. Surv. Canada Pal. Foss., 3, pt. 4, 1906, p. 336.

Niagaran (Guelph): Durham, Ontario.

PLEUROTOMARIA DEIOPEIA Billings. See *Clathrospira deiopeia*.

**Pleurotomaria (Lophospira?) depauperata** (Hall).

*Pleurotomaria depauperata* Hall, Rep. Geol. Surv. Wisconsin, 1862, p. 55, fig. 5. Richmond(?): Southwestern Wisconsin.

PLEUROTOMARIA DIFFICILIS Whitfield. See *Seelya difficilis*.

PLEUROTOMARIA DOCENS of authors. See *Liospira docens*.

PLEUROTOMARIA DRYOPE Billings. See *Eotomaria dryope*.

PLEUROTOMARIA DURHAMENSIS Whiteaves. See *Eotomaria durhamensis*.

PLEUROTOMARIA ELORA Billings. See *Euomphalopterus elora*.

**Pleurotomaria eloroidea** Kindle and Breger.

*Pleurotomaria eloroidea* Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 457, pl. 13, figs. 1, 2; pl. 14, fig. 3?

Niagaran: Delphi and Huntington, Indiana.

PLEUROTOMARIA ETNA Billings. See *Euconia etna*.

PLEUROTOMARIA EUGENIA Billings. See *Liospira eugenia*.

**Pleurotomaria filitexta** Foerste.

*Pleurotomaria filitexta* Foerste, Geol. Surv. Ohio Pal., 7, 1893, p. 550, pl. 37A, figs. 6a, b.

Upper Medinan (Brassfield): Huffman's Quarry, near Dayton, Ohio.

**Pleurotomaria floridensis** Cleland.

*Pleurotomaria floridensis* Cleland, Bull. Amer. Pal., 3, 1900, p. 125 (253), pl. 15, fig. 12; *ibid.*, 4, 1903, p. 17.

Canadian (Tribes Hill): Fort Hunter and Tribes Hill, New York.

PLEUROTOMARIA GALTENSIS Billings. See *Eotomaria galtensis*.

**Pleurotomaria gregaria** Billings.

*Pleurotomaria gregaria* Billings, Canadian Nat. Geol., 4, 1859, pp. 355, 358, fig. 8h, k; Geol. Canada, Geol. Surv. Canada, 1863, p. 119, fig. 29a-c.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 709, figs.

Canadian (Beekmantown): St. Ann and near St. Eustache, Canada.

**Pleurotomaria gonopleura** Winchell and Marcy.

*Pleurotomaria gonopleura* Winchell and Marcy, Mem. Boston Soc. Nat.-Hist., 1, 1865, p. 98, pl. 3, fig. 4.

Niagaran (Racine): Chicago, Illinois.

PLEUROTOMARIA HALEI Hall. See *Euomphalopterus halei*.

PLEUROTOMARIA HALLI Miller. See *Raphistoma halli*.

**Pleurotomaria harpya** Billings.

*Pleurotomaria Harpya* Billings, Pal. Foss. Geol. Surv. Canada, 1865, p. 227.

Canadian (Quebec—G): Cape Norman, Newfoundland.

PLEUROTOMARIA HELENA Billings. See *Liospira helena*.

PLEUROTOMARIA HERCYNA Whiteaves. See *Murchisonia?? billingsana*.

PLEUROTOMARIA HERMIONE Koken. See *Lophospira? hermione*.

PLEUROTOMARIA HORTENSIA Billings. See *Raphistoma hortensia*.

**Pleurotomaria hoyi** Hall.

*Pleurotomaria hoyi* Hall, Rep. Sup. Geol. Surv. Wisconsin, 1861, p. 35; 20th Rep.

New York State Cab. Hist., 1868, p. 364, pl. 15, fig. 10.—Chamberlin, Geol.

Wisconsin, 1, 1883, p. 193, fig.—Kindle and Breger, 28th Ann. Rep. Dep.

Geol. Nat. Res. Indiana, 1904, p. 455.

*Pleurotomaria* (*Trochonema*) *hoyi* Hall, 20th Rep. New York State Cab. Hist.,

rev. ed., 1870, p. 393, pl. 15, fig. 10; pl. 25, figs. 11, 12.

Niagaran: Racine, Wisconsin (Racine); Delphi, Indiana.

PLEUROTOMARIA HUNTERENSIS Cleland. See *Polygyrata hunterensis*.

**Pleurotomaria hyale** Billings.

*Pleurotomaria Hyale* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 228.

Canadian (Quebec—F): Keppel Island and Port aux Choix, Newfoundland.

**Pleurotomaria? idia** Hall.

*Pleurotomaria idia* Hall, Rep. Sup. Geol. Surv. Wisconsin, 1861, p. 35; 20th Rep.

New York State Cab. Hist., 1868, p. 365, pl. 15, figs. 15, 16; rev. ed., 1870.

p. 393, pl. 15, figs. 15, 16.—Kindle and Breger, 28th Ann. Rep. Geol. Nat.

Res. Indiana, 1904, p. 455, pl. 12, fig. 6.

Niagaran: Racine, Wisconsin (Racine); Huntington, Indiana.

PLEUROTOMARIA IMMATURA Billings. See *Raphistoma immaturum*.

**Pleurotomaria indenta** Hall.

*Pleurotomaria indenta* Hall, Pal. New York, 1, 1847, p. 176, pl. 38, fig. 2.—  
Emmons, Amer. Geology, 1, pt. 2, 1855, p. 161, pl. 5, fig. 5; pl. 17, fig. 8.—  
Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 710, fig.  
Trenton: Watertown, New York.

**Pleurotomaria inexpectans** Hall and Whitfield.

*Pleurotomaria inexpectans* Hall and Whitfield, Geol. Surv. Ohio Pal., 2, 1875,  
p. 117, pl. 5, fig. 12.—Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 96;  
Geol. Surv. Ohio Pal., 7, 1893, p. 549.  
Upper Medinan (Brassfield): Todds Fork, Clinton County, Ohio.

PLEUROTOMARIA LABROSA var. OCCIDENS Hall. See *Phanerotrema occidens*.

PLEUROTOMARIA LAPHAMI Whitfield. See *Eotomaria laphami*.

PLEUROTOMARIA LAURENTINA Billings. See *Raphistomina laurentina*.

PLEUROTOMARIA LENTICULARIS of American authors. See *Liospira americana* and  
*L. vitruvia*.

*Pleurotomaria lenticularis* of authors (not Sowerby).

*Pleurotomaria lenticularis* Emmons (Conrad MS., not Sowerby), Nat. Hist. New  
York, Geol., 2, 1842, p. 392, fig. 2; p. 393, figs. 2, 3.—Owen, Geol. Expl. Iowa,  
Wisconsin, Illinois, 2d ed., 1844, p. 86, pl. 18, fig. 6; Amer. Jour. Sci. Arts, 47,  
1844, p. 365, fig. 2.—Hall, Pal. New York, 1, 1847, p. 172, pl. 37, figs. 6a-d.—  
Emmons, Amer. Geology, 1, pt. 2, 1855, p. 160, pl. 6, figs. 13a, b; pl. 17, fig.  
13a; Man. Geology, 1860, p. 98, fig. 87.—Lincklaen, 14th Rep. New York State  
Cab. Nat. Hist., 1861, p. 47, pl. 2, fig. 2.—Nicholson, Rep. Pal. Prov. Ontario,  
2, 1875, p. 19, fig. 7d (loc. occ.).—Koken, Neues Jahrb. Min., Geol., Pal., 6,  
1889, p. 352.

*Raphistoma lenticularis* Hall, Rep. Geol. Surv. Wisconsin, 1862, p. 39, fig. 4.—  
Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 316, pl. 3, fig. 7b (a, c?).—  
Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 319.—Whitfield, Geol. Wis-  
consin, 4, 1882, p. 214, pl. 6, figs. 4, 5.—Chamberlin, Geol. Wisconsin, 1,  
1883, p. 157.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, p. 850, figs.—  
Koken, Neues Jahrb. f. Min., Geol., Pal., 6 Beilage-Band, p. 352.—Miller,  
N. A. Geol. Pal., p. 424, fig. 708.—Whiteaves, Canadian Rec. Sci., 5, p. 318.—  
Keyes, Missouri Geol. Surv., 5, 1894, p. 163.—Raymond, Bull. Amer. Pal., 3,  
1902, p. 306, pl. 19, figs. 7, 8.

*Trochus lenticularis*? Owen, Geol. Expl. Iowa, Wisconsin, Illinois, 2d ed., 1844,  
p. 80, pl. 15, fig. 5.

Middle and Upper Ordovician: United States and Canada.

Observation.—So many distinct species now impossible to determine without  
an examination of the figured specimens have been described as *Pleurotomaria*  
or *Raphistoma lenticularis* that it is believed useless to try to assign the  
references to their proper place.

**Pleurotomaria litorea** Hall.

*Pleurotomaria litorea* Hall, Pal. New York, 2, 1852, p. 12, pl. 4 bis, figs. 4a, b.—  
Grabau, Bull. New York State Mus., 45, 1901, p. 212, fig. 142; Bull. Buffalo  
Soc. Nat. Sci., 7, 1901, p. 212, fig. 142.  
Upper Medinan: Lockport, New York.



**Pleurotomaria lonensis** Walcott.

*Pleurotomaria Lonensis* Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 80, pl. 11, fig. 22.

Upper Pogonip: Lone Mountain, near Eureka, Nevada.

*Cotype*.—Cat. No. 17331, U.S.N.M.

**Pleurotomaria(?) margaritoides** Whiteaves.

*Pleurotomaria(?) margaritoides* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 190, pl. 20, fig. 10.

Black River or Richmond: Inmost Island, Lake Winnipeg, Canada.

PLEUROTOMARIA MICULA Hall. See *Liospira micula*.**Pleurotomaria miser** Billings.

*Pleurotomaria miser*, Billings, Canadian Nat. Geol., 4, 1859, p. 354.

Canadian (Romaine): Mingan Islands, Quebec.

**Pleurotomaria missisquoi** Billings.

*Pleurotomaria Missisquoi* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 191.

Canadian (Beekmantown): Phillipsburg, Quebec.

**Pleurotomaria mohawkensis** Miller.

*Pleurotomaria?* *nodulosa* Hall (not Sandberger, 1842), Pal. New York, 1, 1847, p. 44, pl. 10, fig. 10.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 161.

*Pleurotomaria mohawkensis* Miller, N. A. Geol. Pal., 1889, p. 421.

Black River: Watertown and Mohawk Valley, New York.

**Pleurotomaria muralis** Owen.

*Pleurotomaria muralis* Owen, Rep. Geol. Surv. Wisconsin, Iowa, Minnesota, 1852, p. 581, tab. 2, fig. 6.—Lesley, Geol. Surv. Pennsylvania, Rep. P. 4, 1889, p. 712, fig.—Whiteaves, Canadian Rec. Sci., 5, 1893, p. 319; Pal. Foss., Geol.

Surv. Canada, 3, pt. 3, 1897, p. 189.

Richmond: Red River of the North (Lower Fort Garry), Canada.

*Holotype*.—Cat. No. 17900, U.S.N.M.

PLEUROTOMARIA NASONI Hall. See *Eotomaria supracingulata*.PLEUROTOMARIA NIOTA Hall and Whitfield. See *Trochonema niota*.PLEUROTOMARIA NODULOSA Hall. See *Pleurotomaria mohawkensis*.**Pleurotomaria normani** Billings.

*Pleurotomaria Normani* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 228, fig. 212.

Canadian (Quebec—G): Cape Norman, Newfoundland.

**Pleurotomaria? nucleolata** Hall.

*Pleurotomaria?* *nucleolata* Hall, Pal. New York, 1, 1847, p. 42, pl. 10, figs. 6a, b.—Lesley, Geol. Surv. Pennsylvania, Rep. P. 4, 1889, p. 713, figs.

Black River (Lowville): Watertown, New York.

PLEUROTOMARIA NUMERIA Billings. See *Liospira numeria*.**Pleurotomaria? obsoleta** Hall.

*Pleurotomaria?* *obsoleta* Hall, Pal. New York, 1, 1847, p. 44, pl. 10, fig. 11.

Black River (Lowville): Watertown, New York.

PLEUROTOMARIA OCCIDENS Hall and Whitfield. See *Phanerotrema occidens*.PLEUROTOMARIA OHIOENSIS James. See *Lophospira ohioensis*.

PLEUROTOMARIA PAUPER Hall. See *Trochonema pauper*.

PLEUROTOMARIA PAUPER Billings. See *Raphistoma stamineum*.

PLEUROTOMARIA PERCARINATA Hall. See *Gyronema percarinatum*.

PLEUROTOMARIA PERLATA Hall. See *Liospira perlata*.

PLEUROTOMARIA PERVETUSTA Hall. See *Euconia(?) pervetusta*.

**Pleurotomaria postumia** Billings.

*Pleurotomaria Postumia* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 91 (adv. sheets, 1862).

Canadian?: Point Levis (Levis—erratics) and Phillipsburg, Quebec.

PLEUROTOMARIA PROGNE Billings. See *Liospira progne*.

**Pleurotomaria? quadricarinata** Hall.

*Pleurotomaria quadricarinata* Hall, Pal. New York, 1, 1847, p. 43, pl. 10, fig. 8.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 160.

Black River (Lowville): Watertown, New York.

**Pleurotomaria (Euconia?) quebecensis** (Billings).

*Pleurotomaria Quebecensis* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 190, figs. 172-174.

Ozarkian? (Levis—erratics): Point Levis, Quebec.

PLEUROTOMARIA RACINENSIS Whitfield. See *Mourlonia racinensis*.

PLEUROTOMARIA RAMSAYI Billings. See *Euconia ramsayi*.

PLEUROTOMARIA ROTULOIDES Hall. See *Raphistoma rotuloides*.

**Pleurotomaria rotundispira** Billings.

*Pleurotomaria rotundispira* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 191.

Ozarkian? (Levis—erratics): Point Levis, Quebec.

**Pleurotomaria (Eotomaria?) selecta** Billings.

*Pleurotomaria selecta* Billings, Pal. Foss., Geol. Surv. Canada, 1865, p. 224, fig. 208.

Chazyan (Quebec—H, I, K, L): Table Head, Newfoundland.

PLEUROTOMARIA SEMELE Hall. See *Plethospira semele*.

**Pleurotomaria sigaretoides** Winchell and Marcy.

*Pleurotomaria sigaretoides* Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 98, pl. 3, fig. 5.

Niagaran (Racine): Chicago, Illinois.

PLEUROTOMARIA SOLARIOIDES Hall. See *Pycnomphalus solariooides*.

PLEUROTOMARIA SOLARIOIDES Billings. See *Liospira perlata*.

**Pleurotomaria sponsa** Billings.

*Pleurotomaria sponsa* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 226.

Chazyan (Quebec—N): Table Head, Newfoundland.

**Pleurotomaria stokesiana** Whiteaves.

*Pleurotomaria Stokesiana* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 190, pl. 20, figs. 9, 9a.

Black River or Richmond: West shore of Lake Winnipeg, opposite north end of Selkirk Island, Canada.

PLEUROTOMARIA STRIATA Miller. See *Plethospira striata*.

PLEUROTOMARIA SUBCONICA Hall. See *Clathrospira subconica*.

**Pleurotomaria subdepressa** Hall.

*Pleurotomaria subdepressa* Hall, Pal. New York, 2, 1852, p. 333 pl. 76, fig. 2a, b.  
Cayugan (Cobleskill): Schoharie, New York.

PLEUROTOMARIA SUBTILISTRIATA Hall. See *Liospira subtilistriata*.

PLEUROTOMARIA SUPRACINGULATA Billings. See *Eotomaria supracingulata*.

PLEUROTOMARIA SYBILLINA Billings. See *Lophospira sybillina*.

PLEUROTOMARIA THALIA Billings. See *Cyclonema thalia*.

PLEUROTOMARIA TRILINEATA James. See *Lophospira ohioensis*.

PLEUROTOMARIA TROPIDOPHORA Miller. See *Lophospira tropidophora*.

**Pleurotomaria townsendii** Whiteaves.

*Pleurotomaria townsendii* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2,  
1895, p. 77, pl. 15, fig. 9; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906,  
p. 336.

Niagaran (Guelph): Durham, Ontario.

PLEUROTOMARIA TURGIDA Hall. See *Sinuopea turgida*.

PLEUROTOMARIA UMBILICATA Hall. See *Trochonema umbilicatum*.

**Pleurotomaria (Eccyliomphalus?) vagrans** (Billings).

*Pleurotomaria vagrans* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 90,  
fig. 82 (adv. sheets, 1862).

Ozarkian? (Levis—erratics): Point Levis, Quebec.

PLEUROTOMARIA VALERIA Billings. See *Euomphalopterus valeria*.

PLEUROTOMARIA VARICOSA Emmons. See *Murchisonia? varicosa*.

PLEUROTOMARIA VELARIS Whiteaves. See *Euomphalopterus velaris*.

PLEUROTOMARIA VENTRICOSA Miller. See *Seelya ventricosa*.

PLEUROTOMARIA VIOLA Billings. See *Poleumita viola*.

**Pleurotomaria virgo** Billings.

*Pleurotomaria virgo* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 224,  
fig. 207.

Chazyan (Quebec—H, I, K, L): Table Head, Newfoundland.

**Pleurotomaria virguncula** Billings.

*Pleurotomaria virguncula* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p.  
225, fig. 209.

Chazyan (Quebec—H, I, K, L): Table Head, Newfoundland.

PLEUROTOMARIA VITRUVIA Billings. See *Liospira vitruvia*.

- PLEUROTROCHUS** Grabau. Genotype: *P. tricarinatus* Grabau.  
*Pleurotrochus* Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 179.
- Pleurotrochus tricarinatus*** Grabau.  
*Pleurotrochus tricarinatus* Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909,  
 p. 180, pl. 27, figs. 1, 2; pl. 16, fig. 5.  
 Upper Monroan (Lucas): Salt shaft, Detroit, Michigan.
- PLIOMERA** Raymond (not Angelin). See *Pliomerops* Raymond.
- PLIOMERA CANADENSIS** Grabau and Shimer. See *Pliomerops canadensis*.
- PLIOMEROPS** Raymond. Genotype: *Amphion canadensis* Billings.  
*Pliomera* Raymond (not Angelin), Amer. Jour. Sci., 4th ser., 19, 1905, p. 377.—  
 Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 321.  
*Pliomerops* Raymond, Amer. Jour. Sci., 4th ser., 19, 1905, p. 378; Zittel-Eastman  
 Textb. Pal., 1913, p. 725.
- Pliomerops barrandei*** (Billings).  
*Amphion barrandei* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 288,  
 fig. 277, a, b.  
*Pliomerops barrandei* Raymond, Ann. Carnegie Mus., 7, 1910, p. 76, fig. 7.  
 Chazyan (Quebec—I, K, N, P): Point Rich, Table Head, Bonne Bay, etc.,  
 Newfoundland.
- Pliomerops canadensis*** (Billings).  
*Amphion Canadensis* Billings, Canadian Nat. Geol., 4, 1859, p. 381, fig. 12; Geol.  
 Canada, Geol. Surv. Canada, 1863, p. 133, fig. 69; Pal. Foss., 1, Geol. Surv.  
 Canada, 1865, p. 288, fig. 278.—Miller, N. A. Geol. Pal., 1889, p. 527, fig.  
 956.—Raymond, Ann. Carnegie Mus., 3, 1905, p. 363, pl. 14, figs. 10-13.  
 Cf. *Calymene multicosta* Hall, Pal. New York, 1, 1847, p. 228, pl. 60, fig. 3.  
*Pliomera canadensis* Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 321, fig.  
 1634a-c.  
*Pliomerops canadensis* Raymond, Amer. Jour. Sci., 19, 1905, p. 378 (gen. ref.);  
 Ann. Carnegie Mus., 7, 1910, p. 75, pl. 18, fig. 14, figs. 4-6; 7th Rep. Vermont  
 State Geol., 1910, p. 238, pl. 36, figs. 10-13; pl. 38, fig. 14.—Perkins, Rep.  
 Vermont State Geol., 8th ser., 1912, pl. 18, fig. 14.  
 Chazyan: Mingan Islands (Mingan) and Montreal, Canada; Valcour Island,  
 Chazy, etc., New York; Isle La Motte, Vermont.
- Pliomerops? convexus*** (Billings).  
*Amphion convexus* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 322.  
 Canadian (Beekmantown): Stanbridge, Quebec.
- Pliomerops? insularis*** (Billings).  
*Amphion insularis* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 290.  
 Canadian (Quebec—G): Port aux Choix, Newfoundland.
- Pliomerops? julius*** (Billings).  
*Amphion Julius* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 290, fig. 279.  
 Chazyan (Quebec—P): Cow Head, Newfoundland.
- Pliomerops? nevadensis*** (Walcott).  
*Amphion Nevadensis* Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 94, pl. 12, fig. 13.  
 Upper Pogonip: Eureka and White Pine Districts, Nevada.  
*Cotypes*.—Cat. No. 24645, U.S.N.M.

**Plomerops? salteri** (Billings).

Amphion Salteri Billings, Canadian Nat. Geol., 1861, p. 322, fig. 6; Geol. Canada, Geol. Surv. Canada, 1863, p. 278, fig. 284a, b; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 352, fig. 339.  
Canadian (Beekmantown): Phillipsburg, Quebec.

**Plomerops? westoni** (Billings).

Amphion Westoni Billings, Pal. Foss., 1, Geol. Surv., Canada, 1865, p. 321, fig. 307, a, b.  
Canadian (Beekmantown): Stanbridge, Quebec.

**PLUMULITES GRACILLIMUS** Lesley. See *Turrilepas gracillimus*.

**PLUMULITES JAMESI** Hall and Whitfield. See *Lepidocoleus jamesi*

**PODOLITHUS** Sardeson.

Genotype: *P. strophocrinus* Sardeson.

*Podolithus* Sardeson, Jour. Geol., 16, 1908, p. 242.

Observation.—Founded upon crinoid bases or roots. The necessity of giving separate names to such objects and the value of such work is not apparent. The author creates the genus and species knowing that these organisms are only bases of associated crinoids.

**Podolithus anomalocrinus** Sardeson.

*Podolithus anomalocrinus* Sardeson, Jour. Geol., 16, 1908, p. 246.  
Trenton: Dodge County, Minnesota.

**Podolithus dendrocrinus** Sardeson.

*Podolithus dendrocrinus* Sardeson, Jour. Geol., 16, 1908, p. 248.  
Black River and Trenton: St. Paul, Minnesota.

**Podolithus eucheirocrinus** Sardeson.

*Podolithus eucheirocrinus* Sardeson, Jour. Geol., 16, 1908, p. 247.  
Black River and Trenton: St. Paul, Minnesota.

**Podolithus schizocrinus** Sardeson.

*Podolithus schizocrinus* Sardeson, Jour. Geol., 16, 1908, p. 244.  
Black River: Minnesota.

**PODOLITHUS STROPHOCRINUS** Sardeson. See *Carabocrinus dicyclicus*.

**POLEUMITA** Clarke and Ruedemann.

Genotype: *P. scamnata* Clarke and Ruedemann.

*Euomphalus* (part) Sowerby, Min. Conch., 1, 1814, p. 97.

*Orisotoma* (part) Lindstrom (not Munier Chalmas, 1876), Silur. Gastrop. and Pterop. Gotland, 1884, p. 156.

*Horiostoma* Fischer, Manuel Conch., etc., 1885, p. 813.

*Omphalotrochus* Lindstrom (not Meek), Sil. Gast. and Pter. Gotland, 1884, p. 156.—Eastman, Textb. Pal., 1, 1900, p. 447.

*Polytropis* Dekoninck (not Sandberger, 1874), Fauna Carbon., 2, pt. 3, 1881, p. 107.—Koken, Neues Jahrb. Min., Geol. Pal., 6, Beilage-Band, 1889, p. 425.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 89.—Koken, Die Leitfossilien, Leipzig, 1896, pp. 126, 459, fig. 244; Neues Jahrb. Min., Geol. Pal., 1, 1898, p. 24.

*Poleumita* Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 59.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 337.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 667.

*Polytropina* Donald, Quart. Jour. Geol. Soc. London, 61, 1905, p. 575.

**Poleumita bellasculptilis** Savage.

*Poleumita bellasculptilis* Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 101, pl. 6, fig. 3.

Upper Medinan (Edgewood): Pike County, Missouri.

**Poleumita crenulata** (Whiteaves).

*Straparollus crenulatus* Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 2, 1884, p. 21, pl. 3, figs. 8a-b.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1079, figs.

*Poleumita crenulata* Clarke and Ruedemann, Mem. New York State Museum, 5, 1903, p. 64, pl. 9, figs. 9, 11, 16-24.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 667, fig. 924a.

*Polytropis crenulatus* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 91.

*Poleumita* cf. *crenulata* Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 195, pl. 16, fig. 27.

Niagaran (Guelph): Durham, Ontario; Shelby and Rochester, New York.

?Upper Monroan (Lucas): Salt shaft, Detroit, Michigan.

**Poleumita durhamensis** (Whiteaves).

*Polytropis durhamensis* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 91, pl. 14, figs. 1 and 2.

*Poleumita durhamensis* Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 338 (gen. ref.).

Niagaran (Guelph): Near Durham, Ontario.

**Poleumita hudsonica** Parks.

*Gyronema* or *Poleumita hudsonica* Parks in Tyrrell, 22d Rep. Ontario Bur. Mines, 1913, p. 36.

Niagaran (Guelph): Severn River, Ontario.

**Poleumita huntingtonensis** (Kindle and Breger).

*Oriostoma huntingtonensis* Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 463, pl. 14, figs. 14, 15.

Niagaran: Huntington, Indiana.

**Poleumita huntingtonensis alternata** (Kindle and Breger).

*Oriostoma huntingtonensis* var. *alternatum* Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 465, pl. 14, fig. 9.

Niagaran: Huntington, Indiana.

*Holotype*.—Cat. No. 52943, U.S.N.M.

**Poleumita macrolineata** (Whitfield).

*Eomphalus macrolineatus* Whitfield, Ann. Rep. for 1877, Wisconsin Geol. Surv., 1878, p. 82; Geol. Wisconsin, 4, 1882, p. 294, pl. 18, figs. 5, 6.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 20, pl. 3, fig. 6.

*Polytropis macrolineatus* Whiteaves, *ibid.*, 3, pt. 2, 1895, p. 91.

*Poleumita macrolineata* Whiteaves, *ibid.*, 3, pt. 4, 1906, p. 338 (gen. ref.).

Niagaran: Manitowoc Rapids, Wisconsin; Elora and Durham, Ontario (Guelph).

**Poleumita parvula** (Whiteaves).

*Polytropis parvulus* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 92, pl. 13, figs. 10, 10a.

**Poleumita parvula**—Continued.

*Poleumita parvula* Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 338 (gen. ref.).

Niagaran (Guelph): Durham, Ontario.

**Poleumita plana** (Kindle and Breger).

*Oriostoma plana* Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 465, pl. 14, figs. 7, 8.

Niagaran: Georgetown, Indiana.

**Poleumita rugælineata** (Hall and Whitfield).

*Euomphalus* (*Cyclonema*) *rugælineata* Hall and Whitfield, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 186; 27th Rep. New York State Cab. Nat. Hist., 1875, pl. 13, fig. 2.

*Cyclonema rugælineata* Nettelroth, Kentucky Foss. Shells, Geol. Surv. Kentucky, 1889, p. 187, pl. 33, fig. 21.

Niagaran (Louisville): Louisville, Kentucky.

*Plesiotype*.—Cat. No. 51362, U.S.N.M

**Poleumita scamnata** Clarke and Ruedemann.

*Poleumita scamnata* Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 60, pl. 9, figs. 1-8, 10, 12-15.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 667, fig. 924b.

Niagaran (Guelph): Shelby and Rochester, New York.

**Poleumita? sulcata** (Hall).

*Euomphalus sulcatus* Hall, Geol. New York, 4, 1843, p. 137, fig. 4, p. 138; tab. ill. 25, fig. 4.—Owen, Amer. Jour. Sci. Arts, 2d ser., 1, 1846, p. 46, fig. 4.—Hall, Pal. New York, 2, 1852, p. 340, fig. 4.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 232, figs.

*Cyclonema sulcata* Hall, Pal. New York, 2, 1852, p. 347, pl. 84, figs. 1a-d.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 343, fig. 350.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 18, pl. 3, fig. 5.

*Polytropis sulcatus* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 89, pl. 13, figs. 9, 9a.

*Poleumita(?) sulcata* Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 62, pl. 10, fig. 1-4.

*Poleumita sulcata* Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 337.

Niagaran (Guelph): Newark, Wayne County, Shelby, and Rochester, New York; Galt, Hespeler, etc., Ontario.

**Poleumita viola** (Billings).

*Pleurotomaria?* *Viola* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 169.—Whiteaves, *ibid.*, 3, pt. 2, 1895, p. 76, pl. 12, fig. 2; *ibid.*, pt. 4, 1906, p. 336.

Niagaran (Guelph): Galt, Ontario.

**POLLICIPES** *Aurivillius*.

*Pollicipes Aurivillius*, Bihang till K. Sv. Vet.-Akad. Handl., 18, Afd. 4, No. 3, 1892, p. 4.—Clarke, Zittel-Eastman Textb. Pal., 1, 1900, p. 650.; *ibid.*, 2d ed., 1913, p. 745.

**Pollicipes siluricus** Ruedemann.

*Pollicipes siluricus* Ruedemann, Bull. New York State Mus., 42, 1901, p. 578, pl. 2, figs. 16-24; Bull. New York State Mus., 162, 1912, p. 122, pl.

Trenton (Snake Hill): Green Island and Mechanicsville, New York.

*POLYCOPE SUBLENTICULARIS* Jones. See *Schmidtella sublenticularis*.

*POLYDILASMA* Hall. See *Zaphrentis Rafinesque*.

**POLYGNATHUS** Hinde. Genotype: *P. dubius* Hinde.

*Polygnathus* Hinde, Quart. Jour. Geol. Soc. London, 1879, p. 361.—Miller, N. A. Geol. Pal., 1889, p. 520.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 153.

**Polygnathus wilsoni** James.

*Polygnathus wilsoni* James, Jour. Cincinnati Soc. Nat. Hist., 7, 1884, p. 148, pl. 7, fig. c.  
Maysville (Corryville): Warren County, Ohio.

**POLYGYRATA** Weller.

Genotype: *P. sinistra* Weller.

*Polygyrata* Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 130.

**Polygyrata hunterensis** (Cleland).

*Pleurotomaria hunterensis* Cleland, Bull. Amer. Pal., 3, 1900, p. 124 (252), pl. 17, figs. 1, 2, 7, 8; *ibid.*, 4, 1903, p. 16, pl. 4, figs. 1, 2.  
*Polygyrata hunterensis* Weller, Geol. Surv. New Jersey, Pal., 3, p. 130 (gen. ref.).  
Canadian (Tribes Hill): Ft. Hunter, Tribes Hill, Little Falls, etc., New York.

**Polygyrata polygyrata** (Roemer).

*Euomphalus polygyratus* Roemer, Texas, Bonn, 1849, p. 421; *Kreidebildungen von Texas*, Bonn, 1852, p. 91, pl. 11, figs. 4a, 4b.  
*Polygyrata polygyratus* Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 130 (gen. ref.).  
Canadian (Beekmantown): San Saba Valley, Texas.

**Polygyrata rotuliformis** (Meek).

*Euomphalus (Raphistoma) rotuliformis* Meek, Proc. Acad. Nat. Sci. Philadelphia, 1870, p. 61.  
*Raphistoma? rotuliformis* Meek, U. S. Geol. Expl., 40th Parl., 4, 1877, p. 18, pl. 1, figs. 2a-b.  
*Polygyrata rotuliformis* Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 130 (gen. ref.).  
Canadian (Beekmantown): Muddy Creek, Nevada.  
*Cotypes*.—Cat. No. 17316, U.S.N.M.

**Polygyrata sinistra** Weller.

*Polygyrata sinistra* Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 130, pl. 4, figs. 1, 2.  
Canadian (Beekmantown): Columbia, New Jersey.

**Polygyrata trochiscus** (Meek).

*Euomphalus (Raphistoma?) trochiscus* Meek, Proc. Acad. Nat. Sci. Philadelphia, 1870, p. 61.  
*Raphistoma? trochiscus* Meek, U. S. Geol. Expl., 40th Parl., 4, 1877, p. 19, pl. 1, figs. 3, 3a, 3b.—White, Rep. U. S. Geogr. Surv., West 100th Merid., 4, War Dep., 1877, p. 77, pl. 4, fig. 13a-c.  
*Polygyrata trochiscus* Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 130 (gen. ref.).  
Canadian (Beekmantown): Muddy Creek, Nevada.  
*Cotypes*.—Cat. No. 17315, U.S.N.M.



**POLYOROPHE** Lindström.Genotype: *P. glabra* Lindström.

*Polyorophe* Lindström, *Ofvers K. Vet.-Akad. Forhandl.*, 39, No. 3, 1882, pp. 16, 20; *Bihang till K. Sv. Vet.-Akad. Handl.*, 8, 1883, p. 12; *ibid.*, 21, *Afd.* 4, No. 7, 1896, p. 43.

***Polyorophe radricula*** Foerste.

*Polyorophe radricula* Foerste, *Bull. Kentucky Geol. Surv.*, 7, 1906, p. 313, pl. 5, figs. 3a-e.

Clinton (Waco): Near Estill Springs, north of Irvine, Kentucky.

**POLYPHEMOPSIS** Portlock. See *Subulites* Conrad.

**POLYPORA** McCoy.Genotype: *P. dendroides* McCoy.

*Polypora* McCoy, *Synopsis Carbon. Foss. Ireland*, 1845, p. 206.—D'Orbigny, *Prodr. de Pal.*, 1, 1850, p. 45.—Hall, *Pal. New York*, 2, 1852, p. 167.—McCoy, *British Pal. Foss.*, 1854, p. 115.—Pictet, *Traite de Pal.*, 2d ed., 4, 1857, p. 166.—Eichwald, *Lethæa Rossica*, 1, 1860, p. 372.—Nicholson, *Pal. Province, Ontario*, 1874, p. 98.—Etheridge, *Jun.*, *Proc. Geol. Assoc.*, 4, 1875, p. 120.—Zittel, *Handb. Pal.*, 1, 1880, p. 601.—Vine, *Rep. British Assoc. Adv. Sci.*, 1881, p. 170; *Geol. Mag.*, dec. 2, 7, 1881, p. 513.—Ulrich, *Jour. Cincinnati Soc. Nat. Hist.*, 5, 1882, p. 150.—Claypole, *Quar. Jour. Geol. Soc. London*, 39, 1883, p. 31.—Vine, *Rep. 53d Meeting British Assoc. Adv. Sci.*, 1884, p. 194.—Hall, *Rep. State Geol. New York for 1884, 1885*, p. 35.—Vine, *Proc. Yorkshire Geol. Polyt. Soc.*, 9, 1885, p. 86.—Waagen and Pichl, *Pal. Indica*, ser. 13, 1885, pp. 774, 781.—Ulrich, *Contr. Amer. Pal.*, 1, 1886, p. 5.—Foerste, *Bull. Sci. Lab. Denison Univ.*, 2, 1887, p. 82.—Hall and Simpson, *Pal. New York*, 6, 1887, p. 24.—Miller, *N. A. Geol. Pal.*, 1889, p. 315.—Ulrich, *Geol. Surv. Illinois*, 8, 1890, pp. 396, 585.—Počta, *Syst. Sil. Bohême*, 8, 1, 1894, p. 84.—Simpson, 13th *Ann. Rep. State Geol. New York for 1893, 1895*, pp. 699, 724; 47th *Ann. Rep. New York State Mus.*, pp. 893, 918.—Whidborne, *Devon. Fauna England (Pal. Soc. Pub., 49)*, 2, pt. 4, 1895, p. 174.—Ulrich, *Zittel's Textb. Pal. (Engl. ed.)*, 1896, p. 282.—Simpson, 14th *Ann. Rep. State Geol. New York for 1894, 1897*, pp. 502, 520.—Grabau, *Bull. Buffalo Soc. Nat. Sci.*, 6, 1899, p. 162.—Nickles and Bassler, *Bull. U. S. Geol. Surv.*, 173, 1900, p. 39, 357.—Grabau, *Bull. New York State Mus.*, 45, 1901, p. 172; *Bull. Buffalo Soc. Nat. Sci.*, 7, 1901, p. 172.—Condra, *Nebraska Geol. Surv.*, 2, pt. 1, 1903, p. 67.—Cumings, *Amer. Jour. Sci.*, 4th ser., 17, 1904, p. 49, 70.—Bassler, *Bull. U. S. Geol. Surv.*, 292, 1906, p. 52.—Cumings, 30th *Ann. Rep. Dep. Geol. Nat. Res. Indiana*, 1906, p. 1283.—Hennig, *Archiv. für Zool., K. Sven. Vet.-Akad. Stockholm*, 3, No. 10, 1906, p. 12.—Bassler, *Bull. U. S. Geol. Surv.*, 292, 1906, p. 52.—Grabau and Shimer, *N. A. Index Fossils*, 1, 1907, p. 148.—Bassler, *Zittel-Eastman Textb. Pal.*, 1913, p. 341.

*Protoretopora* Zittel, *Handb. Pal.*, 1, 1880, p. 602.—Etheridge, *Proc. Royal Phys. Soc. Edinburgh*, 5, 1880, p. 275.

*Polyoporella* Simpson, 13th *Ann. Rep. State Geol. New York for 1893, 1895*, pp. 700, 725; 47th *Ann. Rep. New York State Mus.*, pp. 894, 919; 14th *Ann. Rep. State Geol. New York for 1894, 1897*, pp. 502, 520.

*Flabelliporella* Simpson, 13th *Ann. Rep. State Geol. New York for 1893, 1895*, pp. 703, 725; 47th *Ann. Rep. New York State Mus.*, pp. 897, 919; 14th *Ann. Rep. State Geol. New York for 1894, 1897*, pp. 502, 521.

*Protoretopora* De Koninck, *Rech. sur les Foss. Pal. de la Nouv. Galles du Sud*, 3, 1876, p. 176; 1898, *Engl. trans., Mem. Geol. Sur. New South Wales, Pal. No.* 6, p. 136.

**Polypora albionensis** Spencer.

Recognizable?

*Polypora* (*Fenestella*?) *albionensis* Spencer, Trans. St. Louis Acad. Sci., 4, 1884, p. 605, pl. 7, figs. 5, 5a; Bull. Mus. Univ. State Missouri, 1, 1884, p. 55, pl. 7, figs. 5, 5a.

Niagaran: Six miles east of Hamilton, Ontario.

**Polypora conferta** (Hall).

*Fenestella conferta* Hall, Trans. Albany Institute, 10, 1883, p. 63 (abstract, 1879, p. 7); 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 252.

Niagaran (Waldron): Waldron, Indiana.

**Polypora dictyota** Ulrich and Bassler.

*Polypora dictyota* Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 283, pl. 47, fig. 3.

Helderbergian (Keyser): Cumberland, Maryland.

*Holotype*.—Cat. No. 60742, U.S.N.M.

**Polypora incepta** Hall.

*Polypora incepta* Hall, Pal. New York, 2, 1852, p. 167, pl. 40D, figs. 5a-f.—Pictet, *Traite de Pal.*, 2d ed., 4, 1857, p. 166, pl. 92, fig. 15.—Ulrich, *Geol. Surv. Illinois*, 8, 1890, p. 358, pl. 55, fig. 1.—Grabau, *Bull. New York State Mus.*, 45, 1901, p. 172, fig. 73; *Bull. Buffalo Soc. Nat. Sci.*, 7, 1901, p. 172, fig. 73.—Bassler, *Bull. U. S. Geol. Surv.*, 292, 1906, p. 52, pl. 19, figs. 8-13.—Grabau and Shimer, *N. A. Index Fossils*, 1, 1907, p. 148, fig. 204.

Clinton (Rochester): Rochester and Lockport, New York; Grimsby, Ontario.

*Plesiotype*.—Cat. No. 44074, U.S.N.M. (Ulrich).

**Polypora punctostriata** (Hall).

*Fenestella punctostriata* Hall, 28th Ann. Rep. New York State Mus. (doc. ed.), 1876, pl. 12, figs. 15, 16; *mus. ed.*, 1879, p. 125, pl. 12, figs. 15, 16; 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 251, pl. 11, figs. 15, 16.

Niagaran (Waldron): Waldron, Indiana.

**Polypora tantula** (Hall).

*Fenestella tantulus* Hall, Trans. Albany Institute, 10, 1883, p. 64 (abstract, 1879, p. 8); 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 253.

Niagaran (Waldron): Waldron, Indiana.

POLYFORELLA Simpson. See *Polypora* McCoy.

**POLYTECHIA** Hall and Clarke.Genotype: *Hemipronites apicalis* Whitfield.

*Polytechia* Hall and Clarke, *Pal. New York*, 8, pt. 1, 1892, p. 239, figs. 11, 12; 11th Ann. Rep. New York State Geol., 1894, p. 275.—Miller, *N. A. Geol. Pal.*, 1st App., 1892, p. 690.—Schuchert, *Zittel-Eastman Textb. Pal.*, 1, 1900, p. 320; *ibid.*, 2d ed., 1913, p. 393.—Walcott, *Proc. U. S. Nat. Mus.*, 28, 1905, p. 295.

**Polytechia apicalis** (Whitfield).

*Hemipronites apicalis* Whitfield, *Bull. American Mus. Nat. Hist.*, 2, 1886, p. 300, pl. 24, figs. 1-5.—Seely, *Vermont State Geol.*, Rep. 7, 1910, pl. 62, figs. 1-5.

*Polytechia apicalis* Hall and Clarke, *Pal. New York*, 8, pt. 1, 1892, p. 239, fig. 11, 12, pl. 7A, figs. 26-30.

Canadian (Beekmantown): Fort Cassin, Vermont.

POLYTECHIA? MONTANENSIS Walcott. See *Clarkella montanensis*.

POLYTOMURUS Hawle and Corda. See *Dionide Barrande*.

POLYTROPINA Donald. See *Poleumita* Clarke and Ruedemann.

- POLYTROPIS** Dekoninck. See Poleumite Clarke and Ruedemann.
- PONTOBDELLOPSIS** Ruedemann. Genotype: *P. cometa* Ruedemann.  
*Pontobdellopsis* Ruedemann, Bull. New York State Mus., 42, 1901, p. 574.
- Pontobdellopsis cometa** Ruedemann.  
*Pontobdellopsis cometa* Ruedemann, Bull. New York State Mus., 42, 1901, p. 574, pl. 1, figs. 14-18.  
 Trenton (Snake Hill): Rural Cemetery, near Albany, New York.
- PONTOCYPRIS** Sars. Genotype: *P. serrulata* Sars.  
*Pontocypris* Sars, Oversigt af Norges Marine Ostracoder, 1865, p. 15.—Brady, Intellectual Observer, 12, London, 1867, p. 118.—Ulrich, Zittel-Eastman Textb. Pal., 1, 1900, p. 646.—Bassler, *ibid.*, 2d ed., 1913, p. 740.
- Pontocypris arcuata** Ulrich and Bassler.  
*Pontocypris arcuata* Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 541, pl. 98, figs. 23-25.  
 Helderbergian (Keyser): Cumberland, Maryland.  
*Holotype*.—Cat. No. 53288, U.S.N.M.
- Pontocypris(?) illinoisensis** Ulrich.  
*Pontocypris(?) illinoisensis* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 107, pl. 10, figs. 16a-c.  
 Richmond (Maquoketa): Savannah, Illinois.  
*Holotype*.—Cat. No. 41333, U.S.N.M.
- Pontocypris mawi breviata** Jones.  
*Pontocypris mawi* var. *breviata* Jones, Ann. Mag. Nat. Hist., 6th ser., 4, p. 269, pl. 15, fig. 4.—Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 541, pl. 98, figs. 26-28.  
 Silurian: Gotland.  
 Helderbergian (Keyser): Cumberland, Maryland.  
*Cotypes*.—Cat. No. 53287, U.S.N.M.
- PORAMBONITES OBSCURUS** Hall and Whitfield. See *Parastrophia(?) obscura*.
- PORAMBONITES? OTTAWAENSIS** Billings. See *Rhynchotrema ottawaense*.
- PORCELLIA** (part) of authors. See *Oxydiscus* Koken.
- PORCELLIA ORNATA** Sharpe. See *Cyrtolites ornatus*.
- PORCELLIA SENEX** Winchell and Marcy. See *Platyceras senex*.
- PORITES? ASTRAFORMIS** Owen. See *Plasmopora follis*.
- PORITES INORDINATA** Lonsdale. See *Heliolites inordinata*.
- PORITES MEGASTOMA** McCoy. See *Heliolites megastoma*.
- PORITES PETALIFORMIS** Lonsdale. See *Plasmopora petaliformis*.
- PORITES? VETUSTA** Hall. See *Protaræa vetusta*.
- POROCRINUS** Billings. Genotype: *P. conicus* Billings.  
*Porocrinus* Billings, Geol. Surv. Canada, Rep. Progr. for 1853-56, 1857, p. 279; Geol. Surv. Canada, dec. 4, 1859, p. 33, fig. 13.—Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1865, p. 145; Geol. Surv. Illinois, 3, 1868, p. 329.—Zittel, Handb. Pal., 1, Munich, 1879, p. 420.—Grant, Trans. Ottawa Field Nat. Club, 1, 1881, p. 42.—Miller, N. A. Geol. Pal., 1889, p. 273; Zittel-

**POROCRINUS**—Continued.

Eastman Textb. Pal., 1, 1900, p. 184.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 172, fig. 86.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 473.—Springer, Zittel-Eastman Textb., Pal., 2d ed., 1913, p. 217.

**Porocrinus conicus** Billings.

*Porocrinus conicus* Billings, Geol. Surv. Canada, Rep. Progr. for 1853-56, 1857, p. 279; Geol. Surv. Canada, dec. 4, 1859, p. 34, pl. 2, figs. 5a-d.—Zittel, Handb. Pal., 1, Munich, 1879, p. 420, fig. 296a.—Miller, N. A. Geol. Pal., 1889, p. 273, fig. 400.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 474.—Springer, Geol. Surv. Canada, Mem. 15P, 1911, p. 41 (loc. occ.).  
Trenton (Curdsville): Ottawa and Kirkfield, Ontario.

**Porocrinus crassus** Meek and Worthen.

*Porocrinus crassus* Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1865, p. 145; Geol. Surv. Illinois, 3, 1868, p. 330, figs. A, B, pl. 4, figs. 2a, b.—Miller, N. A. Geol. Pal., 1889, p. 273, figs. 401, 402.  
Richmond (Maquoketa): Oswego, Kendall County, Illinois.

**Porocrinus kentuckiensis** Miller and Gurley.

*Porocrinus kentuckiensis* Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 5, 1894, p. 24, pl. 2, fig. 19.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 751, fig. 1380.  
Trenton (Curdsville): Mercer County, Kentucky.

**Porocrinus pentagonius** Meek and Worthen.

*Porocrinus pentagonius* Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1865, p. 146; Geol. Surv. Illinois, 3, 1868, p. 332, pl. 1, fig. 3.  
Black River (Platteville): Dixon, Illinois.

**Porocrinus shawi** Schuchert.

*Porocrinus shawi* Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 155, pl. 12, figs. 1-3.  
Mohawkian: Head of Frobisher Bay, Baffin Land.  
*Holotype*.—Cat. No. 28145, U.S.N.M.

**Porocrinus smithi** Grant.

*Porocrinus Smithi* Grant, Trans. Ottawa Field Nat. Club, 1, 1881, p. 42, pl. figs. 1-8.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 173, fig. 86.  
Trenton: Belleville, Ontario.

*POSIDONIA ALATA* Hall. See *Cyrtodonta? alata*.

*POSIDONOMYA ALATA* Miller. See *Cyrtodonta? alata*.

*POSIDONOMYA AMYGDALINA* Emmons. See *Ambonychia amygdalina*.

*POSIDONOMYA BELLISTRIATA* Emmons. See *Ambonychia bellistriata*.

*POSIDONOMYA OBTUSA* Emmons. See *Cyrtodonta obtusa*.

*POSIDONOMYA ORBICULARIS* Emmons. See *Ambonychia orbicularis*.

*POSIDONOMYA? RHOMBOIDEA* Hall. See *Pterinopecten? rhomboideum*.

*POSIDONOMYA SUBUNDATA* Emmons. See *Clionychia undata*.

**POTERIOCERAS** McCoy.Genotype: *P. ellipticum* McCoy.

*Poterioceras* McCoy, Syn. Carb. Foss. Ireland, 1844, p. 10.—Saemann, Palæontographica, 3, 1852, p. 157.—McCoy, British Pal. Rocks Foss., 1854, p. 321.—Blake, Mon. British Foss. Cephalopoda, 1882, p. 57.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 256.—Whidborne, Mon. Dev. Fauna South England, 1, Pal. Soc., 1890, p. 112.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 697.—Foord, Mon. Carb. Cephalopoda Ireland, Pal. Soc., 1898, p. 47.—Hyatt, Zittel-Eastman Textb. Pal., 1, 1900, p. 530.—Foord, Mon. Carb. Ceph. Ireland, pt. 5, Pal. Soc., App., 1903, p. 213.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 126.—Hyatt, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 611.

*Apioceras* Saemann, Palæontographica, 3, 1852, pp. 138, 157, 162.—Woodward, Man. Mollusca, pt. 3, 1856, p. 449.

*Acleistoceras* Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1883, p. 277.

*Orthóceras*, *Gomphoceras*, *Phragmoceras*, and *Cyrtoceras* (part) of authors.

**Poterioceras apertum** Whiteaves.

*Poterioceras apertum* Whiteaves, Trans. Royal Soc. Canada, 7, sec. 4, 1890, p. 78, pl. 14, figs. 2-4; *ibid.*, 9, sec. 4, 1892, p. 87, pl. 11, figs. 2, 3.—Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 796, pl. 57, fig. 11.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 217.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 126, fig. 1372.

*Oncoceras constrictum* Billings, Canadian Nat. Geol., 1, 1856, p. 314, figs. 2, 3; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 23.

Black River or Richmond: Lake Winnipeg, Manitoba.

Trenton: St. Paul and Cannon Falls, Minnesota.

**POTERIOCERAS CONSTRICTUM** Foord. See *Oncoceras constrictum*.

**Poterioceras gracile** Whiteaves.

*Poterioceras gracile* Whiteaves, Trans. Royal Soc. Canada, 9, sec. 4, 1892, p. 87, pl. 12, figs. 4, 4a; Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 219.

Black River or Richmond: Lake Winnipeg, Manitoba.

**Poterioceras nobile** Whiteaves.

*Poterioceras nobile* Whiteaves, Trans. Royal Soc. Canada, 7, sec. 4, 1890, p. 77, pl. 14, fig. 1; *ibid.*, 9, sec. 4, 1892, p. 87; Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 216.

Black River or Richmond: East Selkirk and Lower Fort Garry, Manitoba.

**Poterioceras obesum** (Billings).

*Gomphoceras obesum* Billings, Geol. Surv. Canada, Rep. Progr. for 1853-1856, 1857, p. 311; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 23 (loc. ref.).

Richmond (English Head, Charleton): Charleton Point and Macasty Bay, Anticosti.

**Poterioceras sauridens** Clarke and Ruedemann.

*Poterioceras sauridens* Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 93, pl. 14, figs. 1-19.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 127, fig. 1373.

*Poterioceras* cf. *sauridens* Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 198, pl. 29, fig. 4.

Niagaran (Guelph): Shelby and Rochester, New York.

Upper Monroan (Amherstburg): Detroit River, opposite Amherstburg, Ontario. Observation.—See *Cyrtoceras reversum* Spencer.

**Poterioceras tyrrelli** Parks.

*Poterioceras tyrrelli* Parks in Tyrrell, 22d Rep. Ontario Bur. Mines, 1913, p. 33. Mohawkian or Richmond: Shamattawa River, Manitoba.

POTERIOCRINITES (DENDROCRINUS) of authors. See *Dendrocrinus* Hall.

POTERIOCRINITES (DENDROCRINUS) POLYDACTYLUS Meek. See *Cupulocrinus polydactylus*.

POTERIOCRINUS of authors. See *Dendrocrinus* Hall.

POTERIOCRINUS? CALYX Hall. See *Ampheristocrinus calyx*.

POTERIOCRINUS PISIFORMIS Roemer. See *Lecanocrinus pisiformis*.

POTERIOCRINUS (DENDROCRINUS) POLYDACTYLUS Meek. See *Cupulocrinus polydactylus*.

**PRASOPORA** Nicholson and Etheridge, jr.

Genotype: *P. grayæ* Nicholson and Etheridge, jr.

*Prasopora* Nicholson and Etheridge, jr., Ann. Mag. Nat. Hist., 4th ser., 20, 1877, p. 38; Mon. Sil. Foss. Girvan Dist., 1878, p. 44.—Nicholson, Pal. Tabulate Corals, 1879, p. 324.—Zittel, Handb. Pal., 1, 1880, p. 616.—Nicholson, Genus *Monticulipora*, 1881, pp. 102, 202.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 153.—Foord, Contr. Micro-Pal. Cambro-Sil., 1883, p. 10.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 472.—Waagen and Wentzel, Mem. Geol. Surv. India, Pal. Indica, 13th ser., 1886, p. 909.—Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 170.—Miller, N. A. Geol. Pal., 1889, p. 201.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 371.—Rominger, Amer. Geol., 6, 1890, pp. 116-119; Geol. Minnesota, 3, 1893, p. 244; (part) Zittel's Textb. Pal. (Engl. ed.), 1896, pp. 104, 273.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 586.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 29.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 129.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 753.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 332.

**Prasopora affinis** Foord.

*Prasopora affinis* Foord, Contr. Micro-Pal. Cambro-Sil., 1883, p. 12, pl. 3, figs. 2-2c.—Ulrich, Geol. Surv. Illinois, 8, 1890, fig. 7c (p. 318).

Trenton: Ottawa, Ontario; Cannon Falls and Berne, Minnesota (Prosser).

PRASOPORA CALYCUCLA Ulrich. See *Aspidopora calycula*.

PRASOPORA CONICA Simpson. See *Prasopora conoidea*.

**Prasopora conoidea** Ulrich.

*Prasopora conoidea* Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 87; Geol. Minnesota, 3, 1893, p. 249, pl. 16, figs. 11-15.—Cumings, Bull. Geol. Soc. Amer., 23, 1912, p. 370, pl. 22, figs. 33-39; pl. 21, figs. 21, 22; pl. 19, figs. 1-6, 9.

*Prasopora conica* (in error for *conoidea*) Simpson, 14th Ann. Rep. State Geologist New York for 1894, 1897, fig. 170 (p. 587).

Black River (Decorah): Cannon Falls, St. Paul, etc., Minnesota.

*Cotypes*.—Cat. No. 43592, U.S.N.M.

**Prasopora contigua** Ulrich.

*Prasopora contigua* Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 87; Geol. Minnesota, 3, 1893, p. 249, pl. 16, figs. 24-26.—J. F. James, Jour. Cincinnati Soc. Nat. Hist., 16, 1894, p. 180.

Black River (Decorah): Goodhue and Dakota Counties, Minnesota.

Figured sections of *holotype*.—Cat. No. 43590, U.S.N.M.

**Prasopora falesi** (James).

Monticulipora falesi James, Jour. Cincinnati Soc. Nat. Hist., 7, 1884, p. 138, pl. 7, figs. 2-2d.—James and James, *ibid.*, 10, 1888, p. 168.—J. F. James, *ibid.*, 16, 1894, p. 185.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 322.  
Prasopora falesi Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 48, pl. 1, figs. 1-4.  
Trenton (Hermitage): Danville, Kentucky.

**Prasopora grandis** (Ulrich).

Monticulipora grandis Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 78; Geol. Minnesota, 3, 1893, p. 219, pl. 15, figs. 1-6.  
Prasopora grandis Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1903, p. 371.  
Black River (Decorah) and Trenton (Prosser): Minneapolis, St. Paul, and Cannon Falls, Minnesota.  
*Cotypes*.—Cat. No. 43591, U.S.N.M.

**Prasopora hero** Seely.

Not recognizable.

Prasopora hero Seely, Rep. Vermont State Geol., 5, 1906, p. 187, pl. 45.  
Chazyan: South Hero, Vermont.

PRASOPORA HOSPITALIS Ulrich. See Homotrypella hospitalis.

**Prasopora insularis** Ulrich.

Prasopora insularis Ulrich, Geol. Minnesota, 3, 1893, p. 251, pl. 16, figs. 18-23.  
Trenton (Prosser): Cannon Falls, St. Paul, Berne, and Kenyon, Minnesota;  
Neenah, Wisconsin; Decorah, Iowa.  
*Cotypes*.—Cat. No. 43588, U.S.N.M.

**Prasopora insularis filmorensis** Ulrich.

Prasopora insularis var. filmorensis Ulrich, Geol. Minnesota, 3, 1893, p. 252, pl. 16, figs. 18, 19.  
Trenton (Prosser): Fountain and Preston, Minnesota.  
Figured sections of *holotype*.—Cat. No. 43589, U.S.N.M.

**Prasopora lenticularis** Ulrich.

Prasopora lenticularis Ulrich, Geol. Minnesota, 3, 1893, p. 253, pl. 17, figs. 22-25.  
Black River (Decorah): St. Paul, Minnesota.  
*Holotype*.—Cat. No. 43587, U.S.N.M.

PRASOPORA LYCOPERDON Ulrich. See Prasopora simulatrix.

**Prasopora lycoperdon selwyni** Ami.

Not recognizable.

Prasopora lycoperdon Vanuxem, var. Selwyni Ami, Canadian Rec. Sci., 5, 1892, p. 99.  
Trenton: Quebec City, Quebec.

PRASOPORA? NEWBERRYI Ulrich. See Aspidopora newberryi.

**Prasopora nodosa** Ulrich.

Prasopora nodosa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 245, pl. 11, figs. 1-1b.—J. F. James, *ibid.*, 16, 1894, p. 189.  
Trenton (Catheys): Nashville, Tennessee.  
*Cotypes*.—Cat. No. 43691, U.S.N.M.

**Prasopora oculata** Foord.

Prasopora oculata Foord, Contr. Micro-Pal. Cambro-Sil., 1883, p. 11, pl. 3, figs. 1-1g.—Ulrich, Geol. Minnesota, 3, 1893, p. 252, figs. 15c, d.  
Trenton: Ottawa, Ontario; Goodhue County, Minnesota (Prosser).  
*Plesiotypes*.—Cat. No. 43586, U.S.N.M.

*PRASOPORA PARMULA* Foerste. See *Aspidopora parmula*.

**Prasopora patera** Ulrich and Bassler.

*Prasopora patera* Ulrich and Bassler, *Smiths. Misc. Coll. Quart.*, 47, 1904, p. 20, pl. 6, figs. 11-14.—Hayes and Ulrich, *U. S. Geol. Surv.*, folio 95, *illus. sheet*, 1903, figs. 44-46.

Trenton (Hermitage): Near Columbia, Nashville, etc., Tennessee.

*Cotypes*.—Cat. No. 43175, U.S.N.M.

**Prasopora selwyni** (Nicholson).

*Monticulipora* (*Diplotrypa*) *Whiteavesii* (part). Nicholson, *Pal. Tab. Corals*, 1879, p. 316.

*Monticulipora* (*Prasopora*) *Selwynii* Nicholson, *Genus Monticulipora*, 1881, p. 206, fig. 44.

*Prasopora selwyni* Ulrich, *Geol. Minnesota*, 3, 1893, p. 250, pl. 16, figs. 16, 17, fig. 15a, b (p. 248); Zittel's *Textb. Pal. (Engl. ed.)*, 1896, fig. 188A (not B=*Peronopora decipiens* (Rominger) p. 104).

Trenton: Peterboro, etc., Ontario; Cannon Falls, Minnesota (Prosser).

*Plesiotypes*.—Cat. Nos. 45052, 45053, U.S.N.M.

*PRASOPORA SELWYNII* var. *HOSPITALIS* Nicholson. See *Homotrypella hospitalis*.

**Prasopora simulatrix** Ulrich.

*Prasopora simulatrix* Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 85; *Geol. Minnesota*, 3, 1893, p. 245, pl. 16, figs. 1-10; Zittel's *Textb. Pal. (Engl. ed.)*, 1896, fig. 452.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, figs. 171, 172, p. 587.—Nickles and Bassler, *Bull. U. S. Geol. Surv.*, 173, 1900, p. 372.—Sardeson, *Jour. Geol.*, 9, 1901, p. 10, pl. A, figs. 7-9.—Weller, *Geol. Surv. New Jersey, Pal.*, 3, 1903, p. 140, pl. 8, figs. 1-3.—Nickles, *Bull. Kentucky Geol. Surv.*, No. 5, 1905, p. 41, pl. 1, fig. 1.—Grabau and Shimer, *N. A. Index Fossils*, 1, 1907, p. 129, fig. 186d.—Bassler, *Bull. Virginia Geol. Surv.*, 2a, 1909, p. 7, figs. 1-2.—Bassler, Zittel-Eastman *Textb. Pal.*, 1913, p. 332, fig. 478.

*Prasopora lycoperdon* Ulrich, *Geol. Surv. Illinois*, 8, 1890, p. 318, figs. 7a-b.—Grabau and Shimer, *N. A. Index Fossils*, 1, 1907, p. 130.

*Monticulipora selwynii* J. F. James (not Nicholson), *Jour. Cincinnati Soc. Nat. Hist.*, 18, 1895, p. 86.

Black River and Trenton: Kentucky, Tennessee, Minnesota, Wisconsin, Virginia; etc.

*Cotypes*.—Cat. Nos. 43593, 43594, U.S.N.M.

**Prasopora simulatrix orientalis** Ulrich.

*Monticulipora* (*Diplotrypa*) *Whiteavesii* (in part). Nicholson, *Pal. Tab. Corals*, 1879, p. 316, fig. 42c, pl. 14, fig. 1.

*Prasopora simulatrix* var. *orientalis* Ulrich, *Geol. Minnesota*, 3, 1893, p. 246, pl. 16, figs. 1, 2, 6, 7.—Ruedemann, *Bull. New York State Mus.*, 49, 1901, p. 13.

Trenton: Ottawa, Peterboro, etc., Ontario; Trenton Falls, New York.

*Cotypes*.—Cat. Nos. 44054, 44055, U.S.N.M.

**PRIMICORALLINA** Whitfield.

Genotype: *P. trentonensis* Whitfield.

*Primicorallina* Whitfield, *Bull. Amer. Mus. Nat. Hist.*, 6, 1894, p. 357.—Miller, *N. A. Geol. Pal.*, 2d App., 1897, p. 721.—Ruedemann, *Bull. New York State Mus.*, 133, 1909, p. 197.

**Primicorallina trentonensis** Whitfield.

*Primicorallina trentonensis* Whitfield, *Bull. Amer. Mus. Nat. Hist.*, 6, 1894, p. 357, pl. 11, figs. 14-17; *Mem. Amer. Mus. Nat. Hist.*, 1, pt. 2, 1895, pl. 4, figs.



**Primicorallina trentonensis**—Continued.

14-17.—Ruedemann, Bull. New York State Mus., 133, 1909, p. 198, figs. 1-3, pl. 1, figs. 1-2.

Trenton: Middleville, New York.

**PRIMITIA** Jones and Holl.

Genotype: *Beyrichia mundula* Jones.

*Primitia* Jones and Holl, Ann. Mag. Nat. Hist., 3d ser., 16, 1865, p. 415.—Jones, Monthly Micros. Jour., 4, 1870, p. 191.—Barrande, Syst. Sil. du Centre Boheme, 1, Suppl., 1872, p. 539.—Alth, Abhandl. der K.-K. Geol. Reichsanstalt, 7, Heft. 1, 1874, p. 64.—Callaway, Quart. Jour. Geol. Soc. London, 33, 1877, p. 668.—Zittel, Handb. Pal., 2, 1885, p. 553.—Jones, Ann. Mag. Nat. Hist., 5th ser., 19, 1887, p. 193.—Miller, N. A. Geol. Pal., 1889, p. 561.—Vogdes, Annals New York Acad. Sci., 5, 1889, p. 30, pl. 2, fig. 14.—Krause, Zeits. d. d. geol. Gesell., 41, 1889, p. 4.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 650.—Koken, Die Leitfossilien, Leipzig, 1896, p. 39.—Gurich, Verh. d. Russ.-Kais. Mineral Gesell. zu St. Petersburg, 2d ser., 32, 1896, p. 382.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 303.—Ulrich, Zittel's Textb. Pal. (Amer. ed.), 1900, p. 644.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1041.—Bonnema, Mitt. Min. Geol. Inst. Groningen, 2, 1909, p. 15.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 345.—Bassler, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 738.

**Primitia æqualis** Jones and Holl.

*Primitia æqualis* Jones and Holl, Ann. Mag. Nat. Hist., 5th ser., 17, 1886, p. 412, pl. 14, figs. 11a, 11b.—Jones, *ibid.*, 6th ser., 3, 1889, p. 379, pl. 17, fig. 2. Silurian: Ironbridge, etc., England; Cape Bon Ami, New Brunswick.

**PRIMITIA BILLINGSI** JONES. See *Eurychilina billingsi*.

**Primitia arctica** Høltedahl.

*Primitia arctica* Høltedahl, 2d Arct. Exp. "Fram," 1898-1902, No. 32, 1914, p. 39, pl. 8, fig. 16. Helderbergian (Lower beds): Near Borgen, southwestern Ellesmereland, Arctic America.

**Primitia celata** Ulrich.

*Primitia celata* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 653, pl. 43, figs. 67, 68. Black River (Decorah): Minneapolis, Minnesota. *Holotype*.—Cat. No. 41339, U.S.N.M.

**Primitia centralis** Ulrich.

*Primitia centralis* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 130, pl. 10, figs. 1, 2a-c.—Jones, Quart. Jour. Geol. Soc. London, 49, 1893, p. 291, pl. 12, figs. 1a-c. Trenton (Upper), Eden, and Maysville: Cincinnati, Ohio, and vicinity. *Holotype* and *paratype*.—Cat. Nos. 41337, 41338, U.S.N.M.

**Primitia cincinnatiensis** (Miller).

*Beyrichia cincinnatiensis* Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 350, fig. 25.—Walcott, Trans. Albany Inst., 10, 1883, p. 23 (loc. occ.). *Primitia cincinnatiensis* Miller, N. A. Geol. Pal., 1889, p. 561, fig. 1045.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 132, pl. 10, figs. 5, 6.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1047, pl. 53, fig. 11-11d.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 345, fig. 1658l, l'.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 738, fig. 1425b. Richmond (Arnheim, Waynesville): Near Fort Ancient, etc., Ohio; Indiana. *Plesiotypes*.—Cat. No. 41346, U.S.N.M.

PRIMITIA CONCINNA Jones and Holl. See *Aparchites concinnus*.

PRIMITIA CONSTRICTA Miller. See *Primitiella constricta*.

PRIMITIA CRISTATA? Whitfield. See *Isochilina cristata*.

**Primitia cumberlandica** Ulrich and Bassler.

*Primitia?* *cumberlandica* Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 516, pl. 95, fig. 5.

Helderbergian (Keyser): Cumberland, Maryland; Keyser, West Virginia.

*Holotype*.—Cat. No. 53282, U.S.N.M.

**Primitia dorsicornis** (Ulrich).

*Leperditia* (?*Primitia*) *dorsicornis* Ulrich, Amer. Geol., 10, 1892, p. 267, pl. 9, figs. 24–26.

*Leperditella?* *dorsicornis* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, pp. 636–639, figs. 19, 20, 20a.

Richmond (Maquoketa): Savannah, Illinois.

*Holotype*.—Cat. No. 41315, U.S.N.M.

**Primitia duplicata** Ulrich.

*Primitia duplicata* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 654, pl. 43, figs. 60, 61.

Black River (Decorah): Minneapolis, Minnesota.

*Holotype*.—Cat. No. 41348, U.S.N.M.

PRIMITIA FILLMORENSIS Miller. See *Primitiella fillmorensis*.

PRIMITIA FROBISHERI Emerson. See *Eurychilina frobisherii*.

**Primitia gibbera** Ulrich.

*Primitia gibbera* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 655, pl. 43, figs. 57–59.

Richmond (Maquoketa): Near Spring Valley, Minnesota.

*Holotype*.—Cat. No. 41341, U.S.N.M.

PRIMITIA GLABRA Ulrich. See *Leperditella?* *glabra*.

PRIMITIA GREGARIA Whitfield. See *Isochilina gregaria*.

**Primitia impressa** Ulrich.

*Primitia impressa* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 131, pl. 10, figs. 3a–c, 4a–4c.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1048, pl. 53, figs. 7, 7d.

Richmond: Savannah, Illinois (Maquoketa); (?)Indiana.

*Cotypes*.—Cat. No. 41332, U.S.N.M.

**Primitia jonesi** (Ruedemann).

*Primitia mundula* (in error for *cincinnatiensis*) var. *jonesi* Ruedemann, Bull. New York State Mus., No. 49, 1901, p. 80, pl. 7, figs. 2–5.

Mohawkian (Rysedorph): Rysedorph Hill, Rensselaer County, New York.

PRIMITIA LATIMARGINATA Raymond. See *Eurychilina latimarginata*.

**Primitia lativia** Ulrich.

*Primitia lativia* Ulrich, Geol. Surv. Canada, Cont. Micro-Pal., pt. 2, 1889, p. 50, pl. 9, figs. 8, 8a.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 2, 1895, p. 126 (loc. occ.).

Richmond: Stony Mountain, Manitoba; Wyoming (Stony Mountain); Ohio and Indiana (Whitewater); Island of Anticosti (Charleton).

PRIMITIA LEPERDITOIDES Jones. See *Primitia logani leperditoides*.

*PRIMITIA LIMBATA* Miller. See *Primitiella limbata*.

***Primitia logani*** (Jones).

*Beyrichia Logani* Jones, Ann. Mag. Nat. Hist., 3d ser., 1, 1858, p. 244, pl. 9, figs. 6-10; Geol. Surv. Canada, dec. 3, 1858, p. 91, pl. 11, figs. 2-4.

*Primitia Logani* Jones and Holl, Ann. Mag. Nat. Hist., 3d ser., 16, 1865, p. 417.—  
Jones, Geol. Surv. Canada, Cont. Micro-Pal., pt. 3, 1891, pp. 63, 97, 99.

Canadian (Beekmantown): Grenville, Quebec, and Hawkesbury, Ontario.

***Primitia logani leperditoides*** (Jones).

*Beyrichia Logani* var. *leperditoides* Jones, Ann. Mag. Nat. Hist., 3d ser., 1, 1858, p. 244, pl. 9, fig. 10; Geol. Surv. Canada, dec. 3, 1858, pl. 11, fig. 5.

*Primitia leperditoides* Jones, Ann. Mag. Nat. Hist., 5th ser., 16, 1884, p. 345.

*Primitia Logani* var. *leperditoides* Jones, Geol. Surv. Canada, Cont. Micro-Pal., pt. 3, 1891, pp. 97, 99.

Canadian (Beekmantown): Grenville, Quebec, and Hawkesbury, Ontario.

***Primitia logani reniformis*** (Jones).

*Beyrichia logani* var. *reniformis* Jones, Ann. Mag. Nat. Hist., 3d ser., 1, 1858, p. 244, pl. 9, fig. 6; Geol. Surv. Canada, dec. 3, 1858, p. 91, pl. 11, fig. 1.

*Primitia Logani* var. *reniformis* Jones, Geol. Surv. Canada, Cont. Micro-Pal., pt. 3, 1891, pp. 97, 99.

Canadian (Beekmantown): Grenville, Quebec, and Hawkesbury, Ontario.

***Primitia mammata*** Ulrich.

*Primitia mammata* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 652, pl. 43, figs. 78-81.

Black River (Decorah): Minneapolis, Minnesota.

*Holotype*.—Cat. No. 41349, U.S.N.M.

***Primitia? medialis*** Ulrich.

*Primitia medialis* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 132, pl. 10, figs. 7a, 7b.

Richmond (Waynesville?): Jefferson County, Kentucky.

*Holotype*.—Cat. No. 41347, U.S.N.M.

***Primitia micula*** Ulrich.

*Primitia micula* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 653, pl. 43, figs. 69-72.

Trenton (Prosser): Near Cannon Falls, Minnesota.

*Cotypes*.—Cat. No. 41336, U.S.N.M.

***Primitia milleri*** Ulrich.

*Primitia milleri* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 133, pl. 12, figs. 2a-2c.

Richmond (Waynesville): Clarksville and Blanchester, Ohio.

*Holotype*.—Cat. No. 41340, U.S.N.M.

*PRIMITIA MINUTA* Jones (part). See *Bythocypris cylindrica*.

***Primitia minutissima*** Ulrich.

*Primitia minutissima* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 651, pl. 45, fig. 31.

Black River (Decorah): Fountain and Oxford Mills, Minnesota.

*Holotype*.—Cat. No. 41838, U.S.N.M.

*PRIMITIA MUNDULA* var. Jones. See *Primitia logani*.

***Primitia mundula effussa*** Jones.

*Primitia mundula* var. *effussa* Jones, Geol. Surv. Canada, Cont. Micro-Pal., pt. 3, 1891, p. 64, pl. 10, fig. 8.

Black River or Trenton (Quebec City): Quebec, Canada.

**Primitia mundula incisa** Jones.

*Primitia mundula incisa* Jones, Geol. Surv. Canada, Cont. Micro-Pal., pt. 3, 1891, p. 64, pl. 10, figs. 9a-c.

Trenton: Lorette Falls, Quebec.

PRIMITIA MUNDULA var. JONESI Ruedemann. See *Primitia jonesi*.

**Primitia muta** Jones and Holl.

*Cytheropsis concinna*? Jones, Ann. Mag. Nat. Hist., 3d ser., 1, 1858, p. 254, pl. 9, fig. 3.

*Primitia muta* Jones and Holl, *ibid.*, 3d ser., 16, 1865, p. 425.—Emerson (?) Narrative Hall's 2d Arctic Exped., U. S. Navy Dep., 1879, p. 580, fig. 7.

Niaganan: Beechy Island, Lancaster Sound, Arctic America.

**Primitia nitida** Ulrich.

*Primitia nitida* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 135, pl. 8, fig. 7.

Trenton (Perryville): Paris, Kentucky.

*Holotype*.—Cat. No. 41334, U.S.N.M.

PRIMITIA NODOSA Ulrich. See *Ulrichia nodosa*.

PRIMITIA (BEYRICHIA) PARALLELA Ulrich. See *Beyrichia parallela*.

**Primitia perminima** Ulrich.

*Primitia perminima* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 131, pl. 7, fig. 7.

Trenton (Upper): Covington, Kentucky.

*Holotype*.—Cat. No. 41436, U.S.N.M.

**Primitia rudis** Ulrich.

*Primitia rudis* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 136, pl. 10, figs. 8a-8c.

Eden (Economy): Covington, Kentucky.

*Holotype*.—Cat. No. 41345, U.S.N.M.

PRIMITIA RUGOSA Jones and Holl. See *Cytherella?* *rugosa*.

**Primitia rugulifera** (Jones).

*Beyrichia rugulifera* Jones, Ann. Mag. Nat. Hist., 3d ser., 1, 1858, p. 242, pl. 9, fig. 4.

*Primitia rugulifera* Jones and Holl, *ibid.*, 3d ser., 16, 1865, p. 419.

Niaganan: Beechy Island, Lancaster Sound, Arctic America.

**Primitia sanctipauli** Ulrich.

*Primitia sancti-pauli* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 652, pl. 43, figs. 73, 74.

Black River (Decorah): St. Paul and near Cannon Falls, Minnesota.

*Holotype*.—Cat. No. 41343, U.S.N.M.

PRIMITIA? SCULPTILIS Ulrich. See *Malliella sculptilis*.

PRIMITIA SEELYI Whitfield. See *Isochilina seelyi*.

**Primitia sigillata** (Jones).

*Beyrichia sigillata* Jones, Ann. Mag. Nat. Hist., 3d ser., 1, 1858, p. 242, pl. 9, fig. 5.

*Primitia sigillata* Jones and Holl, *ibid.*, 3d ser., 16, 1865, p. 418.

Niaganan: Beechy Island, Lancaster Sound, Arctic America.

PRIMITIA SIMULANS Miller. See *Primitiella simulans*.

**Primitia tumidula** Ulrich.

*Primitia tumidula* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 655, pl. 43, figs. 62-65.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 345, fig. 1658m, m', n.

Richmond (Maquoketa): Near Spring Valley, Minnesota.

*Cotypes*.—Cat. No. 41342, U.S.N.M.

PRIMITIA ULRICHI Jones. See *Primitiella ulrichi*.

PRIMITIA UNICORNIS Jones. See *Primitiella unicornis*.

**Primitia uphami** Ulrich.

*Primitia uphami* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 651, pl. 43, fig. 66.

Trenton (Prosser): Cannon Falls, Minnesota.

*Holotype*.—Cat. No. 41344, U.S.N.M.

PRIMITIA WHITFIELDI Jones. See *Primitiella whitfieldi*.

**PRIMITIELLA** Ulrich.

Genotype: *P. constricta* Ulrich.

*Primitiella* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 647.—Bonnema, Mitt. Min.

Geol. Inst. Groningen, 2, 1909, p. 33.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 344.—Bassler, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 737.

**Primitiella claypolei** (Jones).

*Leperditia claypolei* Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 25, pl. 3, figs. 17a, c.

Eden (Fulton): Cincinnati, Ohio, and vicinity.

**Primitiella constricta** Ulrich.

*Primitiella constricta* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 647, pl. 43, figs. 48-52.

*Primitia constricta* Miller, N. A. Geol. Pal., 2d. App., 1897, p. 789 (gen. ref.).

Black River: High Bridge, Kentucky (Lowville); Minneapolis, Minnesota (Platteville).

*Cotypes*.—Cat. Nos. 41462, 41463, U.S.N.M.

**Primitiella fillmorensis** Ulrich.

*Primitiella fillmorensis* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 649, pl. 45, figs. 28-30.

*Primitia fillmorensis* Miller, N. A. Geol. Pal., 2d App., 1897, p. 789 (gen. ref.).

Black River (Decorah): Fountain, Minnesota.

*Holotype*.—Cat. No. 41476, U.S.N.M.

**Primitiella limbata** Ulrich.

*Primitiella limbata* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 648, pl. 43, figs. 53-56.

*Primitia limbata* Miller, N. A. Geol. Pal., 2d App., 1897, p. 789 (gen. ref.).

Black River (Decorah): Minneapolis, Minnesota.

*Cotypes*.—Cat. No. 41350, U.S.N.M.

**Primitiella simulans** Ulrich.

*Primitiella simulans* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 648, pl. 43, figs. 26-28.

*Primitia simulans* Miller, N. A. Geol. Pal., 2d App., 1897, p. 789 (gen. ref.).

Black River (Decorah): Fountain, Minnesota.

*Cotypes*.—Cat. No. 41475, U.S.N.M.

**Primitiella ulrichi** (Jones).

*Primitia ulrichi* Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 6, pl. 4, figs. 1a-c; figs. 2, 3 var.

*Primitiella ulrichi* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 647.

Trenton (Collingwood): Collingwood, Ontario.

**Primitiella unicornis** (Ulrich).

*Leperditia unicornis* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 10, pl. 7, figs. 4, 4b.

*Aparchites unicornis* Ulrich, Geol. Surv. Canada, Cont. Micro-Pal., pt. 2, 1889, p. 50, pl. 9, fig. 11.

*Primitia unicornis* Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 7, pl. 4, figs. 8-13.—Chapman, Proc. Royal Soc. Victoria, n. s., 17, 1904, p. 306.

*Primitiella unicornis* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 647-649, pl. 43, figs. 75-77.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 2, 1895, p. 126 (loc. occ.).—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 344, fig. 1658j, k, k'.—Ruedemann, Bull. New York State Mus., 162, 1912, p. 121, pl. 9, figs. 13, 14.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 738, fig. 1425a.

Eden (Fulton): Cincinnati, Ohio, and vicinity (identified probably erroneously from Stony Mountain, Manitoba, and from Victoria); Minnesota, New York, and Australia.

*Holotype*.—Cat. No. 41467, U.S.N.M.

**Primitiella whitfieldi** (Jones).

*Primitia whitfieldi* Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 9, pl. 3, figs. 24a, 24b.

*Primitiella whitfieldi* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 647.

Eden (Fulton): Cincinnati, Ohio, and vicinity.

**PRIONIODUS** Pander.

Genotype: *P. elegans* Pander.

*Prioniodus* Pander, Mon. d. foss. Fische Sil. Syst., 1856, p. 28.—Miller, N. A. Geol. Pal., 1889, p. 520.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1889, p. 150.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 244.

**Prioniodus dychei** James.

*Prioniodus dychei* James, Jour. Cincinnati Soc. Nat. Hist., 7, 1884, p. 147, pl. 7, figs. A, B.

Maysville (Corryville): Warren County, Ohio.

**Prioniodus elegans** Pander.

*Prioniodus elegans* Pander, Mon. foss. Fische Sil. Syst., 1856, p. 29, pl. 2, figs. 22, 23.—Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 358, pl. 15, fig. 10.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 244, fig. 1538d.

Cincinnati (Pulaski): Garrison Common, near Toronto, Ontario.

**Prioniodus furcatus** Hinde.

*Prioniodus furcatus* Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 358, pl. 15, fig. 13.

Cincinnati (Pulaski): Garrison Common, near Toronto, Ontario.

**Prioniodus? politus** Hinde.

*Prioniodus? politus* Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 358, pl. 15, figs. 11, 12.

Cincinnati (Pulaski): Garrison Common and Don Valley, near Toronto, Ontario.

**Prioniodus radicans** Hinde.

*Prioniodus radicans* Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 356, pl. 15, figs. 1-6.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 244, fig. 1538a-c.

Chazyan: Grenville, Quebec.

**PRIONOTUS CONVOLTUS** Hisinger. See *Monograptus convolutus*.

**PRISCOCHITON** Dall.

Genotype: *Chiton canadensis* Billings.

*Priscochiton* (Billings MS.) Dall, Proc. U. S. Nat. Mus., 4, 1881, p. 281.

**Priscochiton canadensis** (Billings).

*Chiton Canadensis* Billings, Geol. Surv. Canada, Pal. Fossils, 1, p. 394, fig. 370a-c.

*Metoptoma canadensis* Miller, N. A. Geol. Pal., p. 410, fig. 685.

*Priscochiton canadensis* Dall, Proc. U. S. Nat. Mus., 4, 1881, p. 281.

Black River (Leray): Pauquette Rapids, Ottawa River, Canada.

**PRISMATOPHYLLUM** Simpson.

Genotype: *Cyathophyllum rugosum* Edwards and Haime.

*Prismatophyllum* Simpson, Bull. New York State Mus., 398, 1900, p. 218.

**Prismatophyllum inaequale** (Hall).

*Columnaria inaequalis* Hall, Pal. New York, 2, 1852, p. 323, pl. 72, figs. 3a, b, 4a-c.

*Acerularia? inaequalis* Hall and Whitfield, 23d Rep. New York State Mus. Nat. Hist., 1873, p. 233.—Schuchert, Amer. Geol., 31, 1903, p. 163.

*Prismatophyllum inaequalis* Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 219, pl. 17, figs. 12-13.

*Cyathophyllum inaequale* Swartz, Maryland Geol. Surv., Low. Dev., 1913, p. 205, pl. 20, figs. 1-4.

*Acerularia communis* Simpson, Trans. Amer. Phil. Soc., n. s., 16, 1889, p. 459, figs.

Cayugan (Cobleskill): Schoharie, etc., New York.

Helderbergian: New Jersey (Decker Ferry); Pennsylvania and Maryland (Keyser).

**PROBOSCINA** Audouin.

Genotype: *P. boryi* Audouin.

*Proboscina* Audouin, Savigny's Descr. del Egypte, Pol., 1826, p. 236.—D'Orbigny,

Pal. Francais, Terr. Cret., 5, 1854, p. 844.—Haime, Bry. Foss. Form. Juras., 1854, p. 166 (extra edition, p. 10).—Zittel, Handb. Pal., 1, 1880, p. 598.—

Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 149; Geol. Surv. Illinois, 8, 1890, p. 368; Geol. Minnesota, 3, 1893, p. 119.—Simpson, 14th Ann. Rep.

State Geol. New York for 1894, 1897, p. 596.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 20.—Cumings, Amer. Jour. Sci., 4th ser., 17, 1904,

p. 75, fig. 82.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 118.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 753.—Bassler,

Zittel-Eastman Textb. Pal., 1913, p. 319.

**Proboscina auloporoides** (Nicholson).

*Alecto auloporoides* Nicholson, Pal. Ohio, 2, 1875, p. 267, pl. 25, figs. 2-2b.

*Stomatopora auloporoides* Miller, N. A. Geol. Pal., 1889, p. 325.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1102, figs.

*Proboscina auloporoides* Ulrich, Contr. Micro-Pal. Cambro-Sil., pt. 2, 1889, p. 28.—Whiteaves, Pal. Foss., 3, 1895, p. 115.—Cumings, 32d Ann. Rep. Dep.

Geol. Nat. Res. Indiana, 1908, p. 872, pl. 32, figs. 4, 4a, 5.

Maysville and Richmond: Cincinnati, Ohio, and vicinity; Stony Mountain, Manitoba.

**Proboscina confusa** (Nicholson).

- Alecto confusa* Nicholson, Pal. Ohio, 2, 1875, p. 267, pl. 25, fig. 6.  
*Stomatopora confusa* Miller, N. A. Geol. Pal., 1889, p. 325.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1104, fig.  
*Proboscina confusa* Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 375.  
 Eden (Economy—McMicken): Cincinnati, Ohio, and vicinity.

**Proboscina frondosa** (Nicholson).

- Aulopora frondosa* James, Additions to Catal. Sil. Foss. Cincinnati Group, 1873, p. 15. (Not defined.)  
*Alecto frondosa* Nicholson, Pal. Ohio, 2, 1875, p. 266, pl. 25, figs. 3-3b.  
*Proboscina frondosa* Ulrich, Contr. Micro-Pal. Cambro-Sil., pt. 2, 1889, p. 28; Geol. Minnesota, 3, 1893, p. 119, pl. 1, fig. 28.—Whiteaves, Pal. Foss., 3, 1895, p. 115.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, fig. 201 (part) (p. 596).—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 50—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 118, fig. 178c.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 873, pl. 32, figs. 3, 3b—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 319, fig. 439c.  
*Stomatopora frondosa* Miller, N. A. Geol. Pal., 1889, p. 325.  
*Stomatopora* (*Proboscina*) *frondosa* Ulrich, Zittel's Textb. Pal. (Engl. ed.), fig. 412c, p. 261.  
*Stromatopora* (*Alecto*) *frondosa* Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1105, figs.  
 Maysville and Richmond: Cincinnati, Ohio, and vicinity; Indiana; Kentucky; Tennessee; Manitoba; etc.  
*Plesiotype*.—Cat. No. 43264, U.S.N.M. (Ulrich).

*PROBOSCINA MINNESOTENSIS* Sardeson. See *Berenicea minnesotensis*.

**Proboscina tumulosa** Ulrich.

- Proboscina tumulosa* Ulrich, Geol. Minnesota, 3, 1893, p. 119, pl. 1, fig. 24.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, fig. 201 (in part) (p. 596).—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 119, fig. 178d.  
 Black River (Decorah): St. Paul and Cannon Falls, Minnesota.  
*Holotype*.—Cat. No. 43265, U.S.N.M.

*PROCLIVOCRINUS* Ringueberg. See *Eucheirocrinus* Meek and Worthen.

*PRODUCTA INCURVATA* Shepard. See *Strophomena incurvata*.

*PRODUCTELLA MINNEAPOLIS* Sardeson. See *Trematis huronensis*.

*PRODUCTUS? SULCATUS* Castelnau. See *Leptaena rhomboidalis*.

*PRODUCTUS SULCIFER* Verneuil. See *Leptaena rhomboidalis*.

**PROETUS** Steinger.

Genotype: *P. cuvieri* Steinger.

- Proetus* Steinger, Mem. Soc. Geol. France, 1, 1831, p. 355.—Portlock, Rep. Geol. Londonderry, 1843, p. 304.—Loven, Ofvers. K. Vet.-Akad. Forhandl., 2, 1845, p. 48.—Burmeister, Org. Tril., London, 1846, p. 99.—Beyrich, Untersuchung uber Tril., 1846, p. 27.—Hawle and Corda, Abh. d. k. bohmischen Gesell. d. Wiss., 5 (extract), 1847, p. 72, pl. 5, fig. 43.—Rouault, Bull. Soc. Geol. France, 2d ser., 1847, p. 318.—Salter, Mem. Geol. Surv. Great Britain, 2, pt. 1, 1848, p. 337.—McCoy, Ann. Mag. Nat. Hist., 2d ser., 4, 1849, p. 400.—Barrande, Neues Jahrb. Min., etc., 1850, p. 780; Syst. Sil. du Centre Boheme, 1, 1852, p. 429.—Angelin, Pal. Scandinavica, 3d ed., Holmiae, 1852, p. 20.—Hall, Pal. New York, 2, 1852, p. 315.—Pictet, Traité de Pal., 2d ed., 2, 1854,



**PROETUS**—Continued.

p. 494.—Nieszkowski, Archiv fur Naturk. Liv-, Ehst- und Kurl., 1, 1857, p. 555.—Hall, 15th Rep. New York State Cab. Nat. Hist., 1861, p. 97.—Salter, Cat. Camb. and Sil. Foss., 1873, p. 133.—Alth, Abhandl. der K.-K. Geol. Reichsanstalt, 7, Heft 1, 1874, p. 59.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 144.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1880, p. 169.—Woodward, Geol. Mag., dec. 2, 10, 1883, p. 445; Mon. Beit. Carb. Tril., Pal. Soc., 1884, p. 55.—Ehlert, Bull. Soc. d'Etudes Sci. d'Angers, 1885, pp. 4, 8.—Zittel, Handb. Pal., 2, 1885, p. 625.—Ehlert, Bull. Soc. d'Etudes Sci. d'Angers, 15, for 1885, 1886, p. 128.—Herrick, Bull. Sci. Lab. Denison Univ., 2, pt. 1, 1887, p. 53; *ibid.*, 4, 1888, pp. 50, 51, 55.—Clarke, Jour. Morph. 2, 1888, p. 254.—Vogdes, Ann. New York Acad. Sci., 4, 1888, pp. 70, 74, pl. 2, figs. 1, 2; Cal. Acad. Sci. Occ. Papers, 4, 1893, p. 338 (see for generic synonymy).—Hall and Clarke, Pal. New York, 7, 1888, p. xli, fig. p. 43.—Whidborne, Mon. Dev. Fauna South England, 1, Pal. Soc., 1889, p. 20.—Miller, N. A. Geol. Pal., 1889, p. 561.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 7th ser., 42, 1894, p. 38.—Beecher, Amer. Geol., 16, 1895, p. 180.—Ehlert, Bull. Soc. Geol. France, 3d ser., 24, 1896, p. 111, figs. 27, 28.—Koken, Die Leitfossilien, Leipzig, 1896, p. 24, fig. 15, figs. 2-4; p. 422.—Beecher, Amer. Jour. Sci., 4th ser., 3, 1897, p. 104, pl. 3, fig. 20.—Reed, Geol. Mag., dec. 4, 5, 1898, p. 453.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 315.—Beecher, Zittel-Eastman Textb. Pal., 1, 1900, p. 631.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 34, No. 8, 1901, p. 26.—Cummings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1052.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 299.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 721.

**Proetus alaricus** Billings.

*Proetus alaricus* Billings, Canadian Nat. Geol., 5, 1860, p. 68, fig. 12; Geol. Canada, Geol. Surv. Canada, 1863, p. 219, fig. 231; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 28 (loc. ref.).—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 767, fig.—Miller, N. A. Geol. Pal., 1889, p. 562, fig. 1046.  
Richmond (Charleton): Charleton Point, Anticosti.

**Proetus brevimarginatus** Weller.

*Proetus brevimarginatus* Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 197, pl. 15, figs. 1-7.  
Trenton: Jacksonburg, New Jersey.

**Proetus channahonensis** Weller.

*Proetus channahonensis* Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 228, pl. 20, figs. 6, 7.—Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 120, pl. 7, fig. 25.  
Upper Medinah (Channahon): Near Channahon, Will County, Illinois.

**Proetus clelandi** Raymond.

*Proetus clelandi* Raymond, Ann. Carnegie Mus., 3, 1905, p. 354, pl. 13, figs. 13, 14; 7th Rep. Vermont State Geol., 1910, p. 231, pl. 35, figs. 13, 14.  
Chazy (Crown Point?): Chazy, New York.

**Proetus corrugatus** Van Ingen.

*Proetus corrugatus* Van Ingen, School of Mines Quart., 23, 1901, p. 54, figs. 16-17, pl. figs. 12-15.  
Niagaran (St. Clair): St. Clair Spring, Independence County, Arkansas.

**Proetus corycœus** (Conrad).

Asaphus corycœus Conrad, Jour. Acad. Nat. Sci. Philadelphia, 1st ser., 8, pt. 2, 1842, p. 277, pl. 16, fig. 15.—Hall, Geol. New York, pt. 4, 1843, tab. org. rem., 19, fig. 3.

Proetus corycœus Hall, Pal. New York, 2, 1852, p. 315, pl. 67, fig. 15.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 767, text figs.

Clinton (Rochester): Lockport, New York.

**Proetus crassimarginatus** (Hall).

Calymene crassimarginatus Hall, Geol. New York, Geol. 4th Dist., 1843, p. 172, fig. 5.

Proetus crassimarginatus Hall, 15th Rep. New York State Cab. Nat. Hist., 1862 (adv. sheets 1861, p. 72), p. 100, pl. 10, fig. 10.—Nicholson, Rep. Pal. Prov. Ontario, pt. 1, 1874, pp. 123, 124, fig. 56b.—Hall, Illust. Dev. Fossils, Geol. Surv. New York, Pal., Crust., 1877, pl. 20, figs. 20-31.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 768, figs.—Hall and Clarke, Pal. New York, 7, 1888, p. 99, pls. 20, 22, 25.—Whiteaves, Cont. Can. Pal., Geol. Surv. Canada, 1, pt. 5, 1898, p. 410.—Kindle, 25th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1901, p. 750, pl. 30, figs. 1, 1a, 2, 5, 6.—Grabau, Michigan Geol. Surv., Geol., 1st ser., 1909, p. 207, pl. 20, figs. 16-18.

Devonian (Onondaga): New York, etc.

Upper Monroan (Amherstburg): Detroit River, opposite Amherstburg, Ontario.

**Proetus depressus** Weller.

Proetus? depressus Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 249, pl. 22, fig. 27.

Helderbergian (Decker Ferry): Two miles south of Tristates, New York.

**Proetus determinatus** Foerste.

Bathyurus ——— Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 103, pl. 14, fig. 5.

Proetus determinatus Foerste, *ibid.*, 2, pt. 1, 1887, p. 91, pl. 8, figs. 2, 3, 3a; Geol. Surv. Ohio, 7, 1895, p. 523, pl. 26, fig. 5; pl. 27, figs. 2, 3, 3a.—Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 104, pl. 6, figs. 10, 11.

Upper Medinan: Dayton, Ohio (Brassfield); near Thebes, Illinois, Edgewood and Louisiana, Missouri (Edgewood).

**Proetus? handwerki** Weller.

Proetus? handwerki Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2; 1907, p. 229, pl. 20, figs. 8, 9.

Niagaran (Racine): Near Lemont, Illinois.

**Proetus latimarginatus** Weller.

Proetus latimarginatus Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 195, pl. 14, figs. 17-24, (?25).

Trenton: Jacksonburg, New Jersey.

**Proetus leptorhachis** Hortedahl.

Proetus leptorhachis Hortedahl, Second Arctic Exp. "Fram", 1898-1902, No. 32, 1914, p. 33, pl. 8, fig. 14.

Helderbergian (Lower beds): Southwestern Ellesmereland, Arctic America.

**Proetus pachydermatus** Barrett.

Proetus pachydermatus Barrett, Amer. Jour. Sci., 3d ser., 15, 1878, p. 371.—Weller, Pal. New Jersey, 3, 1903, p. 248, pl. 22, figs. 16-21.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 299.—Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 489, pl. 89, fig. 1.

Helderbergian: Nearpass Quarry, New Jersey (two miles south of Tristates, New York) (Decker Ferry); Cumberland, Maryland (Keyser).

**Proetus parvifuscus** Hall.

*Proetus parvifuscus* Hall, 13th Rep. New York State Cab. Nat. Hist., 1860, p. 120; 24th Rep. New York State Cab. Nat. Hist., 1872, p. 223, pl. 8, fig. 14.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 144.—Hall and Whitfield, Geol. Surv. Ohio Pal., 2, 1875, p. 109, pl. 4, fig. 18.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 770, fig.—Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 754.—Beecher, Amer. Geol., 16, 1895, p. 173, pl. 9, figs. 5-7.  
Maysville (Corryville): Cincinnati, Ohio.

**Proetus princeps** Savage.

*Proetus princeps* Savage, Bull. Geol. Surv., Illinois, 23, 1913, p. 57, pl. 2, fig. 14.  
Upper Medinan (Girardeau): Near Thebes, Illinois.

**Proetus spinosus** Weller.

*Proetus spinosa* Weller, Geol. Surv. New Jersey Pal., 3, 1903, p. 250, pl. 22, fig. 26.  
Helderbergian (Decker Ferry): Nearpass Quarry, New Jersey (two miles south of Tristates, New York).

**Proetus spurlocki** Meek.

*Proetus Spurlocki* Meek, Amer. Jour. Sci., 3d ser., 3, 1872, p. 426; Geol. Surv. Ohio, Pal., 1, 1873, p. 161, pl. 14, fig. 12.—Miller, Cincinnati Quart. Jour. Sci., 1, p. 145.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 772, fig.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1062, pl. 54, fig. 13.

*Proetus spurlocki* (*Isotelus maximus*?) Raymond, Bull. Mus. Comp. Zool. Harvard, 58, 1914, pl. 1, fig. 3.

Eden (Southgate): Cincinnati, Ohio.

Observation.—Probably the young of *Isotelus maximus*.

**Proetus stokesi** (Murchison?) Hall.

*Asaphus stokesii* Murchison, Sil. Syst., 1839, p. 625, pl. 14, fig. 6.

*Proetus stokesii* Hall, Pal. New York, 2, 1852, p. 316, pl. 67, figs. 13-14.

*Phacops stokesii* Dawson, Canadian Nat. Geol., 5, 1860, p. 298.

Silurian: England; Lockport, New York (Rochester).

**Proetus stonemanii** (Vogdes).

*Asaphus extans* Winchell, 6th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1878, p. 161.

*Bathyrus Stonemanii* Vogdes, 12th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1884, p. 9.

*Proetus stonemani* Miller, N. A. Geol. Pal., 2d App., 1897, p. 789 (gen. ref.).—Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 724.

Devonian (drift): Minneapolis, Minnesota (erroneously cited as Trenton).

**Proetus subannulatus** Van Ingen.

*Proetus subannulatus* Van Ingen, School of Mines Quart., 23, 1901, p. 57, fig. 18, p. 54, pl. figs. 16, 17.

Niagaran (St. Clair): St. Clair Spring, Independence County, Arkansas.

**Proetus undulostriatus** (Hall).

*Olenus undulostriatus* Hall, Pal. New York, 1, 1847, p. 258, pl. 67, figs. 3a, b.

*Elliptocophala undulostriata* Miller, N. A. Geol. Pal., 1889, p. 546.

*Bathyrus* sp. Whitfield and Hovey, Bull. Amer. Mus. Nat. Hist., pt. 1, 11, 1898, pp. 70, 71.

*Cyphaspis hudsonica* Ruedemann, Bull. New York State Mus., 49, 1901, p. 64, pl. 4, figs. 8, 9.

**Proetus undulostratus**—Continued.

*Proetus undulostrata* Ruedemann, Bull. New York State Mus., 42, 1901, p. 536; *ibid.*, 162, 1912, p. 117, pl. 9, figs. 2, 3.

Trenton (Snake Hill): Snake Hill, Saratoga County, and Green Island, near Albany, New York.

**PROLOBELLA** Ulrich.Genotype: *P. striatula* Ulrich.

*Prolobella*, Ulrich Geol. Minnesota, 3, pt. 2, 1894, p. 532.

**Prolobella aviculoides** (Hall).

*Modiolopsis aviculoides* Hall, Pal. New York, 1, 1847, pp. 161, 317, pl. 36, figs. 1a, b.—Ruedemann, Bull. New York State Mus., 49, 1901, p. 28.

Trenton: Middleville, New York.

**Prolobella? hermione** (Billings).

*Avicula Hermione* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 40, fig. 42, (adv. sheets, 1862); Geol. Canada, Geol. Surv. Canada, 1863, p. 170, fig. 156.

Trenton: Montreal, Quebec.

*Plastotype*.—Cat. No. 46094, U.S.N.M.

**Prolobella striatula** Ulrich.

*Prolobella striatula* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 532, pl. 35, fig. 27. *Pterinea striatula* Miller, N. A. Geol. Pal., 2d App., 1897, p. 784 (gen. ref.).

Trenton (Prosser): Pleasant Grove, Minnesota.

*Holotype*.—Cat. No. 46280, U.S.N.M.

**Prolobella subelliptica** (D'Orbigny).

*Avicula elliptica* Hall (not Phillips, 1836), Pal. New York, 1, 1847, p. 162, pl. 36, fig. 3.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 170, fig. 155.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 68, fig.

*Pterinea elliptica* Miller, N. A. Geol. Pal., 1889, p. 506 (gen. ref.).

*Avicula subelliptica* D'Orbigny, Prodr. Pal., 1, 1850, p. 13.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 175, pl. 13, fig. 27.

Trenton: Middleville, New York.

**Prolobella subspatulata** (Hall).

*Modiolopsis subspatulatus* Hall, Pal. New York, 1, 1847, p. 159, pl. 35, figs. 9a, b, *Lyonsia subspatulatus* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 171.

*Palæarca subspatulata* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 71 (gen. ref.).

*Cypricardites subspatulata* Miller, N. A. Geol. Pal., 1889, p. 477.

Trenton: Watertown, New York.

**Prolobella trentonensis** (Conrad).

*Avicula Trentonensis* Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1842, p. 240, pl. 12, fig. 10.—Hall, Pal. New York, 1, 1847, p. 161, pl. 36, figs. 2a-d.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 176, pl. 13, figs. 28-30.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 70, fig.

*Pterinea trentonensis* Miller, N. A. Geol. Pal., 1889, p. 506 (gen. ref.).

*Prolobella trentonensis* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 532 (gen. ref.).—Ruedemann, Bull. New York State Mus., 162, 1912, p. 97, pl. 5, fig. 4.

*Avicula aviformis* Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1842, p. 243, pl. 13, fig. 11.

Trenton: Middleville, Watertown, Canajoharie, etc., New York.

**PROLUCINA** Dall.Genotype: *Tellina prisca* Hisinger.

*Prolucina* Dall (subgenus of *Lucina*), Zittel-Eastman Textb. Pal., 1900, p. 408.

***Prolocina galtensis* (Whiteaves).**

*Ilonia galtensis* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 15, pl. 3, figs. 1a-b.—Miller, N. A. Geol. Pal., 1889, p. 483, fig. 833.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 68, pl. 15, fig. 3.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 379, fig. 483.

*Prolocina Galtensis* Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 330 (gen. ref.).

Niagaran (Guelph): Galt and Durham, Ontario.

Cayugan (Cobleskill): Cobleskill, New York.

**PROMOPALÆASTER Schuchert.**

Genotype: *Palæaster granulosus* Meek.

*Palæaster* (part) of authors.

*Promopalæaster* Schuchert, in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 33; Bull. U. S. Nat. Mus., 88, 1915, p. 102.

***Promopalæaster bellulus* Schuchert.**

*Promopalæaster bellulus* Schuchert, in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 33; Bull. U. S. Nat. Mus., 88, 1915, p. 113, pl. 15, figs. 6-8; pl. 16, fig. 1; pl. 18, figs. 4, 5.

Richmond (Waynesville): Near Waynesville, Ohio.

***Promopalæaster dyeri* (Meek).**

*Palæaster?* *Dyeri* Meek, Amer. Jour. Sci., 3d ser., 3, 1872, p. 257; Geol. Surv. Ohio, Pal., 1, 1873, p. 58, pl. 4, figs. 2a-f.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 576, figs.—James, Jour. Cincinnati Soc. Nat. Hist., 18, 1895, p. 128.

*Promopalæaster dyeri* Schuchert, in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 33; Bull. U. S. Nat. Mus., 88, 1915, p. 120, pl. 18, fig. 8; pl. 20, figs. 3-6; pl. 25, fig. 1.—Williams, Ohio Naturalist, 14, 1914, pp. 221-224, figs. 1, 2.

Maysville (Fairmount): Cincinnati, Ohio.

***Promopalæaster exculptus* (Miller).**

*Palæaster exculptus* Miller, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 69, pl. 1, fig. 1.—James, *ibid.*, 18, 1895, p. 129.

*Promopalæaster exculptus* Schuchert, in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 33; Bull. U. S. Nat. Mus., 88, 1915, p. 117, pl. 18, fig. 7; pl. 20, fig. 2.

Richmond (Waynesville or Liberty): Waynesville, Ohio.

Observation.—Compare with *Promopalæaster spinulosus*.

***Promopalæaster granulosus* (Hall).**

*Palæaster granulosa* Hall, 20th Rep. New York State Cab. Hist., 1868, p. 285; rev. ed., 1870, p. 327.—James, Jour. Cincinnati Soc. Nat. Hist., 18, 1895, p. 128.

*Promopalæaster granulosus* Schuchert, in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 33; Bull. U. S. Nat. Mus., 88, 1915, p. 112.

Richmond: Near Lebanon, Ohio.

***Promopalæaster magnificus* (Miller).**

*Palæaster magnificus* Miller, Jour. Cincinnati Soc. Nat. Hist., 8, 1884, p. 16, pl. 4, figs. 3, 3a.—James, *ibid.*, 18, 1895, p. 127.

*Promopalæaster magnificus* Schuchert, in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 33; Bull. U. S. Nat. Mus., 88, 1915, p. 122, pl. 21, fig. 1; pl. 22, fig. 1; pl. 23, figs. 1-3.

Richmond (Waynesville or Liberty): Waynesville, Ohio.

*Holotype*.—Cat. No. 40883, U.S.N.M.

**Promopalæaster prenuntius** Schuchert.

*Promopalæaster prenuntius* Schuchert, in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 34 (nom. nud.); Bull. U. S. Nat. Mus., 88, 1915, p. 107, pl. 13, fig. 3; pl. 15, fig. 5.

Trenton (Hermitage): Frankfort, Kentucky.

**Promopalæaster speciosus** (Meek).

*Asterias antiquata* Locke, Proc. Acad. Nat. Sci. Philadelphia, 3, 1848, p. 32, fig. *Palæasterina antiquata* Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 382 (gen. ref.).

*Palæaster antiquata* Hall, 20th Rep. New York State Cab. Hist., 1868, p. 286; rev. ed., 1870, p. 328.—James, Jour. Cincinnati Soc. Nat. Hist., 18, 1895, p. 130.

*Palæaster speciosus* Meek, Amer. Jour. Sci., 3d ser., 4, 1872, p. 277; Geol. Surv. Ohio, Pal., 1, 1873, p. 61.—James, Jour. Cincinnati Soc. Nat. Hist., 18, 1895, p. 131.

*Palæaster granulosa* Meek (not Hall, 1868), Amer. Jour. Sci., 3d ser., 4, 1872, p. 276; Geol. Surv. Ohio, Pal., 1, 1873, p. 60, pl. 4, figs. 3a-c.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 576, figs.

*Promopalæaster speciosus* Schuchert in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 34, Bull. U. S. Nat. Mus., 88, 1915, p. 109, pl. 14, figs. 3, 4; pl. 15, figs. 1-4. Maysville: Cincinnati, Ohio.

Observation.—Although antedating *P. speciosa*, *Asterias antiquata* was so poorly figured that it could not be recognized.

**Promopalæaster spinulosus** (Miller and Dyer).

*Palæaster spinulosus* Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 32, pl. 2, figs. 12, 12a, b.—James, *ibid.*, 18, 1895, p. 129.

*Promopalæaster spinulosus* Schuchert in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 34; Bull. U. S. Nat. Mus., 88, 1915, p. 115, pl. 16, fig. 2; pl. 17, figs. 1, 2; pl. 18, figs. 1-3.

*Palæaster longibrachiatus* Miller, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 102, pl. 3, fig. 4.—James, *ibid.*, 18, 1895, p. 132.

Richmond (Waynesville): Clarksville, Ohio.

*Plesiotype*.—Cat. No. 40881, U.S.N.M. (holotype of *P. longibrachiatus*).

**Promopalæaster? wilsoni** (Raymond).

*Palæaster? wilsoni* Raymond, Ottawa Nat., 26, 1912, p. 78, pl. 5, figs. 1-4.

*Promopalæaster wilsoni* Schuchert in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 34; Bull. U. S. Nat. Mus., 88, 1915, p. 106, pl. 13, figs. 1, 2.

Black River (Lowville): City View, near Ottawa, Ontario.

**Promopalæaster wykoffi** (Miller and Gurley).

*Palæaster wykoffi* Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 12, 1897, p. 46, pl. 3, fig. 27.

*Promopalæaster wykoffi* Schuchert in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 34; Bull. U. S. Nat. Mus., 88, 1915, p. 117, pl. 18, fig. 6; pl. 19, fig. 2.

Richmond: Near Madison, Indiana.

PROPORA of authors. See *Lyellia* Edwards and Haime.

**PROSCORPIUS** Whitfield.

Genotype: *P. osborni* Whitfield.

*Proscorpius* Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1885, p. 183.—Miller, N. A. Geol. Pal., 1889, p. 571.

**Proscorplus osborni** (Whitfield).

*Palæophonus osborni* Whitfield, *Science*, 6, 1885, pp. 87, 88, fig.

*Proscorpius osborni* Whitfield, *Bull. Amer. Mus. Nat. Hist.*, 1, 1885, p. 187, pl. 20.—Scudder, *Zittel's Handb. Pal.*, 1 abth., 2, 1885, p. 739, fig. 915a.—Thorell, *Amer. Nat.*, 20, 1886, p. 269.—Whitfield, *Science*, 7, 1886, p. 216.—Scudder, *Bull. U. S. Geol. Surv.*, 31, 1886, p. 28.—Lesley, *Geol. Surv. Pennsylvania, Rep. P 4*, 1889, p. 973, fig.—Laurie, *Royal Soc. Edinburgh Trans.*, 39, 1899, p. 557, pl. 3.—Pocock, *Quart. Jour. Micr. Sci.*, 2d ser., 1901, pp. 44, 309.—Fritsch, *Pal. Arachniden*, 1904, pp. 65, 78, fig. 81; *Miscel. Pal.*, 1, *Palæozoica*, 1907, p. 6, pl. 3.—Clarke and Ruedemann, *Mem. New York State Mus.*, 14, 1912, p. 387, pl. 88, figs. 81–83.

Cayugan (Bertie): Waterville, Oneida County, New York.

**PROSSERELLA** Grabau. See *Reticularia* subgenus *Prosserella*.

**PROTARÆA** Edwards and Haime.

Genotype: *Porites vetustus* Hall.

*Protaræa* Edwards and Haime, *Mon. d. Polyp. Foss. d. Terr. Pal.* (*Arch. du Mus. d'Hist. Nat.*, 5), 1851, pp. 146, 208; *Ann. Sci. Nat.*, 3d ser., *Zool.*, 16, 1851, p. 46.—Pictet, *Traite de Pal.*, 2d ed., 4, 1857, p. 434.—Milne-Edwards, *Hist. Nat. d. Corall.*, 3, 1860, p. 184.—Zittel, *Handb. Pal.*, 1, 1879, p. 239.—Roemer, *Leth. geog.*, pt. 1, *Leth. Pal.*, 1883, p. 455.—Miller, *N. A. Geol. Pal.*, 1889, p. 201.—James, *Jour. Cincinnati Soc. Nat. Hist.*, 15, pt. 4, 1893, p. 149.—Sardeson, *Neues Jarhb. Min., Geol., Pal., Beilage-Band*, 10, 1896, p. 300.—Kiär, *Palæontographica*, 46, 1899, p. 9, footnote, pp. 10, 13.—Lindström, *Kongl. Sven. Vet.-Akad. Handl.*, 32, 1899, pp. 37, 109.—Lambe, *Cont. Can. Pal., Geol. Surv. Canada*, 4, pt. 1, 1899, p. 89.—Kiär, *Vid.-Selsk. Skrifter, Math.-naturw. Kl.*, No. 10, 1903, pp. 29, 50.—Cumings, 32d *Ann. Rep. Dep. Geol. Nat. Res. Indiana*, 1908, p. 700; *Zittel-Eastman Textb. Pal.*, 2d ed., 1913, p. 112.

**PROTARÆA MAGNA** Kiär. See *Protaræa vetusta magna*.

**Protaræa richmondensis** Foerste.

*Protaræa vetusta* Edwards and Haime, *Mon. d. Polyp. Foss. d. Terr. Pal.* (*Arch. du Mus. d'Hist. Nat.*, 5), 1851, p. 208, pl. 14, figs. 6, 6a.—Milne-Edwards, *Hist. Nat. d. Corall.*, 3, 1860, p. 185.—Nicholson, *Geol. Surv. Ohio, Pal.*, 2, 1875, p. 221.—White, 11th *Ann. Rep. Indiana Dep. Geol. Nat. Hist.*, 1882, p. 49 fig. 4, p. 378.—Miller, *N. A. Geol. Pal.*, 1889, p. 201, fig.—Lesley, *Geol. Surv. Pennsylvania, Rep. P 4*, 1889, p. 774, fig.—James, *Jour. Cincinnati Soc. Nat. Hist.*, 15, pt. 4, 1893, p. 149.—Winchell and Schuchert, *Geol. Minnesota*, 3, pt. 1, 1895, p. 94, pl. G, figs. 24, 25.—Whiteaves, *Pal. Foss., Geol. Surv. Canada*, 3, pt. 2, 1895, p. 114 (loc. occ.); *ibid.*, pt. 3, 1897, p. 155 (loc. occ.).—Kiär, *Palæontographica*, 46, 1899, p. 10, pl. 2, fig. 7.—Lindström, *Kongl. Sven. Vet.-Akad. Handl.*, 32, 1899, p. 111, pl. 12, figs. 19–24.

*Thecia vetusta* Davis, *Kentucky Foss. Corals, Geol. Surv. Kentucky*, pt. 2, 1885, pl. 34, figs. 8–10.

*Protaræa richmondensis* Foerste, *Bull. Sci. Lab. Denison Univ.*, 14, 1909, p. 210, pl. 4, figs. 9a–b; p. 308, pl. 7, fig. 8.

Richmond: Dayton, etc., Ohio; Indiana; Kentucky; Tennessee; Illinois; Minnesota; etc.

*Plesiotypes*.—Cat. No. 52638, U.S.N.M. (Davis).

Observation.—Compare *Protaræa tenuis* (Billings).

**Protaræa richmondensis papillata** Foerste.

*Protaræa richmondensis-papillata* Foerste, *Bull. Sci. Lab. Denison Univ.*, 14, 1909, p. 309, pl. 10, fig. 2.

Richmond (Whitewater): Dayton, Ohio.

**Protaræa tenuis** (Billings).

*Heliolites tenuis* Billings, Canadian Nat. Geol., n. s., 2, 1865, p. 428; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 32.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan District, 1880, p. 247.—Roemer, Leth. Geog., pt. 1, Leth. Pal., 1883, p. 508.

Gamachian (Ellis Bay): Gamache Bay, Anticosti.

Observation.—Compare *Protaræa richmondensis* Foerste.

**Protaræa verneuili** Edwards and Haime.

Not recognizable.

*Protaræa verneuili* Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal. (Arch. du Mus. d'hist. Nat., 5), 1851, p. 209; Ann. Sci. Nat., 3d ser., Zool., 16, 1851, p. 47.—Milne-Edwards, Hist. Nat. d. Corall., 3, 1860, p. 185.—Duncan, Rep. 41st Meeting British Assoc. Adv. Sci., 1872, p. 123.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 455.—James, Jour. Cincinnati Soc. Nat. Hist., 15, pt. 4, 1893, p. 150.—Lindstrom, Kongl. Sveu. Vet.-Acad. Handl., 32, No. 1, 1899, p. 110.—Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 309 (see for remarks).

Lower Silurian: Alexanderville, Ohio.

**PROTARÆA VETUSTA** of authors. See *Protaræa richmondensis*.

**Protaræa vetusta** (Hall).

*Porites? vetusta* Hall, Pal. New York, 1, 1847, p. 71, pl. 25, figs. 5a, b.

*Astreopora vetusta* D'Orbigny, Prodr. de Pal., 1, 1850, p. 25 (gen. ref.).

*Heliolites vetusta* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 74 (gen. ref.).

*Protaræa vetusta*, Edwards and Haime, Ann. Sci. Nat., 3d ser., Zool., 16, 1851, p. 47.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 9.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 455.—Lambe, Cont. Canadian Pal. Geol. Surv. Canada, 4, pt. 1, 1899, p. 90, pl. 5, figs. 8, 8a.

Trenton: Watertown, etc., New York; Ontario; Minnesota, etc.

**Protaræa vetusta magna** Whiteaves.

*Protaræa* (*vetusta?* var.) *magna* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 155, pl. 18, figs. 2, 3, 3a.

*Protaræa vetusta* var. *magna* Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 91.

*Protaræa magna* Kiär, Vid.-Selsk. Skrifter, Math. naturw. Kl., No. 10, 1903, p. 50. Richmond: Lower Fort Garry, Manitoba.

**Protaræa walkeri** (Spencer).

*Caunopora walkeri* Spencer, Trans. Acad. Sci. St. Louis, 4, 1884, p. 596, pl. 6, figs. 9, 9a; Bull. Mus. Univ. Missouri, 1, 1884, p. 46, pl. 4, figs. 9, 9a; Canadian Nat., 10, 1883, p. 165.—Miller, N. A. Geol. Pal., 1889, p. 156, fig.—Nicholson, Mon. British Strom., 1892, p. 26.—Whiteaves, Canadian Rec. Sci. 7, 1896, p. 144.

*Protaræa walkeri* Parks, Univ. Toronto Studies (Geol. Ser.), No. 5, 1908, p. 60, pl. 15, figs. 1, 2.

Niagaran (?Rochester): Hamilton, Ontario.

**PROTASTER** Forbes.Genotype: *P. sedgwicki* Forbes.

*Protaster* Forbes, Mem. Geol. Surv. United Kingdom, dec. 1, 1849, pp. 1-2, pl. 4.—Murchison, Siluria, 1854, p. 221, fig. 39-4.—Forbes, in McCoy's Pal. Rocks Foss., 1855, p. 60.—Salter, Rep. 26th Meeting British Assoc. Adv. Sci., Notes, Abstracts, 1857, p. 76; Ann. Mag. Nat. Hist., 2d ser., 20, 1857, p. 325.—Pictet, Traité de Pal., 2d ed., 4, 1857, p. 277.—Hall, Pal. New York, 3, for



**PROTASTER**—Continued.

1859, 1861, p. 134.—Salter, Ann. Mag. Nat. Hist., 3d ser., 8, 1861, p. 484.—Wright, Mon. British Foss. Echinod., Oolitic, 2, pt. 1, (Pal. Soc. for 1861), 1862, pp. 23, 31.—Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 293; rev. ed., 1870, p. 335.—Quenstedt, Petrefactenkunde Deutschlands, 1, 4, 1876, p. 133, pl. 95, fig. 11.—Zittel, Handb. Pal., 1, 1879, p. 444.—Stürtz, Palaeontographica, 32, 1886, pp. 80, 83, 93; Neues Jahrb. Min., Geol. Pal., 2, 1886, p. 148.—Miller, N. A. Geol. Pal., 1889, p. 276.—Gregory, Geol. Mag., dec. 3, 6, 1889, p. 26.—Stürtz, Verh. naturh. Ver. preuss. Reinl., etc., 1893, p. 18.—James, Jour. Cincinnati Soc. Nat. Hist., 18, 1896, pp. 137, 138.—Gregory, Proc. Zool. Soc. London, 1897, p. 1031, fig. 1.—Whidborne, Mon. Dev. Fauna South England, 3, Pal. Soc., 1898, p. 206.—Parks, Trans. Canadian Inst., 8, 1908, pp. 363, 366.—Schöndorf, Jahrb. nassauisch. Ver. Naturk. Wiesbaden, 63, 1910, p. 238.—Schuchert, Bull. U. S. Nat. Mus., 88, 1915, p. 224.

*Encrinaster* (part) Haeckel, Gen. Morphologie, 2, 1866, p. lxxvii (no definition).

**PROTASTER ELEGANS** Parks. See *Tæniaster elegans*.

**PROTASTER FLEXUOSUS** Miller and Dyer. See *Alepidaster flexuosus*.

**PROTASTER? GRANULIFERUS** Meek. See *Alepidaster granuliferus*.

**PROTASTER MIAMIENSIS** Miller. See *Alepidaster miamiensis*.

**Protaster stellifer** Ringueberg.

*Protaster stellifer* Ringueberg, Bull. Buffalo Soc. Nat. Hist., 5, 1886, p. 7, pl. 1, fig. 2.—Schuchert, Bull. U. S. Nat. Mus., 88, 1915, p. 228.

Clinton (Rochester): Lockport, New York, and Grimsby, Ontario.

**Protaster whiteavesiana** Parks.

*Protaster whiteavesiana* Parks, Trans. Can. Institute, 8, 1908, p. 368, figs. 1–6.—Schuchert, Bull. U. S. Nat. Mus., 88, 1915, p. 227.

Trenton (Curdsville): Kirkfield, Ontario.

**PROTASTERACANTHION** Stürtz. See *Urasterella McCoy*.

**PROTASTERINA** Ulrich. See *Alepidaster Meek*.

**PROTASTERINA** Billings (part). See *Schuchertia Gregory*.

**PROTAXOCRINUS** Springer.

Genotype: *Taxocrinus ovalis* Angelin.

*Lecanocrinus* Billings (not Hall), Geol. Surv. Canada, Can. Org. Rem., dec. 4, 1859, p. 46.

*Taxocrinus* Angelin (part), Icon. Crin. Suec., 1878, p. 8.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, Rev. Pal., 1, 1879, p. 50.

*Protaxocrinus* Springer, Jour. Geol., 14, 1906, pp. 515, 519; Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 205; Mono. Crin. Flex., Smith. Inst. (in press).

**Protaxocrinus elegans** (Billings).

*Lecanocrinus elegans* Billings, Geol. Surv. Canada, Rep. Progr. for 1853–1856, 1857, p. 278; Geol. Surv. Canada, dec. 4, 1859, p. 47, pl. 4, figs. 4a, 4b.

*Taxocrinus elegans* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 68 (Rev. Pal., pt. 3, p. 144).—Miller, N. A. Geol. Pal., 1889, p. 285, fig. 440.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 564.

*Protaxocrinus elegans* Springer, Geol. Surv. Canada, Mem. 15P, 1911, p. 11 (gen. ref.); Mono. Crin. Flex., Smith. Inst. (in press).

Trenton (Curdsville): Ottawa, Ontario.

**Protaxocrinus lævis** (Billings).

*Lecanocrinus lævis* Billings, Geol. Surv. Canada, Rep. Progr. for 1853-1856, 1857, p. 278; Geol. Surv. Canada, dec. 4, 1859, p. 47, pl. 4, fig. 3a.

*Taxocrinus lævis* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 68 (Rev. Pal., pt. 3, p. 144).

*Protaxocrinus lævis* Springer, Geol. Surv. Canada, Mem. 15P, 1911, p. 11, pl. 3, figs. 10, 11; Mono. Crin. Flex., Smith. Inst. (in press).

Trenton (Curdsville): Ottawa and Kirkfield, Ontario.

**Protaxocrinus robustus** Springer.

*Protaxocrinus robustus* Springer, Mono. Crin. Flex., Smith. Inst. (in press).

Niagaran (Brownsport): Decatur County, Tennessee.

**Protaxocrinus virginienensis** Springer.

*Protaxocrinus virginienensis* Springer, Mono. Crin. Flex., Smith. Inst. (in press).

Helderbergian (Keyser): Keyser, West Virginia.

PROTEROCAMEROCERAS Ruedemann. See *Cameroceeras* Conrad.

PROTEROPILOCERAS Ruedemann. See *Piloceras* Salter.

**PROTICHNITES** Owen.

Genotype: *P. septemnotatus* Owen.

*Protichnites* Owen, Quart. Jour. Geol. Soc. London, 8, 1852, p. 214.—Billings, Canadian Nat. Geol., 1, 1857, pp. 35-39.—Dawson, Canadian Nat. Geol., 7, 1862, pp. 271-277.—Chapman, Expos. Minerals Geol. Canada, 1864, pp. 159, 160.—Billings, Quart. Jour. Geol. Soc. London, 26, 1870, pp. 484-485.—Chapman, Canadian Jour. Sci. Lit. Hist., n. s., 15, 1877, pp. 486-490.—Dawson, Quart. Jour. Geol. Soc. London, 46, 1890, pp. 599-601, figs. 4 and 5a.—Packard, Proc. Amer. Acad. Arts Sci. Boston, 36, 1900, pp. 63-71.—Walcott, Smiths. Misc. Coll., 57, 1912, p. 275.

**Protichnites alternans** Owen.

*Protichnites alternans* Owen, Quart. Jour. Geol. Soc. London, 8, 1852, pp. 214-217, pl. 9.—Logan, Geol. Canada, 1863, p. 104, fig. 13.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 775, fig.

Upper Cambrian or Ozarkian (Potsdam): Near Beauharnois, Quebec.

**Protichnites latus** Owen.

*Protichnites latus* Owen, Quart. Jour. Geol. Soc. London, 8, 1852, p. 218, pl. 11. Upper Cambrian or Ozarkian (Potsdam): Near Beauharnois, Quebec.

**Protichnites lineatus** Owen.

*Protichnites lineatus* Owen, Quart. Jour. Geol. Soc. London, 8, 1852, p. 220, pl. 13 and pl. 8A, 3.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 104, fig.—Lesley, Rep. Geol. Surv. Pennsylvania, P 4, 1889, p. 776, figs.

Upper Cambrian or Ozarkian (Potsdam): Near Beauharnois, Quebec.

**Protichnites logananus** Marsh.

*Protichnites logananus* Marsh, Amer. Jour. Sci., 2d. ser., 48, 1869, pp. 46-49; Proc. Amer. Assoc. Adv. Sci., 17, 1869, pp. 322-324.—Walcott, Smiths. Misc. Coll., 57, 1912, p. 279, pl. 48-49.

Upper Cambrian or Ozarkian (Potsdam): Essex County, New York.

*Plesiotype*.—Cat. No. 58402, U.S.N.M.

**Protichnites multinotatus** Owen.

*Protichnites multinotatus* Owen, Quart. Jour. Geol. Soc. London, 8, 1852, pp. 214-217, pl. 9.—Logan, Geol. Canada, 1863, p. 104, fig. 14.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 776, figs.

Upper Cambrian or Ozarkian (Potsdam): Near Beauharnois, Quebec.

**Protichnites octonotatus** Owen.

*Protichnites octonotatus* Owen, Quart. Jour. Geol. Soc. London, 8, 1852, p. 214-217, pl. 9.—Logan, Geol. Canada, 1863, p. 104, figs. 16, 17.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 776, figs.  
Upper Cambrian or Ozarkian (Potsdam): Near Beauharnois, Quebec.

**Protichnites septemnotatus** Owen.

*Protichnites septem-notatus* Owen, Quart. Jour. Geol. Soc. London, 8, 1852, pp. 214-217, pl. 9.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 776, figs.—Walcott, Smiths. Misc. Coll., 57, No. 7, 1912, p. 278, pls. 46, 47.  
Upper Cambrian or Ozarkian (Potsdam): Near Beauharnois, Quebec.  
*Plesiotype*.—Cat. Nos. 58592, 58593, U.S.N.M.

**PROTOCRISINA** Ulrich.Genotype: *P. exigua* Ulrich.

*Protocrisina* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 369.—(Ulrich, in press), Miller, N. A. Geol. Pal., 1889, p. 317.—Ulrich, Zittel's Textb. Pal. (Engl. ed.), 1896, p. 262.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 16.—Nickles and Bassler, Bull. U. S. Geol. Surv., 1900, p. 21.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 71, 72; Zittel-Eastman Textb. Pal., 1913, p. 320.

**Protocrisina exigua** Ulrich.

*Protocrisina exigua* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 405, pl. 29, figs. 4-4c; pl. 43, figs. 11-11c; Zittel's Textb. Pal. (Engl. ed.), 1896, fig. 417 (p. 262).—Cumings, Amer. Jour. Sci., 4th ser., 20, 1905, pl. 7, fig. 53.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 73, fig. 17; Zittel-Eastman Textb. Pal., 1913, p. 320, fig. 443.  
*Crisinella œilensis* Wiman, Bull. Geol. Univ. Upsala, 5, pt. 2, 1902, p. 181, pl. 6, figs. 12-16.  
Richmond: Wilmington, Illinois; central Tennessee (Fernvale); Anticosti (Charleton); Island of Gotland (Borkholm drift).  
Figured sections of *cotype*.—Cat. Nos. 43287, 43288, U.S.N.M.

**Protocrisina perantiqua** (Hall).

*Gorgonia perantiqua* Hall, Pal. New York, 1, 1847, p. 76, pl. 26, figs. 5a, b.  
*Enallopora perantiqua* D'Orbigny, Prodr. de Pal., 1, 1850, p. 22.—Emmons, Amer. Geol., 1, pt. 2, p. 206, pl. 7, figs. 5a, b.—Miller, N. A. Geol. Pal., 1889, p. 301.  
*Protocrisina perantiqua* Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 71 (gen. ref.).  
Trenton: Middleville, Trenton Falls, etc., New York; Montreal, Quebec.

**PROTOCYCLOCERAS** Hyatt.Genotype: *Orthoceras lamarecki* Hall.

*Protocycloceras* Hyatt, Zittel-Eastman Textb. Pal., 1, 1900, p. 518.—Ruedemann, Bull. New York State Mus., 90, 1906, p. 438.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 55.—Hyatt, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 599.

**Protocycloceras(?) furtivum** (Billings).

*Orthoceras furtivum* Billings, Geol. Can. Pal. Foss., 1, 1865, p. 348, fig. 337.  
*Protocycloceras(?)* cf. *furtivum* Ruedemann, Bull. New York State Mus., 90, 1906, p. 445, pl. 16, fig. 3.  
Canadian (Beekmantown): Township of Kitley, Canada; Beekmantown, New York.

**Protocycloceras lamarecki** (Billings).

*Orthoceras Lamarecki* Billings, Canadian Nat. Geol., 4, 1859, p. 362; Geol. Canada, Geol. Surv. Canada, 1863, p. 121, fig. 38a-c; Pal. Foss., 1, Geol. Surv. Canada, 1865, pp. 255, 347, fig. 336.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 551, figs.

**Protocycloceras lamareki**—Continued.

*Protocycloceras lamareki* Hyatt, Zittel-Eastman Textb. Pal., 1, 1900, p. 518 (gen. ref.).—Ruedemann, Bull. New York State Mus., 90, 1906, p. 441, pl. 15, figs. 1-6; pl. 16, figs. 1-2; figs. 15, 16.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 56, fig. 1255.

Canadian: Mingan Islands; Godmanchester, and Leeds and Grenville counties, Canada; Newfoundland; Beekmantown, etc., New York (Beekmantown).

**Protocycloceras whitfieldi** Ruedemann.

*Orthoceras bilineatum* Whitfield, Bull. Amer. Mus. Nat. Hist., 3, 1890, p. 35, pl. 2, fig. 5, fig. 17a-b.

*Protocycloceras whitfieldi* Ruedemann, Bull. New York State Mus. Nat. Hist., 90, 1906, p. 443, fig. 17a, pl. 15, fig. 7.

Canadian (Beekmantown): Fort Cassin, Vermont.

**PROTOKIONOCERAS** Grabau and Shimer.

Genotype: *Orthoceras medullare* Hall.

*Protokionoceras* Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 58.

**Protokionoceras crebescens** (Hall).

*Orthoceras crebescens* Hall, 20th Rep. New York State Cab. Hist., 1868, p. 354, pl. 19 (10), figs. 1-3; rev. ed., 1870, p. 413, pl. 19, figs. 1-3.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 194, fig.—Whiteaves, Pal. Foss. Geol. Surv. Canada, 3, pt. 1, 1884, p. 37; *ibid.*, pt. 2, 1895, p. 98.—Newell, Proc. Boston Soc. Nat. Hist., 23, 1888, p. 466.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 545, fig.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 80, pl. 10, figs. 24, 27, 28; p<sup>l.</sup> 11, figs. 2-5.

*Protokionoceras crebescens* Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 58, fig. 1263.

Niagaran: Racine, etc., Wisconsin (Waukesha, Racine, and Guelph); Hespeler, Elora, etc., Ontario; Shelby, New York (Guelph).

**Protokionoceras medullare** (Hall).

*Orthoceras medullare* Hall, 20th Rep. New York State Cab. Hist., 1868, p. 353, pl. 20, figs. 1, 2; p. 381; rev. ed., 1870, p. 412, pl. 20, figs. 1, 2.—Meek and Worthen, Geol. Surv. Illinois, 6, 1875, p. 504, pl. 26, fig. 1.—Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 323; Trans. Albany Inst., 10, 1883, p. 74.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 37.—Keyes, Missouri Geol. Surv., 5, 1894, p. 227.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 99 (loc. occ.).—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 216; Bull. New York State Mus., 45, 1901, p. 216.—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 469, pl. 19, figs. 1, 2.

*Orthoceras* (*Kionoceras*) *medullare* Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 811 (gen. ref.).

*Kionoceras medullare* Clarke and Ruedemann, Mem. New York State Mus., 65, 1903, p. 86, pl. 10, fig. 23.

*Protokionoceras medullare* Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 58, fig. 1262.

Clinton-Niagaran: Waukesha, etc., Wisconsin (Racine); Elora, Ontario; New York; Delphi, Indiana; etc.

**Protokionoceras truslitum** (Clarke and Ruedemann).

*Orthoceras truslitum* Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 77, pl. 10, figs. 25, 26; pl. 13, figs. 1-10.

**Protokionoceras trusitum**—Continued.

*Protokionoceras trusitum* Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 59.

*Orthoceras* cf. *trusitum* Grabau, Michigan Geol. Surv., Geol., 1st ser., 1909, p. 196.

Niagaran (Guelph): Shelby and Rochester, New York.

Cayugan (Cobleskill): Schoharie, New York.

?Upper Monroan (Lucas): Grosse Isle, Detroit River, Michigan.

**PROTOPALÆASTER** Hudson. See *Hudsonaster* Stürtz.

**PROTOPELTURA** Brögger.

Genotype: *Olenus? acanthurus* Angelin.

*Protopeltura* Brögger, Die Sil. Etagen 2-3, Kristiania, 1882, p. 105.—Koken, Die Leitfossilien, Leipzig, 1896, p. 357.—Moberg and Moller, Geol. Foren. Stockholm Forhandl., 20, 1898, p. 265.

**Protopeltura acanthura tetracanthura** Matthew.

*Protopeltura acanthura* var. *tetracanthura* Matthew, Trans. Royal Soc. Canada, 9, sec. 4, 1892, p. 53, pl. 13, figs. 8a-c.

Canadian (Bretonian—Div. C3a): Germain Street, St. John, New Brunswick.

**PROTOPHRAGMOCERAS** Hyatt.

Genotype: *Cyrtoceras murchisoni* Barrande.

*Protophragmoceras* Hyatt, Zittel-Eastman Textb. Pal., 1900, p. 532; *ibid.*, 2d ed., 1913, p. 612.

**Protophragmoceras hercules** (Winchell and Marcy).

*Lituites Hercules* Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 102, pl. 3, fig. 9.

*Gyroceras Hercules* Chamberlin, Geol. Wisconsin, 1, 1883, p. 194, fig.

*Cyrtoceras hercules* Hall, 20th Rep. New York State Cab. Nat. Hist., rev. ed., 1870, p. 409, pl. 17, figs. 6, 7.

*Halloceras(?) hercules* Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 77, fig. 1292.

*Cyrtoceras* (*Phragmoceras?*) *amplicorne* Hall, 20th Rep. New York State Cab. Hist., 1868, p. 358, pl. 17 (8), figs. 6, 7; p. 393.

Niagaran (Racine): Chicago, Illinois; Wisconsin.

**Protophragmoceras hercules carrollense** (Kindle and Breger).

*Lituites* (*Ophidioceras?*) *hercules carrollensis* Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 474, pl. 16, fig. 1; pl. 17, fig. 1.

Niagaran: Delphi, Indiana.

**Protophragmoceras patronus** Clarke and Ruedemann.

*Protophragmoceras patronus* Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 97, pl. 19, figs. 1, 2.

Niagaran (Guelph): Shelby, New York.

**PROTORETOPORA** Zittel. See *Polypora* McCoy.

**PROTORHYNCHA** Hall and Clarke.

Genotype: *P. dubia* Hall and Clarke=*P. ridleyana* Safford.

*Protorhyncha* Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 180; 13th Ann. Rep. New York State Geol., 1895, p. 824.—Schuchert, Zittel-Eastman Textb.

Pal., 1, 1900, p. 323; 2d ed., 1913, p. 396.—Raymond, Ann. Carnegie Mus., 7, 1911, p. 226.

Observation.—See Raymond (1911) for discussion of this genus. Hall and Clarke based their generic description upon specimens of *Rhynchonella ridleyana* Safford from High Bridge, Kentucky, which they incorrectly identified as *Atrypa dubia* Hall.

*PROTORHYNCHA ÆQUIRADIATA* Hall and Clarke. See *Camarotoechia æquiradiata*.

*PROTORHYNCHA DUBIA* Hall and Clarke. See *Protorhyncha ridleyana*.

*Protorhyncha dubia* Hall.

*Atrypa dubia* Hall, Pal. New York, 1, 1847, p. 21, pl. 4 bis, fig. 5.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 192, pl. 3, fig. 23.

*Rhynchonella dubia* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 66.

*Protorhyncha dubia* Hall and Clarke (part), Pal. New York, 2, 1893, p. 180.—Raymond, Ann. Carnegie Mus., 7, 1911, p. 226.

Chazyan: Chazy, New York.

Observation.—Neither defined nor figured so as to be recognizable. As the original type is lost, the name should be dropped. (See Raymond, 1911.)

*Protorhyncha ridleyana* (Safford).

*Rhynchonella Ridleyana* Safford, Geol. Tennessee, 1869, p. 287 (nom. nud.).

*Protorhyncha ridleyana* Hayes and Ulrich, U. S. Geol. Surv., folio 95, Faunal chart, 1903 (gen. ref.).

*Protorhyncha dubia* Hall and Clarke (part), Pal. New York, 8, pt. 2, 1893, p. 180.

*Catazyga uphami-australis* Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 31, pl. 2, figs. 19a-b; pl. 3, figs. 14a-c.

Stones River (Pierce and Ridley): Murfreesboro, etc., Tennessee; bottom of gorge, High Bridge, Kentucky.

**PROTORTHIS** Hall and Clarke.

Genotype: *Orthis billingsi* Hartt.

*Protorthis* Hall and Clarke, 11th Ann. Rep. State Geol. New York for 1891, 1892, pp. 273, 274; 45th Ann. Rep. New York State Mus., 1892, pp. 589, 590; Pal. New York, 8, pt. 1, 1892, pp. 231-233.—Walcott, Proc. U. S. Nat. Mus., 28, 1905, pp. 280, 281.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 211.—Walcott, Smiths. Misc. Coll., 53, 1908, pl. 11, and pp. 142, 147; Mon. U. S. Geol. Surv., 51, 1912, p. 738.

*Protorthis? cassinensis* Whitfield.

*Protorthis cassinensis* Whitfield, Bull. Amer. Mus. Nat. Hist., 9, 1897, p. 173, pl. 4, figs. 1, 2.—Seely, Vermont State Geol. Rep., 7, 1910, pl. 61, figs. 1, 2.

Canadian (Beekmantown): Fort Cassin, Vermont.

*Protorthis? minima* Whitfield.

*Protorthis minima* Whitfield, Bull. Amer. Mus. Nat. Hist., 9, 1897, p. 178, pl. 4, figs. 3, 4.—Seely, Vermont State Geol. Rep., 7, 1910, pl. 61, figs. 3, 4.

Canadian (Beekmantown): Fort Cassin, Vermont.

**PROTOSCOLEX** Ulrich.

Genotype: *P. covingtonensis* Ulrich.

*Protoscolex* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 89.—Miller, N. A. Geol. Pal., 1889, p. 520.—Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 15, 1892, p. 83.

*Protoscolex covingtonensis* Ulrich.

*Protoscolex covingtonensis* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 89, pl. 4, fig. 2.

Eden (Economy): Covington, Kentucky.

*Holotype*.—Cat. No. 46537, U.S.N.M.

*Protoscolex magnus* Miller and Faber.

*Protoscolex magnus* Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 15, 1892, p. 83, pl. 1, figs. 5, 6.

Eden (Fulton): First ward, Cincinnati, Ohio.

**Protoscolex ornatus** Ulrich.

*Protoscolex ornatus* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 90, pl. 4, fig. 1.—Miller, N. A. Geol. Pal., 1889, p. 520, fig. 941.

Eden (Economy): Covington, Kentucky.

*Cotypes*.—Cat. No. 46538, U.S.N.M.

**Protoscolex simplex** Ulrich.

*Protoscolex simplex* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 91, pl. 4, fig. 4.

Eden (Economy): Covington, Kentucky.

*Holotype*.—Cat. No. 46539, U.S.N.M.

**Protoscolex tenuis** Ulrich.

*Protoscolex tenuis* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 90, pl. 4, fig. 3.

Eden (Economy): Covington, Kentucky.

*Holotype*.—Cat. No. 46540, U.S.N.M.

**PROTOSPONGIA** Salter.

Genotype: *P. fenestrata* Salter.

*Protospongia* Salter, Quart. Jour. Geol. Soc. London, 20, 1864, p. 238.—Roemer, Leth. geog., 1, Theil, Leth. Pal., Erste Lief, 1880, p. 315.—Sollas, Quart. Jour. Geol. Soc. London, 36, 1880, p. 362.—Hinde, Canadian Rec. Sci., 3, 1888, p. 64; Mon. British Foss. Sponges, Pal. Soc., 1888, p. 105.—Miller, N. A. Geol. Pal., 1889, p. 163.—Schluter, Zeits. d. d. geol. Gesell., 44, 1892, p. 616.—Matthew, Trans. Royal Soc. Canada, 10, sec. 4, 1893, p. 95.—Rauff, Palæontographica, 40, 1894, p. 233.—Matthew, Trans. New York Acad. Sci., 14, 1895, p. 112, pl. 2, fig. 5.—Dawson, Trans. Royal Soc. Canada, 2d ser., 2, sec. 4, 1896, p. 101.

*Diagoniella* Rauff, Palæontographica, 40, 1894, p. 248. (Genotypes: *Protospongia coronata* and *P. cyathiformis*.)

**Protospongia (Diagoniella) coronata** Dawson and Hinde.

*Protospongia coronata* Dawson and Hinde, Trans. Royal Soc. Canada, 7, sec. 4, 1890, p. 41, figs. 8–10; pl. 3, fig. 4.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 780, figs.—Dawson, Trans. Royal Soc. Canada, 2d ser., 2, sec. 4, 1896, p. 106, pl. 2, figs. 5, 6; figs. 13–15; *ibid.*, 2d ser., 2, sec. 4, 1895, p. 106, figs. 13–15; pl. 2, figs. 5, 6.

*Protospongia?* (*Diagoniella*) *coronata* Rauff, Palæontographica, 40, 1894, p. 248, pl. 1, figs. 21, 22.

Canadian? (Levis?): Metis, Quebec.

**Protospongia (Diagoniella) cyathiformis** (Dawson and Hinde).

*Protospongia cyathiformis* Dawson and Hinde, Trans. Royal Soc. Canada, 7, sec. 4, 1890, p. 43, figs. 13, 14; pl. 3, fig. 6.—Dawson, *ibid.*, 2d ser., 2, sec. 4, 1896; p. 107, figs. 15, 16, pl. 2, figs. 7–8.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 781, figs.

*Protospongia?* (*Diagoniella*) *cyathiformis* Rauff, Palæontographica, 40, 1894, p. 248, pl. 3, figs. 4, 5.

Canadian? (Levis?): Metis, Quebec.

**Protospongia delicatula** Dawson and Hinde.

*Protospongia delicatula* Dawson and Hinde, Trans. Royal Soc. Canada, 7, sec. 4, 1890, p. 43, fig. 15; *ibid.*, 2d ser., 2, sec. 4, 1896, p. 105, figs. 11, 12.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 782, figs.—Rauff, Palæontographica, 40, 1894, p. 257.

Canadian? (Levis?): Metis, Quebec.

**Protospongia mononema** Dawson and Hinde.

*Protospongia mononema* Dawson and Hinde, Trans. Roy. Soc. Canada, 7, sec. 4, 1890, p. 40, figs. 5-7, pl. 3, fig. 3.—Dawson, *ibid.*, 2d ser., 2, sec. 4, 1896, p. 103, figs. 6-8, pl. 1, figs. 2, 3.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 781, figs.—Rauff, *Palæontographica*, 40, 1894, p. 247, pl. 2, figs. 2, 3.  
Canadian? (Levis?): Metis, Quebec.

**Protospongia polynema** Dawson and Hinde.

*Protospongia polynema* Dawson and Hinde, Trans. Roy. Soc. Canada, 7, sec. 4, 1890, p. 42, figs. 11, 12, pl. 3, fig. 5.—Dawson, *ibid.*, 2d ser., 2, sec. 4, 1896, p. 104, figs. 9, 10.—Lesley, Geol. Surv. Pennsylvania Rep. P 4, 1889, p. 782, figs.—Rauff, *Palæontographica*, 40, 1894, p. 247.  
Canadian? (Levis?): Metis, Quebec.

**Protospongia tetranema** Dawson.

*Protospongia tetranema* Dawson, Canadian Rec. Sci., 3, 1888, p. 52, fig. 1.—Hinde, *ibid.*, 1888, p. 63.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 782, figs.—Dawson and Hinde, Trans. Roy. Soc. Canada, 7, sec. 4, 1890, pp. 37-39, figs. 1-4, pl. 3, figs. 1, 2.—Dawson, *ibid.*, 2d ser., 2, sec. 4, 1896, pp. 101-103, figs. 1-5, pl. 1, figs. 1, 4.—Rauff, *Palæontographica*, 40, 1894, p. 246, pl. 1, figs. 19, 20.  
Canadian? (Levis?): Metis, Quebec.

**PROTOSTIGMA** Lesquereux.Genotype: *P. sigillarioides* Lesquereux.

*Protostigma* Lesquereux, Proc. Amer. Phil. Soc., 1877, p. 169.—Miller, N. A. Geol. Pal., 1889, p. 135.

**Protostigma sigillarioides** Lesquereux.

*Protostigma sigillarioides* Lesquereux, Proc. Amer. Phil. Soc., 17, 1877, p. 169; pl. 1, figs. 7, 8.—Miller, Proc. Davenport Acad. Sci., 2, 1878, p. 206.—Saporta, Le Mondes des Plantes, Appar. Homme, 1879, p. 167, figs. 4, 6.—Lesquereux, Chain of Life, 1880, p. 92, fig. 84b.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 783, figs.

Eden (McMicken) and Richmond (Waynesville): Cincinnati and Oregonia, Ohio.

Observation.—A second species is probably represented in the Richmond specimen, which may belong to the *Glyptoceras* section of *Cyrtoceras*.

**PROTOVIRGULARIA** McCoy.Genotype: *P. dichotoma* McCoy.

*Protovirgularia* McCoy, Ann. Mag. Nat. Hist., 6, 1850, p. 272.

**Protovirgularia dichotoma** McCoy.

*Protovirgularia dichotoma* McCoy, Ann. Mag. Nat. Hist., 6, 1850, p. 272; British Ass'n 20th Rep., 1851, p. 107; British Pal. Foss., 1853, p. 10, pl. 1B, figs. 11, 12.—Malaise, Bull. Acad. Roy. Belge., 20, 1890, p. 447.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 243.

Middle Ordovician: England; Stockport, New York (Normanskill).  
*Plesiotypes*.—Cat. No. 54253, U.S.N.M.

**PROTOWARTHIA** Ulrich and Scofield. See *Sinuities* Koken.**PROTOZEUGA** Twenhofel.Genotype: *Waldheimia mawii* Davidson.

*Protozeuga* Twenhofel in Savage, Bull. Geol. Surv. Illinois, 23, 1913, pp. 16, 51.—Twenhofel, Bull. Victoria Mem. Mus., 3, 1914, p. 29.

*Waldheimia* Davidson, Suppl. Sil. Foss. Brach., 1882, p. 76.



**Protozeuga anticostiana** Twenhofel.

*Protozeuga anticostiana* Twenhofel, Bull. Victoria Mem. Mus., 3, 1914, p. 31, pl. 1, figs. 8-10.

Richmond (English Head, Charleton): English Head, etc., *Anticosti*.

**Protozeuga sulcocarinata** Savage.

*Protozeuga sulcocarinata* Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 51, pl. 1, figs. 19-21; pl. 5, fig. 6.

Upper Medinan: Near Thebes, Illinois (Girardeau); Louisiana, Missouri (Edge-wood—Noix).

PROTOZYGA Hall and Clarke. See *Zygospira* Hall.

**PSEUDOCRINITES** Pearce.

Genotype: *P. bifasciatus* Pearce.

*Pseudocrinites* Pearce, Proc. Geol. Soc. London, 4, 1843, p. 160.—Forbes, Mem. Geol. Surv. Great Britain, 2, pt. 2, 1848, p. 494.—Jaekel, Stammesg. Pelmat., Berlin, 1, 1899, p. 283, fig. 60 on p. 284; Zittel-Eastman Textb. Pal., 1, 1900, p. 187.—Schuchert, Smiths. Misc. Coll., 47, 1904, p. 226, pl. 37, figs. 11, 12.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 153.

*Pseudocrinus* Haeckel, Amphoriden und Cystoideen, Leipzig, 1896, p. 135.—Bather, Treatise Zool., 3, Echinoderma, London, p. 62, fig. 29.

**Pseudocrinites abnormalis** Schuchert.

*Pseudocrinites abnormalis* Schuchert, Smiths. Misc. Coll., 47, 1904, p. 231, pl. 35, figs. 10-12; Maryland Geol. Surv., Low. Dev., 1913, p. 238, pl. 33, figs. 10-12.

Helderbergian (Keyser): Keyser, West Virginia.

*Holotype*.—Cat. No. 35068, U.S.N.M.

**Pseudocrinites clarki** Schuchert.

*Pseudocrinites clarki* Schuchert, Amer. Geol., 32, 1903, p. 233, pl. 36, figs. 4-7; pl. 39, fig. 14; Smiths. Misc. Coll., 47, pt. 2, 1904, pp. 233, 234, pl. 39, fig. 14; Maryland Geol. Surv., Low. Dev., 1913, p. 240, pl. 33, figs. 15-18; pl. 35, fig. 14.

Helderbergian (Keyser): Keyser, West Virginia.

*Cotypes*.—Cat. No. 35070, U.S.N.M.

**Pseudocrinites claypolei** Schuchert.

*Pseudocrinites claypolei* Schuchert, Smiths. Misc. Coll., 47, 1904, p. 232, pl. 37, fig. 1.

Helderbergian (Keyser): Clark's Mill, near New Bloomfield, Pennsylvania.

*Holotype*.—Cat. No. 35066, U.S.N.M.

**Pseudocrinites elongatus** Schuchert.

*Pseudocrinites elongatus* Schuchert, Smiths. Misc. Coll., 47, 1904, p. 235, pl. 35, figs. 6, 7; Maryland Geol. Surv., Low. Dev., 1913, p. 241, pl. 34, figs. 3, 4.

Helderbergian (Keyser): Pleasant Valley, west of Martin Mountain, Pennsylvania.

*Holotype*.—Cat. No. 35065, U.S.N.M.

**Pseudocrinites gordonii** Schuchert.

*Pseudocrinites gordonii* Schuchert, Amer. Geol., 32, 1903, p. 235; Smiths. Misc. Coll., 47, pt. 2, 1904, p. 229, fig. 29, pl. 36; figs. 8-12; pl. 39, figs. 11-13; Maryland Geol. Surv., Low. Dev., 1913, p. 236, pl. 33, figs. 5-9; pl. 35, figs. 11-13.

Helderbergian (Keyser): Keyser, West Virginia.

*Holotype and paratypes*.—Cat. No. 35071, U.S.N.M.

**Pseudocrinites perdewi** Schuchert.

Pseudocrinites perdewi Schuchert, Amer. Geol., 32, 1903, p. 238; Smiths. Misc. Coll., 47, 1904, p. 236, pl. 36, figs. 1-3; pl. 39, figs. 8-10; fig. 32; Maryland Geol. Surv., Low. Dev., 1913, p. 242, pl. 34, figs. 5-7; pl. 35, figs. 8-10.  
Helderbergian (Keyser): Near Keyser, West Virginia.  
*Holotype* and *paratype*.—Cat. No. 35072, U.S.N.M.

**Pseudocrinites stellatus** Schuchert.

Pseudocrinites stellatus Schuchert, Amer. Geol., 32, 1903, p. 236; Smiths. Misc. Coll., 47, 1904, p. 232, pl. 35, figs. 8, 9; pl. 39, fig. 7; Maryland Geol. Surv., Low. Dev., p. 239, 1913, pl. 33, figs. 13, 14; pl. 35, fig. 7.  
Helderbergian (Keyser): Keyser, West Virginia.  
*Holotype*.—Cat. No. 35069, U.S.N.M.

**Pseudocrinites subquadratus** Schuchert.

Pseudocrinites subquadratus Schuchert. Smiths. Misc. Coll., 47, 1904, p. 234, pl. 35, figs. 4, 5; Maryland Geol. Surv., Low. Dev. 1913, p. 237, pl. 34, figs. 1, 2.  
Helderbergian (Keyser): Devil's Backbone, near Cumberland, Maryland.  
*Holotype*.—Cat. No. 35067, U.S.N.M.

PSUDOCRINUS Haeckel. See Pseudocrinites Pearce.

**PSEUDOHORNERA** Roemer.

Genotype: Retepora diffusa Hall.

Drymotrypa Ulrich, Geol. Surv. Illinois, 8, 1890, p. 399.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 684.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 235.—Grabau, Bull. New York State Mus., 45, 1901, p. 169; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 169.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 141.

Thamnocella Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 525.

Pseudohornera Roemer, Leth. geog., Leth. Pal., 1, Atlas, 1876, expl. pl. 12, fig. 2.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 49; Bull. U. S. Nat. Mus., 77, 1911, p. 172.

**Pseudohornera dichotoma** (Ulrich).

Drymotrypa dichotoma Ulrich, Geol. Surv. Illinois, 8, 1890, p. 399, pl. 53, fig. 6.  
Trenton; Montreal, Quebec.  
*Holotype*.—Cat. No. 43388, U.S.N.M.

**Pseudohornera diffusa** (Hall).

Retepora diffusa Hall, Pal. New York, 2, 1852, p. 160, pl. 40C, figs. 1a-f.  
Drymotrypa diffusa Ulrich, Geol. Surv. Illinois, 8, 1890, pl. 53, figs. 7-7b.—Grabau, Bull. New York State Mus., 45, 1901, p. 169, fig. 69; Bull. Buffalo Soc. Nat. Sci., 7, 1907, p. 169, fig. 69.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 142, fig. 197.

Pseudohornera diffusa Roemer, Leth. geog. Leth. Pal., 1, 1876, Atlas, pl. 12, fig. 2.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 50, pl. 23, figs. 6-9; pl. 18, figs. 1-3.

Clinton (Rochester): Lockport and Rochester, New York; Grimsby and Hamilton, Ontario.

*Plesiotype*.—Cat. N. 43389, U.S.N.M.

**Pseudohornera niagarensis** (Hall).

Fenestella n. sp. Hall, Pal. New York, 2, 1852, pl. 40D, fig. 4.  
Thamniscus? Niagarensis Hall, 28th Ann. Rep. New York State Mus. (doc. ed.), 1876, pl. 11, figs. 22-25; *ibid.*, mus. ed., 1879, p. 126, pl. 11, figs. 22-25; 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 254, pl. 10, figs. 22-25.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1185, figs.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, pl. 11, figs. 15-17.

**Pseudohornera niagarensis**—Continued.

*Drymotrypa niagarensis* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 399.

*Pseudohornera niagarensis* Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 49, pl. 18, fig. 20; pl. 19, figs. 14–16.

Clinton—Niagaran: Lockport and Niagara Falls, New York; Hamilton, Ontario (Rochester); Waldron, Indiana; and Newsom, Tennessee (Waldron).

**PSEUDOLINGULA** Mickwitz. See *Lingula* subgenus *Pseudolingula*.

**PSEUDONISCUS** Nieszkowski.

Genotype: *P. aculeatus* Nieszkowski.

*Pseudoniscus* Nieszkowski, Archiv. f. Naturk-Liv-Ehst. u. Kurl., 1, 1859, p. 381.—Schmidt, Mem. Acad. Imp. Sci. St. Petersburg, 7th ser., 31, No. 5, 1883, p. 34.—Zittel, Handb. Pal., 2, 1885, p. 642.—Packard, Mem. Nat. Acad. Sci., 3, pt. 2, 1886, p. 151.—Vogdes, Ann. New York Acad. Sci., 5, 1889, p. 2, pl. 1, fig. 5.—Clarke, 54th Rep. New York State Mus., 1901, pp. 84–88.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 403.—Clarke, Zittel-Eastman Textb. Pal., 1900, p. 673; 2d ed., 1913, p. 777.

**Pseudoniscus roosevelti** Clarke.

*Pseudoniscus roosevelti* Clarke, 54th Ann. Rep. New York State Mus., 1st App., 1902, pp. 87, 89, pl. 1, fig. 1; pl. 2, figs. 1–3.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 403, fig. 1703.

Cayugan: Near Pittsford, Monroe County (Pittsford), and Litchfield, New York (Bertie).

**PSEUDOSPHEREXOCHUS** Schmidt.

Genotype: *Sphærexochus hemicranium* Kutorga.

*Pseudosphærexochus* Schmidt, Mem. Acad. Imp. Sci. St. Petersburg, 7th ser., 30, 1881, pp. 122, 124, 126, 130, 170.—Clarke, Geol. Minnesota, 3, pt. 2, 1894, pp. 737–8.—Reed, Geol. Mag., dec. 4, 3, 1896, p. 119.—Koken, Die Leitfossilien, Leipzig, 1896, p. 35, fig. 23; fig. 2.—Reed, Geol. Mag., dec. 4, 5, 1898, p. 210.—Raymond, Ann. Carnegie Mus., 1905, p. 375.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 320.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 725.

**PSEUDOSPHEREXOCHUS APOLLO** Raymond. See *Anacheirus*? *apollo*.

**Pseudosphærexochus approximus** Raymond.

*Pseudosphærexochus approximus* Raymond, Ann. Carnegie Mus., 3, 1905, p. 369, pl. 14, fig. 18; 7th Rep. Vermont State Geol., 1910, p. 242, pl. 36, fig. 18.

Chazyan (Crown Point): Sloop Bay, Valcour Island, New York.

**Pseudosphærexochus canadensis** (Billings).

*Sphærexochus Canadensis* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 64, fig. 21.

Anticostian (Chicotte): Southwest Point, Anticosti.

**Pseudosphærexochus chazyensis** Raymond.

*Pseudosphærexochus chazyensis* Raymond, Ann. Carnegie Mus., 3, 1905, p. 370, pl. 14, figs. 19, 20; 7th Rep. Vermont State Geol., 1910, p. 243, pl. 36, figs. 19, 20.

Chazyan (Crown Point): Valcour Island and Chazy, New York.

**Pseudosphærexochus? clintoni** (Foerste).

*Ceraurus*——Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 98, pl. 8, fig. 17.

*Ceraurus* (*Pseudosphærexochus*) *clintoni* Foerste, Geol. Surv. Ohio, 7, 1895, p. 527, pl. 27, fig. 17.

Upper Medina (Brassfield): Brown's Quarry, near Dayton, Ohio.

**Pseudosphærexochus? eryx** (Billings).

- Cheirurus Eryx Billings, Canadian Nat. Geol., 5, 1860, p. 322, fig. 30; Geol. Canada, Geol. Surv. Canada, 1863, p. 239, fig. 276 (fig. only); Pal. Foss., Geol. Surv. Canada, 1, 1865, p. 413, fig. 399.  
 Ozarkian? (Levis-erratics): Point Levis, Quebec.

**Pseudosphærexochus mercurius** (Billings).

- Cheirurus Mercurius Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 285, fig. 272.  
 Ceraurus (Cyrtometopus) mercurius Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 736.  
 Pseudosphærexochus mercurius Raymond and Barton, Bull. Mus. Comp. Zool., 54, 1913, p. 542 (gen. ref.).  
 Chazyan (Quebec-P): Cow Head, Newfoundland.

**PSEUDOSPHEREXOCHUS (NIESZKOWSKIA) SATYRUS** Raymond. See *Nieszkowskia satyrus*.

**Pseudosphærexochus trentonensis** Clarke.

- Pseudosphærexochus trentonensis Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 734, figs. 53, 54.—Weller, Geol. Surv. New Jersey Pal., 3, 1903, p. 205, pl. 15, figs. 24, 25.  
 Ceraurus trentonensis Miller, N. A. Geol. Pal., 2d App., 1897, p. 787 (gen. ref.).  
 Trenton: Trenton Falls, New York; Jacksonburg, New Jersey.

**Pseudosphærexochus vulcanus** (Billings).

- Cheirurus vulcanus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 284, figs. 271a-c (not p. 324, fig. 310a-c=*Nieszkowskia billingsi*).  
 Pseudosphærexochus vulcanus Raymond, Ann. Carnegie Mus., 3, 1905, p. 367, pl. 14, fig. 16, fig. 10; 7th Rep. Vermont State Geol., 1910, p. 241, pl. 36, fig. 16.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 320, fig. 1634d.  
 Cheirurus prolificus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 285, fig. 273, p. 325, figs. 311, 312.  
 Ceraurus (Pseudosphærexochus) prolificus Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 738 (gen. ref.).  
 Chazyan: Cow Head, Newfoundland (Quebec-P); Valcour Island, New York.

**PSEUDOSPHEREXOCHUS VULCANUS** var. **BILLINGSI** Raymond. See *Nieszkowskia billingsi*.

**PSILOCONCHA** Ulrich.Genotype: *P. grandis* Ulrich.

- Psiloconcha* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 665; Geol. Minnesota, 3, pt. 2, 1894, p. 530.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 386.

**Psilocoucha elliptica** Ulrich.

- Psilocoucha elliptica* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 667, pl. 52, figs. 3, 4; Geol. Minnesota, 3, pt. 2, 1894, p. 530, fig. 42c-d.  
*Orthodesma ellipticum* Miller, N. A. Geol. Pal., 2d App., 1897, p. 783 (gen. ref.).  
 Richmond (Waynesville): Clarksville, Ohio.  
*Cotypes*.—Cat. No. 46281, U.S.N.M.

**Psiloconcha grandis** Ulrich.

- Psiloconcha grandis* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 665, pl. 52, figs. 1, 2; Geol. Minnesota, 3, pt. 2, 1894, p. 530, fig. 42a-b.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 386, fig. 489d-e.  
*Orthodesma grande* Miller, N. A. Geol. Pal., 2d App., 1897, p. 783 (gen. ref.).  
 Richmond (Waynesville): Waynesville, Ohio.  
*Holotype*.—Cat. No. 46283, U.S.N.M.

**Psiloconcha inornata** Ulrich.

*Psiloconcha inornata* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 667, pl. 52, figs. 11 and 12.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 387, fig. 491.

Maysville: Cincinnati, Ohio (Bellevue); St. Hilaire, Quebec (Pulaski).

*Cotypes*.—Cat. No. 46284, U.S.N.M.

**Psiloconcha minima** Ulrich.

*Psiloconcha minima* Ulrich, Geol. Surv. Ohio, 7, 1893, pl. 52, figs. 8, 9, p. 669.

*Orthodesma minimum* Miller, N. A. Geol. Pal., 2d App., 1897, p. 783 (gen. ref.).

Eden (Southgate): Covington, Kentucky.

*Holotype*.—Cat. No. 46285, U.S.N.M.

**Psiloconcha minnesotensis** Ulrich.

*Psiloconcha minnesotensis* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 531, pl. 36, figs. 31 and 32.

*Orthodesma minnesotense* Miller, N. A. Geol. Pal., 2d App., 1897, p. 783 (gen. ref.).

Trenton (Prosser): Pleasant Grove, Minnesota.

*Holotype*.—Cat. No. 46286, U.S.N.M.

**Psiloconcha senecta** (Sardeson).

*Modiolopsis senecta* Sardeson, Bull. Minnesota Acad. Nat. Sci., 1893, 4, p. 73, pl. 2, fig. 17.

St. Peter: South St. Paul, Minnesota.

**Psiloconcha sinuata** Ulrich.

*Psiloconcha sinuata* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 668, pl. 52, figs. 15 and 16.

Maysville (Bellevue): Cincinnati, Ohio.

*Cotypes*.—Cat. No. 46288, U.S.N.M.

**Psiloconcha sinuata borealis** Foerste.

*Psiloconcha sinuata borealis* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 296, pl. 2, figs. 9a-c.

Cincinnati (Pulaski): Riviere des Hurons and Nicolet River, Quebec.

**Psiloconcha subovalis** (Ulrich).

*Orthodesma subovale* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 8, pl. 7, fig. 18.

*Psiloconcha subovalis* Ulrich, Geol. Surv. Ohio, 1893, p. 666, pl. 52, figs. 5-7.—

Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 295, pl. 2, fig. 15.

Maysville: Morrow, Ohio (Bellevue); Riviere des Hurons, Quebec (Pulaski).

*Holotype* and *pleistotypes*.—Cat. Nos. 46290, 46291, U.S.N.M.

**Psiloconcha subrecta** Ulrich.

*Psiloconcha subrecta* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 667, pl. 52, figs. 13 and 14.

Richmond (Waynesville): Waynesville, Ohio.

*Holotype*.—Cat. No. 46289, U.S.N.M.

**Psiloconcha tenuistriata** Ulrich.

*Psiloconcha tenuistriata* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 668, pl. 52, fig. 10.

*Orthodesma tenuistriatum* Miller, N. A. Geol. Pal., 2d App., 1897, p. 784 (gen. ref.).

Eden (Economy): Covington, Kentucky.

*Holotype*.—Cat. No. 46292, U.S.N.M.

**PSILONYCHIA** Ulrich.

Genotype: *P. perangulata* Ulrich.

*Psilonychia* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 648.

**Psilonychia perangulata** Ulrich.

*Psilonychia perangulata* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 649, pl. 51, figs. 1-3.  
*Ambonychia perangulata* Miller, N. A. Geol. Pal., 2d App., 1897, p. 779 (gen. ref.).  
 Maysville (Corryville): Cincinnati, Ohio.  
*Holotype*.—Cat. No. 46287, U.S.N.M.

**PSILOPHYTON GRACILLIMUS** Lesquereux. See *Mastigograptus gracillimus*.

**PTERASPIS ACADICA** Matthew. See *Cyathaspis acadica*.

**PTERINEA** Goldfuss.Genotype: *P. lævis* Goldfuss.

*Pterinea* Goldfuss, *Petrefacta Germaniae*, 1826, p. 133; *ibid.*, 2d ed., pt. 2, 1863, p. 126.—McCoy, *Syn. Char. Carb. Fossils*, 1844, p. 82.—Brown, *Illust. Foss. Conch. Great Britain and Ireland*, 1849, p. 164.—McCoy, *British Pal. Rocks Foss.*, 1854, p. 258.—Woodward, *Man. Mollusca*, pt. 2, 1854, p. 262.—Pictet, *Traite de Pal.*, 2d ed., 3, 1855, p. 595.—Meek, *Amer. Jour. Sci. Arts*, 2d ser., 37, 1864, p. 216.—Zittel, *Handb. Pal.*, 2, 1881, p. 32.—Barrande, *Syst. Sil. du Centre Boheme*, 6, 1881, p. 26.—Hall, *Pal. New York*, 5, pt. 1, *Lam. 1*, 1884, p. 12; 35th Rep. New York State Mus. Nat. Hist., p. 406b; 1st Rep. State Geol. New York, 1884, p. 13.—Follmann, *Verhandl. d. naturhist. Verein d. preuss Rhein*, 1885, 42, p. 182.—Frech, *Zeits. d. d. geol. Gesell.*, 40, 1888, p. 362.—Jackson, *Mem. Boston Soc. Nat. Hist.*, 4, 1888, p. 386.—Miller, *N. A. Geol. Pal.*, 1889, p. 505.—Jackson, *Amer. Nat.*, 24, 1890, p. 1142.—Whidborne, *Mon. Dev. Fauna South England*, 2, *Pal. Soc.*, 1892, p. 57.—Koken, *Die Leitfossilien, Leipzig*, 1896, p. 186, fig. 154.—Grabau, *Bull. Buffalo Soc. Nat. Hist.*, 1899, p. 244.—Philipps, *Zeits. d. d. geol. Gesell.*, 51, 1899, p. 181.—Dall, *Zittel-Eastman Textb. Pal.*, 1, 1900, p. 367; 2d ed., 1913, p. 444.—Grabau, *Bull. Buffalo Soc. Nat. Sci.*, 7, 1901, p. 207; *Bull. New York State Mus.*, 45, 1901, p. 207.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 984.—Grabau and Shimer, *N. A. Index Fossils*, 1, 1909, p. 419.

*Caritodens* Foerste, *Bull. Denison Univ.*, 16, 1910, p. 71 (Genotype: *Pterinea demissa* Conrad).

**PTERINEA AVICULOIDEA** Whitfield. See *Pterinea lanii*.

**Pterinea bellilineata** Billings.

*Pterinea bellilineata* Billings, *Cat. Sil. Foss. Anticosti*, *Geol. Surv. Canada*, 1866, p. 15.

Richmond (English Head, Charleton): White Cliff, Anticosti.

*Plastotype*.—Cat. No. 46293, U.S.N.M.

**Pterinea bradti** Grabau.

*Pterinea bradti* Grabau, *Michigan Geol. Surv.*, *Geol.*, 1st ser., 1909, p. 166, pl. 16, figs. 9, 10.

*Pterinea subplana* Clarke and Ruedemann, *Mem. New York State Mus.*, 5, 1903, p. 49, pl. 5, fig. 4.

Upper Mouroan (Lucas): Salt shaft, Detroit, Michigan.

Niagaran (Guelph): Shelby and Rochester, New York.

**Pterinea brisa** Hall.

*Pterinea brisa* Hall, 20th Rep. New York State Cab. Hist., 1868 (extras, 1865), p. 337, pl. 14 (5), fig. 1; p. 387; rev. ed., 1870, p. 384, pl. 14, fig. 1.—Winchell and Marcy, *Mem. Boston Soc. Nat. Hist.*, 1, 1865, p. 108.—Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875, pl. 27, figs. 7-9; *ibid.*, *mus. ed.*, 1879, p. 173, pl. 27, figs. 7-9.—Miller and Dyer, *Cont. Pal.*, 1878, p. 10, pl. 3, fig. 7.—Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 316, pl. 27, figs. 24, 25; pl. 28, figs. 7-9.—Chamberlin, *Geol. Wisconsin*, 1,

**Pterinea brisa**—Continued.

1883, p. 192, fig.—Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 91, pl. 13, figs. 14a, b; *ibid.*, 2, pt. 1, 1887, p. 101, pl. 8, fig. 30.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 808, figs.—Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 557, pl. 25, figs. 14a, b; pl. 27, fig. 30; Bull. Sci. Lab. Denison Univ., 14, 1909, p. 65, pl. 4, fig. 61.

Clinton-Niagaran: Bridgeport, Illinois, and Racine, Wisconsin (Racine); Waldron, Indiana, and Newsom, Tennessee (Waldron); Ohio; etc.

\* **PTERINEA CARINATA** Goldfuss. See *Byssonychia carinata*.

**Pterinea cincinnatiensis** Miller and Faber.

*Pterinea cincinnatiensis* Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 17, 1894, p. 25, pl. 1, figs. 11–17.

Maysville (Fairmount): Cincinnati, Ohio.

**Pterinea corrugata** (James).

*Avicula corrugata* James, Cincinnati Quart. Jour. Sci., 1, 1874, p. 239.

*Pterinea corrugata* Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1018.

Richmond: Wayne County, Indiana.

**Pterinea curiosa** Billings.

*Pterinea curiosa* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 51, figs. 18a–18b on p. 52.

Anticostian (Jupiter River): Near Jupiter River, Anticosti.

**Pterinea cyrtodontoidea** Winchell and Marcy.

*Pterinea cyrtodontoidea* Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 95.

Niagaran (Racine): Chicago, Illinois.

**Pterinea (Caritodens) demissa** (Conrad).

*Avicula demissa* Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1842, p. 242, pl. 13, fig. 3.—Emmons, Geol. New York, 2, 1842, p. 404, fig. 2.—Owen, Amer. Jour. Sci. Arts, 47, 1844, pp. 376, 377, fig. 2.—Hall, Pal. New York, 1, 1847, p. 292, pl. 80, figs. 2a, b.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 175, pl. 17, fig. 10; Man. Geol., 1860, p. 102, fig. 2.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 215, fig. 220.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 215.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 63, fig.

*Pterinea demissa* McCoy, British Pal. Rocks, Foss., 1854, p. 260, pl. 1, fig. 7.—Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 78, pl. 2, fig. 1.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 174, fig.—Miller, N. A. Geol. Pal., 1889, p. 505, fig. 902.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1018, pl. 48, fig. 1.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 419, fig. 545.

*Pterinea (Caritodens) demissa* Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 71, pl. 1, fig. 10; Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 134.

*Caritodens demissa* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 269, pl. 1, fig. 10; pl. 3, fig. 11.

*Avicula subretroflexa* D'Orbigny, Prodr. de Pal., 1, 1849, pl. 13.—Boule and Thevenin, Ann. de Pal., 1, fasc. 1, 1906, p. 4 (100), pl. 1, fig. 6.

Maysville and Richmond: Near Rome, New York (Pulaski); Cincinnati, Ohio, and vicinity; Indiana; Kentucky; Tennessee; Quebec; etc.

**Pterinea elegans** Savage.

*Pterinea elegans* Savage, Bull. Geol. Surv., Illinois, 23, 1913, p. 117, pl. 7, fig. 18. Upper Medinan (Channahon): Will County, Illinois.

*PTERINEA ELLIPTICA* Miller. See *Prolobella subelliptica*.

***Pterinea emacerata* (Conrad).**

*Avicula emacerata* Conrad, Jour. Acad. Nat. Sci. Philadelphia, 1842, p. 241, pl. 12, fig. 15.—Hall, Pal. New York, 2, 1852, p. 83, pl. 27, figs. 1a, b; p. 282, pl. 59, figs. 1a-e; Nat. Hist. New York, Geol., 4, 1843, p. 108, fig. 4; p. 109; tab. ill. 15, fig. 4.—Billings, Canadian Nat. Geol., 1, 1856, p. 60, pl. fig. 6.—Hall, 20th Rep. New York State Cab. Hist. (extras, 1865), 1868, p. 337; rev. ed., 1870, p. 384.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 68, figs.

*Pterinea emacerata* Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 207, fig. 135; Bull. New York State Mus., 45, 1901, p. 207, fig. 135.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 242, pl. 22, fig. 4.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 419, fig. 546.

*Actinopteria emacerata* Whitfield and Hovey, Bull. Amer. Mus. Nat. Hist., 11, pt. 2, 1899, p. 156 (gen. ref.).

*Avicula leptonota* Hall, Nat. Hist. New York, Geol., 4, 1843, p. 76, fig. 5; tab. ill. 8, fig. 5.—Owen, Amer. Jour. Sci. Arts, 48, 1845, p. 306, fig. 5.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 69, fig.

Clinton: Lockport, Rochester, Wolcott, etc., New York; Hamilton, etc., Ontario (Rochester); Nova Scotia.

?Helderbergian (Decker Ferry): Two miles south of Tristates, New York.

***Pterinea formosa* Savage.**

*Pterinea formosa* Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 53, pl. 2, fig. 1. Upper Medinan (Girardeau): Alexander County, Illinois.

***Pterinea honeymani* (Hall).**

*Avicula honeymani* Hall, Canadian Nat. Geol., 5, 1860, p. 153, fig. 13.—Dawson, Acadian Geol., Suppl. Chap., 1860, p. 68, fig. 59; 2d ed., 1868, p. 604, fig. 210.

*Pterinea honeymani* Miller, N. A. Geol. Pal., 1889, p. 506 (gen. ref.).

Silurian (Arisaig): Arisaig, Nova Scotia.

***Pterinea insueta* (Emmons).**

*Avicula insueta* Emmons, Geol. New York, 2, 1842, p. 399, fig. 5.—Hall, Pal. New York, 1, 1847, p. 291, pl. 80, figs. 1a, b.—Emmons, Amer. Geol., 1, pt. 2, 1855, p. 175, pl. 17, fig. 15.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 820, fig. 617.—Emmons, Man. Geol., 1860, p. 101, fig. 91.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 4, fig. 6.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 216.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 69, figs.

*Pterinea insueta* Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1019, pl. 48, fig. 2.

Utica(?): Canajoharie, New York.

?Maysville: Cincinnati, Ohio.

***Pterinea lanii* Grabau.**

*Pterinea aviculoidea* Whitfield (not Hall), Geol. Rep. Wisconsin, 4, 1882, p. 322, pl. 25, figs. 6, 7; Ann. New York Acad. Sci., 5, 1891, p. 514, pl. 5, fig. 23; Geol. Ohio, 7, 1893, p. 415, pl. 1, fig. 23.—Sherzer, Michigan Geol. Surv., 7, pt. 1, 1900, p. 225, pl. 17, fig. 23.

*Pterinea lanii* Grabau, Michigan Geol. Surv., Geol., 1st ser., 1909, p. 164, pl. 20, fig. 13; pl. 30, figs. 23, 24.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 420, fig. 547.

Lower Monroan: Waubakee, Wisconsin; southeastern Michigan (Raisin River and Lucas).



**Pterinea laxata** Williams.

*Pterinea laxata* Williams, Proc. U. S. Nat. Mus., 42, 1912, p. 393, pl. 50, figs. 5 and 5a.

Silurian (Pembroke): Leighton Cove, Washington County, Maine.

*Cotypes*.—Cat. No. 58443, U.S.N.M.

**PTERINEA MODIOLARIS** Conrad. See *Modiolopsis modiolaris*.

**Pterinea mucronata** Ulrich.

*Pterinea mucronata* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 24, pl. 7, fig. 21.

Eden (Economy): Covington and Constance, Kentucky.

*Holotype*.—Cat. No. 46294, U.S.N.M.

**PTERINEA (AMBONYCHIA) NEGLECTA** McChesney. See *Amphicellia neglecta*.

**Pterinea nervata** Foerste.

*Pterinea nervata* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 67, pl. 4, fig. 60.

Niagaran (Waldron): Newsom, Tennessee.

**Pterinea newsomensis** Foerste.

*Pterinea newsomensis* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 66, pl. 4, figs. 59a, b.

Niagaran (Waldron): Newsom, Tennessee.

**Pterinea occidentalis** Whiteaves.

*Pterinea occidentalis* Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 287, pl. 28, figs. 1-3.

Niagaran: Ami Island, near northeast shore of Lake Winnipegosis, Manitoba.

**PTERINEA ORBICULARIS** Emmons. See *Ambonychia orbicularis*.

**PTERINEA PARVULA** Miller. See *Pakeopteria parvula*.

**PTERINEA PHOLADIS** Conrad. See *Cymatonota pholadis*.

**Pterinea prolifica** Billings.

*Pterinea prolifica* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 16.

Richmond (Charleton and English Head): Charleton Point, Anticosti.

*Plastotype*.—Cat. No. 46295, U.S.N.M.

**PTERINEA REVOLUTA** Winchell and Marcy. See *Rhombopteria (Newsomella) revoluta*.

**Pterinea rugatula** Miller and Faber.

*Pterinea rugatula* Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 17, 1894, p. 26, pl. 1, figs. 18, 19.

Maysville (Fairmount): Cincinnati, Ohio.

**Pterinea securiformis** (Hall).

*Avicula securiformis* Hall (not Hall, 1859), Pal. New York, 2, 1852, p. 331, pl. 75, fig. 4, 5a, b.

*Pterinea securiformis* Meek, Amer. Jour. Sci. Arts, 2d ser., 37, 1864, p. 216 (gen. ref.).—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 420, fig. 548.

Cayugan (Cobleskill and Rondout): Schoharie, etc., New York.

**Pterinea striacosta** (McChesney).

*Ambonychia striacosta* McChesney, Desc. New Fossils, 1861, p. 88.

*Pterinea (Ambonychia) striacosta* McChesney, Plates Illust. N. Sp. Fossils, 1865, pl. 9, fig. 4.

**Pterinea striæcosta**—Continued.

- Pterinea striæcosta* Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 96.—McChesney, Trans. Chicago Acad. Sci., 1, 1868, p. 41, pl. 9, fig. 4.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 420, fig. Niagaran (Racine): Bridgeport, etc., Illinois; Wisconsin.

**Pterinea striata** (Billings).

- Modiolopsis striata* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 48.  
Gamachian and Anticostian (Gun River, Jupiter River): Junction Cliff, etc., Anticosti.

*PTERINEA STRIATULA* Miller. See *Prolobella striatula*.

*PTERINEA SUBPLANA* Billings. See *Leiopteria subplana*.

*PTERINEA SUBPLANA* Clarke and Ruedemann. See *Pterinea bradti*.

**Pterinea subquadrata** James.

- Pterinea subquadrata* James, Paleontologist, No. 2, 1878, p. 13.  
Richmond: Clinton County, Ohio.

**Pterinea subrecta** (Hall).

- Avicula subrecta* Hall, Pal. New York, 2, 1852, p. 331, pl. 75, fig. 3.  
*Aviculopecten subrectus* Miller, N. A. Geol. Pal., 1889, p. 468 (gen. ref.).  
Cayugan (Cobleskill): Schoharie, New York.

**Pterinea subrugosa** (D'Orbigny).

- Avicula rugosa* Vanuxem (not Münster, 1840), Nat. Hist. New York, Geol., 3, 1842, p. 112, fig. 2.—Hall, *ibid.*, 4, 1843, p. 142, fig. 2; tab. ill. 26, fig. 2.—Mather, *ibid.*, 1, 1843, p. 349, text fig. 2.—Owen, Amer. Jour. Sci. Arts, 2d ser., 1, 1846, p. 47, fig. 2.—Hall, Pal. New York, 3, 1859, p. 291, footnote.—Emmons, Man. Geol., 1860, p. 113, fig. 102.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, p. 58, pl. 9, fig. 2.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 69, fig.  
*Avicula subrugosa* D'Orbigny, Prodr. de Pal., 1, 1849, p. 33.  
Waterlime: New York.

**Pterinea textilis** (Hall).

- Avicula textilis* Hall, Pal. New York, 3, 1859, p. 288, pl. 52, figs. 9, 10?; pl. 53, figs. 2, 3, 5, 7, 10.  
*Pterinea textilis* Billings, Pal. Foss., Geol. Surv. Canada, 2, pt. 1, 1874, pl. 4, fig. 1.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 811, fig.  
Helderbergian (New Scotland and Manlius transition): Albany, Schoharie, and Herkimer Counties, New York.

**Pterinea thebesensis** Meek and Worthen.

- Pterinea Thebesensis* Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 354, fig., pl. 6, fig. 3.—Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 93, pl. 5, fig. 28.  
Upper Medinan (Edgewood): Near Thebes, Illinois; Edgewood and Louisiana, Missouri.

**Pterinea thisbe** Billings.

- Pterinea Thisbe* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 52.  
Anticostian (Gun River, Jupiter River): Chaloupe River, Anticosti.

*PTERINEA TRENTONENSIS* Miller. See *Prolobella trentonensis*.

**Pterinea (?Tolmaia) trescottii** Williams.

*Pterinea* (?Tolmaia) trescottii Williams, Proc. U. S. Nat. Mus., 45, 1913, p. 334, pl. 29, figs. 14, 15.

Silurian (Edmunds): Crow Neck, northeast side of North Trescott, Eastport Quadrangle, Maine.

*Cotypes*.—Cat. No. 53955, U.S.N.M.

**Pterinea undata** (Hall).

*Avicula undata* Hall, Pal. New York, 2, 1852, p. 283, pl. 59, fig. 2; 20th Rep. New York State Cab. Nat. Hist., 1868, p. 389 (extras, 1865); rev. ed. (1870), p. 431.

*Pterinea undata* Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 50, pl. 5, fig. 6.

Niagaran: Rochester, New York (Rochester); Shelby, New York (Guelph).

PTERINEA UNDATA Emmons. See *Clionychia undata*.

**Pterinea varistriata** Billings.

*Pterinea varistriata* Billings, Cat. Sil. Fossils Anticosti, Geol. Surv. Canada, 1866, p. 50.

Richmond (Charleton) and Gamachian (Ellis Bay): Gamache Bay, etc., Anticosti.

**Pterinea volans** Winchell and Marcy.

*Pterinea volans* Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, pp. 95, 108.

Niagaran (Racine): Chicago, Illinois.

**PTERINOPECTEN** Hall.

Genotype: *P. undosus* Hall.

*Pterinopecten* Hall, Pal. New York, 5, pt. 1, Lam. (adv. copy), 1883, p. 3; *ibid.*, Lam. 1, 1884, p. 12; 35th Rep. New York State Mus. Nat. Hist., 1884, p. 406b; 1st Rep. State Geol. New York, 1884, p. 13.—Miller, N. A. Geol. Pal., 1889, p. 507.—Jackson, Mem. Boston Soc. Nat. Hist., 5, 1890, p. 346.—Koken, Die Leitfossilien, Leipzig, 1896, p. 518.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 243.—Hind, Mon. British Carb. Lam., 2, pt. 2, Pal. Soc., 1903, p. 51.

**Pterinopecten? obscurus** (Hall).

*Avicula obscura* Hall, Pal. New York, 3, 1859, p. 280, pl. 49, fig. 6.

*Pterinopecten? obscurus* Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 500 (gen. ref.).

Cayugan (Manlius): Schoharie County, New York.

**Pterinopecten? rhomboideus** (Hall).

*Posidonomya? rhomboidea* Hall, Pal. New York, 2, 1852, p. 284, pl. 59, fig. 5.

*Pterinopecten? rhomboideum* Whitfield and Hovey, Bull. Amer. Mus. Nat. Hist., 11, pt. 2, 1899, p. 162 (gen. ref.).

Clinton (Rochester): Lockport, New York.

PTEROLICHAS Gurich. See *Arctinurus Castelnau*.

**PTERONITELLA** Billings.

Genotype: *P. venusta* Billings.

*Pteronitella* Billings, Pal. Foss., Geol. Surv. Canada, 2, pt. 1, 1874, p. 141; Canadian Nat., n. s., 7, 1874, p. 302.—Barrande, *Accephales* (Extraits Syst. Sil. Centre Boheme, 6), 1881, p. 47.—Bigot, Bull. Soc. Geol. France, 3d ser., 17, 1889, p. 792.—Miller, N. A. Geol. Pal., 1889, p. 507.

**Pteronitella curta** Billings.

*Pteronitella curta* Billings, Pal. Foss., Geol. Surv. Canada, 2, pt. 1, 1874, p. 143, pl. 9, fig. 6.—Dawson, Canadian Nat., n. s., 9, 1880, p. 343.

Silurian (Stonehouse): Arisaig, Nova Scotia.

**Pteronitella oblonga** Billings.

*Pteronitella oblonga* Billings, Pal. Foss., Geol. Surv. Canada, 2, pt. 1, 1874, p. 143, pl. 9, fig. 7.

Silurian: Arisaig, Nova Scotia.

**Pteronitella venusta** Billings.

*Pteronitella venusta* Billings, Pal. Foss., Geol. Surv. Canada, 2, pt. 1, 1874, p. 142, pl. 9, figs. 5, 5a.

Silurian (Stonchouse): Arisaig, Nova Scotia.

✓ **PTERONITES?** *SUBPLANA* Weller. See *Leiopteria subplana*.

**PTEROTHECA** Salter.

Genotype: *P. transversa* Salter.

*Pterotheca* Salter, Rep. British Assoc. Adv. Sci., 1852, p. 61.—Miller, N. A. Geol. Pal., 1889, p. 392.—Koken, Die Leitfossilien, Leipzig, 1896, p. 98.

*Clioderma* Hall, 14th Rep. New York State Cab. Hist., 1861, p. 96.

**Pterotheca anatiniformis** (Hall).

*Tellinomya anatiniformis* Hall, Pal. New York, 1, 1847, p. 154, pl. 34, fig. 7.

*Clioderma anatiniformis* Hall, 14th Rep. New York State Cab. Nat. Hist., 1861, p. 98.

*Lyonsia anatiniformis* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 170.

*Pterotheca anatiniformis* Miller, N. A. Geol. Pal., 1889, p. 393 (gen. ref.).

Trenton: Watertown, New York.

**Pterotheca attenuata** (Hall).

*Clioderma attenuata* Hall, 14th Rep. New York State Cab. Nat. Hist., 1861, p. 98.

*Pterotheca attenuata* Hall, Rep. Geol. Surv. Wisconsin, 1, 1862, p. 40, fig. 2.—

Chamberlin, Geol. Wisconsin, 1, 1883, p. 158, fig.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 312, pl. 11, fig. 3.

Black River: Wisconsin (Platteville); La Cloche Peninsula, Ontario (Lowville).

**Pterotheca canaliculata** (Hall).

*Clioderma canaliculata* Hall, 14th Rep. New York State Cab. Nat. Hist., 1861, p. 97.

*Pterotheca canaliculata* Miller, N. A. Geol. Pal., 1889, p. 392 (gen. ref.).

Trenton: Middleville, New York.

**Pterotheca expansa** (Emmons).

*Delthyris expansus* Emmons, Geol. New York, 2, 1842, p. 397, fig. 2, figs. 109-112.—Owen, Amer. Jour. Sci. Arts, 47, 1844, p. 368, fig. 2; Geol. Expl. Iowa, Wisconsin, Illinois, 2d ed., 1844, p. 84, pl. 17, fig. 14.

*Clioderma expansa* Hall, 14th Rep. New York State Cab. Nat. Hist., 1861, p. 98.

*Pterotheca expansa* Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 821, fig.—Raymond, Bull. Amer. Pal., 3, 1902, p. 306, pl. 19, fig. 12.—Weller, Geol. Surv. Pal. New Jersey, 3, 1903, p. 179, pl. 12, fig. 35.—Branson, Trans. Acad. Sci. St. Louis, 18, 1909, p. 45, pl. 7, fig. 14.

Black River: Watertown, New Poland, etc., New York; Dixon, Illinois; Lincoln County, Missouri.

?Trenton: Jacksonburg, New Jersey.

**Pterotheca pentagona** Foerste.

*Pterotheca pentagona* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 313, pl. 2, figs. 1, 2.

Cincinnati (Pulaski): Near Chambly, etc., Quebec.

**Pterotheca saffordii** (Hall).

*Clioderma saffordii* Hall, 14th Rep. New York State Cab. Nat. Hist., 1861, p. 96, pl. 6, figs. 15-17.

**Pterotheca saffordi**—Continued.

*Pterotheca* (*Clioderma*) *saffordi* Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 821, figs.

Stones River (Lebanon): Lebanon, Tennessee.

**Pterotheca transversa** (?Salter) Billings.

*Pterotheca transversa* Salter, Rep. 22d Meeting British Assoc. Adv. Sci., Notes, Abstracts, 1853, p. 61.—Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, pp. 22, 57 (loc. ref.).

Richmond (English Head, Charleton): Gamache Bay, Anticosti.

**Pterotheca undulata** (Hall).

*Clioderma undulata* Hall, 14th Rep. New York State Cab. Nat. Hist., 1861, p. 97.

*Pterotheca undulata* Miller, N. A. Geol. Pal., 1889, p. 392 (gen. ref.).

Trenton: Watertown, New York.

**PTERYGOMETOPUS** Schmidt.

Genotype: *Calymene sclerops* Dalman.

*Pterygometopus* Schmidt, Mem. P'Acad. Imp. Sci. St. Petersburg, 7th ser., 30, 1881, pp. 62, 67, 76.—Zittel, Handb. Pal., 2, 1885, p. 615.—Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 732.—Koken, Die Leitfossilien, Leipzig, 1896, p. 32, fig. 21, fig. 3.—Beecher, Zittel-Eastman Textb. Pal., 1, 1900, p. 636.—Reed, Geol. Mag., dec. 5, 2, 1905, pp. 226, 228.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 323.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 727.—Slocum, Field Mus. Nat. Hist., Geol. Ser., 4, 1913, p. 79.

**Pterygometopus achates** (Billings).

*Dalmanites Achates* Billings, Canadian Nat. Geol., 5, 1860, p. 63, fig. 9; Geol. Canada, Geol. Surv. Canada, 1863, p. 187, fig. 186.—Miller, N. A. Geol. Pal., 1889, p. 542, fig. 995.—Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 726, fig. 44.—Ruedemann, Bull. New York State Mus., 49, 1902, p. 68.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 325, fig. 1640.—Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 147, pl. 1, fig. 18.

Trenton: Ottawa, Ontario; New York; Kentucky; Minnesota.

**Pterygometopus annulatus** Raymond.

*Pterygometopus annulatus* Raymond, Annals Carnegie Mus., 3, 1905, p. 376, pl. 14, figs. 24, 25; 7th Rep. Vermont State Geol., 1910, p. 247, pl. 36, figs. 24, 25.

Chazyan (Day Point, Crown Point): Valcour Island, New York.

**Pterygometopus callicephalus** (Hall).

*Phacops callicephalus* Hall, Pal. New York, 1, 1847, p. 247; pl. 65, figs. 3a-i; Geol. Lake Sup. Land Dist., Foster and Whitney's Rep., 1851, p. 212, pl. 27, figs. 3a, b.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 214, pl. 15, figs. 3c-e, 7a-c.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 187, fig. 184.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 629, fig.

*Dalmania callicephalala* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 73 (gen. ref.).—Chamberlin, Geol. Wisconsin, 1, 1883, p. 160, fig.

*Dalmanites callicephalus* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 27 (loc. ref.).—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 187, figs.—Miller, N. A. Geol. Pal., 1889, p. 542, fig. 996.—Cumings, 32d Ann. Rep. Dep. Geol. and Nat. Res. Indiana, 1908, pl. 54, figs. 12-12d.

*Pterygometopus callicephalus* Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 731, figs. 51, 52; p. 732.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 235.—Ruedemann, Bull. New York State Mus., 49, 1902, p. 70.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 206, pl. 15, figs. 29-32.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 324, fig. 1639c, d.

Trenton: Middleville, Watertown, etc., New York; Ontario; Manitoba; Kentucky; New Jersey; Minnesota; etc.

***Pterygometopus carleyi* (Meek).**

*Dalmanites Carleyi* Meek, Amer. Jour. Sci., 3d ser., 3, 1872, p. 424; Geol. Surv. Ohio, Pal., 1, 1873, p. 170, pl. 14, figs. 2a-d.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 142.

Maysville (Fairmount): Cincinnati, Ohio, and vicinity.

***Pterygometopus carleyi rogersensis* (Foerste).**

*Dalmanites carleyi-rogersensis* Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 85.

Trenton (Cynthiana): Bridge 54, west of Million Tunnel, Madison County, Kentucky.

***Pterygometopus eboraceus* Clarke.**

*Pterygometopus eboraceus* Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 728, figs. 48, 49.—Ruedemann, Bull. New York State Mus., 49, 1902, p. 69, pl. 4, fig. 15.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 324, fig. 1639e.

*Dalmanites eboraceus* Miller, N. A. Geol. Pal., 2d App., 1897, p. 787 (gen. ref.).  
Trenton: Rawlins Mills, New York.

***Pterygometopus fredricki* Slocum.**

*Pterygometopus fredricki* Slocum, Field Mus. Nat. Hist., Geol. Ser., 4, 1913, p. 79, pl. 18, figs. 1-5.

Richmond (Maquoketa): Bloomfield, Iowa; Clermont and Postville Junction, Iowa.

***Pterygometopus goodridgii* (Schuchert).**

*Dalmanites (Pterygometopus) goodridgii* Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 174, pl. 12, figs. 5, 6.

Mohawkian: Head of Frobisher Bay, Baffin Land.

*Cotypes*.—Cat. No. 28170, U.S.N.M.

***Pterygometopus intermedius* (Walcott).**

*Dalmanites intermedius* Walcott, 31st Rep. New York State Mus. Nat. Hist., 1880 (adv. sheets, 1877), p. 69.

*Pterygometopus intermedius* Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 727, figs. 45-47; p. 732.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 208, pl. 15, fig. 33.—Branson, Trans. Acad. Sci. St. Louis, 18, 1909, p. 47, pl. 7, fig. 20.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 324, fig. 1639a, b.

Black River: Dunleith, Illinois; Clifton and Platteville, Wisconsin (Platteville); Lincoln County, Missouri (Auburn); Minnesota; New Jersey.

*Plesiotype*.—Cat. No. 41955, U.S.N.M.

***Pterygometopus larrabeei* Slocum.**

*Pterygometopus larrabeei* Slocum, Field Mus. Nat. Hist., Geol. Ser., 4, 1913, p. 81, pl. 18, figs. 6-8.

Richmond (Maquoketa): Clermont, Elgin, and Bloomfield, Iowa.

***Pterygometopus lincolnensis* Branson.**

*Pterygometopus lincolnensis* Branson, Trans. Acad. Sci. St. Louis, 18, 1909, p. 46, pl. 7, figs. 17-19.

Black River (Auburn—Decorah): Lincoln County, Missouri.

***Pterygometopus meta* (Hall).**

*Dalmania meta* Hall, Rep. Geol. Surv. Wisconsin, 1862, p. 433.

Trenton (?Black River): Wisconsin.

**Pterygometopus microps** (Green).

*Calymene microps* Green, Mon. Trilobites North Amer., Philadelphia, 1832, p. 34.  
Maysville(?): Near Ripley, Ohio.

**Pterygometopus saltaensis** Kayser.

*Pterygometopus saltaensis* Kayser, Zeits. d. d. Geol. Gesell., 50, 1898, p. 428,  
pl. 16, fig. 4.  
Middle Ordovician: Salte, Argentina.

**Pterygometopus schmidti** Clarke.

*Pterygometopus schmidti* Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 729, fig. 50;  
p. 732.  
Dalmanites schmidti Miller, N. A. Geol. Pal., 2d App., 1897, p. 787 (gen. ref.).  
Black River (Platteville) and Trenton (Prosser): Minneapolis, Kenyon, and Canon Falls, Minnesota.

**Pterygometopus troosti** (Safford).

Dalmanites troosti Safford, Geol. Tennessee, 1869, p. 290 (nom. nud.).—Clarke,  
Geol. Minnesota, 3, pt. 2, 1894, p. 732, footnote.  
Chasmops Troosti Safford and Vogdes, Proc. Acad. Nat. Sci. Philadelphia, 1889,  
p. 167, fig.  
Stones River: Murfreesboro, Tennessee.

**PTERYGOTUS** Agassiz.

Genotype: *P. problematicus* Agassiz.

*Pterygotus* Pictet, Traite de Pal., 2d ed., 2, 1854, p. 538.—Page, Rep. 25th Meeting  
British Assoc. Adv. Sci., Notes, Abstracts, 1856, p. 89.—Hall, Pal. New York,  
3, 1859, pp. 416, 424, fig.—Woodward, Mon. British Foss. Crust., Palaeontological  
Soc., 1866, p. 33; Quart. Jour. Geol. Soc. London, 24, 1868, p. 294.—  
Barrande, Syst. Sil. du Centre Boheme, 1, Suppl., 1872, p. 556.—Alth,  
Abhandl. der K.-K. Geol. Reichsanstalt, 7, Heft 1, 1874, p. 53.—Schmidt,  
Mem. Acad. Imp. Sci. St. Petersburg, 7th ser., 31, No. 5, 1883, p. 64.—Zittel,  
Handb. Pal., 2, 1885, p. 652.—Miller, N. A. Geol. Pal., 1889, p. 564.—Vogdes,  
Annals New York Acad. Sci., 5, 1889, p. 31, 32, fig.—Laurie, Nat. Sci., 3,  
1893, p. 124; Trans. Royal Soc. Edinburgh, 37, 1893, p. 515; Nat. Sci., 2,  
1893, p. 124.—Grabau, Bull. New York State Mus., 45, 1901, p. 231.—Clarke,  
54th Rep. New York State Mus., 1901, p. 83.—Grabau, Bull. Buffalo Soc.  
Nat. Sci., 7, 1901, p. 231.—Grabau and Shimer, N. A. Index Fossils, 2, 1910,  
p. 411.—Clarke and Ruedemann, Mem. New York State Mus., 14, 1912,  
p. 348.—Clarke, Zittel-Eastman Textb. Pal., 1900, p. 677; 2d ed., 1913,  
p. 784.

**PTERYGOTUS ACUTICAUDATUS** Pohlman. See *Pterygotus buffaloensis*.

**PTERYGOTUS BILOBUS** Pohlman. See *Pterygotus buffaloensis*.

**Pterygotus buffaloensis** Pohlman.

*Pterygotus Buffaloensis* Pohlman, Bull. Buffalo Soc. Nat. Sci., 4, 1881, p. 17,  
figs. 1-3; *ibid.*, 5, p. 24, 1886, pl. 3, fig. 1.—Laurie, Trans. Royal Soc. Edinburgh,  
37, pt. 2, 1893, pp. 515, 517.—Semper, Beitr. Pal. Geol. Oester.-Ung.,  
11, 1898, p. 74.—Clarke, Zittel-Eastman Textb. Pal., 1, pt. 2, 1900, p. 678,  
fig. 1425.—Seeman, Beitr. Pal. Geol. Oester.-Ung., Orients, 19, 1906, p. 51.—  
Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 358, pl. 57,  
fig. 3; pls. 67, 68, 72-80, figs. 72-78.  
*Pterygotus cummingsi* Grote and Pitt, Bull. Buffalo Soc. Nat. Sci., 3, 1875, p. 18,  
fig. 1.

**Pterygotus buffaloensis**—Continued.

- Pterygotus* sp. (cummingsi?) Pohlman, *ibid.*, 4, 1881, p. 18, fig. 4.  
*Pterygotus acuticaudatus* Pohlman, *ibid.*, 4, 1881, p. 42, pl. 2, fig. 3.  
*Pterygotus quadraticaundatus* Pohlman, *ibid.*, 4, 1881, p. 43, pl. 3, fig. 1.  
*Pterygotus?* sp. Pohlman, *ibid.*, 4, 1881, p. 44, pl. 3, fig. 2.  
*Pterygotus macrophthalmus?* Pohlman, *ibid.*, 4, 1881, p. 44.  
*Pterygotus bilobus* Pohlman, *ibid.*, 5, 1886, p. 27.  
 Cayugan (Bertie): Near Buffalo, New York.  
*Plciotype*.—Cat. No. 60053, U.S.N.M.

**Pterygotus canadensis** Dawson.

- Pterygotus Canadensis* Dawson, *Canadian Nat.*, n. s., 9, 1879, p. 103, figs. 1, 2.  
 Niagara dolomite: Hamilton, Ontario.

**Pterygotus cobbi** Hall.

- Pterygotus cobbi* Hall, *Pal. New York*, 3, 1859, p. 417, pl. 83B, fig. 4; pl. 84, fig. 8.—Grote and Pitt, *Proc. Amer. Assoc. Adv. Sci.*, 26, 1878, p. 300, 301, fig. 1.—Grabau, *Bull. New York State Mus.*, 45, 1901, p. 231; *Bull. Buffalo Soc. Nat. Sci.*, 7, 1901, p. 231.—Semper, *Beitr. Pal. Geol. Oestr.-Ung.*, *Orients*, 11, 1898, p. 80.—Clarke and Ruedemann, *Mem. New York State Mus.*, 14, 1912, p. 371, pl. 77, fig. 6.  
*Pterygotus cummingsi* Grote and Pitt, *Proc. Amer. Assoc. Adv. Sci.*, 26, 1877, p. 300, 301, fig.  
 Cayugan (Bertie): Near Buffalo, New York.

**Pterygotus cobbi juvenis** Clarke and Ruedemann.

- Pterygotus cobbi* var. *juvenis* Clarke and Ruedemann, *Mem. New York State Mus.*, 14, 1912, p. 429, figs. 119–121.  
 Cayugan (Bertie): Litchfield, Herkimer County, New York.

PTERYGOTUS CUMMINGSI Grote and Pitt. See *Pterygotus buffaloensis* and *P. cobbi*.

PTERYGOTUS GLOBICAUDATUS Pohlman. See *Eurypterus pustulosus*.

**Pterygotus (Erettopterus) globiceps** Clarke and Ruedemann.

- Eurypterus maria* (in part) Clarke, *Bull. New York State Mus.*, 107, 1907, pl. 2, fig. 3.  
*Pterygotus (Erettopterus) globiceps* Clarke and Ruedemann, *Mem. New York State Mus.*, 14, 1912, p. 374, pl. 82, figs. 1–12.  
 Medinan (Shawangunk): Otisville, New York, and probably Delaware Water Gap, Pennsylvania.

**Pterygotus (Erettopterus) grandis** (Pohlman).

- Ceratiocaris grandis* Pohlman, *Bull. Buffalo Soc. Nat. Sci.*, 4, 1881, p. 19, fig. 5.—Jones, *Rep. 59th Meeting Brit. Assoc. Adv. Sci.*, 1890, p. 65.  
*Pterygotus (Erettopterus) grandis* Clarke and Ruedemann, *Mem. New York State Mus.*, 14, 1912, p. 379, pl. 81, fig. 80.  
 Cayugan (Bertie): Buffalo, New York.

PTERYGOTUS MACROPHthalmus? Pohlman. See *Pterygotus buffaloensis*.

**Pterygotus macrophthalmus** Hall.

- Pterygotus macrophthalmus* Hall, *Pal. New York*, 3, 1859, p. 418, pl. 80A, figs. 6, 8, 8a.—Grabau, *Bull. Buffalo Soc. Nat. Sci.*, 7, 1901, p. 231; *Bull. New York State Mus.*, 45, 1901, p. 231.—Grabau and Shimer, *N. A. Index Fossils*, 2, 1910, p. 411.—Clarke and Ruedemann, *Mem. New York State Mus.*, 14, 1912, p. 350; pl. 69, figs. 2–7; pl. 70, figs. 1, 2; pl. 71.



**Pterygotus macrophthalmus**—Continued.

*Pterygotus osborni* Hall, Pal. New York, 3, 1859, p. 419, pl. 80A, fig. 9.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 822, fig.  
Cayugan (Bertie): Litchfield, Waterville, and near Buffalo, New York.

**Pterygotus monroensis** Sarle.

*Pterygotus monroensis* Sarle, Bull. New York State Mus., 69, 1903, p. 1102, pl. 24, figs. 7, 9.—Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 380, pl. 70, figs. 3-5.

?*Pterygotus* sp. Sarle, Bull. New York State Mus., 69, 1903, p. 1104, pl. 24, figs. 6, 8.  
Cayugan (Pittsford): Pittsford, Monroe County, New York.

**Pterygotus (Eusarcus?) nasutus** Clarke and Ruedemann.

*Pterygotus (Eusarcus?) nasutus* Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, pp. 382, 416; pl. 86, figs. 6-10, figs. 102, 103.

Trenton (Schenectady): Schenectady, Aqueduct, and Duanesburg, New York.  
Chazyan (Normanskill): Catskill, New York.

**Pterygotus normanskillensis** Clarke and Ruedemann.

*Pterygotus normanskillensis* Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 416, fig. 104.

Chazyan (Normanskill): Catskill, New York.

PTERYGOTUS OSBORNII Hall. See *Pterygotus macrophthalmus*.

PTERYGOTUS OTISIUS Clarke. See *Dolichopterus otisius*.

**Pterygotus prolificus** Clarke and Ruedemann.

*Pterygotus prolificus* Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 382, pl. 86, figs. 1-5.

Trenton (Schenectady): Schenectady, Aqueduct, Duanesburg, etc., New York.

PTERYGOTUS QUADRICAUDATUS Pohlman. See *Pterygotus buffaloensis*.

**PTILODICTYA** Lonsdale.

Genotype: *Flustra lanceolata* Lonsdale.

*Ptilodictya* Lonsdale, Murchison's Sil. Syst., 1839, p. 676.—Portlock, Rep. Geol.

Londonderry, 1843, p. 338.—McCoy, British Pal. Foss., 1852, p. 45.—Emmons,

Amer. Geology, 1, pt. 2, 1855, p. 205.—Pictet, *Traité de Pal.*, 2d ed., 4, 1857,

p. 169.—Eichwald, *Lethæa Rossica*, 1, 1860, p. 387.—Nicholson, *Geol. Mag.*,

n. s., 1, 1874, p. 123; *Pal. Province Ontario*, 1874, p. 97.—Zittel, *Handb.*

*Pal.*, 1, 1880, p. 604.—Vine, *Geol. Mag.*, dec. 2, 8, 1881, p. 474; *Rep. British*

*Assoc. Adv. Sci.*, 1881, p. 164; *Quart. Jour. Geol. Soc. London*, 38, 1882,

p. 63.—Ulrich, *Jour. Cincinnati Soc. Nat. Hist.*, 5, 1882, pp. 151, 162.—Vine,

*Rep. British Assoc. Adv. Sci.*, 1883, p. 203.—Foerste, *Bull. Sci. Lab. Denison*

*Univ.*, 2, 1887, p. 155.—Hall and Simpson, *Pal. New York*, 6, 1887, p. 19.—

Miller, *N. A. Geol. Pal.*, 1889, p. 318.—Nettelroth, *Kentucky Fossil Shells*,

1889, p. 30.—Ulrich, *Geol. Surv. Illinois*, 8, 1890, p. 390; *Geol. Minnesota*, 3,

1893, p. 163.—Pocta, *Syst. Sil. Centre Boheme*, 8, pt. 1, 1894, p. 21.—Ulrich,

*Zittel's Textb. Pal. (Engl. ed.)*, 1896, p. 279.—Simpson, 14th Ann. Rep. Stato

*Geol. New York for 1894, 1897*, p. 541.—Grabau, *Bull. Buffalo Soc. Nat. Sci.*,

6, 1899, p. 176.—Nickles and Bassler, *Bull. U. S. Geol. Surv.*, 173, 1900,

p. 45.—Hennig, *Archiv. für Zool.*, K. Sven. Vet. Akad. Stockholm, 2, No. 10,

1905, p. 16.—Grabau and Shimer, *N. A. Index Fossils*, 1, 1907, p. 155.—

Cummings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 754.—Bassler,

*Bull. U. S. Nat. Mus.*, 77, 1911, p. 113; *Zittel-Eastman Textb. Pal.*, 1913,

p. 344.

**PTILODICTYA**—Continued.

*Escharopora* (not Hall, 1847), Hall, 26th Ann. Rep. New York State Mus., 1874, p. 99; 32d Ann. Rep. New York State Mus., 1879, p. 161.

*Heterodictya* Nicholson, Geol. Mag., n. s., 2, 1875, p. 33; Pal. Province Ontario, 1875, p. 79.—Zittel, Handb. Pal., 1, 1880, p. 604.—Vine, Rep. 51st Meeting British Assoc. Adv. Sci., 1882, p. 166.—Miller, N. A. Geol. Pal., 1889, p. 309.

**PTILODICTYA** (part) of authors. See *Escharopora* Hall and *Ptilotrypa* Ulrich.

**PTILODICTYA ACUMINATA** James. See *Escharopora acuminata*.

**PTILODICTYA ACUTA** Nicholson. See *Pachydictya acuta*.

**PTILODICTYA ALCYONE** Billings. See *Pachydictya crassa*.

***Ptilodictya angusta*** (Hall).

*Escharopora* (*Ptilodictya*) *angusta* Hall, Trans. Albany Inst., 10, 1883, p. 62 (abstract, 1879, p. 6); 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 245.

*Ptilodictya angusta* Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 377. Niagaran (Waldron): Waldron, Indiana.

**PTILODICTYA ANTIQUA** James. See *Eurydictya multipora*.

**PTILODICTYA?** *ARCTIPORA* Nicholson. See *Bythopora arctipora*.

**PTILODICTYA ARGUTA** Billings. See *Pachydictya crassa*.

**PTILODICTYA BIPUNCTATA** Lesley. See *Phænopora expansa*.

**PTILODICTYA BRIAREUS** Ulrich. See *Escharopora briareus*.

***Ptilodictya canadensis*** Billings.

*Ptilodictya canadensis* Billings, Cat. Sil. Foss. Anticosti, 1866, p. 9. Richmond (Charleton): Charleton Point, Anticosti.

**PTILODICTYA?** *CININNATIENSIS* James. See *Arthropora cincinnatiensis*.

**PTILODICTYA CLEAVELANDI** James. See *Arthropora cleavelandi*.

**PTILODICTYA CLINTONENSIS** James. See *Ptilodictya nodosa*.

**PTILODICTYA CRASSA** Nicholson and Hinde. See *Pachydictya crassa*.

**PTILODICTYA CRUCIFORMIS** D'Orbigny. See *Escharopora falciformis*.

**PTILODICTYA DUBIA** James. See *Arthropora cleavelandi*.

**PTILODICTYA ELEGANTULA** Emmons. See *Stictopora elegantula*.

**PTILODICTYA EMACERATA** Nicholson. See *Dicranopora emacerata*.

**PTILODICTYA ENSIFORMIS** Ulrich. See *Phænopora ensiformis*.

**PTILODICTYA EXCELLENS** Billings. See *Phænopora excellens*.

***Ptilodictya expansa*** Hall.

*Ptilodictya expansa* Hall (part), 12th Ann. Rep. Indiana Geol. Nat. Hist., 1883, pl. 12, figs. 2, 3 (but not description on p. 266=*Phænopora expansa* Hall and Whitfield).—Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 155; *ibid.*, 3, 1888, pl. 15, fig. 5; Proc. Boston Soc. Nat. Hist., 24, 1889, p. 327.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 826, figs.—Ulrich, Geol. Surv. Illinois, 8, 1890, fig. 11e (p. 391).—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 378.

**Ptilodictya expansa**—Continued.

*Ptilodictya lanceolata* var. *americana* Foerste, Geol. Surv. Ohio, 7, 1895, p. 598, pl. 36, figs. 3a–b.

Upper Medinan (Brassfield): Dayton and Todds Fork, Ohio: Cumberland Gap, Tennessee.

*Plesiotype*.—Cat. No. 43419, U.S.N.M. (Ulrich).

**PTILODICTYA EXPANSA** Hall (1883 part). See *Phænopora expansa*.

**Ptilodictya expansa emareescens** Foerste.

*Ptilodictya expansa* var. *emareescens* Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 328, pl. 6, fig. 30.

*Pachydictya emareescens* Foerste, Geol. Surv. Ohio, 7, 1895, p. 599, pl. 31, fig. 30. Upper Medinan (Brassfield): Eaton, Ohio.

Observation.—Probably based on young examples of *Ptilodictya expansa* Hall.

*Ptilodictya explicans* Safford.

Not recognized.

*Ptilodictya explicans* Safford, Geol. Tennessee, 1869, p. 286 (nom. nud).

Stones River: Central Tennessee.

**PTILODICTYA FALCIFORMIS** Nicholson. See *Escharopora falciformis*.

**PTILODICTYA FAMELICUS** Foerste. See *Pachydictya? famelica*.

**PTILODICTYA FARCTUS** Foerste. See *Pachydictya crassa*.

**PTILODICTYA FENESTELLIFORMIS** Nicholson. See *Pachydictya fenestelliformis*.

**PTILODICTYA FIMBRIATA** James. See *Phænopora fimbriata*.

**Ptilodictya flagellum** Nicholson.

*Ptilodictya flagellum* Nicholson, Ann. Mag. Nat. Hist., 4th ser., 15, 1875, p. 179, pl. 14, figs. 3–3b; Pal. Ohio, 2, 1875, p. 262, pl. 25, figs. 4–4b.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 827, figs.

Richmond: Near Lebanon, Ohio (Liberty); Island of Anticosti (Charleton).

**PTILODICTYA FLEXUOSA** James. See *Stictoporella flexuosa*.

**PTILODICTYA FRAGILIS** Billings. See *Dicranopora fragilis*.

**Ptilodictya frondosa** Weller.

*Ptilodictya frondosa* Weller, Geol. Surv. New Jersey Pal., 3, 1903, p. 224, pl. 19, figs. 1–4.

Helderbergian (Decker Ferry): Two miles south of Tristates, New York.

**Ptilodictya gladiola** Billings.

*Ptilodictya gladiola* Billings, Cat. Sil. Foss. Anticosti, 1886, p. 10.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 114, 115, fig. 43.

*Ptilodictya lanceolata* Eichwald (not Goldfuss), Lethæa Ross., 1, 1860, p. 388.

Gamachian and Anticostian: West End Lighthouse, etc., Anticosti.

Silurian (Borkholm): Borkholm and Lyckholm, Esthonia, Russia.

*Plesiotype*.—Cat. No. 57210, U.S.N.M.

**PTILODICTYA GRAHAMI** James. See *Arthropora cleavelandi*.

**PTILODICTYA GRANULOSA** James. See *Rhinidictya parallela*.

**PTILODICTYA HILLI** James. See *Escharopora hilli*.

**PTILODICTYA INTERNODIA** Miller and Dyer. See *Dicranopora internodia*.

*PTILODICTYA KENTUCKIENSIS* James. See *Arthropora kentuckiensis*.

*PTILODICTYA LABYRINTHICA* Emmons. See *Stictopora? labyrinthica*.

*PTILODICTYA LANCEOLATA* Eichwald. See *Ptilodictya gladiola*.

*PTILODICTYA LANCEOLATA* var. *AMERICANA* Foerste. See *Ptilodictya expansa*.

*PTILODICTYA LIBANA* Safford. See *Escharopora libana*.

*PTILODICTYA MACULATA* Ulrich. See *Escharopora maculata*.

***Ptilodictya magnifica* Miller.**

*Ptilodictya magnifica* Miller, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 100, pl. 3, figs. 1, 1a; N. A. Geol. Pal., 1889, fig. 503 (p. 318).—Ulrich, Geol. Surv. Illinois, 8, 1890, fig. 11a-c (p. 391).

*Stenopora mammulata* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 7 (loc. ref.).

Richmond: Richmond, Indiana; Oxford, Ohio, etc. (Whitewater); Wilmington, Illinois; Maury County, etc., Tennessee (Fernvale); Island of Anticosti (English Head and Charleton).

*Plesiotype*.—Cat. No. 43420, U.S.N.M.

*Ptilodictya multiramis* Safford.

Not recognized.

*Ptilodictya multiramis* Safford, Geol. Tennessee, 1869, p. 286.

Stones River (Lebanon): Central Tennessee.

Observation.—See note on *Escharopora briareus* Ulrich.

*PTILODICTYA NITIDULA* Billings. See *Dicranopora nitidula*.

***Ptilodictya nodosa* James.**

*Ptilodictya nodosa* James, Paleontologist, No. 3, 1879, p. 20.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 4, 1882, pl. 7, figs. 2, 2a.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 380.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 50.

*Ptilodictya clintonensis* James, Paleontologist, No. 5, 1881, p. 38.

*Ptilodictya teres* James, Paleontologist, No. 5, 1881, p. 40.

*Ptilodictya variabilis* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 304, fig. 2a, fig. 6a (p. 317).—Miller, N. A. Geol. Pal., 1889, figs. 505, 506 (p. 319).

Richmond (Liberty and Whitewater): Clinton and Warren Counties, Ohio; Indiana.

*Plesiotype*.—Cat. No. 43418, U.S.N.M.

***Ptilodictya obliqua* (Ringueberg).**

*Stictopora obliqua* Ringueberg, Proc. Acad. Nat. Sci. Philadelphia, 1884, p. 146, pl. 2, figs. 2, 2a.

*Ptilodictya obliqua* Miller, N. A. Geol. Pal., 1889, p. 319.

Clinton: Lockport, New York.

Observation.—Defined and figured in such a manner that it is questionable whether it can be recognized.

*PTILODICTYA PAVONIA* D'Orbigny. See *Escharopora pavonia*.

*PTILODICTYA PAVONIA* Boule and Thevenin. See *Peronopora decipiens*.

*PTILODICTYA PERELEGANS* Ulrich. See *Graptodictya perelegans*.

**Ptilodictya plumaria** James.

*Ptilodictya plumaria* James, Paleontologist, No. 1, 1878, p. 4.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, pl. 7, figs. 1, 1a.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 51.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 874, pl. 24, fig. 1; pl. 32, fig. 6.  
Richmond (Whitewater): Waynesville and Oxford, Ohio.

**PTILODICTYA PONDEROSA** Ulrich. See *Escharopora ponderosa*.

**PTILODICTYA? PUNCTATA** Nicholson and Hinde. See *Phænopora punctata*.

**PTILODICTYA RAMOSA** Emmons. See *Stictopora? ramosa*.

**PTILODICTYA RAMOSA** Ulrich. See *Escharopora ramosa*.

**PTILODICTYA RARIPORA** Nicholson. See *Nematopora raripora*.

**PTILODICTYA RECTA** Emmons. See *Escharopora recta*.

**PTILODICTYA RUDIS** Foerste. See *Pachydictya crassa*.

**PTILODICTYA RUSTICA** Billings. See *Pachydictya crassa*.

**PTILODICTYA SHAFFERI** Nicholson. See *Arthropora shafferi*.

**PTILODICTYA SUBRECTA** Ulrich. See *Escharopora subrecta*.

**Ptilodictya sulcata** Billings.

*Ptilodictya sulcata* Billings, Cat. Sil. Foss. Anticosti, 1866, p. 35.  
Anticostian (Jupiter River): The Jumpers, etc., Anticosti.

**PTILODICTYA SUPERBA** Billings. See *Phænopora superba*.

*Ptilodictya symmetra* Safford.

Not recognized.

*Ptilodictya symmetra* Safford, Geol. Tennessee, 1869, p. 286 (nom. nud.).  
Stones River: Central Tennessee.

**Ptilodictya tenella** Ulrich and Bassler.

*Ptilodictya tenella* Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 288, pl. 42, fig. 10; pl. 48, figs. 7, 8.  
Helderbergian (Keyser): Cumberland, Maryland.  
*Cotypes*.—Cat. No. 60744, U.S.N.M.

**PTILODICTYA TENERA** Billings. See *Pachydictya crassa*.

**PTILODICTYA TERES** James. See *Ptilodictya nodosa*.

**PTILODICTYA VARIABILIS** Ulrich. See *Ptilodictya nodosa*.

**PTILODICTYA WELSHI** James. See *Phænopora multifida*.

**Ptilodictya whiteavesi** Ulrich.

*Ptilodictya Whiteavesii* Ulrich, Contr. Micro-Pal. Cambro-Sil., pt. 2, 1889, p. 44, pl. 8, figs. 1-1e.—Whiteaves, Pal. Foss., 3, 1895, p. 118.  
Richmond: Stony Mountain, Manitoba (Stony Mountain); Island of Anticosti (Charleton).  
Figured sections of *cotypes*.—Cat. No. 43476, U.S.N.M.

**Ptilodictya whitfieldi** Foerste.

*Ptilodictya Whitfieldi* Foerste, Geol. Surv. Ohio, 7, 1895, p. 598, pl. 36, fig. 4; pl. 28, fig. 5.  
Upper Medinan (Brassfield): Todds Fork, Clinton County, Ohio.

*Ptilograpsus* Nicholson. See *Ptilograptus* Hall.

**PTILOGRAPTUS** Hall.

Genotype: *P. plumosus* Hall.

*Ptilograptus* Hall, Geol. Surv. Canada, Can. Org. Rem., dec. 2, 1865, p. 139; 20th Rep. New York State Cab. Hist., 1868, p. 218; rev. ed., p. 252.—Zittel, Handb. Pal., 1, 1879, p. 289.—Spencer, Bull. Mus. Univ. State Missouri, 1, 1884, p. 41; Trans. Acad. Sci. St. Louis, 4, 1884, pp. 563, 591.—Miller, N. A. Geol. Pal., 1889, p. 201.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 201.—Wiman, Nat. Sci., 9, 1896, p. 246.—Roemer and Frech, Leth. geog., 1 Theil, Leth. Pal., 1, 3 Lief., 1897, p. 579.—Ruedemann, Mem. New York State Mus., 7, pt. 1, pp. 587, 588.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 27.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 147, 148, 175, 176; Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 128.

*Ptilograpsus* Nicholson, Ann. Mag. Nat. Hist., 4th ser., 1, 1868, p. 239; Mon. British Grapt., 1872, p. 126.

***Ptilograptus foliaceus*** Spencer.

*Ptylograpsus foliaceus* Spencer, Canadian Nat., n. s., 7, 1878, pp. 458, 462.

*Ptilograptus foliaceus* Spencer, Bull. Mus. Univ. State Missouri, 1, 1884, pp. 15, 41, pl. 6, figs. 7, 7a; Trans. Acad. Sci. St. Louis, 4, 1884, p. 591, pl. 6, fig. 7.—Miller, N. A. Geol. Pal., p. 201, fig. 210.—Gurley, Jour. Geol., 4, 1896, pp. 100, 309.—Bassler, Bull. U. S. Nat. Mus., 65, 1909, pp. 16, 17, fig. 18.

Niagaran dolomite: Hamilton, Ontario.

***Ptilograptus geinitzianus*** Hall.

*Ptilograptus geinitzianus* Hall, Geol. Surv. Canada, Can. Org. Rem., dec. 2, 1865, p. 140, pl. 21, figs. 5-8; 20th Rep. New York State Cab. Nat. Hist., 1868, pl. 4, figs. 17, 18; rev. ed., 1870, pl. 4, figs. 17, 18, p. 225.—Gurley, Jour. Geol., 4, 1896, p. 300.—Roemer and Frech, Leth. Pal., 1, 1897, p. 580.—Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, p. 590, pl. 4, fig. 16.

Canadian: Point Levis, Quebec (Levis, *Didymograptus* zone); Deepkill, Rennselaer County, New York (Deepkill).

***Ptilograptus hartnageli*** Ruedemann.

*Ptilograptus hartnageli* Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 149, pl. 1, fig. 9; text fig. 54.

Clinton: Sterling Station, Cayuga County, New York.

***Ptilograptus plumosus*** Hall.

*Ptilograptus plumosus* Hall, Geol. Surv. Canada, Can. Org. Rem., dec. 2, 1865, p. 140, pl. 21, figs. 1, 2, 3, 4.—Billings, Geol. Surv. of Canada, Pal. Fossils, 1, 366, 375.—Hall, New York State Cab. Nat. Hist., 20th Ann. Rep., 1868, pl. 4, fig. 16.—Ami, Geol. Surv. of Canada, Rep. 1889, 2d ser., 3, pt. 2, p. 117k.—Gurley, Jour. Geol., 4, 1896, 300.—Roemer and Frech, Leth. geog., 1 Theil, Leth. Pal., 1, 1897, fig. 151; p. 564, fig. 137.—Ruedemann, New York State Pal., Ann Rep., 1902, p. 570; Mem. New York State Mus., 7, pt. 1, 1904, pp. 588-589, pl. 4, figs. 14, 15.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 27, fig. 38.

*Ptilograpsus plumosus* Nicholson, Mon. British Grapt., 1872, p. 126, fig. 66.

Canadian: Point Levis, Quebec (Levis, *Didymograptus* zone); Deepkill and Mount Moreno, near Hudson, New York (Deepkill, *Diplograptus dentatus* zone); Cowhead, Newfoundland.

***Ptilograptus poctai*** Ruedemann.

*Ptilograptus poctai* Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 148, 149, pl. 1, fig. 8, fig. 53.

Chazyan (Normanskill): Glenmont, Albany County, New York.

**Ptilograptus tenuissimus** Ruedemann.

*Ptilograptus tenuissimus* Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, p. 591, pl. 4, fig. 13.

Canadian (Deepkill, *Didymograptus bifidus* zone): Deepkill, Rensselaer County, New York.

**PTILOPORELLA** Hall. Genotype: *Fenestella* (*Ptiloporella*) *laticrescens* Hall.

*Ptyloporella* Hall, Rep. State Geol. New York for 1884, 1885, p. 36.

*Ptiloporella* Hall and Simpson, Pal. New York, 6, 1887, p. xxiv.—Miller, N. A. Geol. Pal., 1889, p. 319.—Simpson, 13th Ann. Rep. State Geol. New York for 1893, 1895, pp. 690, 704, 725; 47th Ann. Rep. New York State Mus., pp. 884, 898, 919 (on p. 704, p. 898 of Mus. Rep., Simpson has inadvertently interchanged the terms *Ptiloporella* and *Ptiloporina*); 14th Ann. Rep. State Geol. New York for 1894, 1897, pp. 506, 521.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, pp. 40, 383.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 51.

*Pinnaporina* Simpson, 13th Ann. Rep. State Geol. New York for 1893, 1895, p. 705 (not p. 725=*Ptiloporina*); 47th Ann. Rep. New York State Mus., p. 899 (not p. 919).

*Pinnaporella* Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, pp. 507, 521.

**Ptiloporella nervata** (Nicholson).

*Fenestella nervata* Nicholson, Pal. Ohio, 2, 1875, p. 264, pl. 25, figs. 11, 11a.

*Ptiloporella nervata* Miller, N. A. Geol. Pal., 1889, p. 319.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 51, pl. 24, figs. 24, 25; pl. 26, figs. 5, 6.

Niagaran: Cedarville, Ohio; Lockport, New York; Grimsby, Thorold, and Hamilton, Ontario (Rochester); Osgood, Indiana (Osgood).

*Plesiotypes*.—Cat. No. 35743, U.S.N.M.

**PTILOTRYPA** Ulrich.

Genotype: *P. obliquata* Ulrich.

*Ptilotrypa* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 393.—(Ulrich, in press) Miller, N. A. Geol. Pal., 1889, p. 320.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 542.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 17.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 46.

**Ptilotrypa obliquata** Ulrich.

*Ptilotrypa obliquata* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 531, pl. 30, figs. 1–1e.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, figs. 100–103 (p. 542).

Richmond (Fernvale): Wilmington, Illinois; Tennessee.

*Cotypes*.—Cat. No. 43787, U.S.N.M.

**PTYCHASPIS** Hall.

Genotype: *Dikelocephalus miniscaensis* Owen.

*Ptychaspis* Hall, 16th Ann. Rep. New York State Cab. Nat. Hist., 1863, p. 170.—Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 198.—Hall, Trans. Albany Inst., 5, 1867, p. 160.—Zittel, Handb. Pal., 2, 1885, p. 602.—Miller, N. A. Geol. Pal., 1889, p. 564.

**PTYCHASPIS CYLINDRICUS** Billings. See *Arionellus cylindricus*.**Ptychaspis? pauper** (Billings).

*Dikelocephalus pauper* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 200.

*Dicellocephalus pauper* Matthew, Trans. Royal Soc. Canada, 10, sec. 4, 1893, p. 11, footnote.

*Ptychaspis? pauper* Walcott, Smiths. Misc. Coll., 57, No. 13, 1914, p. 352 (gen. ref.).

Ozarkian? (Levis—erratics): Point Levis, Quebec.

**Ptychaspis? selectus** (Billings).

Dikelocephalus selectus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 199.  
 Ptychaspis? selectus Walcott, Smiths. Misc. Coll., 57, No. 13, 1914, p. 352 (gen. ref.).  
 Ozarkian? (Levis—erratics): Point Levis, Quebec.

**Ptychaspis sesostris** (Billings).

Dikelocephalus Sesostris Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 198, fig. 184.  
 Ptychaspis sesostris Miller, N. A. Geol. Pal., 1889, p. 564, fig. 1052.  
 Dicelloccephalus Sesostris Matthew, Trans. Royal Soc. Canada, 1893, p. 11, footnote.  
 Ozarkian? (Levis—erratics): Point Levis, Quebec.

**Ptychaspis speciosus** Walcott.

Ptychaspis speciosus Walcott, 32d Rep. New York State Mus. Nat. Hist., 1879, p. 131.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 830.—Walcott, Smiths. Misc. Coll., 57, 1912, p. 272, pl. 43, figs. 16–19.  
 Ozarkian or Upper Cambrian (Hoyt): Near Saratoga Springs, New York.  
*Cotypes*.—Cat. Nos. 58563–58565, U.S.N.M.

PTYCHASPIS SUBCLAVATUS Billings. See *Arionellus subclavatus*.

**PTYCHOCRINUS** Wachsmuth and Springer.

Genotype: *Gaurocrinus splendens* Miller.

*Ptychocrinus* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1885, p. 321 (Rev. Pal., pt. 3, sec. 1, p. 99).—James, Jour. Cincinnati Soc. Nat. Hist., 19, 1897, p. 109.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 197.—Bather, Geol. Mag., dec. 4, 6, 1899, p. 124; Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 198.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 145.—Zittel, Grundzuge Pal., 1, 1910, p. 161.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 187.

PTYCHOCRINUS ANGULARIS Wachsmuth and Springer. See *Ptychocrinus parvus*.

**Ptychocrinus parvus** (Hall).

*Glyptocrinus parvus* Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, p. 304 (nom. nud.); 24th Rep. New York State Cab. Nat. Hist., 1872, p. 207, pl. 5, fig. 17 (separate, 1871, pl. 1, fig. 17).—Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 36, pl. 2, fig. 4a, b.—Miller, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 224.

*Ptychocrinus parvus* Wachsmuth and Springer, Proc. Acad. Nat. Sci., Philadelphia, 1885, p. 322 (Rev. Pal., pt. 3, sec. 1, p. 100).—James, Jour. Cincinnati Soc. Nat. Hist., 19, 1897, p. 110.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 1897, p. 199, pl. 18, figs. 1, 2.

*Glyptocrinus angularis* Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 28, pl. 1, fig. 10.

*Gaurocrinus angularis* Miller, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 229.

?*Glyptaster* (*Eucrinus*) *angularis* Wachsmuth and Springer, Amer. Jour. Sci., 25, 1883, p. 265.

*Ptychocrinus angularis* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1885, p. 323 (Rev. Pal., pt. 2, p. 100).—James, Jour. Cincinnati Soc. Nat. Hist., 19, 1897, p. 109.

*Reteocrinus gracilis* Wetherby, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 83, pl. 2, figs. 2a, 2.—Carpenter, Phil. Trans. Roy. Soc. London, 174, 1884, p. 927.—James, Jour. Cincinnati Soc. Nat. Hist., 19, 1897, p. 103.

Maysville (Fairmount): Cincinnati, Ohio, and vicinity.

*Plesiotype*.—Cat. No. 40774, U.S.N.M. (Holotype of *R. gracilis*.)



**PTYCHOCRINUS PRISCUS** Wachsmuth and Springer. See *Periglyptocrinus priscus*.

**Ptychoerinus splendens** (Miller).

*Gaurocrinus splendens* Miller, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 230, pl. 2, fig. 3, 3a.

*Ptychoerinus splendens* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1885, p. 323 (Rev. Pal., pt. 3, sec. 1, p. 101).—Keyes, Missouri Geol. Surv., 4, 1894, p. 162, pl. 22, fig. 1.—Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 198, pl. 18, fig. 3a, b.—Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 39, pl. 1, fig. 1.

Upper Medinan (Girardeau): Cape Girardeau, Missouri; Thebes, Illinois.

**PTYCHONEMA** Hall and Simpson. See *Monotrypa* Nicholson.

**PTYCHOPARIA** Corda.

Genotype: *Conocephalus striatus* Emmrich.

*Ptychoparia* Corda, Abh. d. k. böhmischen Gesell., d. Wiss., 5 (extract), 1847, p. 25, pl. 2, fig. 11.—Walcott, Bull. U. S. Geol. Surv., 10, 1884, p. 34; *ibid.*, 30, 1886, p. 193.—Matthew, Canadian Rec. Sci., 2, 1887, p. 357; Trans. Roy. Soc. Canada, 5, sec. 4, 1888, pp. 134, 142.—Miller, N. A. Geol. Pal., 1889, p. 564.—Ehlert, Bull. Soc. Geol. de France, 3d ser., 33, 1895, p. 319, footnote; 34, 1896, p. 111.—Beecher, Amer. Geol., 16, 1895, p. 178.—Pompeckj, Jahrb. d. k.-k. geol. Reichsanstalt, 45, 1896, p. 539.—Beecher, Amer. Jour. Sci., 4th ser., 3, 1897, pp. 104, 184, 187, 188, pl. 3, fig. 16.—Frech, Leth. geog., Leth. Pal., 2, 1897, p. 26, footnote.—Toll, Mem. l'Acad. Imp. Sci. St. Petersburg, 7th ser., 8, No. 10, 1899, p. 21.—Beecher, Zittel-Eastman Textb. Pal., 1, 1900, p. 628.—Lindström, Kongl. Sven. Vet.-Akad. Handl., 34, No. 8, 1901, p. 22.—Jaekel, Zeits. d. d. geol. Gesell., 53, 1901, p. 133; *ibid.*, 54, Brief. Mitth., 1902, p. 53.—Beecher, Amer. Jour. Sci., 4th ser., 13, 1902, p. 166.—Gronwall, Danmarks Geol. Unders., 2, Raekke, No. 13, 1902, p. 148.—Lorenz, Zeitsch. deutsch. geol. Gesell., 58, pt. 2, 1906, p. 57.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 275.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 715.—Walcott, Cambrian Faunas China, Carnegie Inst., 3, 1913, p. 130.

**Ptychoparia affinis** (Walcott).

*Ptychoparia* (*Euloma*?) *affinis* Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 54, pl. 10, fig. 12; 32, pt. 2, 1899, p. 457, pl. 65, fig. 8.

Cambrian and ?Lowest Ordovician: Eureka District, Nevada.

**Ptychoparia? annectans** Walcott.

*Ptychoparia? annectans* Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 91, pl. 12, fig. 18.

Lower Pogonip: Ridge east of Hamburg Ridge, Eureka District, Nevada.

*Cotype*.—Cat. No. 24571, U.S.N.M.

**Ptychoparia blairi** Weller.

*Ptychoparia blairi* Weller, Geol. Surv. New Jersey Pal., 3, 1903, p. 117, pl. 1, fig. 10.

Upper Cambrian or Ozarkian (Kittatinny): Blairstown, New Jersey.

**PTYCHOPARIA CALCIFERA** Walcott. See *Lonchocephalus calciferus*.

**PTYCHOPARIA CONICA?** Keyes. See *Bathyrus conicus*.

**Ptychoparia? devinei** (Billings).

*Dikelocephalus Devinei* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 195, figs. 180-181.

*Conocephalites Devinei* Matthew, Trans. Roy. Soc. Canada, 10, sec. 4, 1893, p. 11, footnote.

**Ptychoparia? devinei**—Continued.

*Ptychoparia? devinei* Walcott, *Smiths. Misc. Coll.*, 57, No. 13, 1914, p. 350 (gen. ref.).

Ozarkian? (Levis-erratics): Point Levis, Quebec.

**Ptychoparia granulosa** (Hall and Whitfield).

*Crepicephalus* (*Loganellus*) *granulosus* Hall and Whitfield, *U. S. Geol. Expl. 40th Parl.*, 4, 1877, p. 214, pl. 2, figs. 2, 3.

*Ptychoparia granulosa* Walcott, *Mon. U. S. Geol. Surv.*, 8, 1884, p. 57.

Cambrian and ? Ordovician (Pogonip): Eureka District, Nevada.

**Ptychoparia haguei** (Hall and Whitfield).

*Crepicephalus* (*Loganellus*) *haguei* Hall and Whitfield, *U. S. Geol. Expl. 40th Parl.*, 4, 1877, p. 210, pl. 2, figs. 14, 15.

*Ptychoparia Haguei* Walcott, *Bull. U. S. Geol. Surv.*, 10, 1884, p. 36, pl. 6, fig. 6; *Mon. U. S. Geol. Surv.*, 8, 1884, p. 57.

*Liostracus haguei* Brogger, *Geol. Foren. Stockholm Forhandl.*, 8, 1886, p. 202.

*Ptychoparia* (*Crepicephalus*) *haguei* Lesley, *Geol. Surv. Pennsylvania, Rep. P 4*, 1889, p. 832, fig.

Cambrian and ? Ordovician (Pogonip): White Pine and Eureka Districts, Nevada.

*PTYCHOPARIA LOGANI* Walcott. See *Loganellus logani*.

**Ptychoparia maculosa** (Hall and Whitfield).

*Crepicephalus* (*Loganellus*) *maculosus* Hall and Whitfield, *U. S. Geol. Expl. 40th Parl.*, 4, 1877, p. 215, pl. 2, figs. 24, 25, 26.

*Ptychoparia maculosus* Walcott, *Mon. U. S. Geol. Surv.*, 8, 1884, pp. 269, 271.

Cambrian and ? Ordovician (Pogonip): Eureka District, Nevada.

**Ptychoparia matheri** Walcott.

*Ptychoparia matheri* Walcott, *Smiths. Misc. Coll.*, 57, 1912, p. 268, pl. 44, figs. 15-17.

Upper Cambrian or Ozarkian (Potsdam): Whitehall, Washington County, New York.

*Cotypes*.—Cat. Nos. 58585-58587, U.S.N.M.

**Ptychoparia minuta** (Bradley).

*Conocephalites minutus* Bradley, *Amer. Jour. Sci.*, 2d ser., 30, 1860, pp. 241-242, figs. 1-3.—Billings, *ibid.*, 2d ser., 30, 1860, pp. 242-243, pp. 337-338, figs. 4a-c.—Bradley, *Canadian Nat. Geol.*, 5, 1860, pp. 420-421, figs. 1-3.—Billings, *ibid.*, pp. 422-425, figs. 4a-c.—Bradley, *Proc. Amer. Assoc. Adv. Sci.*, 14, 1861, pp. 161-163, figs. 1-3.—Billings, *ibid.*, pp. 163-166, figs. 4a-c.—Hall, 16th Ann. Rep. New York State Cab. Nat. Hist., 1863, pp. 150, 151, pl. 8, figs. 5-7; *Trans. Albany Inst.*, 5, 1867, pp. 134-135, pl. 3, figs. 5-7.

*Ptychoparia minutus* Walcott, *Mon. U. S. Geol. Surv.*, 8, 1884, p. 91; *Smiths. Misc. Coll.*, 57, 1912, p. 267, pl. 43, figs. 20-24.

Upper Cambrian or Ozarkian (Potsdam): Various localities in Essex, Washington, and Franklin Counties, New York.

*Plesiotypes*.—Cat. Nos. 58567-58570, U.S.N.M.

**Ptychoparia newtonensis** Weller.

*Ptychoparia newtonensis* Weller, *Geol. Surv. New Jersey, Pal.*, 3, 1903, p. 117, pl. 3, fig. 10.

Upper Cambrian or Ozarkian (Kittatinny): Newton, New Jersey.

**Ptychoparia oweni** (Meek and Hayden).

*Arionellus* (*Crepicephalus*) *Oweni* Meek and Hayden, *Proc. Acad. Nat. Sci. Philadelphia*, 1861, p. 436.

**Ptychoparia oweni**—Continued.

- Arionellus? *Oweni* Meek and Hayden, Amer. Jour. Sci. Arts, (2), 33, 1862, p. 74, fig. 4.
- Conocephalites *oweni* Hall, 16th Rep. New York State Cab. Nat. Hist., 1863, p. 155, pl. 8, figs. 17, 20; Trans. Albany Inst., 5, 1867, p. 141, pl. 3, figs. 17, 20.
- Conaspis *oweni* Hall, 16th Rep. New York State Cab. Nat. Hist., 1863, p. 152.
- Agraulos *Oweni* Meek and Hayden, Pal. Up. Missouri, Smithsonian Cont. Knowl., 14, No. 172, 1865, p. 9, text figs. A-C.
- Conocoryphe (*Ptychoparia*) *Gallatinensis* Meek, 6th Ann. Rep. U. S. Geol. Surv. Terr., 1873, p. 485.
- Crepicephalus (*Loganellus*) *centralis* Whitfield, Prel. Rep. Pal. Black Hills, U. S. Geog. and Geol. Surv., 1877, p. 10.
- Crepicephalus *centralis* Whitfield, Rep. Geol. Res. Black Hills, Dakota, Powell's U. S. Geol. Surv., 1880, p. 341, pl. 2, figs. 21-24.
- Ptychoparia Oweni* Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 55, pl. 10, figs. 3, 3a.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 277.
- Cambrian and ?Ordovician (*Pogonip*): Wyoming; Dakota; Eureka District, Nevada.

**PTYCHOPARIA SARATOGENSIS** Walcott. See *Plethopeltis saratogensis*.

**Ptychoparia unisulcata** (Hall and Whitfield).

- Crepicephalus (*Loganellus*) *unisulcatus* Hall and Whitfield, U. S. Geol. Expl. 40th Parl., 4, 1877, p. 216, pl. 2, figs. 22, 23.
- Ptychoparia unisulcatus* Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 58.
- Cambrian and ?Ordovician (*Pogonip*): Eureka District, Nevada.

**Ptychoparia zenkeri** (Billings).

- Conocephalites *Zenkeri* Billings, Canadian Nat. Geol., 5, 1860, p. 305, fig. 4; p. 422; Amer. Jour. Sci., 2d ser., 30, 1860, p. 243; Proc. Acad. Assoc. Adv. Sci., 14, 1861, p. 163; Geol. Canada, Geol. Surv. Canada, 1863, p. 233, fig. 253.—Chapman, Expos. Min. Geol. Canada, 1864, p. 140, fig. 150; p. 164, fig. 161.—Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 398, fig. 375.
- Ptychoparia zenkeri* Miller, N. A. Geol. Pal., 1889, p. 565, fig. 1052.
- Ozarkian? (*Levis*—erratic): Point Levis, Quebec.

**PTYCHOPHYLLUM** Lonsdale.

Genotype: *P. stokesi* Edwards and Haime.

- Ptychophyllum* Lonsdale, Sil. System, 1839, p. 691.—Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal., 1851 (Arch. du Mus. d'Hist. Nat., 5), pp. 169, 406.—Pictet, *Traité de Pal.*, 2d ed., 4, 1857, p. 457.—Milne-Edwards, Hist. Nat. Corall., 3, 1860, p. 399.—Dybowski, Archiv. f. Natur. Liv-, Ehst- und Kurl., 5, 1873, pp. 336, 398.—Salter, Cat. Camb. Sil. Foss., 1873, p. 113.—Zittel, Handb. Pal., 1, 1879, p. 229.—Roemer, Leth. geog., pt. 1, Leth. Pal. 1883, p. 358.—Miller, N. A. Geol. Pal., 1889, p. 201.—Sherzer, Amer. Geol., 7, 1891, pp. 284-289; Bull. Geol. Soc. Amer., 3, 1892, p. 278.—Nicholson, Rec. Geol. Surv. N. S. Wales, 4, 1894, p. 16.—Koken, Die Leitfossilien, Leipzig, 1896, p. 308.—Zittel-Eastman Textb. Pal., 1, 1900, p. 78; 2d ed. 1913, p. 85.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 62.

**Ptychophyllum benedicti** Greene.

- Ptychophyllum benedicti* Greene, Cont. Indiana Pal., pt. 4, 1900, p. 28, pl. 12, figs. 4-6.
- Niagaran (Louisville): Bear Grass Creek quarries, near Louisville, Kentucky.

**PTYCHOPHYLLUM CANADENSE** Billings. See *Chonophyllum canadense*.

**Ptychophyllum expansum** (Owen).

*Anthophyllum expansum* Owen, Geol. Expl. Iowa, Wisconsin, and Illinois, 1844, p. 69, pl. 13, fig. 3.

*Cyathophyllum corintheum* Owen, *ibid.*, 1844, p. 69, pl. 13, fig. 6.

*Cyathophyllum undulatum et multiplicatum* Owen, *ibid.*, 1844, p. 69, pl. 13, fig. 10.

*Ptychophyllum expansum* Calvin, Amer. Geol., 12, 1893, pp. 108, 110, pl. 5, figs. 1-4.

Niagaran: Iowa and Wisconsin.

**Ptychophyllum floriforme** Hall.

*Ptychophyllum floriforme* Hall, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 409 (Extras, 1882, p. 5).

Niagaran (Racine): Racine, Wisconsin.

**Ptychophyllum fulcratum** Hall.

*Ptychophyllum fulcratum* Hall, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 410 (Extras, 1882, p. 6).

Niagaran (Louisville): Louisville, Kentucky.

**Ptychophyllum invaginatum** Davis.

*Ptychophyllum invaginatum* Davis, Kentucky Foss. Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 105, fig. 8.

Niagaran (Louisville): Near Louisville, Kentucky.

**Ptychophyllum ipomœa** Davis.

*Ptychophyllum ipomœa* Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 104, fig. 7; pl. 105, figs. 9, 10.—Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 342.

Niagaran (?Louisville): Louisville, Kentucky.

Upper Medinan (Brassfield): Near Centerville, Ohio.

**Ptychophyllum stokesi** Edwards and Haime.

*Ptychophyllum stokesi* Edwards and Haime, British Foss. Corals, 1850, p. 69; Mon. Polyp. Foss. d. Terr. Pal. (Arch. du Mus. d'Hist. Nat., 5), 1851, p. 407.—Milne-Edwards, Hist. Nat. d. Corall., 3, 1860, p. 400.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 105, figs. 1-7.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 62.

*Omphyra Stockesii* Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 119, pl. 44, upper tier.

*Omphyra Stokesi* Whitfield, Geol. Wisconsin, 4, 1882, p. 279, pl. 14, fig. 10; pl. 15, fig. 4.

Niagaran: Drummond Island, Lake Huron; Louisville, Kentucky; Racine, Wisconsin.

*Plesiotypes*.—Cat. No. 52775, U.S.N.M. (Davis).

**Ptychophyllum vulcanus** Foerste.

*Ptychophyllum vulcanus* Foerste, Jour. Geol., 11, 1903, p. 713.

Niagaran (Brownsport): West of Hope Creek, west Tennessee.

**PTYCHOPTERIA** Hall.

Genotype: *P. eugenia* Hall.

*Ptychopteria* Hall, Pal. New York, 5, pt. 1, Lam., 1883, p. 3; *ibid.*, 1884, p. 12; 35th Rep. New York State Mus. Nat. Hist., 1884, p. 406c; 1st Rep. State Geol. New York, 1884, p. 13.—Jackson, Mem. Boston Soc. Nat. Hist., 4, 1890, p. 386.—Whidborne, Mon. Dev. Fauna South England, 3, Pal. Soc., 1897, p. 125.

**Ptychopteria? subquadrata** Weller.

Ptychopteria? subquadrata Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 244, pl. 22, fig. 2.

Helderbergian (Decker Ferry): Two miles south of Tristates, New York.

PTYCHOPYGE HUTTONI Clarke. See *Basilicus huttoni*.

PTYCHOPYGE JERSEYENSIS Weller. See *Bathyrurus longispinus*.

PTYCHOPYGE ROMINGERI Clarke. See *Basilicus romingeri*.

PTYCHOPYGE ULRICHI Clarke. See *Basilicus romingeri*.

PTYLOGRAPTUS FOLIACEUS Spencer. See *Ptilograptus foliaceus*.

PTYLOFORELLA Hall. See *Ptiloporella* Hall.

**PYANOMYA** Miller.

Genotype: *P. gibbosa* Miller.

*Pyanomya* Miller, Jour. Cincinnati Soc. Nat. Hist., 1881, 4, p. 318; N. A. Geol. Pal., 1889, p. 509.

***Pyanomya faberi*** Miller.

*Pyanomya faberi* Miller, N. A. Geol. Pal., 1889, p. 509, fig. 912.

Maysville (Fairmount): Cincinnati, Ohio.

***Pyanomya gibbosa*** Miller.

*Pyanomya gibbosa* Miller, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 318, pl. 8, figs. 4, 4a, 4b; N. A. Geol. Pal., 1889, p. 509, fig. 913.

Maysville (Fairmount): Cincinnati, Ohio.

**PYCNOCERAS** Hyatt.

Genotype: *P. apertum* Hyatt.

*Pycnoceras* Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 454.—Miller, N. A. Geol. Pal. 2d App., 1897, p. 777.

***Pycnoceras apertum*** Hyatt.

*Pycnoceras apertum* Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 455, pl. 5, figs. 18-20.

Canadian (Quebec): Port au Choix, Newfoundland.

***Pycnoceras calciferiforme*** Hyatt.

*Pycnoceras calciferiforme* Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 456.

*Pycnoceras calciferiforme* Miller, N. A. Geol. Pal., 2d App., 1897, p. 777.

Canadian: Port au Choix and Schooner Island, Newfoundland; Phillipsburg, Quebec.

PYCNOCERAS CALCIFORME Miller. See *Pycnoceras calciferiforme*.

**PYCNOCRINUS** Miller.

Genotype: *Glyptocrinus shafferi* Miller.

*Pycnocrinus* Miller, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, pp. 219, 231.—

Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1885, p. 324 (Rev. Pal., p. 102).—Miller, N. A. Geol. Pal., 1889, p. 276.—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 161.—Zittel, Grundzuge Pal., 1, 1910, p. 462.

*Glyptocrinus* (part) Miller, Cincinnati Quart. Jour. Sci., 1874, p. 348.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 267.

***Pycnocrinus germanus*** (Miller).

*Glyptocrinus shafferi* var. *germanus* Miller, Jour. Cincinnati Soc. Nat. Hist., 3, 1880, p. 233, pl. 7, figs. 2, 2a.

**Pycnocrinus germanus**—Continued.

*Pycnocrinus germanus* Miller, *ibid.*, 6, 1883, p. 232; *N. A. Geol. Pal.*, 1889, p. 276, fig. 412.

*Glyptocrinus? Shafferi* Wachsmuth and Springer, *Mem. Mus. Comp. Zool.*, Harvard, 20, 1897, p. 272, pl. 21, figs. 3d-f.

Maysville (Corryville): Cincinnati, Ohio, and vicinity.

**Pycnocrinus shafferi** (Miller).

*Glyptocrinus Shafferi* Miller, *Cincinnati Quart. Jour. Sci.*, 2, 1875, p. 277, fig. 20; *Jour. Cincinnati Soc. Nat. Hist.*, 3, 1880, p. 233, pl. 7, figs. 3a-c.—James, *ibid.*, 19, 1897, p. 116.

*Pycnocrinus shafferi* Miller, *Jour. Cincinnati Soc. Nat. Hist.*, 6, 1883, p. 231; *N. A. Geol. Pal.*, 1889, p. 277, figs. 413-415.

Maysville (Corryville): Cincinnati, Ohio, and vicinity.

**PYCNOMPHALUS** Lindström.

Genotype: *P. obesus* Lindström.

*Pycnomphalus* Lindström, *Kongl. Sven. Vet. Akad. Handl.*, 19, No. 6, 1881, p. 153.—Frech, *Zeits. d. d. geol. Gesell.*, 46, 1894, p. 465.—Koken, *Die Leitfossilien*, Leipzig, 1896, pp. 399, 459.—Grabau and Shimer, *N. A. Index Fossils*, 1, 1909, p. 672.

**Pycnomphalus solarioides** (Hall).

*Pleurotomaria solarioides* Hall, *Pal. New York*, 2, 1852, p. 348, pl. 84, fig. 4a-b.—Billings, *Geol. Canada, Geol. Surv. Canada*, 1863, p. 341, fig. 347a, b.—Nicholson, *Quart. Jour. Geol. Soc. London*, 31, 1875, p. 550, pl. 26, fig. 15; *Rep. Pal. Prov. Ontario*, pt. 2, p. 72, pl. 3, fig. 15.—Lesley, *Geol. Surv. Pennsylvania, Rep. P 4*, 1889, p. 715, fig.

*Pycnomphalus solarioides* Whiteaves, *Pal. Foss.*, *Geol. Surv. Canada*, 3, pt. 2, 1895, p. 88, pl. 13, figs. 3, 4-8.—Grabau and Shimer, *N. A. Index Fossils*, 1, 1909, p. 672, fig. 931.

Niagaran (Guelph): Galt, Ontario; Wisconsin.

**PYCNOPEGMA** Rauff.

Genotype: *P. pileum* Rauff.

*Pycnopegma* Rauff, *Palæontographica*, 41, 1895, p. 232.

**Pycnopegma callosum** Rauff.

*Pycnopegma callosum* Rauff, *Palæontographica*, 41, 1895, p. 236, figs. 88-94, pl. 8; figs. 7-9 (pl. in vol. 40).

Niagaran (Brownsport): Decatur County, Tennessee.

**Pycnopegma pileum** Rauff.

*Pycnopegma pileum* Rauff, *Palæontographica*, 41, 1895, p. 233, figs. 84-87, pl. 8; figs. 5, 6 (pl. in vol. 40).

Niagaran (Brownsport): Decatur County, Tennessee.

**Pycnopegma stromatoporoides** Rauff.

*Pycnopegma stromatoporoides* Rauff, *Palæontographica*, 41, 1895, p. 239, figs. 95-97.

Niagaran (Brownsport): Decatur County, Tennessee.

**PYCNOSACCUS** Angelin.

Genotype: *Cyathocrinites? scrobiculatus* Hisinger.

*Pycnosaccus* Angelin, *Icon. Crinoid*, 1878, p. 13.—Zittel, *Handb. Pal.*, 1, 1879, p. 356.—Wachsmuth and Springer, *Proc. Acad. Nat. Sci. Philadelphia*, 1890, p. 388.—Zittel, *Grundzüge Pal.*, 1895, p. 138.—Wachsmuth, *Zittel-Eastman Textb. Pal.*, 1, 1896, p. 164.—Weller, *Jour. Geol.*, 6, 1898, p. 700.—Bather, *Treatise on Zool.*, pt. 3, *Echinoderma*, London, 1900, p. 187, fig. 107.—Weller, *Bull. Chicago Acad. Sci. Nat. Hist. Surv.*, 4, pt. 1, 1900, p. 149, fig. 55.—Springer, *Amer. Geol.*, 30, 1902, p. 94; *Jour. Geol.*, 14, 1906, p. 484; *Zittel-Eastman Textb. Pal.*, 2d ed., 1913, p. 203.

***Pycnosaccus americanus* Weller.**

*Pycnosaccus americanus* Weller, Bull. Chicago Academy of Science, 4, 1900, p. 149, pl. 15, fig. 12.  
Niagaran (Racine): Hawthorne, Illinois.

***Pycnosaccus caliculus* (Hall).**

*Lecanocrinus caliculus* Hall, Pal. New York, 2, 1852, p. 203, pl. 46, figs. 3a, b.  
*Pycnosaccus caliculus* Springer, Mon. Crin. Flex., Smiths. Inst. (in press).  
Clinton (Rochester): Lockport, New York.

***Pycnosaccus dubius* Springer.**

*Pycnosaccus dubius* Springer, Mon. Crin. Flex., Smiths. Inst. (in press).  
Niagaran (Brownsport): Decatur County, Tennessee.

***Pycnosaccus patei* Springer.**

*Pycnosaccus patei* Springer, Mon. Crin. Flex., Smiths. Inst. (in press).  
Niagaran (Brownsport): Decatur County, Tennessee.

***Pycnosaccus tenuibrachiatus* Springer.**

*Pycnosaccus tenuibrachiatus* Springer, Mon. Crin. Flex., Smiths. Inst. (in press).  
Helderbergian (Keyser): Keyser, West Virginia.

***Pycnosaccus welleri* Springer.**

*Pycnosaccus welleri* Springer, Mon. Crin. Flex., Smiths. Inst. (in press).  
Niagaran (Brownsport): Decatur County, Tennessee.

**PYCNOSTYLUS** Whiteaves.Genotype: *P. guelphensis* Whiteaves.

*Pycnostylus* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 2.—Miller, N. A. Geol. Pal., 1889, p. 202.—Schluter, Abhandl. z. geol. Spezialkarte Preussen und den Thuringischen Staaten, 8, Heft 4, 1889, p. 9 (267), footnote.—Sherzer, Amer. Geol., 7, 1891, pp. 284-289.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 131.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 61.

***Pycnostylus elegans* Whiteaves.**

*Pycnostylus elegans* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 4, pl. 1, figs. 2, 2a.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 847, figs.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 49 (loc. occ.).—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 133.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 248 (loc. occ.).—Lambe, Cruise of the "Neptune", App. 4, 1906, p. 326.

Niagaran: Hespeler and Durham, Ontario (Guelph); Southampton Island, Hudson Bay and Ekwan River, Canada.

***Pycnostylus guelphensis* Whiteaves.**

*Pycnostylus guelphensis* Whiteaves, Pal. Foss. Geol. Surv. Canada, 3, pt. 1, 1884, p. 3, pl. 1, figs. 1a, b.—Miller, N. A. Geol. Pal., 1889, p. 202, fig. 212.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 847, figs.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 49.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 132, pl. 10, figs. 4, 4a.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 247 (loc. occ.).—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 62, fig. 91.

*Amplexus laxatus* Billings, Geol. Canada, 1863, p. 340 (nom. nud.).—Nicholson (part), Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 77.

Niagaran: New Hope, Guelph, etc., Ontario; Wisconsin (Guelph); Ekwan River, Canada.

**PYRENOMÆUS** Hall.Genotype: *P. cuneatus* Hall.

*Pyrenomæus* Hall, Pal. New York, 2, 1852, p. 87.—Ulrich, Geol. Surv. Ohio, 7, 1893, p. 681.—Miller, N. A. Geol. Pal., 1889, p. 509.

***Pyrenomæus cuneatus*** Hall.

*Pyrenomæus cuneata* Hall, Pal. New York, 2, 1852, p. 87, pl. 27, figs. 3, 12a, b, c.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 848, figs.  
Clinton: Walcott and New Hartford, New York.

***Pyrenomæus decipiens*** Ulrich.

*Pyrenomæus decipiens* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 682, pl. 51, figs. 7, 8.

Maysville (Corryville): Cincinnati, Ohio.

*Cotypes*.—Cat. No. 46296, U.S.N.M.

***Pyrenomæus subcuneatus*** Ulrich.

*Pyrenomæus subcuneatus* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 682, pl. 51, fig. 6.

Trenton (Upper): River quarries, Covington, Kentucky.

*Holotype*.—Cat. No. 46297, U.S.N.M.

**PYRITONEMA METISSICUM** Rauff. See *Hyalostelia?* metissica.

**QUENSTEDTIA** Rominger. See *Romingeria* Nicholson.

**RAFINESQUINA** Hall and Clarke. Genotype: *Strophomena alternata* Emmons.

*Strophomena* (not Rafinesque) Billings, Canadian Nat. Geol., 1, 1856, p. 133; Canadian Jour., 6, 1861, p. 329; Pal. Fossils, 1, 1862, p. 115.—Hall, Pal. New York, 4, 1867, p. 76.—Meek, Pal. Ohio, 1, 1873, p. 73.—N. H. Winchell, 9th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1881, p. 118.—Shaler, Fossil Brachiopoda of the Ohio Valley, 1887, p. 4.—Herrick, Bull. Sci. Lab. Denison Univ., 4, 1888, p. 14.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 159.

*Rafinesquina* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 281.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 400.—Hall and Clarke, 11th Ann. Rep. New York State Geol., 1894, p. 279.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 312; 2d ed., 1913, p. 384.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 211.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 893.

***Rafinesquina alternata*** (Emmons).

*Leptaena alternata* Conrad, 2d Ann. Rep. New York Geol. Surv., 1838, p. 115 (undefined).—Hall, Pal. New York, 1, 1847, pp. 102, 286, pl. 31, fig. 1; pl. 31A, fig. 1; pl. 79, fig. 2.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 818, fig. 600.

*Strophomena alternata* Conrad, 3d Ann. Rep. New York Geol. Surv., 1839, p. 63; 4th Rep., *ibid.*, 1840, p. 201; 5th Rep., *ibid.*, 1841, p. 37 (undefined).—Emmons, Geol. New York, Rep. 2d Dist., 1842, p. 395, fig. 3.—Owen (Emmons), Amer. Jour. Sci. Arts, 47, 1844, p. 366, fig. 3.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 197, pl. 11, figs. 1 a-c, 3, 5b, 7; pl. 17, fig. 2.—Billings, Canadian Nat. Geol., 1, 1856, p. 204, figs. 3, 4; *ibid.*, 5, 1860, p. 51.—Emmons, Man. Geol., 1860, p. 99, fig. 88.—Hitchcock, Geol. Vermont, 1, 1862, p. 293, fig. 199.—Chapman, Canadian Jour., n. s., 7, 1862, p. 112, fig. 95; *ibid.*, 8, 1863, p. 199, fig. 186.—Billings, Geol. Canada, 1863, p. 163, fig. 140.—Chapman, Expos. Min. Geol. Canada, 1864, p. 115, fig. 95; p. 171, fig. 186.—Billings, Geol. Surv. Canada, Pal. Foss., 1, 1865, p. 117 (adv. sheets 1862).—Safford, Geol. Tennessee, 1869, p. 275, fig. 3.—Meek, Pal. Ohio, 1, 1873, p. 88, pl. 7, fig. 1.—Miller, Cincinnati Quart. Jour. Sci., 1874, p. 45; *ibid.*, 2, 1875, p. 51.—Shaler,



**Rafinesquina alternata**—Continued.

Foss. Brach. Ohio Valley, 1876, p. 424, pls. 2, 3.—Zittel, Handb. Pal., 1, Munich, 1880, p. 678, fig. 509.—White, 2d Ann. Rep. Indiana Bur. Stat., Geol., 1880, p. 481, pl. 1, figs. 6, 7; 10th Rep. State Geol. Indiana, 1881, p. 113, pl. 1, figs. 6, 7.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 155, fig.—Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 38, figs. 6–11; 35th Rep. New York State Mus. Nat. Hist., 1884, pl. 22, fig. 2.—Miller, N. A. Geol. Pal., 1889, p. 381, fig. 622.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1121, figs.—Keyes, Geol. Surv. Missouri, 5, 1895, p. 70, pl. 39, fig. 3.

*Orthis huroniensis* Castelnau, Essai Syst. Sil. l'Amerique Septentrionale, 1843, p. 37, pl. 14, fig. 6.

*Orthis plana* Castelnau (not Pander), *ibid.*, 1843, p. 38, pl. 14, fig. 1.

*Strophomena angulata?* Owen, Geol. Expl. Iowa, Wisconsin, Illinois, 1844, pl. 18, figs. 1, 3.

*Rafinesquina alternata* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 282, pl. 8, figs. 6–11, 27, 28; pt. 2, 1895, pl. 84, figs. 17, 18.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 404, pl. 31, figs. 32–34.—Whiteaves, Pal. Foss., 3, pt. 3, 1897, p. 171.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 337.—Cumings, Amer. Geol., 28, 1901, p. 375.—Ruedemann, Bull. New York State Mus., 49, for 1901, 1902, p. 16, pl. 2, fig. 1.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 148, pl. 9, figs. 12, 13.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 211, fig. 251.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 926, pl. 37, figs. 1–1e.—Bassler, Bull. Virginia Geol. Surv., 2a, 1909, pl. 14, fig. 9.

Trenton-Richmond: New York, Ohio, Indiana, Kentucky, Tennessee, Missouri, Illinois, Virginia, Canada, etc.

**Rafinesquina alternata alternistriata** (Hall).

*Leptæna alternistriata* Hall, Pal. New York, 1, 1847, p. 109, pl. 31B, fig. 1.

*Strophomena alternistriata* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 198, pl. 11, figs. 7, 10.—Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 70.—Emmons, Man. Geol., 1860, p. 95, figs. 83, 84.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1124, figs.

*Strophomena alternata* var. *alternistriata* Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 53.

*Rafinesquina alternistriata* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 283. Maysville: Cincinnati, Ohio, and vicinity; Indiana; Kentucky.

**Rafinesquina alternata fracta** (Meek).

*Strophomena alternata* var. *fracta* Meek, Pal. Ohio, 1, 1873, p. 91, pl. 7, fig. 3.

*Strophomena fracta* Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 13; *ibid.*, 2, 1875, p. 54.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1127, figs.

*Rafinesquina alternata* var. *fracta* Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 927, pl. 37, figs. 5, 5a.

Maysville (McMillan): Cincinnati, Ohio, and vicinity.

**Rafinesquina alternata loxorhytis** (Meek).

*Strophomena alternata* var. *loxorhytis* Meek, Pal. Ohio, 1, 1873, p. 91.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 53.

*Rafinesquina alternata-loxorhytis* Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 928, pl. 37, figs. 2, 2a.

Richmond (Waynesville): Ohio; Indiana; Kentucky.

**RAFINESQUINA ALTERNATA** var. **LOXORHYTIS** Winchell and Schuchert. See *Rafinesquina kingi*.

*RAFINESQUINA ALTERNATA* var. *NASUTA* Cumings. See *Rafinesquina nasuta*.

***Rafinesquina alternata ponderosa* Ulrich.**

*Leptaena alternata* Hall (part), Pal. New York, 1, 1847, pl. 31, fig. 11.

*Rafinesquina alternata* var. *ponderosa* Ulrich in Hayes and Ulrich, U. S. Geol. Surv., Folio 95, illust. sheet, 1903, fig. 20.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 929, pl. 37, figs. 3, 3a.

Maysville (Bellevue): Cincinnati, Ohio, and vicinity; Indiana and Kentucky. *Holotype*.—Cat. No. 35400, U.S.N.M.

Observation.—This shell was known to collectors under the name of “*ponderosa*” since 1840, but was not recognized as a distinct form until 1903.

*RAFINESQUINA ALTERNISTRIATA* Hall and Clarke. See *Rafinesquina alternata alternistriata*.

*RAFINESQUINA? ATAVA* Schuchert. See *Eoorthis atava*.

***Rafinesquina aurora* (Billings).**

*Strophomena aurora* Billings, Geol. Surv. Canada, Pal. Fossils, 1, 1865, p. 218, fig. 202.

*Rafinesquina aurora* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 338.

Chazyan (Quebec, K-N, P): Point Rich, Table Head, etc., Newfoundland.

***Rafinesquina ceres* (Billings).**

*Strophomena ceres* Billings, Canadian Nat. Geol., 5, 1860, p. 54; Geol. Surv. Canada, Pal. Fossils, 1, 1865, p. 119 (adv. sheets, 1862).

*Rafinesquina Ceres* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 120 (loc. occ.).—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 338.

Richmond: Charleton Point, Anticosti (Charleton); Stony Mountain, Manitoba (Stony Mountain).

Gamachian (Ellis Bay): Gamache Bay, Anticosti.

***Rafinesquina champlainensis* Raymond.**

*Rafinesquina champlainensis* Raymond, Bull. Amer. Pal., 1902, 3, p. 37, pl. 18, fig. 5, 6; Ann. Carnegie Mus., 7, p. 233, figs. 6-9.

Chazyan: Crown Point, Valcour Island, Bluff Point, and Chazy, New York; Isle La Motte and South Hero, Vermont (Crown Point); East Tennessee (Lenoir).

***Rafinesquina declivis* (James).**

*Strophomena declivis* James, Cincinnati Quart. Jour. Sci., 1, 1874, p. 240.

*Rafinesquina declivis* Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 43, pl. 2, fig. 4; pl. 5, figs. 12a-d; *ibid.*, 17, 1912, p. 127, pl. 8, fig. 10.

Trenton (Cynthiana): Boyds Station, Kentucky.

***Rafinesquina? delicatula* Savage.**

*Rafinesquina? delicatula* Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 45, pl. 1, fig. 9.

Upper Medinan (Girardeau): Near Thebes, Illinois.

***Rafinesquina deltoidea* (Conrad).**

*Strophomena deltoidea* Conrad, 3d Ann. Rep. New York Geol. Surv., 1839, p. 64; 5th Rep., *ibid.*, 1841, p. 37.—Vanuxem, Geol. New York, Rep. 3d Dist., 1842, p. 46, fig. 2.—Emmons, Geology New York, Rep. 2d Dist., 1842, p. 389, fig. 2.—Mather, Nat. Hist. New York, Geol., 1, 1843, p. 397, fig. 2.—Owen, Amer. Jour. Sci. Arts, 47, 1844, p. 363, fig. 2; Geol. Expl. Iowa, Wisconsin, Illinois, 2d ed., 1844, p. 82, pl. 16, fig. 8; pl. 17, fig. 6.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 197.—Billings, Geol. Canada, 1863, p. 163, fig. 141.—

**Rafinesquina deltoidea**—Continued.

- Davidson, Mon. British Sil. Brach., Pal. Soc., 1871, p. 292, pl. 42, figs. 1-5; pl. 39, fig. 22.—Shaler, Mem. Geol. Surv. Kentucky, 1, 1876, p. 27.—Davidson, Mon. Brit. Sil. Brach., 5, Sil. Suppl., Pal. Soc., 1883, p. 197, pl. 15, figs. 16-32.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1125, figs. Strophomena camerata Conrad, Jour. Acad. Sci. Philadelphia, 8, 1842, p. 254, pl. 14, fig. 5.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 197.
- Leptæna camerata Hall, Pal. New York, 1, 1847, p. 106, pl. 31A, fig.
- Leptæna deltoidea Hall, Pal. New York, 1, 1847, p. 106, pl. 31A, fig. 3.
- Streptorhynchus (Strophonella) deltoidea Hall, 2d ed. Ann. Rep. New York State Geol., 1883, pl. 42, figs. 1, 2, 4 (not fig. 3).
- Rafinesquina deltoidea Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 9A, figs. 1, 2, 4.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 403, pl. 31, figs. 30, 31.—Whiteaves, Pal. Foss., 3, pt. 3, 1897, p. 170.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 212.
- Rafinesquina deltoidea var. Ruedemann, Bull. New York State Mus., 49, 1902, p. 17.
- Trenton: Trenton Falls, etc., New York; St. Paul, Cannon Falls, etc., Minnesota; Oshkosh, Wisconsin; Dubuque, Iowa; Pike County, Missouri; Ottawa, Lake Winnipeg, etc., Canada.

**Rafinesquina distans** Raymond.

- Rafinesquina distans Raymond, Ann. Carnegie Mus., 3, 1906, p. 575; 7, 1911, p. 234, pl. 35, fig. 1.
- Chazyan (Crown Point and Valcour): Valcour Island and Crown Point, New York.

RAFINESQUINA FASCIATA Hall and Clarke. See *Leptæna incrassata*.

**Rafinesquina imbrex** (?Pander) Billings.

- Strophomena imbrex (?Pander) Billings, Geol. Surv. Canada, Pal. Foss., 1, p. 128, fig. 106 (adv. sheets, 1862).
- Rafinesquina imbrex Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 338.
- Richmond (Charleton) and Gamachian (Ellis Bay): Anticosti.
- Observation.—Refers to a new species of *Leptæna* (Twenhofel).

**Rafinesquina incrassata** (Hall).

- Leptæna incrassata Hall, Pal. New York, 1, 1847, p. 19, pl. 4 bis, fig. 2.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 817, fig. 591.
- Strophomena incrassata Billings, Canadian Nat. Geol., 4, 1859, p. 443.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1128, fig.
- Rafinesquina incrassata Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 339.
- Chazyan: Chazy, New York (Crown Point and Valcour); East Tennessee (Lenoir).

**Rafinesquina kingi** (Whitfield).

- Strophomena kingi Whitfield, Ann. Rep. Geol. Surv. Wisconsin, 1877, p. 72; Geol. Wisconsin, 4, 1882, p. 261, pl. 12, figs. 15, 16.
- Rafinesquina alternata var. loxorhysis Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 407, pl. 31, figs. 35-37; pl. 32, figs. 59, 60.
- Rafinesquina kingi Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 283.
- Richmond (Maquoketa): Delafield, Wisconsin; near Spring Valley, Minnesota.

**Rafinesquina lata** Whiteaves.

- Rafinesquina lata Whiteaves, Canadian Rec. Sci., 1895, p. 392; Geol. Surv. Canada, Pal. Foss., 3, pt. 3, 1897, p. 172, pl. 19, figs. 2-5.
- Strophomena lata Miller, N. A. Geol. Pal., 2d App., 1897, p. 764 (gen. ref.).
- Richmond: Red River Valley and Lako Winnipeg, Manitoba.

*Rafinesquina leda* Whiteaves. See *Stropheodonta(?) leda*.

***Rafinesquina mesicosta* (Shumard).**

*Leptæna mesacosta* Shumard, Geol. Rep. Missouri, 1885, p. 205, pl. C, fig. 2.—

Keyes, Geol. Surv. Missouri, 5, 1895, p. 76.

*Rafinesquina mesicosta* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 339.—

Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 46, pl. 1, fig. 10, p. 70.

Upper Medinan: Cape Girardeau County, Missouri (Girardeau); near Thebes, Illinois; Edgewood, and Louisiana, Missouri (Edgewood).

***Rafinesquina mesicosta mesistria* Savage.**

*Rafinesquina?* *mesicosta* var. *mesistria* Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 70, pl. 4, fig. 6.

Upper Medinan (Edgewood): Louisiana, etc., Missouri; below Hamburg, Calhoun County, Illinois.

***Rafinesquina minnesotensis* (N. H. Winchell).**

*Strophomena deltoidea* Owen (not Conrad), Geol. Expl. Iowa, Wisconsin, and Illinois, 1844, pl. 16, fig. 8; pl. 17, fig. 6.

*Leptæna deltoidea* Owen, Geol. Rep. Wisconsin, Iowa, and Minnesota, 1852, p. 620, tab. 2B, fig. 10 (not the middle figure).

*Strophomena incrassata* Hall (not 1847), Geol. Wisconsin, 1, 1862, p. 42, fig. 16.—

Hall (not 1847), 2d Ann. Rep. New York State Geol., 1883, pl. 38, figs. 1-5.

*Strophomena minnesotensis* N. H. Winchell, 9th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1881, p. 120.

*Rafinesquina minnesotensis* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 283.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 401, pl. 31, figs. 25-29.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 212, fig. 252.

Black River: Minneapolis, etc., Minnesota; Beloit, Wisconsin; Decorah, Iowa; Kentucky; Tennessee.

***Rafinesquina minnesotensis inquassa* (Sardeson).**

*Strophomena inquassa* Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, 1892, p. 334, pl. 5, figs. 22-24.

*Rafinesquina minnesotensis* var. *inquassa* Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 403, pl. 31, figs. 27, 28.

Black River (Decorah): Minneapolis and St. Paul, Minnesota; Mineral Point, Wisconsin.

***Rafinesquina mucronata* Foerste.**

*Rafinesquina mucronata* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 265, pl. 2, fig. 7a, b.

Cincinnati (Pulaski): Vars, Chambly, etc., Quebec.

***Rafinesquina nasuta* (Conrad).**

*Strophomena nasuta* Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1842, p. 260.—

Emmons, Geol. New York, Rep. 3d Dist., 1842, p. 403, fig. 3.—Owen, Amer.

Jour. Sci. Arts, 47, 1844, p. 377, fig. 3; Geol. Expl. Iowa, Wisconsin, Illinois,

2d ed., 1844, p. 84, pl. 17, fig. 10.—Emmons, Amer. Geol., 1, pt. 2, 1885, pl.

15, fig. 22; pl. 17, fig. 3.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889,

p. 1129, figs.

*Strophomena alternata* var. *nasuta* Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 53.

*Rafinesquina alternata-nasuta* Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, p. 928, pl. 37, fig. 4.

**Rafinesquina nasuta**—Continued.

*Rafinesquina nasuta* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 263, pl. 3, figs. 2a, b; pl. 4, fig. 2c.

Cincinnati: Rome, etc., Oneida and Jefferson Counties, New York (Pulaski); Cincinnati, Ohio, and vicinity (Maysville).

**RAFINESQUINA NITENS** Hall and Clarke. See *Leptæna nitens*.

**Rafinesquina(?) obscura** Hall.

*Leptæna obscura* Hall, Pal. New York, 2, 1852, pp. 62, 103, pl. 21, figs. 2, 6.

*Strophomena obscura* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 82.

*Strophomena obscura?* Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 306, pl. 6, figs. 15, 16.

*Rafinesquina?* *obscura* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 283.

Clinton (Upper): Near Utica and Kirkland, New York; Cumberland Gap, Tennessee.

**Rafinesquina squamula** (James).

*Strophomena squamula* James, Cat. Foss. Cincinnati Group, 1871, p. 9 (nom. nud.); Cincinnati Quart. Jour. Sci., 1, 1874, p. 335.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 56.

*Rafinesquina squamula* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 283.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 264.

Eden and Maysville: Cincinnati, Ohio, and vicinity.

**Rafinesquina tenuilineata** (Conrad).

*Strophomena tenuilineata* Conrad, Jour. Acad. Nat. Sci., Philadelphia, 8, 1842, p. 259.—Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 70.

*Leptæna tenuilineata* Hall, Pal. New York, 1, 1847, p. 115, pl. 31B, fig. 8.

*Rafinesquina tenuilineata* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 340.

Trenton: New York.

**Rafinesquina ulrichi** (James).

*Strophomena(?) ulrichi* James, Paleontologist, 1, 1878, p. 6.

*Rafinesquina ulrichi* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 283, pl. 15A, figs. 37, 38.

Eden: Cincinnati, Ohio, and vicinity (Economy); New York (Indian Ladder).

**RAFINESQUINA UNICOSTATA** Hall and Clarke. See *Leptæna unicostata*.

**Rafinesquina winchesterensis** Foerste.

*Rafinesquina winchesterensis* Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 42, pl. 5, fig. 13a-c.

Trenton (Cynthiana): Cincinnati anticline area between Nicholas and Madison Counties, Kentucky.

**Rafinesquina winchesterensis filistriata** Foerste.

*Rafinesquina winchesterensis*—*filistriata* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1910, pl. 5, figs. 14, 15; 16, p. 43.

Trenton (Cynthiana): Area between Nicholas and Madison Counties, Kentucky.

**RAPHISTOMA** Hall.

Genotypes: *R. staminea* and *R. planistria* Hall.

*Raphistoma* Hall, Pal. New York, 1, 1847, p. 28.—Woodward, Man. Mollusca, pt. 3, 1856, p. 463.—Billings, Canadian Nat. Geol., 4, pp. 448-450.—Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 74.—Salter, Geol. Surv. Can-

**RAPHISTOMA**—Continued.

ada, dec. 1, 1859, p. 10, 11.—Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 317.—Miller, Cincinnati Quart. Jour. Sci., p. 318.—Koninck, Ann. Mus. Royal Hist. Nat. de Belgique, 6, 1881, p. 133.—Zittel, Handb. Pal., 2, 1882, p. 207.—Miller, N. A. Geol. Pal., 1889, p. 424.—Koken, Neues Jahrb. Min., Geol. Pal., 6, Beilage-Band, 1889, p. 315; Die Leitfossilien, Leipzig, 1896, p. 102, 396.—Whidborne, Mon. Dev. Fauna South England, 3, Pal. Soc., 1896, p. 54.—Koken, Bull. de l'Acad. Imp. Sci. St. Petersburg, 7, 1897, p. 161.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, pp. 931-940.—Koken, Neues Jahrb. Min., Geol. Pal., 1, 1898, pp. 14-15.—Pilsbry, Zittel-Eastman Textb. Pal., 1, 1900, p. 443.—Raymond, Ann. Carnegie Mus., 4, 1908, p. 175.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 952.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 627.—Dall, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 527.

**RAPHISTOMA** (part) of authors. See *Eotomaria* and *Raphistomina* Ulrich and Scofield, and *Eccylopterus Remele*.

**Raphistoma acutum** Hall and Whitfield.

*Raphistoma acuta* Hall and Whitfield, U. S. Geol. Expl. 40th Parl., 4, 1877, p. 235, pl. 1, figs. 20-22.

Pogonip: Ute Peak, Wahsatch Range, Utah.

*Cotypes*.—Cat. No. 17309, U.S.N.M.

**RAPHISTOMA AFFINIS** Foerste. See *Liospira affinis*.

**RAPHISTOMA ANGULATUM** Miller. See *Raphistoma stamineum*.

**Raphistoma apertum** Salter.

*Raphistoma aperta* Salter, Geol. Surv. Canada, dec. 1, 1859, p. 12, pl. 2, fig. 4.

*Pleurotomaria aperta* Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 947 (gen. ref.).

Black River (Leray): Allumette Island, Ottawa River, Canada.

**Raphistoma columbianum** Weller.

*Raphistoma columbiana* Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 128, pl. 4, figs. 3-5.

Canadian (Beekmantown): Columbia, New Jersey.

**Raphistoma compressum** Whitfield.

*Raphistoma compressum* Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 309, pl. 24, figs. 14, 15.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 849, figs.—Seely, Vermont State Geol., Rep. 7, 1910, pl. 62, figs. 14, 15.

Canadian (Beekmantown): Fort Cassin, Vermont.

**RAPHISTOMA DECIPIENS** Miller. See *Liospira decipiens*.

**Raphistoma halli** (Miller).

*Pleurotomaria Halli* Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 318, fig. 34.

*Raphistoma halli* Miller, N. A. Geol. Pal., 1889, p. 424, fig. 707.

Maysville (Fairmount): Cincinnati, Ohio.

**Raphistoma hortensia** (Billings).

*Pleurotomaria Hortensia* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 227, fig. 211.

*Raphistoma Hortensia* Whitfield, Bull. Amer. Mus. Nat. Hist., 3, 1890, p. 32, pl. 1, figs. 15, 16.

Canadian: Table Head, Newfoundland (Quebec—H); ?Fort Cassin, Vermont (Beekmantown).

**Raphistoma immaturum** (Billings).

- Pleurotomaria immatura Billings, Canadian Nat. Geol., 4, 1859, p. 454.  
 Raphistoma immaturum Raymond, Ann. Carnegie Mus., 4, 1908, p. 182, fig. 2.  
 Chazyan: Plattsburgh and Chazy, New York (Day Point); Montreal, Quebec (Aylmer).

RAPHISTOMA LABIATUM Lesley. See Raphistoma stamineum.

RAPHISTOMA LAPICIDA Salter. See Raphistomina lapicidum.

**Raphistoma leiosomellum** Sardeson.

- Raphistoma leiosomellum Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 99, pl. 5, figs. 7, 8; Jour. Geol., 11, p. 481, fig. 27.  
 Ozarkian (Oneota): Near Dresbach, Altura, and near Caledonia, Minnesota.

RAPHISTOMA LENTICULARIS of authors. See Liospira vitruvia.

**Raphistoma lewistonense** Sardeson.

- Raphistoma lewistonense Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 99, pl. 5, figs. 9, 10.  
 Ozarkian (Oneota): Lewiston, Shakopee, and Cannon Falls, Minnesota.

RAPHISTOMA MICULA James. See Liospira micula.

**Raphistoma minnesotense** (Owen).

- Straparollus (Euomphalus) minnesotensis Owen, Rep. Geol. Surv. Wisconsin, Iowa, Minnesota, 1852, p. 581, tab. 2, figs. 12, 13.  
 Euomphalus minnesotensis Miller, N. A. Geol. Pal., 1889, p. 404 (gen. ref.).  
 Straparollus minnesotensis Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1079, figs.  
 Raphistoma minnesotense Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 100, pl. 5, figs. 15-17; Jour. Geol., 11, p. 481, fig. 26.  
 Euomphalus? vaticinus Hall, 16th Ann. Rep. New York State Cab. Nat. Hist., 1863, p. 136, pl. 6, fig. 29; Trans. Albany Inst., 5, 1867, p. 115, pl. 1, fig. 29.  
 Ozarkian (Oneota): Minnesota and Iowa.

**Raphistoma multivolvatum** Calvin.

- Raphistoma multivolvatum Calvin, Amer. Geol., 10, 1892, p. 147; Bull. Lab. Nat. Hist., State Univ. Iowa, p. 192.  
 Ozarkian (Oneota): Northeastern Iowa.

RAPHISTOMA NASONI of authors. See Eotomaria supracingulata.

**Raphistoma?? niagarense** Whitfield.

- Raphistoma Niagarense Whitfield, Ann. Rep. for 1877, Wisconsin Geol. Surv., 1878, p. 82; Geol. Wisconsin, 4, 1882, p. 295, pl. 18, figs. 10-12.  
 Niagaran (Racine): Eastern Wisconsin.

**Raphistoma obtusum** Cleland.

- Raphistoma obtusa Cleland, Bull. Amer. Pal., 3, 1896, p. 125 (253), pl. 15, figs. 7-9; *ibid.*, 4, 1903, p. 18.  
 Canadian (Tribes Hill): Fort Hunter, New York.

**Raphistoma oweni** Sardeson.

- Raphistoma oweni Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 100, pl. 5, fig. 18.  
 Ozarkian (Oneota): St. Croix Valley, above Stillwater, Minnesota.

**Raphistoma paucivolvatum** Calvin.

*Raphistoma paucivolvatum* Calvin, Bull. Lab. Nat. Hist. State Univ. Iowa, 2, 1892, p. 192; Amer. Geol., 10, 1892, p. 147.

Ozarkian (Oneota): Northwestern Iowa.

**Raphistoma pepinense** (Meek).

*Euomphalus Pepinensis* Meek, Proc. Acad. Nat. Sci. Philadelphia, 1870, footnote, p. 62.

*Raphistoma pepinense* Calvin, Amer. Geol., 10, 1892, p. 146; Bull. Lab. Nat. Hist. State Univ. Iowa, 2, 1892, p. 192.

Ozarkian (Oneota): West side Lake Pepin, Minnesota; northeastern Iowa.

Observation.—Probably the same as *R. minnesotense*.

**Raphistoma peracutum** Ulrich and Scofield.

*Raphistoma peracutum* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 934, figs. d-f; p. 940, pl. 68, figs. 1-6.—Weller, Geol. Surv. New Jersey, Pal. 3, 1903, p. 180, pl. 12, figs. 22, 23.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 628, fig. 851a-d.

Black River: Goodhue County, Minnesota (Decorah); Jacksonburg, New Jersey (Jacksonburg).

*Cotypes*.—Cat. No. 45975, U.S.N.M.

**RAPHISTOMA PLANISTRIA** Hall. See *Raphistoma stamineum*.

**RAPHISTOMA PLANISTRIA** var. **PARVA** Hall. See *Raphistoma stamineum*.

**RAPHISTOMA PRÆVIUM** Whitfield. See *Liospira prævia*.

**Raphistoma richmondense** Ulrich.

*Raphistoma richmondensis* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 941, pl. 68, figs. 7-9.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res., Indiana, 1908, p. 972, pl. 41, figs. 6-6b.

Richmond (Whitewater): Richmond, Indiana.

*Holotype*.—Cat. No. 45976, U.S.N.M.

**RAPHISTOMA?** **ROTULIFORMIS** Meek. See *Polygyrata rotuliformis*.

**Raphistoma rotuloides** (Hall).

*Pleurotomaria rotuloides* Hall, Pal. New York, 1, 1847, p. 173, pl. 37, figs. 7a-c.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 161, pl. 6, fig. 10.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 715, fig.

*Raphistoma rotuloides* Miller, N. A. Geol. Pal., 1889, p. 425 (gen. ref.).

Trenton: Middleville, New York.

**Raphistoma ruidum** Sardeson.

*Raphistoma ruidum* Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 101, pl. 5, figs. 13, 14.

Canadian (Shakopee): Near Argyle, Wisconsin; Shakopee and Cannon Falls, Minnesota.

**Raphistoma stamineum** (Hall).

*Raphistoma staminea* Hall, Pal. New York, 1, 1847, p. 29, pl. 6, figs. 4, 5, 5a.—Billings, Canadian Nat. Geol., 1, 1856, p. 318, figs. 6, 7.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 817, fig. 594.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 1, fig. 2.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 851, figs.—Raymond, Ann. Carnegie Mus., 4, 1908, p. 180, pl. 47, figs. 11-13; pl. 48, figs. 1-6; pl. 55, figs. 5-8.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 628, figs. 848a, b, 849.



**Raphistoma stamineum**—Continued.

- Scalites stamineus* D'Orbigny, Prodr. de Pal., 1, 1849, p. 7 (gen. ref.).—Pictet, *Traité de Pal.*, 2d ed., 3, 1855, p. 163, pl. 62, fig. 26.—Emmons, *Amer. Geology*, 1, 1855, p. 159.
- Raphistoma planistria* Hall, Pal. New York, 1, 1847, p. 29, figs. 1, 2; pl. 6, figs. 3a, b.—Grabau and Shimer, *N. A. Index Fossils*, 1, 1909, p. 628.
- Scalites planistria* D'Orbigny, Prodr. de Pal., 1, 1849, p. 7 (gen. ref.).—Emmons, *Amer. Geology*, 1, 1855, p. 159, pl. 4, figs. 16, 17.
- Straparollus planistria* Emmons, *Amer. Geology*, 1, 1855, p. 233.
- Raphistoma planistria* var. *parva* Hall, Pal. New York, 1, 1847, p. 30, pl. 6, figs. 3c-e.—Raymond, *Ann. Carnegie Mus.*, 4, 1908, p. 176.
- Pleurotomaria* sp. Hall, Pal. New York, 1, 1847, p. 31, pl. 6, fig. 8.
- Pleurotomaria calyx* Billings, *Canadian Nat. Geol.*, 4, 1859, p. 455, figs. 30, 31, 32; *Geol. Canada, Geol. Surv. Canada*, 1863, p. 132, fig. 62a-c.—Lesley, *Geol. Surv. Pennsylvania, Rep. P 4*, 1889, p. 705, figs.—Raymond, *Ann. Carnegie Mus.*, 4, 1908, p. 177.
- Straparollus angulatus* Emmons, *Amer. Geology*, 1, pt. 2, 1855, p. 157.
- Raphistoma angulatum* Miller, *N. A. Geol. Pal.*, 1889, p. 424 (gen. ref.).
- Pleurotomaria crevieri* Billings, *Canadian Nat. Geol.*, 4, 1859, p. 456, figs. 33-35.—Raymond, *Ann. Carnegie Mus.*, 4, 1908, p. 177.
- Pleurotomaria pauper* Billings, *Canadian Nat. Geol.*, 4, 1859, p. 457.—Raymond, *Ann. Carnegie Mus.*, 4, 1908, p. 177.
- Maclurea labiatus* Emmons, *Geol. New York*, 2, 1842, p. 312, fig. 2.—Owen, *Amer. Jour. Sci. Arts*, 47, 1844, p. 359, fig. 2.
- Raphistoma labiatum* Lesley, *Geol. Surv. Pennsylvania, Rep. P 4*, 1889, p. 850, figs.
- Straparollus labiatus* Emmons, *Amer. Geology*, 1, pt. 2, 1855, p. 157, pl. 4, fig. 2.—Emmons, *Man. Geology*, 1860, p. 93, fig. 78.—Lesley, *Geol. Surv. Pennsylvania, Rep. P 4*, 1889, p. 1079, figs.
- Chazyan (Day Point—Valcour): Chazy, Crown Point, Valcour, etc., New York; Isle La Motte, Vermont; various localities in Canada; East Tennessee.
- Plesiotypes*.—Cat. No. 53634, U.S.N.M. (Raymond).

**Raphistoma striatum** (Emmons).

- Maclurea striata* Emmons, *Geol. Surv. New York, Rep. 2d Dist.*, 1842, p. 312, fig. 3.—Owen, *Amer. Jour. Sci. Arts*, 47, 1844, p. 358, fig. 3.
- Straparollus striatus* Emmons, *Man. Geol.*, 1860, p. 93, fig. 78.
- Scalites striata* Emmons, *Amer. Geology*, 1, 1855, pl. 4, fig. 20.
- Raphistoma striata* Hall, Pal. New York, 1, 1847, p. 28, pl. 6, figs. 2a-b.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 1, fig. 8.—Miller, *N. A. Geol. Pal.*, 1889, p. 425, fig. 709.—Lesley, *Geol. Surv. Pennsylvania, Rep. P 4*, 1889, p. 851, fig.—Raymond, *Ann. Carnegie Mus.*, 4, 1908, pp. 176, 178, pl. 47, figs. 4-10.—Grabau and Shimer, *N. A. Index Fossils*, 1, 1909, p. 627, fig. 848c, d.
- Chazyan: Chazy, Valcour Island, etc., New York (Day Point—Valcour); Aylmer, etc., Quebec (Aylmer).

**Raphistoma subplanum** Shumard.

- Raphistoma subplana* Shumard, *Trans. Acad. Sci. St. Louis*, 2, 1863, p. 106.—Keyes, *Missouri Geol. Surv.*, 5, 1894, p. 163.
- Canadian (Yellville): Ozark County, Missouri.

**RAPHISTOMA SUBTILISTRIATA** Miller. See *Liospira subtilistriata*.

**RAPHISTOMA TROCHISCUS** White. See *Polygyrata trochiscus*.

- RAPHISTOMINA** Ulrich and Scofield. Genotype: *Raphistoma lapicida* Salter.  
*Raphistomina* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, pp. 932-941.—  
 Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 629.
- Raphistomina denticulata** Ulrich.  
*Raphistoma denticulata* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 943, pl. 68,  
 figs. 21-23.  
 Trenton (Curdsville): Mercer County, Kentucky.  
*Cotypes*.—Cat. No. 45977, U.S.N.M.
- Raphistomina lapicida** (Salter).  
*Raphistoma lapicida* Salter, Geol. Surv. Canada, Canadian Org. Rem., dec. 1,  
 1859, p. 12, pl. 2, figs. 1-3.  
*Raphistomina lapicida* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897,  
 p. 934, figs. 5a-c; p. 942, pl. 68, figs. 18-20.—Grabau and Shimer, N. A. Index  
 Fossils, 1, p. 629, fig. 851e-g.  
 Black River: Allumette Island, Ottawa River, Canada (Leray); near Lebanon,  
 Tennessee.  
*Plesiotype*.—Cat. No. 45978, U.S.N.M.
- Raphistomina laurentina** (Billings).  
*Pleurotomaria Laurentina* Billings, Canadian Nat. Geol., 4, 1859, p. 354, fig. 6;  
 Geol. Canada, Geol. Surv. Canada, 1863, p. 117, fig. 28a-c (not d=*Pleuro-*  
*tomaria canadensis*).—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889,  
 p. 711, figs.  
*Raphistoma Laurentina* Whitfield, Bull. Amer. Mus. Nat. Hist., 2, 1889, p. 42  
 (loc. occ.).  
*Raphistomina laurentina* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1894,  
 p. 942 (gen. ref.).  
 Canadian (Romaine): Mingan Islands, Canada.
- Raphistomina modesta** Ulrich.  
*Raphistomina modesta* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 943, pl. 68,  
 figs. 14-17.  
 Stones River (Murfreesboro): Near Murfreesboro, Tennessee.  
*Holotype*.—Cat. No. 46071, U.S.N.M.
- Raphistomina rugata** Ulrich and Scofield.  
*Raphistomina rugata* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, pl. 68,  
 figs. 10-13.  
 Trenton (Prosser): Goodhue County, Minnesota.  
*Holotype*.—Cat. No. 45979, U.S.N.M.
- Raphistomina undulata** Raymond.  
*Raphistomina undulatum* Raymond, Ann. Carnegie Mus., 3, 1906, p. 576; *ibid.*,  
 4, 1908, p. 183, pl. 48, figs. 7-10.  
 Chazyan (Crown Point): Sloop Bay, Valcour Island, New York.
- RASTRITES BARRANDI** Hall. See *Thamnograptus capillaris*.
- RASTRITES BARRANDI** Harkness. See *Nemagraptus gracilis*.
- RASTRITES URCEOLUS** Eisel. See *Monograptus urceolus*.
- RAUFFELLA** Ulrich. Genotype: *R. filosa* Ulrich.  
*Rauffella* Ulrich, Amer. Geol., 3, 1889, pp. 234-235.—Miller, N. A. Geol. Pal., p.  
 163.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 75, pl. F,  
 figs. 16-20 (ext., 1893).—Ulrich, Harriman Alaska Expedition, 4, 1904, p. 129.

**Rauffella filosa** Ulrich.

*Rauffella filosa* Ulrich, Amer. Geol., 3, 1889, p. 237, figs. 1, 2, 4, p. 236.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 75, pl. F, figs. 16-18.

Black River (Decorah): Minneapolis, St. Paul, Fountain, etc., Minnesota; Decorah, Iowa.

*Cotypes*.—Cat. Nos. 46567, 46568, U.S.N.M.

**Rauffella? fucoida** Sardeson.

*Rauffella? fucoida* Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 78, pl. 4, figs. 5, 6.

St. Peter: Fountain, Minnesota.

**Rauffella palmipes** Ulrich.

*Rauffella palmipes* Ulrich, Amer. Geol., 3, 1889, p. 238, fig. 3. on p. 236.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 76, pl. F, figs. 19, 20 (ext., 1893).

Black River (Decorah): Minneapolis and St. Paul, Minnesota.

*Cotypes*.—Cat. No. 46569, U.S.N.M.

**RECEPTACULITES** DeFrance.

Genotype: *P. neptuni* DeFrance.

*Receptaculites* DeFrance, Dict. Sci. Nat., 45, 1827, p. 5, atlas, pl. 68.—Dana, Wilkes' U. S. Expl. Exped., 7, 1846, Zoophytes, p. 700.—Salter, Canadian Org. Rem., Geol. Surv. Canada, dec. 1, 1859, p. 43.—Eichwald, Lethaea Rossica, 1860, p. 427.—Hall, Rep. Supt. Geol. Surv. Wisconsin, 1861, p. 13; 16th Rep. New York State Cab. Nat. Hist., 1863, pp. 67-69.—Billings (part), Pal. Foss., 1, Geol. Surv. Canada, 1865, pp. 378-388, figs. 353-357; Canadian Nat. Geol., 2d ser., 2, 1865, pp. 184-195, figs. 1-5.—Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 86.—Dames, Zeits. d. d. geol. Gesell., 20, 1868, p. 483.—Kayser, *ibid.*, 27, 1875, p. 781.—Gumbel, Anhandl. d. k. bayer Akad. d. Wissench., 12, 1875, p. 170.—Zittel, Handb. Pal., 1, 1876, p. 83.—Roemer, Leth. Pal., 1876, p. 285; *ibid.*, 1880, p. 286.—Jones, Cat. Foss. Foraminifera British Mus., 1882, p. 83.—Hinde, Quart. Jour. Geol. Soc. London, 40, 1884, p. 821.—James, Jour. Cincinnati Soc. Nat. Hist., 8, 1885, p. 163; *ibid.*, 9, 1886, pp. 246, 249.—Schluter, Zeits. d. d. geol. Gesell., 39, 1887, p. 1.—Rauff, *ibid.*, 40, 1888, p. 606.—Nicholson, Manual Pal., 1, 1889, p. 170, figs. 61a-d; 2, p. 1563.—Miller, N. A. Geol. Pal., 1889, pl. 163.—James, Jour. Cincinnati Soc. Nat. Hist., 14, 1891, pp. 60-62.—Rauff, Abh. d. math.-phys. Classe. d. k. bayer Akad. d. Wiss., 17, 3, 1892, p. 654.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 56, pl. F, figs. 1-4 (extr., 1893).—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 43.—Dawson, Canadian Rec. Sci., 7, 1896, p. 214.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 18; Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 72.

*Dictuocrinites* Conrad, figured on pl. intended to accompany Geol. Rep. New York, 1841.—Hall, 15th Rep. New York State Cab. Nat. Hist., 1862, pl. 11, fig. 22.

*Dictuocrinites* (Conrad MS) Hall, Pal. New York, 3, for 1859, 1861, pp. 135, 148.—Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 86.—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 77 (Genotype: *D. squamifer* Conrad).

*Dictuocrinus* (*Dictuocrinites*) Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 367.

**Receptaculites arcticus** Etheridge.

*Receptaculites arcticus* Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 576.—Jones, Cat. Foss. Foram. British. Mus., 1882, p. 3.—Hinde, Quart.

**Receptaculites arcticus**—Continued.

Jour. Geol. Soc. London, 40, 1884, p. 845.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 59 (extras, 1893).

Ordovician: Cape Louis Napoleon and Cape Frazer, Arctic America.

**Receptaculites biconstrictus** Ulrich.

*Receptaculites biconstrictus* (Ulrich MS) Bassler, Bull. Virginia Geol. Surv., 2a, 1909, pl. 21, figs. 4, 5.

Chazyan (Ottosee): Speer Ferry, Virginia, southward to Knoxville, Tennessee.

*Cotypes*.—Cat. No. 49578, U.S.N.M.

**Receptaculites calciferus** Billings.

*Receptaculites calciferus* Billings, Canadian Nat. Geol., 2d ser., 2, 1865, p. 190, text. fig. 6; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 359, fig. 346; p. 834, fig. 358.—Hinde, Quart. Jour. Geol. Soc. London, 40, p. 845.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 60 (extr., 1893).

Canadian (Romaine): Mingan Islands, Quebec.

RECEPTACULITES CANADENSIS Billings. See *Ischadites canadensis*.

RECEPTACULITES CIRCULARIS Emmons. See *Ischadites circularis*.

RECEPTACULITES DICKHAUTI James. See *Lepidolites dickhauti*.

**Receptaculites dixonensis** Miller and Gurley.

*Receptaculites dixonensis* Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 11, 1896, p. 47, pl. 5, figs. 21, 22.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 723 figs. 1267–1268.

Trenton (Galena): Near Dixon, Illinois.

**Receptaculites? elegantulus** Billings.

*Receptaculites? elegantulus* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 360, fig. 347.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, Pal., 1895, p. 61 (extras, 1893).

Canadian (Romaine): Mingan Islands, Quebec.

**Receptaculites ellipticus** Walcott.

*Receptaculites ellipticus* Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 67, pl. 11, fig. 12.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, Pal., 1895, p. 60 (extr., 1893).

Upper Pogonip: White Mountain, Eureka District, Nevada.

*Holotype*.—Cat. No. 24548, U.S.N.M.

**Receptaculites elongatus** Walcott.

*Receptaculites elongatus* Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 66.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, Pal., 1895, p. 60.

Upper Pogonip: White Pine District, Nevada.

*Cotypes*.—Cat. No. 24635, U.S.N.M.

RECEPTACULITES FORMOSUS Meek and Worthen. See *Receptaculites tessellatus*.

RECEPTACULITES FUNGOSUM Hall. See *Ischadites iowensis*.

RECEPTACULITES GLOBULARE Hall. See *Ischadites iowensis*.

**Receptaculites hemisphericus** (Hall).

*Receptaculites hemisphericum* Hall, Rep. Supt. Geol. Surv. Wisconsin, 1861, p. 16.—Whitfield, Geol. Wisconsin, 4, 1882, p. 269, pl. 13, fig. 4; Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 46, pl. 5, figs. 3, 4.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 19.

**Receptaculites hemisphericus**—Continued.

*Ischadites koenigii* (part) Hinde, Quart. Jour. Geol. Soc. London, 40, 1884, p. 836.

*Ischadites hemisphericus* Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 66 (extr., 1893).

Niaganan (Racine): Racine and Waukesha, Wisconsin.

RECEPTACULITES INFUNDIBULUM Hall. See *Receptaculites tessellatus*.

RECEPTACULITES? INSULARIS Billings. See *Ischadites insularis*.

RECEPTACULITES IOWENSIS Billings. See *Ischadites iowensis*.

**Receptaculites mammillaris** Walcott.

*Receptaculites mammillaris* Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 65, pl. 11, fig. 11.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 60.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 19.

Upper Pogonip: Eureka and White Pine Districts, Nevada.

*Cotypes*.—Cat. No. 24636, U.S.N.M.

RECEPTACULITES NEPTUNI Hall. See *Receptaculites occidentalis*.

**Receptaculites occidentalis** Salter.

*Receptaculites neptuni* Hall (not DeFrance), Pal. New York, 1, 1847, p. 68, pl. 24, figs. 3a-3d.—Emmons, Amer. Geol., pt. 2, 1855, p. 230, pl. 14, fig. 1.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 853, figs.—Girty, 48th Rep. New York State Mus., 2, 1897, p. 287; 14th Rep. State Geol. New York, 1894, p. 287.

*Receptaculites occidentalis* Salter, Canadian Org. Rem. Geol. Surv. Canada, dec. 1, 1859, p. 45, pl. 10, figs. 1-7.—Billings, Geol. Canada, 1863, p. 937.—Hall, 16th Ann. Rep. New York State Cab. Nat. Hist., 1863, p. 69.—Billings, Pal. Foss. Geol. Surv. Canada, 1, 1865, p. 381, figs. 354-356; Canadian Nat. Geol., 2d ser., 2, 1865, p. 187, figs. 2-4.—Gumbel, Abh. d. Math.-Phys. Classe, d. k. Bay. Akad. d. Wiss., 12, 1, Abth., 1875, p. 173.—Etheridge, Quart. Jour. Geol. Soc. London, 34, 1875, p. 577.—Hinde, Quart. Jour. Geol. Soc. London, 40, 1884, p. 842, pl. 37, figs. 3, 3a-m.—Miller, N. A. Geol. Pal., 1889, p. 164, figs. 119-121.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, Pal., 1895, p. 60 (extr., 1893).—Weller, Geol. Surv. New Jersey Pal., 3, 1903, p. 135, pl. 6, figs. 2-4.

Black River: Pauquettes Rapids, Ottawa River, Canada (Leray); near High Bridge, Kentucky; ?Carlisle, Pennsylvania; New Jersey; Cape Louis Napoleon, Arctic America.

RECEPTACULITES OCCIDENTALIS Hinde (part). See *Receptaculites oweni*.

**Receptaculites ohioensis** Hall and Whitfield.

*Receptaculites Ohioensis* Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 123, pl. 6, fig. 1.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 854, fig.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 19, fig. 29.

Niaganan: Yellow Springs, Ohio.

**Receptaculites oweni** Hall.

*Coscinopora sulcata* Owen (not Goldfuss), Geol. Rep. of Iowa, Wisconsin, and Illinois, 1884, p. 40, pl. 7, fig. 5.

*Receptaculites oweni* Hall, Rep. Supt. Geol. Surv. Wisconsin, 1861, p. 11-13; Geol. Rep. Wisconsin, 1862, p. 46, fig. 2, and p. 429.—Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 302, pl. 2, fig. 3.—Whitfield, Geol. Wisconsin, 4, 1882, p. 239, pl. 10, fig. 7.—Hall, 12th Rep. State Geol. of Indiana, 1883,

**Receptaculites oweni**—Continued.

p. 243, pl. 1, fig. 1; p. 246, text figs. 1-3.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1893, p. 57, pl. F, figs. 1-4.—Hall, 16th Ann. Rep. New York State Cab. Nat. Hist., 1863, p. 69.—Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 384, fig. 359; Canadian Nat. Geol., n. s., 2, 1865, p. 189, fig. 7.—Whiteaves, Geol. Surv. Canada, Rep. Progr. for 1878-1879, 1880, p. 45c.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 166, fig.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 854, fig.—Keyes, Missouri Geol. Surv., 4, 1894, p. 103, pl. 12, figs. 2a, b.—Girty, 14th Rep. State Geol. New York for 1894, 1897, p. 284, pl. 6, figs. 1-4; 48th Rep. New York State Mus., 2, for 1895, 1897, p. 284, pl. 6, figs. 1-4.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 44, pl. 5, figs. 8-11.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 142.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 152.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 18, fig. 28.—Holtodahl, Vidensk. Skrifter, 1, No. 9, 1912, p. 4, pl. 1, figs. 1, 2; pl. 4, fig. 3.

*Receptaculites occidentalis* (part) Hinde, Quart. Jour. Geol. Soc. London, 40, 1884, p. 842.

Black River and Trenton: Wisconsin; Illinois; Iowa; Missouri; Minnesota; Manitoba; Arctic America.

*Plesio*type.—Cat. No. 56616, U.S.N.M. (Meek and Worthen).

**Receptaculites pearyi** Whitfield.

*Receptaculites pearyi* Whitfield, Bull. Amer. Mus. Nat. Hist., 13, 1900, p. 19, pl. 1, fig. 1.

Niagaran: Cope Bay, Princess Marie Bay, Greenland.

**RECEPTACULITES RETICULATUS** James. See *Anomaloides reticulata*.

**RECEPTACULITES RETICULATUS** Hall. See *Ischadites iowensis*.

**Receptaculites? sacculus** Hall.

*Receptaculites sacculus* Hall, 11th Rep. State Geol. Indiana, 1882, p. 222, pl. 1, fig. 5; Trans. Albany Inst., 10, 1883, p. 57.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 855, figs.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 61 (extras, 1893).

Niagaran (Waldron): Waldron, Indiana.

**RECEPTACULITES SUBTURBINATUS** Hall. See *Ischadites subturbinatus*.

**Receptaculites tessellatus** (Winchell and Marcy).

*Ischadites tessellatus* Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 85, pl. 2, fig. 3.—Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, pp. 390-395.—Hinde, Quart. Jour. Geol. Soc. London, 40, 1884, p. 839.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 66.

*Receptaculites infundibulum* Hall, Rep. Sup. Geol. Surv. Wisconsin, 1861, p. 16.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 46, pl. 5, figs. 1, 2.

*Receptaculites formosus* Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1870, p. 22; Geol. Surv. Illinois, 4, 1875, p. 500, pl. 24, fig. 1.

Niagaran (Racine): Bridgeport, Illinois; Racine, Wisconsin.

**REMOPLEURIDES** Portlock.

Genotype: *Remopleurides colbii* Portlock.

*Remopleurides* Portlock, Geol. Rep. Londonderry, 1843, p. 254.—Emmrich, Neues Jahrb. f. Min., etc., 1845, p. 45.—Hawle and Corda, Abh. d. k. böhmischen Gesell. d. Wiss., 5, (Extract), 1847, pp. 111, 113, pl. 6, fig. 59.—Barrande, Neues Jahrb. Min., Geol. Pal., 1850, p. 777.—Angelin, Pal. Scandinavica, 3d ed., Holmiae, 1852, p. 13.—Barrande, Syst. Sil. du Centre

**REMOPLEURIDES**—Continued.

Boheme, 1, 1852, p. 356, pl. 45.—Salter, Mem. Geol. Surv. United Kingdom, dec. 7, 1853, pl. 8, Rep. 22d Meeting British Assoc. Adv. Sci., Notes and Abstracts, 1853, p. 60.—Pictet, Traite de Pal., 2d ed., 2, 1854, p. 488.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1880, p. 145.—Zittel, Handb. Pal., 2, 1885, p. 599.—Miller, N. A. Geol. Pal., 1889, p. 565.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 7th ser., 47, 1894, p. 87.—Krause, Jahrb. d. Konig. Preuss. geol. Landesanst. u. Berg-akad. for 1894, 1895, p. 109.—Koken, Die Leitfossilien, Leipzig, 1896, p. 15.—Beecher, Zittel-Eastman Textb. Pal., 1, 1900, p. 628.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 34, No. 8, 1901, p. 16.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 270.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 717.

**Remopleurides affinis** Billings.

*Remopleurides affinis* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 325, fig. 313.

Canadian (Beekmantown): Stanbridge, Quebec.

**Remopleurides canadensis** Billings.

*Remopleurides canadensis* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 182, fig. 164.—Raymond, Ann. Carnegie Mus., 3, 1905, p. 334, pl. 10, figs. 8-10; p. 366, fig. 9.—Bassler, Bull. Virginia Geol. Surv., 2A, 1909, p. 111, fig. 10.—Raymond, Ann. Carnegie Mus., 7, 1910, p. 60; 7th Rep. Vermont State Geol., 1910, p. 217, pl. 32, figs. 8-10.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 270, fig. 1564.

Chazyan: Township of Clarence, etc., Quebec; Chazy, Valcour Island, etc., New York (Crown Point); Lexington, Virginia (Liberty Hall).

**REMOPLEURIDES LINGUALIS** Grabau and Shimer. See *Remopleurides linguatus*.

**Remopleurides linguatus** Ruedemann.

*Remopleurides* (*Caphyra*) *linguatus* Ruedemann, Bull. New York State Mus., 49, 1901, p. 56, pl. 3, figs. 21-29.

*Remopleurides lingualis* Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 270, fig. 1565.

Mohawkian (Rysedorph): Rysedorph Hill, Rensselaer County, New York.

**REMOPLEURIDES MAGNIFICUS** Billings. See *Hungaia magnifica*.

**Remopleurides panderi** Billings.

*Remopleurides Panderi* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 293, fig. 283.

Chazyan (Quebec—N.): Table Head, Newfoundland.

**Remopleurides schlotheimi** Billings.

*Remopleurides?* *Schlotheimi* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 284, fig. 284a, b.

*Apatokephalus Schlotheimi* Brögger, Nyt Mag. f. Naturvid., 36, 1897, p. 175, fig. 8a, b; p. 184.

Chazyan (Quebec—N, P.): Table Head, Pistolet Bay, and near Portland Creek, Newfoundland.

**Remopleurides striatulus** Walcott.

*Remopleurides striatulus* Walcott, Cincinnati Quart. Jour. Sci., 2, 1875, p. 347, fig. 27A, a, b.—Miller, N. A. Geol. Pal., p. 566, fig. 1054.

Trenton: Trenton Falls, New York.

**Remopleurides tumidus** Ruedemann.

*Remopleurides tumidus* Ruedemann, Bull. New York State Mus., 49, 1901, p. 54, pl. 4, figs. 2-4.

Mohawkian (Rysedorph): Rysedorph Hill, Rensselaer County, New York.

**RENSELÆRIA** Hall.

Genotype: *Terebratula ovoides* Eaton.

*Rensselæria* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 39; Pal.

New York, 3, 1859, p. 454.—Dall, Amer. Jour. Conch., 6, 1870, p. 105.—Claypole, Proc. Amer. Philos. Soc., 1883, p. 235.—Hall and Clarke, Pal. New

York, 8, pt. 2, 1893, p. 255; 13th Ann. Rep. New York State Geol., 1895, p. 849.

**Rensselæria keyserensis** Swartz.

*Rensselæria keyserensis* Swartz, Maryland Geol. Surv., Low. Dev., 1913, p. 384, pl. 66, figs. 26-28.

Helderbergian (Keyser): Three-fourths mile southwest of Rawlings, Maryland.

**Rensselæria mutabilis** (Hall).

*Meganteris mutabilis* Hall, 10th Ann. Rep. New York State Cab. Nat. Hist., 1857, p. 97.

*Rensselæria mutabilis* Hall, Pal. New York, 3, 1859, p. 254, pl. 45, figs. 2a-2p.—Schuchert and Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 378, pl. 66, figs. 5, 6.

Helderbergian: Albany County, New York (New Scotland): Keyser, West Virginia; near Cumberland, Corriganville, and Tonoloway, Maryland (Keyser).

**Rensselæria (Beachia) proavita** Schuchert.

*Rensselæria (Beachia) proavita* Schuchert and Maynard, Maryland Geol. Surv., Low Dev., 1913, p. 385, pl. 67, figs. 1-3.

Helderbergian (Keyser): Pinto, Maryland; New Bloomfield, Pennsylvania.

**RETEOCRINUS** Billings.

Genotype: *R. stellaris* Billings.

*Reteocrinus* Billings, Geol. Surv. Canada, dec. 4, 1859, p. 63.—Wetherby, Jour.

Cincinnati Soc. Nat. Hist., 4, 1881, p. 83.—Wachsmuth and Springer, Proc.

Acad. Nat. Sci. Philadelphia, 1881, p. 365 (Rev. Pal., pt. 2, p. 191); *ibid.*,

1887, p. 105; 1890, pp. 353-390.—Miller, Jour. Cincinnati Soc. Nat. Hist.,

5, 1882, p. 36.—Wachsmuth and Springer, Amer. Jour. Sci., 3d ser., 25, 1883,

p. 255.—Miller, Amer. Jour. Sci., 1883, pp. 105, 113.—Carpenter, Phil. Trans.

Royal Soc. London, 174, 1884, pp. 923, 924, 927, 930; Proc. Royal Soc. Lon-

don, 35, 1883, p. 139.—Miller, N. A. Geol. Pal., 1889, p. 277.—James, Jour.

Cincinnati Soc. Nat. Hist., 19, 1897, pp. 101, 102.—Wachsmuth and Springer,

Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 176.—Bather, Treatise on

Zool., pt. 3, Echinoderma, London, 1900, p. 198.—Wachsmuth, Zittel-Eastman

Textb. Pal., 1, 1900, p. 144.—Grabau and Shimer, N. A. Index Fossils, 2,

1910, p. 546.—Springer, Geol. Surv. Canada, Mem. 15P, 1911, p. 9; Zittel-

Eastman Textb. Pal., 2d ed., 1913, p. 186.

*Gaurocrinus* Miller, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, pp. 219-228.—

Carpenter, Phil. Trans. Royal Soc. London, 174, 1884, p. 932.—Miller, N. A.

Geol. Pal., 1889, p. 246.—Bather, Treatise on Zool., pt. 3, Echinoderma,

London, 1900, p. 203. (Genotype: *Glyptocrinus nealli* Hall.)

**Reteocrinus alveolatus** Miller and Gurley.

*Reteocrinus alveolatus* Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 5,

1894, p. 26, pl. 2, fig. 22.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 752,

fig. 1390.—Springer, Geol. Surv. Canada, Mem. 15P, 1911, p. 10, pl. 1, figs. 1-5.

Trenton (Curdsville): Mercer County, Kentucky; Kirkfield, Ontario.



**RETEOCRINUS BAERI** Miller. See *Xenocrinus baeri*.

**RETEOCRINUS COGNATUS** Wachsmuth and Springer. See *Reteocrinus nealli*.

**Reteocrinus fimbriatus** Billings.

*Reteocrinus?* *fimbriatus* Billings, Geol. Surv. Canada, dec. 4, 1859, p. 65, pl. 9, figs. 3a-c; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 8 (loc. ref.).—Wachsmuth and Springer, Amer. Jour. Sci., 25, 1893, p. 266; Mem. Mus. Comp. Zool., Harvard, 1897, p. 179, pl. 9, fig. 4.

Richmond (Charleton): Charleton Point, Anticosti.

**RETEOCRINUS GRACILIS** Wetherby. See *Ptychocrinus parvus*.

**Reteocrinus magnificus** Miller.

*Gaurocrinus magnificus* Miller, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 230, pl. 11, fig. 2.

*Reteocrinus magnificus* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, p. 316 (Rev. Pal., pt. 3, sec. i, 1885, p. 94).—James, Jour. Cincinnati Soc. Nat. Hist., 19, 1897, p. 104.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 181, pl. 9, fig. 2.

Richmond (Waynesville): Warren County, Ohio.

*Plesiotype*.—Cat. No. 40757, U.S.N.M.

**Reteocrinus nealli** (Hall).

*Glyptocrinus Nealli* Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 206, pl. 5, figs. 18, 19 (separates, 1886, p. 2, and 1871, pl. 1, figs. 18, 19).—Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 34, pl. 2, figs. 3a-c.—Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 260, fig. 1.—Miller, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 37.—Carpenter, Phil. Trans. Royal Soc. London, 174, 1884, p. 931.—Dyche, Jour. Cincinnati Soc. Nat. Hist., 15, 1892, p. 101.

*Gaurocrinus nealli* Miller, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 228; N. A. Geol. Pal., 1889, p. 246, figs. 309, 310.

*Reteocrinus O'Nealli* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 367 (Rev. Pal., pt. 2, p. 193); Amer. Jour. Sci., 25, 1883, p. 260.—James, Jour. Cincinnati Soc. Nat. Hist., 19, 1897, p. 102.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 199, fig. 122.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 174, fig. 6.—Springer, *ibid.*, 25, 1905, pl. 1, figs. 14–21.

*Glyptocrinus cognatus* Miller, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 75, pl. 1, figs. 5, 5a.

*Gaurocrinus cognatus* Miller, *ibid.*, 6, 1883, p. 229.

*Reteocrinus cognatus* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 367 (Rev. Pal., pt. 2, p. 193).—James, Jour. Cincinnati Soc. Nat. Hist., 1897, 19, p. 103.

Richmond (Waynesville-Liberty): Lebanon, etc., Ohio.

*Cotype* and *plesiotype*.—Cat. Nos. 40756, 42145, U.S.N.M.

**RETEOCRINUS O'NEALLI** Wachsmuth and Springer. See *Reteocrinus nealli*.

**RETEOCRINUS PATTERSONI** Wachsmuth and Springer. See *Glyptocrinus pattersoni*.

**RETEOCRINUS RICHARDSONI** Wachsmuth and Springer. See *Glyptocrinus richardsoni*.

**Reteocrinus stellaris** Billings.

*Reteocrinus stellaris* Billings, Geol. Surv. Canada, dec. 4, 1859, p. 64, pl. 9, figs. 4a-c.—Wachsmuth and Springer, Amer. Jour. Sci., 3d ser., 25, 1883, p. 261, figs. 1-3.—Carpenter, Phil. Trans. Royal Soc. London, 174, 1884, p. 931.—

**Reteoerlnus stellaris**—Continued.

Miller, N. A. Geol. Pal., 1889, p. 277, fig. 416.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 178, pl. 9, figs. 3a-c.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 547.—Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 10, pl. 1, figs. 6, 7.

Trenton (Curdsville): Ottawa, Ontario.

**RETEOCRINUS SUBGLOBOSUS** Wachsmuth and Springer. See *Glyptocrinus subglobosus*.

**RETEOGRAPTUS** Hall. See *Retiograpthus* Hall.

**RETEPORA** of authors (not Lamarck, 1801). See *Chasmatopora* Eichwald.

*Retepora clintonii* Vanuxem. Not defined.

*Retepora clintonii* Vanuxem, Geol. Rep. 3d Dist. New York, 1842, p. 87

Clinton: No locality given.

**RETEPORA DIFFUSA** Hall. See *Pseudohornera diffusa*.

**RETEPORA FOLIACEA** Hall. See *Bucania punctifrons*.

**RETEPORA TRENTONENSIS** Nicholson. See *Chasmatopora fenestrata*.

**RETICULARIA** McCoy. Genotype: *Terebratula imbricata* Sowerby.

*Reticularia* McCoy, Carboniferous Fossils of Ireland, 1844, p. 142.—Waagen, Pal. Indica, 13th ser., 1, 1883, p. 538.—Davidson, Mon. British Brach. 5, Sil. Suppl., Pal. Soc., 1882, p. 80.—Koken, Die Leitfossilien, Leipzig, 1896, p. 242, fig. 203, 1.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 763.—Schellwien, Abhandl. d. k. k. geol. Reichsanst., 16, Heft 1, 1900, p. 82, fig. 13.—Girty, U. S. Geol. Surv., Prof. Pap. 16, 1903, p. 387.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 412.

*Spirifer* subgenus *Prosserella* Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 138.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 412. (Genotype: *P. modestoides* Grabau.)

**Reticularia bicostata** (Vanuxem).

*Orthis bicostatus* Vanuxem, Geol. New York, Rep. 3d Dist., 1842, pp. 91, 94.

*Spirifer bicostatus* Hall, Pal. New York, 2, 1852, p. 263, pl. 54, fig. 4.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, pp. 19, 37, pl. 36, fig. 7.

*Spirifera bicostata* Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 61, fig. 7.

*Reticularia bicostata* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 341.—Weller, Geol. Surv. New Jersey, Pal. 3, May, 1903, p. 239, pl. 21, figs. 44, 45.—Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 420, pl. 72, figs. 8-10.

*Spirifer* cf. *bicostatus* Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 44, pl. 4, figs. 21, 22.

Helderbergian: Vernon Center, New York; Roundtop, Maryland (Keyser); New Jersey (Decker Ferry).

**Reticularia bicostata petila** (Hall).

*Spirifera bicostata?* var. *petila* Hall, Desc. n. sp. Fossils from Waldron, Indiana, 1879, p. 15.

*Spirifera bicostata* var. *petila* Hall, 11th Rep. State Geol. Indiana, 1882, p. 279, pl. 27, figs. 8, 9; Trans. Albany Institute, 10, 1883, p. 71.

*Spirifer bicostatus* var. *petilus* Beecher and Clarke, Mem. New York State Mus., 1, 1889, p. 75, pl. 6, figs. 1-3.

*Reticularia bicostata petila* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 341.

*Spirifer petilus* Grabau, Bull. New York State Mus., 69, 1903, p. 1045.

Niagaran (Waldron): Waldron, Indiana.

**Reticularia dubia** (Nettelroth).

*Spirifera dubia* Nettelroth, Kentucky Fossils Shells, Mem. Kentucky Geol. Surv., 1889, p. 115, pl. 33, figs. 23, 24.

Niagaran (Louisville): Louisville, Kentucky.

*Holotype*.—Cat. No. 51334, U.S.N.M.

**Reticularia (Prosserella) lucasi** (Grabau).

*Prosserella lucasi* Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 142, pl. 16, fig. 21; pl. 19, figs. 2, 3; pl. 21, fig. 23.

Upper Monroan (Lucas): Near Sylvania, Lucas County, Ohio; Salt shaft, Detroit, Michigan.

RETICULARIA MODESTA—Schuchert. See *Spirifer (Delthyris) modestus*.

**Reticularia (Prosserella) modestoides** (Grabau).

*Prosserella modestoides* Grabau, Michigan Geol. Surv., Geol. Ser. 1, 1909, p. 139, pl. 16, figs. 20, 22, 23; pl. 21, figs. 28–30.

Upper Monroan: Salt shaft, Detroit, Michigan (Anderdon); Detroit River bed, opposite Amherstburg, Ontario (Amherstburg).

**Reticularia (Prosserella) modestoides depressus** (Grabau).

*Prosserella modestoides* mut. *depressus* Grabau, Michigan Geol. Surv., Geol. Ser. 1, 1909, p. 141, pl. 21, figs. 24–26, 31–33.

Upper Monroan (Amherstburg): Detroit River bed, opposite Amherstburg, Ontario.

**Reticularia pegramensis** Foerste.

*Reticularia pegramensis* Foerste, Jour. Geol., 11, 1903, p. 710; Bull. Sci. Lab. Denison Univ., 14, 1909, p. 92, pl. 2, fig. 31a, b.

Niagaran (Brownsport): Pegram, Tennessee.

**Reticularia (Prosserella) planisinosa** (Grabau).

*Prosserella planisinosa* Grabau, Michigan Geol. Surv., Geol. Ser. 1, 1909, p. 147, pl. 16, figs. 19 and 26; pl. 18, fig. 8.

Upper Monroan (Lucas): Salt shaft, Detroit, Michigan.

**Reticularia proxima** Kindle and Breger.

*Reticularia proxima* Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 443, pl. 9, figs. 6–8.

Niagaran: Fishersburg, Hamilton County, Indiana.

**Reticularia septentrionalis** Whiteaves.

*Reticularia septentrionalis* Whiteaves, Geol. Surv. Canada, Ann. Rep., n. s., 14, App. F, 1904, p. 44; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 253, pl. 27, figs. 2, 3, 4, 5.

Niagaran: Ekwan River, Canada.

**Reticularia (Prosserella) subtransversa** (Grabau).

*Prosserella subtransversa* Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 143, pl. 21, fig. 27; pl. 18, figs. 7, 9; pl. 19, figs. 1, 4–8, 12, 13.

Upper Monroan (Amherstburg): Monroe County, Michigan.

**Reticularia (Prosserella) subtransversa alta** (Grabau).

*Prosserella subtransversa* mut. *alta* Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 145, pl. 18, fig. 10.

Upper Monroan (Amherstburg): Monroe County, Michigan.

**Reticularia (Prosserella) unilamellosa** (Grabau).

*Prosserella unilamellosus* Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 146, pl. 19, figs. 9-11.

Upper Monroan (Lucas): Patrick quarry, Grosse Isle, Detroit River.

**RETIAGRAPTUS** Hall.

Genotype: *Graptolithus tentaculatus* Hall.

*Retiograptus* Hall, Geol. Surv. Canada, dec. 2, 1865, p. 115; 20th Rep. New York State Cab. Nat. Hist., 1868, p. 218; rev. ed., p. 251.—Zittel, Handb. Pal., 1, 1879, p. 302.—Spencer, Trans. Acad. Sci. St. Louis, 4, 1884, p. 562.—Miller, N. A. Geol. Pal., 1889, p. 202.—Koken, Die Leitfossilien, Leipzig, 1896, p. 329.—Roemer and Frech, Leth. geog., 1 Theil, Leth. Pal., 1, 3 Lief., 1897, p. 607.—Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 732, 633; *ibid.*, Mem. 11, pt. 2, 1908, p. 462.

*Reteograptus* Hall, Pal. New York, 3, 1859, p. 518; 13th Rep. New York State Cab. Nat. Hist., 1860, p. 61.—Gurley, Jour. Geol., 4, 1896, p. 80.

*Retiograpsus* Nicholson, Mon. British Grapt., 1872, p. 123.

*RETIAGRAPTUS BARRANDEI* Hall. See *Retiograptus geinitzianus*.

*RETIAGRAPTUS EUCHARIS* Hall. See *Lasiograptus (Thysanograptus) eucharis*.

**Retiograptus geinitzianus** (Hall).

*Retiograptus geinitzianus* Hall, Pal. New York, 3, 1859, p. 518.—Gurley, Jour. Geol., 4, 1896, p. 80.—Frech, Leth. Pal., 1, 1897, p. 608.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 215, pl. 16, fig. 18.

*Retiograptus geinitzianus* Walcott, Trans. Alb. Inst., 10, 1883 (adv. sheets, 1879, p. 35); Bull. Geol. Soc. Amer., 1, 1890, p. 339.—Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 224.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 463-467, pl. 29, figs. 5, 6; pl. 31, figs. 9-17, figs. 444, 445.

*Clathrograptus geinitzianus* Lapworth, Ann. Mag. Nat. Hist., 5, 1880, p. 22.—T. S. Hall, Geol. Surv. N. S. Wales Rec., 7, pt. 2, 1902, pl. 14, fig. 5.

*Reteograptus barrandi* Hall, New York State Cab. Nat. Hist., 13th Ann. Rep., 1860, p. 61, fig.

Chazyan (Normanskill): Kenwood, Chatham, etc., New York; New Jersey; Arkansas; Tennessee.

*Plesiotype*.—Cat. No. 54248, U.S.N.M. (Ruedemann).

**Retiograptus tentaculatus** (Hall).

*Graptolithus tentaculatus* Hall, Geol. Surv. Canada, Rep. for 1857, 1858, p. 134; Canadian Nat. Geol., 3, 1858, p. 167.

*Reteograptus tentaculatus* Hall, Geol. Surv. Canada, dec. 2, 1865, p. 116f, pl. 14, figs. 6-8.—Gurley, Jour. Geology, 4, 1896, p. 299.—Roemer and Frech, Leth. Pal., 1, 1897, p. 608.

*Retiograptus tentaculatus* Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 199, pl. 4, fig. 8; rev. ed., 1870.—Matthew, Trans. Royal Soc. Canada, 10, sec. 4, 1893, p. 100; Proc. and Trans. Royal Soc. Canada, 11, 1894, p. 114.—Ruedemann, New York State Pal., Ann. Rep., 1902, p. 571; Mem. New York State Mus., 7, pt. 1, 1904, pp. 733, 734, pl. 16, figs. 33-35.

Canadian: Point Levis, Quebec (Levis, *Diplograptus dentatus* zone); St. John, New Brunswick (Bretonian, Div. C3d); Deepkill, Mount Moreno, etc., New York (Deepkill, D. *dentatus* zone); Arkansas.

**RETIOLITES** Barrande.

Genotype: *Graptolithus geinitzianus* Barrande.

*Gladiolites* Barrande, Grapt. de Boheme, 1850, p. 68 (*Retiolites* proposed in footnote in case *Gladiolites* should be considered too near *Gladiolus*).

**RETIOLITES**—Continued.

Retiolites Geinitz, Amer. Jour. Sci. Arts, 2d ser., 14, 1852, p. 129; Bull. Soc. Geol. France, 2d ser., 9, 1852, p. 187; Zeits. d. d. geol. Gesell., 3, 1852, p. 389.—Barrande, Neues Jahrb. f. Min., etc., 1852, p. 402.—Hall, Geol. Surv. Canada, dec. 2, 1865, p. 113.—Nicholson, Quart. Jour. Geol. Soc. London, 24, 1868, p. 529.—Carruthers, Geol. Mag., 5, 1868, p. 73, 132.—Hall, 20th Rep. New York State Cab. Hist., 1868, p. 218; rev. ed., p. 251.—Nicholson, Mon. British Grapt., 1872, p. 120.—Zittel, Handb. Pal., 1, 1879, p. 302.—Tullberg, Sveriges Geol. Unders., Ser. C, No. 55, 1883, p. 40.—Spencer, Trans. Acad. Sci. St. Louis, 4, 1884, p. 562, 566; Bull. Mus. Univ. State Missouri, 1, 1884, p. 16.—Jaekel, Zeits. d. d. geol. Gesell., 41, 1889, p. 686.—Miller, N. A. Geol. Pal., 1889, p. 202.—Koken, Die Leitfossilien, Leipzig, 1896, p. 329.—Wiman, Nat. Sci., 9, 1896, p. 240.—Roemer and Frech, Leth. geog., 1 Theil, Leth. Pal., 1, 3 Lief., 1897, p. 667.—Zittel-Eastman Textb. Pal., 1, 1900, p. 119.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 34.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 467, 469; Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 132.

**RETIOLITES ENSIFORMIS** Hall. See *Trigonograptus ensiformis*.

**Retiolites geinitzianus venosus** (Hall).

*Graptolithus venosus* Hall, Pal. New York, 2, 1852, p. 40, pl. 17A, fig. 2a-c.

*Retiolites venosus* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 81 (gen. ref.); Pal. New York, 3, 1859, p. 518; Geol. Surv. Canada, dec. 2, 1865, pp. 22, 47, 113, 114, pl. B, figs. 20-21; 20th Rep. New York State Cab. Nat. Hist., 1868, pl. 1, figs. 20, 21; rev. ed., 1870, p. 213, pl. 1, figs. 20, 21; p. 224.—Nicholson, Mon. British Grapt., 1872, p. 42, fig. 12.—Roemer, Leth. geog., 1, Leth. Pal., Atlas, 1876, pl. 3, fig. 7.—Roemer and Frech, *ibid.*, 1, 3 Lief., 1897, p. 669, fig. 221.—Elles and Wood, Mon. British Grapt., Pal. Soc., 1903, p. xxxiii.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 34, fig. 55a.

*Gladiolites venosus* Gurley, Jour. Geol., 4, 1896, p. 79, 308.

*Retiolites geinitzianus* var. *venosus* Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 469, pl. 29, figs. 7, 8; pl. 31, figs. 6-8, figs. 449-455.

Not *Retiolites venosus* Spencer, Bull. Mus. Univ. State Missouri, 1, 1884, p. 16, pl. 1, fig. 2; Trans. Acad. Sci. St. Louis, 4, 1884, pp. 564, 566, pl. 1, fig. 2.—Miller, N. A. Geol. Pal., 1889, p. 202, fig. 215. (Probably not a graptolite.)

Clinton: Rochester, etc., New York; Arisaig, Nova Scotia.

**Retiolites (Gladiograptus) perlatus** (Nicholson).

*Retiolites perlatus* Nicholson, Quart. Jour. Geol. Soc., 24, 1868, p. 530, pl. 19 figs. 21, 22.

*Retiolites* cfr. *perlatus* Tornquist, Acta Univ. Lund., 26, 1890, p. 11, fig. 26, pl. 2.

*Retiolites (Gladiograptus) perlatus* Elles and Wood, Mon. British Grapt., 8, 1911, p. 338, pl. 34, figs. 10a-f.

Silurian: Ireland and Scotland (Llandoverly-Birchill and Skelgill); Blaylock Mountain, Montgomery County, Arkansas (Blaylock) [Ulrich].

**RETIOLITES VENOSUS** Hall. See *Retiolites geinitzianus venosus*.

**RETZIA** Billings. See *Rhynchospira* Hall.

**RETZIA EVAX** Hall. See *Homœospira evax*.

**RETZIA FORMOSA** Whitfield. See *Rhynchospira præformosa*.

**RETZIA (TREMATOSPIRA) GRANULIFERA** Meek. See *Trematospira granulifera*.

*RETZIA SINUATA* Miller. See *Rhynchospira(?) sinuata*.

*RETZIA SOBRINA* Beecher and Clarke. See *Homœospira sobrina*.

**RHABDARIA** Billings. Genotype: *R. fragilis* Billings.

*Rhabdaria* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 357.—Miller, N. A. Geol. Pal., 1889, p. 164.

***Rhabdaria fragilis*** Billings.

*Rhabdaria fragilis* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 357.—Rauff, Palæontographica, 40, 1894, p. 245.

Canadian (Romaine): Mingan Islands, Quebec.

***Rhabdaria furcata*** Billings.

*Rhabdaria furcata* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 358.—Rauff, Pal., 40, 1894, p. 245.

Canadian (Romaine): Mingan Islands, Quebec.

**RHABDINOPORA FLABELLIFORMIS** Eichwald. See *Dictyonema flabelliforme*.

**RHAPHANOCRINUS** Wachsmuth and Springer.

Genotype: *Glyptocrinus subnodosus* Walcott.

*Rhaphanocrinus* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1885, p. 320 (Rev. Pal., pt. 3, sec. 1, p. 98).—Ehlert, Ann. des Sci. Geol., 19, 1887.—Miller, N. A. Geol. Pal., 1889, p. 277.—Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 258.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 145.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 200.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 187.

***Rhaphanocrinus gemmeus*** Hudson.

*Rhaphanocrinus gemmeus* Hudson, Bull. New York State Mus., 80, 1905, p. 280, fig. 6, pl. 2, figs. 1-5.

Chazyan (Valcour): Valcour Island, Lake Champlain, New York.

***Rhaphanocrinus sculptus*** (Miller).

*Glyptocrinus sculptus* Miller, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 37, pl. 1, fig. 2; *ibid.*, 6, 1883, p. 224.—James, *ibid.*, 19, 1897, p. 116.

*Rhaphanocrinus sculptus* Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 260, pl. 10, fig. 3.

Richmond (Liberty): Waynesville, Ohio.

*Cotypes*.—Cat. No. 40772, U.S.N.M.

***Rhaphanocrinus subnodosus*** (Walcott).

*Glyptocrinus? subnodosus* Walcott, 35th Rep. New York State Mus. Nat. Hist., 1883, p. 208, pl. 17, fig. 3.—Miller, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 227.

*Rhaphanocrinus subnodosus* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1885, p. 321 (Rev. Pal., pt. 3, sec. 1, p. 99); Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 259, pl. 11, fig. 2.

Trenton: Trenton Falls, New York.

**RHINIDICTYA** Ulrich.

Genotype: *Rhinidictya nicholsoni* Ulrich.

*Stictopora* (part) Hall, Pal. New York, 1, 1847, p. 73.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 388.

*Rhinidictya* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 152.—Hall and Simpson, Pal. New York, 6, 1887, p. 20.—Miller, N. A. Geol. Pal., 1889, p. 320.—Ulrich, Geol. Minnesota, 3, 1893, p. 124.—Pocta, Syst. Sil. Centre

**RHINIDICTYA**—Continued.

Boheme, 8, pt. 1, 1894, p. 15.—Ulrich, *Zittel's Textb. Pal.* (Engl. ed.), 1896, p. 279.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 605.—Nickles and Bassler, *Bull. U. S. Geol. Surv.*, 173, 1900, p. 48.—Grabau and Shimer, *N. A. Index Fossils*, 1, 1907, p. 158.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 755.—Bassler, *Bull. U. S. Nat. Mus.*, 77, 1911, pp. 131, 132; *Zittel-Eastman Textb. Pal.*, 1913, p. 345.

**Rhinidictya basalis** (Ulrich).

*Stictopora basalis* Ulrich, *Jour. Cincinnati Soc. Nat. Hist.*, 5, 1882, p. 169, pl. 8, figs. 4, 4a.

*Rhinidictya basalis* Ulrich, *Geol. Minnesota*, 3, 1893, p. 128.

Stones River (Lebanon): Shelbyville, Tennessee.

*Holotype*.—Cat. No. 43720, U.S.N.M.

RHINIDICTYA? BORKHOLMIENSIS Wiman. See *Pachydiictya bifurcata*.

**Rhinidictya exigua** Ulrich.

*Rhinidictya exigua* Ulrich, *Jour. Cincinnati Soc. Nat. Hist.*, 12, 1890, p. 184, fig. 9; *Geol. Minnesota*, 3, 1893, p. 131, pl. 8, figs. 6–10.

Black River (Decorah): Minneapolis, St. Paul, and Fountain, Minnesota.

*Cotypes*.—Cat. No. 43708, U.S.N.M.

**Rhinidictya fenestrata** (Hall).

*Stictopora fenestrata* Hall, *Pal. New York*, 1, 1847, p. 16, pl. 4, figs. 4a–e.

*Sulcopora fenestrata* D'Orbigny, *Prodr. de Pal.*, 1, 1850, p. 22.—Emmons, *Amer.*

*Geology*, 1, pt. 2, 1855, p. 206, pl. 3, figs 4a, 5a.

*Rhinidictya fenestrata* Ulrich, *Geol. Surv. Illinois*, 8, 1890, p. 492.

Chazyan: Chazy and Galway, New York.

**Rhinidictya fidelis** (Ulrich).

*Stictopora fidelis* (part) Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 68.

*Rhinidictya fidelis* Ulrich, *Geol. Minnesota*, 3, 1893, p. 134, pl. 6, figs. 7–7b, 8.

*Eurydictya multipora* (part), Ulrich, *Geol. Minnesota*, 3, 1893, p. 139, pl. 7, figs. 24, 29–31.

Black River (Decorah): Minneapolis, Minnesota.

*Cotypes*.—Cat. No. 43603, U.S.N.M.

**Rhinidictya grandis** Ulrich.

*Rhinidictya grandis* Ulrich, *Geol. Minnesota*, 3, 1893, p. 136, pl. 5, figs. 11, 12; pl. 6, figs. 19, 20.

Black River (Platteville): Dixon, Illinois; Beloit, Mineral Point, and Janesville, Wisconsin.

*Cotypes*.—Cat. No. 43606, U.S.N.M.

RHINIDICTYA HUMILIS Ulrich. See *Pachydiictya pumila*.

**Rhinidictya lata** (Ulrich).

*Dicranopora lata* Ulrich, *Jour. Cincinnati Soc. Nat. Hist.*, 5, 1882, p. 166, pl. 6, figs. 16, 16a.

*Rhinidictya lata* Nickles and Bassler, *Bull. U. S. Geol. Surv.*, 173, 1900, p. 390.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 875, pl. 32, figs. 7, 7a.

Richmond (Waynesville): Clarksville, etc., Ohio; Indiana.

*Cotypes*.—Cat. No. 44098, U.S.N.M.

**Rhinidietya minima** Ulrich.

*Rhinidietya minima* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 12, 1890, p. 183, fig. 8; Geol. Minnesota, 3, 1893, p. 132, pl. 5, figs. 13-18.

Trenton (Prosser): Cannon Falls, Minnesota.

*Cotypes*.—Cat. No. 43709, U.S.N.M.

**Rhinidietya minima modesta** Ulrich.

*Rhinidietya minima* var. *modesta* Ulrich, Geol. Minnesota, 3, 1893, p. 133, pl. 5, fig. 17.

Trenton (Prosser): Cannon Falls, Minnesota.

*Cotypes*.—Cat. No. 43610, U.S.N.M.

**Rhinidietya mutabilis** (Ulrich).

*Stictopora mutabilis* Ulrich (part), 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 66.—Miller, N. A. Geol. Pal., 1889, fig. 517 (p. 324).—Ulrich, Geol. Surv. Illinois, 8, 1890, figs. 2c-h (p. 304).

*Rhinidietya mutabilis* Ulrich, Geol. Minnesota, 3, 1893, p. 125, pl. 6, figs. 1-6, 12, 13; pl. 7, figs. 10-23, 25-28; pl. 8, figs. 1-3.—Whiteaves, Pal. Foss., 3, 1897, p. 240.—Sardeson, Amer. Geol., 26, 1900, p. 388, fig. 1; Jour. Geol., 9, 1901, p. 155, pl. B, figs. 4-6.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 158, fig. 20Si.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 132, 133, fig. 56; Zittel-Eastman Textb. Pal., 1913, p. 345, fig. 505a-c.

*Stictopora mutabilis* var. *minor* Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 67.

Black River (Decorah) and Trenton (Prosser): Minneapolis, etc., Minnesota; Decorah, Iowa.

Ordovician (Wassalem): Uxnorn, Esthonia, Russia.

*Cotypes*.—Cat. No. 43812, U.S.N.M.

**Rhinidietya mutabilis major** (Ulrich).

*Stictopora mutabilis* var. *major* Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 66.

*Rhinidietya mutabilis* var. *major* Ulrich, Geol. Minnesota, 3, 1893, p. 127, pl. 7, figs. 22, 23, 25-28, 32.

Black River (Decorah): St. Paul, Minneapolis, and Cannon Falls, Minnesota.

*Cotypes*.—Cat. No. 43813, U.S.N.M.

**Rhinidietya mutabilis senilis** Ulrich.

*Rhinidietya mutabilis* var. *senilis* Ulrich, Geol. Minnesota, 3, 1893, p. 127, pl. 6, figs. 2, 3; pl. 7, figs. 16, 17.

Black River (Decorah): St. Paul, Minnesota.

*Cotypes*.—Cat. No. 43814, U.S.N.M.

**Rhinidietya nashvillensis** (Miller).

*Bythopora nashvillensis* Miller, Jour. Cincinnati Soc. Nat. Hist., 3, 1880, p. 143, pl. 4, figs. 4, 4a; N. A. Geol. Pal., 1889, fig. 462 (p. 295).

*Rhinidietya nashvillensis* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 12, 1890, p. 185.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 391.

Stones River (Pierce): Murfreesboro, Tennessee.

**Rhinidietya neglecta** Ulrich.

*Stictopora paupera* (part) Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 69.

*Rhinidietya neglecta* Ulrich, Geol. Minnesota, 3, 1893, p. 130, pl. 5, figs. 22-25. Trenton: Frankfort, Boyle, and Mercer Counties, Kentucky (Wilmore); Nashville, Tennessee; St. Paul, Minnesota.

*Cotypes*.—Cat. No. 43608, U.S.N.M.



**Rhinidictya neglecta canadensis** Ulrich.

*Rhinidictya neglecta* var. *canadensis* Ulrich, Geol. Minnesota, 3, 1893, p. 130.

Trenton: Ottawa, Ontario.

*Holotype*.—Cat. No. 43609, U.S.N.M.

**Rhinidictya nicholsoni** Ulrich.

*Rhinidictya nicholsoni* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 170,

pl. 8, figs. 6–6b.—Miller, N. A. Geol. Pal., 1889, fig. 507 (p. 320).—Bassler,

Bull. Virginia Geol. Surv., 2a, 1909, pl. 23, figs. 9–11.

Black River (Lowville): High Bridge, Kentucky; Virginia; Tennessee.

*Cotypes*.—Cat. No. 43706, U.S.N.M.

**Rhinidictya nitidula** (Billings).

*Ptilodictya nitidula* Billings, Catal. Sil. Foss. Anticosti, 1886, p. 9.

*Dicranopora nitidula* Miller, N. A. Geol. Pal., 1889, p. 300.

Richmond (Charleton): Charleton Point and Salmon River, Anticosti.

**Rhinidictya obliqua** (Ulrich) Whiteaves.

*Rhinidictya obliqua* (Ulrich) Whiteaves, Pal. Foss., 3, 1897, p. 240.

Mohawkian or Richmond: Deer Island, Lake Winnipeg, Canada.

**Rhinidictya parallela** (James).

*Ptilodictya parallela* James, Paleontologist, No. 1, 1878, p. 5.

*Rhinidictya parallela* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 170.—

Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 392.—Bassler,

Proc. U. S. Nat. Mus., 30, 1906, p. 52, pl. 2, figs. 5–7; pl. 5, figs. 2, 3.—Cum-

ings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 875, pl. 32, fig. 8.

*Ptilodictya granulosa* James, Paleontologist, No. 1, 1878, p. 4.

Eden (Economy): Cincinnati, Ohio, and vicinity.

**Rhinidictya paupera** Ulrich.

*Stictopora paupera* (part), 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 69.

*Rhinidictya paupera* Ulrich, Geol. Minnesota, 3, 1893, p. 129, pl. 5, figs. 19–21.

Black River (Decorah): St. Paul and Cannon Falls, Minnesota; Decorah, Iowa.

*Cotypes*.—Cat. No. 43602, U.S.N.M.

**Rhinidictya pediculata** Ulrich.

*Rhinidictya pediculata* Ulrich, Geol. Minnesota, 3, 1893, p. 137, pl. 7, figs. 1–5.

Black River (Platteville): Minneapolis, Minnesota.

*Cotypes*.—Cat. No. 43605, U.S.N.M.

**Rhinidictya trentonensis** (Ulrich).

*Dicranopora trentonensis* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 167, pl. 6, figs. 15, 15a.

*Rhinidictya trentonensis* Ulrich, Geol. Minnesota, 3, 1893, p. 135, pl. 6, figs.

14–18; pl. 7, figs. 6–9.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 159.

*Stictopora fidelis* (part) Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 68.

Stones River (Lebanon): Lebanon, etc., Tennessee.

Black River (Platteville): Minnesota, Wisconsin, and Illinois.

*Holotype*.—Cat. No. 43707, U.S.N.M.

**RHINOBOLOUS** Hall. Genotype: *Rhynobolus* sp. Hall—?*Obolus galtensis* Billings.

*Rhynobolus* Hall, Notes on some New or Imperfectly Known Forms among the Brachiopoda, 1871, p. 5; *ibid.*, 1872, p. 5 pl. 13, fig. 10; 23d Rep. New York

**RHINOBOLOUS**—Continued.

State Cab. Nat. Hist., 1873, p. 247, pl. 13, fig. 10.—Waagen, Pal. Indica, 13th ser., 1, 1885, p. 761.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 44, 46, 164; 11th Ann. Rep. New York State Geol., 1894, p. 239.

Rhinobolus Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 346.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 60.

**Rhinobolus davidsoni** Hall and Clarke.

Rhinobolus davidsoni Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 45, 176, pl. 4B, figs. 10-12; 48th Rep. New York State Mus., 2, for 1895, 1897, p. 331, pl. 2, figs. 6-8; 14th Rep. State Geol. New York for 1894, 1897, p. 331, pl. 2, figs. 6-8.—Huene, Verh. d. Russ.-Kais. Min. Ges. zu St. Petersburg, 38, 1900, p. 194, fig. 4.

Niagaran: Near Grafton, Wisconsin.

**Rhinobolus galtensis** (Billings).

Obolus galtensis Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 168, fig. 153, Obolellina galtensis Billings, Canadian Nat. Geol., 6, 1871, p. 222; *ibid.*, 1872, p. 328.

Trimerella minor Dall, Amer. Jour. Conch., 7, 1871, p. 83, pl. 11, fig. 6.

?Rhinobolus sp.? Hall, 23d Rep. New York State Cab. Nat. Hist., 1873, p. 247, pl. 13, fig. 10.

Trimerella(?) galtensis Davidson and King, Quart. Jour. Geol. Soc. London, 30, 1874, p. 151, pl. 18, fig. 13; pl. 19, fig. 4.—Miller, N. A. Geol. Pal., 1889, p. 387, fig. 633.

Rhinobolus galtensis Whiteaves, Pal. Fossils, 3, 1884, p. 7, pl. 2, fig. 1; pl. 8, fig. 3.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 908, figs.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 45, pl. 4B, figs. 7-9.

Rhinobolus Galtensis Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 59, pl. 15, fig. 2 (?p. 61, pl. 9, figs. 2, 2a).—Huene, Verh. d. Russ.-Kais. Min. Gesell. zu St. Petersburg, 38, 1900, p. 194, fig. 2.

Niagaran (Guelph): Galt, Elora, Durham, etc., Ontario.

**RHINOPORA** Hall.

Genotype: *Rhinopora verrucosa* Hall.

Rhinopora Hall, Pal. New York, 2, 1852, p. 48.—Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 166.—Miller, N. A. Geol. Pal., 1889, p. 321.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 388; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 280.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 540.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 54.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 174; Bull. New York State Mus., 45, 1901, p. 174.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 59; Zittel-Eastman Textb. Pal., 1913, p. 347.

**Rhinopora curvata** Ringuenberg.

Rhinopora curvata Ringuenberg, Bull. Buffalo Soc. Nat. Hist., 5, 1886, p. 19, pl. 2, fig. 14.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 60, pl. 22, figs. 12, 13.

Clinton (Rochester): Lockport, New York; Grimsby, Ontario.

*Plesiotype*.—Cat. No. 35767, U.S.N.M.

RHINOPORA FRONDOSA Lesley. See *Rhinopora verrucosa*.

**Rhinopora prima** Whitfield.

Rhinopora prima Whitfield, Bull. Amer. Mus. Nat. Hist., 9, 1897, p. 177, pl. 6 figs. 5, 6.—Seely, Vermont State Geol., Rep. 5, 1906, p. 184, pl. 42; *ibid.* Rep. 7, 1910, pl. 61, figs. 5, 6.

Canadian (Beekmantown): Fort Cassin, Vermont.

Observation.—Not a bryozoan.

**RHINOPORA TUBERCULOSA** Hall. See *Fistulipora tuberculosa*.

**Rhinopora? tubulosa** Hall.

*Rhinopora tubulosa* Hall, Pal. New York, 2, 1852, p. 49, pl. 19, figs. 2a-c.  
Clinton: Sodus, Wayne County, and Reynales Basin, New York.

**RHINOPORA VENOSA** Spencer. See *Rhinopora verrucosa*.

**Rhinopora verrucosa** Hall.

*Rhinopora verrucosa* Hall, Pal. New York, 2, 1852, p. 48, pl. 19, figs. 1a-c.—Rominger, Proc. Acad. Nat. Sci. Philadelphia, 1866, p. 119.—Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 141.—Nicholson, Pal. Prov. Ontario, 1875 p. 44, fig. 19, 1, 1a.—Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 166; *ibid.*, 3, 1888, pl. 15, fig. 13; Proc. Boston Soc. Nat. Hist., 24, 1889, p. 332; Geol. Surv. Ohio, 7, 1895, p. 599, pl. 28, figs. 13a-c.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 393.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, pl. 23, figs. 7-9; Proc. U. S. Nat. Mus., 30, 1906, p. 53.

*Rhinopora frondosa* Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 875, figs.

*Rhinopora venosa* Spencer, Trans. St. Louis Acad. Sci., 4, 1884, p. 604, pl. 7, fig. 3; Bull. Mus. Univ. State Missouri, 1, 1884, p. 54, pl. 7, fig. 3.

*Escharina? distorta* James, Paleontologist, No. 3, 1875, p. 21.

Upper Medinan: Flamboro Head, Dundas, etc., Canada (Cataract); Dayton, Fairhaven, etc., Ohio; Hanover, Indiana; Tennessee; Alabama (Brassfield).

**RHIPIDOMELLA** Ehlert.

Genotype: *Terebratulina michelini* L'Éveillé.

*Rhipidomys* Ehlert (not Wagnor, 1844), Fischer's Manuel Conch., 1887, p. 1288.—Hall, Bull. Geol. Soc. Amer., 1, 1889, p. 21.

*Rhipidomella* Ehlert, Jour. Conch., 1891, p. 372.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 209; 11th Ann. Rep. New York State Geol., 1894, p. 271.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 188; *ibid.*, 7, 1901, p. 188; Bull. New York State Mus., 45, 1901, p. 188.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 262.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 382.

**Rhipidomella circulus** Hall.

*Orthis circulus* Hall, Geol. New York, Rep. 4th Dist., 1843, p. 71, fig. 1; Pal. New York, 2, 1852, p. 56, pl. 20, fig. 6.—Billings, Canadian Nat. Geol., 1, 1856, p. 134, pl. 2, fig. 1.

*Orthis circularis* Owen, Amer. Jour. Sci. Arts, 48, 1845, p. 305, fig. 1.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 511, figs.

*Rhipidomella circulus* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 210, 224, pl. 6A, figs. 1, 2.—Grabau, Bull. New York State Mus., 45, p. 188, fig. 99; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 188, fig. 99.—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 434, pl. 2, fig. 16.

Early Silurian: Reynales Basin, New York (Clinton); Indiana; Ontario (Cataract).

**Rhipidomella emarginata** (Hall).

*Orthis oblata* var. *emarginata* Hall, Pal. New York, 3, 1859, p. 164, pl. 10a, figs. 4-6.

*Rhipidomella emarginata* Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 302, pl. 55, figs. 1-8.

Helderbergian (Keyser): Cash Valley and Cumberland, Maryland; Keyser, etc., West Virginia.

**Rhipidomella hybrida** (Sowerby).

*Orthis hybrida* Sowerby, Murchison's Sil. Syst., 1839, p. 630, pl. 13, fig. 11.—Hall, Geol. New York; Rep. 4th Dist., 1843, p. 105, fig. 7; Pal. New York, 2, 1852, p. 253, pl. 52, fig. 4.—Roemer, Die Sil. Fauna West. Tennessee, 1860, p. 63, pl. 5, fig. 6.—Emmons, Man. Geol., 1860, p. 109, fig. 99.—Meek and Worthen, Geol. Surv. Illinois, 1868, p. 371, pl. 7, fig. 7.—Hall, 28th Rep. New York State Mus. Nat. Hist., 1879, p. 149, pl. 21, figs. 18–25; 11th Rep. State Geol. Indiana, 1882, p. 285, pl. 21, figs. 18–25; 2d Ann. Rep. New York State Geol., 1883, pl. 36, figs. 1–5.—Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 83, pl. 13, fig. 10.—Beecher and Clarke, Mem. New York State Mus., 1, 1889, p. 17, pl. 1, figs. 13–18.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 39, pl. 32, figs. 32–35.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 517, figs.

*Orthis hybrida?* Hall, Trans. Albany Inst., 4, 1863, p. 209.

*Rhipidomella hybrida* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 210, 224, pl. 6, figs. 1–5.—Grabau, Bull. New York State Mus., 45, 1901, p. 188, fig. 98; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 188, fig. 98.—Kindle and Breger, 28th Rep. Ann. Dep. Geol. Nat. Res. Indiana, 1904, p. 433, pl. 2, fig. 8.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 263, fig. 315.—Savage, Bull. Geol. Surv. Illinois, 23, 1913, pl. 7, fig. 10.

*Orthis* (*Rhipidomella*) *hybrida* Foerste, Geol. Ohio, 7, 1895, p. 584, pl. 25, fig. 10. *Dalmanella* cf. *hybrida* Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, pl. 4, p. 42, figs. 7, 8.

Silurian: Europe; many localities in the Niagaran of the United States and Canada.

*Plesiotype*.—Cat. No. 51346, U.S.N.M.

**Rhipidomella lenticularis** Foerste.

*Rhipidomella lenticularis* Foerste, Jour. Geol., 11, 1903, p. 711; Bull. Sci. Lab. Denison Univ., 14, 1909, pl. 2, figs. 28A, B, p. 72.

Niagaran (Brownsport): Brownsport Furnace, 3 miles west of Vice Landing, Tennessee.

**Rhipidomella magnicardinalis** Foerste.

*Rhipidomella magnicardinalis* Foerste, Cincinnati Soc. Nat. Hist. Jour., 21, 1909, p. 27, pl. 1, fig. 11a–d, pl. 2, fig. 12A, B.

Clinton (West Union): Big Salt Lick Creek, Lewis County, Kentucky.

*RHIPIDOMELLA MEDIA* Schuchert. See *Dalmanella elegantula media*.

**Rhipidomella newsomensis** Foerste.

*Rhipidomella newsomensis* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 73, pl. 4, figs. 72A, B.

Niagaran (Waldron): Newsom, Tennessee; Hartsville, Waldron, etc., Indiana.

**Rhipidomella preoblata** Weller.

*Rhipidomella preoblata* Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 232, pl. 20, figs. 25, 26.

Helderbergian (Decker Ferry): Two miles south of Tristates, New York.

*RHIPIDOMELLA RHYNCHONELLIFORMIS* Schuchert. See *Rhipidomella uberis rhynchonelliformis*.

**Rhipidomella saffordi** Foerste.

*Rhipidomella saffordi* Foerste, Jour. Geol., 11, 1903, p. 711; Bull. Sci. Lab. Denison Univ., 14, 1909, p. 72, pl. 1, figs. 17A–C.

Niagaran (Brownsport): Gant Place, Pegram, Bath Springs, and near Savannah, Tennessee.

**Rhipidomella sola** (Billings).

*Orthis sola* Billings, Cat. Sil. Fossils of Anticosti, 1866, p. 12.  
Richmond (Charleton): Salmon River, Anticosti.

**Rhipidomella subcircularis** (Simpson).

*Orthis subcircularis* Simpson, Trans. Amer. Phil. Soc., n. s., 16, 1889, p. 437, fig. 2.—  
Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 534, figs.  
*Rhipidomella subcircularis* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 352.  
Clinton: Mifflin and Huntington Counties, Pennsylvania.

**Rhipidomella tenuilineata** Savage.

*Rhipidomella tenuilineata* Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 77,  
pl. 4, figs. 9, 10.  
Upper Medinan (Edgewood): Louisiana, near mouth of Buffalo Creek, Pike  
County, Missouri.

**Rhipidomella uberis** (Billings).

*Orthis aequalva* Shaler (not Hall, 1847), Bull. Mus. Comp. Zool., 1, 1865, p. 66.  
*Orthis uberis* Billings, Catalogue Sil. Foss. Anticosti, 1866, p. 42.  
*Rhipidomella uberis* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 224.  
Gamachian (Ellis Bay) and Anticostian (Becksie River—Chicotte): Junction Cliff,  
etc., Anticosti.

**Rhipidomella uberis rhynchonelliformis** (Shaler).

*Orthis rhynchonelliformis* Shaler, Bull. Mus. Comp. Zool., 1, 1865, p. 66.—Billings,  
Cat. Sil. Foss. Anticosti, 1866, p. 42.  
*Rhipidomella rhynchonelliformis* Schuchert, Bull. U. S. Geol. Surv., 87, 1897,  
p. 351.  
Gamachian (Ellis Bay) and Anticostian (Becksie River—Jupiter River): Gull Cove,  
Jupiter River, etc., Anticosti.

**RHIPIDOMYS** Ehlert. See *Rhipidomella* Ehlert.

**RHIZOGRAPTUS** Spencer.

Genotype: *R. bulbosus* Spencer.

*Rhizograptus* Spencer, Canadian Nat., n. s., 8, 1878, p. 460.  
*Rhizograptus* Spencer, Proc. Amer. Assoc. Adv. Sci., 31, 1883, p. 364; Bull. Mus.  
Univ. State Missouri, 1, 1884, p. 30; Trans. Acad. Sci. St. Louis, 4, 1884,  
p. 562, 580.—Miller, N. A. Geol. Pal., 1889, p. 202.

**Rhizograptus bulbosus** Spencer.

*Rhizograptus bulbosus* Spencer, Canadian Nat., n. s., 8, 1878, p. 460.—Gurley,  
Jour. Geol., 4, 1896, pp. 101, 308.  
*Rhizograptus bulbosus* Spencer, Bull. Mus. Univ. State Missouri, 1, 1884, p. 30,  
pl. 4, fig. 4; Trans. Acad. Sci. St. Louis, 4, 1884, p. 580, pl. 4, fig. 4.—Miller,  
N. A. Geol. Pal., 1889, p. 202, fig. 215.—Bassler, Bull. U. S. Nat. Mus., 65,  
1909, p. 41, fig. 52.  
Niagaran dolomite: Hamilton, Ontario.

**RHIZOPHYLLUM** Lindstrom. See *Calceola* subgenus *Rhizophyllum*.

**RHODOCRINUS** (**THYSANOCRINUS**) **ACULEATUS** Shumard. See *Dimerocrinus aculeatus*.

**RHODOCRINUS** **ASPERATUS** Billings. See *Deocrinus asperatus*.

**RHODOCRINUS** (**THYSANOCRINUS**) **CANALICULATUS** Shumard. See *Thysanocrinus canaliculatus*.

**RHODOCRINUS** (**LYRIOCRINUS**) **DACTYLUS** Shumard. See *Lyriocrinus dactylus*.

**Rhodocrinus gigas** Billings.

*Rhodocrinus gigas* Billings, Geol. Surv. Canada, dec. 4, 1859, pl. 6, fig. 3.  
Trenton: Ottawa, Ontario.  
Observation.—Not recognized. Founded on stem fragment.

**RHODOCRINUS HALLI** Lyon. See *Dimerocrinus halli*.

**RHODOCRINUS (THYSANOCRINUS) IMMATURUS** Shumard. See *Gazacrinus immaturus*.

**RHODOCRINUS (THYSANOCRINUS) LILIFORMIS** Shumard. See *Dimerocrinus lilliformis*.

**RHODOCRINUS (LYRIOCRINUS) MELISSA** Hall. See *Lyriocrinus melissa*.

**RHODOCRINUS MICROBASILIS** Billings. See *Archæocrinus microbasilis*.

**RHODOCRINUS PYRIFORMIS** Billings. See *Archæocrinus pyriformis*.

**RHODOCRINUS? RECTUS** Hall. See *Crinocystites? rectus*.

**RHODOCRINUS (LYRIOCRINUS) SCULPTILIS** Hall. See *Lyriocrinus sculptilis*.

**RHODOCRINUS VESPERALIS** White. See *Diaboloocrinus vesperalis*.

**RHOMBODICTYON** Whitfield.Genotype: *R. reniforme* Whitfield.

*Rhombodictyon* Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 347.—Miller, N. A. Geol. Pal., 1889, p. 164.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 14, pt. 1, 1891, p. 57.

**Rhombodictyon discum** Whitfield.

*Rhombodictyon discum* Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 348, pl. 35, fig. 1.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 877, fig. Chazyan (Normanskill): Kenwood, Albany County, New York.

**Rhombodictyon globosum** James.

*Rhombodictyon globosum* James, J. F., Jour. Cincinnati Soc. Nat. Hist., 14, pt. 1, 1891, p. 57, figs. 2a-c.  
Eden(?): Cincinnati, Ohio.

**Rhombodictyon reniforme** Whitfield.

*Rhombodictyon reniforme* Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 347, pl. 35, figs. 2-7.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 879, figs.  
Chazyan (Normanskill): Kenwood, Albany County, New York.

**Rhombodictyon reniforme rhombiforme** Whitfield.

*Rhombodictyon reniforme* var. *rhombiforme* Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 348, pl. 35, figs. 8, 9.  
Chazyan (Normanskill): Kenwood, Albany County, New York.

**RHOMBOPORA GRANULIFERA** Ulrich. See *Batostomella granulifera*.

**RHOMBOPTERIA** Jackson.Genotype: *Avicula mira* Barrande.

*Rhombopteria* Jackson, Mem. Boston Soc. Nat. Hist., 4, 1890, pp. 330-380; Amer. Nat., 24, 1890, p. 1141.—Dall, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 444.

*Newsomella* (subgenus of *Rhombopteria*) Foerste, Bull. Sci. Lab. Denison Univ.; 14, 1909, p. 68. (Genotype: *Rhombopteria ulrichi* Foerste.)

**Rhombopteria (Newsomella) divaricata** Foerste.

*Rhombopteria (Newsomella) revoluta* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 68, pl. 4, figs. 63a-c. (Name *R. divaricata* suggested at end.)  
Niagaran (Waldron): Newsom, Tennessee.

**Rhombopteria (Newsomella) revoluta** (Winchell and Marcy).

*Pterinea revoluta* Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 95, pl. 2, fig. 12.

*Rhombopteria (Newsomella) revoluta* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 68 (gen. ref.).

Niagaran (Racine): Chicago, Illinois.

**Rhombopteria (Newsomella) ulrichi** Foerste.

*Rhombopteria (Newsomella) ulrichi* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 67, pl. 4, fig. 62a-b.

Niagaran (Waldron): Newsom, Tennessee.

**RHOMBOTRYPA** Ulrich and Bassler. Genotype: *Chætetes quadratus* Rominger.

*Monotrypella* (part) of authors.

*Rhombotrypa* Ulrich and Bassler, Smiths. Misc. Coll., Quart., 47, 1904, p. 44.—

Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 37.—Cumings; 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 755.

**Rhombotrypa crassimuralis** (Ulrich).

*Monotrypella crassimuralis* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 452, pl. 38, figs. 2-2f.

*Monticulipora crassimuralis* J. F. James, Jour. Cincinnati Soc. Nat. Hist., 16, 1894, p. 208.

*Rhombotrypa crassimuralis* Ulrich and Bassler, Smiths. Misc. Coll., Quart., 47, 1904, p. 45, 46 (gen. ref.).—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 876, pl. 23, figs. 2-2c.

Richmond: Wilmington, Illinois; Tennessee (Fernvale); ?Richmond, Indiana, Figured sections of *cotype*.—Cat. No. 43780, U.S.N.M.

**Rhombotrypa quadrata** (Rominger).

*Chætetes quadratus* Rominger, Proc. Acad. Nat. Sci. Philadelphia, 1866, p. 116.

*Monticulipora (Monotrypa) quadrata* Nicholson, Genus *Monticulipora*, 1881, p. 179, fig. 36.

*Monticulipora quadrata* James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 176; James, *ibid.*, 16, 1894, p. 198.

\* *Monotrypella quadrata* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 248; Contr. Micro-Pal. Cambro-Sil., pt. 2, 1889, p. 36.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, 1895, p. 116.—Miller, N. A. Geol. Pal., 1889, p. 196, fig. 195.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 318.—Hayes and Ulrich, U. S. Geol. Surv., Folio 95, illus. sheet, 1903, fig. 9, 10.

*Monotrypella (Rhombotrypa) quadrata* Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 131.

*Rhombotrypa quadrata* Nickles, Bull. Kentucky Geol. Surv., 5, 1905, p. 58, pl. 3, fig. 11.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 877, pl. 23, figs. 4, 4b; pl. 25, fig. 5.—Ulrich and Bassler, Smiths. Misc. Coll., Quart., 47, 1904, p. 45.

• *Chætetes rhombicus* Nicholson, Pal. Ohio, 2, 1875, p. 201, pl. 21, figs. 12, 12a; Quart. Jour. Geol. Soc. London, 30, 1874, p. 507, pl. 29, figs. 11, 11b; Ann. Mag. Nat. Hist., 4th ser., 18, 1876, p. 86, pl. 5, figs. 1, 1b.

*Monticulipora rectangularis* Whitfield, Ann. Rep. Geol. Surv. Wisconsin, 1878, p. 70; Geol. Surv. Wisconsin, 4, 1882, p. 249, pl. 11, figs. 11, 12.—Buel, Trans. Wisconsin Acad. Sci., 5, 1882, p. 190.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 172.

**Rhombotrypa quadrata**—Continued.

*Monticulipora multituberculata* Whitfield, Ann. Rep. Geol. Surv. Wisconsin, 1878, p. 71; Geol. Surv. Wisconsin, 4, 1882, p. 250, pl. 11, figs. 9, 10.—Buel, Trans. Wisconsin Acad. Sci., 5, 1882, p. 190.

Richmond: A common and characteristic species of almost all the divisions of the Richmond in North America.

*Plesiotypes*.—Cat. No. 35401, U.S.N.M. (Hayes and Ulrich).

**Rhombotrypa spinulifera** Bassler.

*Rhombotrypa spinulifera* Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 37, pl. 10, figs. 13-16; pl. 25, fig. 21.

Clinton: Lockport and Rochester, New York; Thorold, Ontario (Rochester); Osgood, Indiana (Osgood).

*Cotypes*.—Cat. Nos. 35494, 35495, U.S.N.M.

**Rhombotrypa subquadrata** (Ulrich).

*Monotrypella subquadrata* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 249, pl. 11, figs. 4-4b.

*Monticulipora quadrata* var. *subquadrata* J. F. James, Jour. Cincinnati Soc. Nat. Hist., 16, 1894, p. 199.

*Rhombotrypa subquadrata* Ulrich and Bassler, Smiths. Misc. Coll. Quart., 47, 1904, pp. 45, 46 (gen. ref.).—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 877, pl. 23, figs. 3-3b.

Richmond (Waynesville): Osgood, etc., Indiana; Blanchester, Hanover, and Oregonia, Ohio.

*Cotypes*.—Cat. No. 43685, U.S.N.M.

**RHOPALONARIA** Ulrich.

Genotype: *R. venosa* Ulrich.

*Ropalonaria* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 26; *ibid.*, 5, 1882, p. 149.—Vine, Ann. Mag. Nat. Hist., 5th ser., 14, 1884, p. 84, fig. 4.

*Rhopalonaria* Vine, Proc. Yorkshire Geol. Polyt. Soc., 9, 1887, p. 185.—Miller, N. A. Geol. Pal., 1889, p. 321—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 367.—Vine, Proc. Yorkshire Geol. Polyt. Soc., 12, 1892, p. 91.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 13.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 603.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 19.—Ulrich and Bassler, Smiths. Misc. Coll. (quart. issue), 45, 1904, pp. 266, 267.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 11.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 166.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 755.

**Rhopalonaria attenuata** Ulrich and Bassler.

*Rhopalonaria attenuata* Ulrich and Bassler, Smiths. Misc. Coll. (quart. issue), 45, 1904, p. 268, pl. 66, figs. 4, 5.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, pp. 11, 12, pl. 4, figs. 4, 5.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 166.—Ulrich and Bassler, Maryland Geol. Surv., Low Dev., 1913, p. 259, pl. 46, fig. 1.

Clinton (Rochester): Lockport, Rochester, etc., New York; Ontario; Juniata County, Pennsylvania.

Helderbergian (Keyser): Cash Valley, Maryland.

*Cotypes*.—Cat. No. 43116, U.S.N.M.

**RHOPALONARIA PERTENUIS** Ulrich. See *Corynotrypa delicatula*.**Rhopalonaria venosa** Ulrich.

*Ropalonaria venosa* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 26, pl. 7, figs. 24, 24a.

*Rhopalonaria venosa* Miller, N. A. Geol. Pal., 1889, fig. 511 (p. 321).—Ulrich, Geol. Minnesota, 3, 1893, p. 114, fig. 8e.—Simpson, 14th Ann. Rep. State



**Rhopalonarla venosa**—Continued.

Geol. New York for 1894, 1897, fig. 221 (p. 603).—Ulrich and Bassler, *Smiths. Misc. Coll. Quart.*, 45, 1904, p. 268, pl. 66, figs. 2, 3.—Grabau and Shimer, *N. A. Index Fossils*, 1, 1907, p. 116, fig. 177a.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 879, pl. 31, figs. 7, 7a.

Richmond (Arnheim, Waynesville): Clarksville, Waynesville, etc., Ohio; Indiana; Kentucky.

*Holotype* and *plesiotype*.—Cat. Nos. 43113, 43115, U.S.N.M.

**RHYNCHONELLA** Fischer de Waldheim.

Genotype: *R. loxia* Fischer de Waldheim.

*Rhynchonella* Fischer de Waldheim, *Notice des Fos. Gouv. Moscou*, 1809, p. 35, pl. 2, figs. 5, 6.—Hall, 13th Rep. New York State Cab. Nat. Hist., 1860, p. 65.—Meek and Hayden, *Pal. Upper Missouri*, *Smiths. Cont. to Knowl.*, 14, 172, 1864, p. 70.—Hall, *Pal. New York*, 4, 1867, p. 332; 20th Rep. New York State Cab. Nat. Hist., 1867, p. 269.—Dall, *Amer. Jour. Conch.*, 6, 1870, p. 151; *ibid.*, 7, 1871, p. 70.—Billings, *Pal. Foss.*, 2, 1874, p. 35.—Nettelroth, *Kentucky Fossil Shells*, *Mem. Kentucky Geol. Surv.*, 1889, p. 72.—Hall and Clarke, *Pal.*, New York, 8, pt. 2, 1893, pp. 177, 178; 13th Ann. Rep. New York State Geol., 1895, p. 822.—Schuchert, *Zittel-Eastman Textb. Pal.*, 1, 1900, p. 324.

**RHYNCHONELLA ACINUS** Hall. See *Camarotœchia*(?) *acinus*.

**RHYNCHONELLA ACINUS** var. *CONVEXA* Foerste. See *Camarotœchia*(?) *acinus convexa*.

**RHYNCHONELLA ACUTIROSTRIS** Hall. See *Zygospira*(?) *acutirostris*.

**RHYNCHONELLA ÆQUIRADIATA** Miller. See *Camarotœchia æquiradiata*.

**RHYNCHONELLA AGGLOMERATA** Weller. See *Camarotœchia litchfieldensis*.

**RHYNCHONELLA AINSLIEI** Winchell. See *Rhynchotrema ainsliei*.

**RHYNCHONELLA ALTILIS** Hall. See *Camarotœchia plena*.

**RHYNCHONELLA ANTICOSTIENSIS** Billings. See *Rhynchotrema anticostiensis*.

**RHYNCHONELLA APRINIS** Miller. See *Homœospira apriniformis*.

**RHYNCHONELLA?** *ARGENTEA* Billings. See *Camarotœchia argentea*.

**RHYNCHONELLA ARGENTURBICA** White. See *Rhynchotrema argenturbica*.

***Rhynchonella***(?) *bellaforma* Nettelroth.

*Rhynchonella bellaforma* Nettelroth, *Kentucky Fossil Shells*, *Mem. Kentucky Geol. Surv.*, 1889, p. 73.

Niagara (Louisville): Louisville, Kentucky.

*Holotype*.—Cat. No. 51338, U.S.N.M.

***Rhynchonella***(?) *bidens* Hall.

*Atrypa bidens* Hall, *Pal. New York*, 2, 1852, p. 69, pl. 23, fig. 3.

*Rhynchonella bidens* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 77.—Lesley, *Geol. Surv. Pennsylvania*, Rep. P 4, 1889, p. 884, 4 figs.—Grabau, *Bull. Buffalo Soc. Nat. Sci.*, 7, 1901, p. 194, fig. 110; *Bull. New York State Mus.*, 45, 1901, p. 194, fig. 110.

Clinton (Lower): Lockport, New York.

***Rhynchonella***(?) *bidentata* (Hisinger).

*Terebratula bidentata* Hisinger, *Kongl. Svenska Vet.-Akad. Handl.*, for 1825, 1826, p. 343, pl. 7, fig. 5.

**Rhynchonella(?) bidentata**—Continued.

*Atrypa bidentata* Hall, Pal. New York, 1852, p. 276, pl. 57, fig. 3.

*Rhynchonella bidentata* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 77.—Grabau, Bull. New York State Mus., 45, 1901, p. 195, fig. 111; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 195, fig. 111.

Clinton (Rochester): Lockport, New York.

RHYNCHONELLA BISULCATA Safford. See *Cyclospira bisulcata*.

RHYNCHONELLA BREVIROSTRIS Billings. See *Anastrophia brevirostris*.

RHYNCHONELLA CAMURA Billings. See *Trematospira camura*.

RHYNCHONELLA CAPAX Billings. See *Rhynchotrema capax*.

**Rhynchonella colletti** Miller.

*Rhynchonella colletti* Miller, 18th Ann. Rep. Geol. Surv. Indiana, 1894, p. 311, pl. 9, figs. 8, 9 (adv. sheets, 1892).

Niagaran: Wabash, Indiana.

**Rhynchonella(?) corinthia** Billings.

*Rhynchonella Corinthia* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 220. Chazyan (Quebec—N): Table Head, Newfoundland.

RHYNCHONELLA CUNEATA Hall. See *Rhynchotrema cuneata americana*.

RHYNCHONELLA DECEMPPLICATA of authors. See *Camarotoechia decemplicata*.

RHYNCHONELLA DECKERENSIS Weller. See *Rhynchotrema deckerense*.

RHYNCHONELLA DENTATA Hall. See *Rhynchotrema dentatum*.

RHYNCHONELLA DUBIA Hall. See *Protorhyncha dubia*.

**Rhynchonella? emacerata** (Hall).

*Atrypa emacerata* Hall, Pal. New York, 2, 1852, p. 71, pl. 23, fig. 6.—Dawson, Acadian Geol., 3d ed., 1878, p. 599.

*Rhynchonella emacerata* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 77.

Clinton: Sodus and Rochester, New York; Arisaig, Nova Scotia.

RHYNCHONELLA EVA Billings. See *Camarotoechia decemplicata*.

RHYNCHONELLA FORMOSA Hall. See *Rhynchotrema formosum*.

RHYNCHONELLA FRINGILLA Billings. See *Camarotoechia fringilla*.

RHYNCHONELLA GLACIALIS Billings. See *Camarotoechia glacialis*.

RHYNCHONELLA HYDRAULICA Whitfield. See *Camarotoechia hydraulica*.

RHYNCHONELLA INÆQUIVALVIS LATICOSTATA Sardeson. See *Rhynchotrema increbescens laticostatum*.

RHYNCHONELLA INCREBESCENS Billings. See *Rhynchotrema increbescens*.

RHYNCHONELLA INDIANENSIS Hall. See *Camarotoechia(?) indianensis*.

**Rhynchonella? janea** Billings.

*Rhynchonella janea* Billings, Cat. Sil. Fossils Anticosti, 1866, p. 43.—Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 316, pl. 5, figs. 23, 24; Ohio Geol. Surv., 7, 1895, pl. 30, figs. 23, 24.—Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 83, pl. 5, fig. 3.

**Rhynchonella? janca**—Continued.

Richmond (Charleton) and Gamachian (Ellis Bay): Gamache Bay, etc.; Anticosti.

Upper Medinan: Near Thebes, Illinois, and Edgewood, Missouri (Edgewood); Ontario (Cataract).

RHYNCHONELLA KOKOMOENSIS Miller. See *Wilsonia kokomoensis*.

**Rhynchonella levis** Simpson.

*Rhynchonella* (*Stenochisma*) *levis* Simpson, Trans. Amer. Phil. Soc., n. s., 16, 1889, p. 443, fig. 8.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 890, fig.

Clinton: Blair County, Pennsylvania.

RHYNCHONELLA LAMELLATA Hall. See *Camarotoëchia lamellata*.

RHYNCHONELLA(?) LITCHFIELDENSIS Schuchert. See *Camarotoëchia litchfieldensis*.

RHYNCHONELLA MANSONII Salter. See *Atrypa mansonii*.

RHYNCHONELLA MICA Billings. See *Zygospira(?) mica*.

RHYNCHONELLA MINNESOTENSIS Sardeson. See *Rhynchotrema minnesotensis*.

RHYNCHONELLA? MODESTA Billings. See *Zygospira modesta*.

RHYNCHONELLA NEENAH Whitfield. See *Rhynchotrema neenah*.

RHYNCHONELLA NEGLECTA Hall. See *Camarotoëchia* (*Stegerhynchus*) *neglecta*.

RHYNCHONELLA (STEGERHYNCHUS) NEGLECTA-CLIFTONENSIS. See *Camarotoëchia* (*Stegerhynchus*) *neglecta cliftonensis*.

RHYNCHONELLA NEGLECTA VAR. SCOBINA Meek. See *Camarotoëchia* (*Stegerhynchus*) *neglecta*.

RHYNCHONELLA NUCLEOLATA Hall. See *Uncinulus nucleolatus*.

**Rhynchonella nucula** (Sowerby).

*Terebratula nucula* Sowerby, Murchison's Sil. Syst., 1839, pl. 5, fig. 20.

*Rhynchonella nucula* Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 595.

Silurian: England; Bessels Bay, Arctic America.

RHYNCHONELLA NUTRIX Billings. See *Camarotoëchia nutrix*.

RHYNCHONELLA OBTUSIPPLICATA Hall. See *Camarotoëchia obtusiplicata*.

RHYNCHONELLA ORIENTALIS Billings. See *Camarotoëchia orientalis*.

RHYNCHONELLA PERLAMELLOSA Whitfield. See *Rhynchotrema perlamellosum*.

RHYNCHONELLA PHOCA Salter. See *Lissatrypa phoca*.

RHYNCHONELLA PISA. See *Camarotoëchia pisa*.

RHYNCHONELLA PLENA Hall. See *Camarotoëchia plena*.

RHYNCHONELLA PPLICATA Miller. See *Cœlospira plicatula*.

**Rhynchonella(?) plicata** (Hall).

*Atrypa plicata* Hall, Pal. New York, 2, 1852, p. 10, pl. 4, fig. 6.—Owen (Hall), Amer. Jour. Sci. Arts, 48, 1845, p. 303, fig. 4.

*Rhynchonella plicata* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 78. Upper Medinan: Lockport, New York.

**Rhynchonella plicatella** (Linnæus).

*Atrypa plicatella?* Hall, Pal. New York, 2, 1852, p. 279, pl. 58, figs. 3, 4.—Miller, N. A. Geol. Pal., 1889, p. 337.

*Rhynchonella plicatella* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 78.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 897, figs.

Niagaran: Europe; Walcott, New York.

RHYNCHONELLA PLICATULA Lesley. See *Cœlospira plicatula*.

RHYNCHONELLA PLICIFERA Hall. See *Camarotœchia plena*.

RHYNCHONELLA PROCTERI Ulrich. See *Rhynchotrema procteri*.

RHYNCHONELLA PYRRHA Billings. See *Camarotœchia pyrrha*.

RHYNCHONELLA QUADRICOSTATA Miller. See *Hyattidina congesta*.

RHYNCHONELLA RECURVIROSTRIS Billings. See *Zygospira recurvirostris*.

RHYNCHONELLA? RETICULATA Hall. See *Dictyonella reticulata*.

RHYNCHONELLA RIDLEYANA Safford. See *Protorhyncha ridleiana*.

RHYNCHONELLA ROBUSTA Hall. See *Rhynchotrema robustum*.

**Rhynchonella rugicosta** Nettelroth.

*Rhynchonella rugæcosta* Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 78, pl. 32, figs. 48-51.

Niagaran (Louisville): Louisville, Kentucky.

*Holotype*.—Cat. No. 51320, U.S.N.M.

RHYNCHONELLA RUGOSA Billings. See *Atrypa rugosa*.

RHYNCHONELLA SAFFORDI Hall. See *Wilsonia saffordi*.

RHYNCHONELLA SAFFORDI VAR. DEPRESSA Nettelroth. See *Wilsonia saffordi depressa*.

RHYNCHONELLA SANCTA Sardeson. See *Rhynchotrema increbescens laticostatum*.

RHYNCHONELLA SCOBINA Hall and Whitfield. See *Camarotœchia (Stegerhynchus) neglecta*.

RHYNCHONELLA SEMPLICATA Hall. See *Camarotœchia semplicata*.

RHYNCHONELLA SORDIDA Hall. See *Plectorthis (Encuclodema) sordida*.

**Rhynchonella sordida** Hall.

*Atrypa sordida* Hall, Pal. New York, 1, 1847, p. 148, pl. 33, fig. 16.

*Rhynchonella sordida* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 66.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 900, fig.

Trenton: New York(?).

RHYNCHONELLA STRICKLANDI Hall. See *Uncinulus stricklandi*.

RHYNCHONELLA SUBTRIGONALIS Hall. See *Rhynchotrema subtrigonale*.

RHYNCHONELLA TENNESSEENSIS Hall. See *Uncinulus stricklandi*.

RHYNCHONELLA VICINA Billings. See *Camarotœchia vicina*.

RHYNCHONELLA WHITIANA Miller. See *Camarotœchia (Stegerhynchus) whitei*.

RHYNCHONELLA WHITH Hall. See *Camarotœchia (Stegerhynchus) whitei*.

**RHYNCHONELLA** (*STEGERHYNCHUS*) *WHITE-PRÆCURSOR* Foerste. See *Camarotœchia* (*Stegerhynchus*) *whitei* præcursor.

**RHYNCHONELLA** *WILSONI* Roemer. See *Wilsonia wilsoni*.

**RHYNCHORTHOCERAS** Remele. Genotype: *Ancistroceras breynii* Remele.  
*Rhynchorthoceras* Remele, *Zeits. d. d. geol. Gesell.*, 33, 1881, p. 480; *ibid.*, 34, 1882, pp. 122, 201.—Hyatt, *Proc. Amer. Phil. Soc.*, 32, 1894, p. 511.

**Rhynchorthoceras dubium** Hyatt.

*Rhynchorthoceras?* *dubium* Hyatt, *Proc. Amer. Phil. Soc.*, 32, 1894, p. 512.  
 Niagaran: Indiana.

**RHYNCHOSPIRA** Hall.

Genotype: *Waldheimia formosa* Hall.

*Rhynchospira* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 29; *Pal. New York*, 3, 1859, pp. 213, 484; 16th Rep. New York State Cab. Nat. Hist., 1863, p. 58, figs. 12–17; *Pal. New York*, 4, 1867, p. 276.—Hall and Clarke, *ibid.*, 8, pt. 2, 1893, p. 108, fig. 101; 13th Ann. Rep. New York State Geol., 1895, p. 791.

*Retzia* Billings, *Canadian Jour.*, 6, 1861, p. 147.

**Rhynchospira(?) acadiaë** (Hall).

*Trematospira acadiaë* Hall, *Canadian Nat. Geol.*, 5, 1860, p. 146, fig. 4.—Dawson, *Acadian Geol.*, 3d ed., 1878, p. 597.—Miller, *N. A. Geol. Pal.*, 1889, p. 386, fig. 630.—Lesley, *Geol. Surv. Pennsylvania*, Rep. P 4, 1889, p. 1203, fig.

*Rhynchospira?* *acadiaë* Schuchert, *Bull. U. S. Geol. Surv.* 87, 1897, p. 367.

Silurian: Arisaig, Nova Scotia.

**RHYNCHOSPIRA** *APRINIFORMIS* Hall. See *Homœospira apriniformis*.

**RHYNCHOSPIRA?** *APRINIS* Hall. See *Homœospira apriniformis*.

**RHYNCHOSPIRA?** *EQUIRADIATA* Hall. See *Camarotœchia æquiradiata*.

**RHYNCHOSPIRA** *EVAX* Hall. See *Homœospira evax*.

**Rhynchospira excavata** Grabau.

*Rhynchospira excavata* Grabau, *Bull. New York State Mus.*, 69, 1903, p. 1050, fig. 9.

Helderbergian (Keyser–Manlius): Becraft Mountain, near Hudson, New York.

**Rhynchospira formosa** (Hall).

*Waldheimia formosa* Hall, 10th Ann. Rep. New York State Mus. Nat. Hist., 1857, p. 88.

*Trematospira formosa* Hall, *Pal. New York*, 3, 1859, p. 215, pl. 36, figs. 2a–t.

*Rhynchospira formosa* Hall, *Pal. New York*, 3, 1859, p. 485, pl. 95A, figs. 7–11.—Hall and Clarke, *ibid.*, 8, pt. 2, 1893, p. 109, pl. 50, figs. 21–25.—Weller, *Geol. Surv. New Jersey*, *Pal.*, 3, 1903, p. 240, pl. 21, figs. 30–34.—Maynard, *Maryland Geol. Surv.*, *Low. Dev.*, 1913, p. 426, pl. 72, figs. 26–30.

Helderbergian: Albany County, New York (New Scotland); Devils Backbone, Cash Valley, and Tonoloway, Maryland; Keyser, West Virginia (Keyser); New Jersey (Decker Ferry).

**Rhynchospira globosa** (Hall).

*Waldheimia globosa* Hall, 10th Ann. Rep. New York State Cab. Nat. Hist., 1857, p. 87.

*Trematospira* (*Rhynchospira*) *globosa* Hall, *Pal. New York*, 3, 1859, p. 215, pl. 36, figs. 1a–p.

**Rhynchospira globosa**—Continued.

*Rhynchospira globosa* Schuchert and Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 425, pl. 72, figs. 16–25.

Helderbergian: Albany County, New York (New Scotland); Pinto, Cash Valley, Cumberland, etc., Maryland (Keyser).

**Rhynchospira(?) helena** (Nettelroth).

*Trematospira helena* Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 137, pl. 32, figs. 40–43.

*Rhynchospira? helena* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 367.

Niagaran (Louisville): Louisville, Kentucky.

*Holotype*.—Cat. No. 51321, U.S.N.M.

**Rhynchospira lowi** Whiteaves.

*Rhynchospira Lowi* Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 277, pl. 25, figs. 8, 9.

Niagaran: Fawn River, Canada.

**Rhynchospira præformosa** Grabau.

*Retzia formosa* Whitfield (not Hall), Ann. New York Acad. Sci., 5, 1891, p. 512, pl. 5, figs. 15, 16; Geol. Ohio, 7, 1893, p. 413, pl. 1, figs. 15, 16.—Sherzer, Michigan Geol. Surv., 7, pt. 1, 1900, p. 224, pl. 17, figs. 15, 16.

*Rhynchospira præformosa* Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 131, pl. 20, figs. 2, 3; pl. 30, figs. 15, 16.

Lower Monroan (Greenfield): Greenfield, Ohio.

**Rhynchospira(?) sinuata** Hall.

*Rhynchospira sinuata* Hall, Canadian Nat. Geol., 5, 1860, p. 146.—Dawson, Acadian Geol., 3d ed., 1878, p. 597.

*Retzia sinuata* Miller, N. A. Geol. Pal., 1889, p. 367.

Silurian: Arisaig, Nova Scotia.

**RHYNCHOTREMA** Hall.

Genotype: *Rhynchonella capax* Conrad.

*Rhynchotrema* Hall, 13th Rep. New York State Cab. Nat. Hist., 1860, p. 68, figs. 12–14.—Waagen, Pal. Indica, 13th ser., 1, 1883, p. 410.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 458.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 182; 13th Ann. Rep. New York State Geol., 1895, p. 825.—Koken, Die Leitfossilien, Leipzig, 1896, p. 245.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 763.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 281.—Cumings, 32d Ann. Rep. Geol. Nat. Res. Indiana, 1908, p. 893.—Schuchert, Zittel-Eastman Textb. Pal., 1910, p. 323; 2d ed., 1913, p. 396.

*Stenocisma* Conrad, 2d Ann. Rep. New York Geol. Surv., 1839, pp. 58, 59.—Meek and Hayden (part), Pal. Upper Missouri, Smiths. Cont. to Knowl., 14, 172, 1864, p. 16, footnote.—Hall, Pal. New York, 4, 1867, pp. 334, 335.—Waagen, Pal. Indica, 13th ser., 1, 1883, pp. 411, 431, 436.—Miller, N. A. Geol. Pal., 1890, p. 337.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 187; 13th Ann. Rep. New York State Geol., 1895, p. 826.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 413 (see for discussion of genus).

**Rhynchotrema ainsliei** N. H. Winchell.

*Rhynchonella ainsliei* N. H. Winchell, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 315, pl. 2, figs. 5, 6.

*Rhynchotrema ainsliei* Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 459, pl. 34, figs. 1–8.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 282, fig. 343l–m.

Black River (Decorah): Minneapolis, St. Paul, etc., Minnesota; Decorah, Iowa.

**Rhynchotrema? anticostiense** (Billings).

*Rhynchonella anticostiensis* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 142, fig. 119 (adv. sheets, 1862); Geol. Canada, 1863, p. 211, fig. 212.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 174, fig.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 884, figs.—Whiteaves, Pal. Foss., 3, Geol. Surv. Canada, pt. 2, 1895, p. 122 (loc. occ.).

*Rhynchonella(?) anticostiensis* Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 464, fig. 34.

*Rhynchonella anticostiensis* var. *Whiteaves*, Pal. Foss., 3, pt. 3, 1897, p. 179.

Richmond and Gamachian: English Head, etc., Anticosti; Wilmington and Savannah, Illinois; Iowa; Wisconsin; Manitoba.

Observation.—See *R. argenturbica* (White) for a probable synonym.

**Rhynchotrema argenturbica** (White).

*Rhynchonella argenturbica* White, Wheeler's Expl. and Surv. West 100th Merid., 4, Prel. Rep., 1874, p. 14; *ibid.*, Final Rep., 1875, p. 75, pl. 4, fig. 12.

Richmond: Silver City, New Mexico.

Observation.—Probably the same as *R. anticostiense*.

*Cotypes*.—Cat. No. 8549, U.S.N.M.

**Rhynchotrema capax** (Conrad).

*Atrypa capax* Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1842, p. 264, pl. 14, fig. 21.—Hall, Amer. Jour. Sci. Arts, 47, 1844, p. 109.

*Atrypa increbescens* Hall (part), Pal. New York, 1, 1847, p. 146, pl. 33, figs. 13i, 13k-13y.—Billings, Canadian Nat. Geol., 1, 1856, p. 207, figs. 15, 16.—Hall, 13th Rep. New York State Cab. Nat. Hist., 1860, p. 66, figs. 6, 7, 9-11.

*Rhynchonella increbescens* Hall (part), Geol. Wisconsin, 1, 1862, p. 123, pl. 11, fig. 2.

*Rhynchonella capax* Billings, Geol. Canada, 1863, p. 211, fig. 213.—Safford, Geol. Tennessee, 1869, p. 275, figs. 4-6.—Meek, Pal. Ohio, 1, 1873, p. 123, pl. 11, fig. 2.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 17.—Roemer, Leth. geog., 1, Leth. Pal., Atlas, 1876, p. 4, fig. 13a.—White, 2d Ann. Rep. Indiana Bur. Stat. Geol., 1880, p. 489, pl. 1, figs. 9-11; 10th Rep. State Geol. Indiana, 1881, p. 121, pl. 1, figs. 9-11.—Whitfield, Geol. Wisconsin, 4, 1882, p. 263, pl. 12, figs. 26, 27.—Chamberlin, *ibid.*, 1, 1883, pp. 155, 174, fig.—Miller, N. A. Geol. Pal., 1889, p. 368, fig. 606.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 885, figs.—Keyes, Geol. Surv. Missouri, 5, 1895, p. 99, pl. 41, fig. 12.

*Rhynchotrema capax* Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 462, pl. 34, figs. 30-34.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, pp. 183, 185, pl. 56, figs. 14-18, 20-27; pl. 83, fig. 31.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 121; *ibid.*, pt. 3, 1897, p. 178.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 282, fig. 343h-k.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 931, pl. 36, figs. 6-6h.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 397, fig. 590.

Richmond: Richmond, Indiana; Oxford, etc., Ohio; Illinois; Iowa; Tennessee; Missouri; Wisconsin; Minnesota; Anticosti; Lake Winnipeg, Manitoba; Fort Churchill, Hudson Bay, etc.

**RHYNCHOTREMA CAPAX MANNIENSIS** Foerste. See *Rhynchotrema manniense*.

**Rhynchotrema deckerense** (Weller).

*Rhynchonella deckerensis* Weller, Geol. Surv. New Jersey, 3, 1903, p. 234, pl. 21, figs. 1-4.

*Stenochisma deckerensis* Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 349, pl. 63, figs. 1-4.

**Rhynchotrema deckerense**—Continued.

Helderbergian: Two miles south of Tristates, New York (Decker Ferry); Cash Valley, Devils Backbone, and Corriganville, Maryland; Keyser, West Virginia; Hyndman, Pennsylvania (Keyser).

**Rhynchotrema deckerense arcticum** (Holtedahl).

*Stenochisma deckerensis* var. *arctica* Holtedahl, Second Arct. Exp. "Fram", 1898-1902, No. 32, 1914, p. 21, pl. 7, figs. 7, 8.

Helderbergian (lower beds): Southwestern Ellesmereland, Arctic America.

**Rhynchotrema dentatum** (Hall).

*Atrypa dentata* Hall, Pal. New York, 1, 1847, p. 148, pl. 33, fig. 14.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 193, pl. 10, fig. 14.

*Rhynchonella dentata* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 65.—Meek, Pal. Ohio, 1, 1873, p. 121, pl. 11, fig. 3.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 18.—White, 2d Ann. Rep. Indiana Bur. State Geol., 1880, p. 490, pl. 1, figs. 12-14; 10th Rep. State Geol. Indiana, 1881, p. 122, pl. 1, figs. 12-14.—?Keyes, Geol. Surv. Missouri, 5, 1895, p. 100, pl. 41, fig. 3.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 887, figs.

*Rhynchotrema dentata* Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 185.—Weller, Geol. Surv. New Jersey Pal., 3, 1903, p. 159, pl. 10, figs. 19-22.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 281, fig. 343e-g.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 932, pl. 36, figs. 7-7d.—Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 29, pl. 2, fig. 16; pl. 3, fig. 12.

Trenton: Turin, New York; New Jersey.

Richmond: Dayton, Oxford, etc., Ohio; Indiana; Kentucky; Tennessee.

**Rhynchotrema dentatum arnheimense** Foerste.

*Rhynchotrema dentata-arnheimensis* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 227, pl. 4, fig. 12; 16, 1910, p. 27, pl. 3, fig. 13; Ohio Nat., 12, 1912, p. 453, pl. 22, fig. 9.

Richmond (Arnheim): Andersonville, etc., Ohio; Kentucky; Newsom, Clifton, etc., Tennessee.

**Rhynchotrema formosum** (Hall).

*Rhynchonella formosa* Hall, 10th Ann. Rep. New York State Cab. Nat. Hist., 1859, p. 76, figs. 1-5; Pal. New York, 8, 1859, p. 236, pl. 35, figs. 6a-y.

*Rhynchotrema formosum* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 369.

*Stenochisma formosa* Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 349, pl. 62, figs. 25-29.

Helderbergian (Keyser): Devils Backbone, Cumberland, Cash Valley, Pinto, etc., Maryland; Hyndman, Pennsylvania.

**Rhynchotrema? illinoisense** Savage.

*Rynchotrema? illinoisensis* Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 49, pl. 1, figs. 22, 23.

Upper Medinan (Girardeau): Near Thebes, Illinois.

**Rhynchotrema inaequivalve** (Castelnau).

*Spirifer inaequivalvis* Castelnau, Essai Syst. Sil. Amer. Sept., 1843, p. 40, pl. 14, fig. 8.

Magnesian limestone: Drummond Island, Lake Huron.

Observation.—Although the abundant Mohawkian species *R. increbescens* Hall is commonly quoted under the above name, there is no certainty that the two species are identical. Furthermore, the matter can not be settled without an examination of Castelnau's types, and until this is done *R. increbescens* is recognized as valid.



*Rhynchotrema inæquivalvis* var. *laticostata* Winchell and Schuchert. See *Rhynchotrema increbescens laticostatum*.

*Rhynchotrema inæquivalvis subtrigonalis* Schuchert. See *Rhynchotrema subtrigonale*.

***Rhynchotrema increbescens* (Hall).**

*Atrypa increbescens* (part) Hall, Pal. New York, 1, 1847, pp. 146, 289, pl. 33, figs. 13a-h; ?pl. 79, fig. 6.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 192, pl. 10; figs. 13a-x.

*Rhynchonella increbescens* Billings (part), Canadian Nat. Geol., 1, 1856, p. 207, figs. 11-14.—Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 66.—Chapman, Canadian Jour., n. s., 7, 1862, p. 114, fig. 104; *ibid.*, 8, 1863, p. 199, fig. 187.—Billings, Geol. Canada, 1863, p. 168, fig. 153.—Chapman, Expos. Min. and Geol. Canada, 1864, p. 118, fig. 104; p. 171, fig. 187.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 83, pl. 34, figs. 26-29.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 890, figs.—Sardeson, Amer. Geol., 19, 1897, p. 184.

*Rhynchotrema increbescens* Hall and Clarke, Pal. New York, 8, pt. 2, 1893, pp. 183, 185.—Hayes and Ulrich, U. S. Geol. Surv., folio 95, *illus. sheet*, 1903, figs. 38, 39.—Bassler, Bull. Virginia Geol. Surv., 2a, 1909, p. 183, figs. 20, 5-8.

*Hemithiris increbescens* D'Orbigny, Prodr. de Pal., 1, 1849, p. 18 (gen. ref.).

*Rhynchotrema inæquivalvis* Winchell and Schuchert (part), Geol. Minnesota, 3, 1893, p. 459, pl. 34, figs. 12-14, 24, 25 (not 9-11, 15-23=*R. minnesotensis*).—Whiteaves, Pal. Foss. Geol. Surv. Canada, 3, pt. 2, 1895, p. 121; *ibid.*, pt. 3, 1897, p. 179.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 159.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 159, pl. 10, figs. 15-18.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 281, figs. 243a-d.—Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 314, pl. 7, figs. 10a-c.

*Trematospira*(?) *quadriplicata* Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 60, figs. 6, 7.

*Rhynchotreta quadriplicata* Miller, N. A. Geol. Pal., 1889, p. 370, fig. 608.

Trenton: Middleville, etc., New York; Canada; Virginia; Kentucky; Tennessee; Illinois; Wisconsin; Minnesota; Iowa; etc.

*Plesiotypes*.—Cat. Nos. 35399, 51375, U.S.N.M. (Nettelroth and Hayes and Ulrich).

***Rhynchotrema increbescens laticostatum* (Winchell and Schuchert).**

*Rhynchotrema inæquivalvis* var. *laticostata* Winchell and Schuchert, Amer. Geol., 9, April 1, 1892, p. 293; Geol. Minnesota, 3, 1893, p. 461, pl. 34, figs. 26-29.

*Rhynchonella sancta* Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, April 9, 1892, p. 333, pl. 4, figs. 19, 20.

*Rhynchonella inæquivalvis* var. *laticostata* Sardeson, Amer. Geol., 19, 1897, p. 185.

Trenton (Prosser): Cannon Falls, Minnesota.

***Rhynchotrema manniense* Foerste.**

*Rhynchotrema capax manniensis* Foerste, Jour. Geol., 11, 1903, p. 38.

*Rhynchotrema manniensis* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 215, pl. 7, fig. 4.

Richmond (Fernvale): Clifton, Riverside, etc., Tennessee.

***Rhynchotrema minnesotense* (Sardeson).**

*Rhynchonella minnesotensis* Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, 1892, p. 333, pl. 4, figs. 21-23; Amer. Geol., 18, 1896, p. 184.

*Rhynchotrema minnesotensis* Schuchert, Proc. U. S. Nat. Mus., 32, 1900, p. 158.

**Rhynchotrema minnesotense**—Continued.

*Rhynchotrema inæquivalvis* Winchell and Schuchert (part), Geol. Minnesota, 3, pt. 1, 1893, p. 459, pl. 34, figs. 9-11, 15-23 (not figs. 12-14, 24, 25=*R. increbescens*).

Black River (Platteville and Decorah): St. Paul, etc., Minnesota; Platteville, etc., Wisconsin.

**Rhynchotrema neenah** (Whitfield).

*Rhynchonella neenah* Whitfield, Geol. Wisconsin, 4, 1882, p. 265, pl. 12, figs. 19-22.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 465, pl. 34, figs. 35-37.

Richmond (Maquoketa): Iron Ridge, Clifton, etc., Wisconsin; Savannah, Illinois; Lattners, Iowa.

**Rhynchotrema ottawaense** (Billings).

*Porambonites? ottawaensis* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 140, fig. 117 (adv. sheets, 1862).—Miller, N. A. Geol. Pal., 1889, p. 362, fig. 598.

*Rhynchotrema ottawaensis* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 369.  
Black River (Leray): Pauquette Rapids, Ottawa River, Canada.

**Rhynchotrema perlamellosum** (Whitfield).

*Rhynchonella perlamellosa* Whitfield, Ann. Rep. Geol. Surv. Wisconsin, 1877, 1878, p. 73.—James, Paleontologist, 2, 1878, p. 15.—Whitfield, Geol. Wisconsin, 4, 1882, p. 265, pl. 12, figs. 23-25.

*Rhynchotrema perlamellosum* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 370.

Richmond: Delafield and Iron Ridge, Wisconsin; Oxford, etc., Ohio; Indiana; Anticosti; Manitoba.

**Rhynchotrema procteri** Ulrich.

*Rhynchonella procteri* Ulrich, Amer. Geol., 1, 1888, p. 181.

Trenton (Flanagan): Danville, etc., Kentucky.

**Rhynchotrema subtrigonale** (Hall).

*Atrypa subtrigonalis* Hall, Pal. New York, 1, 1847, p. 145, pl. 33, fig. 12.—Emons, Amer. Geology, 1, pt. 2, 1855, p. 191, pl. 10, fig. 12.

*Hemithiris subtrigonalis* D'Orbigny, Prodr. de Pal., 1, 1849, p. 18 (gen. ref.).

*Rhynchonella subtrigonalis* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 66.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 902, figs.

*Rhynchotrema inæquivalvis subtrigonalis* Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 159.

Trenton: Turin, etc., New York; Kentucky; Baffin Land.

**RHYNCHOTRETA** Hall.

Genotype: *Rhynchonella cuneata* Dalman.

*Rhynchotreta* Hall, 28th Rep. New York State Mus. Nat. Hist., 1879, p. 166, figs.

1-4; 11th Rep. State Geol. Indiana, 1882, p. 309.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 84.—Miller, N. A. Geol.

Pal., p. 370.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 185; 13th Ann. Rep. New York State Geol., 1895, p. 825.—Williams, Bull. U. S. Geol.

Surv., 165, 1900, p. 59.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 192; Bull. New York State Mus., 45, 1901, p. 192.—Grabau and Shimer, N. A.

Index Fossils, 1, 1907, p. 282.—Schuchert, Zittel-Eastman Textb. Pal., 1900, p. 323; 2d ed., 1913, p. 397.

**RHYNCHOTRETA AMERICANA** Foerste. See *Rhynchotreta cuneata americana*.

**Rhynchotreta cuneata americana** (Hall).

*Atrypa cuneata* Hall (not Dalman), Geol. New York; Rep. 4th Dist., 1843, Tab. Org. Rem., 13, figs. 3, 4; Pal. New York, 2, 1852, p. 276, pl. 57, fig. 4.—Billings, Canadian Nat. Geol., 1, 1856, p. 138, pl. 2, fig. 13.—Emmons, Amer. Geology, 1860, p. 108, fig.

*Rhynchonella cuneata* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 77.—Billings, Geol. Canada, 1863, p. 315, fig. 323.—Safford, Geol. Tennessee, 1869, p. 315, fig. 8.

*Rhynchotreta cuneata* var. *americana* Hall, 28th Rep. New York State Mus. Nat. Hist., 1879, p. 167, pl. 25, figs. 29–38; 11th Rep. State Geol. Indiana, 1882, p. 310, pl. 25, figs. 29–38.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 85, pl. 32, figs. 58, 59, 62, 63.—Beecher and Clarke, Mem. New York State Mus., 1, 1889, p. 47, pl. 4, figs. 12–22.—Miller, N. A. Geol. Pal., 1889, p. 370, fig. 607.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, pp. 886, 908, figs.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 187, pl. 56, figs. 31–38.

*Rhynchotreta cuneata* var. *americana* Grabau, Bull. New York State Mus., 45, 1901, p. 192, fig. 150; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 192, fig. 105.—Clarke and Ruedemann, Mem. New York State Mus., 5, p. 46, pl. 4, figs. 23–25.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 283, fig. 344.

*Rhynchotreta americana* Foerste, Cincinnati Soc. Nat. Hist. Jour., 21, 1909, p. 11. Niagara: Lockport, etc., New York; Ontario; Waldron, etc., Indiana; Kentucky; Tennessee; Wisconsin.

**Rhynchotreta intermedia** Savage.

*Rhynchotreta intermedia* Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 115, pl. 7, figs. 14, 15.

Upper Medinan (Channahon): Will County, Illinois.

**Rhynchotreta lepida** Savage.

*Rhynchotreta lepida* Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 114, pl. 7, figs. 16, 17.

Upper Medinan (Channahon): Will County, Illinois.

**Rhynchotreta parva** Savage.

*Rhynchotreta parva* Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 80, pl. 5, figs. 9, 10.

Upper Medinan (Edgewood-Noix): Louisiana, Missouri, and south of Hamburg, Illinois.

**Rhynchotreta robusta** (Hall).

*Atrypa robusta* Hall, Pal. New York, 2, 1852, p. 71, pl. 23, fig. 7.

*Rhynchonella robusta* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 78.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 899, figs.—Grabau, Bull. New York State Mus., 45, 1901, p. 194, fig. 109; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 194, fig. 109.

Clinton (Irondequoit): Lockport and Niagara, New York.

**Rhynchotreta thebesensis** Foerste.

*Rhynchotreta thebesensis* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 94, pl. 4, figs. 66a–c.—Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 80, pl. 4, figs. 19–20.

Upper Medinan (Edgewood): Thebes, Illinois; near Edgewood and Louisiana, Missouri.

**Rhynchotretra thebesensis multistriata** Savage.

*Rhynchotretra thebesensis* var. *multistriata* Savage, Bull. Geol. Surv., 23, 1913, p. 81, pl. 4, figs. 21, 22.

Upper Medinan (Edgewood): Near Thebes, Illinois.

**RHYNCHOTRETRA QUADRIPPLICATA** Miller. See *Rhynchotretra* *inequivalve*.

**Rhynchotretra simplex** Foerste.

*Rhynchotretra simplex* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 94, pl. 3, fig. 46A, B.

Upper Medinan (Brassfield): Clifton, Tennessee.

**RHYNCHOTROPIS** Meek. See *Whitella* Ulrich.

**RHYNBOLUS** Hall. See *Rhinobolus* Hall

**RHYSOPHYCUS** Roemer. See *Rusophycus* Hall.

**RHYTIMYA** Ulrich.

Genotype: *R. producta* Ulrich.

*Orthodesma* Whitfield (not Hall and Whitfield), Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 139.—Miller, *idem.*, 4, 1881, p. 76.

*Sedgwickia* Whitfield (not McCoy), *ibid.*, 1, 1878, p. 140.

*Rhytimya* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 618; Geol. Surv. Ohio, 7, 1893, p. 688.—Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 17, p. 140.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 984.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 526.

**Rhytimya byrnesi** (Miller).

*Orthodesma* *byrnesi* Miller, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 76, pl. 1, figs. 7a-b.

*Rhytimya byrnesi* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 689, pl. 56, figs. 4, 5.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1019, pl. 48, figs. 3-3a.

Richmond, Indiana (Whitewater); Weisburg, Indiana, and Blanchester, Ohio (Waynesville).

*Plesiotype*.—Cat. No. 46298, U.S.N.M.

**Rhytimya compressa** Ulrich.

*Rhytimya compressa* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 692, pl. 56, fig. 13.

Maysville (Fairmount): Cincinnati, Ohio, and vicinity.

*Holotype*.—Cat. No. 46299, U.S.N.M.

**Rhytimya convexa** Ulrich.

*Rhytimya convexa* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 691, pl. 56, figs. 2, 3.

\*Maysville (Fairmount): Cincinnati, Ohio, and vicinity.

*Holotype*.—Cat. No. 46300, U.S.N.M.

**Rhytimya emma** (Billings).

*Cyrtodonta* Emma Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 150, fig. 130 (adv. sheets, 1862).—Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 13 (loc. ref.).

*Cypriocardites* Emma Miller, N. A. Geol. Pal., 1889, p. 476 (gen. ref.).

*Rhytimya emma* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 619 (gen. ref.).

Richmond (English Head and Charleton): English Head, etc., Anticosti.

**Rhytimya faberi** (Miller).

*Orthodesma faberi* Miller, N. A. Geol. Pal., 1889, p. 497, fig. 873.

Richmond: Versailles, Indiana.

**Rhytimya? kagawongensis** Foerste.

*Rhytimya kagawongensis* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, pl. 4, fig. 5.

Richmond: Kagawong, Manitoulin Island, Lake Huron.

**Rhytimya lunulata** (Whitfield).

*Sedgewickia*(?) *lunulata* Whitfield, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 140, pl. 6, figs. 8, 8a.

*Rhytimya lunulata* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 619 (gen. ref.).

Richmond: Clinton County, Ohio.

**Rhytimya mickleboroughi** (Whitfield).

*Orthodesma mickleboroughi* Whitfield, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 139, pl. 6, fig. 7.

*Rhytimya mickleboroughi* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 690, pl. 56, figs. 14-15.—Grabau and Shimer, N. A. Index Fossils, 1 (3), 1909, p. 526, fig. 714.

*Orthodesma cymbula* Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 17, 1894, p. 143, pl. 8, figs. 7-9.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 783, fig. 1445.

Maysville (Fairmount): Cincinnati, Ohio, and vicinity.

*Plesiotype*.—Cat. No. 46301, U.S.N.M.

Observation.—See *Modiolopsis? terminalis* and *Orthodesma contractum* Hall.

**Rhytimya munda** (Miller and Faber).

*Orthodesma mundum* Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 15, 1892, p. 82, pl. 1, figs. 11, 12.

Maysville (Corryville): Cincinnati, Ohio.

**Rhytimya œhana** Ulrich.

*Rhytimya œhana* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 689, pl. 56, fig. 1.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 307, pl. 1, fig. 11.

Cincinnati: Cincinnati, Ohio, and vicinity (Maysville-McMillan); Chambly, Quebec (Pulaski).

*Holotype*.—Cat. No. 46302, U.S.N.M.

**Rhytimya producta** Ulrich.

*Rhytimya producta* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 688, pl. 56, figs. 6-9.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 526, fig. 713.

Maysville (Fairmount): Cincinnati, Ohio, and vicinity.

*Cotypes*.—Cat. Nos. 46303, 46304, U.S.N.M.

**Rhytimya radlata** Ulrich.

*Rhytimya radiata* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 692, pl. 56, figs. 10-12.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 526, fig. 712.

*Orthodesma ashmani* Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 17, 1894, p. 146, pl. 8, figs. 12-14.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 783, fig. 1446.

Eden (Southgate): Cincinnati, Ohio, and vicinity.

*Cotypes*.—Cat. No. 46305, U.S.N.M.

**Rhytimya recta** Whiteaves.

*Rhytimya recta* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 186, pl. 20, fig. 7.

Black River or Richmond: Reindeer Island, Lake Winnipeg, Canada.

**Rhytimya scaphula** (Miller and Faber).

*Orthodesma scaphula* Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 17, 1894, p. 145, pl. 8, figs. 10, 11.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 783, fig. 1447.

Maysville (Fairmount): Cincinnati, Ohio, and vicinity.

**Rhytimya sinuata** Ulrich.

*Rhytimya sinuata* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 619, pl. 36, figs. 46, 47.

*Orthodesma sinuatum* Miller, N. A. Geol. Pal., 2d App., 1897, p. 784 (gen. ref.).

Trenton (Prosser): Near Wykoff, Minnesota.

*Holotype*.—Cat. No. 46306, U.S.N.M.

**RIBEIRELLA** Shubert and Waagen. See *Technophorus* Miller.

**RIBEIRIA** Sharpe.

Genotype: *R. pholandiformis* Sharpe.

*Ribeiria* Sharpe, Quart. Jour. Geol. Soc. London, 9, 1853, p. 157.—Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, pp. 339, 340 (*Ribeiria* proposed in case his species should be distinct).—Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 343.—Miller, N. A. Geol. Pal., 1889, p. 566.—Cleland, Bull. Amer. Pal., 3, 1890, p. 132 (260).—Jones, Rep. 59th Meeting British Assoc. Adv. Sci., 1890, p. 66.—Schubert and Waagen, Jahrb. d. k. k. geol. Reichsanst., 53, 1903, pp. 33, 41.—Clarke, Mem. New York State Mus., 6, 1904, p. 406, expl. pl.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 374.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 733.

**Ribeiria calcifera** Billings.

*Ribeiria? calcifera* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 340, figs. 326a-c.—Miller, N. A. Geol. Pal., 1889, p. 566, fig. 1055.—Schubert and Waagen, Jahrb. geol. Reichsanst., 53, 1903, p. 42, pl. 1, figs. 1a-c.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 374, fig. 1675.

Canadian (Beekmantown): Leeds and Grenville Counties, Quebec.

**Ribeiria compressa** Whitfield.

*Ribeiria compressa* Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 344, pl. 33, figs. 3-5.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 909, fig.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 374.

Canadian (Beekmantown): Fort Cassin, Vermont.

**Ribeiria? longiuscula** Billings.

*Ribeiria? longiuscula* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 341, fig. 327.—Schubert and Waagen, Jahrb. geol. Reichsanst., 53, 1903, p. 43, pl. 1, fig. 2.

Canadian (Beekmantown): Leeds and Grenville Counties, Canada.

**Ribeiria? nuculitiformis** Cleland.

*Ribeiria? nuculitiformis* Cleland, Bull. Amer. Pal., 3, 1900, p. 133 (261), pl. 16, figs. 10-14.

Canadian (Tribes Hill): Near Fort Hunter, New York.

**Ribeiria nuculitiformis equilatera** Cleland.

*Ribeiria nuculitiformis* var. *equilatera* Cleland, Bull. Amer. Pal., 3, 1900, p. 134 (262), pl. 16, fig. 15.

Canadian (Tribes Hill): Fort Hunter, New York.

**Ribeiria parva** Collie.

*Ribeiria parva* Collie, Bull. Geol. Soc. Amer., 14, 1903, p. 419, pl. 59, figs. 4, 5.

Canadian (Beekmantown): Bellefonte, Pennsylvania.

**Ribeiria turgida** Cleland.

*Ribeiria turgida* Cleland, Bull. Amer. Pal., 4, 1903, p. 12, pl. 3, figs. 6, 7.  
Canadian (Tribes Hill): Fort Hunter and Tribes Hill, New York.

**Ribeiria ventricosa** Whitfield.

*Ribeiria ventricosa* Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 344, pl. 33, figs. 1, 2.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 909, fig.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 375.  
Canadian (Beckmantown): Fort Cassin, Vermont.

RIBEIRINA Billings. See *Ribeiria* Sharpe.

RÖMERASTER Stüztz. See *Urasterella* McCoy.

**ROMINGERIA** Nicholson.

Genotype: *Aulopora umbellifera* Billings.

*Quenstedtia Rominger*, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 71 (preoccupied).  
*Romingeria* Nicholson, Tab. Corals Pal. Period, 1879, p. 114.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 449.—Miller, N. A. Geol. Pal., 1889, p. 203.—Beecher, Trans. Connecticut Acad. Arts Sci., 8, 1891, pp. 212, 218.—Sardeson, Neues Jahrb. Min., Geol., Pal., Beilage-Band, 10, 1896, pp. 251, 327.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 46.—Pocta, Syst. Sil. du Centre Boheme, 8, pt. 2, 1902, p. 265.—Beecher, Amer. Jour. Sci., 16, 1903, p. 1.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 79; Zittel-Eastman Textb. Pal., 2d ed., 1900, p. 101; 2d ed., 1913, p. 116.

**Romingeria niagarensis** (Rominger).

*Quenstedtia niagarensis* Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 72, pl. 33, fig. 3.  
*Romingeria Niagarensis* Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 450 (gen. ref.).  
Niagaran: Point Detour, Michigan; Masonville, Iowa.

**Romingeria? trentonensis** Weller.

*Romingeria? trentonensis* Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 138, pl. 6, fig. 5.  
Black River (Jacksonburg): Near Stillwater, New Jersey.

**Romingeria umbellifera** (Billings).

*Aulopora umbellifera* Billings, Canadian Jour., 4, 1859, p. 119.—Nicholson, Pal. Ontario, 1874, p. 43, pl. 6, fig. 4.—Whiteaves, Rep. Progr., Geol. Surv. Canada, 1877, p. 317.  
*Quenstedtia umbellifera* Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 71, pl. 33, fig. 3.  
*Romingeria umbellifera* Nicholson, Tabulate Corals Pal. Period, 1879, p. 116, fig. 19.—Lambe, Contr. Can. Pal., Geol. Surv. Canada, 1899, p. 46.—Beecher, Amer. Jour. Sci., 4th ser., 16, 1903, pp. 2-6, pls. 1-4.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 79.—Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 108, pl. 14, fig. 7.  
Middle Devonian: Ontario and New York.  
Upper Mouroan (Amherstburg): Detroit River, opposite Amherstburg, Ontario.

**Romingeria uva** Davis.

*Romingeria uva* Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 75, figs. 6, 7.  
Niagaran (Louisville): Louisville, Kentucky.

**Romingeria vannula** Davis.

Romingeria vannula Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 75, figs. 1-3, 5.

Niagaran (Louisville): Louisville, Kentucky.

*Cotype*.—Cat. No. 52743, U.S.N.M.

**ROPALONARIA VENOSA** Ulrich. See *Rhopalonia venosa*.

**ROSACILLA** Roemer. See *Berenicea Lamouroux*.

**ROSENELLA** Nicholson.

Genotype: *R. glenelgensis* Parks.

Rosenella Parks, Univ. Toronto Studies (Geol. Series), No. 4, 1907, p. 23.

**Rosenella glenelgensis** Parks.

Rosenella glenelgensis Parks, Univ. Toronto Studies (Geol. Series), No. 4, 1907, p. 23, pl. 2, fig. 3; pl. 3, fig. 4; pl. 6, fig. 5.

Niagaran (Guelph): Durham and Elora, Ontario.

**Rosenella? manitoulinensis** Parks.

Rosenella(?) manitoulinensis Parks, Univ. Toronto Studies (Geol. Series), No. 5, 1908, p. 42, pl. 12, fig. 3; pl. 14, fig. 8.

Niagaran: Manitoulin Island; drift at Ann Arbor, Michigan.

**ROUVILLIGRAPTUS** Barrois. See *Holograptus Holm*.

**RUEDEMANNIA** Foerste. See *Lophospira Whitfield*.

**RUSICHNITES** Dawson. See *Rusophycus Hall*.

**RUSOPHYCUS** Hall.

Genotype: *R. clavatum* Hall.

Rusophycus Hall, Pal. New York, 2, 1852, p. 23.—Dawson, Canadian Nat. and Geol., n. s., 1, 1864, p. 363.—Nathorst, Kongl. Sven. Vet.-Akad. Handl., 18, No. 7, 1881, p. 33.—Dawson, Quart. Jour. Geol. Soc. London, 46, 1890, p. 599.—James, Jour. Cincinnati Soc. Nat. Hist., 7, 1885, pp. 153-155.—Miller, N. A. Geol. Pal., 1889, p. 138.

Rhysophycus Roemer, Leth. geog., 1 Theil, Leth. Pal., Erste Lief, 1880, p. 130.

Rusichnites Dawson, Can. Nat. Geol., 1, 1861, p. 363.

**Rusophycus asperum** Miller and Dyer.

Rusophycus asper Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 25, pl. 1, figs. 5, 5a.

Cruziana aspera James, *ibid.*, 7, 1885, p. 156.

Eden (Economy): Cincinnati, Ohio, and vicinity.

**Rusophycus biloba** (Vanuxem).

Fucoides biloba Vanuxem, Nat. Hist. New York, pt. 3, 1842, p. 79, fig. 11, No. 1; *ibid.*, pt. 4, 1843, p. 77, fig. 1; tab. ill. 9, fig. 1.—Owen, Amer. Jour. Sci. Arts, 48, 1845, p. 307, fig. 1.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 6, fig. 13.

Rusophycus bilobatus Hall, Pal. New York, 2, 1852, p. 24, pl. 9, figs. 1a-c.—Rogers, Geol. Pennsylvania, 2, 1858, p. 822, fig. 626.—Emmons, Man. Geol., 1860, p. 107, fig. 1.—Dana, Man. Geol., 1863, p. 235, fig. 365.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 37, fig. 14.—Miller, N. A. Geol. Pal., 1889, p. 914, fig.

Rhysophycus bilobatus Delgado, Etude Bilobites, Syst. Sil. Portugal, Lisbonne, Suppl., 1887, p. 65, pl. 8, fig. 5.

Cruziana bilobata James, Jour. Cincinnati Soc. Nat. Hist., 7, 1885, pp. 154-57.

Clinton: Oneida County, New York.



**RUSOPHYCUS BILOBATUS** Hall. See *Rusophycus biloba*.

**RUSOPHYCUS CARLEYI** (James).

*Cruziana carleyi* James, Jour. Cincinnati Soc. Nat. Hist., 7, 1885, p. 155, pl. 8, fig. 1.

Eden or Maysville: Bantam, Clermont County, Ohio.

**Rusophycus clavatum** Hall.

*Rusophycus clavatus* Hall, Pal. New York, 2, 1852, p. 23, pl. 8, figs. 1a-b.

Clinton: New Hartford, Oneida County, New York.

**Rusophycus clintonense** (Dawson).

*Rusichnites* (*Psammichnites*) *clintonensis* Dawson, Quart. Jour. Geol. Soc. London, 46, 1890, p. 598, fig. 3.

*Rhysophycus clintonense* Miller, N. A. Geol. Pal., 1st App., 1892, p. 666 (gen. ref.).

Upper Medinan (Cataract): Hamilton, Ontario.

**Rusophycus grenvillense** Billings.

*Rusophycus Grenvillensis* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 101 (adv. sheets, 1862).—Dawson, Canadian Nat. Geol., n. s., 1, 1864, p. 363, figs.

*Rusichnites grenvillensis* Dawson, Quart. Jour. Geol. Soc. London, 46, 1890, p. 597, fig. 1.

Chazy sandstone: Head of Grenville Canal, Canada.

**Rusophycus pudicum** Hall.

*Rusophycus pudicus* Hall, Pal. New York, 2, 1852, p. 24, pl. 8, fig. 6a-b.

*Cruziana pudica* James, Jour. Cincinnati Soc. Nat. Hist., 7, 1885, pp. 154, 157.

Clinton: New Hartford, New York.

**Rusophycus subangulatum** (Hall).

*Rusophycus subangulatus* Hall, Pal. New York, 2, 1852, p. 23, pl. 8, fig. 2a-b.

*Cruziana subangulata* James, Jour. Cincinnati Soc. Nat. Hist., 7, 1885, p. 154.

Clinton: New Hartford, New York.

**SABELLARITES** Dawson.

Genotype: *Sabellarites trentonensis* Dawson.

*Sabellarites* Dawson, Quart. Jour. Geol. Soc. London, 46, 1890, p. 605.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 703.

**Sabellarites phosphaticus** Dawson.

*Sabellarites phosphaticus* Dawson, Quart. Jour. Geol. Soc. London, 46, 1890, p. 608.

Canadian? (Levis?): Kamouraska, Quebec.

**Sabellarites trentonensis** Dawson.

*Sabellarites trentonensis* Dawson, Quart. Jour. Geol. Soc. London, 46, 1890, p. 607, fig. 11, p. 608.

Black River: Pointe Clair, near Montreal, Quebec.

**SACCOCRINUS** Hall. See *Periechocrinus* Austin.

**SACCOCRINUS BENEDICTI** Miller. See *Habrocrinus benedicti*.

**SACCOCRINUS CHRISTYI** Meek and Worthen. See *Periechocrinus whitfieldi*.

**SACCOCRINUS HOWARDI** Miller. See *Habrocrinus howardi*.

**SACCOCRINUS PYRIFORMIS** Miller. See *Periechocrinus urniformis*.

*SACCOCRINUS SACCULUS* Meek and Worthen. See *Periechocrinus whitfieldi*.

*SACCOCRINUS SEMIRADIATUS* Miller. See *Macrostylocrinus semiradiatus*.

*SACCOCRINUS SPECIOSUS* Roemer. See *Periechocrinus dubius*.

*Saccophycus* James.

Genotype: *Saccophycus intortus* James.

*Saccophycus* James, *Paleontologist*, No. 3, 1879, p. 17; *Jour. Cincinnati Soc. Nat. Hist.*, 7, 1885, p. 157.

*Saccophycus intortus* James.

*Saccophycus intortus* James, *Paleontologist*, No. 3, 1879, p. 17.

Maysville?: Near Lebanon, Ohio.

Observation.—Not recognizable without a restudy of the type.

**SACCOSPONGIA** Ulrich.

Genotype: *S. rudis* Ulrich.

*Saccospongia* Ulrich, *Amer. Geol.*, 3, 1889, pp. 235, 242.—Miller, *N. A. Geol. Pal.*, 1889, p. 164.

*Saccospongia danvillensis* Ulrich.

*Saccospongia danvillensis* Ulrich, *Amer. Geol.*, 3, 1889, p. 243.

Trenton (Perryville): Boyle, Mercer, Franklin, and Fayette Counties, Kentucky.

*Cotypes*.—Cat. No. 46570, U.S.N.M.

*Saccospongia rudis* Ulrich.

*Saccospongia rudis* Ulrich, *Amer. Geol.*, 3, 1889, p. 242, fig. 7.

Trenton (Cynthiana): Near Lexington and Frankfort, Kentucky.

*Cotypes*.—Cat. No. 46571, U.S.N.M.

*SACTOCERAS* Hyatt. See *Loxoceras* McCoy.

*SACTOCERAS CANADENSE* Whiteaves. See *Actinoceras* (*Paractinoceras*) *canadense*.

**SÆRICHNITES** Billings.

Genotype: *S. abruptus* Billings.

*Særichnites* Billings, *Cat. Sil. Foss. Anticosti, Geol. Surv. Canada*, 1866, p. 73.—Miller, *N. A. Geol. Pal.*, 1889, p. 453.

*Særichnites abruptus* Billings.

*Særichnites abruptus* Billings, *Cat. Sil. Foss. Anticosti, Geol. Surv. Canada*, 1866, p. 73.

Richmond (English Head): Near English Head, etc., Anticosti.

**SAFFORDIA** Ulrich.

Genotype: *S. ventralis* Ulrich.

*Saffordia* Ulrich, *Geol. Minnesota*, 3, pt. 2, 1894, p. 625.—Grabau and Shimer, *N. A. Index Fossils*, 1, 1909, p. 384.

*Saffordia modesta* (Ulrich).

*Cypricardites?* *modestus* Ulrich, *Amer. Geol.*, 10, 1892, p. 100, pl. 7, figs. 5-7.

*Saffordia modesta* Ulrich, *Geol. Minnesota*, 3, pt. 2, 1894, p. 627, pl. 41, figs.

29-31.—Schuchert, *Proc. U. S. Nat. Mus.*, 22, 1900, p. 163.—Grabau and Shimer, *N. A. Index Fossils*, 1, 1909, p. 385, fig. 489c.

Trenton: Oshkosh, Wisconsin; Goodhue and Fillmore Counties, Minnesota (Prosser); Baffin Land.

*Holotype*.—Cat. No. 46307, U.S.N.M.

*Saffordia sulcodorsata* (Ulrich).

*Cuncemya sulcodorsata* Ulrich, 19th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1892, p. 248, fig. 32.

*Saffordia sulcodorsata* Ulrich, *Geol. Minnesota*, 3, pt. 2, 1894, p. 626, pl. 41, figs. 32, 33.

**Saffordia sulcodorsata**—Continued.

*Cypricardites sulcodorsatus* Miller, N. A. Geol. Pal., 2d App., 1897, p. 781 (gen. ref.).

Richmond (Maquoketa): Spring Valley, Minnesota.

*Holotype*.—Cat. No. 46308, U.S.N.M.

**Saffordia ulrichi** Ruedemann.

*Saffordia ulrichi* Ruedemann, Bull. New York State Mus., 162, 1912, p. 107, pl. 6, figs. 17, 18.

Trenton (Schenectady): Schenectady, New York.

**Saffordia ventralis** Ulrich.

*Saffordia ventralis* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 626, pl. 41, figs.

34-41.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 385, figs. 489a-b.

*Cypricardites ventralis* Miller, N. A. Geol. Pal., 2d App., 1897, p. 781 (gen. ref.).

Richmond (Maquoketa): Spring Valley, Minnesota; Iron Ridge, Wisconsin.

*Cotypes*.—Cat. Nos. 46309, 46310, U.S.N.M.

SAGENELLA Hall. See *Berenicea Lamouroux*.

*Sagenella ambigua* Walcott.

Not recognizable.

*Sagenella ambigua* Walcott, Trans. Albany Inst., 10, 1883, p. 22, pl. 1, figs. 3, 3a.

Utica: Trenton, New York.

SAGENELLA ELEGANS Hall. See *Berenicea consimilis*.

SAGENELLA MEMBRANACEA Hall. See *Berenicea consimilis*.

SAGENELLA STRIATA James. See *Escharopora acuminata*.

SAGENOCRINITES Austin. See *Sagenocrinus* Austin.

**SAGENOCRINUS** Austin.

Genotype: *Actinocrinus expansus* Phillips.

*Sagenocrinites* Austin, Ann. Mag. Nat. Hist., 11, 1843, p. 205.

*Sagenocrinus* Pictet, Traite Pal., 4, 1857, p. 323.—Angelin, Icon. Crin. Suec., 7,

1878.—Ehler, Bull. Soc. Geol. France, 7, 1879, p. 8.—Zittel, Handb. Pal., 1,

1879, p. 375.—Waschmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia,

1881 (Rev. Pal., pt. 2), pp. 184-201; *ibid.*, 1885, p. 321; *ibid.*, 1888, p. 357;

*ibid.*, 1890, p. 338.—Jackel, Zeits. d. d. geol. Ges., 49, Verhandl., 1897, p.

46.—Bather, Treatise on Zool., 1900, p. 190.—Springer, Jour. Geol., 14, 1906,

p. 518; Mono. Crin. Flex. Smiths. Inst. (in press); Zittel-Eastman Textb. Pal.,

2d ed., 1913, p. 204.

**Sagenocrinus americanus** Springer.

*Sagenocrinus americanus* Springer, Amer. Geol., 30, 1902, p. 88, fig.; Mono. Crin.

Flex. Smiths. Inst. (in press).

Niagaran (Waldron): Waldron, Indiana.

**Sagenocrinus clarki** Springer.

*Sagenocrinus clarki* Springer, Mono. Crin. Flex. Smiths. Inst. (in press).

Niagaran (Brownsport): Decatur County, Tennessee.

**SALPINGOSTOMA** (Roemer).

Genotype: *S. megalostoma* Eichwald.

Bellerophon and Bucania (part) of authors.

*Salpingostoma* Roemer, Leth. Geog., 1, Leth. Pal. Atlas, 1876, pl. 5, fig. 12.—

Zittel, Handb. Pal., 2, 1882, p. 184.—Koken, Neues Jahrb. Min. Geol. Pal.,

6, Beilage-Band, 1889, p. 381, 385.—Newton, Geol. Mag., dec. 3, 9, 1892, p.

338.—Koken, Die Leitfossilien, Leipzig, 1896, p. 99.—Whidborne, Mon. Dev.

Fauna South England, 3, Pal. Soc., 1896, p. 66.—Ulrich and Scofield, Geol.

**SALPINGOSTOMA**—Continued.

Minnesota, 3, pt. 2, 1897, pp. 851–897.—Koken, Bull. Acad. Imp. Sci. St. Petersburg, 7, p. 129; Neues Jahrb. Min. Geol. Pal., 1, 1898, p. 6, 7.—Pilsbry, Zittel-Eastman Textb. Pal., 1, 1900, p. 445.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 56.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 952.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 614.—Dall, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 521.

**Salpingostoma boreale** Whiteaves.

*Salpingostoma boreale* Whiteaves, Geol. Surv. Canada, Ann. Rep., n. s., 14, App. F, 1904, p. 49; *ibid.*, Pal. Foss., 3, pt. 4, 1906, p. 258, pl. 28, figs. 10, 11.  
Niaganan: Ekwon River, Canada.

**Salpingostoma buelli** (Whitfield).

*Bucania buelli* Whitfield, Ann. Rep. Geol. Surv. Wisconsin, 1878, p. 76.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 158.—Koken, Neues Jahrb. Min. Geol. Pal., 6, Beilage-Band, 1889, p. 386.  
*Bucania* (*Tremanotus?*) *buelli* Whitfield, Geol. Wisconsin, 4, 1882, p. 224, pl. 6, figs. 12–14.—Whiteaves, Canadian Rec. Sci., 5, 1893, p. 322 (loc. occ.).  
*Salpingostoma Buelli* Whiteaves, Pal. Foss., 3, pt. 3, Geol. Surv. Canada, 1897, p. 189.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 900, pl. 47, figs. 34–37.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 614, fig. 823a–c.  
Black River: Beloit and Janesville, Wisconsin; Rockton and Dixon, Illinois; Minneapolis, etc., Minnesota; Lower Fort Garry, Manitoba.  
*Plesiotype*.—Cat. No. 45980, U.S.N.M.

**Salpingostoma buelli kentuckyense** Ulrich and Scofield.

*Salpingostoma buelli* var. *kentuckyensis* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 901.  
Trenton (Curdsville): Mercer County, Kentucky.  
*Cotypes*.—Cat. No. 45981, U.S.N.M.

**Salpingostoma canadense** (Billings).

*Bellerophon Canadensis* Billings, Cat. Sil. Fossils Anticosti, Geol. Surv. Canada, 1866, p. 18, fig. 6; p. 56.  
*Salpingostoma canadensis* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 851 (gen. ref.).  
Richmond (English Head, Charleton) and Gamachian (Ellis Bay): Macasty Bay, etc., Anticosti.

**Salpingostoma expansum** (Hall).

*Bucania expansa* Hall, Pal. New York, 1, 1847, p. 186, pl. 40, figs. 7a–d.—Miller, Cincinnati Quart. Jour. Sci., 1874, 1, p. 307.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 96, figs.  
*Bellerophon expansus* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 164, pl. 6, fig. 7.  
*Bucania* (*Bellerophon*) *expansa* Hall, Rep. Geol. Surv. Wisconsin, 1862, p. 40, fig. 1.  
*Salpingostoma expansum* Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 973, pl. 40, figs. 1–1b.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 614.  
Trenton: Watertown, New York; Canada; etc.

**Salpingostoma fraternum** (Billings).

*Bellerophon fraternus* Billings, Cat. Sil. Fossils Anticosti, Geol. Surv. Canada, 1866, p. 19.

**Salpingostoma fraternum**—Continued.

Salpingostoma fraternum Ulrich and Schofield, Geol. Minnesota, 3, pt. 2, 1897, p. 851 (gen. ref.).

Richmond (English Head): English Head, Anticosti.

**Salpingostoma imbricatum** Ulrich and Scofield.

Salpingostoma imbricata Ulrich and Schofield, Geol. Minnesota, 3, pt. 2, 1897, p. 902, pl. 82, figs. 21 and 22.

Bucania imbricata Miller, N. A. Geol. Pal., 2d App., 1897, p. 766 (gen. ref.).

Richmond (Maquoketa): Near Spring Valley, Minnesota.

*Holotype*.—Cat. No. 45982, U.S.N.M.

**Salpingostoma richmondense** Ulrich.

Salpingostoma richmondensis Ulrich, Geol. Minnesota, 3, 1897, p. 903, pl. 67, figs. 39, 40.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 974, pl. 39, figs. 7, 7a.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 614, fig. 823d-e.

Bucania richmondensis Miller, N. A. Geol. Pal., 1897, p. 766 (gen. ref.).

Richmond (Whitewater): Richmond, Indiana.

*Holotype*.—Cat. No. 45983, U.S.N.M.

**Salpingostoma sculptile** Ulrich and Scofield.

Salpingostoma sculptilis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 902, pl. 82, figs. 16-20.

Bucania sculptilis Miller, N. A. Geol. Pal., 2d App., 1897, p. 766 (gen. ref.).

Trenton (Prosser): Goodhue County; near Fountain, Minnesota.

*Cotype*.—Cat. No. 45984, U.S.N.M.

SALTERASTER Sturtz. See Urasterella McCoy.

**SALTERELLA** Billings.

Genotype: *S. rugosa* Billings.

Salterella Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 17 (adv. sheets, 1861); Geol. Vermont, 2, p. 954; Rep. Econ. Geol., etc., Vermont, 1862, p. 226; Amer. Jour. Sci. Arts, 2d ser., 33, 1862, p. 105.—Barrande, Syst. Sil. du Centre Boheme, 3, 1867, p. 137.—Zittel, Handb. Pal., 2, 1882, p. 315.—Walcott, Bull. U. S. Geol. Surv., 30, 1886, p. 143.—Miller, N. A. Geol. Pal., 1889, p. 520.

**Salterella billingsi** Safford.

Salterella Billingsi Safford, Geol. Tennessee, 1869, p. 289.

Stones River (Murfreesboro): Murfreesboro, Tennessee.

SANNIONITES Barrande. See Cameroceras Conrad.

SAO(?) LAMOTTENSIS WHITFIELD. See Glaphurus pustulatus.

SARCINULA COSTATA OWEN. See Lyellia glabra.

SARCINULA (PORITES) GLABRA OWEN. See Lyellia glabra.

SARCINULA? OBSOLETA Hall. See Columnaria (Palaeophyllum) stokesi.

SARCINULA ORGANUM Goldfuss. See Syringophyllum organum.

**SAUKIA** Walcott.

Genotype: *Dikelocephalus lodensis* Whitfield.

Saukia Walcott, Smiths. Misc. Coll., 57, No. 13, 1914, p. 373.

**Saukia stosei** Walcott.

*Dikelocephalus hartti* Walcott in Stose, U. S. Geol. Surv., folio No. 170, 1909, p. 6.  
*Saukia stosei* Walcott, Smiths. Misc. Coll., 57, No. 13, 1914, p. 384, pl. 69, figs. 3-5; pl. 70, figs. 12, 12a.

Lower Ozarkian or Upper Cambrian (Conococheague): Near Scotland, Franklin County, Pennsylvania.

**SCÆVOGYRA** Whitfield.Genotype: *S. swezeyi* Whitfield.

*Scævogyra* Whitfield, Ann. Rep. for 1877, Wisconsin Geol. Surv., 1878, p. 61; Geol. Wisconsin, 4, 1882, p. 198.—Koken, Neues Jahrb. Min., Geol., Pal., 6, Beilage-Band, 1889, p. 402.—Miller, N. A. Geol. Pal., 1889, p. 425.—Berkey, Amer. Geol., 21, 1898, p. 286.

***Scævogyra elevata*** Whitfield.

*Scævogyra elevata* Whitfield, Ann. Rep. for 1877, Wisconsin Geol. Surv., 1878, p. 62; Geol. Wisconsin, 4, 1882, p. 199, pl. 3, fig. 11.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 142, fig.—Sardeson, Jour. Geol., 11, 1903, p. 479, fig. 9.

Ozarkian (Mendota): East of Baraboo, Wisconsin.

***Scævogyra obliqua*** Whitfield.

*Scævogyra obliqua* Whitfield, Ann. Rep. for 1877, Wisconsin Geol. Surv., 1878, p. 63; Geol. Wisconsin, 4, 1882, p. 199, pl. 3, fig. 10.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 142, fig.

Ozarkian (Mendota): East of Baraboo, Wisconsin.

**SCÆVOGYRA PRIMORDIALE** Berkey. See *Platyceras primordiale*.***Scævogyra swezeyi*** Whitfield.

*Scævogyra Swezeyi* Whitfield, Ann. Rep. for 1877, Wisconsin Geol. Surv., 1878, p. 62; Geol. Wisconsin, 4, 1882, p. 198, pl. 3, figs. 7-9.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 142, fig.—Sardeson, Jour. Geol. 11, 1903, p. 479, fig. 8.

Ozarkian (Mendota): East of Baraboo, Wisconsin.

**SCALITES** Emmons.Genotype: *S. angulatus* Emmons.

*Scalites* Emmons, Geol. Rep. New York, 1842, p. 312.—D'Orbigny, Prodr. de Pal., 1, 1849, p. 7.—Woodward, Man. Mollusca, pt. 1, 1851, p. 147.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 155.—Pictet, Traite de Pal., 2d ed., 3, 1855, p. 163.—Salter, Geol. Surv. Canada, dec. 1, 1859, p. 10.—Billings, Canadian Nat. Geol., 4, 1859, pp. 448-450.—Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 317.—Zittel, Handb. Pal., 2, Munich, 1882, p. 182.—Koken, Neues Jahrb. Min., Geol., Pal., 6, Beilage-Band, 1889, p. 321, 348.—Miller, N. A. Geol. Pal., 1889, p. 425.—Ulrich and Schofield, Geol. Minnesota, 3, pt. 2, 1897, p. 933.—Pilsbry, Zittel-Eastman Textb. Pal., 1, 1900, p. 458.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 630.—Dall, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 527.

***Scalites angulatus*** Emmons.

*Scalites angulatus* Emmons, Geology Rep. New York, 1842, p. 312.—Hall, Pal. New York, 1, 1847, p. 27.—Pictet, Traite de Pal., 2d ed., 3, 1855, p. 163, pl. 62, fig. 25.—Emmons, Amer. Geology, 1855, p. 159, pl. 4, fig. 20; Manual Geol., 1860, p. 93, fig. 78.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, p. 40, pl. 1, fig. 6.—Miller, N. A. Geol. Pal., 1889, p. 425, fig. 711.—Koken, Neues Jahrb. Min., Geol., Pal., 6, Beilage-Band, 1889, p. 348.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 931, fig.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 933, fig. 4.—Raymond, Ann. Carnegie Mus., 4, 1908, p. 183, pl. 68, figs. 13-16; fig. 3, 4.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 630, fig. 854a.

Chazy (Day Point): Chazy, etc., New York.

*Plesiotype*.—Cat. No. 45985, U.S.N.M.

SCALITES ELEVATUS Miller. See *Eotomaria elevata*.

SCALITES LATICINCTUS Miller. See *Omospira laticincta*.

SCALITES PLANISTRIA Emmons. See *Raphistoma stamineum*.

SCALITES STAMINEA Emmons. See *Raphistoma stamineum*.

SCALITES STRIATA Emmons. See *Raphistoma striatum*.

**SCENELLA** Billings.

Genotype: *S. reticulata* Billings.

*Scenella* Billings, Canadian Nat. Geol., 4, 1872, p. 479; Pal. Foss., Geol. Surv. Canada, 2, pt. 1, 1874, p. 77.—Whiteaves, *ibid.*, 3, pt. 1, 1884, p. 32.—Walcott, Bull. U. S. Geol. Surv., 30, 1886, p. 125.—Miller, N. A. Geol. Pal., 1889, p. 392.—Ulrich and Schofield, Geol. Minnesota, 3, pt. 2, 1897, pp. 822–837.—Berkey, Amer. Geol., 21, 1898, p. 278.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 608.

***Scenella affinis*** Ulrich and Scofield.

*Scenella affinis* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 840, pl. 61, figs. 36, 37.

Black River (Decorah) and Trenton (Prosser): Kenyon, Wykoff, etc., Minnesota. *Holotype*.—Cat. No. 45986, U.S.N.M.

***Scenella affinis obsoleta*** Ulrich and Scofield.

*Scenella affinis* var. *obsoleta* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 841.

Trenton (Prosser): Cannon Falls, Minnesota. *Cotypes*.—Cat. No. 45987, U.S.N.M.

***Scenella?* *alta*** (Whitfield).

*Metoptoma alta* Whitfield, Bull. Amer. Mus. Nat. Hist., 2, 1889, p. 44, pl. 7, figs. 12, 13.—Koken, Neues Jahrb. Min., Geol., Pal., 6, Beilage-Band, 1889, p. 478.—Calvin, Bull. Lab. Nat. Hist. State Univ. Iowa, 2, 1892, p. 191; Amer. Geol., 10, 1892, p. 146.

*Scenella?* *alta* Ulrich and Schofield, Geol. Minnesota, 3, pt. 2, 1897, p. 838 (gen. ref.).

Canadian: Beekmantown, New York (Beekmantown); Northeastern Iowa (Oneota).

***Scenella analoga*** (Walcott).

*Metoptoma?* *analoga* Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 84, pl. 1, figs. 11, 11a.

Upper Pogonip: Pogonip Ridge, Eureka District, Nevada. *Holotype*.—Cat. No. 17358, U.S.N.M.

***Scenella beloitensis*** Ulrich and Scofield.

*Scenella beloitensis* Ulrich and Scofield, Geol. Minn., 3, pt. 2, 1897, pl. 61, figs. 33 and 34.

Black River (Platteville): Beloit, Wisconsin. *Plastotype*.—Cat. No. 46532, U.S.N.M.

***Scenella cassinensis*** Bassler (new name).

*Tryblidium conicum* Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 306, pl. 24, figs. 26, 27, 32, 33; *ibid.*, 3, p. 29, pl. 1, figs. 3, 4.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1234, figs.—Sedley, Vermont State Geol. Rep., 7, 1910, pl. 60, figs. 9, 10; pl. 62, figs. 26, 27, 32, 33.

**Scenella cassinensis**—Continued.

*Scenella conica* Ulrich and Scofield (not Whiteaves, 1894), Geol. Minnesota, 3, pt. 2, 1897, p. 826 (gen. ref.).  
Canadian (Beekmantown): Fort Cassin, Vermont.

**Scenella compressa** Ulrich and Scofield.

*Scenella compressa* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 840, pl. 61, figs. 38–41.  
*Conchopeltis compressa* Miller, N. A. Geol. Pal., 1897, p. 766 (gen. ref.).  
Black River (Platteville): Minneapolis, Minnesota.  
*Holotype*.—Cat. No. 45988, U.S.N.M.

SCENELLA CONICA Ulrich and Scofield. *Scenella cassinensis*.

**Scenella conica** Whiteaves.

*Scenella conica* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 32, pl. 5, figs. 2, 2a.—Miller, N. A. Geol. Pal., 1889, p. 392, fig. 648.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 933, figs.—Whiteaves, Pal. Foss., Geol. Surv. Canada, pt. 2, 1895, p. 69.  
Niagaran (Guelph): Durham, Ontario.

**Scenella magnifica** Ulrich and Scofield.

*Scenella magnifica* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 839, pl. 82, figs. 7–9.  
Black River (Platteville): Cannon Falls, Minnesota.  
*Plastotype*.—Cat. No. 45989, U.S.N.M.

**Scenella montrealensis** (Billings).

*Metoptoma Montrealensis* Billings, Pal. Foss., 1, 1865, p. 394, fig. 371.  
*Scenella montrealensis* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 838.—Raymond, Ann. Carnegie Mus., 4, 1908, p. 173, pl. 46, figs. 9, 10; pl. 55, fig. 1.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 608, fig. 812, 813.  
Chazyan (Day Point—Valcour): Montreal, Quebec; etc.; Chazy, etc., New York; Isle La Motte, Vermont.  
*Plesiotype*.—Cat. No. 53633, U.S.N.M.

**Scenella obtusa** (Sardeson).

*Conchopeltis* (*Metoptoma*) *obtusa* Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, 1892, p. 336, pl. 6, fig. 17.  
*Scenella obtusa* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 841, pl. 82, fig. 10.  
Black River (Decorah): Minneapolis, Minnesota.

**Scenella orithyia** (Billings).

*Metoptoma orithyia* Billings, Pal. Foss., 1, Geol. Surv. Canada, p. 38, fig. 40a, b (adv. sheets, 1862); Geol. Canada, Geol. Surv. Canada, 1863, p. 276, fig. 282a, b.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 402, figs.—Sardeson, Jour. Geol., 11, 1903, p. 479, fig. 7.  
Canadian (Beekmantown): Phillipsburg, Quebec.

**Scenella pretensa** Raymond.

*Scenella pretensa* Raymond, Amer. Jour. Sci., 4th ser., 20, 1905, p. 375; Ann. Carnegie Mus., 4, 1908, p. 173, pl. 46, figs. 11–13.  
Chazyan: Chazy, New York (Day Point); Lenoir, Tennessee (Lenoir).



**Scenella radialis** Ulrich and Scofield.

*Scenella radialis* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 841, pl. 61, figs. 31, 32.

Trenton (Prosser): St. Paul, Minnesota.

*Plastotype*.—Cat. No. 45590, U.S.N.M.

**Scenella robusta** Raymond.

*Scenella robusta* Raymond, Amer. Jour. Sci., 4th ser., 20, 1905, p. 376; Ann. Carnegie Mus., 4, 1903, p. 174, pl. 47, figs. 1, 2, 3.

Chazyan: Valcour Island, New York (Crown Point); Lenoir, Tennessee (Lenoir).

**Scenella superba** (Billings).

*Metoptoma superba* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 173, fig. 155.

*Scenella superba* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 838, pl. 61, fig. 35.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 608.

*Conchopeltis Minnesotensis* Walcott, 28th Rep. New York State Mus. Nat. Hist., 1875, p. 94, doc. ed., 1877.

Black River: Pauquettes Rapids, Ottawa River, Canada (Leray); Cannon Falls, Minnesota (Platteville).

*Plesiotype*.—Cat. No. 45991, U.S.N.M.

**Scenella? venilla** (Billings).

*Metoptoma Venillia* Billings, Pal. Foss. 1, Geol. Surv. Canada, 1865, p. 88, text fig. 80 (adv. sheets, 1862).

*Scenella? venilla* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 838 (gen. ref.).

Ozarkian? (Levis-erratics): Point Levis, Quebec.

**SCENELLOPORA** Ulrich.

Genotype: *S. radiata* Ulrich.

*Scenellopora* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 150.—Miller, N. A. Geol. Pal., 1889, p. 322.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 368.—

Poeta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 13.—Ulrich, Zittel's Textb. Pal. (Engl. ed.), 1896, p. 268.—Simpson, 14th Ann. Rep. State Geol. New

York for 1894, 1897, p. 593.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 24.—Bassler, Bull. U. S. Geol. Surv., 77, 1911, p. 107.—Zittel-

Eastman Textb. Pal., 1913, p. 328.

**Scenellopora radiata** Ulrich.

*Scenellopora radiata* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 158, pl. 6, figs. 6-6b.—Simpson, 14th Ann. Rep. State Geol. New York for 1894,

1897, figs. 194, 195 (p. 593).

Chazyan (Ottosee): Near Knoxville, Tennessee.

*Holotype*.—Cat. No. 43289, U.S.N.M.

**SCENIDIUM** Hall.

Genotype: *Orthis insignis* Hall.

*Skenidium* Hall, 13th Rep. New York State Cab. Nat. Hist., 1860, p. 70, figs. 1-5; Amer. Jour. Sci. Arts, 2d ser., 31, 1861, p. 293.—Zittel, Handb. Pal., 1, 1880,

p. 677.—Davidson, Mon. British Foss. Brach., 5, Dev. Suppl., Pal. Soc., 1882, p. 48.—Waagen, Pal. Indica, 13th ser., 1, 1884, p. 549.—Miller, N. A.

Geol. Pal., 1889, p. 371.—Koken, Die Leitfossilien, Leipzig, 1896, p. 235.

*Scenidium* Ehlert, Bull. Soc. d'Études Sci. d'Angers, 1887, p. 4, extract.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 241.—Winchell and Schuchert,

Geol. Minnesota, 3, 1893, p. 381.—Hall and Clarke, 11th Ann. Rep. New York State Geol., 1894, p. 276.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900,

p. 320.—Grabau, Bull. New York State Mus., 45, 1901, p. 189; Buffalo Soc. Nat. Sci., 7, 1901, p. 189.—Grabau and Shimer, N. A. Index Fossils, 1, 1907,

p. 270.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 393.

**Scenidium anthonense** Sardeson.

*Skenidium halli* Safford, Geol. Tennessee, 1869, p. 287 (undefined).

*Scenidium halli* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 242, pl. 7A, figs. 33-39.

*Scenidium anthonensis* Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, 1892, p. 333, pl. 4, fig. 7.

*Scenidium anthonensis* Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 381, pl. 30, figs. 20-23.—Weller, Geol. Surv. New Jersey Pal., 3, 1903, p. 157, pl. 10, figs. 5-7.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 270, figs. 324h-k.

Black River: Minneapolis, Cannon Falls, etc., Minnesota; Dixon, Illinois; Jacksonburg, New Jersey.

**Scenidium bassleri** Foerste.

*Scenidium bassleri* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 72, pl. 4, figs. 68A, B.

Niagaran (Waldron): Newsom, Tennessee.

**SCENIDIUM HALLI** Hall and Clarke. See *Scenidium anthonense*.

**Scenidium(?) merope** (Billings).

*Orthis Merope* Billings, Geol. Surv. Canada Pal. Foss., 1, 1865, p. 139, fig. 116 (adv. sheets, 1862).

*Scenidium? merope* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 242, pl. 7A, figs. 31, 32.

Trenton: Ottawa, Ontario; Burgin, Kentucky.

**Scenidium? nodocostatum** Rowley.

*Skenidium? nodocostatum* Rowley, Amer. Geol., 34, 1904, p. 280, pl. 16, figs. 60-63.

Niagaran (Bainbridge): Six miles west of St. Marys, Ste. Genevieve County, Missouri.

**Scenidium pyramidale** Hall.

*Orthis pyramidalis* Hall, Pal. New York, 2, 1852, p. 251, pl. 52, fig. 2.

*Scenidium pyramidalis* Hall, 13th Rep., New York State Cab. Nat. Hist., 1860, p. 70.

*Scenidium pyramidale* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 242, pl. 7, figs. 29, 30; pl. 7A, figs. 40-42.—Grabau, Bull. New York State Mus., 45, 1901, p. 189, fig. 100; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 189, fig. 100.

*Skenidium pyramidata* Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 37, figs. 29, 30.

Clinton (Rochester): Lockport, New York.

**SEPTROPORA** Ulrich.

Genotype: *S. facula* Ulrich.

*Septropora* Ulrich, Amer. Geol., 1, 1888, p. 228; Contr. Micro-Pal. Cambro-Sil., pt. 2, 1889, p. 46.—Miller, N. A. Geol. Pal., 1889, p. 322.—Ulrich, Geol. Sur.

Illinois, 8, 1890, p. 400; Zittel's Textb. Pal. (Eng. ed.), 1896, p. 281.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 548.—Nickles

and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 143.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 152; Zittel-Eastman Textb. Pal., 1913, p. 343.

**Septropora facula** Ulrich.

*Septropora facula* Ulrich, Amer. Geol., 1, 1888, p. 229, fig. 1; Contr. Micro-Pal. Cambro-Sil., pt. 2, 1889, p. 46, fig. 2; Geol. Sur. Illinois, 8, 1890, p. 401, fig.

15.—Whiteaves, Pal. Foss., 3, pt. 2, 1895, p. 117.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, fig. 116 (p. 549).—Bassler, Bull. U. S.

Nat. Mus., 77, 1911, p. 153, fig. 74.

**Sceptropora facula**—Continued.

Richmond: Stony Mountain, Manitoba; Anticosti (English Head, Charleton);  
Wilmington (Fernvale) and Savannah (Maquoketa), Illinois; Tennessee;  
Missouri; Wyoming; etc.; Borkholm, Esthonia, Russia.

*Cotypes*.—Cat. No. 43478, U.S.N.M.

**Sceptropora fustiformis** Ulrich.

*Sceptropora fustiformis* Ulrich, Contr. Micro-Pal. Cambro-Sil., pt. 2, 1889, p. 46.  
Upper Medinan (Cataract): Hamilton, Ontario.

*Cotypes*.—Cat. No. 43474, U.S.N.M.

**SCHIZAMBON** Walcott.

Genotype: *S. typicalis* Walcott.

*Schizambon* Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 69.—Hall and Clarke,  
Pal. New York, 8, pt. 1, 1892, pp. 113, 167.—Winchell and Schuchert, Geol.  
Minnesota, 3, 1893, p. 360.—Hall and Clarke, 11th Ann. Rep. New York  
State Geol., 1894, p. 253.—Miller, N. A. Geol. Pal., 1889, p. 370.—Hall and  
Clarke, 45th Ann. Rep. New York State Mus., 1892, pp. 569–570.—Walcott,  
Smiths. Misc. Coll., 53, 1908, pl. 11, pp. 142, 144; U. S. Geol. Surv., Mon. 51,  
pt. 1, 1912, p. 622.—Schuchert, Zittel-Eastman Textb. Pal., 1910, p. 309;  
2d ed., 1913, p. 376.

*Schizambonia* Ehlert, Fischer's Manuel Conch., 1887, p. 1266.

**Schizambon canadensis** (Ami).

*Siphonotreta scotica* Whiteaves, Amer. Jour. Sci., 3d ser., 24, 1882, p. 278;  
Canadian Nat. Geol., 10, 18–83, p. 396.—Ami, Canadian Rec. Sci., 3, p. 104.

*Siphonotreta scotica* var. *canadensis* Ami, Ottawa Nat., 1, 1887, p. 124.

*Schizambon*(?) *fissus* var. *canadensis* Hall and Clarke, Pal. New York, 8, pt.  
1, 1892, p. 115, pl. 4, figs. 32–36.

Trenton: Gloucester, Ontario (Collingwood); Rural Cemetary, near Albany, New  
York (Canajoharie).

**Schizambon? dodgei** Winchell and Schuchert.

*Schizambon*(?) *dodgii* Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 361,  
pl. 30, figs. 5–7.

Trenton: Sandyhill, New York.

**Schizambon duplicimuratus** Hudson.

*Schizambon duplicimuratus* Hudson, Bull. New York State Mus., 80, 1905, p.  
284, pl. 5, figs. 6, 7.—Raymond, Ann. Carnegie Mus., 7, 1911, p. 228, pl. 34,  
figs. 23–25.

Chazyan: Valcour Island and Chazy, New York (Valcour); Mingan Islands,  
Quebec (Mingan).

*Schizambon*(?) *fissus* var. *canadensis* Hall and Clarke. See *Schizambon cana-*  
*densis*.

**Schizambon? lockei** Winchell and Schuchert.

*Schizambon*(?) *lockii* Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 362,  
pl. 30, figs. 8–10.

Maysville (Fairmount): Cincinnati, Ohio.

**Schizambon manitouensis** Walcott.

*Schizambon manitouensis* Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 623, pl.  
84, figs. 3, 3a–e.

Canadian: Williams Canyon, Manitou, near Colorado Springs, Colorado.

*Holotype* and *pleistotypes*.—Cat. No. 52224, U.S.N.M.

**Schizambon priscus** Matthew.

Schizambon priscus Matthew, Bull. Nat. Hist. Soc. New Brunswick, 4, pt. 4, No. 19, 1901, pp. 277-278, pl. 5, figs. 4a-d; Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, pp. 187-189, pl. 11, figs. 6a-d.—Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 623, pl. 84, figs. 2-2e.

Canadian (Bretonian—Div. C 3c): McLeod Brook, etc., Cape Breton, Nova Scotia; Navy Island, St. John Harbor, New Brunswick.

**Schizambon typicalis** Walcott.

Schizambon typicalis Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 70, pl. 1, fig. 3.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 114, fig. 65, pl. 4, figs. 27-30.—Hall and Clarke, 11th Ann. Rep. State Geol. New York, 1892, p. 253, pl. 4, figs. 18-20.—Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 624, pl. 84, figs. 1, 1a-d.

Lower Pogonip: East of Hamburg Ridge, Eureka County, Nevada. Also Upper Cambrian of Utah.

*Holotype* and *plesiotypes*.—Cat. No. 24556, U.S.N.M.

SCHIZAMBONIA Ehlert. See Schizambon Walcott.

**SCHIZOCRANIA** Hall and Whitfield.

Genotype: *Orbicula?* *filosa* Hall.

Schizocrania Hall and Whitfield, Pal. Ohio, 2, 1875, p. 71.—Zittel, Handb. Pal., 1, 1880, p. 665.—Miller, N. A. Geol. Pal., 1889, p. 371.—Beecher, Amer. Jour. Sci., 3d ser., 44, 1892, p. 148.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 142, 168.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 369.—Hall and Clarke, 11th Ann. Rep. New York State Geol., 1894, p. 259.—Koken, Die Leitfossilien, Leipzig, 1896, p. 230.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1907, p. 894.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 202.—Schuchert, Zittel-Eastman Textb. Pal., 1900, p. 309; 2d ed., 1913, p. 377.

**Schizocrania filosa** Hall.

*Orbicula?* *filosa* Hall, Pal. New York, 1, 1847, p. 99, pl. 30, fig. 9.

*Orbiculoidea filosa* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 200, pl. 8, fig. 9.

*Crania filosa* Hitchcock, Geol. Vermont, 1, 1862, p. 292, fig. 196.

*Obolus filosus* Safford, Geol. Tennessee, 1869, p. 275, fig. 9.

*Trematis filosa* Billings, Geol. Canada, 1863, p. 159, fig. 126.—Hall, 23d Rep. New York State Cab. Nat. Hist., 1873, pl. 13, figs. 21, 22.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 15.

Schizocrania filosa Hall and Whitfield, Pal. Ohio, 2, 1875, p. 73, pl. 1, figs. 12-15.—Miller, N. A. Geol. Pal., 1889, p. 371, fig. 609.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 143, pl. 4G, figs. 22-30.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 934, figs.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 370, fig. 31; pl. 29, figs. 29-31.—Crane, Geol. Mag., dec. 4, 2, 1895, pl. 5, fig. 18.—Huene, Verh. d. Russ.-Kais. Mineral Ges. zu St. Petersburg, 36, 1899, p. 336, fig. 9.—Weller, Geol. Surv. New Jersey Pal., 3, 1903, p. 146, pl. 9, figs. 3, 4.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 202, fig. 236a.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 933, pl. 34, figs. 8, 8a.—Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 40.

Trenton: Middleville, etc., New York; New Jersey; Minnesota; Kentucky; Ontario.

Maysville and Richmond: Cincinnati, Ohio, and vicinity; Anticosti, etc.

**Schizocraula(?) rudis** Hall.

*Trematis rudis* Hall, 23d Rep. New York State Cab. Nat. Hist., 1873, p. 243, pl. 13, fig. 19 (separates, 1871).

*Schizocrania(?) rudis* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 144, pl. 4G, fig. 21.—Foerste, Jour. Geol., 11, 1903, p. 706; Bull. Sci. Lab. Denison Univ., 16, 1910, p. 40, pl. 3, fig. 22a-b:

Trenton (Hermitage): Clifton, Tennessee.

**Schizocrania schucherti** Hall and Clarke.

*Schizocrania schucherti* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 143, 179, pl. 4G, figs. 31-33; 48th Rep. New York State. Mus., 2, for 1895, p. 334, pl. 3, figs. 5-7; 14th Rep. State Geol. New York for 1894, p. 334, pl. 3, figs. 5-7.

Trenton (Upper): Covington, Kentucky.

**SCHIZOCRINUS** Hall.

Genotype: *S. nodosus* Hall.

*Schizocrinus* Hall, Pal. New York, 1, 1847, p. 81.—Pictet, *Traite de Pal.*, 2d ed., 4, 1857, p. 328.—Hitchcock, *Geol. Vermont*, 1, for 1861, 1862, p. 291.—Zittel, *Handb. Pal.*, 1, 1879, p. 371.—Wachsmuth and Springer, *Proc. Acad. Nat. Sci. Philadelphia*, 1881, p. 394 (*Rev. Pal.*, pt. 2, p. 220).—Miller, *N. A. Geol. Pal.*, 1889, p. 281.

*SCHIZOCRINUS NODATUS* Hitchcock. See *Schizocrinus nodosus*.

**Schizocrinus nodosus** Hall.

*Schizocrinus nodosus* Hall, Pal. New York, 1, 1847, p. 81, pl. 27, figs. 1a-b; *Geol. Lake Sup. Land. Dist.*, Foster and Whitney's Rep., 1851, p. 208, pl. 25, figs. 2a-c.—Miller, *N. A. Geol. Pal.*, 1889, p. 281, fig. 427.

*Scyphocrinus nodosus* D'Orbigny, *Prodr. de Pal.*, 1, 1849, p. 21 (gen. ref.).—Emmons, *Amer. Geology*, 1, pt. 2, 1855, p. 224.

*Schizocrinus nodatus* Hitchcock, *Geol. Vermont*, 1, for 1861, 1862, p. 291.

Trenton: Glen Falls, Middleville, Trenton Falls, etc., New York.

**Schizocrinus striatus** Hall.

*Schizocrinus striatus* Hall, Pal. New York, 1, 1847, p. 316, pl. 28, figs. 4a-c.

*Scyphocrinus striatus* D'Orbigny, *Prodr. de Pal.*, 1, 1849, p. 24 (gen. ref.).

Trenton: Middleville, New York.

**SCHIZOLOPHA** Ulrich.

Genotype: *S. textilis* Ulrich.

*Schizolopha* Ulrich, *Geol. Minnesota*, 3, pt. 2, 1897, pp. 952-991.—Koken, *Neues Jahrb. Min. Geol. Pal.*, 1, 1898, p. 18.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 952.—Grabau and Shimer, *N. A. Index Fossils*, 1, 1909, p. 637.

**Schizolopha moorei** Ulrich.

*Schizolopha moorei* Ulrich, *Geol. Minnesota*, 3, pt. 2, 1897, p. 992, pl. 65, figs. 31-37.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 975, pl. 41, figs. 7, 7c.—Grabau and Shimer, *N. A. Index Fossils*, 1, 1909, p. 637, fig. 865.

Maysville: Cincinnati, Ohio, and vicinity.

Richmond: Richmond, Indiana; Oxford, etc., Ohio.

*Cotypes*.—Cat. Nos. 45992, 45993, U.S.N.M.

**Schizolopha(?) prosseri** Kindle and Breger.

*Schizolopha(?) prosseri* Kindle and Breger, 28th Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 467, pl. 12, fig. 3.

Niagaran: Delphi, Indiana.

**Schizolopha textilis** Ulrich.

*Schizolopha textilis* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 992, pl. 65, fig. 30.  
*Murchisonia textilis* Miller, N. A. Geol. Pal., 2d App., 1897, p. 768 (gen. ref.).  
 Trenton (Catheys): Nashville, Tennessee.  
*Holotype*.—Cat. No. 45992, U.S.N.M.

SCHIZONEMA Foerste. See *Orthostrophia* subgenus *Schizoramma* Foerste.

**SCHIZOPHORIA** King.

Genotype: *Orthis resupinata* (Martin).

*Schizophoria* King, Mon. Permian Fossils, Pal. Soc., 1850, p. 106.—Hall, Bull. Geol. Soc. Amer., 1, 1889, p. 21.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 211; 11th Ann. Rep. New York State Geol., 1894, p. 272.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 383.

**Schizophoria senecta** Hall and Clarke.

*Orthis* (*Schizophoria*) *senecta* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 343, pl. 6A, figs. 23, 24; 48th Rep. New York State Mus., 2, for 1895, 1897, p. 342, pl. 4, figs. 22, 23; 14th Rep. State Geol. New York for 1894, 1897, p. 342, pl. 4, figs. 22, 23.

Clinton: Reynales Basin, Niagara County, New York.

SCHIZORAMMA Foerste. See *Orthostrophia* subgenus *Schizoramma*.

SCHIZOSTOMA COMPLANATUM Clarke and Ruedemann. See *Ophileta complanata*.

SCHIZOSTOMA LEVATUM Clarke and Ruedemann. See *Ophileta levata*.

**SCHIZOTRETA** Kutorga.

Genotype: *S. elliptica* Kutorga.

*Schizotreta* Kutorga, Verhand. Kais. Min. Gessel. zu St. Petersburg, 7, 1848, p. 273.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 135, 169.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 365.—Hall and Clarke, 11th Ann. Rep. New York State Geol., 1894, p. 257.—Miller, N. A. Geol. Pal., Sec. App., 1897, p. 763.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 205.

**Schizotreta conica** (Dwight).

*Orbiculoidea conica* Dwight, Amer. Jour. Sci., 3d ser., 19, 1880, p. 452, pl. 21, figs. 1-11; Proc. Poughkeepsie Soc. Nat. Sci., 1880, p. 19.

*Schizotreta conica* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 126, 135, pl. 4E, figs. 6-8; pl. 4F, fig. 7.

Trenton: Near Newburg, New York.

**Schizotreta minutula** Winchell and Schuchert.

*Schizotreta minutula* Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 366, fig. 28.

*Crania minutula* Miller, N. A. Geol. Pal., 2d App., 1897, p. 760 (gen. ref.).

Richmond (Maquoketa): Near Granger, Minnesota.

**Schizotreta ovalis** Hall and Clarke.

*Orbiculoidea* (*Schizotreta*) *ovalis* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 177, pl. 4E, figs. 4, 5; 48th Rep. New York State Mus., 2, 1895, p. 332, pl. 2, figs. 12, 13; 14th Rep. New York State Geol. for 1894, 1897, p. 332, pl. 2, figs. 12, 13.

Trenton: Middleville, New York.

**Schizotreta papilliformis** Ruedemann.

*Schizotreta papilliformis* Ruedemann, Bull. New York State Mus., 42, 1901, p. 570, pl. 1, figs. 3-5.

Chazy (Normanskill): Mount Moreno, near Hudson, New York.

**Schizotreta pelopea** (Billings).

*Discina Pelopea* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 52, fig. 56 (adv. sheets, 1862); Geol. Canada, 1863, p. 159, fig. 124.

*Discina concordensis* Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, 1892, p. 328, pl. 4, figs. 13, 14.

*Schizotreta pelopea*, Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 365, pl. 29, figs. 26-28.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 205, fig. 241a-b.

Trenton: Montreal, etc., Canada; Minnesota; Iowa; Wisconsin.

?Richmond (Maquoketa): Spring Valley, Minnesota.

**Schizotreta tenuilamellata** (Hall).

*Orbicula tenuilamellata* Hall, Pal. New York, 2, 1852, p. 250, pl. 53, fig. 3.

*Discina forbesi* Nicholson (not Davidson), Pal. Prov. Ontario, 1875, p. 62.

*Discina solitaria* Ringueberg, Amer. Nat., 1882, p. 175, figs. a-e.

*Discina clara* Spencer, Bull. Univ. State Missouri, 1, 1884, p. 56; Trans. St. Louis Acad. Sci., 4, 1886, p. 606, pl. 8, fig. 5.

*Schizotreta tenuilamellata* Beccher, Amer. Jour. Sci., 3d ser., 41, 1891, p. 357, pl. 17, fig. 11.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 205.

*Orbiculoidea* (*Schizotreta*?) *tenuilamellata* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 127, 135, pl. 4E, figs. 9-11; pl. 4F, figs. 2-6.

Niagaran: Lockport, New York (Lockport); Hamilton, Ontario (Rochester); Arisaig, Nova Scotia (Arisaig).

**SCHMIDTELLA** Ulrich.

Genotype: *S. crassimarginata* Ulrich.

*Schmidtella* Ulrich, Amer. Geol., 10, 1892, p. 269.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 711.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 639.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 343.

**Schmidtella affinis** Ulrich.

*Schmidtella affinis* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 641, pl. 43, figs. 45-47.

Trenton (Prosser): Near Cannon Falls, Minnesota.

*Cotypes*.—Cat. No. 41296, U.S.N.M.

**Schmidtella brevis** Ulrich.

*Schmidtella brevis* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 642, pl. 45, figs. 34, 35.

Black River (Decorah): Near Fountain, Minnesota.

*Holotype*.—Cat. No. 41299, U.S.N.M.

**Schmidtella crassimarginata** Ulrich.

*Schmidtella crassimarginata* Ulrich, Amer. Geol., 10, 1892, p. 269, pl. 9, figs. 27-30.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 711, fig. 1265.—Ulrich,

Geol. Minnesota, 3, pt. 2, 1894, p. 640, pl. 43, figs. 42-44.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 343, figs. 1656o-q.—Raymond, Ann. Carnegie

Mus., 7, 1911, p. 256, fig. 27.

Black River (Platteville): Mineral Point, Wisconsin; Dixon, Illinois.

Chazyan (Valcour): Valcour Island, New York.

*Holotype*.—Cat. No. 41295, U.S.N.M.

**Schmidtella crassimarginata ventrilabiata** Ruedemann.

*Schmidtella crassimarginata* var. *ventrilabiata* Ruedemann, Bull. New York State Mus., 49, 1901, p. 75, pl. 7, figs. 12-18.

Mohawkian (Rysedorph): Rysedorph Hill, Rensselaer County, New York.

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**Schmidtella incompta** Ulrich.

*Schmidtella incompta* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 642, pl. 45, figs. 27, 32-33.

Black River (Decorah): Fountain, Minnesota.

*Cotypes*.—Cat. No. 41298, U.S.N.M.

**Schmidtella incompta subæqualis** Ulrich.

*Schmidtella incompta subæqualis* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 642, pl. 43, figs. 39-41.

Trenton (Prosser): Near Cannon Falls, Minnesota.

*Holotype*.—Cat. No. 41297, U.S.N.M.

**Schmidtella sublenticularis** (Jones).

*Polycope sublenticularis* Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 550, pl. 21, figs. 6a, b.

Richmond (English Head and Charleton): English Head, Anticosti.

**Schmidtella subrotunda** Ulrich.

*Schmidtella subrotunda* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 643, pl. 45, figs. 39-42.

Black River (Decorah): Minneapolis, Minnesota.

*Cotypes*.—Cat. No. 41300, U.S.N.M.

**Schmidtella umbonata** Ulrich.

*Schmidtella umbonata* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 641, pl. 45, figs. 36-38.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 343, figs. 1656r-t.

Black River (Decorah): St. Paul and Cannon Falls, Minnesota.

*Cotypes*.—Cat. No. 41301, U.S.N.M.

SCHMIDTIA Zittel. See *Dicellomus* Hall.

**SCHRÖDEROCERAS** Hyatt.

Genotype: *Lituities angulatum* Saeman.

*Schröderoceras* Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 458.—Miller, N. A.

Geol. Pal., 2d App., 1897, p. 777.—Ruedemann, Bull. New York State Mus., 90, 1906, p. 475.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 70.

**Schröderoceras cassinense** (Whitfield).

*Lituities eatoni* var. *cassinensis* Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 332, pl. 32, fig. 2.—Seely, Vermont State Geol. Rep., 7, 1910, pl. 54, fig. 2.

*Schröderoceras cassinense* Hyatt, Amer. Phil. Soc. Proc., 32, 1894, p. 473, pl. 6, figs. 36-38; pl. 7, figs. 4-6.—Ruedemann, Bull. New York State Mus., 90, 1906, p. 476, pl. 20, figs. 1, 2, figs. 35-36.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 71.

Canadian (Beckmantown): Fort Cassin, Vermont; Valcour, New York.

*Plesiotypes*.—Cat. No. 25661, U.S.N.M. (Hyatt).

**Schröderoceras eatoni** (Whitfield).

*Lituities eatoni* Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 331, pl. 28, figs. 5-7; pl. 32, fig. 1.—Seely, Vermont State Geol. Rep., 7, 1910, pl. 54.

*Discoceras eatoni* Schröder, Pal. Abhandl. von Dames and Kayser, neue folge, 1, 5, Heft 4, Jena, 1891, p. 22.

*Schröderoceras eatoni* Hyatt, Amer. Phil. Soc. Proc., 32, 1894, p. 470, pl. 6, figs. 28-35; pl. 7, figs. 7-8.—Ruedemann, Bull. New York State Mus., 90, 1906, pp. 453, 476, pl. 20, figs. 3-4; pl. 23, fig. 1.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 70, figs. 1280, 1281.

Canadian (Beckmantown): Fort Cassin, Vermont; Valcour, New York.

*Plesiotypes*.—Cat. No. 25660, U.S.N.M. (Hyatt).



**Schröderoceras palinurus** (Billings).

Lituities Palinurus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 25 (adv. sheets, 1862).

Schröderoceras palinurus Miller, N. A. Geol. Pal., 2d App., 1897, p. 778 (gen. ref.). Canadian (Romaine): Mingan Islands, Quebec.

**SCHUCHERTELLA** Girty.

Genotype: Streptorhynchus lens White.

Schuchertella Girty, Proc. U. S. Nat. Mus., 27, 1904, p. 734.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 228.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 386.

Orthothetes Hall and Clarke, and other American authors.

Streptorhynchus (part) Hall, Nettelroth, and other authors.

**Schuchertella alterniradiata** (Shaler).

Strophomena alterniradiata Shaler, Bull. Mus. Comp. Zool., 4, 1865, p. 63.

Anticostian (Gun River): Southwest Point, Anticosti.

**Schuchertella amherstburgensis** Grabau.

Schuchertella amherstburgensis Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 124, pl. 17, figs. 1-3.

Upper Monroan (Amherstburg): Detroit River bed, Amherstburg, Ontario.

**Schuchertella conferta** Foerste.

Schuchertella confertus Foerste, Cincinnati Soc. Nat. Hist. Jour., 21, 1909, p. 23 pl. 2, fig. 13A, B.

Clinton (West Union): Near Martins, Lewis County, Kentucky.

**Schuchertella curvistriata** Savage.

Schuchertella curvistriata Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 112, pl. 7, fig. 6.

Upper Medinan (Channahon): Will County, Illinois.

**Schuchertella deckerensis** (Weller).

Orthothetes deckerensis Weller, Geol. Surv. New Jersey, Pal., 3, 1903, pp. 229, 230, pl. 20, figs. 6, 7.

Schuchertella deckerensis Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 329, pl. 60, figs. 13-16.

Helderbergian: Two miles south of Tristates, New York (Decker Ferry); Keyser, West Virginia; Cumberland, Cash Valley, etc., Maryland (Keyser).

**Schuchertella deformis** (Hall).

Orthis deformis Hall, 10th Rep. New York State Cab. Nat. Hist., 1857, p. 44; Pal. New York, 3, 1859, p. 174, pl. 10a, fig. 13; pl. 15, fig. 3.

Orthothetes deformis Schuchert, Bull. U. S. Geol. Surv., No. 87, 1897, pp. 296-297.

Schuchertella deformis Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 331, pl. 61, figs. 1, 2.

Helderbergian: Albany County, New York (New Scotland); Devils Backbone and Cash Valley, Maryland (Keyser).

**Schuchertella hydraulica** (Whitfield).

Streptorhynchus hydraulicum Whitfield, Annals New York Acad. Sci., 2, 1882, p. 193; *ibid.*, 5, 1891, p. 508, pl. 5, figs. 1-3; Geol. Ohio, 7, 1895, p. 410, pl. 1, figs. 1-3.—Sherzer, Geol. Surv. Michigan, 7, pt. 1, 1900, pl. 17, figs. 1-3.

Orthothetes hydraulicus Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 297.

Schuchertella hydraulica Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 120, pl. 17, fig. 7; pl. 30, figs. 1-3.

Monroan: Ballville and Greenfield, Ohio (Greenfield); Salt shaft, Detroit, Michigan (Raisin River).

**Schuchertella interstriata** (Hall).

- Orthis interstriata* Hall, Pal. New York, 2, 1852, p. 326, pl. 74, figs. 1, 2.  
*Orthothetes interstriatus* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 297.—  
 Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 229, pl. 20, figs. 8, 9.—Schuchert, Amer. Geol., 31, 1903, p. 165.—Grabau, Bull. New York State Mus., 92, 1906, p. 109, fig. 8.  
*Schuchertella interstriata* Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 228, fig. 277.—Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 121, pl. 17, figs. 4, 5; pl. 32, figs. 1a-c.  
*Orthothetes hydraulicus* Grabau (not Whitfield), Bull. Geol. Soc. Amer., 2, 1900, p. 365, pl. 22, figs. 1a-c; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 184, fig. 92; Bull. New York State Mus., 45, 1901, p. 184, fig. 92.  
 Cayuga: Schoharie Valley, etc. (Rondout and Cobleskill), Buffalo, etc. (Akron), New York.  
 Helderbergian (Decker Ferry): Two miles south of Tristates, New York, etc.  
 Upper Monroan (Lucas): Northern Ohio and Ontario.

**Schuchertella interstriata sinuata** Hortedahl.

- Schuchertella interstriata sinuata* Hortedahl, 2d Arct. Exp. "Fram," 1898-1902, No. 32, 1914, p. 20, pl. 7, fig. 6.  
 Helderbergian (Lower beds): Reindeer Valley, Southwestern Ellesmerland, Arctic America.

**Schuchertella marylandica** Maynard.

- Schuchertella marylandica* Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 333, pl. 61, figs. 5-9.  
 Helderbergian (Keyser): Cumberland, Maryland; Keyser, West Virginia.

**Schuchertella missouriensis** (Shumard).

- Orthis missouriensis* Shumard, Geol. Rep. Missouri, 1855, p. 205, pl. C, fig. 9.—  
 Keyes, Geol. Surv. Missouri, 5, 1895, p. 60.  
*Schuchertella missouriensis* Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 48, pl. 1; figs. 12 and 13, p. 74.  
 Upper Medinan: Cape Girardeau, Missouri; Alexander County, Illinois (Girardeau); near Louisiana, Missouri (Edgewood).

**Schuchertella missouriensis convexa** Savage.

- Schuchertella missouriensis* var. *convexa* Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 74, pl. 4, fig. 2.  
 Upper Medinan (Edgewood—Noix): Louisiana, and near Buffalo Creek, Pike County, Missouri; near Hamburg, Illinois.

**Schuchertella pecten** (Roemer).

- Strophomena pecten* Roemer, Die Sil. Fauna West. Tennessee, 1860, p. 67, pl. 5, fig. 4.—Billings, Geol. Canada, 1863, p. 311, fig. 375; Cat. Sil. Fossils of Anticosti, 1866, p. 40.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 1130, figs.  
*Schuchertella pecten* Schuchert and Twenhofel, Bull. Geol. Soc. Amer., 21, 1910, p. 702.  
 Niagara (Brownspont): Decatur County, Tennessee.  
 Richmond—Anticostian: Island of Anticosti.

**Schuchertella prolifica** Schuchert and Maynard.

- Schuchertella prolifica* Schuchert and Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 327, pl. 60, figs. 1-3.  
 Helderbergian (Keyser): Keyser, West Virginia; Dawson, Devils Backbone, Corriganville, and Tonoloway, Maryland.

**Schuchertella propinqua** (Meek and Worthen).

Hemipronites subplanus? Meek and Worthen, Illinois, Geol. Surv., 3, 1868, p. 349.

Hemipronites propinquus Meek and Worthen, Illinois Geol. Surv., 3, 1868, p. 351.

Schuchertella propinqua Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 73, pl. 4, fig. 1.

Upper Medinan (Edgewood): Alexander County, Illinois; Pike County, Missouri.

**Schuchertella roemeri** (Foerste).

Orthotheses roemeri Foerste, Jour. Geol., 11, 1903, p. 711.

Schuchertella roemeri Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 82, pl. 2, fig. 27A-C.

Niagaran (Brownsport): Near Dixon Spring and Pegram, Tennessee.

**Schuchertella sinuata** (Hall and Clarke).

Orthotheses deformis var. sinuatus Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 20, figs. 8 and 9.

Schuchertella sinuata Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 331, pl. 61, figs. 3, 4.

Helderbergian (Keyser): Devil's Backbone, near Cumberland, Maryland.

**Schuchertella subplana** (Conrad).

Strophomena subplana Conrad, Jour. Acad. Nat. Sci., Philadelphia, 8, 1842, p. 253.—Hall, Geol. New York, Rep. 4th Dist., 1843, p. 104, fig. 1; 12th Rep. New York State Cab. Nat. Hist., 1859, p. 82.—Owen, Amer. Jour. Sci. Arts, 48, 1845, p. 312, fig.

Leptaena subplana Hall, Pal. New York, 2, 1852, p. 259, pl. 53, figs. 8-10.—Billings, Canadian Nat. Geol., 1, 1856, p. 138, pl. 2, figs. 16, 17.

Streptorhynchus (Strophodonta) subplanus Hall, Geol. Survey Wisconsin, 1, 1862, p. 436.

Streptorhynchus subplanus Hall, Trans. Albany Institute, 4, 1863, p. 226; 16th Rep. New York State Cab. Nat. Hist., 1863, p. 63, figs. 1, 2; 28th Rep. New York State Mus. Nat. Hist., 1879, p. 151, pl. 21, figs. 26-33; 11th Rep. State Geol. Indiana, 1882, p. 288, pl. 21, figs. 26-33; 2d Ann. Rep. New York State Geol., 1883, pl. 39, figs. 21-24; pl. 42, fig. 19.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 141, pl. 29, figs. 11, 12.—Beecher and Clarke, Mem. New York State Mus., 1, 1889, p. 23, pl. 2, figs. 14-20.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1097, figs.

Streptorhynchus hemiaster Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 93, pl. 2, fig. 10.—Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, p. 392.

Orthotheses subplana Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 255, pl. 9, figs. 21-24; pl. 9A, fig. 19; pl. 11A, figs. 9-12.

Orthotheses subplanus Grabau, Bull. New York State Mus., 45, 1901, p. 184, fig. 91; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 184, fig. 91.—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 432, pl. 1, fig. 5.

Schuchertella subplana Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 228, fig. 276.

Niagaran: Lockport, etc., New York (Rochester); Ontario; Indiana; Kentucky; Tennessee; Illinois; Missouri; Nova Scotia; Anticosti, etc.

*Plesiotype*.—Cat. No. 51313 (Nettelroth).

**Schuchertella tenuis** (Hall).

Streptorhynchus tenuis Hall, Trans. Albany Inst., 4, 1863, p. 210; 28th Rep. New York State Mus. Nat. Hist., 1879, p. 150, pl. 23, figs. 11-13; 11th Rep. State Geol. Indiana, 1882, p. 287, pl. 23, figs. 11-13.—Foerste, Bull. Sci. Lab.

**Schuchertella tenuis**—Continued.

Denison Univ., 2, 1887, p. 105, pl. 8, figs. 31, 32, 38.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 142.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1098, figs.

*Orthothetes tenuis* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 255.

*Strophomena* (*Orthothetes*) *tenuis* Foerste, Geol. Ohio, 7, 1895, p. 568, pl. 27, figs. 31, 32, 38.

Niagaran: Waldron, Indiana (Waldron); Near Louisville, Kentucky (Louisville).

Upper Medinan (Brassfield): Dayton, Ohio; Hanover, Indiana.

*Plesiotype*.—Cat. No. 51329, U.S.N.M. (Nettelroth).

**SCHUCHERTIA** Gregory.

Genotype: *Palasterina stellata* Billings.

*Schuchertia* Gregory, Geol. Mag., dec. 4, 6, 1899, p. 351.—Schuchert, Bull. U. S. Nat. Mus., 88, 1915, p. 195.

Trentonaster Sturtz, Verh. naturh. Ver. preuss. Rheinl., etc., 56, 1899, p. 224. (Genotype: *Palasterina stellata* Billings.)

*Palasterina* Billings (part) (not McCoy) Geol. Surv. Canada, dec. 3, 1858, p. 76.

**Schuchertia laxata** Schuchert.

*Schuchertia laxata* Schuchert, in Frech, Cat. Foss., 1, Anim., pt. 3, 1914, p. 38 (nom. nud.); Bull. U. S. Nat. Mus., 88, 1915, p. 198, pl. 32, fig. 3; pl. 33, figs. 2, 3.

Richmond (Waynesville): Near Waynesville, Hamilton, and Oxford, Ohio.

**Schuchertia ordinaria** Schuchert.

*Schuchertia ordinaria* Schuchert, in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 38 (nom. nud.); Bull. U. S. Nat. Mus., 88, 1915, p. 199.

Upper Medinan (Girardeau): Alexander County, Illinois.

**Schuchertia stellata** (Billings).

*Palasterina stellata* Billings, Geol. Surv. Canada, Rep. Progr. for 1853-56, 1857, p. 290; Geol. Surv. Canada, dec. 3, 1858, p. 76, pl. 9, figs. 1a, 1b.—Wright, Mon. Brit. Foss. Echinod., Oolitic, 2, pt. 1, Pal. Soc., 1862, p. 27, fig. 1b on p. 26.—Chapman, Canadian Jour., n. s., 6, 1861, p. 517.—Quenstedt, Petrefactenkunde Deutschlands, 1, 4, 1876, p. 74, pl. 92, fig. 34.

Trentonaster *stellata* Sturtz, Verh. naturh. Verh. preuss. Rheinl., etc., 1899, p. 225.

*Schuchertia stellata* Gregory, Geol. Mag., dec. 4, 6, 1899, p. 351.—Schuchert, Bull. U. S. Nat. Mus., 88, 1915, p. 196, pl. 32, fig. 2; pl. 33, fig. 1.

Trenton: Ottawa, Ontario.

**SCOFIELDIA** Ulrich and Bassler.

Genotype: *Drepanella bilateralis* Ulrich.

*Scofieldia* Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 314.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 356.

**Scofieldia bilateralis** (Ulrich).

*Drepanella bilateralis* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 671, pl. 46, figs. 35-38.

*Scofieldia bilateralis* Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 314, pl. 41, figs. 16-18.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 356, fig. 1664d-f.

Black River (Decorah): St. Paul and near Cannon Falls, Minnesota

*Cotypes*.—Cat. No. 41558, U.S.N.M.

**SCOLECOLITHUS** Roemer. See *Scolithus* Haldeman.

**SCOLITHUS** Haldemann.Genotype: *Fucoides?* *linearis* Haldemann.

*Scolithus* Haldemann, Supp. Mon. Limniades, 1840, p. 3.—Hall, Pal. New York, 1, 1847, p. 2.—Hitchcock, Geol. Vermont, 1, 1861, p. 356.—Nathorst, Kongl. Sven. Vet.-Acad. Handl., 18, 1881, p. 49.—Barrois, Rech. Terr. Anciens Asturies Galice (Mem. Soc. Geol. Nord, 2), 1882, p. 177.—Whiteaves, Trans. Royal Soc. Canada, 1, sec. 4, 1883, p. 109.—Ami, Canadian Rec. Sci., 2, 1886, p. 304.—Lebesconte, Bull. Soc. Geol. France, 3d ser., 14, 1886, p. 793.—Miller, N. A. Geol. Pal., 1889, p. 520.—Wanner, Amer. Geol., 5, 1890, p. 35.—Dawson, Quart. Jour. Geol. Soc. London, 46, 1890, p. 603, figs. 7, 8.—J. F. James, Bull. Geol. Soc. Amer., 3, 1892, p. 32.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 246.

*Scolecolithus* Roemer, Neues Jahrb. f. Min., etc., 1848, p. 171.

**Scolithus canadensis** Billings.

*Scolithus Canadensis* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 96 (adv. sheets, 1862); Geol. Surv. Canada, p. 101, fig. 7.—Miller, N. A. Geol. Pal., p. 521, fig. 943.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 943, fig.—J. F. James, Bull. Geol. Soc. Amer., 3, 1892, p. 37, fig. 8.

Upper Cambrian or Ozarkian (Potsdam): Township of Landsdowne, Bastard, etc., Canada; Snake Mountain, Vermont.

**SCOLITHUS CLINTONENSIS** James. See *Scolithus verticalis*.

**Scolithus delicatulus** James.

*Scolithus delicatulus* James, The Paleontologist, No. 5, 1881, p. 33.—J. F. James, Bull. Geol. Soc. Amer., 3, 1892, pp. 40, 41, fig. 15.

Richmond: Dearborn County, Indiana.

**Scolithus dispar** James.

*Scolithus linearis* James, Paleontologist, No. 5, 1881, p. 33 (*S. dispar* proposed in case distinct).

Eophyton (*Scolithus*) *dispar*, J. F. James, Bull. Geol. Soc. Amer., 3, 1892, p. 41, fig. 14.

Eden (Economy): Cincinnati, Ohio, and vicinity.

**Scolithus linearis** (Haldemann).

*Fucoides?* *linearis* Haldemann, Supp. Monograph Limniades, 1840, p. 3.

*Scolithus linearis* Hall, Pal. New York, 1, 1847, p. 2, pl. 1, figs. 1a-1c.—Billings, Canadian Nat. Geol., 1, 1856, p. 32.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 616, fig. 589.—Mackie, The Geologist, 2, 1859, p. 338, fig. 5.—Chapman, Canadian Jour., 6, 1861, p. 503, fig. 65.—Hitchcock, Geol. Vermont, 1, 1861, p. 356, fig. 254.—Billings, Geol. Vermont, 2, 1861, p. 943; Rep. Econ. Geol., etc., Vermont, 1862, p. 215.—Winchell, Amer. Jour. Sci. Arts, 2d ser., 37, 1864, p. 227.—Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 2 (adv. sheets, 1861).—Torell, Lunds Univers. Arsskrift, 6, No. 8, 1869, p. 12 (loc. occ.).—Roemer, Leth. geog. 1, Leth. Pal., Atlas, 1876, pl. 2, fig. 11.—Nathorst, Kongl. Sven. Vet.-Akad. Handl., 18, No. 7, 1881, pp. 50, 100.—Barrois, Rech. Terr. Anciens Asturies Galice (Mem. Soc. Geol. Nord, 2), 1882, p. 177, pl. 4, fig. 4; pl. 5, figs. 1-3.—Walcott, 10th Ann. Rep. U. S. Geol. Surv., 1890, p. 31, 603, pl. 63, figs. 1, 1a-c.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 944, fig.—J. F. James, Bull. Geol. Soc. Amer., 3, 1892, p. 34, figs. 3, 4; p. 36, fig. 6; p. 35.

*Scolithus* cf. *linearis* Grabau, Occ. Papers Boston Soc. Nat. Hist., 4, 1900, p. 614.

*Scolecolithus linearis* Goepfert, Zeits. d. d. geol. Gesell., 3, 1851, p. 189.

*Arenicolithes* (*Scolithus*) *linearis* Salter, Quart. Jour. Geol. Soc. London, 13, 1857, p. 205.

**Scolithus linearis**—Continued.

*Arenicolites* (*linearis*?) Salter, Mem. Geol. Surv. Great Britain, 3, 1866, p. 292, pl. 11b, fig. 27; *ibid.*, 2d ed., 1881, p. 484, pl. 11b, fig. 27.

Cambrian and ?Lower Ordovician: Pennsylvania, New York, Virginia, Wisconsin, Canada, etc.

**SCOLITHUS LINEARIS** James. See *Scolithus dispar*.

**Scolithus minnesotensis** James.

*Arenicolites* sp. Winchell, Geol. Minnesota, 1, 1884, pp. 656, 657.

*Scolithus minnesotense* J. F. James, Bull. Geol. Soc. Amer., 3, 1892, p. 41; Jour. Cincinnati Soc. Nat. Hist., 17, 1895, p. 134.

St. Peter: Rice County, Minnesota.

**Scolithus minutus** Brainerd and Seely.

*Scolithus minutus* (Wing) Brainerd and Seely, Bull. Geol. Soc. Amer., 1, 1890, p. 504.—J. F. James, Bull. Geol. Soc. Amer., 3, 1892, p. 38, figs. 9, 10.

Canadian (Beekmantown): Vermont.

**Scolithus tuberosus** Miller and Dyer.

*Scolithus tuberosus* Miller and Dyer, Cont. to Pal., No. 2, 1878, p. 5, pl. 4, fig. 4.—J. F. James, Bull. Geol. Soc. Amer., 3, 1892, p. 39, fig. 11.

Maysville (Mount Hope): Cincinnati, Ohio, and vicinity.

**Scolithus verticalis** Hall.

*Fucoides verticalis* Hall, Geol. New York, Rep. 4th Dist., 1843, p. 242.

*Scolithus verticalis* Hall, Pal. New York, 2, 1852, p. 6, pl. 2, fig. 3.—Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 138.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 40, fig. 16.—J. F. James, Bull. Geol. Soc. Amer., 3, 1892, p. 34.—Bassler, Bull. Virginia Geol. Surv., 2a, 1909, pl. 8, fig. 3.

*Scolithus clintonensis* James, Bull. Geol. Soc. Amer., 3, 1892, p. 33, footnote, p. 35, fig. 5.

Upper Medinan: Monroe County, New York, etc.

**SCOLITHUS WOODI** Whitfield. See *Arenicolites woodi*.

**SCYPHIA DIGITATA** Owen. See *Brachiospongia digitata*.

*Scyphia stellata* Troost.

Not recognized.

*Scyphia stellata* Troost, 5th Geol. Rep. Tennessee, 1840, p. 74.

Silurian: Perry County, Tennessee.

**SCYPHOCRINUS** Hall. See *Cupulocrinus* D'Orbigny.

**SCYPHOCRINUS HETEROCOSTALIS** Hall. See *Cupulocrinus heterocostalis*.

**SCYPHOCRINUS NODOSUS** D'Orbigny. See *Schizocrinus nodosus*.

**SCYPHOCRINUS STRIATUS** D'Orbigny. See *Schizocrinus striatus*.

**SEDGWICKIA** McCoy.

Genotype: *S. attenuata* McCoy.

*Sedgwickia* McCoy, Syn. Char. Carb. Foss. Ireland, 1844, p. 61.—Woodward, Man. Mollusca, pt. 2, 1854, p. 322.—Meek and Hayden, Pal. Up. Missouri, Smiths. Contr. Knowl., 172, 14, 1865, p. 38.—Zittel, Handb. Pal., 2, 1881, p. 129.—Miller, N. A. Geol. Pal., 1889, p. 511.—Hind, Mon. British Carb. Lamelli-branchiata, 1, Pal. Soc., 1899, p. 277.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 984.

**SEDGWICKIA** Whitfield. See *Rhytimya* Ulrich.

**Sedgwickia? compressa** Meek.

*Sedgwickia? compressa* Meek, Proc. Acad. Nat. Sci. Philadelphia, 1872, p. 324; Geol. Surv. Ohio Pal., 1, 1873, p. 144, pl. 12, figs. 7a, b.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 219.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 946, figs.

Maysville (Fairmount): Cincinnati, Ohio.

**Sedgwickia? divaricata** Hall and Whitfield.

Not recognized.

*Sedgwickia? divaricata* Hall and Whitfield, Geol. Surv. Ohio Pal., 2, 1875, p. 89, pl. 2, fig. 3.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 946, fig.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 280.

Richmond: Blanchester, Ohio.

Observation.—Based on a greatly compressed shell, probably a young specimen of *Whiteavesia pholodiformis*.

**Sedgwickia? fragilis** Meek.

*Sedgwickia? fragilis* Meek, Proc. Acad. Nat. Sci. Philadelphia, 1872, p. 323; Geol. Surv. Ohio Pal., 1, 1873, p. 143, pl. 12, figs. 3a, b.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 219.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 946, fig.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1020, pl. 48, figs. 4, 4a.

Maysville: Cincinnati, Ohio.

Observation.—Founded on greatly compressed specimen.

**SEDGWICKIA(?) LUNULATA** Whitfield. See *Rhytimya lunulata*.

**SEDGWICKIA (GRAMMYSIA?) NEGLECTA** Meek. See *Cuneamya neglecta*.

**SEELYA** Ulrich.Genotype: *S. ventricosa* Ulrich.

*Pleurotomaria* (part) of authors.

*Seelya* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, pp. 958, 1011.

**Seelya cassandra** (Billings).

*Murchisonia Cassandra* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 189, fig. 171.

*Seelya cassandra* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1011 (gen. ref.).

Ozarkian? (Levis-erratics): Point Levis, Quebec.

**Seelya difficilis** (Whitfield).

*Pleurotomaria difficilis* Whitfield, Bull. Amer. Mus. Nat. Hist., 3, 1890, p. 33, pl. 1, figs. 17, 18.—Seely, Vermont State Geol. Rep., 7, 1910, pl. 57, fig. 8.

Canadian (Beekmantown): Fort Cassin, Vermont.

*Plesiotypes*.—Cat. No. 28136, U.S.N.M. (Ulrich).

**Seelya mundula** Ulrich.

*Seelya mundula* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1012, pl. 70, figs. 11–12.

Maysville (Fairmount): Cincinnati, Ohio, and vicinity.

*Cotypes*.—Cat. No. 45995, U.S.N.M.

**Seelya(?) (Plethospira?) ulrichi** Schuchert.

*Seelya(?) (Plethospira?) ulrichi* Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 166, pl. 12, figs. 9, 10.

Mohawkian: Head of Frobisher Bay, Baffin Land.

*Cotypes*.—Cat. No. 28187, U.S.N.M.

**Seelya ventricosa** Ulrich.

*Seelya ventricosa* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1009, figs. 7b–d.

*Pleurotomaria ventricosa* Miller, N. A. Geol. Pal., 2d App., 1897, p. 769.

Canadian (Beekmantown): Fort Cassin, Vermont.

*Holotype*.—Cat. No. 45996, U.S.N.M.

SELENOIDES Owen. See *Ischadites* Murchison.

**SEMICOSEINIUM** Prout.

Genotype: *S. rhomboideum* Prout.

*Semicosciniium* Prout, Trans. St. Louis Acad. Sci., 1, 1859, p. 443.—Ulrich, Contr. Amer. Pal., 1, 1886, p. 4.—Miller, N. A. Geol. Pal., 1889, p. 322.—Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 395, 555.—Simpson, 13th Ann. Rep. New York State Geol., for 1893, 1895, p. 705; 47th Ann. Rep. New York State Mus., p. 899.—Ulrich, Zittel's Textb. Pal. (Engl. ed), 1896, p. 281.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 509.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, pp. 38, 400.—Grabau, Bull. New York State Mus., 45, 1901, p. 171; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 171.—Bassler, Bull. U. S. Geol. Surv. 292, 1906, p. 51.—Hennig, Archiv. für Zool., k. Sven. Vat.-Akad. Stockholm, 3, No. 10, 1906, p. 7.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 143.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 341.

*Cryptopora* Nicholson, Canadian Jour., n. s., 14, 1874, p. 131; Ann. Mag. Nat. Hist., 4th ser., 13, 1874, p. 77; Pal. Province Ontario, 1874, p. 102.—Vine, Rep. 51st Meeting British Assoc. Adv. Sci., 1882, p. 169.—Hall, Rep. State Geol. New York for 1884, 1885, p. 40.—Ulrich, Contr. Amer. Pal., 1, 1886, p. 6.

*Carinopora* Nicholson, Canadian Jour., n. s., 14, 1874, p. 132; Ann. Mag. Nat. Hist., 4th ser., 13, 1874, p. 81; Pal. Province Ontario, 1874, p. 109.—Zittel, Handb. Pal., 1, 1880, p. 602.—Vine, Rep. 51st Meeting British Assoc. Adv. Sci., 1882, p. 169.—Hall, Rep. State Geol. New York for 1884, 1885, p. 38.—Ulrich, Contr. Amer. Pal., 1, 1886, p. 4.

*Cycloporina* Simpson, 13th Ann. Rep. State Geol. New York for 1893, 1895, pp. 711, 725; 47th Ann. Rep. New York State Mus., 1895, pp. 905, 919; 14th Ann. Rep. State Geol. New York for 1894, 1897, pp. 504, 520.

**Semicosciniium acmeum** (Hall).

*Fenestella acmea* Hall, 28th Ann. Rep. New York State Mus., doc. ed., 1876, pl. 12, figs. 10-13, 14 (sp.?) ; *ibid.*, mus. ed., 1879, p. 124, pl. 12, figs. 10-14; 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 250, pl. 11, figs. 10-14.—Cumings, Amer. Jour. Sci., 20, 1905, pl. 7, fig. 52.

*Semicosciniium acmea* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 355.

Niagaran (Waldron): Waldron, Indiana.

**Semicosciniium planum** Ulrich and Bassler.

*Semicosciniium planum* Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 285, pl. 45, fig. 7; pl. 49, fig. 4.

Helderbergian (Keyser): Hyndman, Pennsylvania.

*Holotype*.—Cat. No. 60743, U.S.N.M.

**Semicosciniium tenuiceps** (Hall).

*Fenestella prisca*(?) (not of Lonsdale nor of Goldfuss) Hall, Pal. New York, 2, 1852, p. 50, pl. 19, figs. 4a-m.

*Fenestella tenuiceps* Hall, Pal. New York, 2, 1852, p. 165, pl. 40D, figs. 2a-b.

*Semicosciniium tenuiceps* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 355.—Grabau, Bull. New York State Mus., 45, 1901, p. 171, figs. 71, 72; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 171, figs. 71, 72.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 52, pl. 19, figs. 6, 7.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 143, fig. 200.

Clinton: Lockport, Rochester, Lewiston, and Niagara Falls, New York; Grimsby, Ontario (Rochester); Osgood, Indiana (Osgood).



**SEPTAMEROCERAS** Hyatt.Genotype: *Gomphoceras inflatum* Billings.*Septameroceras* Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1883, p. 278.—Foord, Cat.

Foss. Ceph. British Mus., 1, 1888, p. 246.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 131.

Observation.—As pointed out by Whiteaves (Pal. Fossils, Geol. Surv. Canada, 3, pt. 2, 1895, p. 102), *Gomphoceras inflatum*, the genotype of *Septameroceras*, is a manuscript name of Billings applied to a rough cast of the body chamber of a shell from the Silurian at L'Anse a la Barbe, near Port Daniel, Canada, with the aperture badly preserved. He remarks further that this shell is probably the same as *Gomphoceras subgracilis* or *G. septore*. As the latter is the best known species of this type of structure, it would be well to recognize it as the genotype of *Septameroceras*.

**Septameroceras septore** (Hall).

*Gomphoceras septoris* Hall, 20th Rep. New York State Cab. Nat. Hist. (extras, 1865), 1868, p. 350, figs. 9, 10; rev. ed. for 1868 (1870), p. 410, figs. 6, 7.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 102.

*Cyrtoceras septoris* Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 151 (gen. ref.).—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 39 (loc. occ.).

*Septameroceras septoris* Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 131, fig. 1379.

Niagaran: Wauwatosa, Wisconsin (Racine?); Elora, Ontario (Guelph).

**SERPULITES** Macleay.Genotype: *S. longissimus* Murchison.

*Serpulites* Macleay in Murchison Sil. Syst., 1839, p. 700; Ann. Mag. Nat. Hist., 4, 1840, p. 387.—McCoy, British Pal. Rocks Foss., 1854, p. 132.—Pictet, Traité de Pal., 2d ed., 2, 1854, p. 569.—Salter, Cat. Camb. Sil. Foss., 1873, p. 176.—Etheridge, Geol. Mag., dec. 2, 7, 1880, p. 304.—Zittel, Handb. Pal., 1, 1880, p. 565.—Waagen, Mem. Geol. Surv. Indica, Pal. Indica, 13th ser., 1, 1885, p. 816.—Miller, N. A. Geol. Pal., 1889, p. 521.—Hinde, Zittel-Eastman Textb. Pal., 1, 1900, p. 253; 2d ed., 1913, p. 139.

**Serpulites dissolutus** Billings.

*Serpulites dissolutus* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 56 (adv. sheets, 1862).—Whiteaves, *ibid.*, 3, pt. 3, 1897, pp. 160, 240.

Black River—Richmond: Montreal, Ottawa, etc., Canada. Various localities in the United States.

**Serpulites longissimus** Murchison.

*Serpulites longissimus* Murchison, Sil. Syst., 1839, p. 608, pl. 5, fig. 1.—Salter in Murchison's Siluria, 1867, 4th ed., pl. 16, fig. 1.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1, 1880, p. 303, pl. 20, figs. 12, 13.—Ami, Proc. and Trans. Nova Scotian Inst. Sci., 8, 1895, p. 411.

Silurian: Great Britain, Antigonish County, Nova Scotia (Moynet).

**Serpulites splendens** Billings.

*Serpulites splendens* Billings, Canadian Nat. Geol., 4, 1859, p. 470.

Chazyau (Aylmer): Island of Montreal and Caughnawaga, Canada.

**SHUMARDIA** Billings.Genotype: *S. granulosa* Billings.

*Shumardia* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 92 (adv. sheets, 1862).—Miller, N. A. Geol. Pal., 1889, p. 566.—Zittel, Handb. Pal., 2, 1885, p. 593.—Vogdes, Bull. U. S. Geol. Surv., 63, 1890, p. 145; Cal. Acad. Sci., Occ. Pap., 4, 1893, pp. 355, 356.—Beecher, Amer. Jour. Sci., 4th ser., 3, 1897, p. 182.—Reed, Geol. Mag., dec. 4, 5, 1898, p. 503; Low Pal. Tril. Girvan Dist., 1903, p. 43.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 711.

**Shumardia glacialis** Billings.

Shumardia glacialis Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 283, fig. 270.

Canadian (Quebec—P): Portland Creek and Pistolet Bay, Newfoundland.

**Shumardia granulosa** Billings.

Shumardia granulosa Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 92, fig. 83a, b (adv. sheets, 1862).—Miller, N. A. Geol. Pal., 1889, p. 566, fig. 1057.

Canadian (Levis, Diplograptus dentatus zone): Point Levis, Quebec.

**Shumardia pusilla** (Sars).

Battus pusillus Sars, Okens Isis, 1835, p. 333, pl. 8, fig. 2.

Conophrys pusilla Brögger, Die Sil. Etagen 2-3, 1882, p. 125, pl. 12, fig. 9 (cites bibliography).—Reed, Geol. Mag., dec. 4, 5, 1898, p. 501.

Shumardia pusilla Moberg, Afh. Sveriges Geol. Unders., Ser. C, No. 109, 1890, p. 4, figs. a-c.—Frech, Leth. geog., 1 Th., Leth. Pal., 2, 1 Lief., 1897, pl. 1b, fig. 13.

Canadian: Europe; Point Levis, Quebec (Levis, Diplograptus dentatus zone) [Raymond].

**SICYOCRINUS** Angelin. See Botryocrinus Angelin.

**Sidemina** Castelnau.

Genotype: *S. infundibuliforme* Castelnau.

*Sidemina* Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 33.

**Sidemina infundibuliforme** Castelnau.

*Sidemina infundibuliforme* Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 33, pl. 10, fig. 1.

Silurian: Little Manitoulin Island, Lake Huron.

Observation.—Not recognized. Probably fragment of an Endoceras.

**SIDEROCRINITES** Troost. See Siderocrinus (Troost) Wood.

**SIDEROCRINUS** (Troost) Wood.

Genotype: *S. ornatus* Troost.

*Siderocrinites* Troost, MS., 1850.

*Siderocrinus* Wood., Bull. U. S. Nat. Mus., 64, 1909, p. 104.

**Siderocrinus ornatus** (Troost) Wood.

*Siderocrinites ornatus* Troost, MS., 1850.

*Siderocrinus ornatus* Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 105, pl. 12, fig. 7.

Niagaran (Brownport): Decatur County, Tennessee.

*Holotype*.—Cat. No. 39935, U.S.N.M.

**SIEBERELLA** Ehlert. See Gypidula subgenus Sieberella Ehlert.

**SIGMACYSTIS** Hudson. See Canadocystis Jaekel.

**SIGMAGRAPTUS** Ruedemann.

Genotype: *S. præcursor* Ruedemann.

*Sigmagraptus* Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 701, 702.

**Sigmagraptus præcursor** Ruedemann.

Cænograptid Ruedemann, New York State Pal., Ann. Rep., 1902, p. 566.

*Sigmagraptus præcursor* Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 702, 703, pl. 5, figs. 13, 14; fig. 93.

Canadian (Deepkill, Didymograptus bifidus zone): Deepkill, Rensselaer County, New York.

**SINUITES** Koken.Genotype: *Bellerophon bilobatus* Sowerby.*Bellerophon* (part) of numerous authors.

*Protowarthia* Ulrich and Scofield, *Minnesota Geol.*, 3, pt. 2, 1897, pp. 848-867.—Koken, *Neues Jahrb. Min., Geol., Pal.*, 1, 1898, p. 5.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 952.—Grabau and Shimer, *N. A. Index Fossils*, 1, 1909, p. 611. (Genotype: *Bellerophon cancellatus* Hall.)

*Sinuities* Koken, *Die Leitfossilien*, Leipzig, 1896, p. 392, footnote; *Bull. Acad. Imp. Sci. St. Petersburg*, 7, 1897, p. 117.—Dall, *Zittel-Eastman Textb. Pal.*, 2d ed., 1913, p. 521.

***Sinuities cancellatus* (Hall).**

*Bellerophon bilobatus* Emmons (not Sowerby), *Geol. New York.*, 2, 1842, p. 392, fig. 6.—Owen, *Geol. Expl. Iowa, Wisconsin, Illinois*, 2d ed., 1844, p. 84, pl. 17, fig. 15; *Amer. Jour. Sci. Arts*, 47, 1844, p. 365, fig. 6; *ibid.*, 48, 1845, p. 300, fig. 7.—Hall, *Pal. New York*, 1, 1847, p. 184, pl. 40, figs. 3a-d.—Rogers, *Geol. Pennsylvania*, 2, pt. 2, 1858, p. 819, fig. 607.—Emmons, *Man. Geol.*, 1860, p. 98, fig. 87.—Lincklaen, 14th Rep. *New York State Cab. Nat. Hist.*, 1861, p. 47, pl. 2, fig. 6.—Hitchcock, *Geol. Vermont*, 1, 1861, p. 297, fig. 206.—Hall, *Rep. Geol. Surv. Wisconsin*, 1862, p. 39, fig. 7.—Billings, *Geol. Canada, Geol. Surv. Canada*, 1863, p. 184, fig. 180a, b.; *Cat. Sil. Foss., Anticosti, Geol. Surv. Canada*, 1866, pp. 20, 56 (loc. occ.).—Miller, *Cincinnati Quart. Jour. Sci.*, 1, 1874, p. 306.—Kayser, *Beitr. Geol. Pal. Argentin. Republik, Pal. Supp.*, 3, 1876, p. 25, pl. 5, figs. 6, 7.—Chamberlin, *Geol. Wisconsin*, 1, 1883, p. 158, fig.—Lesley, *Geol. Surv. Pennsylvania*, Rep. P 4, 1889, p. 81, figs.—Miller, *N. A. Geol. Pal.*, 1899, p. 396, fig. 652.—Keyes, *Missouri Geol. Surv.*, 5, 1894, p. 147, pl. 51, fig. 2.—Whiteaves, *Pal. Foss., Geol. Surv. Canada*, 3, pt. 2, 1895, p. 124 (loc. occ.).

*Cyrtolites bilobatus* Emmons, *Amer. Geology*, 1, pt. 2, 1855, p. 166, pl. 6, figs. 2, 3, 22, 24; pl. 17, fig. 10c.

*Bellerophon cancellatus* Hall, *Pal. New York*, 1, 1847, p. 307, pl. 83, figs. 10a-c.—Emmons, *Amer. Geology*, pt. 2, 1855, p. 166.

*Protowarthia cancellata* Ulrich and Scofield, *Geol. Minnesota*, 3, pt. 2, 1897, p. 872, pl. 63, figs. 1-14.—Ruedemann, *Bull. New York State Mus.*, 49, 1901, p. 29.—Weller, *Geol. Surv. New Jersey, Pal.*, 3, 1903, p. 175, pl. 12, figs. 3-5.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 971, pl. 39, fig. 6, 6b.—Grabau and Shimer, *N. A. Index Fossils*, 1, 1909, p. 611, fig. 817g-i.

Trenton—Richmond: New York, Canada, and throughout the middle United States, chiefly in the Trenton.

*Plsiotypes*.—*Cat. Nos.* 45963-45967, U.S.N.M. (Ulrich and Scofield).

***Sinuities cancellatus acutus* (Sowerby?) Hall.**

*Bellerophon bilobatus* var. *acutus* (Sowerby?) Hall, *Pal. New York*, 1, 1847, p. 185, pl. 40, figs. 4a-b; 5a-b.—Lesley, *Geol. Surv. Pennsylvania*, Rep. P 4, 1889, p. 82, fig.

*Cyrtolites acutus* Emmons, *Amer. Geology*, 1, pt. 2, 1855, p. 166, pl. 6, figs. 4, 5.

Trenton: Middleville, Trenton Falls, etc., New York.

***Sinuities cancellatus corrugatus* (Hall).**

*Bellerophon bilobatus* var. *corrugatus* Hall, *Pal. New York*, 1, 1847, p. 185, pl. 40, figs. 6a-b.—Lesley, *Geol. Surv. Pennsylvania*, Rep. P 4, 1889, p. 82, fig.

Trenton: Middleville, Trenton Falls, etc., New York.

***Sinuities cancellatus trentonensis* (Ulrich and Scofield).**

*Bellerophon bilobatus* (part) of authors.

*Protowarthia cancellata* var. *trentonensis* Ulrich and Schofield, *Geol. Minnesota*, 3, pt. 2, 1897, p. 872.

Trenton: Minnesota; Iowa; Ohio; etc.

**Sinuities cassinensis** (Whitfield).

Bellerophon Cassinensis Whitfield, Bull. Amer. Mus., Nat. Hist., 1, 1886, p. 318, pl. 26, figs. 8, 9.—Seely, Vermont State Geol., Rept. 7, 1910, pl. 61, fig. 14.  
 Protowarthia cassinensis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 848 (gen. ref.).  
 Canadian (Beckmantown): Fort Cassin, Vermont.

**Sinuities concinna** (Ulrich and Scofield).

Protowarthia concinna Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 874, pl. 63, figs. 36–39.  
 Richmond (Maquoketa): Near Spring Valley, Minnesota.  
*Holotype*.—Cat. No. 45958, U.S.N.M.

**Sinuities globularis** (Miller and Faber).

Bellerophon globularis Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 17, 1894, p. 28, pl. 1, figs. 21, 22.  
 Eden: Cincinnati, Ohio.  
 Observation.—Compare with *S. granistriata* Ulrich.

**Sinuities granistriatus** (Ulrich).

Protowarthia granistriata Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 870, pl. 63, figs. 28–30.  
 Eden (Southgate): Cincinnati, Ohio, and vicinity.  
*Cotypes*.—Cat. No. 45959, U.S.N.M.

**Sinuities morrowensis** (Miller and Dyer).

Bellerophon morrowensis Miller and Dyer, Cont. to Pal., No. 2, 1878, p. 8, pl. 3, fig. 6.  
 Protowarthia? morrowensis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 874 (gen. ref.).  
 Richmond: Morrow, Ohio.  
 Observation.—Not recognizable without a restudy of the type.

**Sinuities obesus** (Ulrich).

Protowarthia obesa Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 874, pl. 63, figs. 45–47.  
 Trenton (Hermitage): Burgin and Danville, Kentucky.  
*Cotypes*.—Cat. Nos. 45961, 45962, U.S.N.M.

**Sinuities pervolutus** (Ulrich and Scofield).

Protowarthia pervoluta Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 871, pl. 63, figs. 21–27.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 164.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 611, fig. 817d-f.  
 Black River (Decorah) and Trenton (Curdsville, Hermitage): St. Paul, etc., Minnesota; Curdsville, Kentucky; Baffin Land.  
*Cotypes*.—Cat. Nos. 45968–45970, U.S.N.M.

**Sinuities planodorsatus** (Ulrich).

Protowarthia planodorsata Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 871, pl. 63, figs. 31–35.  
 Eden (Southgate): Covington, Kentucky.  
*Cotypes*.—Cat. No. 45960, U.S.N.M.

**Sinuities rectangularis** (Ulrich and Scofield).

Protowarthia rectangularis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 868, pl. 63, figs. 15–20.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 611, fig. 817a-c.

**Sinuities rectangularis**—Continued.

Black River (Platteville): Mineral Point, etc., Wisconsin; Dixon, Illinois; Minneapolis, Cannon Falls, etc., Minnesota.

*Cotypes*.—Cat. Nos. 45971, 45972, U.S.N.M.

**Sinuities rossi** (Collie).

*Protowarthia rossi* Collie, Bull. Geol. Soc. America, 14, 1903, p. 420, pl. 59, figs. 6, 7.

Canadian (Beckmantown): Bellefonte, Pennsylvania.

**Sinuities subcompressus** (Ulrich).

*Protowarthia subcompressa* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 873, pl. 63, figs. 40–44.—Cumings, 32d Ann. Rep. Dep. Geol. and Nat. Res. Indiana, 1908, p. 972, pl. 39, figs. 5–5b.

Richmond (Waynesville): Versailles, Indiana; Butler County, Ohio.

*Cotypes*.—Cat. Nos. 45973, 45974, U.S.N.M.

**Sinuities tenuissimus** (Collie).

*Protowarthia tenuissima* Collie, Bull. Geol. Soc. America, 14, 1903, p. 420, pl. 59, figs. 10, 11.

Trenton: Bellefonte, Pennsylvania.

**SINUOPEA** Ulrich.

Genotype: *Holopea sweeti* Whitfield.

*Sinuopea* Ulrich, Bull. Geol. Soc. Amer., 22, 1911, p. 630.

**Sinuopea obesa** (Whitfield).

*Holopea obesa* Whitfield, Geol. Wisconsin, 4, 1882, p. 348, pl. 27, fig. 11.—Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 97, pl. 5, fig. 19; Jour. Geol., 11, 1903, p. 481, fig. 21.

Ozarkian (Oneota): River Falls, Wisconsin.

**Sinuopea strongi** (Whitfield).

*Euomphalus Strongi* Whitfield, Wisconsin Geol. Surv., Ann. Rep. for 1877, 1878, p. 66; Geol. Wisconsin, 4, 1882, p. 200, pl. 4, figs. 1, 2.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 142, fig.

*Oxydiscus Strongi* Koken, Neues Jahrb. Min., Geol., Pal., 6, Beilage-Band, 1889, p. 392.

Ozarkian (Oneota): Richland County, Wisconsin.

**Sinuopea turgida** (Hall).

*Pleurotomaria? turgida* Hall, Pal. New York, 1, 1847, p. 12, pl. 3, figs. 9, 10.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 160.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 720, figs.

*Holopea turgida* Billings, Canadian Nat. Geol., 4, 1859, p. 350.—Koken, Neues Jahrb. Min. Geol. Pal., 6, Beilage-Band, 1889, p. 478.—Whitfield, Bull. Amer. Mus. Nat. Hist., 2, 1889, p. 50, pl. 9, figs. 3–7.—Calvin, Amer. Geol., 10, 1892, p. 147; Bull. Lab. Nat. Hist. State Univ. Iowa, 2, 1892, p. 192.—Cleland, Bull. Amer. Pal., 3, 1900, p. 253, pl. 15, fig. 14.

Ozarkian: Saratoga County, etc., New York (Little Falls); Iowa.

**SIPHONIA CRATERA** Roemer. See *Palæomanon cratera*.

**SIPHONIA IMBRICATO-ARTICULATA** Roemer. See *Astylosporgia imbricatoarticulata*.

**SIPHONOCRINUS** Miller.

Genotype: *Glyptocrinus nobilis* Hall.

*Siphonocrinus* Miller, Amer. Geol., 1, 1888, p. 263; N. A. Geol. Pal., 1889, p. 281.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1890, p. 371.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p.

**SIPHONOCRINUS**—Continued.

85, fig. 40.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 199.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 554.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 187.

**Siphonocrinus armosus** (McChesney).

*Eucalyptocrinus armosus* McChesney, Desc. New Fossils, 1861, p. 95, fig.—Hall, 20th Rep. New York State Mus. Nat. Hist., 1868, pl. 10, fig. 11.—McChesney, Trans. Chicago Acad. Sci., 1, 1868, p. 23, pl. 7, fig. 6.

*Glyptocrinus armosus* Hall, 20th Rep. New York State Cab. Nat. Hist., rev. ed., 1870, p. 373, pl. 10, fig. 11.—Billings, Amer. Jour. Sci. Arts, 2d ser., 48, 1869, p. 73; Canadian Nat., n. s., 4, 1869, p. 281, fig. 3; Ann. Mag. Nat. Hist., 4th ser., 5, 1870, p. 255; Pal. Foss., Geol. Surv. Canada, 2, pt. 1, 1874, p. 94.—Whitfield, Geol. Wisconsin, 4, 1882, p. 284, pl. 16, fig. 11.

*Glyptaster armosus* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 370 (Rev. Pal., pt. 2, p. 196).

*Siphonocrinus armosus* Miller, Amer. Geol., 1, 1888, p. 264.—Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 211, pl. 19, fig. 3a-c.

*Glyptocrinus siphonatus* Hall, Rep. Sup. Geol. Surv. Wisconsin, 1861, p. 22; 20th Rep. New York State Cab. Nat. Hist. (extras, 1865), 1868, p. 328, pl. 10 (1), fig. 10.—Billings, Amer. Jour. Sci. Arts, 2d ser., 48, 1869, p. 73; Ann. Mag. Nat. Hist., 4th ser., 5, 1870, p. 256.

Niagaran (Racine): Racine, Greenfield, and Waukesha, Wisconsin; Chicago, Illinois.

**Siphonocrinus nobilis** (Hall).

*Glyptocrinus nobilis* Hall, Rep. Sup. Geol. Surv. Wisconsin, 1861, p. 21; 20th Rep. New York State Cab. Nat. Hist., 1868 (extras, 1865), p. 328, pl. 10, fig. 9; rev. ed., 1870, p. 372, pl. 10, figs. 9, 10.—Whitfield, Geol. Wisconsin, 4, 1882, p. 283, pl. 16, figs. 9, 10.

*Siphonocrinus nobilis* Miller, Amer. Geol., 1, 1888, p. 265; N. A. Geol. Pal., 1889, p. 281, fig. 428.—Weller, Bull. Chicago Acad. Sci., 4, pt. 1, 1900, p. 86, pl. 2, fig. 1.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 554, fig. 1885.

Niagaran (Racine): Racine, Waukesha, etc., Wisconsin; Chicago, Illinois.

**Siphonocrinus pentagonus** Wachsmuth and Springer.

*Siphonocrinus pentagonus* Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 213, pl. 19, figs. 4a, b.

Niagaran (Racine): Racine, Waukesha, etc., Wisconsin.

**SIPHONOTRETA** Verneuil.

Genotype: *Crania unguiculata* Eichwald.

*Siphonotreta* Verneuil, Geol. de la Russie d'Europe et des Mont. de l'Oural, 2, 1845, p. 286.—Kutorga (in part), Verhandl. Russ.-kais. min. Gesell. St. Petersburg, No. 12, 1847, pp. 261-263.—D'Orbigny, Compt. Rend. de l'Acad. Sci., 25, 1847, p. 269.—Morris, Ann. Mag. Nat. Hist., 2d ser., 4, 1849, pp. 315-320; Rep. British Assoc. Adv. Sci., Notices and Abstracts, 1850, pp. 57, 58.—Davidson, British Foss. Brach., Pal. Soc., 1853, p. 131.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 72.—Chapman, Canadian Jour., n. s., 3, 1858, p. 160.—Eichwald, Leth. Rossica, ancienne periode, 1, sec. 2, 1860, p. 915.—Seebach, Zeitschr. Deutsch. geol. Gesell. for 1865, 17, Heft 2, p. 341.—Davidson, British Foss. Brach., 3, pt. 7, p. 75.—Quenstedt, Petrefactenkunde Deutschlands, Abth. 1, 2, Brach., 1871, pp. 673-674.—Dall, Amer. Jour. Conch., 7, 1871, p. 75; Bull. U. S. Nat. Mus., 8, 1877, p. 62.—Davidson, Geol. Mag., n. s., dec. 2, 4, 1877, pp. 13-16.—Zittel, Handb. Pal., 1, Munich, 1880, p. 665.—Davidson, British Foss. Brach., 5, pt. 2, 1883, pp. 217-219.—Ehler, Manual Conch., Fischer, 1887, p. 1265.—Miller, N. A. Geol. Pal., 1889, p.

**SIPHONOTRETA**—Continued.

371.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 110, 167; 45th Rep. New York State Mus., 1892, pp. 568, 569.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 358.—Hall and Clarke, 11th Ann. Rep. New York State Geol., 1894, p. 252.—Koken, Die Leitfossilien, Leipzig, 1896, p. 229.—Walcott, Smiths. Misc. Coll., 53, 1908, pl. 11, pp. 142, 146; Mon. U. S. Geol. Surv., 51, pt. 1, 1912, p. 624.—Schuchert, Zittel-Eastman Textb. Pal., 1900, p. 309; 2d ed., 1913, p. 375.

**Siphonotreta(?) micula** McCoy.

*Siphonotreta micula* McCoy, Ann. Nat. Hist., 2d ser., 8, 1851, p. 389; British Pal. Foss., 1852, p. 188, pl. 1, fig. 3.—Salter, Siluria, 2d ed., 1859, p. 212, fig. 3.—Harkness, Geol. Mag., 2, 1865, p. 431.—Davidson, British Sil. Brach., pt. 7, 1866, pp. 76, 77, pl. 8, figs. 2-6.—Ami, Rep. Progr. Geol. Nat. Hist. Surv. Canada for 1887-88, 1889, p. 52K.

Lower Ordovician: Great Britain; Point Levis, Quebec (Levis).

**Siphonotreta(?) minnesotensis** Hall and Clarke.

*Siphonotreta?* *minnesotensis* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 112, 177, pl. 4, figs. 37, 38.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 358, pl. 29, figs. 23, 24.—Hall and Clarke, 48th Rep. New York State Mus., 2, for 1895, 1897, p. 332, pl. 2, figs. 9, 10; 14th Rep. State Geol. New York for 1894, 1897, p. 332, pl. 2, figs. 9, 10.—Ruedemann, Bull. New York State Mus., 49, 1902, p. 14, pl. 1, figs. 4, 5.

Black River: Minneapolis, Minnesota (Platteville); Rysedorph Hill, Rensselaer County, New York (Rysedorph).

**SIPHONOTRETA SCOTICA** Whiteaves. See *Schizambon canadensis*.

**SIPHONOTRETA SCOTICA** var. **CANADENSIS** Ami. See *Schizambon canadensis*.

**SKENIDIUM** Hall. See *Scenidium* Hall.

**SKENIDIUM HALLI** Safford. See *Scenidium anthonense*.

**SKENIDIUM PYRAMIDATA** Hall. See *Scenidium pyramidale*.

**SKOLITHUS** James. See *Scolithus Haldeman*.

**SOLEMYA** Lamarck. See *Solenomya* Lamarck.

**SOLENOMYA** Lamarck.

Genotype: *S. australis* Lamarck.

*Solenomya* Lamarck, Hist. Nat. An. sans Vert., 2, 1818, p. 488.

*Solenomya* Pictet, Traite de Pal., 2d ed., 3, 1855, p. 572.—Miller, N. A. Geol. Pal., 1889, p. 512.—Hind, Mon. British Carb. Lamell. Pal. Soc., 1900, p. 435.

**Solenomya? insperata** Ruedemann.

*Solenomya?* *insperata* Ruedemann, Bull. New York State Mus., 162, 1912, p. 105, pl. 6, figs. 13, 14.

Trenton (Snake Hill): Snake Hill, Saratoga County, New York.

**SOLENOPLEURA** Angelin.

Genotype: *Solenopleura holometopa* Angelin.

*Solenopleura* Angelin, Pal. Scandinavia, 3d ed. Holmie, 1854, p. 26.—Salter, Mem. Geol. Surv. Great Britain, 3, 1866, p. 305; *ibid.*, 2d ed., 1881, p. 499.—Walcott, Bull. U. S. Geol. Surv., 10, 1884, p. 36.—Matthew, Canadian Rec. Sci., 2, 1887, p. 357; Trans. Roy. Soc. Canada, 5, 1888, pp. 134, 152.—Miller, N. A. Geol. Pal., 1889, p. 567.—Beecher, Amer. Geol., 16, 1895, p. 178.—Koken, Die Leitfossilien, Leipzig, 1896, p. 21, fig. 13, figs. 3, 4.—Ehlert, Bull. Soc. Geol. France, 24, 1896, p. 111, fig. 18.—Pompeckj, Jahrb. d. k. k. geol. Reich., 45, 1896, p. 546.—Lindström, Kongl. Sven. Vet.-Akad. Handl., 34, No. 8, 1901, p. 25.

**Solenopleura jerseyensis** (Weller).

*Liostracus?* *jerseyensis* Weller, Ann. Rep. State Geol. New Jersey for 1899, 1900, p. 51, pl. 1, figs. 1-8.

*Solenopleura jerseyensis* Weller, Geol. Surv. New Jersey Pal., 3, 1903, p. 119, pl. 2, figs. 1-8.

Upper Cambrian or Ozarkian (Kittatinny): Near Carpentersville, New Jersey.

**SOLENOPIORA** Dybowski.

Genotype: *S. spongioides* Dybowski.

*Solenopora* Dybowski, Chæt. Ostbalt. Sil. Form. St. Petersburg, 1877, p. 124.—

Zittel, Handb. Pal., 1, 1880, p. 616.—Nicholson, Geol. Mag., dec. 3, 5, 1888, p. 19.—Brown, Geol. Mag., dec. 4, 1, 1894, pp. 146, 197.—Rothpletz, Sver. Geol. Under. ser. Ca, No. 10, 1913, p. 7.

**Solenopora compacta** (Billings).

*Stromatopora compacta* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, pp. 55, 212 (adv. sheets, 1862).

*Solenopora* (?) *compacta* Nicholson and Etheridge, Geol. Mag., dec. 3, 2, 1885, p. 629, pl. 13, figs. 1-8.—Nicholson, Geol. Mag., dec. 3, 5, 1888, p. 20, fig. 3; Man. Pal., 1, 1889, p. 201, figs. 83a-83d.—Ami, Canadian Rec. Sci., 5, 1892, p. 97.—Brown, Geol. Mag., dec. 4, 1, 1894, p. 146, figs. 1, 2.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 80, pl. F, figs. 21-23.—Whiteaves, Pal. Foss. Geol. Surv. Canada, 3, pt. 3, 1897, p. 237.—Seward, Fossil Plants, Cambridge, 1, 1898, p. 189, fig. 38.—Rothpletz, Handl. Kgl. Sv. Vet.-Akad., 43, No. 5, 1908, p. 12, pl. 3, figs. 1-6.—Seely, Vermont State Geol. Rep., 7, 1910, p. 274, fig. 24.—Rothpletz, Sver. Geol. Under., ser. Ca, No. 10, 1913, p. 11, pl. 1, figs. 5, 6.

*Solenopora compacta* var. *minuta* Ami, Ann. Rep. Geol. Nat. Hist. Surv. Canada, n. s., 3, pt. 2, 1888, p. 116k; Canadian Rec. Sci., 5, 1892, p. 96.

*Solenopora Paquettiana* Ami, Canadian Rec. Sci., 5, 1892, p. 98.

*Tetradium peachii* Nicholson and Etheridge, Ann. Mag. Nat. Hist., 4th ser., 20, 1877, p. 166, figs. d-g.

*Tetradium Peachii* var. *canadense* Foord, Cont. Micro. Pal. Geol. Surv. Canada, 1883, p. 24, pl. 6, figs. 1-1f.

*Solenopora compacta* *Peachii* Nicholson and Etheridge, Geol. Mag. London, 2, 1885, p. 530, pl. 13, figs. 2, 3, 9-11.

*Solenopora spongioides* Dybowski, Die Chætetiden der ostbaltischen Silur. Formation, 1877, p. 124, pl. 2, figs. 11a-b.

*Actinostroma trentonensis* Weller, Geol. Surv. New Jersey Pal., 3, 1903, p. 139, pl. 6, fig. 8; pl. 7, figs. 3, 4.

*Solenopora compacta trentonensis* Brown, Geol. Mag. London, 1, 1894, p. 146, fig. 2.—Ruedemann, Bull. New York State Mus., 133, 1909, p. 201.

Middle and Upper Ordovician: A widespread and abundant species in Esthonia, Russia, and North America.

**SOLENOPIORA COMPACTA** var. **MINUTA** Ami. See *Solenopora compacta*.

**SOLENOPIORA COMPACTA PEACHII** Nicholson and Etheridge. See *Solenopora compacta*.

**SOLENOPIORA COMPACTA TRENTONENSIS** Brown. See *Solenopora compacta*.

**SOLENOPIORA SPONGIOIDES** Dybowski. See *Solenopora compacta*.

**SOLENOPIORA** Ulrich. See *Ectomaria* Koken.

**SOWTERIA** Whiteaves.

Genotype: *Whitella canadensis* Raymond.

*Sowteria* Whiteaves, Ottawa Nat., 22, 1908, p. 112.



**Sowteria canadensis** (Raymond).

*Whitella canadensis* Raymond, Amer. Jour. Sci., 20, 1905, p. 373.

*Sowteria canadensis* Whiteaves, Ottawa Nat., 22, 1908, p. 112, pl. 3, figs. 13-15.

Black River (Lowville): Aylmer, Quebec; Hog Back, near Ottawa, Ontario.

**SPATIOPORA** Ulrich.

Genotype: *S. aspera* Ulrich.

*Spatiopora* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 155; *ibid.*, 6, 1883, p. 166.—Foord, Contr. Micro-Pal. Cambro-Sil., 1883, p. 20.—Miller, N. A. Geol. Pal., 1889, p. 323.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 381; Geol. Minnesota, 3, 1893, p. 319; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 269.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 24.—Bassler, Bull. U. S. Geol. Surv., 292, p. 21.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 756.—Hennig, Archiv. fur Zool., 4, 1908, p. 12.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 106; Zittel-Eastman Textb. Pal., 1913.

***Spatiopora?* areolata** Foord.

*Spatiopora areolata* Foord, Contr. Micro-Pal. Cambro-Sil., 1883, p. 21, pl. 5, figs. 1-11.

Trenton; Hull, Quebec.

***Spatiopora aspera*** Ulrich.

*Spatiopora aspera* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 166, pl. 7, figs. 5-5b; Zittel's Textb. Pal. (Engl. ed.), 1896, fig. 441 (p. 269).—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 329, fig. 468.

*Monticulipora aspera* J. F. James, Jour. Cincinnati Soc. Nat. Hist., 18, 1895, p. 82. Maysville (Bellevue): Hamilton and Cincinnati, Ohio.

*Cotypes*.—Cat. No. 43254, U.S.N.M.

***Spatiopora corticans*** (Nicholson).

*Chaetetes corticans* Nicholson, Quart. Jour. Geol. Soc. London, 30, 1874, p. 512, pl. 19, figs. 13, 14; Pal. Ohio, 2, 1875, p. 210, pl. 22, figs. 6, 6a.

*Chaetetes tuberculatus* (not Milne-Edwards and Haime) Nicholson, Ann. Mag. Nat. Hist., 4th ser., 18, 1876, p. 91.

*Monticulipora* (*Monotrypa*) *tuberculata* (not Milne-Edwards and Haime) Nicholson, Genus *Monticulipora*, 1881, p. 200, pl. 4, figs. 2-2d.

*Spatiopora corticans* Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1908, p. 407. Richmond (Waynesville): Warren and Clinton Counties, Ohio; Indiana.

***Spatiopora iowensis*** Ulrich.

*Spatiopora iowensis* Ulrich, Geol. Minnesota, 3, 1893, p. 321.

Richmond (Maquoketa): Graf, Iowa.

*Cotypes*.—Cat. No. 43253, U.S.N.M.

***Spatiopora labeculosa*** Ulrich.

*Spatiopora labeculosa* Ulrich, Geol. Minnesota, 3, 1893, p. 320, pl. 28, figs. 1, 2.

Black River (Decorah): Minneapolis, St. Paul, and Fountain, Minnesota.

*Holotype*.—Cat. No. 43255, U.S.N.M.

***Spatiopora lineata*** Ulrich.

*Spatiopora lineata* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 167, pl. 7, fig. 7.

Maysville (Bellevue): Hamilton and Cincinnati, Ohio.

*Holotype*.—Cat. No. 43252, U.S.N.M.

**Spatiopora lineata incepta** Ulrich.

- Spatiopora maculosa* var. *incepta* Ulrich, Geol. Minnesota, 3, 1893, p. 320.  
*Spatiopora lineata-incepta* Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 407.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 107, pl. 7, figs. 9, 10.  
 Black River (Decorah): Chatfield, Minnesota.  
 Middle Ordovician (Wesenberg): Wesenberg, Esthonia, Russia.  
*Cotypes* and *plesiotypic*.—Cat. Nos. 43299, 57206, U.S.N.M.

**Spatiopora maculata** (Hall).

- Hall, Pal. New York, 2, 1852, pl. 40E, figs. 7 a, b.  
*Paleschara maculata* Hall, 28th Ann. Rep. New York State Mus., doc. ed., 1876, pl. 8, figs. 9, 10; *ibid.*, mus. ed., 1879, p. 121, pl. 8, figs. 9–13; 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 246, pl. 7, figs. 9–13.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 591, figs.  
*Paleschara?* *aspera* Hall, 28th Ann. Rep. New York State Mus., doc. ed., 1876, pl. 8, figs. 11–13.  
*Leptotrypa maculata* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 158.  
*Spatiopora maculata* Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 22, pl. 8, figs. 1–4; pl. 9, figs. 10, 11.  
 Niagara: Waldron, Indiana, and Newsom, Tennessee (Waldron); Lockport, New York; Grimsby, Ontario (Rochester).  
*Plesiotypic*.—Cat. No. 35463, U.S.N.M.

**Spatiopora maculosa** Ulrich.

- Spatiopora maculosa* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 167, pl. 7, fig. 6.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 879, pl. 32, fig. 9.  
 Maysville (Corryville): Cincinnati, Ohio, and vicinity.  
*Holotype*.—Cat. No. 43257, U.S.N.M.

*SPATIOPORA MACULOSA* VAR. *INCEPTA* Ulrich. See *Spatiopora lineata incepta*.

**Spatiopora montifera** Ulrich.

- Spatiopora montifera* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 168, pl. 6, figs. 1, 1a, pl. 7, fig. 8.  
 Richmond (Waynesville): Waynesville, Clarksville, and Oxford, Ohio.  
*Holotype*.—Cat. No. 43256, U.S.N.M.

**Spatiopora tuberculata** (Milne-Edwards and Haime).

- Chaetetes tuberculatus* Milne-Edwards and Haime, Pol. Foss. Terr. Pal., 1851, p. 268, pl. 19, figs. 3, 3a.  
*Monticulipora tuberculata* Hall, 12th Ann. Rep. Indiana Geol. Nat. Hist., 1883, p. 251, pl. 10, fig. 6.—James and James, Jour. Cincinnati Soc. Nat. Hist., 11, 1888, p. 21.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 422, fig.—J. F. James, Jour. Cincinnati Soc. Nat. Hist., 16, 1895, p. 78.  
*Spatiopora tuberculata* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 166.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 407.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 880, pl. 32, fig. 10.  
 Maysville and Richmond: Cincinnati, Maysville, etc., Ohio: Indiana; Kentucky.

**SPHÆREXOCHUS** Beyrich.

Genotype: *S. mirus* Beyrich.

- Sphærexochus* Beyrich, Ueber einige böhm. Tril., 1845, p. 19; Untersuchung über Tril., 1846, p. 5.—Bell and Forbes, in Burmeister's Org. Tril., London, Suppl., App., 1846, p. 126.—Beyrich, Neues Jahrb. Min., Geol. Pal., 1846, p. 119.—Hawle and Corda, Abh. d. k. böhmischen Gesell. d. Wiss., 5 (ex-

**SPHÆREXOCHUS**—Continued.

tract), 1847, p. 137, pl. 7, fig. 72.—Salter, Mem. Geol. Surv. Gt. Britain, 1, 1848, p. 344.—McCoy, Ann. Mag. Nat. Hist., 2d ser., 4, 1849, p. 400.—Barrande, Neues Jahrb. f. Min., etc., 1850, p. 779; Syst. Sil. du Centre Boheme, 1, 1852, p. 805.—Salter, Mem. Geol. Surv. United Kingdom, dec. 7, 1853, pl. 3.—Pictet, Traite de Pal., 2d ed., 2, 1854, p. 521.—Nieszkowski, Archiv. f. Naturk. Liv.-Ehst-u. Kurl., 1, 1857, p. 594.—Salter, Mon. British Tril., Pal. Soc., 1864, p. 76.—Barrande, Syst. Sil. du Centre Boheme, 1, Suppl., 1872, p. 109.—Steinhardt, Beit. z. Naturk. Preus. Phys.-Oekon. Gesell., Königsberg, 1874, p. 60.—Angelin, Pal. Scandinavica, 3d ed., Holmiac, 1878, p. 36.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 7th ser., 30, 1881, p. 188.—Zittel, Handb. Pal., 2, 1885, p. 619.—Miller, N. A. Geol. Pal., 1889, p. 567.—Koken, Die Leitfossilien, Leipzig, 1896, p. 33, fig. 23, fig. 3.—Reed, Geol. Mag., dec. 4, 5, 1898, p. 210.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 321.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 725.

**SPHÆREXOCHUS CANADENSIS** Billings. See *Pseudosphærexochus canadensis*.

**SPHÆREXOCHUS MIRUS** Roemer. See *Sphærexochus romingeri*.

**Sphærexochus parvus** Billings.

——— Billings, Can. Nat. Geol., 4, 1859, p. 468, fig. 36.

*Sphærexochus parvus* Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 133, fig. 66; Pal., Foss., 1, Geol. Surv. Canada, 1865, p. 180, fig. 161a, b.—Miller, N. A. Geol. Pal., 1889, p. 567, fig. 1060.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 974, fig.—Raymond, Annals Carnegie Mus., 3, 1905, p. 366, figs. 4, 5; p. 372, pl. 14, fig. 22; 7th Rep. Vermont State Geol., 1910, p. 246, pl. 36, fig. 22.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 321, fig. 1634e.

Chazyan: Island of Montreal and Mingan Islands, Canada; Chazy, Valcour Island, etc., New York; Isle La Motte, Vermont (Crown Point).

**SPHÆREXOCHUS PISUM** Foerste. See *Deiphon forbesi*.

**Sphærexochus romingeri** Hall.

*Sphærexochus mirus* Roemer, Sil. Fauna West Tennessee, 1860, p. 81, pl. 5, fig. 20.—Hall, Adv. sheets 18th Rep. New York State Cab. Nat. Hist., 1865, p. 30; 20th Rep. New York State Cab. Nat. Hist., 1867, p. 334.—Foerste, Bull. Sci. Lab. Denison Univ., 3, 1888, p. 121, pl. 13, fig. 6.

*Sphærexochus romingeri* Hall, Geol. Surv. Wisconsin, 1, 1867, p. 434; 20th Rep. New York State Cab. Nat. Hist., 1867, p. 375, pl. 21, figs. 4-7; 20th Rep. New York State Cab. Nat. Hist., 1870, rev. ed., p. 425, pl. 21, figs. 4-7.—Meek and Worthen, Geol. Surv. Illinois, 7, 1875, p. 510, pl. 24, fig. 4.—Whitfield, Geol. Wisconsin, 4, 1882, p. 311, pl. 21, figs. 1-3.—Chamberlin, *ibid.*, 1, 1883, p. 195, fig.—Van Ingen, School of Mines Quart., 23, 1901, p. 35.—Kindle, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 483, pl. 22, figs. 8-9, 12-15.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 266, pl. 24, figs. 6-19.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 321, fig. 1635.

Niaganan: Milwaukee and Waukesha, Wisconsin; Bridgeport, Illinois (Racine); Cedarville, Ohio (Guelph); Independence County, Arkansas (St. Clair); Connor's Mill, etc., Indiana; West Tennessee (Brownspport).

**SPHÆREXOCHUS ROMINGERI?** Hall 1877. See *Cheirurus niagarensis*.

**SPHÆROBOLUS** Matthew. See *Obolus* subgenus *Lingulobolus* Walcott.

- SPHÆROCOCITES** Sternberg. Type: *S. ciliatus* Sternberg.  
*Sphærococites* Sternberg, *Flora Vorw.*, 2 (Versuch), pt. 5, 6, 1883, p. 28.
- Sphærococites(?) glomeratus** Grabau.  
*Sphærococites*(?) *glomeratus* Grabau, *Michigan Geol. Surv., Geol. Series*, 1, 1909, p. 210, pl. 11, fig. 1.  
 Lower Monroan: Greenfield, Ohio (Greenfield); Roche de Boeuf, Lucas County, Ohio; Monroe County, Michigan (Raisin River).
- SPHÆROCORYPHE** Angelin. Genotype: *S. dentata* Angelin.  
*Sphærocoryphe* Angelin, *Pal. Scandinavica*, 3d ed., *Holmiæ*, 1878, p. 65.—Schmidt, *Mem. l'Acad. Imp. Sci. St. Petersburg*, 7th ser., 30, 1881, pp. 123, 126, 129, 166.—Zittel, *Handb. Pal.*, 2, 1885, p. 618.—Miller, *N. A. Geol. Pal.*, 1889, p. 567.—Clarke, *Geol. Minnesota*, 3, pt. 2, 1894, p. 738.—Reed, *Geol. Mag.*, dec. 4, 3, 1896, p. 118; 5, 1898, p. 211.—Koken, *Die Leitfossilien*, *Leipsig*, 1896, p. 35.—Raymond, *Annals Carnegie Mus.*, 3, 1905, p. 375.—Slocum, *Field Mus. Nat. Hist., Geol. Ser.*, 4, 1913, p. 77.—Raymond, *Zittel-Eastman Textb. Pal.*, 1913, p. 725.
- Sphærocoryphe goodnovi** Raymond.  
*Sphærocoryphe goodnovi* Raymond, *Annals Carnegie Mus.*, 3, 1905, p. 371, pl. 14, fig. 23; *ibid.*, 7, p. 78, pl. 19, figs. 16-18; 7th Rep. *Vermont State Geol.*, 1910, p. 246, pl. 36, fig. 23; pl. 39, figs. 16-18.  
 Chazyan (Crown Point): Chazy, New York.
- Sphærocoryphe major** Ruedemann.  
*Sphærocoryphe major* Ruedemann, *Bull. New York State Mus.*, 49, 1901, p. 67, pl. 4, figs. 13, 14.  
 Mohawkian (Rysedorph): Rysedorph Hill, Rensselaer County, New York.
- Sphærocoryphe maquoketensis** Slocum.  
*Sphærocoryphe maquoketensis* Slocum, *Field Mus. Nat. Hist., Geol. Ser.*, 4, 1913, p. 77, pl. 15, figs. 1-4.  
 Richmond (Maquoketa): Clermont, Elgin, and Bloomfield, Iowa.
- Sphærocoryphe robustus** Walcott.  
*Sphærocoryphe robustus* Walcott, *Cincinnati Quart. Jour. Sci.*, 2, 1875, p. 273, figs. 18a, b.—Miller, *N. A. Geol. Pal.*, 1889, p. 567, fig. 1061.  
 Ceraurus (*Sphærocoryphe*) *robusta* Clarke, *Geol. Minnesota*, 3, pt. 2, 1894, p. 738 (gen. ref.).  
 Trenton: Trenton Falls, New York.
- Sphærocoryphe salteri** Billings.  
*Sphærocoryphe Salteri* Billings, *Cat. Sil. Fossils, Anticosti, Geol. Surv. Canada*, 1866, p. 63.  
 Gamachian (Ellis Bay): Junction Cliff, Anticosti.
- SPHÆROCYSTIS Haeckel. See *Sphærocystites* Hall.
- SPHÆROCYSTITES Jaekel (part). See *Cœlocystis* Schuchert.
- SPHÆROCYSTITES** Hall. Genotype: *S. multifasciatus* Hall.  
*Sphærocystites* Hall, *Amer. Jour. Sci. Arts*, 25, 1858, p. 279; *Pal. New York*, 3, 1859, pp. 130, 151.—Miller, *N. A. Geol. Pal.*, 1889, p. 282.—Jaekel, *Stammesges. Pemat.*, 1, 1899, p. 288.—Schuchert, *Amer. Geol.*, 32, 1903, p. 232.—Zittel, *Grundzuge Pal.*, 1, 1910, p. 188.—Grabau and Shimer, *N. A. Index Fossils*, 2, 1910, p. 470.  
*Sphærocystis* Haeckel, *Amphor. und Cystoid.*, 1896, pl. 3, fig. 10-13.—Bather, *Treatise on Zool. (Lankester)*, pt. 3, 1900, p. 63.

**Sphærocystites bloomfieldensis** Schuchert.

Sphærocystites bloomfieldensis Schuchert, Smiths. Misc. Coll., 47, pt. 2, 1904, p. 251.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 471.  
Helderbergian (Keyser): Clark's Mill, near Bloomfield, Pennsylvania.  
*Cotypes*.—Cat. No. 35059, U.S.N.M.

SPHÆROCYSTITES DOLOMITICUS Jaekel. See *Cœlocystis subglobosus*.

**Sphærocystites globularis** Schuchert.

Sphærocystites globularis Schuchert, Amer. Geol., 32, 1903, p. 233; Smiths. Misc. Coll., 47, 1904, p. 252, pl. 38, figs. 3-5; pl. 39, figs. 5, 6; text figs. 40, 41; Maryland Geol. Surv., Low. Dev., 1913, p. 247, pl. 36, fig. 1.  
Helderbergian (Keyser): Keyser, West Virginia; Devils Backbone, Maryland.  
*Holotype*.—Cat. No. 35053, U.S.N.M.

**Sphærocystites globularis ovalis** Schuchert.

Sphærocystites globularis ovalis Schuchert, Smiths. Misc. Coll., 47, 1904, p. 253, pl. 38, fig. 6; Maryland Geol. Surv., Low. Dev., 1913, p. 248, pl. 36, fig. 2.  
Helderbergian (Keyser): Keyser, West Virginia.  
*Holotype*.—Cat. No. 35054, U.S.N.M.

**Sphærocystites multifasciatus** Hall.

Sphærocystites multifasciatus Hall, Pal. New York, 3, 1859, p. 130, pl. 7a, figs. 1-4.—Jaekel, Stammesgeschichte der Pelmatozoen, 1, 1899, p. 289.—Schuchert, Amer. Geol., 32, 1903, p. 233; Smiths. Misc. Coll., 47, pt. 2, 1904, p. 250, figs. 38, 39, pl. 38, figs. 1, 2; pl. 39, figs. 1-4.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 470, fig. 1781.—Schuchert, Maryland Geol. Surv., Low. Dev., 1913, p. 245, pl. 34, figs. 11, 12; pl. 35, figs. 1-4.  
Sphærocystis multifuscatus Haeckel, Beitr. Morph. u. Phyl. d. Echinodermen, 1896, p. 133.  
Helderbergian (Keyser): Cumberland, Maryland; Keyser, West Virginia.  
*Plesiotypes*.—Cat. Nos. 35052, 35058, U.S.N.M.

SPHÆRODICTYA Hall and Clarke. See *Teganium* Rauff.

SPHÆROLITHES NICHOLSONI Hinde. See *Hindia sphaeroidalis*.

SPHÆRONIS Angelin. See *Holocystites* Hall.

SPHÆRONITES AURANTIUM Hisinger. See *Echinosphærites aurantium*.

**SPHÆROPTHALMUS** Angelin.

Genotype: *S. flagellifer* Angelin.

Sphærophthalmus Angelin, Pal. Scandinavica, 3d ed., Holmiæ (1854), 1878, p. 49.—Salter, Cat. Camb. Sil. Foss., 1873, p. 11.—Brøgger, Die Sil. Etagen 2-3, Kristiania, 1882, p. 113.—Zittel, Handb. Pal., 2, 1885, p. 596.—Koken, Die Leitfossilien, Leipzig, 1896, p. 20, fig. 11, fig. 13.—Lindstrom, Kongl. Sven. Vet.-Acad. Handl., 34, No. 8, 1901, pp. 27, 29.—Lake, Paleontographical Soc., 1913, p. 73.

**Sphærophthalmus alatus** (Boeck).

*Trilobites alatus* Boeck, Keilhan's Gæa Norv., 1838, p. 143.

Sphærophthalmus alatus Angelin, Pal. Scandinavica, 3d ed., Holmiæ, 1878, p. 49, pl. 26, fig. 9.—Linnarsson, Afh. Sveriges Geol. Unders., ser. C, No. 43, 1880, p. 7, pl. 1, figs. 6-10.—Pompeckj, Beit. Phys.-Oekon. Gesell., Königsberg, 1890, p. 89, pl. 4, figs. 27, 27a.—Koken, Die Leitfossilien, Leipzig, 1896, p. 18, fig. 11, fig. 13.—Frech, Leth. geog., 1, Leth. Pal., 2, 1 Lief, 1897, pl. 1b, fig. 20a, b.—Lindström, Kongl. Sven. Vet.-Akad. Handl., 34, No. 8, 1901.

**Sphaerophthalmus alatus**—Continued.

p. 29, pl. 3, figs. 31-34.—Matthew, Geol. Surv. Canada, Rep. Camb. Rocks Cape Breton, 1903, p. 228.—Lake, Paleontographical Soc., 1913, p. 74 (see for complete bibliography).

*Leptoplastus* (*Sphaerophthalmus*) *alatus* Brögger, Die Sil. Etagen 2-3, Kristiania, 1882, p. 119, pl. 2, fig. 14.

Lower Ordovician: Scandinavia; St. John County, New Brunswick; McNeil Brook, Cape Breton, Nova Scotia (Bretonian—Div. C3b).

**Sphaerophthalmus alatus canadensis** Matthew.

*Sphaerophthalmus alatus* var. *canadensis* Matthew, Trans. Royal Soc. Canada, 11, sec. 4, 1904, p. 107, pl. 17, figs. 11a, b, 12.

Canadian (Bretonian—Div. C3b): St. John, New Brunswick.

**Sphaerophthalmus flagellifer** Angelin.

*Sphaerophthalmus flagellifer* Angelin, Pal. Scandinavia, 1854, p. 49, pl. 26, fig. 7.—Linnarsson, Afh. Sveriges Geol. Unders., ser. C, No. 43, 1880, p. 12, pl. 1, figs. 13-17.

*Leptoplastus* (*Ctenopyge*) *flagellifera* Brögger, Die Sil. Etagen 2-3, Kristiania, 1882, p. 120, pl. 2, fig. 15a, b, 16, 17 (cites bibliography).

*Ctenopyge flagellifer* Matthew, Trans. Royal Soc. Canada, 9, sec. 4, 1892, p. 56, pl. 13, figs. 12a, b.—Frech, Leth. geog., 1, Leth. Pal., 2, 1 Lief, 1897, pl. 1b, fig. 21.

Lower Ordovician: Scandinavia; St. John, New Brunswick (Bretonian—Div. C3b).

**Sphaerophthalmus fletcheri** Matthew.

*Sphaerophthalmus Fletcheri* Matthew, Bull. Nat. Hist. Soc. New Brunswick, No. 19, 1901, p. 280, pl. 5, figs. 7a-f; Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, p. 227, pl. 17, figs. 7a-f.

Canadian (Bretonian—Div. C3b): McAdam shore, East Bay, east of Bras d'Or Lake, Cape Breton, New Brunswick.

**SPHENOLIUM** Miller.

Genotype: *Orthodesma cuneiforme* Miller.

*Sphenolium* Miller, N. A. Geol. Pal., 1889, p. 513.—Ulrich, Geol. Minnesota, 3, pt. 2, p. 623.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 984.

**Sphenolium cuneiforme** (Miller).

*Orthodesma cuneiforme* Miller, Jour. Cincinnati Soc. Nat. Hist., 3, 1881, p. 314, pl. 8, figs. 1, 1a.

*Sphenolium cuneiforme* Miller and Faber, *ibid.*, 17, 1894, p. 141, pl. 8, figs. 5, 6.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 785, fig. 1455.

Richmond: Versailles, Indiana.

**Sphenolium faberi** Miller.

*Sphenolium faberi* Miller, N. A. Geol. Pal., 1889, p. 513, fig. 924.

Maysville: Cincinnati, Ohio.

**Sphenolium parallelum** Ulrich.

*Sphenolium parallelum* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 624, pl. 36, figs. 42, 43.

Black River (Platteville): Mineral Point, Wisconsin.

**Sphenolium richmondense** Miller.

*Sphenolium richmondense* Miller, N. A. Geol. Pal., 1889, p. 513, figs. 925, 926.—Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 17, 1894, p. 142.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1021, pl. 48, fig. 5.

Richmond (Whitewater): Richmond, Indiana.

**Sphenollum striatum** Ulrich.

*Sphenolium striatum* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 624, pl. 36, figs. 44, 45.

Trenton (Prosser): Goodhue County, Minnesota.

*Holotype*.—Cat. No. 46311, U.S.N.M.

**SPHENOPHYCUS** Ruedemann.

Genotype: *Sphenothallus latifolius* Hall.

*Sphenothallus* (part) Hall and other authors.

*Sphenophycus* Ruedemann, Bull. New York State Mus., 162, 1912, p. 73.

**Sphenophycus latifolius** (Hall).

*Sphenothallus latifolius* Hall, Pal. New York, 1, 1847, p. 262, pl. 68, figs. 2a-f.

*Sphenophycus latifolius* Ruedemann, Bull. New York State Mus., 162, 1912, p. 73, pl. 1, figs. 1-10; pl. 2, figs. 1-14.

Trenton (Schenectady): Near Schenectady, New York.

**SPHENOPHYLLUM** Koenig.

Genotype: *Sphenophyllites emarginatum* Koenig.

*Sphenophyllum* Koenig, Icon. Foss. Sect. London, 1825, pl. 12, fig. 149.—Brongniart, Prodr. d. Hist. Veg. Foss., 1828, p. 68.

**Sphenophyllum primævum** Lesquereux.

*Sphenophyllum primævum* Lesquereux, Proc. Amer. Phil. Soc., 17, 1877, p. 167, pl. 1, figs. 3-5.—Miller, Proc. Davenport Acad. Sci., 2, 1878, p. 206.—Lesley,

Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 980, figs.

Eden and Maysville: Cincinnati, Ohio, and vicinity.

**SPHENOTHALLUS** Hall.

Genotype: *S. angustifolius* Hall.

*Sphenothallus* Hall, Pal. New York, 1, 1847, p. 261.—Roemer, Loth. geog., 1,

Theil, Leth. Pal., Erste Lief, 1880, p. 126.—Miller, N. A. Geol. Pal., 1889,

p. 143.—Nathorst, Geol. Foren. Stockholm Forhandl., 18, 1896, p. 228.—

Ruedemann, Bull. New York State Mus., 162, 1912, p. 73.

**Sphenothallus angustifolius** Hall.

*Sphenothallus angustifolius* Hall, Pal. New York, 1, 1847, p. 261, pl. 68, fig. 1.—

Ruedemann, 15th Rep. State Geol. New York for 1895, 1898, p. 705, pl. 4,

fig. 40; 49th Rep. New York State Mus., 2, 1898, p. 705, pl. 4, fig. 40.—Miller,

N. A. Geol. Pal., 1889, p. 144, fig. 75.—Ruedemann, Bull. New York State

Mus., 162, 1912, p. 73.

*Sphenothallus* cf. *angustifolius* Nathorst, Geol. Foren. Forhandl., 6, 1883, p. 315, pl. 15; *ibid.*, 18, 1896, p. 228.

Trenton (Canajoharie): Between Canajoharie and Schoharie, New York.

**SPHENOTHALLUS LATIFOLIUS** Hall. See *Sphenophycus latifolius*.

**SPHYRADOCERAS** Hyatt. See *Trochoceras* Barrande.

**SPIRIFER** Sowerby.

Genotype: *Anomites striatus* Martin.

*Spirifer* Sowerby, Min. Conch., 2, 1815, p. 41.—Billings, Canadian Nat. Geol., 1,

1856, p. 134.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 31.—Meek and Hayden,

Pal. Upper Missouri, Smiths. Contr. Knowl., 14, 172, 1864, p. 17.—Zittel,

Handb. Pal., 1, 1880, p. 682.—Waagen, Mem. Geol. Surv. India, Pal. Indica,

13th Ser., 1, 1883, p. 507.—Hall and Clarke, Nat. Hist. New York, 8, pt. 2,

1893, pp. 1-40; 13th Rep. New York State Geol., 1895, p. 751.—Koken, Die

Leitfossilien, Leipzig, 1896, p. 243, figs. 205, 1.—Grabau, Bull. Buffalo Soc.

Nat. Sci., 6, 1899, p. 207.—Girty, 20th Ann. Rep. U. S. Geol. Surv., 1900,

pp. 50-55.—Beede, Univ. Geol. Surv. Kansas, 6, 1900, p. 98.—Schellwien,

Abhandl. d. k. k. geol. Reichsanst., 16, Heft 1, 1900, p. 69.—Grabau, Bull.

**SPIRIFER**—Continued.

Buffalo Soc. Nat. Sci., 7, 1901, p. 197; Bull. New York State Mus., 45, 1901, p. 197.—Frech, Leth. geog., 1, Theil, Leth. Pal., 2, 4th Lief, 1902, p. 588.—Loomis, Bull. New York State Mus., 69, 1903, p. 900.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 315.—Schuchert, Zittel-Eastman Textb. Pal. 1900, p. 335; 2d ed., 1913, p. 410.

*Spirifera* Billings, Canadian Jour., 6, 1861, p. 253.—Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, p. 251; Nat. Hist. New York, 4, 1867, p. 186.—White, Wheeler's Expl. and Surv. west of the 100th Merid., 1875, p. 90.—Herrick, Bull. Sci. Lab. Denison Univ., 4, 1888, p. 14.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 105.—Miller, N. A. Geol. Pal., 1889, p. 371.—Hall, Bull. Geol. Soc. Amer., 1, 1890, p. 567; 9th Ann. Rep. New York State Geol., 1890, p. 9.

*Delthyris* Dalman, Kongl. Svenska Vet.-Akad. Handl. for 1827, 1828, pp. 93, 99.—Hall, Pal. New York, 2, 1852, p. 65, footnote.—Dall, Amer. Jour. Conch., 6, 1870, p. 116.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, pp. 9, 16, under caption *Septati* (not p. 19).—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 411. (Genotype: *Delthyris elevata* Dalman.)

*Spirifera* "lamellosa" Hall, 9th Ann. Rep. New York State Geol., 1890, p. 11 (= *Delthyris*).

*Eospirifer* Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 411. (Genotype: *Spirifer radiata* Sowerby.)

**Spirifer (Eospirifer) asperatus** (Ringueberg).

*Spirifera asperata* Ringueberg, Bull. Buffalo Soc. Nat. Sci., 5, 1886, p. 16, pl. 2, fig. 5.

Clinton (Rochester): Lockport, New York.

**SPIRIFER BICOSTATUS** Hall. See *Reticularia bicostata*.

**SPIRIFERA BICOSTATUS?** var. *PETILA* Hall. See *Reticularia bicostata petila*.

**SPIRIFER BIFORATA** var. *LYNX* Hall. See *Platystrophia biforata*.

**SPIRIFER BILOBUS** Hall. See *Bilobites bilobus*.

**Spirifer (Delthyris) corallinensis** (Grabau).

*Spirifer crispus* Hall (not Hisinger), Pal. New York, 2, 1852, p. 328, pl. 74, figs. 9a-h.

*Spirifer crispus corallinensis* Grabau, Bull. Geol. Soc. Amer., 11, 1900, p. 352; Bull. New York State Mus., 45, 1901, p. 199.

*Spirifer modestus corallinensis* Schuchert, Amer. Geol., 31, 1903, p. 166.

*Spirifer corallinensis* Grabau, Bull. New York State Mus., 69, 1903, p. 1042, fig. 6.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 320, fig. 405.—Grabau, Bull. New York State Mus., 92, 1906, p. 109, fig. 10.—Foerste, Cincinnati Soc. Nat. Hist., Jour., 21, 1909, p. 18.

Cayuga: Schoharie County, New York (Cobleskill and Rondout); Kokomo, Indiana (Kokomo).

Helderbergian (Decker-Keyser): Becraft Mountain, near Hudson, New York.

**Spirifer (Delthyris) crispatus** (Hall and Clarke).

*Spirifer crispatus* Hall and Clarke, Pal. New York, 8, pt. 2, 1895, p. 360, pl. 36, figs. 9, 10; 48th Rep. New York State Mus., 2, for 1895, 1897, p. 355, pl. 7, figs. 12, 13; 14th Rep. State Geol. New York, 1897, p. 355, pl. 7, figs. 12, 13.

"Niagara group, Maryland."



**Spirifer (Delthyris) crispus** (Hisinger).

*Terebratula crisa* Hisinger, Svenska Vet.-Akad. Handl., 1826, tab. 7, fig. 4.

*Spirifer crispus* Hall, Amer. Jour. Sci., 20, 1849, p. 228.—Davidson, Bull. Soc. Geol. France, 2d ser., 5, 1848, p. 325, pl. 3, fig. 42; Pal. New York, 2, 1852, p. 262, pl. 54, fig. 3; p. 328, pl. 74, fig. 9.—Salter, Sutherland's Jour. Voyage in Baffin's Bay, etc., 2, App., 1852, p. 225, pl. 5, fig. 8.—Marcou, Geol. Map United States and British Prov., etc., 1853, p. 27, pl. 2, fig. 5.—Beecher and Clarke, Mem. New York State Mus., 1, 1889, p. 75, pl. 6, figs. 6, 7.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, pp. 19, 20, 36, pl. 36, figs. 1-6.—Grabau, Bull. New York State Mus., 45, 1901, p. 199, fig. 118; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 199, fig. 118.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 42, pl. 4, figs. 10-20; Bull. New York State Mus., 69, 1903, p. 1046.—Raymond, Ann. Carnegie Mus., 3, 1904, p. 146, figs. 49, 50.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 253, pl. 27, fig. 1.

*Spirifera crisa* Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 94.—Davidson, Mon. British Sil. Brach., Pal. Soc., 1867, p. 97, pl. 10, figs. 13-15.—Hall, 28th Rep. New York State Mus. Nat. Hist., 1879, p. 157, pl. 24, figs. 6-12, 19; 11th Rep. State Geol. Indiana, 1882, p. 295, pl. 24, figs. 6-12, 19; 2d Ann. Rep. New York State Geol., 1883, pl. 61, figs. 1-6.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1003, figs.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 62.

*Delthyris crisa* Dalman, Kongl. Vet.-Akad. Handl. for 1827, 1828, p. 122, pl. 3, fig. 6.

*Delthyris staminea* Hall, Geol. New York, Rep. 4th Dist., 1843, p. 105, fig. 3.—Owen, Amer. Jour. Sci. Arts, 48, 1845, p. 313, figs. 3, 3b.

*Spirifer staminea* Emmons, Man. Geol., 1860, p. 109, fig. 99.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 1030, figs.

Middle Silurian: Europe and America; Niagaran of New York, Ontario, Nova Scotia, Arctic America, Indiana, Kentucky, and Tennessee.

**SPIRIFER CRISPUS CORALLINENSIS** Grabau. See *Spirifer (Delthyris) corallinensis*.

**Spirifer (Delthyris) crispus simplex** (Hall).

*Spirifera crisa* var. Hall, Trans. Albany Inst., 4, 1863, p. 212.

*Spirifera crisa* var. simplex Hall, 28th Rep. New York State Mus. Nat. Hist., 1879, p. 157, pl. 24, figs. 1-5; 11th Rep. State Geol. Indiana, 1882, p. 296, pl. 24, figs. 1-5.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 111, pl. 17, figs. 36, 37.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1004, figs.

*Spirifer crispus* var. simplex Beecher and Clarke, Mem. New York State Mus., 1, 1889, p. 75, pl. 6, figs. 4, 5.

*Spirifer (Reticularia) crispus* var. simplex Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 442, pl. 8, figs. 26-28.

Niagaran: Waldron and St. Paul, Indiana; Newsom, Tennessee (Waldron and Laurel); Louisville, Kentucky (Louisville); Hamilton County, Indiana.

*Plesiotype*.—Cat. No. 51333, U.S.N.M. (Nettelroth).

**SPIRIFER DECEMPLOCATUS** Emmons. See *Spirifer (Delthyris) sulcata*.

**SPIRIFER DUBIUS** Nettelroth. See *Reticularia dubia*.

**Spirifer (Delthyris) oriensis** (Grabau).

*Spirifer oriensis* Grabau, Bull. Geol. Soc. Amer., 11, 1900, p. 366, pl. 21, figs. 2 a-b; Bull. New York State Mus., 45, 1901, p. 199, fig. 119; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 199, fig. 119.—Schuchert, Amer. Geol., 31, 1903, p. 166.—Grabau, Bull. New York State Mus., 69, 1903, p. 1043, fig. 7; *ibid.*, 92, 1906,

**Spirifer (*Delthyris*) *eriensis***—Continued.

p. 109, fig. 11.—Grabau and Shimer, *N. A. Index Fossils*, 1, 1907, p. 320, fig. 404.—Grabau, *Michigan Geol. Surv., Geol. Ser.*, 1, 1906, p. 133, pl. 31, figs. 2 a, b.—Maynard, *Maryland Geol. Surv., Low. Dev.*, 1913, p. 404, pl. 69, fig. 7.

Cayugan (Cobleskill and Rondout): Williamsville, North Buffalo, etc., New York.

Helderbergian (Keyser): Cash Valley, Maryland; New York; New Jersey.

**Spirifer (*Eospirifer*) *eudora*** (Hall).

*Spirifera eudora* Hall, *Ann. Rep. Geol. Surv. Wisconsin*, 1861, p. 25; *Geol. Rep. Wisconsin*, 1, 1863, p. 69, pl. 5; p. 436; *Trans. Albany Inst.*, 4, 1863, p. 211; 20th Rep. New York State Cab. Nat. Hist., 1867, p. 370, pl. 13, figs. 5, 7; *ibid.*, 28th Rep., 1879, p. 156, pl. 24, figs. 13–18; 11th Rep. State Geol. Indiana, 1882, p. 294, pl. 24, figs. 13–18; 2d Ann. Rep. New York State Geol. 1883, pl. 51, figs. 19–21, 29.—Lesley, *Geol. Surv. Pennsylvania*, Rep. P 4, 1890, p. 1010, figs.

*Spirifer eudora* Hall and Clarke, *Pal. New York*, 8, pt. 2, 1893, pp. 13, 35, pl. 21, figs. 19–21, 29.—Grabau and Shimer, *N. A. Index Fossils*, 1, 1907, p. 318, fig. 399.—Foerste, *Cincinnati Soc. Nat. Hist. Jour.*, 21, 1909, p. 16, pl. 2, fig. 14 A, B.

Niagaran: Racine, Wisconsin (Racine); Waldron, Indiana; Newsom, Tennessee (Waldron); Louisville, Kentucky (Louisville); West Union, Ohio (West Union); Osgood, Indiana (Osgood).

**Spirifer (*Delthyris*) *exiguus*** (Foerste).

*Spirifer exiguus* Foerste, *Cincinnati Soc. Nat. Hist. Jour.*, 21, 1909, p. 17, pl. 1, figs. 8 A, B, C.

Cayugan (Kokomo): Kokomo, Indiana.

**Spirifer (*Eospirifer*) *foggi*** (Nettelroth).

*Spirifera foggi* Nettelroth, *Kentucky Fossil Shells*, *Mem. Kentucky Geol. Surv.*, 1889, p. 117, pl. 32, figs. 28–31.

*Spirifer foggi* Foerste, *Jour. Geol.*, 11, 1903, p. 710 (loc. occ.).—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 441, pl. 8, figs. 24, 25.

Niagaran: Louisville, Kentucky (Louisville); Pegram, etc., Tennessee (Brownport); Georgetown, Indiana.

*Holotype*.—Cat. No. 51317, U.S.N.M.

**Spirifer (*Eospirifer*?) *geronticus*** (Foerste).

*Spirifer geronticus* Foerste, *Jour. Geol.*, 11, 1903, p. 710, *Bull. Sci. Lab. Denison Univ.*, 14, 1909, p. 92, pl. 2, figs. 30 A, B.

Niagaran (Brownport): Dixon Spring, Pegram, Clifton, etc., Tennessee.

**Spirifer (*Eospirifer*) *gibbosus*** (Hall).

*Spirifer gibbosus* Hall, *Ann. Rep. Geol. Surv. Wisconsin*, 1861, p. 25.

*Spirifera gibbosa* Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, p. 370, pl. 13, figs. 6, 8.

Niagaran (Racine): Racine, Wisconsin.

**Spirifer (*Eospirifer*) *harinensis*** (Foerste).

*Spirifer harinensis* Foerste, *Cincinnati Soc. Nat. Hist. Jour.*, 21, 1909, p. 16, pl. 2, figs. 2 A, B.

Clinton (West Union): Harin Hill, Lewis County, Kentucky.

*SPIRIFER INÆQUIVALVIS* Castelnau. See *Rhynchotrema inæquivalve*.

*SPIRIFER INCONSTANS* Hall. See *Spirifer (Eospirifer) nobilis*.

*Spirifer liratus* Sowerby. See *Stricklandinia lirata*.

*Spirifer macropleurus* Safford. See *Spirifer (Eospirifer) niagarensis oligoptychus*.

***Spirifer (Delthyris) modestus* (Hall).**

*Spirifer modestus* Hall, 10th Rep. New York State Cab. Nat. Hist., 1857, p. 61; Pal. New York, 3, 1859, p. 2, 3, pl. 28, figs. 1 a-e.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 37, pl. 38, figs. 1, 3.—Grabau, Michigan Geol. Surv. Geol. Ser., 1, 1909, p. 137, pl. 16, figs. 11, 12, 24, 25.—Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 399, pl. 68, figs. 17-22.

*Reticularia modestus* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 343.

Helderbergian (Keyser): Cumberland, Pinto, Cash Valley, Tonoloway, etc., Maryland; Hyndman, Pennsylvania; Keyser, West Virginia.

Upper Monroan (Lucas): Salt shaft, Detroit, Michigan.

*Spirifer modestus corallinensis* Schuchert. See *Spirifer (Delthyris) corallinensis*.

***Spirifer (Delthyris) modestus plicatus* (Maynard).**

*Spirifer modestus* var. *plicatus* Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 400, pl. 68, figs. 23, 24.

Helderbergian (Keyser): Keyser, West Virginia.

***Spirifer (Delthyris) modestus striatissimus* Hortedahl.**

*Spirifer modestus striatissimus* Hortedahl, 2d Arct. Exp. "Fram," 1898-1902, No. 32, 1914, p. 26, pl. 8, fig. 2.

Helderbergian (Lower beds): Southwestern Ellesmerland, Arctic America.

***Spirifer (Delthyris) nanus* (Foerste).**

*Spirifer nanus* Foerste, Cincinnati Soc. Nat. Hist. Jour., 21, 1909, p. 15, pl. 1, fig. 7; pl. 2, fig. 7.

Clinton (West Union): Big Salt Lick Creek, Lewis County, Kentucky; West Union, Adams County, Ohio.

***Spirifer (Eospirifer) niagarensis* (Conrad).**

*Delthyris niagarensis* Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1842, p. 261.—Hall, Geol. New York, Rep. 4th Dist., 1843, p. 105, fig. 1.—Owen, Amer. Jour. Sci. Arts, 48, 1845, p. 313, fig. 1.

*Spirifer niagarensis* Hall, Pal. New York, 2, 1852, p. 264, pl. 54, fig. 5.—Emmons, Man. Geol., 1860, p. 109, fig. 99.—Chapman, Canadian Jour., n. s., 7, 1862, p. 113, fig. 98; *ibid.*, 8, 1863, p. 212, fig. 219; Expos. Min. Geol. Canada, 1864, p. 116, fig. 98; p. 184, fig. 219.—Safford, Geol. Tennessee, 1869, p. 315, fig. 1, 2.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1024, figs.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, pp. 14-35, pl. 21, figs. 1-4, 25; pl. 37, fig. 1.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 198, fig. 117; Bull. New York State Mus., 45, 1901, p. 298, fig. 117.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 319, fig. 400.

*Spirifera niagarensis* Billings, Canadian Nat. Geol., 1, 1856, p. 137, pl. 2, fig. 8; Geol. Canada, 1863, p. 317, fig. 329.—Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 51, figs. 1-4, 25.

Clinton: Lockport, Rochester, etc., New York; Ontario (Rochester); Osgood, Indiana (Osgood).

***Spirifer (Eospirifer) niagarensis oligoptychus* (Roemer).**

*Spirifera niagarensis* var. *oligoptychus* Roemer, Sil. Fauna West. Tennessee, 1860, p. 68, pl. 5, fig. 8.

**Spirifer (Eospirifer) niagarensis oligoptychus**—Continued.

*Spirifer macropleurus* Safford, Geol. Tennessee, 1869, p. 321.

*Spirifer oligoptychus* Foerste, Jour. Geol., 11, 1903, p. 710.

Niagaran (Brownsport): Decatur County, Tennessee.

**Spirifer (Eospirifer) nobilis** (Barrande).

*Spirifer nobilis* Barrande, Ueber die Brach. der Sil. Schicht von Böhmen, 1847.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, pp. 14, 35, pl. 29, fig. 16; pl. 37, figs. 2, 3.—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 441, pl. 9, figs.

*Spirifer racinensis* McChesney, New Pal. Fossils, 1861, p. 84; Plates, 1865, pl. 8, figs. 3-3b.

*Spirifer inconstans* Hall, Ann. Rep. Geol. Surv. Wisconsin, 1861, p. 26; Geol. Rep. Wisconsin, 1, 1862, p. 69, fig. 6; p. 436.

*Spirifera nobilis* Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, p. 372, pl. 13, figs. 14-16.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 192, fig.

*Spirifera racinensis* McChesney, New Pal. Fossils, 1868, p. 84.

Niagaran: Racine, Wisconsin; Chicago, Illinois (Racine); Pendleton, Georgetown, etc., Indiana.

**Spirifer (Delthyris) octocostatus** (Hall).

*Spirifer octocostatus* Hall, 10th Ann. Rep. New York State Cab. Nat. Hist., 1857, p. 62; Pal. New York, 3, 1859, p. 205, pl. 28, figs. 4a-e.—Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 401, pl. 68, figs. 25-29.

Helderbergian (Keyser): Devil's Backbone, Cash Valley, Cumberland, etc., Maryland; Hyndman, Pennsylvania; Keyser, West Virginia.

**Spirifer (Delthyris) ohioensis** (Grabau).

*Spirifer vanuxemi* Whitfield (not Hall), Ann. New York Acad. Sci., 5, 1891, p. 509, pl. 5, figs. 4, 5; Geol. Ohio, 7, 1893, p. 141, pl. 1, figs. 4, 5.

*Spirifer ohioensis* Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 134, pl. 18, figs. 1-3; pl. 29, figs. 4, 5.

Lower Monroan (Put-in-Bay): Put-in-Bay Island, Lake Erie.

*SPIRIFER OLIGOPTYCHUS* Foerste. See *Spirifer (Eospirifer) niagarensis oligoptychus*.

*SPIRIFER PETILUS* Grabau. See *Reticularia bicostata petila*.

*SPIRIFER Plicatella* var. *RADIATA* Sowerby. See *Spirifer (Eospirifer) radiatus*.

*SPIRIFER PYRAMIDALIS* Hall. See *Cyrtina pyramidalis*.

*SPIRIFER RACINENSIS* McChesney. See *Spirifer (Eospirifer) nobilis*.

**Spirifer (Eospirifer) radiatus** (Sowerby).

*Spirifer plicatella* var. *radiata* Sowerby, Min. Conch., 5, 1825, p. 493, figs. 1, 2.

*Delthyris bialveata* Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1842, p. 261, pl. 14, fig. 17.

*Delthyris radiata* Hall, Geol. New York, Rep. 4th Dist., 1843, p. 105, fig. 2.—Owen, Amer. Jour. Sci., 48, 1845, p. 313, figs. 2, 2b.

*Spirifer radiata* Hall, Pal. New York, 2, 1852; pp. 66, 265, pl. 22, figs. 2d-25 (not 2a-2c=Crytia meta); pl. 54, fig. 6.

*Spirifera radiata* Billings, Canadian Nat. Geol., 1, 1856, p. 135, pl. 2, figs. 2, 3; Geol. Canada, 1863, p. 317, fig. 328.—Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 94.—Hall and Whitfield, 27th Rep. New York State Cab. Nat. Hist., 1875, pl. 9, figs. 17, 18.—Hall, 28th Rep., *ibid.*, 1879, p. 157, pl. 24, figs. 20-30.—White, 2d Ann. Rep. Indiana Bu. of Stat. Geol., 1880, p. 497, pl. 3, figs. 5, 6; 10th Rep. State Geol. Indiana, 1881, p. 129, pl. 3, figs.

**Spirifer (Eospirifer) radiatus**—Continued.

5, 6.—Hall, 11th Rep., *ibid.*, 1882, p. 296, pl. 24, figs. 20–30.—Whitfield, *Geol. Wisconsin*, 4, 1882, p. 287, pl. 17, figs. 1, 2.—Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 51, figs. 9–13, 26 (?14–17).—Nettelroth, *Kentucky Fossil Shells*, Mem. Kentucky Geol. Surv., 1889, p. 130, pl. 29, figs. 13–16.—Foerste, *Proc. Boston Soc. Nat. Hist.*, 24, 1890, p. 313, pl. 5, fig. 6.—Lesley, *Geol. Surv. Pennsylvania*, Rep. P 4, 1890, p. 1028, figs.

*Spirifer tenuistriatus* Shaler (not Hall), *Bull. Mus. Com. Zool.*, 4, 1865, p. 70.

*Spirifera plicatella* Billings, *Cat. Sil. Fossils of Anticosti*, 1866, p. 48.

*Spirifera plicatella* var. *radiata* Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, p. 371, pl. 13, figs. 9–11.

*Spirifer radiatus* Emmons, *Man. Geol.*, 1860, p. 109, fig. 99.—Chapman, *Canadian Jour.*, n. s., 8, 1863, p. 212, fig. 220; *Expos. Min. Geol. Canada*, 1864, p. 116; p. 184, fig. 220.—Beecher and Clarke, *Mem. New York State Mus.*, 1, 1889, p. 77, pl. 6, figs. 9–11.—Hall and Clarke, *Pal. New York*, 8, pt. 2, 1893, pp. 13, 35, pl. 21, figs. 5, 9–13, 26 (14–18).—Grabau, *Bull. New York State Mus.*, 45, 1901, p. 198, fig. 116; *Bull. Buffalo Soc. Nat. Sci.*, 7, 1901, p. 198, fig. 116.—Kindle and Breger, 28th Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 442, pl. 8, figs. 19–23.—Grabau and Shimer, *N. A. Index Fossils*, 1, 1907, p. 318, figs. 397, 398.—Foerste, *Cincinnati Soc. Nat. Hist. Jour.*, 21, 1909, p. 14, pl. 2, fig. 8.

Middle Silurian: Europe; New York; Ontario; New Brunswick; Indiana; Kentucky; Tennessee; Wisconsin; etc. (Clinton and Niagaran).

*Plesiotype*.—*Cat. No. 53218*, U.S.N.M. (Nettelroth).

**Spirifer (Eospirifer) radiatus obsoletus** (Foerste).

*Spirifer radiatus-obsoletus* Foerste, *Cincinnati Soc. Nat. Hist.*, 21, 1909, p. 14, pl. 2, fig. 10.

Clinton (West Union): Big Salt Lick Creek, Lewis County, Kentucky.

**Spirifer (Eospirifer?) repertus** (Foerste).

*Spirifer repertus* Foerste, *Cincinnati Soc. Nat. Hist. Jour.*, 21, 1909, p. 16, pl. 1, figs. 14A, B; pl. 2, fig. 5.

Clinton (West Union): Harin Hill, Lewis County, Kentucky; West Union, Ohio.

**Spirifer (Eospirifer) rostellum** (Hall and Whitfield).

*Spirifera rostellum* Hall and Whitfield, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 182.—Hall, 27th Rep. *ibid.*, 1875, pl. 9, figs. 11–13.

*Spirifer rostellum* Nettelroth, *Kentucky Fossil Shells*, Mem. Kentucky Geol. Surv., 1889, p. 129, pl. 29, fig. 25; pl. 27, figs. 17–19.

*Spirifera* (Cyrta) *rostellum* Foerste, *Proc. Boston Soc. Nat. Hist.*, 24, 1890, p. 313, pl. 5, fig. 5.

Niagaran: Louisville, Kentucky (Louisville); Collinsville, Alabama.

*Plesiotypes*.—*Cat. No. 51318*, U.S.N.M. (Nettelroth).

**Spirifer (Delthyris?) rugicosta** (Hall).

*Spirifera rugicosta* Hall, *Canadian Nat. Geol.*, 5, 1860, p. 145.—Dawson, *Acadian Geol.*, 3d ed., 1878, p. 596.

*Delthyris*(?) *rugicosta* Schuchert, *Bull. U. S. Geol. Surv.*, 87, 1897, p. 208.

Silurian (Stonehouse): Arisaig, Nova Scotia.

**Spirifer (Delthyris) saffordi** (Hall).

*Spirifer saffordi* Hall, *Pal. New York*, 3, 1859, p. 203, pl. 28, fig. 2.—Foerste, *Jour. Geol.*, 11, 1903, p. 710.

Niagaran (Brownsport): Decatur County, Tennessee.

*SPIRIFER SHEPPARDI* Castelnau. See *Platystrophia acutilirata*.

**Spirifer? similior** (Winchell and Marcy).

*Spirifera* (Martinia) *similior* Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 93.

*Pentamerus similior* Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 397. Niagaran (Racine): Bridgeport, Illinois.

**SPIRIFER STAMINEA** Emmons. See *Spirifer* (*Delthyris*) *crispus*.

**Spirifer** (*Delthyris*) **subsulcatus** (Hall).

*Spirifer subsulcata* Hall (not Dalman, 1828), Canadian Nat. Geol., 5, 1860, p. 145.

*Spirifera subsulcata* Dawson, Acadian Geol., 3d ed., 1878, p. 597.—Miller, N. A. Geol. Pal., 1889, p. 376.

Silurian (Moydart, Stonehouse): Arisaig, Nova Scotia.

**Spirifer** (*Delthyris*) **sulcatus** (Hisinger).

*Delthyris sulcata* Hisinger, Petref. Suecica, 1837, p. 73, pl. 21, fig. 8.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 208.

*Spirifer sulcatus* Hall, Amer. Jour. Sci., 20, 1849, p. 228; Pal. New York, 2, 1852, p. 261, pl. 54, fig. 2.—Marcou, Geol. Map United States and British Prov., etc., 1853, p. 27, pl. 2, fig. 4.—Billings, Canadian Nat. Geol., 1, 1856, p. 137, pl. 2, fig. 7.—Safford, Geol. Tennessee, 1869, p. 315, figs. 3, 4.—Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 60, figs. 1-4.—Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pl. 35, figs. 1-4.

*Spirifer* (*Delthyris*) *sulcatus* Grabau, Bull. New York State Mus., 45, 1901, p. 200, fig. 120; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 200, fig. 120.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 319, fig. 401.

*Spirifera sulcata* Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 1031, fig.

*Delthyris rugatina* Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1842, p. 261.

*Delthyris decemplicatus* Hall, Geol. New York, Rep. 4th Dist., 1843, p. 105, fig. 4.—Owen, Amer. Jour. Sci. Arts, 48, 1845, p. 313, figs. 4, 4a.

*Spirifera decemplicatus* Emmons, Man. Geol., 1860, p. 109, fig. 99.

*Spirifera decemplicata* Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 1005, figs.

Middle Silurian: Europe; Lockport, Rochester, etc., New York; Hamilton, Ontario (Clinton).

**Spirifer** (*Delthyris*) **sulcatus submersus** (Grabau).

*Spirifer sulcata* mut. *submersa* Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 136, pl. 18, figs. 4-6.

Upper Monroan (Amherstburg): Detroit River, opposite Amherstburg, Ontario.

**Spirifer** (*Delthyris*) **swallowensis** (Foerste).

*Spirifer swallowensis* Foerste, Jour. Geol., 11, 1903, p. 708; Bull. Sci. Lab. Denison Univ., 14, p. 93, pl. 2, fig. 33.

Niagaran (Waldron): Swallow Bluff, Tennessee.

**SPIRIFER TENUISTRIATUS** Shaler. See *Spirifer* (*Eospirifer*) *radiatus*.

**SPIRIFER** (*CYRTIA*) **TRAPEZOIDALIS** Hall and Whitfield. See *Cyrtia exporrecta*.

**Spirifer** **trentonensis** Emmons.

*Spirifer trentonensis* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 235, pl. 15, fig. 20.

*Spirifera trentonensis* Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1031, fig.

Trenton: New York.

Observation.—Not recognizable without a restudy of the type specimen. If a Trenton species, probably a *Platystrophia*.

**Spirifer (Delthyris) vanuxemi** Hall.

- Orthis plicata* Vanuxem (not Sowerby), Geol. New York, Rep. 3d Dist., 1842, p. 112, fig. 1.—Mather, Nat. Hist. New York Geol., 1, 1843, p. 349, fig. 1.
- Orthis (Delthyris) plicatus* Hall, Geol. New York, 4th Dist., 1843, p. 142, fig. 1.
- Delthyris plicatus* Owen, Amer. Jour. Sci. Arts, 2d ser., 1, 1846, p. 47, fig. 1.
- Spirifer vanuxemi* Hall, Pal. New York, 3, 1859, p. 198, pl. 8, figs. 17-23; 2d Rep. New York State Geol., 1883, pl. 61, fig. 11.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, pp. 19, 36, pl. 36, fig. 11.—Whitfield, Geol. Ohio, 7, 1895, p. 411, pl. 1, figs. 4, 5.—Sherzer, Michigan Geol. Surv., 7, pt. 1, 1900, p. 223, pl. 17, figs. 4, 5.—Grabau, Bull. New York State Mus., 69, 1903, p. 1040, fig. 5.—Weller, Geol. Surv. New Jersey, Rep. Pal., 3, 1903, p. 262, pl. 24, figs. 9-12.—Shimer, Bull. New York State Mus., 80, 1905, p. 246.—Grabau, *ibid.*, 92, 1906, p. 114, fig. 24.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 320, fig. 403.—Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 403, pl. 68, figs. 32, 33.
- Spirifera vanuxemi* Whitfield, Ann. New York Acad. Sci., 5, 1891, p. 509, pl. 5, figs. 4, 5.—Lesley, Geol. Surv. Pennsylvania Rep., P 4, 1889, p. 1032, fig.
- Cayugan (Manlius): Albany and Schoharie County, New York; New Jersey; etc.
- Helderbergian (Keyser): Devil's Backbone, Cash Valley, etc., Maryland; Pennsylvania; etc.

*SPIRIFER VANUXEMI* Whitfield. See *Spirifer (Delthyris) ohioensis*.

**Spirifer (Delthyris) vanuxemi minor** (Weller).

- Spirifer vanuxemi* var. *minor* Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 238, pl. 21, figs. 41, 42.
- Helderbergian (Decker Ferry): Two miles south of Tristates, New York.

**Spirifer (Delthyris) vanuxemi prognosticus** (Schuchert).

- Spirifer vanuxemi* var. *prognosticus* Schuchert and Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 403, pl. 68, figs. 34 and 35; pl. 69, figs. 1-3.—Holtedahl, Second Arct. Exp. "Fram," 1898-1902, No. 32, 1914, p. 27, pl. 8, fig. 4.
- Helderbergian: Pinto, near Rawlings and Tonoloway, Maryland (Keyser); South-western Ellesmere land, Arctic America.

*SPIRIFER VENTRICOSA* Hall. See *Nucleospira ventricosa*.

*SPIRIFERA* of authors. See *Spirifer* Sowerby.

*SPIRIFERA DECEMPPLICATA* Lesley. See *Spirifer (Delthyris) sulcatus*.

*SPIRIFERA META* Hall. See *Cyrtia meta*.

*SPIRIFERA PlicateLLA* Billings. See *Spirifer (Eospirifer) radiatus*.

*SPIRIFERA PlicateLLA* var. *RADIATA* Hall. See *Spirifer (Eospirifer) radiatus*.

*SPIRIFERA(?) WALDRONENSIS* Miller and Dyer. See *Mimulus waldronensis*.

*SPIRIGERA* D'Orbigny. See *Athyris* McCoy.

*SPIROPHYTON* Kayser. See *Taonurus* Fisher.

*SPIROPHYTON ARCHIMEDES* Ringueberg. See *Dædalus archimedes*.

**SPIORBIS** Lamarck.

Genotype: *Serpula spirorbis* Linnæus.

- Spirorbis* Lamarck, An. sans Vert., 1801, p. 326.—Steininger, Mem. Soc. Geol. France, 1, 1834, p. 358.—McCoy, Syn. Char. Carb. Foss. Ireland, 1844, p. 169.—King, Mon. Permian Foss. England, Pal. Soc., 1850, p. 54.—Pictet, Traite de Pal., 2d ed., 2, 1854, p. 566.—McCoy, British Pal. Rocks Foss., 1854,

**SPIRORBIS**—Continued.

p. 131.—Chapman, Expos. Min. Geol. Canada, 1864, p. 132.—Nicholson, Rep. Pal. Proc. Ontario, pt. 1, 1874, p. 121.—Zittel, Handb. Pal., 1, 1879, p. 564.—Etheridge, Geol. Mag., dec. 2, 7, 1880, pp. 110, 171, 215.—Vine, Quart. Jour. Geol. Soc. London, 38, 1882, p. 378.—Waagen, Mem. Geol. Surv. India, Pal. Indica, 13th ser., 1, 1885, p. 814.—Miller, N. A. Geol. Pal., 1889, p. 521.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 148.—Hinde, Zittel-Eastman Textb. Pal., 1, 1900, p. 253; 2d ed., 1913, p. 138.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 235.

**Spirorbis cincinnatiensis** Miller and Dyer.

*Spirorbis cincinnatiensis* Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 38, pl. 1, fig. 13.—Hall, Pal. New York, 7, Sup., 1888, p. 17, pl. 115, figs. 1, 2.

Maysville: Cincinnati, Ohio, and vicinity.

Observation.—Probably based on young coiled specimens of *Cornulites*.

**Spirorbis? flexuosus** Hall.

*Spirorbis? flexuosus* Hall, Trans. Albany Inst., 4, 1863, p. 224.

Niagaran (Waldron): Waldron, Indiana.

Observation.—Probably a young coiled specimen of *Cornulites*.

**Spirorbis inornatus** Hall.

*Spirorbis inornatus* Hall, Trans. Albany Inst., 4, 1863, p. 224; 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875, pl. 31, figs. 14, 15; mus. ed., 1879, p. 181, pl. 31, figs. 14, 15; 11th Ann. Rep. Indiana Dept. Geol. Nat. Hist., 1882, p. 327, pl. 32, figs. 14, 15.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1040, figs.

Niagaran (Waldron): Waldron, Indiana; Newsom, Tennessee.

**Spirorbis laxus** Hall.

*Spirorbis laxus* Hall, Pal. New York, 3, 1859, p. 349, pl. 54, figs. 18a-18e.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 84, figs. 44a, b.—Sherzer, Geol. Surv. Michigan, 7, pt. 1, 1900, p. 225.—Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 201, pl. 15, fig. 12.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 235, fig. 1517.

Cayuga (Manlius): Schoharie, New York.

Lower Monroan (Raisin River): Monroe County, Michigan.

**Spirorbis? lovelandensis** James.

*Spirorbis? lovelandensis* James, Paleontologist, No. 1, 1878, p. 7.

Maysville: Loveland, Clermont County, Ohio.

Observation.—Probably based on young specimen of *Cornulites*.

**Spirula mortoni** Troost.

Not recognized.

*Spirula mortoni* Troost, 5th Geol. Rep. Tennessee, 1840, p. 51; *ibid.*, 6th Rep., 1841, p. 179.

Niagaran(?): Perry County, Tennessee.

**SPONGIA INCISO-LOBATA** Roemer. See *Carpomanon incisolobatum*.

**SPONGIA STELLATIM-SULCATA** Roemer. See *Carpomanon stellatimsulcatum*.

**SPYRO CERAS** Hyatt.

Genotype: *Orthoceras crotalum* Hall.

*Spyrocera* Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 276; Zittel-Eastman Textb. Pal., 1, 1900, p. 519; 2d ed., 1913, p. 600.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 63.



**Spyroceras anellus** (Conrad).

*Orthoceras anellus* Conrad, Proc. Acad. Nat. Sci. Philadelphia, 1, 1843, p. 334.—Hall, Pal. New York, 1, 1847, p. 202, pl. 43, figs. 6a-f.—Emmons, Amer. Geol., 1, pt. 2, 1855, p. 150.—Hitchcock, Geol. Vermont, 1, for 1861, 1862, p. 298, fig. 209.—Meek and Worthen, Geol. Surv. Illinois, 3, p. 318, pl. 3, fig. 3.—Whitfield, Geol. Wisconsin, 4, 1882, p. 226, pl. 7, fig. 13.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 8, 1886, p. 239.—Clarke, Geol. Minnesota, 2, 1897, p. 784, pl. 47, figs. 22, 23.—Whiteaves, Pal. Foss. Geol. Surv. Canada, 3, pt. 3, 1897, p. 213.

*Spyroceras cf. anellus* Ruedemann, Bull. New York State Mus., 49, 1901, p. 39.

*Spyroceras anellus* Whiteaves, Geol. Surv. Canada Pal. Foss., 3, pt. 4, 1906, p. 344 (gen. ref.).—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 63, fig. 1270.

Mohawkian: Mineral Point, Wisconsin; Minnesota; Iowa; Missouri; Canada (Black River); Middleville, New York (Trenton).

**Spyroceras balteatum** (Billings).

*Orthoceras balteatum* Billings, Geol. Surv. Canada, Rep. Progr. for 1853-1856, 1857, p. 318; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 22 (loc. ref.).

Richmond (English Head and Charleton): English Head, etc., Anticosti.

**Spyroceras beauportense** (Whiteaves).

*Orthoceras Beauportense* Whiteaves, Ottawa Nat., 12, 1908, p. 118.

*Spyroceras Beauportense* Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 323, pl. 33, figs. 2, 2a.

Trenton: Beauport, near Quebec, Canada.

**Spyroceras bilineatum** (Hall).

*Orthoceras bilineatum* Hall, Pal. New York, 1, 1847, p. 35, pl. 7, figs. 4, 4a; p. 200, pl. 43, figs. 2, 3.—Emmons, Amer. Geol., 1, pt. 2, 1855, p. 149.—Billings, Canadian Nat. Geol., 1, 1856, p. 316, fig. 4; Canadian Nat. Geol., 4, 1859, p. 462 (loc. occ.).—Chapman, Canadian Jour., n. s., 8, 1863, p. 20, fig. 128; p. 200, fig. 193; Expos. Min. Geol. Canada, 1864, p. 128, fig. 128; p. 172, fig. 193.—Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 786, pl. 47, figs. 20, 21; pl. 54, figs. 6, 7.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 169.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1033, pl. 51, figs. 2, 2b.

*Spyroceras bilineatum* Ruedemann, Bull. New York State Mus., 49, 1901, p. 39; Bull. New York State Mus., 90, 1906, p. 449.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 63, fig. 1269.

Black River and Trenton: Middleville, etc., New York; Canada; Minnesota; Kentucky; Tennessee; Missouri; etc.

**Spyroceras bilineatum frankfortense** Foerste.

*Orthoceras (Spyroceras) bilineatum-frankfortensis* Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 75, pl. 1, figs. 6a, b.

Trenton (Hermitage): South of Glenn Creek, near Frankfort, Kentucky.

**Spyroceras clintoni** (Miller).

*Orthoceras subarcuatum* Hall, Pal. New York, 1, 1847, p. 34, pl. 7, fig. 3 (lower part of drawing).—Billings, Canadian Nat. Geol., 4, 1859, p. 461.

*Orthoceras clintoni* Miller, Amer. Pal. Foss. (1st ed.), 1877, p. 244. (Proposed in place of *O. subarcuatum* preoccupied.)

*Spyroceras clintoni* Ruedemann, Bull. New York State Mus., 90, 1906, p. 445, pl. 14, fig. 4; pl. 16, figs. 4-7, text fig. 18.

Chazy (Day Point-Valcour): Chazy, Valcour Islands, etc., New York; Isle La Motte, Vermont.

**Spyroceras ferum** (Billings).

*Orthoceras ferum* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 22.

Richmond (English Head): Anticosti.

**Spyroceras jamesi** (Hall and Whitfield).

*Orthoceras Jamesi* Hall and Whitfield, Geol. Surv. Ohio Pal., 2, 1875, p. 118, pl. 5, fig. 13.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 551, fig.

*Orthoceras* (*Spyroceras*) *jamesi* Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 283, pl. 7, fig. 3; Geol. Surv. Ohio Pal., 7, 1893, p. 546, pl. 32, fig. 3.

Upper Medinan (Brassfield): Todds Fork, Clinton County, Ohio.

**Spyroceras maro** (Billings).

*Orthoceras Maro* Billings, Canadian Nat. Geol., 4, 1859, p. 461.

Chazyan (Mingan): Mingan Islands, Quebec.

**Spyroceras meridionale** Whiteaves.

*Spyroceras meridionale* Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 281, pl. 30, fig. 9.

Niagaran: Stonewall, Manitoba.

**Spyroceras subannulatum** (D'Orbigny).

*Cyrtoceras annulatum* Hall (not Goldfuss), Pal. New York, 1, 1847, p. 194, pl. 41, figs. 4a-d, 5.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 147.—Chapman, Canadian Jour., n. s., 8, 1863, p. 22, fig. 132; p. 198, fig. 174; Expos. Min. Geol. Canada, 1864, p. 130, fig. 132; p. 170, fig. 174.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 158, fig.

*Cyrtoceras subannulatum* D'Orbigny, Prodr. Pal., 1, 1849, p. 1.

*Spyroceras* (*Cyrtoceras*) *subannulatum* Ruedemann, Bull. New York State Mus., 49, 1901, p. 40.

Trenton: Middleville, etc., New York.

**SQUAMASTER** Ringueberg.

Genotype: *S. echinatus* Ringueberg.

*Squamaster* Ringueberg, Bull. Buffalo Soc. Nat. Sci., 5, 1886, p. 5.—Schuchert, Bull. U. S. Nat. Mus., 88, 1915, p. 249.

**Squamaster echinatus** Ringueberg.

*Squamaster echinatus* Ringueberg, Bull. Buffalo Soc. Nat. Sci., 5, 1886, p. 6, pl. 1, fig. 1.—Schuchert, Bull. U. S. Nat. Mus., 88, 1915, p. 249.

Clinton (Rochester): Lockport, New York; Grimsby, Ontario.

**STAUROCEPHALITES** Hinde.

Genotype: *S. niagarensis* Hinde.

*Staurocephalites* Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 383.—Miller, N. A. Geol. Pal., 1889, p. 521.

**Staurocephalites niagarensis** Hinde.

*Staurocephalites niagarensis* Hinde, Quart. Jour. Geol. Soc. London, 35, p. 383, pl. 20, 1879, fig. 1.

Niagaran? (Cataract?): Toronto, Ontario.

**STAUROCEPHALUS** Barrande.

Genotype: *Trochurus speciosus* yri Bech.

*Trochurus* Beyrich, Ueber einige bohlm. Tril., 1845, p. 81; *ibid.*, 2, 1846, p. 10.—Bell and Forbes, Burmeister's Org. Tril., London, Suppl. App., 1846, p. 126.—Beyrich, Neues Jahrb. Min., Geol., Pal., 1846, p. 120.—Hawle and Corda, Abh. d. k. bohmischen Gesell., d. Wiss., 5 (extract), 1847, p. 137, pl. 7, fig. 73.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 34, No. 8, 1901, p. 70.—Reed, Quart. Jour. Geol. Soc. London, 58, 1902, p. 63.

**STAUROCEPHALUS**—Continued.

*Staurocephalus* Barrande, Prelim. Not. Syst. Sil. Boheme, 1846, p. 52; Neues Jahrb. Min., Geol., Pal., 1850, p. 779; Syst. Sil. du Centre Boheme, 1, 1852, p. 810.—McCoy, British Pal. Rocks and Fossils, 1854, p. 152.—Salter, Mem. Geol. Surv. United Kingdom, 1864, dec. 11, pl. 5; Mon. British Tril., Pal. Soc., 1865, p. 84.—Angelin, Pal. Scandinavica, 3d ed., Holmiae, 1878, p. 67.—Zittel, Handb. Pal., 2, 1885, p. 620.—Koken, Die Leitfossilien, Leipzig, 1896, p. 33, fig. 23, figs. 1, 1a.—Reed, Geol. Mag., dec. 4, 5, 1898, p. 212.—Raymond, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 725.

**Staurocephalus murchisoni** Barrande.

*Staurocephalus murchisoni* Barrande, Not. Prel. Sil. Syst. Boheme, 1846, p. 53.—McCoy, British Pal. Rocks and Fossils, 1854, p. 153, pl. 1F, fig. 15.—Salter, Mem. Geol. Surv. United Kingdom, dec. 11, 1864, pl. 5, figs. 1–5; Mon. British Tril., Pal. Soc., 1865, p. 84, pl. 7, figs. 13–20 (cites bibliography); Cat. Camb. Sil. Foss., 1873, p. 50.—Roemer, Leth. geog., Leth. Pal., 1, Atlas, 1876, pl. 17, fig. 14.—Van Ingen, School of Mines Quart., 23, 1891, p. 35.—Reed, Quart. Jour. Geol. Soc. London, 52, 1896, p. 425.

Silurian: England; St. Clair Springs, Independence County, Arkansas (St. Clair).

**Staurocephalus obsoletus** Weller.

*Staurocephalus obsoleta* Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 270, pl. 24, fig. 15.

Niagaran (Racine): Near Lemont, Illinois.

**STAUROGRAPSUS** Emmons. See *Staurograptus* Emmons.

**STAUROGRAPTUS** Emmons.

Genotype: *S. dichotomus* Emmons.

*Staurograpsus* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 108.

*Staurograptus* Miller, N. A. Geol. Pal., 1889, p. 203.—Elles and Wood, Mon. British Grapt., Pal. Soc., 1903, p. 38.—Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 612–614.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 27.

**Staurograptus dichotomus** Emmons.

*Staurograpsus dichotomus* Emmons, Amer. Geology, 1, 1855, 2, p. 109, pl. 1, fig. 21; Man. Geol., 1860, p. 87, fig. 69.

*Staurograptus dichotomus* Miller, N. A. Geol. Pal., 1889, p. 203, fig. 216.—Ruedemann, Bull. New York State Mus., 69, 1903, p. 939; Mem. New York State Mus., 7, pt. 1, 1904, pp. 614–617, pl. 2, figs. 1–20; fig. 34, p. 613.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 27, fig. 39.

*Bryograptus kjerulfi* Matthew, Trans. Roy. Soc. Canada, 1891, sect. 4, p. 35.

*Bryograptus patens* Matthew, Roy. Soc. Canada, Trans. and Proc., 10, 4, 1893, p. 17, figs. 1a, 1c, 1d; Trans. New York Acad. Sci., 14, 1895, p. 268, pl. 48, figs. 4, 4b.—Ruedemann, Bull. New York State Mus., 69, 1903, p. 938 (loc. occ.).

*Bryograptus lentus* Matthew, Trans. New York Acad. Sci., 14, 1895, p. 270, pl. 48, figs. 2a, 2b.

*Clonograptus proximus* Matthew, Trans. New York Acad. Sci., 14, 1895, p. 265, pl. 48, figs. 1a–d.—Ruedemann, Bull. New York State Mus., 69, 1903, p. 938.

*Staurograptus dichotomus* var. *apertus* Ruedemann, Mem. New York State Mus., 7, 1904, pt. 1, p. 617, pl. 2, figs. 21–24.—Hahn, Ann. New York Acad. Sci., 22, 1912, p. 140.

Canadian (*Dictyonema flabelliforme* beds): Schaghticoke, and other localities in slate belt of Rensselaer and Washington Counties, New York (Schaghticoke); Navy Island, St. John, New Brunswick (Bretonian—Div. C 3c).

**STAUROGRAPTUS DICHOTOMUS** var. **APERTUS** Ruedemann. See *Staurograptus dichotomus*.

**STEGANOBLASTUS** Whiteaves. See *Astrocystites* Whiteaves.

**STEGANOBLASTUS CANADENSIS** Whiteaves. See *Astrocystites ottawaensis*.

**STEGERYNCHUS** Foerste. See *Camarotœchia* subgenus *Stegerhynchus*.

**STELIDIOCRINUS** Angelin. Genotype: *S. capitulum* Angelin.  
*Stelidiocrinus* Angelin, *Icon. Crin. Suec.*, 1878, p. 21, pl. 17, figs. 5a-g.—Zittel, *Handb. Pal.*, 1, 1879, pp. 345, 371.—Wachsmuth and Springer, *Proc. Acad. Nat. Sci. Philadelphia*, 1881, pp. 266-270 (*Rev. Pal.*, pt. 2, pp. 92, 96); *ibid.*, 1885, p. 324; *Mem. Mus. Comp. Zool.*, Harvard, 20, 1897, p. 297.—Bather, *Treatise on Zool.* (Lanckester), pt. 3, 1900, p. 161.—Wachsmuth, *Zittel-Eastman Textb. Pal.*, 1, 1900, p. 148.—Zittel, *Grundzüge Pal.*, 1, 1910, p. 163.—Springer, *Zittel-Eastman Textb. Pal.*, 2d ed., 1913, p. 189.

**Stelidiocrinus argutus** (Walcott).

*Glyptocrinus argutus* Walcott, 35th Rep. New York State Mus. Nat. Hist., 1883, p. 207, pl. 17, fig. 9.—Miller, *Jour. Cincinnati Soc. Nat. Hist.*, 6, 1883, p. 226.  
*Stelidiocrinus argutus* Wachsmuth and Springer, *Proc. Acad. Nat. Sci. Philadelphia*, 1885, p. 324 (*Rev. Pal.*, pt. 3, sec. 1, p. 102); *Mem. Mus. Comp. Zool.*, Harvard, 20, 1897, p. 280, pl. 24, fig. 6.  
 Trenton: Trenton Falls, New York.

**STELIELLA** Hinde. Genotype: *S. billingsi* Hinde.  
*Steliella* Hinde, *Canadian Rec. Sci.*, 3, 1889, p. 395.

**Steliella billingsi** Hinde.

*Steliella Billingsi* Hinde, *Canadian Rec. Sci.*, 3, 1889, p. 396, pl., figs. 1-4.  
 Trenton: Ottawa, Ontario.

**Steliella crassa** Hinde.

*Steliella crassa* Hinde, *Canadian Rec. Sci.*, 3, 1889, p. 397, pl., fig. 5-6.  
 Trenton: Ottawa, Ontario.

**STELLIPORA** Milne-Edwards. See *Constellaria* Dana.

**STELLIPORA** Hall. Genotype: *S. antheloidea* Hall.  
*Stellipora* Hall, *Pal. New York*, 1, 1847, p. 79.—D'Orbigny, *Prodr. de Pal.*, 1, 1850, p. 22.—Dybowski (part), *Die Chætetiden d. Ostbaltischen Silur-Form.*, 1877, p. 42.—Ulrich, *Jour. Cincinnati Soc. Nat. Hist.*, 5, p. 155; *ibid.*, 6, 1883, 1882, p. 263.—Miller, *N. A. Geol. Pal.*, 1889, p. 203.—Ulrich, *Geol. Surv. Illinois*, 8, 1890, p. 374; *Zittel's Textb. Pal.* (Engl. ed.), 1896, p. 276.—Nickles and Bassler, *Bull. U. S. Geol. Surv.*, 173, 1900, p. 34.—Bassler, *Bull. U. S. Nat. Mus.*, 77, 1911, p. 221; *Zittel-Eastman Textb. Pal.*, 1913, p. 334.

**Stellipora antheloidea** Hall.

*Stellipora antheloidea* Hall, *Pal. New York*, 1, 1847, p. 79, pl. 26, figs. 10a-c.—Emmons, *Amer. Geology*, 1, pt. 2, pl. 7, fig. 10.—Ulrich, *Jour. Cincinnati Soc. Nat. Hist.*, 6, 1883, p. 263, pl. 14, figs. 1, 1a.—Lesley, *Geol. Surv. Pennsylvania*, Rep. P 4, 1890, p. 1047, figs.—Sardeson, *Jour. Geol.*, 9, 1901, p. 13.  
*Monticulipora* (*Constellaria*) *antheloidea* (in part) James and James, *Jour. Cincinnati Soc. Nat. Hist.*, 11, p. 31.  
 Trenton: Lowville, etc., New York; Ottawa, Ontario.  
*Plesiotype*.—Cat. No. 43710, U.S.N.M. (Ulrich).

**STELLIPORA ANTHELOIDEA** D'Orbigny. See *Constellaria florida*.

*STELLIPORA LIMITARIS* Ulrich. See *Constellaria limitaris*.

*STELLIPORA POLYSTOMELLA* Miller. See *Constellaria polystomella*.

**STENASTER** Billings.

Genotype: *S. salteri* Billings.

*Stenaster* Billings, Geol. Surv. Canada, dec. 3, 1858, p. 77.—Chapman, Canadian Jour., n. s., 6, 1861, p. 517; Expos. Min. Geol. Canada, 1864, p. 111.—Miller, N. A. Geol. Pal., 1889, p. 282.—Sturtz, Palæontographica, 36, 1890, p. 220.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 18, 1895, pp. 126, 135.—Gregory, Geol. Mag., dec. 4, 6, 1899, p. 352.—Schuchert, Bull. U. S. Nat. Mus., 88, 1915, p. 163.

*Urasterella* Sturtz (not McCoy), Vern. naturh. Ver. preuss. Rheinl., etc., 50, 1893, pp. 40, 41, 56.

*STENASTER* Billings (part). See *Urasterella* McCoy.

**Stenaster salteri** Billings.

*Stenaster Salteri* Billings, Geol. Surv. Canada, dec. 3, 1858, p. 78, pl. 10, figs. 1a, 1b.—Chapman, Canadian Jour., n. s., 6, 1861, p. 517.—Wright, Mon. British Foss. Echinod., Oolitic, 2, pt. 1 (Pal. Soc.), 1862, p. 28, fig. 15 (2) on p. 24.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 572, fig. 1910.—Springer, Mem. Geol. Surv. Canada, 15 P, 1911, p. 45 (loc. occ.).—Schuchert, Bull. U. S. Nat. Mus., 88, 1915, p. 165, pl. 32, fig. 1.

Trenton (Curdsville): Belleville, Ottawa, and Kirkfield, Ontario; Curdsville, Kentucky.

*STENOCHISMA* Conrad. See *Rhynchotrema* Hall.

*STENOCISMA* Hall. See *Zygospira* Hall.

*STENOCRINUS* Wachsmuth and Springer. See *Heterocrinus* Hall.

*STENOCRINUS BELLEVILLENSIS* Wachsmuth and Springer. See *Ohioocrinus belle-*  
*villensis*.

**STENOPORA** Lonsdale.

Genotype: *S. tasmaniensis* Lonsdale.

*Stenopora* Lonsdale, Darwin's Volcanic Islands, 1844, Appendix, p. 161; Strzelecki's Physical Description New South Wales, 1845, p. 262; Geol. Russia and Ural Mountains, 1, 1845, p. 631.—King, Mono. Perm. Foss. England, 1850, p. 28.—McCoy, British Pal. Foss., 1852, p. 24.—Eichwald, Lethaea Rossica, 1, 1860, p. 414.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 368.—Dybowski, Verh. d. k. Min. Ges. St. Petersburg, ser. 2, 10, 1876, p. 180.—Nicholson and Etheridge, jr., Ann. Mag. Nat. Hist., ser. 5, 4, 1879, p. 265.—Nicholson, Pal. Tabulate Corals, 1879, p. 168.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 154.—Nicholson and Etheridge, jr., Ann. Mag. Nat. Hist., ser. 5, 17, 1886, pp. 173–187.—Waagen and Wentzel, Pal. Indica, ser. 13, 1886, pp. 875, 885.—Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 85.—Miller, N. A. Geol. Pal., 1889, p. 203.—Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 375, 436; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 105.—Ulrich, Zittel's Textb. Pal. (Engl. ed.), 1896, p. 277.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 583.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 134.—Bassler, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 335.

*Tabulipora* Young, Ann. Mag. Nat. Hist., ser. 5, 12, 1883, p. 154.

*Tubuliclidia* Lonsdale, Bull. Soc. Geol. France, ser. 2, 1, 1844, p. 497; Murchison's Geol. Russia, 1845, pp. 221, 631.

- Stenopora adherens* Billings. Not recognizable.  
*Stenopora adherens* Billings, Canadian Nat. Geol., 4, 1859, p. 427.  
 Chazyan: Mingan Islands, Canada.
- STENOPORA BULBOSA* Billings. See *Cyphotrypa bulbosa*.
- STENOPORA HURONENSIS* Billings. See *Stromatocerium huronense*.
- Stenopora fibrosa* of authors (not Goldfuss).  
*Stenopora fibrosa* Billings, Canadian Nat. Geol., 4, 1859, p. 346.—Chapman, Canadian Jour., n. s., 6, 1861, p. 509, fig. 73; *ibid.*, 8, 1863, p. 195, fig. 165a; p. 198, fig. 177.—Billings, Geol. Canada, 1863, p. 156, fig. 116; Geol. Canada, Geol. Surv. Canada, 1863, p. 124, fig. 45.—Chapman, Expos. Min. Geol. Canada, 1864, p. 103, fig. 73; p. 167, fig. 165a; p. 170, fig. 177.—Billings, Catal. Sil. Foss. Anticosti, 1866, p. 32.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 369.  
 Ordovician: Various localities.  
 Observation.—The above citations are to various unidentified ramose bryozoa.
- Stenopora(?) incrustans*** Ulrich and Bassler.  
*Stenopora(?) incrustans* Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 275, pl. 42, figs. 11–16; pl. 44, fig. 6.  
 Helderbergian (Keyser): Cash Valley and Pinto, Maryland.  
*Cotypes*.—Cat. No. 53649, U.S.N.M.
- STENOPORA LIBANA* Safford. See *Batostoma libana*.
- STENOPORA LYCOPERDON* Miller. See *Chaetetes lycoperdon*.
- STENOPORA MAMMULATA* Billings. See *Ptilodictya magnifica*.
- Stenopora patula* Billings. Not recognizable.  
*Stenopora patula* Billings, Canadian Nat. Geol., 4, 1859, p. 427.  
 Chazyan: Island of Montreal and Mingan Islands, Canada.
- STENOTHECA*** (Salter) Hicks. Genotype: *S. cornucopia* Salter.  
*Stenotheca* (Salter) Hicks, Quart. Jour. Geol. Soc., 28, 1872, p. 180.—Salter, Cat. Camb. Sil. Foss., 1873, p. 8 (nom. nud.).—Geol. Mag., dec. 3, 2, 1885, p. 425.—Walcott, Bull. U. S. Geol. Surv., 30, 1886, p. 128.—Matthew, Trans. Royal Soc. Canada, 3, sec. 4, 1886, p. 56.—Miller, N. A. Geol. Pal., 1889, p. 392.—Matthew, Trans. Royal Soc. Canada, 8, sec. 4, 1891, p. 132; Trans. New York Acad. Sci., 15, 1896, p. 200.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, pp. 822, 842.—Berkey, Amer. Geol., 21, 1898, p. 278.—Pilsbry, Zittel-Eastman Textb. Pal., 1, 1900, p. 460.—Grabau, Occ. Papers Boston Soc. Nat. Hist., 4, 1900, p. 636.—Dall, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 530.
- STENOTHECA DUBIA* Whitfield and Hovey. See *Archinacella deformata*.
- Stenotheca exserta*** (Sardeson).  
*Tryblidium exsertum* Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, 1892, p. 337, pl. 6, figs. 3, 4.  
*Stenotheca exserta* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 842, pl. 82, figs. 11–15.  
 Black River (Platteville): Minneapolis, Minnesota; Peiloit, Wisconsin.
- STENOTHECA UNGUIFORMIS* Ulrich. See *Vallatotheca unguiiformis*.
- STEPHANELLA*** Hinde. Genotype: *S. sancta* Hinde.  
*Stephanella* Hinde, Geol. Mag., dec. 3, 8, 1891, p. 23.—Dawson, Trans. Royal Soc. Canada, 2d ser., 2, sec. 4, 1896, p. 116.

**Stephanella hindii** Dawson.

*Stephanella hindii* Dawson, Trans. Royal Soc. Canada, 2d ser., 2, sec. 4, 1896, p. 116, fig. 27-29.

Canadian? (Levis?): Metis, Quebec.

**Stephanella sancta** Hinde.

*Stephanella sancta* Hinde, Geol. Mag., dec. 3, 8, 1891, p. 23, fig.

Trenton (Collingwood): Ottawa, Ontario.

**STEPHANOCRINUS** Conrad.

Genotype: *S. angulatus* Conrad.

*Stephanocrinus* Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1842, p. 278.—

Roemer, Archiv für Naturgeschichte, Jahrg., 16, 1, 1850, pp. 365, 366, 373.—

Hall, Pal. New York, 2, 1852, pp. 212, 355.—Pictet, Traite de Pal., 2d ed., 4,

1857, p. 304.—Allman, Trans. Royal Soc. Edinburgh, 23, 1864, p. 248, fig. 4.—

Beyrich, Ann. Mag. Nat. Hist., 4th ser., 7, 1871, p. 409.—Zittel, Handb. Pal.,

1, 1879, p. 436.—Etheridge and Carpenter, Ann. Mag. Nat. Hist., 5th ser., 11,

1883, p. 237.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia,

1887, pp. 92, 93, 96, 97, 98-113.—Miller, N. A. Geol. Pal., 1889, p. 283.—

Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 145.—Weller,

Bull. Chicago Acad. Sci. Nat. Hist. Surv., 4, pt. 1, 1900, p. 150, fig. 56; p. 46.—

Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 137.—Grabau, Bull.

Buffalo Soc. Nat. Sci., 7, 1901, p. 153; Bull. New York State Mus., 45, 1901,

p. 153.—Slocum, Field Columbian Mus., 2, Geol. Ser., 1908, p. 281, fig. 4.—

Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 499.—Springer, Zittel-

Eastman Textb. Pal., 2d ed., 1913, p. 207.

**Stephanocrinus angulatus** Conrad.

*Stephanocrinus angulatus* Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1842,

p. 279, pl. 15, fig. 18.—Roemer, Archiv für Naturgeschichte, Jahrg., 16, 1,

1850, p. 365, footnote; pl. 5, figs. 1-6; Zeits. d. d. geol. Gesell., 2, 1850, p. 14.—

Hall, Pal. New York, 2, 1852, p. 212, pl. 48, figs. 1a-m; p. 351, pl. 85, figs.

1-4.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 304, pl. 99, fig. 23.—Roemer,

Leth. geog., 1, Leth. Pal., Atlas, 1876, pl. 11, fig. 5a.—Zittel, Handb. Pal.,

1, 1879, p. 436, fig. 310.—Etheridge and Carpenter, Blastoides British Mus.,

1886, pl. 19, figs. 8-12.—Wachsmuth and Springer, Proc. Acad. Nat. Sci., Phil-

adelphia, 1887, pp. 99, 113, pl. 4, fig. 3.—Miller, N. A. Geol. Pal., 1889, p. 283,

text fig. 433.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900,

p. 97, fig. 2.—Grabau, Bull. New York State Mus., 45, 1901, p. 154, fig. 48;

Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 154, fig. 48.—Grabau and Shimer, N.

A. Index Fossils, 2, 1910, p. 499, fig. 1808-1809.

Clinton (Rochester): Lockport, Rochester, etc., New York; Grimsby, Ontario.

**Stephanocrinus cornetti** Miller.

*Stephanocrinus cornetti* Miller, 18th Ann. Rep. Indiana Dep. Geol. Nat. Res.,

1894, p. 266, pl. 2, figs. 10-12 (Adv. sheets, 1892, p. 12, pl. 2, figs. 10-12).

Clinton (Osgood): Madison, Indiana.

**Stephanocrinus deformis** Rowley.

*Stephanocrinus deformis* Rowley, in Greene's Cont. Indiana Pal., 11, 1903, p.

103, pl. 32, figs. 22, 23.

Clinton (Osgood): Big Creek, near Big Creek Post Office, Jefferson County,

Indiana.

**Stephanocrinus elongatus** Miller.

*Stephanocrinus elongatus* Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res.,

1892, p. 634, pl. 6, fig. 5 (adv. sheets, 1891, p. 24).

Clinton (Osgood): Near Madison, Indiana.

**Stephanocrinus gemmiformis** Hall.

*Stephanocrinus gemmiformis* Hall, Pal. New York, 2, 1852, p. 215, pl. 48, figs. 2a-i; 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1877, pl. 14, figs. 15-20; mus. ed., 1879, p. 146, pl. 14, figs. 15-20; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 279, fig.; pl. 13, figs. 15, 20.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 191, fig.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1062, figs.—Grabau, Bull. New York State Mus., 45, 1901, p. 155, fig. 49; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 155, fig. 49.—Rowley, in Greene's Cont. Indiana Pal., 11, 1903, p. 104, pl. 32, figs. 24, 25.

Clinton (Rochester): Lockport, etc., New York; Grimsby, Ontario.

Niagaran: Waldron, Indiana; Newsom, Tennessee (Waldron); ?Wisconsin (Racine).

**Stephanocrinus hammelli** Miller.

*Stephanocrinus hammelli* Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 635, pl. 6, figs. 7, 8, 9 (Adv. sheets, 1891, p. 25); N. A. Geol. Pal., 2d App., 1897, p. 752, fig. 1395.—Rowley in Greene's Cont. Indiana Pal., 11, 1902, p. 104, pl. 32, figs. 28-30.

Clinton (Osgood): Near Big Creek Post Office, Jefferson County, Indiana.

**Stephanocrinus obconicus** Slocum.

*Stephanocrinus obconicus* Slocum, Field Columbian Mus., Geol. Ser., 2, 1908, p. 281, pl. 84, figs. 12, 13.

Niagaran (Racine): Romeo, Illinois.

**Stephanocrinus obpyramidalis** Miller.

*Stephanocrinus obpyramidalis* Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 634, pl. 6, fig. 6 (Adv. sheets, 1891, p. 24.).

Clinton (Osgood): Near Madison, Indiana.

**Stephanocrinus osgoodensis** Miller.

*Stephanocrinus osgoodensis* Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 116, pl. 10, figs. 7, 7a; 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 632, pl. 6, figs. 1-4 (adv. sheets, 1891, p. 22); N. A. Geol. Pal., 2d App., 1897, p. 753, fig. 1396.—Weller, Bull. Chicago Acad. Sci. Nat. Hist. Surv., 4, pt. 1, 1900, p. 151, pl. 15, fig. 14.—Rowley, in Greene's Cont. Indiana Pal., 11, 1903, p. 104, pl. 32, figs. 26, 27.

*Codaster osgoodensis* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 217.

Clinton (Osgood): Osgood and Big Creek Post Office, Jefferson County, Indiana.

?Niagaran (Racine): Romeo, Illinois.

**Stephanocrinus pentalobus** (Hall).

*Codaster pentalobus* Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 280, pl. 15, fig. 16.—Hall, Trans. Albany Inst., 10, 1883, p. 69.

*Stephanocrinus pentalobus* Miller, N. A. Geol. Pal., 1889, p. 283.

Niagaran (Waldron): Waldron, Indiana.

**Stephanocrinus pulchellus** (Miller and Dyer).

*Codaster pulchellus* Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 35, pl. 2, figs. 13, 13a.—Hambach, Trans. Acad. Sci., St. Louis, 13, 1903, p. 48.

*Codaster* (*Stephanocrinus*?) *pulchellus* Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 280, pl. 15, figs. 8-10; Trans. Albany Inst., 10, 1883, p. 68.

*Stephanocrinus pulchellus* Etheridge and Carpenter, Ann. Mag. Nat. Hist., 5th ser., 11, 1883, p. 241 (gen. ref.).—Miller, N. A. Geol. Pal., 1889, p. 283, fig. 434.

Niagaran (Waldron): Waldron, Indiana.



**Stephanocrinus quinquepartitus** Rowley.

*Stephanocrinus quinquepartitus* Rowley in Greene's Cont. Indiana Pal., 11, 1903, p. 105, pl. 32, figs. 31-33.

Clinton (Osgood): Big Creek, near Big Creek Post Office, Jefferson County, Indiana.

**Stephanocrinus skiffi** Slocum.

*Stephanocrinus skiffi* Slocum, Field Columbian Mus., Geol. Ser., 2, 1908, p. 282, pl. 84, figs. 16-20.

Niagaran (Racine): Chicago Drainage Canal, near Lemont, Illinois.

**Stephanocrinus tennesseensis** Foerste.

*Stephanocrinus tennesseensis* Foerste, Jour. Geol., 11, 1903, p. 708; Bull. Sci. Lab. Denison Univ., 14, 1909, p. 99, pl. 1, fig. 4A, B.

Niagaran (Waldron): Iron City, Clifton, Swallow Bluff, etc., Tennessee.

**STEPHANOGRAPTUS** Geinitz. See *Nemagraptus* Emmons.

**STEPHANOGRAPTUS CRASSICAULIS** Gurley. See *Nemagraptus gracilis crassicaulis*.

**STEPHANOCRINUS SURCULARIS** Walcott. See *Nemagraptus gracilis surcularis*.

**STICTOPORA** Hall.

Genotype: *S. elegantula* Hall.

*Stictopora* Hall, Pal. New York, 1, 1847, p. 73.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, pp. 47, 411.

*Stictopora* (in part) Hall, 25th Ann. Rep. New York State Mus., 1879, p. 122; 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 247.—Miller, N. A. Geol. Pal., 1889, p. 323.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 605.

Not *Stictopora* Eichwald, Ulrich, Hall and Simpson, and others.

**STICTOPORA** Ulrich (1882). See *Rhinidictya* Ulrich.

**STICTOPORA ACUTA** Ulrich. See *Pachydietya acuta*.

**STICTOPORA BASALIS** Ulrich. See *Rhinidictya basalis*.

**STICTOPORA BIFURCATA** Hall. See *Pachydietya bifurcata*.

**STICTOPORA CLATHRATULA** James. See *Escharopora pavonia*.

**STICTOPORA COMPRESSA** Hall. See *Phænopora magna*.

**STICTOPORA CRASSA** Hall. See *Pachydietya crassa*.

**STICTOPORA DICHOTOMA** Whitfield. See *Thamniscus dichotomus*.

**Stictopora elegantula** Hall.

*Stictopora elegantula* Hall, Pal. New York, 1, 1847, p. 75, pl. 26, figs. 4a-g.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 153, fig.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1064, figs.—Ruedemann, Bull. New York State Mus., 49, 1901, p. 13.

*Ptilodictya elegantula* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 205, pl. 7, fig. 4a-g.

Trenton: Middletown, Trenton Falls, etc., New York.

**STICTOPORA FENESTRATA** Hall. See *Rhinidictya fenestrata*.

**STICTOPORA FIDELIS** Ulrich. See *Rhinidictya fidelis* and *R. trentonensis*.

**STICTOPORA FRAGILIS** Whitfield. See *Dicranopora fragilis*.

**Stictopora? glomerata** Hall.

*Stictopora glomerata* Hall, Pal. New York, 1, 1847, p. 17, pl. 4, fig. 5.

*Clathropora glomerata* Whitfield and Hovey, Bull. Amer. Mus. Nat. Hist., 11, pt. 1, 1898, p. 26 (gen. ref.).

Chazyan: Granville, Vermont.

**Stictopora graminifolia** Ringueberg.

Recognizable?

*Stictopora graminifolia* Ringueberg, Proc. Acad. Nat. Sci. Philadelphia, 1884, p. 147, pl. 2, fig. 4.

Niagaran (Lockport—Gasport member): Gasport, New York.

**Stictopora? (Phyllodictya?) labyrinthica** Hall.

*Stictopora labyrinthica* Hall, Pal. New York, 1, 1847, p. 50, pl. 12, figs. 8a, b, and woodcut on p. 50.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1067, figs.

*Ptilodictya labyrinthica* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 205, pl. 4, figs. 14, 18, 22.

Black River: Chazy and Watertown, New York (Lowville).

STICTOPORA MAGNA Hall and Whitfield. See *Phænopora magna*.

STICTOPORA MULTIFIDA Hall. See *Phænopora multifida*.

STICTOPORA MUTABILIS Ulrich. See *Rhinidictya mutabilis*.

STICTOPORA MUTABILIS var. MAJOR. See *Rhinidictya mutabilis major*.

STICTOPORA MUTABILIS var. MINOR Ulrich. See *Rhinidictya mutabilis*.

STICTOPORA OBLIQUA Ringueberg. See *Ptilodictya obliqua*.

STICTOPORA ORBIPORA Hall. See *Stictotrypa orbipora*.

STICTOPORA OVATIPORA Miller. See *Stictotrypa similis*.

STICTOPORA PAUPERA Ulrich. See *Rhinidictya paupera* and *R. neglecta*.

STICTOPORA PUNCTIPORA Hall. See *Stictotrypa punctipora*.

**Stictopora? ramosa** Hall.

*Stictopora ramosa* Hall, Pal. New York, 1, 1847, p. 51, pl. 12, figs. 6, 7, 7a, and woodcut on p. 51.—Hitchcock, Geol. Vermont, 1, 1861, p. 290, fig. 189.—Emerson, Narrative Hall's Sec. Arctic Exped., U. S. Navy Dep., 1879, p. 577.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1069, figs.

*Ptilodictya ramosa* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 205, pl. 4, fig. 1, 1a, 14; pl. 7, figs. 7, 7a.

Black River (Lowville): Watertown, New York.

STICTOPORA RARIPORA Hall. See *Nematopora raripora*.

STICTOPORA SCALPELLUM Eichwald. See *Pachydictya bifurcata*.

STICTOPORA SCITULA Hall and Simpson. See *Pachydictya crassa*.

STICTOPORA SHAFFERI Lesley. See *Arthropora shafferi*.

STICTOPORA SIMILIS Hall. See *Stictotrypa similis*.

STICTOPORA VANCLEVII Hall. See *Phænopora fimbriata*.

**STICTOPORELLA** Ulrich.Genotype: *S. interstincta* Ulrich

- Stictoporella* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, pp. 152, 169.—Miller, N. A. Geol. Pal., 1889, p. 325.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 394; Geol. Minnesota, 3, 1893, p. 179.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 14.—Ulrich, Zittel's Textb. Pal. (Engl. ed.), 1896, p. 279.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 535.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 46.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 157.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 756.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 127; Zittel-Eastman Textb. Pal., 1913, p. 345.
- Micropora* Eichwald (not Gray, 1848), Bull. Soc. Nat. Moscow, No. 4, 1855, p. 457; *Lethæa* Rossica, 1, 1860, p. 393.

**Stictoporella angularis** Ulrich.

- Stictoporella angularis* Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 71; Geol. Minnesota, 3, 1893, p. 182, pl. 11, figs. 1-3, 6, 8-11.
- Black River (Decorah): Minneapolis, St. Paul, Goodhue, and Fillmore Counties, Minnesota.
- Cotypes*.—Cat. No. 43470, U.S.N.M.

**Stictoporella angularis intermedia** Ulrich.

- Stictoporella angularis* var. *intermedia* Ulrich, Geol. Minnesota, 3, 1893, p. 183, pl. 11, figs. 4, 5, 7.
- Black River (Decorah): Minneapolis, Fountain, Lanesboro, and Preston, Minnesota; Decorah, Iowa.
- Cotypes*.—Cat. No. 44101, U.S.N.M.

**Stictoporella cribrosa** Ulrich.

- Stictoporella?* *cribrosa* Ulrich, 11th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 69; Geol. Minnesota, 3, 1893, p. 184, pl. 10, figs. 21-25, pl. 11, figs. 22, 23.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, fig. 93 (p. 536).—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 157, fig. 208h.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 128-130, pl. 7, fig. 4; figs. 52, 53; Zittel-Eastman Textb. Pal., 1913, p. 344, fig. 504c, d.
- Black River (Decorah): Minneapolis and St. Paul, Minnesota.
- Middle Ordovician (Wassalem): Uxnorn, etc., Esthonia, Russia.
- Cotypes*.—Cat. No. 43471, U.S.N.M.

STICTOPORELLA CRIBROSA Sardeson. See *Graptodictya proava*.**Stictoporella dumosa** Ulrich.

- Stictoporella dumosa* Ulrich, Geol. Minnesota, 3, 1893, p. 181.
- Black River (Decorah): St. Paul, Minnesota.
- Cotypes*.—Cat. No. 43613, U.S.N.M.

STICTOPORELLA? EXCELLENS Ulrich. See *Phænopora excellens*.**Stictoporella exigua** Ulrich.

- Stictoporella exigua* Ulrich, Geol. Minnesota, 3, 1893, pl. 13, figs. 18-21.
- Trenton: Montreal, Quebec.
- Cotypes*.—Cat. No. 43612, U.S.N.M.

STICTOPORELLA FLABELLATA Nickles and Bassler. See *Graptodictya proava*.**Stictoporella flexuosa** (James).

- Ptilodictya flexuosa* James, Paleontologist, No. 1, 1878, p. 4.
- Stictoporella flexuosa* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 169.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 417.—Bassler Proc. U. S. Nat. Mus., 30, 1906, p. 54.

**Stictoporella flexuosa**—Continued.

*Stictoporella interstincta* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 169, pl. 8, figs. 9, 9a.—Miller, N. A. Geol. Pal., 1889, figs. 520, 521 (p. 325).—Ulrich, Geol. Surv. Illinois, 8, 1890, fig. 14a, b (p. 394).

Eden (Economy): Cincinnati, Ohio, and vicinity.

*Plesiotype*.—Cat. No. 43722, U.S.N.M. (*holotype* of *S. interstincta*).

**Stictoporella frondifera** Ulrich.

*Stictoporella frondifera* Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 72; Geol. Minnesota, 3, 1893, p. 183, pl. 11, figs. 12–19.

Black River (Decorah): Minneapolis, St. Paul, Preston, Fountain, etc., Minnesota.

*Cotypes*.—Cat. No. 32472, U.S.N.M.

STICTOPORELLA INTERSTINCTA Ulrich. See *Stictoporella flexuosa*.

**Stictoporella rigida** Ulrich.

*Stictoporella rigida* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 12, 1890, p. 188, fig. 13; Geol. Minnesota, 3, 1893, p. 180, pl. 11, figs. 20, 21.

Black River (Decorah): Fountain, St. Paul, and Cannon Falls, Minnesota.

*Holotype*.—Cat. No. 43723, U.S.N.M.

**STICTOTRYPA** Ulrich.

Genotype: *S. similis* Hall.

*Stictotrypa* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 393; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 279.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 54.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 61.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 166.

**Stictotrypa orbipora** (Hall).

*Stictopora orbipora* Hall, Trans. Albany Inst., 10, 1883, p. 61 (abstract, 1879, p. 5); 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 248.

*Stictotrypa orbipora* Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 418. Niagaran (Waldron): Waldron, Indiana.

**Stictotrypa punctipora** (Hall).

*Stictopora punctipora* Hall, Pal. New York, 2, 1852, p. 157, pl. 40B, figs. 2a–c.—Miller, N. A. Geol. Pal., 1889, fig. 519 (p. 324).

*Stictotrypa punctipora* Ulrich, Geol. Surv. Illinois, 8, 1890, fig. 13a (p. 394).—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 61, pl. 22, figs. 7–11; pl. 24, figs. 26, 27.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 166, fig. 214k.

Clinton (Rochester): Lockport, Rochester, and Niagara Falls, New York; Grimsby, Hamilton, and Thorold, Ontario.

*Plesiotypes*.—Cat. Nos. 35776, 35758, U.S.N.M.

**Stictotrypa similis** (Hall).

*Stictopora similis* Hall, 28th Ann. Rep. New York State Mus., doc. ed., 1876, pl. 11, figs. 13–16; *ibid.*, mus. ed., 1879, p. 122, pl. 11, figs. 13–16; 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 247, pl. 10, figs. 13–16.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1070, figs.

*Stictotrypa similis* Ulrich, Geol. Surv. Illinois, 8, 1890, fig. 13b, c (p. 394).

*Stictopora ovatipora* (not of Hall) Miller, N. A. Geol. Pal., 1889, fig. 518 (p. 324). Niagaran (Waldron): Waldron, Indiana.

*Plesiotype*.—Cat. No. 43326, U.S.N.M.

- STIGMATELLA** Ulrich and Bassler. Genotype: *S. crenulata* Ulrich and Bassler.  
*Stigmatella* Ulrich and Bassler, *Smiths. Misc. Coll.*, 47, 1904, pp. 24, 33.—Bassler, *Bull. U. S. Geol. Surv.*, 292, 1906, pp. 27, 28.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 756.—Bassler, *Bull. U. S. Nat. Mus.*, 77, 1911, pp. 210, 211.
- Stigmatella aleicornis*** Cumings and Galloway.  
*Stigmatella aleicornis* Cumings and Galloway, 37th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1913, p. 84, pl. 18, figs. 1–1c.  
 Maysville (Fairmount): Big Four Railroad, near Guilford, Indiana.
- Stigmatella catenulata*** Cumings and Galloway.  
*Stigmatella catenulata* Cumings and Galloway, 37th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1913, p. 85, pl. 19, figs. 1–1c.  
 Richmond (Arnheim): Big Four Railroad, near Harmon's Station, Indiana.
- Stigmatella claviformis*** (Ulrich).  
*Leptotrypa claviformis* Ulrich, *Geol. Minnesota*, 3, 1893, p. 319, pl. 27, figs. 20, 21.  
*Stigmatella claviformis* Bassler, *Bull. U. S. Nat. Mus.*, 77, 1911, p. 217, fig. 119.  
 Black River (Decorah): Minneapolis and St. Paul, Minnesota.  
 Middle Ordovician (Wassalem): Uxnorn, Esthonia, Russia.  
*Cotypes*.—Cat. No. 43611, U.S.N.M.
- Stigmatella clavis*** (Ulrich).  
*Leptotrypa clavis* Ulrich, *Jour. Cincinnati Soc. Nat. Hist.*, 6, 1883, p. 161, pl. 6, figs. 3, 3a.  
*Stigmatella clavis* Ulrich and Bassler, *Smiths. Misc. Coll., Quart.*, 47, 1904, p. 34, pl. 10, fig. 4.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 881, pl. 24, figs. 2, 2a; pl. 25, fig. 3.  
 Eden (Economy-McMicken): Cincinnati, Ohio, and vicinity.  
*Cotypes and plesiotypes*.—Cat. Nos. 43718, 44060, U.S.N.M.
- Stigmatella crenulata*** Ulrich and Bassler.  
*Stigmatella crenulata* Ulrich and Bassler, *Smiths. Misc. Coll., Quart.*, 47, 1904, p. 34, pl. 9, figs. 1–4; pl. 14, figs. 1, 2.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 882, pl. 24, fig. 4–4d.  
 Richmond (Waynesville): Hanover, Waynesville, Clarksville, etc., Ohio.  
*Cotypes*.—Cat. No. 43197, U.S.N.M.
- Stigmatella dychei*** (James).  
*Monticulipora (Monotrypa) dychei* James, *Paleontologist*, No. 6, 1882, p. 52.  
*Monticulipora dychei* James, *Jour. Cincinnati Soc. Nat. Hist.*, 6, 1883, p. 235, pl. 10, figs. 2–2e.—James and James, *ibid.*, 11, 1888, p. 25.—J. F. James, *ibid.*, 18, 1895, p. 83.  
*Leptotrypa? dychei* Nickles and Bassler, *Bull. U. S. Geol. Surv.*, 173, 1900, p. 298.  
*Stigmatella dychei* Ulrich and Bassler, *Smiths. Misc. Coll., Quart.*, 47, 1904, p. 34, pl. 10, fig. 11.—Bassler, *Proc. U. S. Nat. Mus.*, 30, 1906, p. 54, pl. 3, figs. 8–10.  
 Maysville (Mount Auburn): Lebanon, etc., Ohio.  
*Plesiotype*.—Cat. No. 44059, U.S.N.M.
- Stigmatella globata*** Bassler.  
*Stigmatella globata* Bassler, *Bull. U. S. Geol. Surv.*, 292, 1906, p. 28, pl. 14, figs. 6–9.  
 Clinton (Rochester): Lockport and Rochester, New York.  
*Holotype*.—Cat. No. 35769, U.S.N.M.

**Stigmatella incrustans** Cumings and Galloway.

Stigmatella incrustans Cumings and Galloway, 37th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1913, p. 86, pl. 19, fig. 2; pl. 20, figs. 1, 1a.  
 Richmond (Liberty): Big Four Railroad, near Weisburg, Indiana.

**Stigmatella interporosa** Ulrich and Bassler.

Stigmatella interporosa Ulrich and Bassler, Smiths. Misc. Coll., Quart., 47, 1904, p. 35, pl. 12, figs. 4, 5.  
 Richmond (Waynesville): Hanover, Ohio.  
*Cotypes*.—Cat. No. 43202, U.S.N.M.

**Stigmatella irregularis** (Ulrich).

Chaetetes irregularis Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 129, pl. 12, figs. 10–10b.  
 Monticulipora (Monotrypa) irregularis Nicholson, Genus Monticulipora, 1881, p. 177, fig. 35.  
 Monotrypa irregularis Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 256.  
 Monticulipora irregularis James and James, *ibid.*, 10, 1888, p. 163.—J. F. James, *ibid.*, 15, 1893, p. 159.  
 Leptotrypa? irregularis Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 298.  
 Stigmatella irregularis Ulrich and Bassler, Smiths. Misc. Coll., Quart., 47, 1904, p. 34, pl. 10, figs. 5, 6; pl. 14, figs. 6–8.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 883, pl. 25, figs. 2, 2a.  
 Maysville (Bellevue): Hamilton, Morrow, Mason, and Cincinnati, Ohio.  
*Cotypes*.—Cat. No. 43719, U.S.N.M.

**Stigmatella nana** Ulrich and Bassler.

Stigmatella nana Ulrich and Bassler, Smiths. Misc. Coll., Quart., 47, 1904, p. 36, pl. 10, figs. 7–10; pl. 14, figs. 11, 12.  
 Eden (Economy): Covington, Kentucky, and vicinity.  
*Cotypes*.—Cat. No. 43203, U.S.N.M.

**Stigmatella nicklesi** Ulrich and Bassler.

Stigmatella nicklesi Ulrich and Bassler, Smiths. Misc. Coll., Quart., 47, 1904, p. 36, pl. 10, figs. 1–3; pl. 14, figs. 9, 10.  
 Maysville (Fairmount): Cincinnati, Ohio, and vicinity.  
*Cotypes*.—Cat. No. 43204, U.S.N.M.

**Stigmatella personata** Ulrich and Bassler.

Stigmatella personata Ulrich and Bassler, Smiths. Misc. Coll., Quart., 47, 1904, p. 35, pl. 12, figs. 1–3.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 884, pl. 24, figs. 3, 3d.  
 Richmond (Waynesville): Hanover, Ohio.  
*Holotype*.—Cat. No. 43201, U.S.N.M.

**Stigmatella sessilis** Cumings and Galloway.

Stigmatella sessilis Cumings and Galloway, 37th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1913, p. 87, pl. 19, fig. 3; pl. 20, figs. 2–2b.  
 Maysville (Fairmount): Big Four Railroad, near Manchester Station, Indiana.

**Stigmatella spinosa** Ulrich and Bassler.

Stigmatella spinosa Ulrich and Bassler, Smiths. Misc. Coll., Quart., 47, 1904, p. 34, pl. 9, figs. 5–8.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 884, pl. 25, figs. 1, 1d.  
 Richmond: Versailles, Indiana.  
*Holotype*.—Cat. No. 43200, U.S.N.M.

*STOMATIA AURIFORMIS* Emmons. See *Diaphorostoma auriforme*.

**STOMATOPORA** Bronn.

Genotype: *Alecto dichotoma* Lamouroux.

*Alecto* Lamouroux, 1821, Blainville, Johnston, Milne-Edwards, Busk, and others (not *Alecto* Leach, 1814, a genus of Echinodermata).

*Aulopora* (in part) Goldfuss, Reuss, Hall, Nicholson.

*Stomatopora* Bronn, Pflanzenth., 1825, p. 27.—D'Orbigny, Pal. Francais, Terr. Cret., 5, 1854, p. 833.—Haime, Bry. Foss. Form. Juras., 1854, p. 159 (extra ed., p. 3).—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 142.—Zittel, Handb. Pal., 1, 1880, p. 598.—Hincks (part) British Marine Polyz., 1880, p. 424.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 149.—Vine, Geol. Mag., dec. 2, 8, 1881, p. 514; Rep. 51st Meeting British Assoc. Adv. Sci., 1882, p. 171; Rep. 53d Meeting British Assoc. Adv. Sci., 1884, p. 185; Proc. Yorkshire Geol. Polyt. Soc., 9, 1887, p. 186.—Miller, N. A. Geol. Pal., 1889, p. 325.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 367; Geol. Minnesota, 3, 1893, p. 115; Zittel's Textb. Pal. (Eng. ed.) 1896, p. 260.—Simpson, 14th Rep. State Geol. New York, 1897, p. 597.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 20.—Cumings, Amer. Jour. Sci., 4th ser., 17, 1904, p. 75, fig. 81.—Hennig, Archiv. fur Zool., K. Sven. Vet.-Akad. Stockholm, 3, No. 10, 1906, p. 24.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 14.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 118.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 757.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 59, 60.

*STOMATOPORA* (part) of authors. See *Corynotrypa* Bassler.

**Stomatopora arachnoidea** (Hall).

*Aulopora arachnoidea* Hall, Pal. New York, 1, 1847, p. 76, pl. 26, figs. 6a-c, and woodcut on p. 76.—Nicholson, Pal. Ohio, 2, 1875, p. 216, pl. 23, figs. 1, 1b.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 230, fig. 83, pl. 7, fig. 6.—Nicholson, Rep. 44th Meeting British Assoc. Adv. Sci., Notes and Abstracts, 1875, p. 90.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 173, fig.

*Stomatopora arachnoidea* Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 885, pl. 32, figs. 2-2c.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 60, 61, fig. 7.

Trenton-Richmond: Cincinnati, Ohio (Maysville); various localities in the United States and Canada.

*STOMATOPORA AULOPOROIDES* Miller. See *Proboscina auloporoides*.

*STOMATOPORA CANADENSIS* Whiteaves. See *Corynotrypa canadensis*.

*STOMATOPORA CONFUSA* Miller. See *Proboscina confusa*.

*STOMATOPORA DELICATULA* Grabau and Shimer. See *Corynotrypa delicatula*.

*STOMATOPORA DELICATULA-TENUISSIMA* Nickles and Bassler. See *Corynotrypa delicatula*.

*STOMATOPORA DISSIMILIS* Vine. See *Corynotrypa dissimilis*.

*STOMATOPORA DISSIMILIS* var. *ELONGATA* Vine. See *Corynotrypa elongata*.

*STOMATOPORA ELONGATA* Vine. See *Corynotrypa elongata*.

*STOMATOPORA FRONDOSA* Miller. See *Proboscina frondosa*.

*STOMATOPORA INFLATA* Vine. See *Corynotrypa inflata*.

*STOMATOPORA MINOR* Hennig. See *Corynotrypa dissimilis*.

STOMATOPORA PARVA Ringueberg. See *Corynotrypa elongata*.

STOMATOPORA PROUTANA Ulrich. See *Corynotrypa delicatula*.

STOMATOPORA RECTA Ringueberg. See *Corynotrypa dissimilis*.

STOMATOPORA TENUISSIMA Ulrich. See *Corynotrypa delicatula*.

STOMATOPORA TURGIDA Ulrich. See *Corynotrypa turgida*.

**STRAPAROLLINA** Billings.

Genotype: *S. pelagica* Billings.

*Straparollina* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 223.—Koken, Neues Jahrb. Min. Geol. Pal., 6, Beilage-Band, 1889, p. 428.—Miller, N. A. Geol. Pal., 1889, p. 426.

**Straparollina asperostriata** (Billings).

*Straparollus asperostriatus* Billings, Canadian Nat. Geol., 5, 1860, p. 162; Geol. Canada, Geol. Surv. Canada, 1863, p. 144, fig. 84.

*Straparollina asperostriatus* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 223 (gen. ref.).—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, p. 1078, fig.

Black River (Leray): Pauquettes Rapids, Ottawa River, Canada.

**Straparollina circe** (Billings).

*Straparollus Circe* Billings, Canadian Nat. Geol., 5, 1860, p. 161, figs. 1-3; Geol. Canada, Geol. Surv. Canada, 1863, p. 144, fig. 85a-c.

*Straparollina Circe* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 223 (gen. ref.).—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1078, figs.

Black River (Leray): Pauquettes Rapids, Ottawa River, Canada.

**Straparollina daphne** (Billings).

*Straparollus Daphne* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 160, fig. 145 (adv. sheets, 1862).

*Straparollina Daphne* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 93; Cont. Can. Pal., Geol. Surv. Canada, 1, pt. 4, 1892, p. 329.

Niagaran (Guelph): Galt, Ontario.

**Straparollina eurydice** (Billings).

*Straparollus Eurydice* Billings, Canadian Nat. Geol., 5, 1860, p. 162, figs. 4, 5; Geol. Canada, Geol. Surv. Canada, 1863, p. 144, fig. 86a, b.

*Straparollina eurydice* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 223 (gen. ref.).—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1078, figs.

Black River (Leray): Pauquettes Rapids, Ottawa River, Canada.

STRAPAROLLINA HARPA Hudson. See *Holopea harpa*.

**Straparollina minima** Whitfield.

*Straparollina minima* Whitfield, Bull. Amer. Mus. Nat. Hist., 9, 1897, p. 179, pl. 4, figs. 10-12.—Seely, Vermont State Geol. Rep. 7, pl. 61, figs. 10-12.

Canadian (Beekmantown): Colchester, Vermont.

**Straparollina pelagica** Billings.

*Straparollina pelagica* Billings, Pal. Foss., Geol. Surv. Canada, 1865, p. 223, fig. 205.—Miller, N. A. Geol. Pal., 1889, p. 426, fig. 714.

Canadian (Quebec—G, H): Pistolet Bay and Cape Norman, Newfoundland.

**STRAPAROLLUS** Montfort.

Genotype: *S. dionysii* Montfort.

*Straparollus* Montfort, Conch. Syst., 2, 1810, p. 174.—D'Orbigny, Prodr. de Pal., 1849, 1, p. 6.—McCoy, British Pal. Rocks Foss., 1854, p. 536.—Pictet, Traité de Pal., 2d ed., 3, 1855, p. 153.—Meek and Worthen, Proc. Acad. Nat. Sci.,



**STRAPAROLLUS**—Continued.

Philadelphia, 1860, p. 462; Geol. Surv. Illinois, 2, 1866, p. 158.—Hall, Pal. New York, 5, pt. 2, 1879, p. 54.—Koninck, Ann. d. Mus., Royal d'Hist. Nat. de Belgique, 6, 1881, p. 119.—Zittel, Handb. Pal., 2, 1882, p. 205.—Miller, N. A. Geol. Pal., 1889, p. 426.—Keyes, Amer. Geol., 5, 1890, p. 194; Missouri Geol. Surv., 5, 1894, p. 155.—Koken, Leitfossilien, Leipzig, 1896, p. 126; Neues Jahrb. Min., Geol., Pal., 1, 1898, p. 23; *ibid.*, 6, Beilage-Band, 1899, p. 405.—Grabau, Bull. Buffalo. Soc. Nat. Sci., 6, 1899, p. 277, fig. 205.—Pilsbry, Zittel-Eastman Textb. Pal., 1, 1900, p. 446.—Dall, *ibid.*, 2d ed., 1913, p. 527.

**STRAPAROLLUS ANGULATUS** Emmons. See *Raphistoma stamineum*.

**STRAPAROLLUS ASPEROSTRIATUS** Billings. See *Straparollina asperostriata*.

**Straparollus bicarinatus** Calvin.

*Straparollus bicarinatus* Calvin, Bull. Lab. Nat. Hist. State Univ. Iowa, 1, 1890, p. 179, pl. 2, fig. 2a, b.  
Niagaran: Monmouth, Iowa.

**STRAPAROLLUS CIRCE** Billings. See *Straparollina circe*.

**Straparollus claytonensis** Calvin.

*Straparollus claytonensis* Calvin, Bull. Lab. Nat. Hist. State Univ. Iowa, 2, 1892, p. 191; Amer. Geol., 10, 1892, p. 146.  
Ozarkian (Onocota): Northeastern Iowa.

**STRAPAROLLUS COMPLANATUS** Emmons. See *Ophileta complanata*.

**STRAPAROLLUS CRENULATUS** Whiteaves. See *Poleumita crenulata*.

**STRAPAROLLUS DAPHNE** Billings. See *Straparollina daphne*.

**STRAPAROLLUS EURYDICE** Billings. See *Straparollina eurydice*.

**STRAPAROLLUS HEMISPHERICUS** D'Orbigny. See *Diaphorostoma hemisphericum*.

**Straparollus hippolyta** Billings.

*Straparollus Hippolyta* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 160, fig. 144a, b.—Miller, N. A. Geol. Pal., 1889, p. 426, fig. 715.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 94 (*loc. occ.*).  
Niagaran (Guelph): Galt, Ontario; Wisconsin.

**Straparollus incarinatum** Foerste.

*Straparollus* (cf. *Oriostoma*) *incarinatum* Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 552, pl. 37A, figs. 7a, b.  
Upper Medinan (Brassfield): Huffman's quarry, near Dayton, Ohio.

**Straparollus intralobatus** Sardeson.

*Straparollus intralobatus* Sardeson, Bull. Minnesota Acad. Nat. Sci., 1896, p. 101, pl. 5, fig. 20.  
Ozarkian (Onocota): Altura, Winona County, Minnesota.

**STRAPAROLLUS LABIATUS** Emmons. See *Raphistoma stamineum*.

**STRAPAROLLUS LEVATUS** D'Orbigny. See *Ophileta levata*.

**STRAPAROLLUS MAGNUS** D'Orbigny. See *Maclurites magnus*.

**STRAPAROLLUS MATUTINA** Emmons. See *Maclurites matutinus*.

**STRAPAROLLUS MINNESOTENSIS** Owen. See *Raphistoma minnesotense*.

**Straparollus mopsus** Hall.

Straparollus mopsus Hall, 20th Rep. New York State Cab. Hist., 1868, p. 342, pl. 15 (6), figs. 21, 22; rev. ed., 1870, p. 390, pl. 15, figs. 21, 22.

Euomphalus (Straparollus) mopsus Whitfield, Geol. Wisconsin, 4, 1882, p. 358 (gen. ref.).

Niagaran (Racine): Racine and Waukeska, Wisconsin.

**Straparollus niagarensis** Hall and Whitfield.

Straparollus Niagarensis Hall and Whitfield, Geol. Surv. Ohio, Pal. 2, 1875, p. 144, pl. 8, fig. 3.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1079, fig.

Niagaran (Guelph): Cedarville, Ohio.

**Straparollus parvus** Cleland.

Straparollus parva Cleland, Bull. Amer. Pal., 3, 1900, p. 127 (255), pl. 15, figs. 10, 11. Canadian (Tribes Hill): Near Fort Hunter, New York.

STRAPAROLLUS PERVETUSTUS D'Orbigny. See *Euconia pervetusta*.

STRAPAROLLUS PLANISTRIA Emmons. See *Raphistoma stamineum*.

**Straparollus pristiniiformis** Calvin.

Straparollus pristiniiformis Calvin, Amer. Geol., 10, 1892, p. 146; Bull. Lab. Nat. Hist. Univ. Iowa, 2, 1892, p. 191.

Ozarkian (Oneota): Northeastern Iowa.

**Straparollus pumilis** Savage.

Straparollus pumilis Savage, Bull. Geol. Surv. Illinois 23, 1913, p. 100, pl. 5, fig. 29.

Upper Medinan (Edgewood): Near Edgewood, Missouri.

**Straparollus sanctisabae** (Roemer).

Euomphalus sancti-sabae Roemer, Die Kreidebildungen von Texas, 1852, p. 91, 421, pl. 11, figs. 5a, b.

Straparollus sanctisabae Miller, N. A. Geol. Pal. 1889, p. 426 (gen. ref.).

Ordovician: San Saba River, Texas.

**Straparollus sinuatus** (Hall).

Euomphalus sinuatus Hall, Pal. New York, 3, 1859, p. 340, pl. 69, fig. 1a, b.

Straparollus sinuatus Miller, N. A. Geol. Pal., 1889, p. 426 (gen. ref.).

Euomphalus cf. sinuatus Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 292, pl. 5, figs. 10-12.

Cayugan (Manlius): Herkimer County, New York.

STRAPAROLLUS SORDIDUS Emmons. See *Maclurites sordidus*.

STRAPAROLLUS STRIATUS Emmons. See *Raphistoma striatum*.

**Straparollus tricarinatus** Calvin.

Straparollus tricarinatus Calvin, Bull. Lab. Nat. Hist. State Univ. Iowa, 1, 1890, p. 179, pl. 2, figs. 2a, b.

Niagaran: Monmouth, Iowa.

STRAPAROLLUS UNIANGULATUS Emmons. See *Helicotoma uniangulata*.

**Straparollus valvataformis** Shumard.

Straparollus valvataformis Shumard, Trans. Acad. Sci. St. Louis, 2, 1863, p. 105.—

Keyes, Missouri Geol. Surv., 5, 1894, p. 157, pl. 51, fig. 8.

Canadian (Yellville): Ozark County, Missouri.

**STREPHOCHETUS** Seely. See *Girvanella* Nicholson and Etheridge.

**STREPHODES?** AUSTINI Salter. See *Acervularia austini*.

**STREPHODES** PICKTHORNII Salter. See *Cyathophyllum pickthorni*.

**STREPTASTER** Hall. Genotype: *Agelacrinus vorticellatus* Hall.  
*Streptaster* Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, pl. 6.—Foerste,  
 Bull. Sci. Lab. Denison Univ., 17, 1914, p. 450.

**Streptaster reversatus** Foerste.

*Streptaster reversata* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 451,  
 pl. 4, fig. 3.

Eden (Southgate): Two miles west of Million, Kentucky.

**Streptaster septembrachiatus** (Miller and Dyer).

*Agelacrinus septembrachiatus* Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist.,  
 1, 1878, p. 27, pl. 1, fig. 9.

*Agelacrinites septembrachiatus* Jaekel, Stammesg. Pemat., 1, Thecoidea u.  
 Cystoidea, Berlin, 1899, p. 50.

*Streptaster septembrachiatus* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914,  
 pl. 4, fig. 2.

Richmond (Liberty and Elkhorn): Waynesville and near Dayton, Ohio.

**Streptaster vorticellatus** (Hall).

*Agelacrinus* (*Streptaster*) *vorticellatus* Hall, 24th Rep. New York State Cab. Nat.  
 Hist., 1872, p. 215, pl. 6, figs. 11–13 (adv. sheets, 1871).

*Agelacrinites vorticellata* Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 57, pl. 3, figs.  
 7a, b.—Jaekel Stammesg. Pemat., 1, Thecoidea und Cystoidea, 1899, p. 50.

*Agelacrinus vorticellatus* Haackel, Amphor. u. Cystoideen, Leipzig, 1896, p. 112.  
*Streptaster vorticellatus* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, pl. 6,  
 fig. 4.

Maysville (Fairmount—Corryville): Cincinnati, Ohio, and vicinity.

**STREPTELASMA** Hall.

Genotype: *S. corniculum* Hall.

*Streptoplasma* Hall, Pal. New York, 1, 1847, p. 17, (changed to *Streptelasma* in  
 explanation of figures.)

*Streptelasma* D'Orbigny, Prodr. de Pal., 1, 1849, p. 24.—Edwards and Haime,  
 Mon. d. Polyp. Foss. d. Terr. Pal. (Arch. du Mus. d'Hist. Nat., 5) 1851, p.  
 168, 398.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 228.—Billings, Canadian  
 Nat. Geol., 1, 1856, p. 122.—Milne-Edwards, Hist. Nat. d. Corall., 3, 1860, p.  
 392.—Hitchcock, Geol. Vermont, 1, 1861, p. 290.—Dybowski, Archiv. f.  
 Natur. Liv-, Ehst- und Kurl., 5, 1873, pp. 334, 381.—Nicholson, Rep. Pal.  
 Prov. Ontario, pt. 2, 1875, p. 26; Geol. Surv. Ohio, Pal., 2, 1875, p. 217.—  
 Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 151.—Nicholson  
 and Etheridge, Mon. Sil. Foss. Girvan Dist., 1878, p. 67.—Nicholson,  
 Man. Pal., 1, 1879, p. 247, fig. 127B; pp. 278, 279, fig. 156a; p. 280, fig.  
 157; p. 297, figs. 178a, b.—Zittel, Handb. Pal., 1, 1879, p. 228.—Roemer,  
 Leth. geog., pt. 1, Leth. Pal., 1883, p. 365.—Hall and Simpson, Pal. New  
 York, 6, 1887, p. xi.—Miller, N. A. Geol. Pal., 1889, p. 204.—Sherzer, Amer.  
 Geol., 7, 1891, pp. 284–289.—James, Jour. Cincinnati Soc. Nat. Hist., 15, pt.  
 4, 1893, pp. 145–146.—Winchell and Schuchert, Geol. Nat. Hist. Surv. Min-  
 nesota, 3, pt. 1, 1895, p. 87.—Koken, Die Leitfossilien, Leipzig, 1896, p.  
 308.—Girty, 19th Ann. Rep. U. S. Geol. Surv., 1899, p. 556.—Grabau, Bull.  
 Buffalo Soc. Nat. Sci., 6, 1899, p. 122.—Zittel-Eastman Textb. Pal., 1, 1900,  
 p. 75.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 107.—  
 Pocta, Syst. Sil. du Centre Boheme, 8, pt. 2, 1902, p. 154.—Grabau and Shimer,

**STREPTELASMA**—Continued.

N. A. Index Fossils, 1, 1906, p. 54.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 700.—Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 82.

Petraia Zittel, Handb. Pal., 1, 1879, p. 226.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 410.—Miller, N. A. Geol. Pal., 1889, p. 199.—Sherzer, Amer. Geol., 7, 1891, pp. 278–283.—Koken, Die Leitfossilien, Leipzig, 1896, p. 313.—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 104.

Observation.—The type of *Streptelasma* has been cited by most authors as *S. expansum* because this species was the first to follow the generic diagnosis. This species, however, was founded upon a cystid plate (*Blastoidocrinus carcaridens*). Hall undoubtedly had *S. corniculum* in mind when he drew up the generic diagnosis, and *S. expansum* came first simply because of geological position. Lambe has employed *Petraia* for certain American species usually referred to *Streptelasma* but differing in having a deep calyx, no tabulae, dissepiments, or columella. Until the type of *Petraia* is better known it is believed best to refer these species to *Streptelasma*.

***Streptelasma angulatum*** (Billings).

*Petraia angulata* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 103, fig. 90a, b (Adv. sheets, 1862); Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 7 (loc. ref.).

*Streptelasma angulatum* Miller, N. A. Geol. Pal., 1889, p. 204 (gen. ref.).—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 112.

Richmond (English Head, Charleton): Charleton Point, West End, etc., Anticosti.

***Streptelasma (Petraia?) apertum*** (Billings).

*Petraia aperta* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 102, fig. 89a, b (Adv. sheets, 1862).—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 105.

*Streptelasma apertum* Miller, N. A. Geol. Pal., 1889, p. 204 (gen. ref.).

Black River (Leray): Pauquettes Rapids, Ottawa River, Canada.

**STREPTELASMA (DUNCANELLA) BOREALIS** Hall. See *Duncanella borealis*.

***Streptelasma breve*** Winchell and Schuchert.

*Streptelasma breve* Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 92, fig. 7.

Black River (Platteville): Near Fountain, Minnesota.

*Cotypes*.—Cat. No. 42538, U.S.N.M.

**STREPTELASMA CALICULA** var. **GEOMETRICUS** Foerste. See *Enterolasma geometricum*.

**STREPTELASMA (ENTEROLASMA) CALICULUM** Hall. See *Enterolasma caliculum*.

***Streptelasma conulus*** Rominger.

*Streptelasma conulus* Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 144, pl. 39, fig. 4.

*Zaphrentis conulus* Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 133, figs. 12–14.

Niagaran: Drummond's Island, Lake Huron; Louisville, Kentucky (Louisville).

***Streptelasma corniculum*** Hall.

*Streptoplasma corniculum* Hall, Pal. New York, 1, p. 69, pl. 25, figs. 1a–e.

*Streptelasma corniculum* Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal., 1851 (Arch. du Mus. d'Hist. Nat., 5), p. 398, pl. 7, figs. 4–4b (figures probably refer to *S. rusticum*).—Billings, Canadian Nat. Geol., 1, 1856,

**Streptelasma corniculum**—Continued.

- p. 122, figs. 3, 4.—Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 75.—Hitchcock, Geol. Vermont, 1, 1861, p. 291, fig. 191.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 142, pl. 51, lower tier.—Nicholson, Ann. Mag. Nat. Hist., 4th ser., 18, 1876, p. 94, pl. 5, figs. 15, 15a.—Zittel, Handb. Pal., 1, 1879, p. 217, fig. 126; p. 228, fig. 134.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 366.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1085, figs.—Ami, Ottawa Nat., 8, 1894, p. 84.—Keyes, Missouri Geol. Surv., 4, 1894, p. 117, pl. 13, fig. 9.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 90, pl. G, figs. 20, 21.—Shuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 154.—Ruedemann, Bull. New York State Mus., 49, 1901, p. 10.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 108, pl. 6, figs. 7a-b.—Weller, Geol. Surv. New Jersey, Pal. 3, 1903, p. 136, pl. 6, figs. 6, 7.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 55, fig. 76c-d.
- Streptelasma (Petraia) corniculum* Chamberlin, Geol. Wisconsin, 1, 1883, p. 153, fig.
- Streptoplasma parvula* Hall, Pal. New York, 1, 1847, p. 71, pl. 25, figs. 4a-c.
- Streptoplasma parvula* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 75.
- Petraia Ottawaensis* Billings, Canadian Nat. Geol., n. s., 2, 1865, p. 429.
- Streptoplasma crassa* Hall, Pal. New York, 1, 1847, p. 70, pl. 25, figs. 2a-c.
- Turbinolia mitrata* Eaton, Geol. Textb., 2d ed., 1832, p. 39, pl. 3, figs. 32, 33.—Clarke, 11th Rep. State Geol. New York, 1894, p. 34; *ibid.*, 45th Rep. New York State Mus., 1894, p. 350.
- Petraia cornicula* Chapman, Canadian Jour., n. s., 6, 1861, p. 510, fig. 79.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 156, fig. 118.—Chapman, Canadian Jour., n. s., 8, 1863, p. 198, fig. 178; Expos. Min. Geol. Canada, 1864, p. 104, fig. 79, p. 170, fig. 178.
- Petraia (Streptelasma) corniculum* Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 627, fig.
- Streptoplasma multilamellosa* Hall, Pal. New York, 1, 1847, p. 70, pl. 25, figs. 3a-c.
- Trenton: Trenton Falls, Middleville, etc., New York. Widely distributed in the United States and Canada.

**STREPTELASMA CORNICULUM** (part) Nicholson. See *Streptelasma rusticum*.

**STREPTELASMA CRASSA** Hall. See *Streptelasma corniculum*.

**Streptelasma dispanum** Foerste.

- Streptelasma dispanum* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 307, pl. 9, fig. 4a, b.
- Richmond (Waynesville): Moores Hill, Versailles, etc., Indiana; Ohio.

**Streptelasma divaricans** (Nicholson).

- Palæophyllum divaricans* Nicholson, Geol. Surv. Ohio, Pal., 2, 1875, p. 220, pl. 22, figs. 10, 10b.—White, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 377, pl. 52, fig. 4.—Hall, 12th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1883, p. 251, pl. 1, fig. 5.—Miller, N. A. Geol. Pal., 1889, p. 199, fig. 204.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 589, figs.—James, Jour. Cincinnati Soc. Nat. Hist., 15, pt. 4, 1893, p. 147.
- Streptelasma divaricans* Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 707, pl. 1, figs. 6, 6a.—Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 307, pl. 10, figs. 4a-e.

**Streptelasma divaricans**—Continued.

*Zaphrentis inequalis* Hall, 35th Rep. New York State Mus. Nat. Hist., 1884, pp. 430, 482 (ext., 1882, p. 26).

Richmond (Waynesville-Whitewater): Richmond, etc., Indiana; Oxford, etc., Ohio; Kentucky.

**Streptelasma divaricans angustatum** Foerste.

*Streptelasma divaricans angustatum* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 308, pl. 9, fig. 6a, b.

Richmond (Whitewater): Osgood, Indiana.

**Streptelasma expansum** (Hall).

*Streptelasma expansa* Hall, Pal. New York, 1, 1847, p. 17, pl. 4, figs. 6a, b.

*Streptelasma? expansa* Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal., 1851 (Arch. du Mus. d' Hist. Nat., 5), p. 399.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 228, pl. 3, figs. 6, 7a, b.—Milne-Edwards, Hist. Nat. d. Corall., 3, 1860, p. 393.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1085, figs.—Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 56.

Chazy: Chazy, New York.

Observation.—Founded upon a section of cystid plate (*Blastoidocrinus*).

**Streptelasma? (Zaphrentis?) extans** Hall.

*Streptelasma? (Zaphrentis?) extans* Hall, 35th Rep. New York State Mus. Nat. Hist., 1884 (ext., 1882, p. 5), p. 409.

Niagaran (?Racine): Milwaukee, Wisconsin.

**STREPTELASMA? GEOMETRICUM** Foerste. See *Enterolasma geometricum*.

**Streptelasma hoskinsoni** Foerste.

*Streptelasma Hoskinsoni* Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 344, pl. 9, figs. 1-4 (?5, 6); Geol. Surv. Ohio, Pal., 7, 1893, p. 601, pl. 34, figs. 1-6 (loc. occ.).

Upper Medinan (Brassfield): Near New Carlisle, Ohio.

**Streptelasma insolitum** Foerste.

*Streptelasma insolitum* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 306, pl. 10, fig. 3.

Richmond (Whitewater) bed: Decatur, Jennings, and Ripley Counties, Indiana.

**Streptelasma? latusculum** (Billings).

*Petraia latuscula* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 104, fig. 92a, b; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 33 (loc. ref.).

*Streptelasma latusculum* Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 114, pl. 6, figs. 9, 9a.

Anticostian (Gun River-Jupiter River): Three miles west of Jupiter River, East Point, and the Jumpers, Anticosti.

**Streptelasma latusculum trilobatum** (Whiteaves).

*Streptelasma rusticum* var. *trilobatum* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 113.

*Streptelasma latusculum* var. *trilobatum* Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 115.

Richmond (Stony Mountain): Stony Mountain, Manitoba.

**Streptelasma? (Zaphrentis?) limitare** Hall.

*Streptelasma? (Zaphrentis?) limitare* Hall, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 409 (ext., 1882, p. 5).

Niagaran: Racine, Wisconsin.

*STREPTELASMA MINIMA* Hall. See *Duncanella borealis*.

***Streptelasma obliquus* Foerste.**

*Streptelasma obliquus* Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 346, pl. 9, figs. 14, 15.

*Streptelasma obliquus* Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 601, pl. 34, figs. 14, 15 (loc. occ.).

Upper Medinan (Brassfield): Hanover, Indiana.

***Streptelasma(?) parasiticum* Ulrich.**

*Streptelasma (?) parasiticum* Ulrich in Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 89, fig. 6.

Black River (Platteville and Decorah): St. Paul and Minneapolis, Minnesota.

*Holotype*.—Cat. No. 42557, U.S.N.M.

*STREPTELASMA PARVULA* Hall. See *Streptelasma corniculum*.

***Streptelasma patula* Rominger.**

*Streptelasma patula* Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 143, pl. 39, fig. 1.

*Zaphrentis patula* Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 133, figs. 4-6.

Niagaran: Drummonds Island, Lake Huron; Point Detour, Michigan; Masonville, Iowa; Louisville, Kentucky (Louisville).

***Streptelasma (Petraia) profundum* (Conrad).**

*Cyathophyllum profundum* Conrad, Proc. Acad. Nat. Sci. Philadelphia, 1843, p. 335.—Owen, Geol. Iowa, Wisconsin, and Illinois, 1844, pl. 16, fig. 5.

*Streptoplasma profunda* Hall, Pal. New York, 1, 1847, p. 49, pl. 12, figs. 4a-d.

*Streptelasma profunda* Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal. (Arch. du Mus. d'Hist. Nat., 5), 1851, p. 400.—Billings, Canadian Nat. Geol., 1, 1856, p. 123, figs. 7, 8.—Hitchcock, Geol. Vermont, 1, 1861, p. 291.—Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 102.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 88, pl. G, figs. 17-19.—Sardeson, Amer. Geol., 20, 1897, p. 279, pl. 16, figs. 1-8; pl. 17, figs. 1-11.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 54, figs. 76a, b.

*Petraia profunda* Billings, Canadian Jour., n. s., 4, 1859, p. 120.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 105, pl. 6, figs. 5a, b.

Black River: Watertown, etc., New York; various localities in the United States and Canada.

*STREPTELASMA PULCHELLUM* Miller. See *Streptelasma selectum*.

***Streptelasma (Petraia) pygmæum* (Billings).**

*Petraia pygmæa* Billings, Pal. Foss., Geol. Surv. Canada, 1865, p. 103, fig. 91 (adv. sheets, 1862); Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 33 (loc. ref.).—Nicholson, Pal. Ontario, 1875, p. 59.—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 106, pl. 6, figs. 6, 6a, b.

*Streptelasma pygmæum* Miller, N. A. Geol. Pal., 1889, p. 204 (gen. ref.).

Anticostian (Gun River, Jupiter River): Challowpe River, etc., Anticosti.

***Streptelasma pygmæum occidentale* (Whiteaves).**

*Petraia (pygmæa? var.) occidentalis* Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 291, pl. 24, figs. 2-5.

Niagaran: Saskatchewan River, Canada.

**Streptelasma radicans** Hall.

*Streptelasma radicans* Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1877, pl. 5, figs. 1-4; mus. ed., 1879, p. 106, pl. 5, figs. 1-4; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 226, pl. 4, figs. 1-4.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1087, figs.

*Zaphrentis radicans* Davis, Kentucky Foss. Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 132, figs. 11-13.

Niagaran: Waldron, etc., Indiana; Newsom, Tennessee (Waldron); Louisville, Kentucky (Louisville).

**Streptelasma robustum** Whiteaves.

*Streptelasma corniculum?* Whiteaves, Geol. Surv. Canada, 1879-80, Rep. Progress, 1881, p. 57c.

*Streptelasma robustum* Whiteaves, Canadian Rec. Sci., 6, 1895, p. 390; Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 153, pl. 18, figs. 1, 1a.—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 109, pl. 7, fig. 1; Cruise of the "Neptune," App. 4, 1906, p. 325.

Richmond: Red River Valley, Lake Winnipeg, and Southampton Island, Hudson Bay, Canada.

**Streptelasma rusticum** (Billings).

*Petraia rustica* Billings, Canadian Nat. Geol., 3, 1858, p. 422; Geol. Surv. Canada, Rep. Progress, 1858, p. 168.

*Zaphrentis rustica* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 106.

*Streptelasma rusticum* Miller, N. A. Geol. Pal., 1889, p. 205.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 2, 1895, p. 113 (loc. occ.).—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 93, pl. G, figs. 22, 23.—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 110, pl. 7, figs. 2, 2a, 3.—Nickles, Amer. Geol., 32, 1903, p. 207.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 342.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 55, fig. 76c-f.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 708, pl. 2, figs. 2, 2b.

*Petraia Canadensis* Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 208, fig. 205.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 627, fig.

*Zaphrentis Canadensis* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 105, fig. 93a-c (adv. sheets, 1862).—Hall, 35th Rep. New York State Mus., 1884, pl. 16, figs. 1-3.

*Streptelasma vagans* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 305, pl. 11, figs. 1a-c.

*Zaphrentis corniculum* Davis, Kentucky Foss. Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 132, figs. 1-3; pl. 138, fig. 8.

*Streptelasma corniculum* Edwards and Haime (not Hall), Mon. Poly. Foss. des Terr. Pal., 1851, pl. 7, fig. 4.—Nicholson, Pal. Ohio, 2, 1875, p. 208.—Rominger, Geol. Surv. Michigan, 1876, p. 141, pl. 51, upper row.—Hall, 11th Rep. State Geol. Indiana, 1882, p. 376, pl. 51, figs. 2-4.—Nicholson, Manual of Pal., 1, 1889, p. 247, fig. 127b; pp. 278, 279, figs. 156a-b; p. 280, fig. 157; p. 297, figs. 178a, 178b.

Richmond: Snake Island, Lake St. John, Canada. Widespread and abundant in all divisions of the Richmond in the United States and Canada.

**STREPTELASMA RUSTICUM** var. **TRILOBATUM** Whiteaves. See *Streptelasma laticulum* trilobatum.

**Streptelasma selectum** (Billings).

*Petraia selecta* Billings, Canadian Nat. Geol., n. s., 2, 1865, p. 429; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 7, 33.



**Streptelasma selectum**—Continued.

*Streptelasma selectum* Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 113, pl. 6, figs. 8, Sa.

*Petraia pulchella* Billings, Canadian Nat. Geol., n. s., 2, 1865, p. 429; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 33.

*Streptelasma pulchellum* Miller, N. A. Geol. Pal., 1889, p. 204 (gen. ref.).

Gamachian (Ellis Bay): Gamache Bay, etc., Anticosti.

**Streptelasma spongaxis** Rominger.

*Streptelasma spongaxis* Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 144, pl. 39, fig. 2.

*Zaphrentis spongiaxis* Davis, Kentucky Foss. Corals, Geol. Surv. Kentucky, 1885, pt. 2, pl. 132, figs. 4-6.

Niagaran: Point Detour, Michigan; Drummonds Island, Lake Huron; Masonville, Iowa; Louisville, Kentucky (Louisville); Laurel, Indiana (Laurel).

**STREPTELASMA VAGANS** Foerste. See *Streptelasma rusticum*.

**STREPTELASMA WAYNENSE** Miller. See *Enterolasma waynense*.

**STREPTIS** Davidson.

Genotype: *Terebratula grayi* Davidson.

*Streptis* Davidson, Geol. Mag., 8, 1881, p. 150, pl. 5, fig. 13.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 274; 11th Ann. Rep. New York State Geol., 1894, p. 289.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 315; *ibid.*, 2d ed., 1913, p. 388.

**Streptis grayi** (Davidson).

*Terebratula grayii* Davidson, Bull. Soc. Geol. France, 2d ser., 5, 1848, p. 331, pl. 3, fig. 33.

*Atrypa? grayi* Davidson, British Sil. Brach., Pal. Soc., 1866, 1867, p. 141, pl. 13, figs. 14-22.

*Streptis Grayi* Davidson, Mon. British Foss. Brachiopoda, 5, 1883, Sil. Suppl., Pal. Soc., p. 139.—Williams, Amer. Jour. Sci., 3d ser., 48, 1894, p. 331.

Silurian: England; Batesville, Arkansas (St. Clair.)

**STREPTIS WALDRONENSIS** Beecher and Clarke. See *Mimulus waldronensis*.

**STREPTOCERAS** Billings.

Genotype: *S. janus* Billings.

*Streptoceras* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 88.—Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 281.—Miller, N. A. Geol. Pal., 1889, p. 454.—Hyatt, Zittel-Eastman Textb. Pal., 1, 1900, p. 531, *ibid.*, 2d ed., 1913, p. 611.

**Streptoceras heros** Billings.

*Streptoceras heros* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 89, fig. 28, lower.

Niagaran (Lockport): Grimsby, Ontario.

**Streptoceras janus** Billings.

*Streptoceras Janus* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 88, fig. 28, upper.—Miller, N. A. Geol. Pal., 1889, p. 454, text fig. 760.

Niagaran (Lockport): Grimsby, Ontario.

**STREPTOLASMA** D'Orbigny. See *Streptelasma* Hall.

**STREPTOMYTILUS** Kindle and Breger.

Genotype: *S. wabashensis* Kindle and Breger.

*Streptomytilus* Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 453.

**Streptomytilus aphæa** (Hall).

Ambonychia Aphæa Hall, 20th Rep. New York State Cab. Nat. Hist., 1868 (extras, 1865), p. 336, pl. 14 (5), fig. 3; p. 38b; rev. ed., 1870, p. 383, pl. 14, fig. 3.—Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 108.

Streptomytilus aphæa Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 452 (gen. ref.).

Niagaran (Racine): Wauwatosa, Wisconsin; Bridgeport, Illinois.

Observation.—See *S. pernoides* Whiteaves for a possible synonym.

**Streptomytilus eduliformis** (Clarke and Ruedemann).

Mytilarca eduliformis Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 47, pl. 5, figs. 8–10.

Streptomytilus eduliformis Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 452 (gen. ref.).

Niagaran (Guelph): Rochester, New York.

**Streptomytilus pernoides** (Whiteaves).

Mytilarca pernoides Whiteaves, Geol. Surv. Canada, Ann. Rep., n. s., 14, App. F, 1904, p. 47; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 255, pl. 27, fig. 8.

Niagaran: Ekwan River, Canada.

Observation.—Probably a synonym of *S. aphæa* (Hall).

**Streptomytilus wabashensis** Kindle and Breger.

Streptomytilus wabashensis Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 452, pl. 10, figs. 11, 12.

Niagaran: Wabash, Indiana.

STREPTOPLASMA Hall. See *Streptelasma* Hall.

STREPTOPLASMA CRASSA Hall. See *Streptelasma corniculum*.

STREPTOPLASMA MULTILAMELLOSA Hall. See *Streptelasma corniculum*.

STREPTOPLASMA PARVULA Hall. See *Streptelasma corniculum*.

STREPTORHYNCHUS AMERICANUS Miller. See *Clitambonites diversus*.

STREPTORHYNCHUS APPROXIMATA James. See *Strophomena vetusta approximata*.

STREPTORHYNCHUS CARDINALE Whitfield. See *Strophomena cardinalis*.

STREPTORHYNCHUS CONVEXUM Sardeson. See *Strophomena incurvata*.

STREPTORHYNCHUS DEFLECTUM Miller. See *Dinorthis (Plæsiomys) deflecta*.

STREPTORHYNCHUS (STROPHONELLA) DELTOIDEA Hall. See *Rafinesquina deltoidea* and *Strophomena winchelli*.

STREPTORHYNCHUS (STROPHOMENA) ELONGATA James. See *Strophomena planumbona elongata*.

STREPTORHYNCHUS ELONGATA Mickelborough and Wetherby. See *Strophomena rugosa*.

STREPTORHYNCHUS FILITEXTA Hall. See *Strophomena incurvata* and *S. neglecta*.

STREPTORHYNCHUS HALLANUM Miller. See *Strophomena hallie*.

STREPTORHYNCHUS(?) HALLIE Miller. See *Strophomena hallie*.

STREPTORHYNCHUS HEMIASTER Winchell and Marcy. See *Schuchertella subplana*.

- STREPTORHYNCHUS HYDRAULICUM** Whitfield. See *Schuchertella hydraulica*.
- STREPTORHYNCHUS MINOR** Walcott. See *Strophomena(?) minor*.
- STREPTORHYNCHUS NEGLECTA** James. See *Strophomena neglecta*.
- STREPTORHYNCHUS NUTANS** Miller. See *Strophomena nutans*.
- STREPTORHYNCHUS PATENTA** Hall. See *Strophonella patentia*.
- STREPTORHYNCHUS PLANOCONVEXA** Miller. See *Strophomena planocconvexa*.
- STREPTORHYNCHUS PLANUMBONUM** of authors. See *Strophomena planumbona*.
- STREPTORHYNCHUS? PRIMORDIALE** Whitfield. See *Billingsella(?) primordialis*.
- STREPTORHYNCHUS RECTUS** Miller. See *Dinorthis (Plæsiomys) deflecta*.
- STREPTORHYNCHUS SINUATUM** Lesley. See *Strophomena sinuata*.
- STREPTORHYNCHUS (STROPHOMENA) SUBPLANA** Hall. See *Schuchertella subplana*.
- STREPTORHYNCHUS SUBSULCATUM** Sardeson. See *Strophomena scofieldi*.
- STREPTORHYNCHUS SUBTENTA** Hall. See *Strophomena trentonensis*.
- STREPTORHYNCHUS SUBTENTUM** Lesley. See *Strophomena planumbona*.
- STREPTORHYNCHUS SULCATUS** Hall. See *Strophomena sulcata*.
- STREPTORHYNCHUS TENUIS** Hall. See *Schuchertella tenuis*.
- STREPTORHYNCHUS (STROPHOMENA) VETUSTA** James. See *Strophomena vetusta*.
- STREPTOSOLEN** Ulrich and Everett. Genotype: *S. obconicus* Ulrich and Everett.  
*Streptosolen* Miller, N. A. Geol. Pal., 1889, p. 165 (Ulrich and Everett in press).—  
 Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 273.
- Streptosolen obconicus** Ulrich and Everett.  
*Streptosolen obconicus* Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 274,  
 pl. 4, figs. 4, 4a, b.  
 Black River (Platteville): Near Dixon, Illinois.
- STREPTOSPONGIA** Ulrich. Genotype: *S. labyrinthica* Ulrich.  
*Streptospongia* Ulrich, Amer. Geol., 3, 1889, p. 235, 244.—Miller, N. A. Geol. Pal.,  
 1889, p. 165.
- Streptospongia labyrinthica** Ulrich.  
*Streptospongia labyrinthica* Ulrich, Amer. Geol., 3, 1889, p. 244, fig. 8, p. 236.  
*Girvanella labyrinthica* James, J. F., Jour. Cincinnati Soc. Nat. Hist., 14, pt. 1,  
 1891, p. 51.  
 Richmond (Arnheim): Near Lebanon, Kentucky.  
*Holotype*.—Cat. No. 46572, U.S.N.M.
- STREPTOTROCHUS** Perner. Genotype: *S. rugulosus* Barrande.  
*Streptotrochus* Perner, Syst. Sil. du Centre Boheme, pt. 1, 4, Gasteropoden, 2,  
 1907, p. 238.—Williams, Proc. U. S. Nat. Mus., 42, 1912, p. 394.
- Streptotrochus carinatus** Williams.  
*Streptotrochus carinatus* Williams, Proc. U. S. Nat. Mus., 42, 1912, p. 395, pl. 50,  
 fig. 8.  
 Silurian (Eastport): West side of Shackford Head, Moose Island, Eastport,  
 Maine.  
*Holotype*.—Cat. No. 58444, U.S.N.M.

**Streptotrochus ione** Williams.

*Streptotrochus ione* Williams, Proc. U. S. Nat. Mus., 42, 1912, p. 395, pl. 50, fig. 13.

Silurian (Eastport): West side of Shackford Head, Moose Island, Eastport, Maine.

*Holotype*.—Cat. No. 58447, U.S.N.M.

**Streptotrochus regularis** Williams.

*Streptotrochus regularis* Williams, Proc. U. S. Nat. Mus., 42, 1912, p. 395, pl. 50, fig. 12.

Silurian (Eastport): West side of Shackford Head, Moose Island, Eastport, Maine.

*Holotype*.—Cat. No. 58446, U.S.N.M.

**Streptotrochus sulcatus** Williams.

*Streptotrochus sulcatus* Williams, Proc. U. S. Nat. Mus., 42, 1912, p. 396, pl. 50, fig. 9.

Silurian (Eastport): West side of Shackford Head, Moose Island, Eastport, Maine.

*Holotype*.—Cat. No. 58445, U.S.N.M.

**STREPULA** Jones and Holl.

Genotype: *S. concentrica* Jones and Holl.

*Strepula* Jones and Holl, Ann. Mag. Nat. Hist., 5th ser., 17, 1886, p. 403.—Krause, Zeits. d. d. geol. Gesell., 41, 1889, p. 15.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 711.—Koken, Die Leitfossilien, Leipzig, 1896, p. 40.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 305.—Bonnena, Mitt. Min. Geol. Inst. Groningen, 2, 1909, p. 48.

**Strepula irregularis** Jones and Holl.

*Strepula irregularis* Jones and Holl, Ann. Mag. Nat. Hist., 5th ser., 17, 1886, p. 404, pl. 13, figs. 5, 7, 8, 9, 15.—Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 519, pl. 95, figs. 12-15.

Silurian (Wenlock): England.

Helderbergian (Keyser): Cumberland, Maryland.

*Plesiotypes*.—Cat. No. 53281, U.S.N.M.

STREPULA LUNATIFERA Ulrich. See *Tetradella lunatifera*.

STREPULA QUADRILIRATA Ulrich. See *Tetradella quadrilirata*.

**STRIATOPORA** Hall.

Genotype: *S. flexuosa* Hall.

*Striatopora* Hall, Amer. Jour. Sci. Arts, 2d ser., 1851, p. 400; Rep. Geol. Surv. Iowa, 1, pt. 2, 1858, p. 478.—Billings, Canadian Jour., n. s., 5, 1860, p. 253.—Rominger, Amer. Jour. Sci. Arts, 2d ser., 34, 1862, p. 391.—Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 368.—Nicholson, Rep. Pal. Prov. Ontario, pt. 1, 1874, p. 58.—Rominger, Geol. Surv. Illinois, 3, pt. 2, 1876, p. 58.—Nicholson, Tab. Corals Pal. Period, 1879, p. 97.—Zittel, Handb. Pal., 1, 1879, p. 237.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 439.—Hall and Simpson, Pal. New York, 6, 1887, p. 12.—Miller, N. A. Geol. Pal., 1889, p. 205.—Beecher, Trans. Connecticut Acad. Arts Sci., 8, 1891, pp. 209, 211.—Sardeson, Neues Jahrb. Min., Geol. and Pal., Beilage-Band, 10, 1896, p. 304, p. 252.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 40.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 147; Bull. New York State Mus., 45, 1901, p. 147.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 94; Zittel-Eastman Textb. Pal., 1900, p. 100; 2d ed., 1913, p. 114.

**Striatopora flexuosa** Hall.

*Striatopora flexuosa* Hall, Pal. New York, 2, 1852, p. 156.—Pietet, *Traite de Pal.*, 2d ed., 4, 1857, p. 170, pl. 92, fig. 21.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 55, fig. 26; Tab. Corals Pal. Period, 1879, p. 98, fig. 18.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 440, fig. 105.—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 40.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 148, fig. 45; Bull. New York State Mus., 45, 1901, p. 148, fig. 45.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 94, fig. 151.  
Clinton: Lockport, etc., New York; Grimsby, etc., Ontario (Rochester); Osgood, Indiana (Osgood).

**Striatopora gorbyi** Miller.

*Striatopora gorbyi* Miller, 18th Ann. Rep. Geol. Nat. Res. Indiana, 1894, p. 261, pl. 8, fig. 1 (adv. sheets, 1892).  
Niagaran (Laurel): St. Paul, Indiana.

**Striatopora huronensis** Rominger.

*Striatopora huronensis* Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 58, pl. 24, fig. 2.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 51, fig. 3; pl. 64, figs. 5, 6.  
Niagaran: Point Detour, Lake Huron, Michigan; Louisville, Kentucky (Louisville).

**Striatopora (Cladopora?) proboscoidialis** Foerste.

*Striatopora (Cladopora?) proboscoidialis* Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 337.  
Upper Medinan (Brassfield): Fair Haven and Ludlow Falls, Ohio.

**STRIBALOCYSTITES** Miller.Genotype: *S. tumidus* Miller.

*Stribalocystites* Miller, 17th Rep. Geol. Surv. Indiana, 1892, p. 630 (adv. sheets, 1871); N. A. Geol. Pal., 1st App., 1892, p. 682.—Jaekel, Stammesges. Pemat., 1, 1899, p. 312.—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 67.

**Stribalocystites? elongatus** (Rowley).

*Stribalocystis? elongatus* Rowley, Amer. Geol., 34, 1904, p. 273, pl. 16, fig. 25, 26.  
Niagaran or Helderbergian: Red Rock Landing, Perry County, Missouri.

**Stribalocystites gorbyi** Miller.

*Stribalocystites gorbyi* Miller, 18th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1894, p. 265, pl. 2, figs. 3-8 (adv. sheets, 1892); N. A. Geol. Pal., 1st App., 1892, p. 682, fig. 1249.—Jaekel, Stammesges. Pemat., 1, Thecoidea u. Cystoidea, Berlin, 1899, p. 312.  
Niagaran (Laurel): St. Paul, Indiana.

**Stribalocystites missouriensis** (Rowley).

*Stribalocystis missouriensis* Rowley, Amer. Geol., 25, 1900, p. 71, pl. 2, figs. 40, 41; *ibid.*, 34, p. 273, pl. 16, figs. 23, 24.  
Niagaran (Bainbridge): Near St. Marys, Ste. Genevieve County, Missouri.

**Stribalocystites sphaeroidalis** Miller and Gurley.

*Stribalocystites sphaeroidalis* Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 6, 1895, p. 58, pl. 5, figs. 19-21.—Miller, N. A. Geol. Pal., 2d App., p. 753, fig. 1397.  
Niagaran (Laurel): St. Paul, Indiana.

**Stribalocystites tumidus** Miller.

*Stribalocystites tumidus* Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 630, pl. 6, figs. 33, 34 (adv. sheets, 1891, p. 20); N. A. Geol. Pal., 1st App., p. 632, fig. 1250.—Jaekel, Stammesg. Pelmat., 1, Thecoidea u. Cystoidea, Berlin, 1899, p. 313.

Niagaran (Laurel): St. Paul, Indiana.

STRICKLANDIA Billings. See *Stricklandinia* Billings.

STRICKLANDIA? ARACHINE Billings. See *Syntrophia arachne*.

**STRICKLANDINIA** Billings. Genotype: *Stricklandia gaspensis* Billings.

*Stricklandia* Billings, Canadian Nat. and Geol., 4, 1859, p. 132; Canadian Jour., 6, 1861, p. 265; Pal. Fossils, 1, 1865, p. 84; Proc. Portland Soc. Nat. Hist., 1863, p. 114.—Waagen, Pal. Indica, 13th ser., 1, 1883, p. 412.

*Stricklandinia* Billings, Canadian Nat. and Geol., 8, 1863, p. 370.—Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, p. 160; Pal. New York, 4, 1867, p. 369.—Billings, Pal. Fossils, 2, 1874, p. 78.—Netteleth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 64.—Miller, N. A. Geol. Pal., 1889, p. 379.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 249; 13th Ann. Rep. New York State Geologist, 1895, p. 847.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 321; 2d ed., 1913, p. 395.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 274.

**Stricklandinia anticostiensis** (Billings?) Hall and Clarke.

*Stricklandinia anticostiensis* (Billings?) Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 251, pl. 73, figs. 12–14.

Anticostian: Island of Anticosti.

STRICKLANDINIA ARETHUSA Billings. See *Syntrophia arethusa*.

**Stricklandinia billingsiana** Dawson.

*Stricklandinia billingsiana* Dawson, Canadian Nat. and Geol., 2d ser., 9, 1880, p. 341.

Silurian: Pictou, Nova Scotia.

**Stricklandinia brevis** (Billings).

?*Spirifer* species? Hall, Pal. New York, 2, 1852, p. 66, pl. 22, fig. 3.

*Stricklandia brevis* Billings, Canadian Nat. and Geol., 4, 1859, p. 135.

*Stricklandinia brevis* Billings, Pal. Fossils, 2, 1874, p. 84, pl. 6, fig. 2.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 251.

Anticostian (Gun River, Jupiter River): Southwest Point, etc., Anticosti.

**Stricklandinia canadensis** (Billings).

*Stricklandia canadensis* Billings, Canadian Nat. and Geol., 4, 1859, p. 135.

*Stricklandinia canadensis* Billings, Pal. Fossils, 2, 1874, p. 81; pl. 6, fig. 3; pl. 7, fig. 2.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 251.

Lower Clinton: Near Thorold, Ontario.

**Stricklandinia castellana** White.

*Stricklandinia castellana* White, Proc. Acad. Nat. Sci. Philadelphia, 1876, p. 30.—

Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 251, pl. 73, figs. 3–7.—

Weller and Davidson, Jour. Geol., 4, 1896, p. 173.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 275, fig. 333.

Niagaran: Castle Grove, Jones County, Iowa.

**Stricklandinia chapmani** Hall and Clarke.

*Stricklandinia chapmani* Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pl. 83, fig. 40.

Niagaran: Hamilton, Ontario.

**Stricklandinia davidsoni** Billings.

*Stricklandinia davidsoni* Billings, Geol. Mag., 5, 1868, p. 59, pl. 4, figs. 1-1d; Pal. Fossils, 2, 1874, p. 86, pl. 6, fig. 1, p. 80, figs. 46, 47.—White, Proc. U. S. Nat. Mus., 3, 1880, p. 48.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 251, pl. 73, fig. 15.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 274.

*Stricklandinia lens* Billings (not *Atrypa lens* Sowerby), Cat. Sil. Foss. Anticosti, 1866, p. 45.—Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 321, pl. 5, figs. 1-4.

Anticostian (Gun River-Chicotte): Southwest Point, The Jumpers, etc., Anticosti.

?Clinton: Ringgold, Catoosa County, Georgia.

**Stricklandinia deformis** Meek and Worthen.

*Stricklandinia deformis* Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1870, p. 37; Geol. Surv. Illinois, 6, 1875, p. 502, pl. 24, fig. 5.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 251, pl. 73, figs. 8-10.

Niagaran: Carroll County, Illinois.

**Stricklandinia(?) dichotoma** Foerste.

*Stricklandinia(?) dichotoma* Foerste, Jour. Geol., 11, 1903, p. 707; Bull. Sci. Lab. Denison Univ., 14, 1909, p. 71, pl. 1, figs. 2A, B.

Upper Medinan (Brassfield): Riverside and Iron City, Tennessee.

**Stricklandinia gaspiensis** (Billings).

*Stricklandia gaspiensis* Billings, Canadian Nat. and Geol., 4, 1859, p. 134.

*Stricklandinia gaspiensis* Billings, Geol. Surv. Canada, Pal. Foss., 2, 1874, p. 83, fig. 49, pt. 6, fig. 4a.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 251, pl. 73, fig. 11.

Silurian: Bay of Chaleurs, Quebec.

STRICKLANDINIA LENS Billings. See *Stricklandinia davidsoni*.

**Stricklandinia lirata** (Sowerby).

*Spirifer liratus* Sowerby, Murchison's Silurian System, 1839, pl. 22, fig. 6.

*Stricklandinia lirata* Davidson, Mon. British Sil. Brach., Pal. Soc., 1867, p. 159, pl. 20, figs. 1-13.—Billings, Cat. Sil. Foss. Anticosti, 1866, p. 45; Pal. Foss., Geol. Surv. Canada, 2, pt. 1, 1874, pl. 6, fig. 4.

Silurian: Europe; East Point, The Jumpers, etc., Anticosti (Gun River-Jupiter River).

**Stricklandinia(?) louisvillensis** Nettelroth.

*Stricklandinia louisvillensis* Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 65, pl. 34, figs. 31-34.

Niagaran (Louisville): East of Louisville, Kentucky.

*Holotype*.—Cat. No. 51319, U.S.N.M.

**Stricklandinia melissa** Billings.

*Stricklandinia melissa* Billings, Pal. Fossils, 2, 1874, p. 89, pl. 7, fig. 4.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 251.—Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 323.

Anticostian (Jupiter River): Southwest Point, Anticosti.

**Stricklandinia multilirata** Whitfield.

*Stricklandinia multilirata* Whitfield, Ann. Rep. Geol. Surv. Wisconsin, 1877, p. 81; Geol. Wisconsin, 4, 1882, p. 315, pl. 23, figs. 3-5.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 251, pl. 73, figs. 1, 2.  
Niagaran (Guelph): Sheboygan, Wisconsin.

**Stricklandinia norwoodi** Foerste.

*Stricklandinia norwoodi* Foerste, Bull. Kentucky Geol. Surv., 7, 1906, p. 324, pl. 1, figs. 1a-d.  
Clinton (Oldham): Five and one-half miles south of Indian Fields, etc., Kentucky.

**Stricklandinia salteri** Billings.

*Stricklandinia salteri* Billings, Geol. Mag., 5, 1868, p. 61, pl. 4, figs. 2-2a; Pal. Fossils, 2, 1874, p. 87, pl. 7, fig. 1.—White, Proc. U. S. Nat. Mus., 3, 1880, p. 48.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 251.  
Anticostian (Gun River, Jupiter River): Heath Point and Cormorant Point, Anticosti.

**Stricklandinia triplesiana** Foerste.

*Stricklandinia triplesiana* Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 89, pl. 14, figs. 13, 14.; Proc. Boston Soc. Nat. Hist., 24, 1890, p. 323; Geol. Ohio, 7, 1895, p. 594, pl. 26, figs. 13, 14.  
Upper Medinan (Brassfield): Dayton, Ohio.

STROBILOSPONGIA Beecher. See *Pattersonia* Miller.

**STROMATOCERIUM** Hall.

Genotype: *S. rugosum* Hall.

*Stromatocerium* Hall, Pal. New York, 1, 1847, p. 48.—Winchell, Proc. Amer. Assoc. Adv. Sci., 15, 1867, p. 93.—Nicholson and Murie, Jour. Linnean Soc. London, Zool., 14, 1878, p. 189, 222.—Zittel, Handb. Pal., 1, 1879, p. 287.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 535.—Nicholson, Mon. British Strom., Pal. Soc., 1886, p. 8, 17.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 9, 1886, p. 252; 1892, p. 93.—Miller, N. A. Geol. Pal., 1889, p. 165.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 46.—Parks, Univ. Toronto Studies, Geol. Series, No. 7, 1910, p. 8.

**Stromatocerium canadense** Nicholson and Murie.

*Stromatocerium canadense* Nicholson and Murie, Jour. Linn. Soc. Zool., 14, 1878, p. 223, pl. 3, figs. 9, 10.—James, Jour. Cincinnati Soc. Nat. Hist., 15, 1892, p. 93; *ibid.*, 9, 1886, p. 252.—Parks, Univ. Toronto Studies, Geol. Series, No. 7, 1910, p. 15, pl. 21, figs. 8, 9; pl. 22, figs. 1-3.  
*Labechia canadense* Nicholson, Mon. British Strom., 1886, p. 32, pl. 2, figs. 3-5; Ann. Mag. Nat. Hist., 5th ser., 18, 1886, p. 14, pl. 2, fig. 5; Mon. British Strom., 1891, p. 163, pl. 20, fig. 9.—Whiteaves, Can. Rec. Sci., 7, 1897, p. 131.  
Black River: Peterborough, Pauquettes Rapids, etc., Canada; Kentucky; Tennessee.  
*Plesiotype*.—Cat. No. 49502, U.S.N.M.

STROMATOCERIUM CANADENSE var. MINIMUM Parks. See *Stromatocerium pustulosum*.

**Stromatocerium eatoni** Seely.

*Stromatocerium Eatoni* Seely, Rep. Vermont State Geol., 4, 1904, p. 146, pl. 71, pl. 74, fig. 2.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 46.  
Chazyan: Isle La Motte, Vermont (Crown Point, Valcour).



**Stromatocerium huronense** (Billings).

- Stenopora Huronensis Billings, Geol. Surv. Canada, Pal. Foss., 1, 1865, p. 185.  
 Tetradium huronense Foord (part), Contr. Canadian Cambro-Sil. Micropal., 1883, p. 25, pl. 7, figs. 1, 1a.  
 Labechia huronensis Whiteaves, Canadian Rec. Sci., 7, 1897, p. 131.—Lambe, Ottawa Nat., 13, 1899, p. 170.  
 Stromatocerium huronense Parks, Univ. Toronto Studies, Geol. Ser., No. 7, 1910, p. 20, pl. 22, figs. 4-10; pl. 23, fig. 5.  
 Alveolites granulosus James, Cat. Foss. Cincinnati Group, 1872, p. 2; Jour. Cincinnati Soc. Nat. Hist., 15, 1892, p. 148, fig. 9a-c.  
 Labechia ohioensis Nicholson, Mon. British Strom., 1885, p. 32, pl. 1, figs. 1, 2, footnote; Ann. Mag. Nat. Hist., 5th ser., 18, 1886, p. 13, pl. 2, figs. 1, 2.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 46, fig. 73.  
 Richmond: Cape Smyth, etc., Ontario; Ohio; Indiana; Kentucky.

**Stromatocerium huronense australe** Parks.

- Stromatocerium huronense var. australe Parks, Univ. Toronto Studies, Geol. Series, No. 7, 1910, p. 24, pl. 22, fig. 11.  
 Richmond: Near Lebanon, and Jefferson County, Kentucky.  
 Maysville (Leipers): Nashville, Tennessee.  
*Holotype*.—Cat. No. 49507, U.S.N.M.

**Stromatocerium lamottense** Seely.

- Stromatocerium lamottense Seely, Rep. Vermont State Geol., 4, 1904, p. 147, pl. 69; pl. 72; pl. 74, fig. 1.  
 Chazyan (Crown Point, Valcour): Isle La Motte, Vermont.

**Stromatocerium lamottense chazianum** Seely.

- Stromatocerium lamottense var. chazianum Seely, Rep. Vermont State Geol., 4, 1904, p. 148, pl. 73, upper fig.  
 Chazyan (Crown Point, Valcour): Basin Harbor, Appletree Point, and South Hero, Vermont; Chazy, New York.

**Stromatocerium michiganense** Parks.

- Stromatocerium michiganense Parks, Univ. Toronto Studies, Geol. Series, No. 7, 1910, p. 9, pl. 21, figs. 1, 2.  
 Lower Trenton: Ann Arbor, Michigan (Drift).  
*Holotype*.—Cat. No. 56834, U.S.N.M.

**Stromatocerium? moniliferum** Seely.

- Stromatocerium? moniliferum Seely, Rep. Vermont State Geol., 4, 1904, p. 149, pl. 73, lower fig.; pl. 74, figs. 3, 4.  
 Chazyan (Crown Point, Valcour): Isle La Motte, Vermont.

**Stromatocerium montiferum** (Ulrich).

- Labechia montifera Ulrich, Contr. to Amer., Pal., 1, 1886, p. 33, pl. 2, figs. 9, 9a.—Cumings, 32d Ann. Rep. Dep. Geol. Res. Indiana, 1907, p. 704, pl. 1, figs. 2-2b.  
 Richmond (Whitewater—Saluda): Madison, Indiana.

**Stromatocerium pustulosum** (Safford).

- Stromatopora pustulosa Safford, Geol. Tennessee, 1869, p. 285.  
 Stromatocerium pustulosum Hayes and Ulrich, U. S. Geol. Surv., Folio 95, 1903, illustr. sheet, figs. 23, 24.  
 Stromatocerium canadense var. minimum Parks, Univ. Toronto Studies, Geol. Ser., No. 7, 1910, p. 20, pl. 22, fig. 3.

**Stromatocerium pustulosum**—Continued.

Trenton: Nashville and many other localities in Tennessee (Bigby, Catheys); various localities in Kentucky (Bigby—Cynthiana).

*Plesiotypes*.—Cat. Nos. 35406, 36930, U.S.N.M.

**STROMATOCERIUM RICHMONDENSE** Miller. See *Girvanella richmondensis*.

**Stromatocerium rugosum** Hall.

*Stromatocerium rugosum* Hall, Pal. New York, 1, 1847, p. 48, pl. 12, figs. 2, 2a, b.—Billings, Canadian Nat. Geol., 1, 1856, p. 127, figs. 14, 15.—Hitchcock, Geol. Vermont, 1, 1861, p. 290, fig. 190.—Chapman, Canadian Jour., n. s., 6, 1861, p. 508, fig. 72; Expos. Min. Geol. Canada, 1864, p. 102, fig. 72.—Rominger, Proc. Acad. Nat. Sci. Philadelphia, 1866, p. 118.—Nicholson and Murie, Jour. Linn. Soc. Zool., 14, 1878, p. 223.—Nicholson, Mon. British Strom., 1886, p. 83.—Roemer, Leth. Pal., 1880, p. 535.—Miller, N. A. Geol. Pal., 1889, p. 165, fig. 123.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 1102, fig.—Whiteaves, Canadian Rec. Sci., 7, 1897, p. 143.—Seely, Rep. Vermont State Geol., 1904, p. 144, pl. 74, fig. 5; pl. 70.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 46.—Parks, Univ. Toronto Studies, Geol. Series, No. 7, 1910, p. 11, pl. 21, fig. 3-7.

*Stromatopora rugosa* D'Orbigny, Prodr. de Pal., 1, 1849, p. 26 (gen. ref.).—Chapman, Canadian Jour., n. s., 8, 1863, p. 197, fig. 169.—Billings, Geol. Surv. Canada, Rep. Progr. to 1863, 1863, p. 140, fig. 72; Geol. Surv. Canada, Pal. Foss., 1, 1865, p. 213; Geol. Canada, 1863, p. 140, fig. 72.—Nicholson and Murie, Jour. Linn. Soc. London, Zool., 14, 1878, p. 195, fig. 1.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1108, fig.

Black River: Watertown, etc., New York; Lake Champlain area; Pauquettes Rapids, etc., Canada; Kentucky; Tennessee; etc.

Observation.—See *Labechia macrostyla* Parks for a possible synonym.

**STROMATOPORA** Goldfuss.

Genotype: *S. concentrica* Goldfuss.

*Stromatopora* Goldfuss, Pref. German, 1826, p. 22.—Nicholson, Ann. Mag. Nat. Hist., 4th ser., 4, 13, 1874, p. 4; Geol. Surv. Ohio Pal., 2, 1875, pp. 245, 246.—Carter, Ann. Mag. Nat. Hist., 4th ser., 19, 1877, p. 67.—Dawson, *ibid.*, 2, 1878, p. 28.—Carter, *ibid.*, 2, 1878, p. 85, 304, 314; *ibid.*, 4, 1879, pp. 101, 254.—Nicholson and Murie, Jour. Linn. Soc. London, Zool., 14, 1878, pp. 187, 195, 217.—Steinmann, Palæontographica, 25, 1878, p. 113.—Zittel, Handb. Pal., 1, 1879, p. 285.—Dawson, Quart. Jour. Geol. Soc. London, 35, 1879, p. 55.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 529, 536.—Bargatsky, Ann. Soc. Geol. du Nord., Lille, 9, 1883, p. 127.—Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 100.—Spencer, Bull. Mus. Univ. State Missouri, 1, 1884, p. 44; Trans. Acad. Sci. St. Louis, 4, 1884, p. 594.—Maurer, Abhandl. d. geol. Landes, 1, Heft 2, 1885, p. 107.—Frech, Zeits. d. Deutschen geol. Gesell., 37, 1885, p. 115.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 1886, pp. 250, 246.—Nicholson, Mon. British Strom. Pal. Soc., 1886, pp. 2, 11, 91; *ibid.*, 1892, p. 219.—Waagen and Wentzel, Mem. Geol. Surv. Indica, Pal. Indica, 13th ser., 1, 1888, p. 943.—Miller, N. A. Geol. Pal., 1889, p. 165.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 15, pt. 3, 1892, pp. 88, 89.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 156; Zittel-Eastman Pal., 1, 1900, p. 112.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 134; Bull. New York State Mus., 9, 1901, p. 134.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 44.—Parks, Univ. Toronto Studies, Geol. Series, No. 4, 1907, p. 25; *ibid.*, No. 5, 1908, p. 44; *ibid.*, No. 6, 1909, p. 20; Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 123.

*Pachystroma* Nicholson and Murie, Jour. Linn. Soc. London, zool., 14, 1878, pp. 214, 223.—Nicholson, Mon. British Strom. Pal. Soc., 1886, pp. 17, 91.

***Stromatopora amii* Parks.**

*Stromatopora amii* Parks, Univ. Toronto Studies, Geol. Series, No. 6, 1909, p. 36, pl. 19, figs. 7, 8.

Niagaran: Southampton Island, Hudson Bay, Canada.

***Stromatopora antiqua* (Nicholson and Murie).**

*Pachystroma antiqua* Nicholson and Murie, Jour. Linn. Soc. Zool., 14, 1879, p. 224, pl. 4, figs. 2-5.

*Stromatopora antiqua* Nicholson, Mon. British Strom., pt. 1, 1886, p. 17, pl. 5, figs. 8-11; Ann. Mag. Nat. Hist., 1891, p. 310, pls. 8-10, figs. 9-11.—Whiteaves, Pal. Foss., 3, pt. 2, 1895, p. 53; Canadian Rec. Sci., 7, 1896, p. 136; Pal. Foss., 3, pt. 4, 1906, p. 328.—Grabau and Shimer, N. A. Index Fossils, 1; 1906, p. 44, fig. 70.—Parks, Univ. Toronto Studies, Geol. Series, No. 4, 1907, p. 28; *ibid.*, No. 5, 1908, p. 48, pl. 13, figs. 1-6.

Niagaran: Thorold, Ontario, and Lockport, New York (Lockport); ?Durham, Ontario (Guelph).

STROMATOPORA BARRETTI Grabau and Shimer. See *Syringostroma barretti*.

***Stromatopora carteri* Nicholson.**

*Stromatopora carteri* Nicholson, Mon. British Strom., 1891, p. 174, pl. 1, figs. 6, 7; pl. 22, figs. 1, 3; Ann. Mag. Nat. Hist., 6th ser., 7, 1891, p. 314, pl. 9, figs. 5, 6.—Whiteaves, Canadian Rec. Sci., 7, 1896, p. 137.—Parks, Ottawa Nat., 22, 1908, p. 28; Univ. Toronto Studies, Geol. Series, No. 5, 1908, p. 52; *ibid.*, No. 6, 1909, p. 38, pl. 19, figs. 9, 10.

Silurian: England; Hudson Bay region, Canada.

***Stromatopora clarkei* Parks.**

*Stromatopora clarkei* Parks, Univ. Toronto Studies, Geol. Series, No. 6, 1909, p. 48, pl. 17, fig. 12; pl. 18, fig. 1.

Cayugan (Cobleskill): Schoharie County, New York.

STROMATOPORA COMPACTA Billings. See *Solenopora compacta*.

STROMATOPORA CONCENTRICA of authors. See *Stromatopora constellata*.

***Stromatopora constellata* Hall.**

*Stromatopora constellata* Hall, Pal. New York, 2, 1851, p. 324, pl. 72, figs. 2a, b.—Whiteaves, Canadian Rec. Sci., 7, 1896, p. 137.—Schuchert, Amer. Geol., 31, 1903, p. 164.—Parks, Univ. Toronto Studies, Geol. Series, No. 5, 1908, p. 44, pl. 13, figs. 7, 8, 10; *ibid.*, No. 6, 1909, pp. 41, 46, pl. 17, figs. 10, 11; pl. 18, fig. 8.—Swartz, Maryland Geol. Surv., Low. Dev., 1913, p. 221, pl. 27, figs. 1-6; pl. 28, figs. 1-2; pl. 29; pl. 30, fig. 1.

*Cenostoma constellatum* Spencer, Bull. Univ. State Missouri, 1, 1884, p. 48, pl. 6, fig. 11; Trans. Acad. Sci. St. Louis, 4, 1884, p. 598, pl. 6, fig. 11.

*Cœnostroma constellatum* Miller, N. A. Geol. Pal., 1889, p. 157, fig. 100.—Nicholson, Mon. British Strom. Pal. Soc., 1891, p. 173.

*Stromatopora hudsonica* Dawson, Quart. Jour. Geol. Soc., 35, 1879, p. 52, pl. 4, figs. 9a, 9b; pl. 5, fig. 10.—Nicholson, Mon. British Strom., 1891, p. 172; Ann. Mag. Nat. Hist., 6th ser., 7, 1891, p. 312, pl. 8, figs. 1-3.—Whiteaves, Canadian Rec. Sci., 7, 1896, p. 137.

*Stromatopora concentrica* Hall, Pal. New York, 2, 1851, pl. 73, figs. 2a-b.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 63.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 190.—Spencer, Trans. Acad. Sci. St. Louis, 4, 1884, p. 595, pl. 6, figs. 8, 8a; Bull. Mus. Univ. State Missouri, 1, 1884, p. 45, pl. 6, figs. 8, 8a.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 1102, fig.—

**Stromatopora constellata**—Continued.

Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 134, fig. 28.—Schuchert, Amer. Geol., 31, 1903, p. 165.—Weller, Geol. Surv. New Jersey Pal., 3, 1903, p. 223.

Niagaran and Cayugan: Schoharie, New York (Cobleskill). Various localities in New York and Canada.

Helderbergian (Keyser): Cumberland, etc., Maryland; West Virginia; Pennsylvania; New Jersey.

**STROMATOPORA CONTORTA** Grabau and Shimer. See *Syringostroma centrotum*.

**Stromatopora corallifera** Parks.

*Stromatopora corallifera* Parks, Univ. Toronto Studies, Geol. Series, No. 6, 1909, p. 22, pl. 18, fig. 7.

Helderbergian: Port Jervis, New York.

**STROMATOPORA CYSTOSA** Rominger. See *Clathrodictyon cystosum*.

**Stromatopora galtensis** (Dawson).

*Cenostroma galtense* Dawson, Life's Dawn on the Earth, 1875, p. 160; Quart. Jour. Geol. Soc. London, 25, 1879, p. 52.

*Stromatopora galtensis* Nicholson, Mon. Brit. Strom., 1891, p. 173.—Whiteaves, Pal. Fossils, 3, pt. 2, 1895, p. 52; Can. Rec. Sci., 7, 1896, p. 136.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 36, pl. 1, fig. 13.—Whiteaves, Pal. Fossils, 3, 1906, p. 328.—Parks, Univ. Toronto Studies, Geol. Series, No. 4, 1907, p. 25, pl. 4, figs. 3, 4.—Grabau, Mich. Geol. Surv., Geol. Ser., 1, 1909, p. 90, pl. 8, fig. 1

Niagaran (Guelph) Elora and Durham, Ontario.

Upper Monroan (Amherstburg): Amherstburg, Ontario.

**Stromatopora Hindei** Nicholson.

Not recognized.

*Stromatopora hindei* Nicholson, Ann. Mag. Nat. Hist., 4th ser., 4, 13, 1874, p. 12, and p. 13, figs. 3a-c; Rep. Pal. Prov. Ontario, 1874, p. 13, figs. 1a-c.—Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 140.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, pp. 43, 49, 50, fig. 23.—Nicholson and Murie, Jour. Linn. Soc. London, Zool., 14, 1878, p. 209, fig. 3.—James, Paleontologist, No. 2, 1878, p. 10.—Whiteaves, Can. Rec. Sci., 7, 1897, p. 144.—Parks, Univ. Toronto Studies, Geol. Series, No. 5, 1908, p. 56.—Miller, N. A. Geol. Pal., 1889, p. 165, fig. 124.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 15, pt. 3, 1892, p. 92.

Niagaran: Owen Sound, Ontario.

Observation.—Species rejected by author.

**STROMATOPORA HUDSONICA** Dawson. See *Stromatopora constellata*.

**Stromatopora indianensis** Parks.

*Stromatopora indianensis* Parks, Univ. Toronto Studies, Geol. Series, No. 5, 1908, p. 50, pl. 12, figs. 6, 9.

Brassfield (?Louisville): North Madison, Indiana.

*Holotype*.—Cat. No. 41216, U.S.N.M.

**Stromatopora indianensis** James.

*Stromatopora indianensis* James, Jour. Cincinnati Soc. Nat. Hist., 15, pt. 3, 1892, p. 92.—Parks, Univ. Toronto Studies, Geol. Series, No. 7, 1910, p. 48.

Upper Cincinnati: Near Connersville, Indiana.

Observation.—Probably the same as *Stromatocentrum huronense*, although the James species is not defined so as to be recognized. Moreover the type is lost, so the name had better be dropped.

*STROMATOPORA INSOLENS* James. See *Dystactospongia insolens*.

*STROMATOPORA LICHENOIDES* James. See *Arthropora shafferi*.

*Stromatopora ludlowensis* James. Not recognized.

*Stromatopora ludlowensis* James, Jour. Cincinnati Soc. Nat. Hist., 7, 1884, p. 140, pl. 8, figs. 4, 4a, 7, 7a; *ibid.*, 9, 1886, p. 251; *ibid.*, 15, pt. 3, 1892, p. 91.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 57.

Eden: Ludlow, Kentucky.

Observation.—Not a valid species. The type specimen is an irregular, solid mass, composed of successively incrusting layers of *Ceramoporella*.

*Stromatopora lunata* James. Not recognized.

*Stromatopora lunata* James, Paleontologist, No. 2, 1878, p. 10.

Alexandrian (Brassfield): Clinton County, Ohio.

*STROMATOPORA MAMMILLATA* Schmidt. See *Clathrodictyon striatellum*.

*STROMATOPORA MINUTUM* Rominger. See *Clathrodictyon vesiculosum minutum*.

*STROMATOPORA OSTIOLATA* Nicholson. See *Clathrodictyon ostiolatum*.

*STROMATOPORA PAPILLATA* James. See *Dermatostroma papillatum*.

*STROMATOPORA PUSTULOSA* Safford. See *Stromatocerium pustulosum*.

***Stromatopora* (*Cænostroma*) *pustulosa* Grabau.**

*Stromatopora* (*Cænostroma*) *pustulosum* Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 91, pl. 9, figs. 3, 4.

Upper Monroan (Anderdon): Anderdon quarry, near Amherstburg, Ontario.

*STROMATOPORA RUGOSA* Billings. See *Stromatocerium rugosum*.

*STROMATOPORA SCABRA* James. See *Dermatostroma scabrum*.

*STROMATOPORA STRIATELLA* McCoy. See *Clathrodictyon vesiculosum*.

*STROMATOPORA STRIATELLA* D'Orbigny. See *Clathrodictyon striatellum*.

*STROMATOPORA SUBCYLINDRICA* James. See *Labechia subcylindrica*.

*Stromatopora tubularis* James. Not recognized.

*Stromatopora tubularis* James, Jour. Cincinnati Soc. Nat. Hist., 7, 1884, p. 139, pl. 7, figs. 3-3b; *ibid.*, 9, 1886, p. 250; *ibid.*, 15, 1892, p. 89.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 57.

Eden: Cincinnati, Ohio.

Observation.—The type of this species is a cephalopod shell incrustated by successive layers of *Ceramoporella*.

*STROMATOPORA VARIOLARIS* Von Rosen. See *Clathrodictyon variolare*.

*STROMATOPORA VESICULOSA* Rominger. See *Clathrodictyon cystosum*.

***Stromatopora wilsoni* Parks.**

*Stromatopora wilsoni* Parks, Ottawa Nat., 22, 1908, p. 28; Univ. Toronto Studies, Geol. Series, No. 6, 1909, p. 40, pl. 19, figs. 11, 12.

Niagaran: Pagwachuan River, Hudson Bay, Canada.

***STROMATOPORELLA* Nicholson. Genotype: *Stromatopora granulata* Nicholson.**

*Stromatoporella* Nicholson, Ann. Mag. Nat. Hist., 5th ser., 17, 1886, p. 234, footnote; Mon. Brit. Strom. Pal. Soc., 1886, p. 92; *ibid.*, 1892, p. 219.—Parks, Univ. Toronto Studies, Geol. Ser., No. 4, 1907, p. 29.

**Stromatoporella elora** Parks.

Stromatoporella elora Parks, Univ. Toronto Studies, Geol. Ser., No. 4, 1907, p. 29, pl. 3, fig. 3; pl. 5, figs. 1-3; pl. 6, fig. 6.  
Niagaran (Guelph): Galt, Elora, Durham, etc., Ontario.

**Stromatoporella elora minuta** Parks.

Stromatoporella elora var. minuta Parks, Univ. Toronto Studies, Geol. Ser., No. 4, 1907, p. 31, pl. 5, figs. 2, 5, 6; pl. 6, fig. 7.  
Niagaran (Guelph): Durham, Ontario.

**STROMATOTRYPA** Ulrich.Genotype: *S. ovata* Ulrich,

Stromatotrypa Ulrich, Geol. Minnesota, 3, 1893, p. 301.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 758.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, p. 35.—Grabau and Shimer, N. A. Index Fossils, 1, p. 137.

**Stromatotrypa globularis** Ulrich and Bassler.

Stromatotrypa globularis Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 279, pl. 62, figs. 1-4; pl. 66, figs. 8, 9.  
Helderbergian (Keyser): Keyser, West Virginia; Cash Valley, Pinto, etc., Maryland.  
*Cotypes*.—Cat. No. 53671, U.S.N.M.

**Stromatotrypa ovata** Ulrich.

Stromatotrypa ovata Ulrich, Geol. Minnesota, 3, 1893, p. 302, pl. 24, figs. 24-31.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 137, fig. 188m, 190m.  
Black River: Minneapolis and St. Paul, Minnesota (Decorah); Beloit, Wisconsin (Platteville).  
*Cotypes*.—Cat. No. 43614, U.S.N.M.

**STROMBODES** Schweigger.Genotype: *S. pentagonus* Goldfuss.

Strombodes Schweigger, Handb. der Naturg., 1820, p. 418.—Goldfuss, Petrefacta, 1826, p. 63.—Eichwald, Zool. Specialis, pt. 1, Vilnae, 1829, p. 188.—Dana, Amer. Jour. Sci. Arts, 2d ser., 1, 1846, p. 185; Wilkes' U. S. Expl. Exped., 1838-42, 7, Zoophytes, 1846, p. 359.—Owen, Amer. Jour. Sci. Arts, 2d ser., 2, 1847, p. 70.—McCoy, Ann. Mag. Nat. Hist., 2d ser., 3, 1849, p. 10.—Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal., 1851 (Arch. du Mus. d'Hist. Nat., 5), pp. 172, 426.—McCoy, Cont. Brit. Pal., 1854, p. 78; Brit. Pal. Rocks and Foss., 1854, p. 34.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 459.—Milne-Edwards, Hist. Nat. d. Corall., 3, 1860, p. 416.—Goldfuss, Petrefacta, 2d ed., pt. 1, 1862, p. 58.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 130.—Zittel, Handb. Pal., 1, 1879, p. 233.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 400.—Miller, N. A. Geol. Pal., 1889, p. 205.—Sherzer, Amer. Geol., 7, 1891, pp. 296-301.—Koken, Die Leitiossilien, Leipzig, 1896, p. 312; Zittel-Eastman Textb. Pal., 1, 1913, p. 79.—Poeta, Syst. Sil. du Centre Boheme, 8, pt. 2, 1902, p. 176.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 70; Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 86.

Lamellopora Owen, Geol. Expl. Iowa, Wisconsin, Illinois, 2d ed., 1844, p. 70.

Arachnophyllum Dana, Wilkes' U. S. Expl. Exped., 1838-42, 7, Zoophytes, 1846, p. 360, pl. 26, fig. 5; Amer. Jour. Sci. Arts, 2d ser., 1, 1846, p. 186, fig. 1.—McCoy, Brit. Pal. Rocks Fossils, 1854, p. 37.—Dybowsky, Archiv. f. Naturf. Liv., Ehst- und Kurl., 5, 1873, p. 339.—Miller, N. A. Geol. Pal., 1889, p. 172.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 180. (Genotype: *Acervularia baltica* Lonsdale.)

Astræophyllum Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 152.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 56.—Miller, N. A. Geol. Pal., 1889, p. 172. (Genotype: *A. gracile* Nicholson and Hinde.)

**Strombodes diffluens** Edwards and Haime.

*Strombodes diffluens* Edwards and Haime, Polyp. Foss. Ter. Pal., 1851, p. 431; Brit. Foss. Corals, 1855, p. 294, pl. 71, figs. 2, 2a.—Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 34 (loc. ref.).

*Arachnophyllum diffluens* Lambe, Ottawa Nat., 12, 1899, p. 244; Contr. Canadian Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 183, pl. 14, fig. 12.

Silurian: Wenlock, England (Wenlock); Chicotte River and Southwest Point, Anticosti (Ellis Bay, Gun River); Owen Sound, Ontario; Lake Temiscaming, Quebec.

**Strombodes eximius** Billings.

*Strombodes eximius* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 93.

*Arachnophyllum eximium* Lambe, Ottawa Nat., 12, 1899, p. 245; Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 184, pl. 16, figs. 3, 3a, 4.

Niaganan: Manitoulin and Cockburn Islands, Lake Huron.

**Strombodes gigas** (Owen).

*Astrea?* *gigas* Owen, Rep. Mineral Lands, 1844, p. 70, pl. 14, fig. 7 (not *Phillipastrea gigas* of Billings and subsequent authors).

*Strombodes gigas* Calvin, Amer. Geol., 12, 1893, p. 111, pl. 5, fig. 5.

Niaganan: Iowa and Wisconsin.

**Strombodes gracilis** (Nicholson and Hinde).

*Astræophyllum gracile* Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 138, fig. 4.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 57, fig. 28.—

Miller, N. A. Geol. Pal., 1889, p. 172, text. fig. 135.

Niaganan: Owen Sound, Ontario.

**STROMBODES GRACILIS** Billings. See *Acervularia gracilis*.

**Strombodes granulosus** (Foerste).

*Arachnophyllum* (*Strombodes*) *granulosum* Foerste, Bull. Kentucky Geol. Surv. 7, 1906, p. 318, pl. 3, fig. 1.

Clinton (Waco): Near Waco, Kentucky.

**Strombodes incertus** Davis.

*Strombodes incertus* Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 123, fig. 2.

Niaganan (Louisville): Near Louisville, Kentucky.

**Strombodes infundibularius** (Owen).

*Lamellopora infundibularia* Owen, Geol. Expl. Iowa, Wisconsin, Illinois, 2d ed., 1844, p. 70, pl. 14, fig. 1.

*Strombodes infundibularius* Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal., 1851 (Arch. du Mus. d'Hist. Nat., 5), p. 432.

Niaganan: Iowa and Wisconsin.

Observation.—Neither defined nor figured so as to be recognized.

**Strombodes mamillaris** (Owen).

*Astrea mamillaris* Owen, Geol. Expl. Iowa, Wisconsin, Illinois, 2d ed., 1844, p. 70, pl. 14, fig. 3.

*Strombodes mamillaris* Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 123, fig. 4.—Calvin, Amer. Geol., 12, 1893, p. 109.

*Strombodes mamillatus* Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 133, pl. 48, fig. 4.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 71.

**Strombodes mamillaris**—Continued.

Arachnophyllum mamillare Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 182, pl. 15, fig. 4.

Niaganan: Iowa, Wisconsin, Michigan, Kentucky, Indiana, etc.

**Strombodes mamillaris distans** (Foerste).

Arachnophyllum (Strombodes) mamillare-distans Foerste, Bull. Kentucky Geol. Surv., 7, 1906, p. 319, pl. 3, figs. 2a-c.

Clinton (Waco): Panola, Kentucky.

**Strombodes mamillaris wilmingttonensis** (Foerste).

Arachnophyllum mamillare-wilmingtonensis Foerste, Bull. Kentucky Geol. Surv., 7, 1906, p. 320.

Lyellia striata N. P. James, Paleontologist, No. 2, 1878, p. 10.

Strombodes pygmæus Foerste, Bull. Sci. Lab. Denison Univ., 3, 1888, p. 120, pl. 13, fig. 18.

Clinton (Dayton): Near Wilmington, Ohio.

STROMBODES MAMILLATUS Rominger. See Strombodes mamillaris.

**Strombodes pentagonus** Goldfuss.

Strombodes pentagonus Goldfuss, Petrefacta Germaniae, 1, 1826, p. 62, pl. 21, fig. 3a, b.—Troost, 6th Geol. Rep. Tennessee, 1841, p. 185.—Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal., 1851 (Arch. du Mus. d'Hist. Nat.), 5, p. 430.—Milne-Edwards, Hist. Nat. d. Corall., 3, 1860, p. 420.—Goldfuss, Petrefacta, 2d ed., pt. 1, 1862, p. 58.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 306, fig. 308.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 131, pl. 48, fig. 2.—Whitfield, Geol. Wisconsin, 4, 1882, p. 275, pl. 15, fig. 5.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 401.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 121, figs. 2, 3.—Miller, N. A. Geol. Pal., 1889, p. 205, fig. 222.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1109, fig.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 70, fig. 109.

Arachnophyllum pentagonum Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 181, pl. 15, figs. 3, 3a.

Niaganan: Drummonds Island, etc., Lake Huron; Kentucky; Tennessee; Wisconsin; etc.

STROMBODES PYGMEUS Foerste. See Strombodes mamillaris-wilmingtonensis.

**Strombodes pygmæus** Rominger.

Strombodes pygmæus Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 132, pl. 48, fig. 3.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 123, fig. 1.

Niaganan: Point Detour and Drummonds Island, Lake Huron; Louisville, Kentucky (Louisville).

**Strombodes quadrangularis** Davis.

Strombodes quadrangularis Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 122, fig. 3.

Niaganan (Louisville): Near Louisville, Kentucky.

**Strombodes richardsoni** (Salter).

Arachnophyllum Richardsons Salter, Sutherland's Jour. Voyage in Baffins Bay, etc., 2, 1852, p. 232, pl. 6, figs. 10, 10a.—Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 585.

Niaganan: Point Eden, Baring Bay, and Cape Hilgard, Arctic America.



**Strombodes separatus** Ulrich.

*Strombodes separatus* Ulrich, Cont. Amer. Pal., 1, 1886, p. 32, figs. 1, 2.  
Niagaran (Louisville): Near Louisville, Kentucky.

**Strombodes sinemurus** Davis.

*Strombodes sinemurus* Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 121, fig. 4; pl. 122, figs. 4, 6; pl. 123, fig. 3.  
Niagaran (Louisville): Near Louisville, Kentucky.

**Strombodes striatus** (D'Orbigny).

*Favastrea striata* D'Orbigny, Prodr. Pal., 1, 1849, p. 48.—Bonle and Thevenin, Ann. Pal., 1, 1906, p. 8, pl. 3, figs. 10, 11.

*Strombodes striatus* Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal., 1851 (Arch. du Mus. d'Hist. Nat., 5), p. 430.—Milne-Edwards, Hist. Nat. d. Corall., 3, 1860, p. 420.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 131, pl. 48, fig. 1.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 121, fig. 1; pl. 122, figs. 1, 2.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 71.

Niagaran: Drummonds Island, etc., Lake Huron; Louisville, Kentucky; Tennessee (Louisville).

**Strombodes unicus** Davis.

*Strombodes unicus* Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 122, fig. 5.  
Niagaran (Louisville): Near Louisville, Kentucky.

**STROPHEODONTA** Hall.

Genotype: *Strophomena demissa* Conrad.

*Stropheodonta* Hall, Pal. New York, 2, 1852, p. 63.—Hall and Clarke, *ibid.*, 8, pt. 1, 1892, p. 284.—Beecher, Amer. Jour. Sci., 3d ser., 44, 1892, p. 147.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 194; *ibid.*, 7, 1901, p. 180; Bull. New York State Mus., 45, 1901, p. 180.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 212.—Schuchert, Zittel-Eastman Textb. Pal., 1900, p. 313; 2d ed., 1913, p. 385.

*Strophodonta* Hall, Geol. Surv. Iowa, 1, 1858, p. 491.—Billings, Canadian Jour. Sci. Arts, n. s., 6, 1861, p. 332; Proc. Portland Soc. Nat. Hist., 1863, p. 108.—Hall, Pal. New York, 4, 1867, p. 78.—Zittel, Handb. Pal., 1, 1880, p. 677.—Hall, Proc. Amer. Assoc. Adv. Sci., 32, 1884, p. 268.—Miller, N. A. Geol. Pal., 1889, p. 379.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 142.

*Brachyprion* Shaler, Bull. Mus. Comp. Zool., 4, 1865, p. 63.—Hall and Clarke, Nat. Hist. New York, 8, pt. 1, 1892, pp. 220, 286, 288, 289, 292; 11th Ann. Rep. New York State Geol., 1894, pp. 280, 281.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 385.

*Leptostrophia* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 288; 11th Ann. Rep. New York State Geol., 1894, p. 281. (Genotype: *Stropheodonta magnifica* Hall.)

*Cardiodonta* Hall, Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 349, footnote.

**Stropheodonta acanthoptera** (Whiteaves).

*Strophomena acanthoptera* Whiteaves, Canadian Rec. Sci., 1891, p. 294, pl. 3, figs. 1, 2.

*Stropheodonta acanthoptera* Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 285, pl. 24, figs. 8, 9.

Niagaran: District of Saskatchewan and Lake Winnipegosis, Canada.

**Stropheodonta (Brachyprion) anticostiensis** (Shaler).

Strophomena anticostiensis Shaler, Bull. Mus. Comp. Zool., 4, 1865, p. 62.

Anticostian (Gun River and Jupiter River): Island of Anticosti.

**Stropheodonta bipartita** (Hall).

Leptæna bipartita Hall, Pal. New York, 2, 1852, p. 326, pl. 74, figs. 4, 5.

Strophomena bipartita Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 82.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 429.

Stropheodonta bipartita Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 226, pl. 20, figs. 1-5.

Stropheodonta (Leptostrophia) bipartita Schuchert, Amer. Geol., 31, 1903, p. 165.—Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 316, pl. 57, figs. 17, 18.

Stropheodonta textilis Hall, Nat. Hist. New York, 2, 1852, p. 327, pl. 74, fig. 6.—Schuchert, Bull. U. S. Geol. Surv., 89, 1897, p. 427.

Stropheodonta (Leptostrophia) textilis Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 288.—Schuchert, Amer. Geol., 31, 1903, p. 165.

Leptæna ——— Hall, Nat. Hist. New York, 2, 1852, pl. 74, fig. 3.

Stropheodonta nearpassi Barrett, Amer. Jour. Sci., 3d ser., 15, 1878, p. 372.

Stropheodonta nearpassi Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 427.—Weller, Ann. Rep. State Geol. New Jersey for 1899, 1900, p. 15.

Cayugan (Cobleskill): Schoharie, New York.

Helderbergian: Near Port Jervis, etc., New Jersey (Decker Ferry); Hyndman, Pennsylvania; Hancock, near Cumberland, Pinto, etc., Maryland (Keyser).

**Stropheodonta corrugata** (Conrad).

Strophomena corrugata Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1842, p. 256, pl. 14, fig. 8.—Hall, Geol. New York; Rep. 4th Dist., 1843, p. 73, fig. 2 on p. 72; 12th Rep. New York State Cab. Nat. Hist., 1859, p. 82.—Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 303, pl. 6, fig. 25.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1125, fig.

Leptæna corrugata Hall, Pal. New York, 2, 1852, p. 59, pl. 21, figs. 2a-2c.

Stropheodonta corrugata Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 46, fig. 1.

Stropheodonta corrugata Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 15, fig. 1; pt. 2, 1895, pl. 84, fig. 14.—Grabau, Bull. New York State Mus., 45, 1901, p. 181, fig. 85; Bull. Soc. Nat. Sci., 7, 1901, p. 181, fig. 85.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 213, fig. 253.

Stropheodonta cf. corrugata Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 429, pl. 1, fig. 3.

Clinton: Rochester, Wolcott, etc., New York; Cumberland Gap, Tennessee.

?Niagaran: Georgetown, Indiana.

**Stropheodonta(?) corrugata pleuristriata** (Foerste).

Leptæna corrugata (part) Hall, Pal. New York, 2, 1852, p. 59, pl. 21, figs. 2d, 2e.

Strophomena corrugata var. pleuristriata Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 303, pl. 6, figs. 26, 27.

Clinton: Cumberland Gap, Tennessee.

**Stropheodonta demissa homolostriata** Grabau.

Stropheodonta demissa mut. homolostriata Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 126, pl. 17, fig. 6.

Upper Monroan (Amherstburg): Detroit River opposite Amherstburg, Ontario.

**Stropheodonta feildeni** Etheridge.

Stropheodonta feildeni Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 598, pl. 25, fig. 4.

**Stropheodonta Fieldeni**—Continued.

Silurian(?): Cape Hildgard, Arctic America.

Observation.—Since this species is very closely related to *S. magnifica* of the Oriskany sandstone the horizon is probably Lower Devonian (Schuchert).

**STROPHEODONTA? GENICULATA** Schuchert. See *Strophonella* (*Strophoprion*) *geniculata*

**Stropheodonta(?) gilpeni** (Dawson).

*Strophomena gilpeni* Dawson, Canadian Nat. Geol., n. s., 9, 1880, p. 341.

*Stropheodonta(?) gilpeni* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 422.

Silurian: Pictou, Nova Scotia.

**Stropheodonta (Brachyprion) latisculptilis** (Savage).

*Brachyprion latisculptilis* Savage, Bull. State Geol. Surv. Illinois, 23, 1913, p. 71, pl. 4, fig. 5.

Upper Medinan (Edgewood): Louisiana, Missouri; south of Hamburg, Illinois.

**Stropheodonta (Brachyprion) leda** (Billings).

*Strophomena leda* Billings, Canadian Nat. Geol., 5, 1860, p. 55, figs. 2, 3; Pal.

Foss., 1, Geol. Surv. Canada, 1865, p. 120, figs. 98, 99 (adv. sheets, 1862);

Geol. Canada, 1863, p. 311, fig. 316.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 1129, figs.

*Brachyprion leda* Shaler, Bull. Mus. Comp. Zool., 1865, p. 63.

*Stropheodonta leda* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 288.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 423.

*Rafinesquina leda* Whiteaves, Pal. Foss., 3, pt. 3, Geol. Surv. Canada, 1897, p. 172.

Anticostian (Bessie River and Jupiter River): East Point, near Bessie River Bay, etc., Anticosti.

**Stropheodonta maera** (Winchell and Marcy).

*Strophomena maera* Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 91.—Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, p. 392.

*Stropheodonta maera* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 424.

Niagaran: Probably near Chicago, Illinois.

**Stropheodonta mundula** Foerste.

*Stropheodonta mundula* Foerste, Cincinnati Soc. Nat. Hist. Jour., 21, 1909, p. 21, pl. 2, fig. 18.

Clinton (Crab Orchard): Between Poplar Flats and Martin's store, Lewis County, Kentucky.

**STROPHEODONTA NEARPASSI** Weller. See *Stropheodonta bipartita*.

**Stropheodonta (Brachyprion) newsomensis** Foerste.

*Stropheodonta (Brachyprion) newsomensis* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 87, pl. 4, fig. 67.

Niagaran (Waldron): Newsom, Tennessee.

**STROPHEODONTA (BRACHYPRION) NIAGARENSIS** Whiteaves. See *Stropheodonta profunda*.

**Stropheodonta patersoni antiqua** Hortedahl.

*Stropheodonta patersoni antiqua* Hortedahl, 2d Arct. Exp. "Fram," 1898–1902, No. 32, p. 19, pl. 7, figs. 2, 3.

Helderbergian (Lower beds): Near Borgen, Southwestern Ellesmereland, Arctic America.

**Stropheodonta (Brachyprion) philomela** (Billings).

*Strophomena philomela* Billings, Canadian Nat. Geol., 5, 1860, p. 56, figs. 4, 5;

Pal. Fossils, 1, 1862, p. 122, figs. 100, 101; Geol. Canada, 1863, p. 311, fig.

317.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1131, figs.

*Brachyprion ventricosa* Shaler, Bull. Mus. Comp. Zool., 1865, p. 63.

*Stropheodonta*(?) *ventricosa* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 427.

Anticostian (Gun River-Jupiter River): East Point, Southwest Point, and The Jumpers, Anticosti.

**Stropheodonta (Brachyprion) plana** Foerste.

*Stropheodonta (Brachyprion) planus* Foerste, Cincinnati Soc. Nat. Hist. Jour.,

21, 1909, p. 22, pl. 1, figs. 13A-C; pl. 2, figs. 11A, B.

Clinton (West Union): Near Martins and at Harin Hill, Lewis County, Kentucky; West Union, Ohio.

**Stropheodonta præplicata** Grabau.

*Stropheodonta præ-plicata* Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 126, pl. 17, fig. 12.

Upper Monroan (Amherstburg): Detroit River, opposite Amherstburg, Ontario.

**Stropheodonta prisca** Hall.

*Stropheodonta prisca* Hall, Pal. New York, 2, 1852, p. 63, pl. 21, fig. 9.—Lesley,

Geol. Surv. Pennsylvania, Rep. P 4, p. 1117, figs.

Clinton (upper): Kirkland, Oneida County, New York.

**Stropheodonta (Brachyprion) profunda** (Hall):

*Leptæna profunda* Hall, Pal. New York, 2, 1852, p. 61, pl. 21, figs. 4, 5.

*Strophomena profunda* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 82.

*Strophodonta profunda* Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, pp. 369, 392, pl. 13, figs. 3, 4; 28th Rep. New York State Mus. Nat. Hist.,

1879, p. 151, pl. 23, figs. 9, 10; 11th Rep. Indiana State Geol., 1882, p. 289,

pl. 23, figs. 9, 10; pl. 27, fig. 18; 2d Ann. Rep. New York State Geol., 1883,

pl. 44, figs. 1-5 (?figs. 19, 20).—Nettelroth, Kentucky Fossil Shells, Mem.

Kentucky Geol. Surv., 1889, p. 148, pl. 29, fig. 26; pl. 17, figs. 20, 21.—Lesley,

Geol. Surv. Pennsylvania, Rep. P 4, p. 1118, fig.

*Stropheodonta (Brachyprion) profunda* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 13, figs. 1-5 (?19, 20); pl. 20, figs. 29-31; pt. 2, 1895, pl. 84, fig. 12.

*Stropheodonta profunda* Grabau, Bull. New York State Mus., 45, 1901, p. 181, fig. 86; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 181, fig. 86.—Grabau and

Shimer, N. A. Index Fossils, 1, 1907, p. 213, fig. 254.

*Brachyprion profundum* Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 201 (gen. ref.).

*Strophomena niagarensis* Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 92, pl. 2, fig. 9.

*Stropheodonta (Brachyprion) Niagarensis* Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 271.

Niagaran: Rochester, etc., New York (Irondequoit-Rochester); Waldron, Indiana (Waldron); Louisville, Kentucky (Louisville); Racine, Wisconsin, and Bridgeport, Illinois (Racine).

*Plesiotypes*.—Cat. No. 51309, U.S.N.M. (Nettelroth).

**Stropheodonta (Brachyprion) shaleri** (Williams).

*Brachyprion shaleri* Williams, Proc. U. S. Nat. Mus., 45, 1913, p. 329, pl. 29, figs. 10-12.

**Stropheodonta (Brachyprion) shaleri**—Continued.

Silurian (Edmunds): Burnt Cove, etc., Edmunds Township, Washington County, Maine.

*Cotypes*.—Cat. Nos. 58950–58952, U.S.N.M.

**Stropheodonta (Brachyprion) stropheodontoides** (Savage).

Brachyprion stropheodontoides Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 72, pl. 4, fig. 4.

Upper Medinan (Edgewood): Louisiana, etc., Pike County, Missouri; south of Hamburg, Illinois.

**STROPHEODONTA TEXTILIS** Hall. See *Stropheodonta (Leptostrophia) bipartita*.

**Stropheodonta varistriata** (Conrad).

*Strophomena varistriata* Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1842, p. 255, pl. 14, fig. 6.

*Strophodonta varistriata* Hall, Pal. New York, 3, 1859, p. 180, pl. 8, figs. 1–16; pl. 16, figs. 1–8.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1119, figs.

*Stropheodonta varistriata* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 427.—Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 312, pl. 59, figs. 1, 2.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 261, pl. 24, figs. 13, 14.—Shimer, Bull. New York State Mus., 80, 1905, p. 240.—Grabau, Bull. New York State Mus., 92, 1906, p. 115, fig. 23.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 214, fig. 255.

Cayugan (Manlius): Albany and Schoharie localities, New York.

Helderbergian: New York and New Jersey (Decker Ferry); Hyndman, Pennsylvania, and Cash Valley, Maryland (Keyser); Dalhousie, New Brunswick, and Gaspé, Quebec.

**Stropheodonta vasculosa** Grabau.

*Stropheodonta vasculosa* Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 124, pl. 17, figs. 8–11.

Upper Monroan (Amherstburg): Detroit River, opposite Amherstburg, Ontario.

**STROPHEODONTA? VENTRICOSA** Schuchert. See *Strophodonta (Brachyprion) philomena*.

**STROPHOCRINUS** Sardeson. See *Carabocrinus* Billings.

**STROPHODONTA GENICULATA** Hall. See *Strophonella geniculata*.

**STROPHODONTA NEARPASSI** Barrett. See *Strophodonta vipartita*.

**STROPHODONTA STRIATA** Hall. See *Strophonella striata*.

**STROPHOGRAPTUS** Ruedemann. Genotype: *S. trichomanes* Ruedemann.

*Strophograptus* Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 716, 717.

**Strophograptus trichomanes** Ruedemann.

*Strophograptus trichomanes* Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 717, 718, pl. 4, figs. 17–20.

Canadian (Deepkill, *Diplograptus dentatus* zone): Deepkill, Rensselaer County, New York.

**STROPHOMENA** (Rafinesque) Blainville. Genotype: *S. rugosa* Blainville.

*Strophomenes* Rafinesque, Desc. Remarkable Objects in the Cabinet of Professor Rafinesque, 1831, p. 4.

**STROPHOMENA**—Continued.

- Strophomena* Blainville, Man. Malacol. et Conch., 1, 1825, p. 513, pl. 53, fig. 2.—De France, Dict. Sci. Nat., 51, 1827, p. 151, and atlas.—King, Mon. Per. Foss., Pal. Soc., 1850, p. 103.—Emmons, Amer. Geology, 1, pt. 2, 1855, pp. 186, 197.—Billings, Canadian Nat. Geol., 1, 1856, p. 133.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 58.—Chapman, Canadian Jour., n. s., 3, 1858, p. 161; *ibid.*, 7, 1862, p. 112; Expos. Min. Geol. Canada, 1864, p. 115.—Meek (part), Pal. Ohio, 1, 1873, p. 73.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 51.—Zittel, Handb. Pal., 1, 1880, p. 677.—Winchell, 9th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1881, p. 118.—Ehler, Fischer's Manuel Conch., 1887, p. 1281.—Miller, N. A. Geol. Pal., 1889, p. 381.—Beecher, Amer. Jour. Sci., 3d ser., 44, 1892, pp. 145, 147.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 245.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 384.—Hall and Clarke, 11th Ann. Rep. New York State Geol., 1894, p. 283.—Koken, Die Leitfossilien, Leipzig, 1896, p. 237, fig. 198, 7, 8.—Nickles, Amer. Geol., 32, 1903, p. 214.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 222.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 894.—Schuchert, Zittel-Eastman Textb. Pal., 1900, p. 314; 2d. ed., 1913, p. 387.
- Hemipronites Meek and Hayden, Pal. Upper Missouri, Smiths. Contr. Knowl., 14, 172, 1864, p. 24.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 41.

*STROPHOMENA ACANTHOPTERA* Whiteaves. See *Stropheodonta acanthoptera*.

***Strophomena acuta*** (Winchell and Schuchert).

- Strophomena neglecta* var. *acuta* Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 388, pl. 31, figs. 6, 7.
- Strophomena acuta* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, p. 115, pl. 7, figs. 3a-d; pl. 9, figs. 13a, b.
- Richmond (Maquoketa): Spring Valley, Minnesota.

*STROPHOMENA ALTERNATA* Conrad. See *Rafinesquina alternata*.

*STROPHOMENA ALTERNATA* var. *ALTERNISTRATA* Miller. See *Rafinesquina alternata alternistriata*.

*STROPHOMENA ALTERNATA* var. *FRACTA* Meek. See *Rafinesquina alternata fracta*.

*STROPHOMENA ALTERNATA* var. *LOXORHYTIS* Meek. See *Rafinesquina alternata loxorhytis*.

*STROPHOMENA ALTERNATA* var. *NASUTA* Miller. See *Rafinesquina nasuta*.

*STROPHOMENA ALTERNIRADIATA* Shaler. See *Schuchertella alterniradiata*.

*STROPHOMENA ANALOGA* Davidson. See *Leptaena rhomboidalis*.

*STROPHOMENA ANGULATA*? Owen. See *Rafinesquina alternata*.

***Strophomena(?) antiquata*** Sowerby.

- Strophomena antiquata* Sowerby, Murchison's Silurian System, 1839.—Billings, Pal. Fossils, 1, 1862, p. 129, fig. 107.
- Silurian: Europe; Prinsta Bay, East Point, etc., Anticosti (Charleton—Jupiter River); Forks of the Chatts River, Gaspe.

*STROPHOMENA APPROXIMATA* James. See *Strophomena vetusta approximata*.

*STROPHOMENA ARCUATA* Shaler. See *Strophomena semiovalis*.

**Strophomena(?) arethusa** Billings.

*Strophomena Arethusa* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 132 (adv. sheets, 1862).

Richmond (Charleton): Observation Cape, Anticosti.

STROPHOMENA ATAVA Matthew. See *Eoorthis atava*.

STROPHOMENA AURORA Billings. See *Rafinesquina aurora*.

**Strophomena billingsi** Winchell and Schuchert.

*Strophomena recta* Billings (not Conrad), Geol. Surv. Canada, Pal. Foss., 1, 1865, p. 130, fig. 108 (adv. sheets, 1862).

*Strophomena billingsi* Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 397, fig. 32.—Whiteaves, Pal. Foss., 3, pt. 3, 1897, p. 170.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 223.

Trenton: Ottawa, Ontario; St. Paul, Cannon Falls, and Fountain, Minnesota; East Selkirk, Manitoba.

STROPHOMENA BIPARTITA Hall. See *Stropheodonta (Leptostrophia) bipartita*.

STROPHOMENA CAMERATA Conrad. See *Rafinesquina deltoidea*.

**Strophomena cardinalis** (Whitfield).

*Streptorhynchus cardinale* Whitfield, Geol. Wisconsin, 4, 1882, p. 261, pl. 12, figs. 9, 10.

*Strophomena cardinalis* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 252.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, p. 108.

Richmond (Maquoketa): Delafield, Wisconsin.

STROPHOMENA CERES Billings. See *Rafinesquina ceres*.

*Strophomena clintonii* Vanuxem.

Not recognized.

*Strophomena clintonii* Vanuxem, Geol. New York, 3, 1842, p. 84.

Clinton: Clinton, New York.

**Strophomena concordensis** Foerste.

*Strophomena concordensis* Foerste, Bull. Sci. Lab. Denison Univ., 14, p. 213, pl. 4, fig. 6a-b, 1909; *ibid.*, Bull. 17, 1912, p. 59, pl. 3, figs. 1a-m; Ohio Nat., 12, No. 3, 1912, p. 453, pl. 22, fig. 10.

Richmond (Top of Arnheim and Waynesville): Concord, etc., Kentucky; Ohio.

**Strophomena concordensis huronensis** Foerste.

*Strophomena concordensis-huronensis* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, p. 63, pl. 2, figs. 1a-k.

Richmond: Clay cliffs (Cape Smyth)? Manitoulin Island, Kagawong and Gore Bay, Lake Huron.

**Strophomena conradi** Hall and Clarke.

*Strophomena conradi* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 344, pl. 9A, fig. 3; pl. 20, figs. 32, 33; 48th Rep. New York State Mus., 2, 1897, p. 343, pl. 4, figs. 27-30; 14th Rep. State Geol. New York for 1894, 1897, p. 343, pl. 4, figs. 27-30.

Trenton: Trenton Falls, New York.

STROPHOMENA CONVEXA Owen. See *Strophomena incurvata*.

STROPHOMENA CORNUTA Hall. See *Chonetes cornutus*.

STROPHOMENA CORRUGATA Conrad. See *Stropheodonta corrugata*.

**STROPHOMENA CORRUGATA** var. **PLEURISTRIATA** Foerste. See *Strophodontia*(?) *corrugata pleuristriata*.

**STROPHOMENA DECLIVIS** James. See *Rafinesquina declivis*.

**STROPHOMENA DEFLECTA** Conrad. See *Dinorthis* (*Plasiomys*) *deflecta*.

**STROPHOMENA DELTOIDEA** Owen. See *Rafinesquina minnesotensis*.

**STROPHOMENA DELTOIDEA** Conrad. See *Rafinesquina deltoidea*.

**STROPHOMENA DEPRESSA** Vanuxem. See *Leptaena rhomboidalis*.

**Strophomena**(?) **doneti** Salter.

*Strophomena doneti* Salter, Jour. of a Voyage in Baffins Bay and Barrow Straits, 1852.

Silurian: Wellington Channel, Arctic America.

**STROPHOMENA ELEGANTULA** Hall. See *Plectambonites transversalis*.

**Strophomena**(?) **elliptica** Conrad.

*Strophomena elliptica* Conrad, 3d Ann. Rep. Geol. Surv. New York, 1839, p. 64. Niagaran: Rochester, New York.

**STROPHOMENA ELONGATA** James. See *Strophomena planumbona elongata*.

**Strophomena emaciata** Winchell and Schuchert.

*Strophomena emaciata* Winchell and Schuchert, American Geol., 9, 1892, p. 287; Geol. Minnesota, 3, 1893, p. 399, pl. 31, figs. 22-24.

Trenton (Prosser): Near Cannon Falls, Minnesota.

**STROPHOMENA EUGLYPHA** Salter. See *Strophonella euglypha*.

**STROPHOMENA EUGLYPHA** Roemer. See *Strophonella tenuistriata*.

**STROPHOMENA FASCIATA** Emmons. See *Leptaena incrassata*.

**STROPHOMENA FILITEXTA** Billings. See *Strophomena incurvata*.

**STROPHOMENA FILITEXTA** Meek. See *Strophomena neglecta*.

**Strophomena fluctuosa** Billings.

*Strophomena fluctuosa* Billings, Canadian Nat. Geol., 5, 1860, p. 57, fig. 6; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 123, fig. 102 (Adv. sheets, 1862); Geol. Canada, 1863, p. 209, fig. 207.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 1127, figs.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 251, pl. 2a, figs. 4, 5.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 119.

Richmond: Charleton Point, Anticosti (English Head-Ellis Bay); Stony Mountain, Manitoba (Stony Mountain); Texas; etc.

**STROPHOMENA FLUCTUOSA** Winchell and Schuchert. See *Strophomena fluctuosa occidentalis*.

**Strophomena fluctuosa occidentalis** Foerste.

*Strophomena fluctuosa-occidentalis* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, p. 113, pl. 9, figs. 17a-d; pl. 10, figs. 9a-c.

*Strophomena fluctuosa* Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 395, pl. 31, figs. 14-17.

Richmond (Maquoketa): Spring Valley, Minnesota.

**STROPHOMENA FONTINALIS** White. See *Dinorthis fontinalis*.



**STROPHOMENA FRACTA** Miller. See *Rafinesquina alternata fracta*.

**STROPHOMENA GIBBOSA** James. See *Leptæna gibbosa*.

**STROPHOMENA GILPENI** Dawson. See *Stropheodonta(?) gilpeni*.

**STROPHOMENA HALLI** Sardeson. See *Leptæna charlottæ*.

**Strophomena hallie** (Miller).

*Streptorhynchus(?) hallie* Miller, *Cincinnati Quart. Jour. Sci.*, 1, 1874, p. 148, figs. 14-16.

*Streptorhynchus hallianum* Miller, *N. A. Geol. Pal.*, 1889, p. 378, figs. 618, 619.

*Strophomena hallie* Hall and Clarke, *Pal. New York*, 8, pt. 1, 1892, p. 252.—

*Foerste Jour. Cincinnati Soc. Nat. Hist.*, 21, 1914, p. 130, pl. 2, figs. 5a, b;

*Bull. Sci. Lab. Denison Univ.*, 17, 1912, p. 38, pl. 2, figs. 1a-c, 2.

Eden (Economy, Southgate): Cincinnati, Ohio, and vicinity.

Trenton (Upper): Rogers Gap, etc., Kentucky.

**STROPHOMENA HANOVERENSIS** Foerste. See *Strophonella striata*.

**Strophomena hecuba** Billings.

*Strophomena hecuba* Billings, *Canadian Nat. Geol.*, 5, 1860, p. 60, fig. 7; *Pal.*

*Foss.*, 1, *Geol. Surv. Canada*, 1865, p. 126, fig. 104 (*Adv. sheets*, 1862); *Geol.*

*Canada*, 1863, p. 209, fig. 206.—Lesley, *Geol. Surv. Pennsylvania*, *Rep. P* 4,

1890, p. 1127, fig.—Hall and Clarke, *Pal. New York*, 8, pt. 1, 1892, p. 252.

Richmond (English Head, Charleton) and Gamachian: Island of Anticosti.

**Strophomena higginsportensis** Foerste.

*Strophomena higginsportensis* Foerste, *Bull. Sci. Lab. Denison Univ.*, 17, 1912,

p. 37, pl. 2, figs. 3a, b; pl. 10, fig. 4; *Jour. Cincinnati Soc. Nat. Hist.*, 21, 1914,

p. 130, pl. 1, fig. 9.

Trenton (Upper): Stony Point, east of Higginsport, Ivor, Rogers Gap, etc., Kentucky.

**Strophomena(?) imbecilis** Billings.

*Strophomena imbecilis* Billings, *Pal. Fossils*, 1, *Geol. Surv. Canada*, 1865, p. 219 (*Adv. sheets*, 1862).

Chazyan (Quebec—P): Four miles northeast of Portland Creek, Newfoundland.

**STROPHOMENA IMBEX** Pander. See *Rafinesquina imbex*.

**STROPHOMENA INCRASSATA** Billings. See *Rafinesquina incrassata*.

**STROPHOMENA INCRASSATA** Hall. See *Rafinesquina minnesotensis*.

**Strophomena incurvata** (Shepard).

*Producta incurvata* Shepard, *Amer. Jour. Sci.*, 34, 1838, p. 144, figs. 1, 2.

*Orthis incurvata* Castelnau, *Essai sur le Syst. Sil. de l'Amérique Septentrionale*, 1843, p. 38.

*Strophomena convexa* Owen, *Geol. Expl. Iowa, Wisconsin, and Illinois*, 1844, p. 70, pl. 17, fig. 2.

*Streptorhynchus convexum* Sardeson, *Bull. Minnesota Acad. Nat. Sci.*, 3, 1892, p. 343.

*Leptæna filitexta* Hall, *Pal. New York*, 1, 1847, p. 111, pl. 31B, fig. 3.

*Strophomena filitexta* Billings, *Canadian Nat. Geol.*, 1, 1856, p. 203, figs. 1, 2.—Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 70.—Billings, *Geol.*

*Canada*, 1863, p. 164, fig. 142.—Hall and Clarke, *Pal. New York*, 8, pt. 1,

1892, p. 251, pl. 9, figs. 1-7; pl. 9A, figs. 11-14 (not figs. 10, 15=S. neglecta).—

Emmons, *Amer. Geol.*, 1, pt. 2, 1855, p. 198, pl. 11, figs. 8, 9.

***Strophomena incurvata***—Continued.

*Streptorhynchus filitexta* Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 39, figs. 1-7; pl. 42, figs. 11-14 (not figs. 10, 15=*S. neglecta*).—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1093, figs.

*Strophomena incurvata* Whiteaves, Pal. Foss. Geol. Surv. Canada, 3, pt. 2, 1895, p. 119 (loc. occ.).—Raymond, Bull. Amer. Pal., 3, 1902, p. 303, pl. 19, fig. 11.—Weller, Geol. Surv. New Jersey Pal., 3, 1903, p. 150, pl. 9, figs. 16, 17.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 223, figs. 271a-d.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, p. 24, pl. 11, figs. 7-9a-c.

Stones River and Black River: Green Bay, Wisconsin. Various localities in Minnesota, Iowa, Kentucky, Tennessee, Missouri, Canada, etc.

*STROPHOMENA INQUASSA* Sardeson. See *Rafinesquina minnesotensis inquassa*.

*STROPHOMENA ITHACENSIS* Vanuxem. See *Atrypa reticularis*.

*STROPHOMENA JULIA* Billings. See *Leptaena julia*.

*STROPHOMENA KINGI* Whitfield. See *Rafinesquina kingi*.

***Strophomena laevis*** Emmons.

*Strophomena laevis* Emmons, Geol. New York, Rep. 2d Dist., 1842, p. 385, fig. 972; Amer. Geol., 1, pt. 2, 1855, p. 235, pl. 3, fig. 8.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1128, figs.

Black River: Great Bend, Jefferson County, New York.

*STROPHOMENA LATA* Miller. See *Rafinesquina lata*.

*STROPHOMENA LEDA* Billings. See *Stropheodonta(?) leda*.

*STROPHOMENA MACRA* Winchell and Marcy. See *Stropheodonta macra*.

***Strophomena maysvillensis*** Foerste.

*Strophomena maysvillensis* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 212, pl. 4, figs. 13a-b; *ibid.*, 17, 1912, p. 47, pl. 2, figs. 4a-j.

Maysville (Mount Hope, Fairmount): Maysville, etc., Kentucky; Ohio, Indiana, and Tennessee.

***Strophomena millionensis*** Foerste.

*Strophomena millionensis* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, p. 45, pl. 1, figs. 9a-c; pl. 10, fig. 14.

Eden: Near Million, Kentucky.

*STROPHOMENA MINNESOTENSIS* Winchell. See *Rafinesquina minnesotensis*.

***Strophomena(?) minor*** (Walcott).

*Streptorhynchus minor* Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 75, pl. 11, fig. 9.

*Strophomena? minor* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 432.

Upper Pogonip: Lone Mountain, near Eureka, Nevada.

*Cotype*.—Cat. No. 17274, U.S.N.M.

***Strophomena(?) modesta*** Conrad.

*Strophomena modesta* Conrad, 3d Ann. Rep. New York Geol. Surv., 1839, p. 64. Clinton(?): Rochester, New York.

*STROPHOMENA NASUTA* Conrad. See *Rafinesquina nasuta*.

***Strophomena neglecta*** (James).

*Strophomena filitexta* Meek (not Hall), Pal. Ohio, 1, 1873, p. 83, pl. 6, fig. 5.

?*Strophomena filitexta* White, U. S. Geol. Geogr. Surv. west 100th Merid., 4, 1875, p. 69, pl. 4, fig. 8.

**Strophomena neglecta**—Continued.

- Hemipronites filitextus Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 43.  
 Streptorhynchus filitextus (part) Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 42, figs. 10, 15 (not figs. 11-14); pl. 39, figs. 1-7.  
 Strophomena filitexta Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 9A, figs. 10, 15 (not figs. 11-14); pl. 11A, fig. 3.  
 Streptorhynchus neglecta James, Paleontologist, 5, 1881, p. 41.  
 Strophomena neglecta Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 388.—Foerste, Amer. Geol., 31, 1903, p. 338.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 224, fig. 272b.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 934, pl. 38, figs. 1-1b.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, pl. 5, figs. 1, 3; pl. 7, fig. 5; pl. 9, fig. 1; pl. 11, fig. 10.  
 Richmond: Oxford, Clarksville, Waynesville, etc., Ohio; Indiana (Waynesville); Savannah, Illinois (Maquoketa); Manitoulin Island, Lake Huron; Anticosti; Stony Mountain, Manitoba.

**STROPHOMENA NEGLECTA** var. **ACUTA** Winchell and Schuchert. See *Strophomena acuta*.

**STROPHOMENA NEMEA** Hall and Whitfield. See *Pianodema pogonipensis*.

**STROPHOMENA NIAGARENSIS** Winchell and Marcy. See *Stropheodonta profunda*.

**STROPHOMENA NITENS** Billings. See *Leptaena nitens*.

**Strophomena nutans** Meek.

- Strophomena* (*Hemipronites*) *nutans* (James) Meek, Pal. Ohio, 1, 1873, p. 77, pl. 6, fig. 1.  
 Hemipronites nutans Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 46.  
 Streptorhynchus nutans Miller, N. A. Geol. Pal., 1889, p. 378.  
 Streptorhynchus (*Strophomena*) *nutans* Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1094, figs.  
 Strophomena nutans Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 251, pl. 8, fig. 11; pl. 9A, figs. 5-7; pl. 11A, figs. 6, 7.—Foerste, Amer. Geol., 31, 1903, p. 338 (loc. occ.).—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 936, pl. 38, figs. 5-5c.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, p. 68, pl. 3, figs. 2a-c; pl. 9, figs. 15; pl. 10, figs. 2a-c; pl. 3, fig. 2b; pl. 11, fig. 8; pl. 10, figs. 3a-d; pl. 9, fig. 16.  
 Richmond (Waynesville): Butler, Warren, and Clinton Counties, Ohio; Indiana.

**STROPHOMENA OBSCURA** Hall. See *Rafinesquina*(?) *obscura*.

**Strophomena**(?) **orthididea** (Hall).

- Leptaena orthididea* Hall, Pal. New York, 2, 1852, p. 62, pl. 21, fig. 7.  
 Strophomena orthididea Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 82.  
 Clinton (Upper): Kirkland, Oneida County, New York.

**STROPHOMENA PATENTA** Hall. See *Strophonella*(?) *patenta*.

**STROPHOMENA PATENTA** Foerste. See *Strophonella daytonensis*.

**STROPHOMENA PECTEN** Roemer. See *Schuchertella pecten*.

**STROPHOMENA PHILOMENA** Billings. See *Stropheodonta* (*Brachyprion*) *philomena*.

**Strophomena planoconvexa** Hall.

- Leptaena planoconvexa* Hall, Pal. New York, 1, 1847, p. 114, pl. 31B, fig. 7.—Verneuil, Bull. Soc. Geol. France, 2d ser., 5, 1848, p. 350, pl. 4, fig. 2.

***Strophomena planoconvexa***—Continued.

*Strophomena planoconvexa* Emmons, Amer. Geology, 1, pt. 2, 1855, pl. 11, fig. 12.—Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 70.—Shaler, Mem. Geol. Surv. Kentucky, 1, ed., 1876, p. 26.—McCreery, Amer. Geol., 5, 1890, p. 102.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 251, pl. 9, figs. 19, 20.—Hayes and Ulrich, U. S. Geol. Surv., Folio 95, illustr. sheet, 1903, figs. 18, 19.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 938, pl. 38, figs. 3-3e.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, p. 54, pl. 1, figs. 1a-f, 2a, b.

*Strophomena* (Hemipronites) *planoconvexa* Meek, Pal. Ohio, 1, 1873, p. 82, pl. 6, fig. 2.

Hemipronites *planoconvexa* Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 48.

*Streptorhynchus planoconvexa* Miller, Amer. Pal. Foss., 1877, p. 134.—Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 39, figs. 19, 20.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 1095, figs.

Maysville (Fairmount): Cincinnati, Ohio, and vicinity.

*Plesiotypes*.—Cat. No. 35407, U.S.N.M. (Hayes and Ulrich).

***Strophomena planodorsata*** Winchell and Schuchert.

*Strophomena planodorsata* Winchell and Schuchert, Amer. Geol., 9, 1892, p. 286; Geol. Minnesota, 3, 1893, p. 393, pl. 31, figs. 8-10.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, p. 109, pl. 7, figs. 4a-b, 7a-b, 8; pl. 9, figs. 6a-b, 7, 8a-b, 9, 11, 12, 14a-b.

Richmond: Spring Valley, Minnesota, and Iron Ridge, Wisconsin (Maquoketa); Wilmington, Illinois; and West Tennessee (Fernvale).

***Strophomena planumbona*** (Hall).

*Leptæna planumbona* Hall, Pal. New York, 1, 1847, p. 112, pl. 31, fig. 4.—Vernueil, Bull. Soc. Geol. France, 2d ser., 5, 1848, p. 352, pl. 4, fig. 3.

*Strophomena planumbona* Emmons, Amer. Geology, 1, pt. 2, 1855, p. 198, pl. 11, fig. 2; p. 186, figs. 54-56.—Hall, Geol. Wisconsin, 1, 1862, p. 54, fig. 7.—Shaler, Mem. Geol. Surv. Kentucky, 1, 1876, pp. 13, 25, pls. 4, 5.—White, 2d Ann. Rep. Indiana Bur. Stat. and Geol., 1880, p. 483, pl. 2, figs. 13, 14; 10th Rep. Indiana State Geol., 1881, p. 115, pl. 2, figs. 13, 14.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 251, pl. 9, figs. 15-17; pl. 9A, figs. 8, 9.—Keyes, Geol. Surv. Missouri, 5, 1895, p. 73.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 939, pl. 38, figs. 4-4d.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, p. 73, pl. 8, figs. 1a-e; pl. 9, figs. 3a, b; pl. 4, figs. 1-4.

*Strophomena planumbona* var. Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 260, pl. 2, figs. 4a, b.

*Strophomena* (*Leptæna*) *planumbona* King, Mon. Permian Foss. England, Pal. Soc., 1850, p. 103.

*Strophomena* (Hemipronites) *planumbona* Meek, Pal. Ohio, 1, 1873, p. 79, pl. 6, fig. 3.

Hemipronites *planumbona* Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 45.

*Streptorhynchus planumbonus* Miller, Amer. Pal. Foss., 1877, p. 134.—Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 39, figs. 15-17; pl. 42, figs. 8, 9.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 1095, figs.

*Strophomena rugosa* Winchell and Schuchert (not Rafinesque), Geol. Minnesota, 3, 1893, p. 390, pl. 31, figs. 4, 5.—Whiteaves, Pal. Foss., 3, pt. 3, 1897, p. 168.—Foerste, Amer. Geol., 31, 1903, p. 338.—Nickles, Amer. Geol., 32, 1903, p. 214.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 224, fig. 271e-f.

**Strophomena planumbona**—Continued.

*Leptaena* (n. sp.)? Owen, Geol. Surv. Wisconsin, Iowa, Minnesota, 1852, pl. 2B, fig. 21.

Richmond (Waynesville, Liberty): Lebanon and many other localities in Ohio, Kentucky, and Indiana.

**Strophomena planumbona elongata** (James).

*Strophomena elongata* James, Cat. Foss. Cincinnati Group, 1871, p. 9 (nom. nud.).  
*Streptorhynchus* (*Strophomena*) *elongata* James, Cincinnati Quart. Jour. Sci., 1, 1874, p. 240.

*Streptorhynchus elongata* Mickleborough and Wetherby, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 76.

*Strophomena planumbona elongata* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, p. 81, pl. 4, figs. 1a-1; pl. 9, figs. 4a, b.

Richmond (Waynesville): Various localities in Ohio, Indiana, and Kentucky.

**Strophomena planumbona gerontica** Foerste.

*Strophomena planumbona-gerontica* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, p. 87, pl. 4, figs. 2a-c; pl. 11, fig. 6.

Richmond: Clarksville and Oregonia, Ohio; near Roseburg and Madison, Indiana (Waynesville); Gore Bay, Manitoulin Island, Lake Huron.

**Strophomena planumbona subtenta** (Hall).

*Strophomena subtenta* Conrad, 5th Ann. Rep. New York Geol. Surv., 1841, p. 37 (undefined).—Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 132, fig. 109 (adv. sheets, 1862).—Foerste, Amer. Geol., 31, 1903, p. 338 (loc. occ.), p. 341.

*Leptaena subtenta* Hall, Pal. New York, 1, 1847, p. 115, pl. 31B, fig. 9.

*Hemipronites subtenta* Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 46.

*Streptorhynchus subtentum* Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 1097, figs.

*Strophomena rugosa* var. *subtenta* Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 393.—Whiteaves, Pal. Foss., 3, pt. 3, 1897, p. 169.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 225.

*Strophomena planumbona* var. *subtenta* Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 940, pl. 38, figs. 6, 6g.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, p. 84, pl. 4, figs. 4a-d; pl. 8, figs. 2a-b; pl. 9, fig. 2.

*Strophomena plicata* James, Cat. L. Sil. Foss. Cincinnati Group, 1871, p. 9 (nom. nud.).

*Strophomena* (*Hemipronites*) *plicata* Meek, Pal. Ohio, 1, 1873, p. 81, pl. 6, fig. 4.

Richmond (Waynesville—Liberty): Oxford, Clarksville, etc., Ohio; Richmond, etc., Indiana; Kentucky.

**STROPHOMENA (HEMIPRONITES) PLICATA** Meek. See *Strophomena planumbona subtenta*.

**STROPHOMENA PLICIFERA** Hall. See *Dalmanella*(?) *plicifera*.

**STROPHOMENA PLICIFERA** Emmons. See *Leptaena incrassata*.

**Strophomena prisca** Raymond.

*Strophomena prisca* Raymond, Amer. Jour. Sci., 20, 4th ser., 1905, p. 369; Ann. Carnegie Mus., 7, 1911, p. 234, pl. 35, figs. 2, 3.

Chazy (Day Point): Valcour Island, New York.

**STROPHOMENA PROFUNDA** Hall. See *Stropheodonta profunda*.

*STROPHOMENA*\**RECTA* Billings. See *Strophomena billingsi*.

*STROPHOMENA RECTA* Conrad. See *Dinorthis* (*Plæsiomys*) *deflecta*.

*STROPHOMENA RETICULATA* Shaler. See *Leptæna reticulata*.

*STROPHOMENA RHOMBOIDALIS* Billings. See *Leptæna rhomboidalis*.

*STROPHOMENA RHOMBOIDALIS* Meek. See *Leptæna richmondensis*.

*STROPHOMENA RUGOSA* Safford. See *Leptæna rhomboidalis*.

*Strophomena rugosa* (Rafinesque).

Not recognized.

*Strophomena rugosa* (Rafinesque) Blainville, *Malacol. Conch.*, 1, 1825, p. 513, pl. 53, figs. 2, 2a.—King, *Mon. Permian Fossils*, *Pal. Soc.*, 1850, p. 103.—Hall and Clarke, *Pal. New York*, 8, pt. 1, 1892, p. 247, figs. 13, 14.—Foerste, *Bull. Sci. Lab. Denison Univ.*, 17, 1912, p. 87.

*Strophomenes rugosa* De France, *Dict. des Sci. Nat.*, 1, 1827, p. 151, and atlas. Silurian: North America.

Observation.—See Hall and Clarke [1892] and Foerste [1912] for discussion of this species.

*STROPHOMENA RUGOSA* of authors. See *Strophomena planumbona*.

*STROPHOMENA RUGOSA* var. *SUBTENTA* Grabau and Shimer. See *Strophomena planumbona subtenta*.

***Strophomena scofieldi*** Winchell and Schuchert.

*Strophomena scofieldi* Winchell and Schuchert, *Amer. Geol.*, 9, April 1, 1892, p. 236; *Geol. Minnesota*, 3, 1893, p. 398, pl. 31, figs. 18–21.

*Streptorhynchus subsulcatum* Sardeson, *Bull. Minnesota Acad. Nat. Sci.*, 3, April 9, 1892, p. 335, pl. 4, fig. 39.

Trenton (Prosser): Cannon Falls, Minneapolis, and St. Paul, Minnesota; Beloit, Wisconsin.

*STROPHOMENA* (*STROPHODONTA*?) *SEMIFASCIATA* Hall. See *Strophonella semifasciata*.

*STROPHOMENA SEMIOVALIS* Vanuxem. See *Plectambonites sericeus*.

***Strophomena*(?) *semiovalis*** Shaler.

*Strophomena semiovalis* Shaler, *Bull. Mus. Comp. Zool.*, 1, 1865, p. 61.

*Strophomena arcuata* Shaler, *ibid.*, p. 62.

Gamachian (Ellis Bay): Ellis Bay, Anticosti.

***Strophomena septata*** Winchell and Schuchert.

*Strophomena septata* Winchell and Schuchert, *Amer. Geol.*, 9, 1892, p. 285; *Geol. Minnesota*, 3, 1893, p. 390, pl. 30, figs. 1–3.

Black River (Decorah): St. Paul, Minneapolis, and Rochester, Minnesota.

*STROPHOMENA SERICEA* Conrad. See *Plectambonites sericeus*.

***Strophomena*(?) *siluriana*** Davidson.

*Strophomena siluriana* Davidson, *British Sil. Brach.*, *Pal. Soc.*, 1871, p. 303, pl. 47, figs. 1–4.—Etheridge, *Quart. Jour. Geol. Soc. London*, 34, 1878, p. 597.

Silurian: England; Cape Leidy, lat. 79° 38', Arctic America.

***Strophomena sinuata*** James.

*Strophomena sinuata* James, *Cat. Foss. Cincinnati Group*, 1871, p. 9 (nom. nud.).—Hall and Clarke, *Pal. New York*, 8, pt. 1, 1892, p. 251.—Cummings, 32d *Ann. Rep. Dep. Geol. Nat. Res. Indiana*, 1908, p. 941, pl. 38, figs. 2–2e.—Foerste, *Bull. Sci. Lab. Denison Univ.*, 17, 1912, p. 57, pl. 1, figs. 3a–c.

**Strophomena sinuata**—Continued.

*Strophomena* (*Hemipronites*) *sinuata* Meek, Pal. Ohio, 1, 1873, p. 87, pl. 5 (not *S. sinuata* Emmons, 1855).

*Hemipronites sinuata* Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 50.

*Streptorhynchus sinuatum* Lesley, Geol. Surv. Pennsylvania, Rep. P 4 1889, p. 1096, figs.

Maysville (Fairmount): Cincinnati, Ohio, and vicinity; Tennessee.

**STROPHOMENA SINUATA** EMMONS. See *Strophomena sulcata*.

**STROPHOMENA SQUAMULA** JAMES. See *Rafinesquina squamula*.

**STROPHOMENA STRIATA** HALL. See *Strophonella striata*.

**STROPHOMENA SUBPLANA** CONRAD. See *Schuchertella subplana*.

**STROPHOMENA SUBTENTA** CONRAD. See *Strophomena planumbona subtenta*.

**STROPHOMENA SUBTENTA** HALL AND CLARKE. See *Strophomena trentonensis*.

**Strophomena sulcata** (Verneuil).

*Leptæna sulcata* Verneuil, Bull. Geol. Soc. France, 2d ser., 5, 1848, p. 350, pl. 4, fig. 4.

*Strophomena* (*Hemipronites*) *sulcata* Meek, Pal. Ohio, 1, 1873, p. 85, pl. 5, fig. 4.

*Hemipronites sulcata* Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 48, fig. 5.

*Streptorhynchus sulcatus* Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 39, figs. 8, 9.—Miller, N. A. Geol. Pal., 1889, p. 379, fig. 620.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 1098, figs.

*Strophomena sulcata* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 9, figs. 8, 9; pl. 11A, fig. 8.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 436.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 942, pl. 36, figs. 10-10d.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, p. 102, pl. 1, figs. 4a-c; pl. 11, figs. 2a-b.

*Strophomena sinuata* Emmons, Amer. Geology, 1, 1855, p. 199, fig. 61; Man. Geol., 1860, p. 99, fig. 88.

Richmond (Waynesville—Whitewater): Oxford, Clarksville, etc., Ohio; Richmond, etc., Indiana; Manitoulin Island, Lake Huron.

**Strophomena(?) talacastrensis** Kayser.

*Strophomena talacastrensis* Kayser, Palæontographica, Suppl., 3, 1876, p. 20, pl. 3, fig. 20.

Ordovician: Talacastra, Cordillere San Juan, Argentina.

**STROPHOMENA TENUILINEATA** CONRAD. See *Rafinesquina tenuilineata*.

**STROPHOMENA (ORTHOTHETES) TENUIS** FOERSTE. See *Schuchertella tenuis*.

**STROPHOMENA TENUISTRIATA** D'ORBIGNY. See *Leptæna richmondensis*.

**Strophomena thalia** Billings.

*Strophomena Thalia* Billings, Canadian Nat. Geol., 5, 1860, p. 59; Pal. Fossils, 1, Geol. Surv. Canada (adv. sheets, 1862), 1865, p. 125, fig. 103; Geol. Canada, 1863, p. 164, fig. 143.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 251.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1134, figs.

Trenton: Ottawa, Ontario.

**STROPHOMENA TRANSVERSALIS** HALL. See *Plectambonites transversalis*.

**Strophomena trentonensis** Winchell and Schuchret.

*Leptæna subtenta* (part) Hall, Pal. New York, 1, 1847, p. 115.

*Streptorhynchus subtenta* Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 39, fig. 18.

**Strophomena trentonensis**—Continued.

*Strophomena subtenta* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 251, pl. 9, fig. 18.

*Strophomena trentonensis* Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 389, pl. 30, fig. 41.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 223, fig. 272a.

Trenton: Cannon Falls, Minneapolis, and Fountain, Minnesota; Janesville and Beloit, Wisconsin; Frankfort, Kentucky; Nashville, Tennessee; Trenton Falls, New York.

**Strophomena trilobata** (Owen).

*Leptæna trilobata* Owen, Geol. Surv. Wisconsin, Iowa, Minnesota, 1852, p. 584, pl. 2, figs. 17, 18.

*Strophomena trilobata* Miller, American Pal. Fossils, 1877, p. 138.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1134, figs.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 395, pl. 31, figs. 12, 13.—Whiteaves, Pal. Foss., 3, pt. 3, 1897, pp. 169, 241.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 223, fig. 271g-h.

Trenton: Turkey River, Iowa; Goodhue County, Minnesota (Prosser); Lake Winipeg, Manitoba.

*Holotype*.—Cat. No. 17875, U.S.N.M.

STROPHOMENA? ULRICHI James. See *Rafinesquina ulrichi*.

STROPHOMENA UNDULATUS Vanuxem. See *Leptæna rhomboidalis*.

STROPHOMENA UNDULOSA Conrad. See *Leptæna rhomboidalis*.

STROPHOMENA UNICOSTATA Meek and Worthen. See *Leptæna unicastata*.

STROPHOMENA VARISTRIATA Conrad. See *Stropheodonta varistriata*.

**Strophomena vetusta** (James).

*Streptorhynchus* (*Strophomena*) *vetusta* James, Cincinnati Quart. Jour. Sci., 1, 1874, p. 241.

*Streptorhynchus vetusta* Mickelborough and Wetherby, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 76.—James, Paleontologist, 2, 1878, p. 15.

*Strophomena vetusta* Foerste, Amer. Geol., 31, 1903, p. 338, 340; Bull. Sci. Lab. Denison Univ., 17, 1912, p. 98, pl. 6, figs. 2a-h.

Richmond (Waynesville-Whitewater): Ohio, Indiana, and Kentucky.

**Strophomena vetusta approximata** (James).

*Streptorhynchus approximata* James, Paleontologist, 2, 1878, p. 15; *ibid.* 5, 1881, p. 43.

*Strophomena approximata* Foerste, Amer. Geol., 31, 1903, p. 342 (loc. occ.).

*Strophomena vetusta-approximata* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, p. 101, pl. 6, figs. 1a-d.

Richmond (Liberty or Whitewater): Dearborn County, Indiana.

**Strophomena vetusta precursor** Foerste.

*Strophomena vetusta-precursor* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, pl. 10, figs. 1a-c.

Richmond (Waynesville): Two and one-half miles west of Clarksville, Ohio, etc.

**Strophomena vicina** Foerste.

*Strophomena vicina* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 317, pl. 7, fig. 12a, b; 17, 1912, p. 28, pl. 7, fig. 2.

Trenton (Wilmore-Perryville): Becknerville, Carnestown, Flanagan, Versailles, etc., Kentucky.



**Strophomena winchelli** Hall and Clarke.

*Streptorhynchus* (*Strophonella*?) *deltoides* Hall (not *Leptaena deltoidea*, 1847), 2d Ann. Rep. New York State Geol., 1883, pl. 39, figs. 10, 12-14 (not fig. 11 = *S. nutans*).

*Strophomena winchelli* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 344, pl. 9, figs. 10, 12-14; pl. 20, fig. 26.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 394, pl. 31, fig. 11.—Hall and Clarke, 48th Rep. New York State Mus., 2, 1895, p. 344, pl. 4, figs. 31-33; 14th Rep. State Geol. New York for 1894, 1897, p. 344, pl. 4, figs. 31-33.

Black River (Platteville): Janesville, Clifton, and Oshkosh, Wisconsin.

**Strophomena wisconsinensis** Whitfield.

*Strophomena wisconsinensis* Whitfield, Geol. Wisconsin, 4, 1882, p. 263, pl. 12, figs. 11-13.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 251, pl. 11A, figs. 1, 2.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, p. 108, pl. 7, figs. 1a-c; pl. 9, figs. 5a-c.

Richmond (Maquoketa): Delafield, Wisconsin.

**STROPHOMENES** Rafinesque. See *Strophomena* Blainville.*Strophomenes flexilis* Rafinesque.

Not recognized.

*Strophomenes flexilis* Rafinesque, Enumeration and Account of Some Remarkable Natural Objects in the Cabinet of Prof. Rafinesque, 1831, p. 4.

"Limestone of Ohio."

*Strophomenes levigata* Rafinesque.

Not recognized.

*Strophomenes levigata* Rafinesque, Enumeration and Account of some Remarkable Natural Objects in the Cabinet of Prof. Rafinesque, 1831, p. 4.

"Kentucky limestone."

**STROPHOMENES RUGOSA** DeFrance. See *Strophomena rugosa*.**STROPHONELLA** Hall.

Genotype: *Strophomena semifasciata* Hall.

*Strophonella* Hall, 28th Rep. New York State Mus. Nat. Hist., 1879, p. 153; 11th Rep. Indiana State Geol., 1882, p. 291.—Miller, N. A. Geol. Pal., 1889, p. 383.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 290; 11th Ann. Rep. New York State Geol., 1894, p. 282.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 182; Bull. New York State Mus., 45, 1901, p. 182.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 220.

*Amphistrophia* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 292; 11th Ann. Rep. New York State Geol., 1894, p. 283. (Genotype: *Strophonella striata* Hall.)

*Strophoprian* (subgenus of *Strophonella*) Twenhofel, Bull. Victoria Mem. Mus., 3, 1914, p. 25. (Genotype: *Brachyprion geniculatum* Shaler).

**Strophonella costatula** Hall and Clarke.

*Strophonella costatula* Hall and Clarke, Pal. New York, 8, pt. 2, 1895, p. 359, pl. 84, figs. 15, 16; 48th Rep. New York State Mus., 2, for 1895, 1897, p. 354, pl. 6, figs. 9, 10; 14th Rep. State Geol. New York for 1894, 1897, p. 354, pl. 6, figs. 9, 10.

Niagaran (Louisville): Louisville, Kentucky.

**Strophonella daytonensis** Foerste.

*Strophomena patenta* Foerste (not Hall), Bull. Sci. Lab. Denison Univ., 2, 1887, p. 105, pl. 8, figs. 34-37; Proc. Boston Soc. Nat. Hist., 24, 1890, p. 300, pl. 5, fig. 22.

**Stroponella daytonensis**—Continued.

- Strophomena* (*Strophonella*) *patenta* Foerste, Geol. Ohio, 7, 1895, p. 569, pl. 27, figs. 35-37.  
*Strophonella filistriata* Foerste, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 29.  
*Strophonella daytonensis* Foerste, Amer. Jour. Sci., 4th ser., 18, 1904, p. 339.  
 Upper Medinan (Brassfield): Dayton, etc., Ohio.

**Strophonella dixoni** Foerste.

- Strophonella dixoni* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 85, pl. 2, fig. 21.  
 Niagaran (Brownsport): Dixon Spring and Clifton, Tennessee.

**Strophonella euglypha** (Hisinger).

- Leptaena euglypha* Hisinger, Anteckn., 1819, pl. 6, fig. 4.  
*Strophomena euglypha* Salter, Siluria, 1859, pl. 20, fig. 9.—Davidson, Mon. British Sil. Brach. Pal. Soc., 1871, p. 288, pl. 40, figs. 1-5. (See for complete bibliography.)—Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 597.  
*Strophonella* cf. *euglypha* Høltedahl, 2d Arct. Expl. Fram, 1898-1902, No. 32, 1914, p. 5.  
 Niagaran: Europe; Cape Hildgard, Cape Louis Napoleon, and North Devon, Arctic America.

*STROPHONELLA FILISTRIATA* Foerste. See *Strophonella daytonensis*.

**Strophonella ganti** Foerste.

- Strophonella ganti* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 86, pl. 2, fig. 22.  
 Niagaran (Brownsport): Martins Mills and Gant Place, West Tennessee.

**Strophonella geniculata** (Hall).

- Strophodonta geniculata* Hall, Pal. New York, 3, 1859, p. 483, pl. 23, figs. 6a-c.  
*Strophonella geniculata* Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 321, pl. 59, figs. 3-5.  
 Helderbergian (Keyser): Devils Backbone, near Cumberland, Cash Valley, and Tonoloway, Maryland; Keyser, West Virginia.

**Strophonella (Strophoprion) geniculata** (Shaler).

- Brachyprion geniculatum* Shaler, Bull. Mus. Comp. Zool., 1, 1865, p. 63.  
*Stropheodonta(?) geniculata* Schuchert, Bull. U. S. Geol. Surv., 87, 1907, p. 422.  
*Strophoprion geniculatum* Twenhofel, Bull. Victoria Mem. Mus., 3, 1914, p. 25.  
 Anticostian (Gun River-Jupiter River): Southwest Point, etc., Anticosti.

**Strophonella keyserensis** Swartz.

- Strophonella keyserensis* Swartz, Maryland Geol. Surv., Low. Dev., 1913, p. 324, pl. 59, fig. 11.  
 Helderbergian (Keyser): Tonoloway, Maryland.

**Strophonella laxiplicata** Foerste.

- Strophonella laxiplicata* Foerste, Jour. Geol., 11, 1903, p. 711; Bull. Sci. Lab., Denison Univ., 14, 1909, p. 86, pl. 2, fig. 25.  
 Niagaran (Brownsport): Brownsport Furnace, Cerro Gordo, Bath Springs, etc., Tennessee.

**Strophonella(?) patenta** (Hall).

- Leptaena patenta* Hall, Pal. New York, 2, 1852, p. 60, pl. 21, fig. 3.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 823, fig. 631.

**Strophonella(?) patenta**—Continued.

- Strophomena patenta* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 82.—Hall and Whitfield, Pal. Ohio, 2, 1875, p. 115, pl. 5, fig. 10.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1130, figs.
- Streptorhynchus patenta* Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 42, figs. 16–18.
- Strophomena?* (*Strophonella?*) *patenta* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 291, 292, pl. 9A, figs. 16–18.
- Strophonella?* (*?*) *patenta* Grabau, Bull. New York State Mus., 45, 1901, p. 182, fig. 88; Bull. Buffalo Soc. Nat. Hist., 7, 1901, p. 182, fig. 88.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 220, fig. 266.
- Silurian: Reynales Basin, Medina, etc., New York (Clinton); Ontario (?Lockport).

**Strophonella prolongata** Foerste.

- Strophonella prolongata* Foerste, Jour. Geol., 11, 1903, p. 710; Bull. Sci. Lab. Denison Univ., 14, 1909, p. 85, pl. 2, figs. 23A, B.
- Niagaran (Brownsport): Near Brownsport Furnace, Dixon Spring, Gant Place, etc., West Tennessee.

**Strophonella roemeri** Foerste.

- Strophonella roemeri* Foerste, Jour. Geol., 11, 1903, p. 711; Bull. Sci. Lab. Denison Univ., 14, 1909, p. 84, pl. 2, fig. 24.
- Niagaran (Brownsport): Brownsport Furnace, Martins Mills, and New Era, Tennessee.

**Strophonella semifasciata** (Hall).

- Strophomena* (*Strophodonta?*) *semifasciata* Hall, Trans. Albany Inst., 4, 1863, p. 210.
- Strophonella semifasciata* Hall, 28th Rep. New York State Mus. Nat. Hist., 1879, p. 154, pl. 22, figs. 1–3; pl. 23, figs. 7, 8; 11th Rep. Indiana State Geol., 1882, p. 292, pl. 22, figs. 1–3; pl. 23, figs. 7, 8; 2d Ann. Rep. New York State Geol., 1883, pl. 43, figs. 4, 5.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1135, figs.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 12, figs. 4, 5.
- Niagaran: Waldron, Indiana; Newsom, Tennessee (Waldron); Wisconsin (Racine).

**Strophonella semifasciata brownsportensis** Foerste.

- Strophonella semifasciata-brownsportensis* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 87, pl. 2, fig. 26.
- Niagaran (Brownsport): Brownsport, Tennessee.

**Strophonella striata** (Hall).

- Strophomena striata* Hall, Geol. New York, Rep. 4th Dist., 1843, p. 104, fig. 3; 12th Rep. New York State Cab. Nat. Hist., 1859, p. 82.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1134, fig.
- Strophodonta striata* Hall, 28th Rep., *ibid.*, 1879, p. 152, pl. 23, figs. 1–6; 11th Rep. Indiana State Geol., 1882, p. 290, pl. 23, figs. 1–6.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 149.
- Leptæna striata* Hall, Pal. New York, 2, 1852, p. 259, pl. 53, fig. 7.
- Strophodonta* (*Strophonella?*) *striata* Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 43, figs. 1–3.
- Strophonella striata* Beecher and Clarke, Mem. New York State Mus., 1, 1889, p. 25, pl. 3, figs. 1–8.—Grabau, Bull. New York State Mus., 45, 1901, p. 182, fig. 87; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 182, fig. 87.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 220, fig. 267.

**Strophonella striata**—Continued.

*Strophomena hanoverensis* Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 301, pl. 6, fig. 1.

*Strophonella* (*Amphistrophia*) *striata* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 292, pl. 12, figs. 1-3.

*Strophomena* (*Orthothetes*) *hanoverensis* Foerste, Geol. Ohio, 7, 1895, p. 567, pl. 27, fig. 34; pl. 31, fig. 1.

*Strophonella* cf. *striata* Kindle and Breger, 28th Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 430, pl. 1, fig. 4.

Niagaran: Lockport, etc., New York (Rochester); Waldron, Indiana, and Newsom, Tennessee (Waldron); Louisville, Kentucky, etc., (Louisville); Wisconsin (Racine).

Upper Medinan (Brassfield): Dayton, etc., Ohio; Hanover, Indiana.

*Plesiotypes*.—Cat. No. 51335, U.S.N.M. (Nettelroth).

**Strophonella tenuistriata** Foerste.

*Strophomena euglypha* Roemer (not Salter), Sil. Fauna West Tennessee, 1860, p. 66, pl. 5, fig. 3.

*Strophonella tenuistriata* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 83, pl. 2, figs. 20a, b.

Niagaran (Brownsport): Near New Era, Cerro Gordo, and Martins Mills, Tennessee.

**Strophonella williamsi** Kindle and Breger.

*Strophonella williamsi* Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 430, pl. 1, figs. 6, 7, 11.

Niagaran: Georgetown, Pendleton, Delphi, etc., Indiana.

STROPHOPRIAN Twenhöfel. See *Strophonella* subgenus *Strophoprian*.

**STROPHOSTYLUS** Hall.

Genotype: *S. elegans* Hall.

*Strophostylus*, Hall, Pal. New York, 3, 1859, p. 303, figs. 1-3; p. 304, fig. 4; p. 468; 12th Rep. New York State Cab. Nat. Hist., p. 21.—Nicholson, Rep. Pal. Prov. Ontario, pt. 1, 1874, p. 117.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 19, No. 6, 1881, p. 61.—Zittel, Handb. Pal., 2, 1882, p. 218.—Miller, N. A. Geol. Pal., 1889, p. 427.—Koken, Neues Jahrb. Min., Geol. Pal., 6, Beilage-Band, 1889, p. 349.—Nettelroth, Kentucky Foss. Shells, Geol. Surv. Kentucky, 1889, p. 186.—Barrois, Mem. Soc. Agriculture Arts de Lille, 4th ser., 17, 1889, p. 203.—Keyes, Amer. Nat., 24, 1890, p. 1111.—Whidborne, Mon. Dev. Fauna South England, 1, Pal. Soc., 1891, p. 197.—Keyes, Proc. Iowa Acad. Sci., 1, pt. 2, 1892, p. 25; Missouri Geol. Surv., 5, 1894, p. 192.—Koken, Die Leitfossilien, Leipzig, 1896, p. 128, fig. 110, 1, 2.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1063.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 677.

**Strophostylus amplus** Rowley.

*Strophostylus amplus* Rowley, Green's Cont. Indiana Pal., 1, pt. 8, 1901, p. 66, pl. 23, fig. 8.

Niagaran (Waldron): Waldron, Indiana.

STROPHOSTYLUS AMPLUS Whiteaves. See *Strophostylus canadensis*.

**Strophostylus canadensis** Bassler (new name).

*Strophostylus amplus* Whiteaves (not Rowley, 1901), Geol. Surv. Canada, Ann. Rep., n. s., 14, App. F, 1904, p. 53; Pal. Foss., 3, pt. 4, 1906, p. 262, pl. 30, figs. 1, 1a.

Niagaran: Ekwan River, Canada.

**Strophostylus cancellatus** (Hall).

*Littorina cancellata* Hall, Geol. Rep. 45th Dist. New York, 1843, pp. 72, 73, figs. 5, 6; tab. ill., 7, fig. 5.

*Cyclonema cancellata* Hall, Pal. New York, 2, 1852, p. 90, pl. 28, figs. 1a-g.—Hall and Whitfield, 27th Rep. New York State Cab. Nat. Hist., 1875, pl. 13, figs. 6, 7.—Nettelroth, Kentucky Foss. Shells, Geol. Surv. Kentucky, 1889, p. 187, pl. 20, figs. 10, 11.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 172, figs.—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 467, pl. 14, figs. 5, 6.—Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 55, pl. 2, fig. 4.

Silurian: Sodus and Rochester, New York (Clinton); Ontario (Cataract); Georgetown, Indiana, and Louisville, Kentucky (Niagaran).

**Strophostylus cyclostomus** Hall.

*Strophostylus cyclostomus* Hall, Trans. Albany Inst., 4, 1864, p. 218; 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875, pl. 30, figs. 1-13; pl. 31, fig. 1; mus. ed., 1879, p. 176, pl. 30, figs. 1-13; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 319, pl. 31, figs. 1-13.—Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 96, pl. 14, fig. 15.—Keyes, Amer. Nat., 24, 1890, pl. 33, fig. 19.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 677, fig. 947.—Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 185, pl. 23, figs. 9-11.

Niagaran (Waldron): Waldron, Indiana; Newsom, Tennessee.

Upper Medinan (Brassfield): Dayton, Ohio.

Upper Monroan (Amherstburg): Detroit River region, Michigan.

**Strophostylus cyclostomus disjunctus** Hall.

*Strophostylus cyclostomus* var. *disjunctus* Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875, pl. 30, figs. 14, 15; mus. ed., 1879, p. 177, pl. 30, figs. 14, 15; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 320, pl. 31, figs. 14, 15.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1135, figs.

Niagaran (Waldron): Waldron, Indiana.

**Strophostylus elevatus** Hall.

*Cyclonema?* *elevata* Hall, 20th Rep. New York State Cab. Nat. Hist., 1868 (ext. Jan., 1865), p. 342, pl. 15 (6), fig. 4; rev. ed., 1870, p. 391, pl. 15, fig. 4.—Nicholson, Quart. Jour. Geol. Soc. London, 31, 1875, p. 548, pl. 26, figs. 16, 16a.—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 468, pl. 13, figs. 3, 5.

Niagaran: Racine, Wisconsin (Racine); Huntington, Indiana.

**Strophostylus filicinetus** Whiteaves.

*Strophostylus filicinetus* Whiteaves, Geol. Surv. Canada, Ann. Rep., n. s., 14, App. F, 1904, p. 54; Pal. Foss., 3, pt. 4, 1906, p. 263, pl. 30, figs. 4-6.

Niagaran: Ekwan River, Canada.

**Strophostylus inflatus** Whiteaves.

*Strophostylus inflatus* Whiteaves, Geol. Surv. Canada, Ann. Rep., n. s., 14, App. F, 1904, p. 53; Pal. Foss., 3, pt. 4, 1906, p. 262, pl. 30, figs. 2, 3.

Niagaran: Ekwan River, Canada.

**STROPHOSTYLUS NIAGARENSIS** Keyes. See *Diaphorostoma niagarense*.

**Strophostylus tennesseensis** (Roemer).

*Turbo tennesseensis* Roemer, Sil. Fauna West Tennessee, 1860, p. 77, pl. 5, fig. 17.  
*Cyclonema tennesseense* Miller, N. A. Geol. Pal., 1889, p. 401 (gen. ref.).  
 Niagaran (Brownsport): Decatur County, Tennessee.

**Strophostylus textilis** Ulrich and Scofield.

*Strophostylus textilis* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1064, pl. 82, figs. 49-54.  
*Holopea textilis* Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 677, fig. 943.  
*Cyclonema textile* Miller, N. A. Geol. Pal., 2d App., 1897, p. 766 (gen. ref.).  
 Black River: Minneapolis, St. Paul, Cannon Falls, etc., Minnesota (Decorah); Lincoln County, Missouri (Auburn).  
 Trenton: St. Paul, Minnesota (Prosser); Burgin, Kentucky (Flanagan).  
*Cotypes*.—Cat. Nos. 45999-46002, U.S.N.M.

**Strophostylus ventricosus** (Hall).

*Cyclonema ventricosa* Hall (not Hall 1870), Pal. New York, 2, 1852, p. 90, pl. 28, figs. 2a-c.  
 Lower Clinton: Sodus, New York.

**STROTOSPONGIA** Ulrich and Everett.

Genotype: *S. maculosa* Ulrich and Everett.

*Strotospongia* Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 276.—Miller, N. A. Geol. Pal., 1889, p. 166.

**Strotospongia maculosa** Ulrich and Everett.

*Strotospongia maculosa* Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 277, pl. 8, figs. 1, 1a-d.  
 Black River (Platteville): Dixon, Illinois.  
 Figured sections of *holotype*.—Cat. No. 46573, U.S.N.M.

**STYLARÆA** Von Seebach.

Genotype: *S. roemeri* Von Seebach.

*Stylaræa* Von Seebach, Zeits. d. d. Geol. Gesell., 18, 1866, p. 306.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1878, p. 60.—Zittel, Handb. Pal., 1, 1879, p. 239.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 456.—Lindstrom, Kongl. Sven. Vet.-Akad., Handl., 32, No. 1, 1899, p. 110.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 91.

**Stylaræa parva** (Billings).

*Columnaria parva* Billings, Canadian Nat. and Geol., 4, 1859, p. 428.  
*Stylaræa parva* Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 91, pl. 5, figs. 9, 9a, b.—Bassler, Bull. Virginia Geol. Surv., 2a, 1909, pl. 20, fig. 7.  
 Chazyan: Mingan Islands, Canada; Lake Champlain region; Virginia; Tennessee.

**STYLIOLA** Lesueur.

*Styliola* Hall, Pal. New York, 5, pt. 2, 1879, p. 175.—Zittel, Handb. Pal., 2, 1882, p. 313.—Nettelroth, Kentucky Foss. Shells, Geol. Surv. Kentucky, 1889, p. 157.—Miller, N. A. Geol. Pal., 1889, p. 392.—Matthew, Trans. Royal Soc. Canada, 10, sec. 4, 1893, p. 104.—Koken, Die Leitfossilien, Leipzig, 1896, p. 96, fig. 75, fig. 4.

**Styllola corrugata** (Matthew).

*Creseis corrugata* Matthew, Trans. Royal Soc. Canada, 10, sec. 4, 1893, p. 105, pl. 7, figs. 12a, b.  
*Cyrtotheca corrugata* Matthew, Bull. Nat. Hist. Soc. New Brunswick, 10, 1892, p. 8.  
 Canadian (Bretonian—Div. C3d): Suspension Bridge, St. John, New Brunswick,

**Styliola minuta** (Matthew).

*Creseis minuta* Matthew, Trans. Royal Soc. Canada, 10, sec. 4, 1893, p. 105, pl. 7, figs. 11a-c.

*Cyrtotheca minuta* Matthew, Bull. Nat. Hist. Soc. New Brunswick, 10, 1892, p. 8.

Canadian (Bretonian—Div. C3d): Suspension Bridge, St. John, New Brunswick.

**Styliola primæva** Matthew.

*Styliola primæva* Matthew, Trans. Royal Soc. Canada, 10, sec. 4, 1893, p. 104, pl. 7, figs. 10a, b.

Canadian (Bretonian—Div. C3d): Suspension Bridge, St. John, New Brunswick.

**STYLODICTYON** Nicholson and Murie. Genotype: *S. columnare* Nicholson.

*Stylodictyon* Nicholson and Murie, Jour. Linn. Soc. Zool., 14, 1878, p. 221.—

Zittel, Handb. Pal., 1, 1879, p. 286.—Roemer, Leth. geog., pt. 1, Leth. Pal.,

1883, p. 535.—Nicholson, Mon. British Strom., Pal. Soc., 1886, p. 79.—

Waagen and Wentzel, Mem. Geol. Surv. India, Pal. Indica, 13th ser., 1, 1888, p. 956.

**Stylodictyon sherzeri** Grabau.

*Stylodictyon sherzeri* Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 92, pl. 8, figs. 4-5.

Upper Monroan (Anderdon): Amherstburg, Ontario; Detroit, Michigan.

**STYLONURUS** Page.

Genotype: *S. powriei* Page.

*Stylonurus* Page, Adv. Textb. Geol., 4th ed., 1857, p. 208.—Woodward, Geol.

Mag., 1, 1864, p. 197; Mon. British Foss. Crust., Pal. Soc., 1872, p. 121.—

Alth, Abhandl. der K.-K. Geol. Reichsanstalt, 7, Heft 1, 1874, p. 54.—Zittel,

Handb. Pal., 7, 1885, p. 651.—Hall and Clarke, Pal. New York, 7, 1888,

p. 51.—Vogdes, Ann. New York Acad. Sci., 5, 1889, p. 34, fig.—Miller, N. A.

Geol. Pal., 1889, p. 568.—Laurie, Nat. Sci., 2, 1893, p. 125; Trans. Royal Soc.

Edinburgh, 37, 1893, p. 519; Nat. Sci., 3, 1893, p. 124.—Clarke and Ruedem-

mann, Mem. New York State Mus., 14, 1912, p. 278.—Clarke, Zittel-Eastman

Textb. Pal., 2d ed., 1913, p. 783.

*Ctenopterus* new subg. of *Stylonurus* Clarke and Ruedemann, Mem. New York

State Mus., 14, 1912, p. 287.—Clarke, Zittel-Eastman Textb. Pal., 1913,

p. 784. (Genotypes: *Stylonurus elegans* Laurie and *S. cestrotus* Clarke.)

*Drepanopterus* Laurie, Trans. Royal Soc. Edinburgh, 1892, p. 159; Nat. Sci., 3,

1893, p. 125; Rep. 62d Meeting British Assoc. Adv. Sci., 1893, p. 725; Trans.

Royal Soc. Edinburgh, 39, 1899, p. 582.—Clarke and Ruedemann, Mem.

New York State Mus., 14, 1912, p. 314.—Clarke, Zittel-Eastman Textb. Pal.,

1, 1913, p. 784.

**Stylonurus (Ctenopterus) cestrotus** (Clarke).

*Eurypterus? cestrotus* Clarke, Bull. New York State Mus., 107, 1907, p. 307, pl. 3, figs. 8-10.

*Stylonurus (Ctenopterus) cestrotus* Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 288, pl. 49; pl. 50, figs. 1-7.

Medinan (Shawangunk): Otisville, New York.

**Stylonurus limbatus** Clarke and Ruedemann.

*Stylonurus limbatus* Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 295, pl. 85, figs. 1-3, 5.

Trenton (Schenectady): Schenectady and Duanesburg, New York,

**Stylonurus (Drepanopterus) longicaudatus** Clarke and Ruedemann.

*Drepanopterus longicaudatus* Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 316, pl. 25, fig. 3; pls. 54-56.

Cayugan (Kokomo): Kokomo, Indiana.

**Stylonurus modestus** Clarke and Ruedemann.

*Stylonurus modestus* Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 415, figs. 99-101.

Chazyan (Normanskill): Catskill, New York.

**Stylonurus (Ctenopterus) multispinosus** Clarke and Ruedemann.

Unknown Eurypterid (genus?) Sarle, Rep. New York State Pal., 1902, p. 1105, pl. 26, figs. 2-4.

*Stylonurus (Ctenopterus) multispinosus* Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 297, pl. 50, figs. 9, 10.

Cayugan (Pittsford): Pittsford, Monroe County, New York.

**Stylonurus myops** (Clarke).

*Eurypterus maria* Clarke, Bull. New York State Mus., 107, 1907, pl. 3, fig. 6.

*Eurypterus* or *Pterygotus*, *ibid.*, pl. 6, fig. 8.

Segments and joints of *Eurypterus*, *Hughmilleria*, etc., *ibid.*, pl. 8, fig. 4.

*Eurypterus myops* Clarke, *ibid.*, p. 306, pl. 6, figs. 1-5.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 407, fig. 1713f, g.

*Stylonurus myops* Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 300, pls. 51, 52, 53, figs. 1-5, 7.

Medinan (Shawangunk): Otisville, New York; Delaware Water Gap, Pennsylvania.

SUBRETEPORA D'Orbigny. See *Chasmatopora* Eichwald.

SUBRETEPORA DICHOTOMA Miller. See *Thamniscus dichotomus*.

**SUBULITES** Conrad.

Genotype: *S. elongatus* Conrad.

*Subulites* (Conrad MS.) Hall, Pal. New York, 1, 1847, p. 182.—Meek and Worthen, Geol. Surv. Illinois, 2, 1866, p. 373; *ibid.*, 3, 1868, p. 361.—Lindström, Kongl. Sven. Vet.-Akad. Handl., 19, No. 6, 1881, p. 193.—Zittel, Handb. Pal., 2, 1882, p. 239.—Miller, N. A. Geol. Pal., 1889, p. 427.—Koken, Neues Jahrb. Min. Geol. Pal., 6, Beilage-Band, 1889, p. 451; Die Leitfossilien, Leipzig, 1896, p. 400, 806; Bull. Acad. Imp. Sci. St. Petersburg, 7, 1897, p. 209.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1069.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 696.

SUBULITES ABBREVIATA Hall. See *Cyrtospira abbreviata*.

**Subulites beloitensis** Ulrich and Scofield.

*Subulites beloitensis* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1072, pl. 81, figs. 9-11.

Black River (Platteville): Beloit, Wisconsin.

*Holotype*.—Cat. No. 46003, U.S.N.M.

**Subulites benedicti** Miller.

*Subulites benedicti* Miller, 17th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1892, p. 604, (694?), pl. 14, fig. 6. (adv. sheets, 1891).

Niaganan (Laurel?): Franklin County, Indiana.

**Subulites brevis** Winchell and Marcy.

*Subulites brevis* Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 100, pl. 2, fig. 19; p. 108.



**Subulites brevis**—Continued.

*Subulites* (*Polyphemopsis*) *brevis* Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 362, pl. 5, fig. 6.

Niagaran (Racine): Chicago, Illinois.

**SUBULITES CALCIFERA** Billings. See *Fusispira calcifera*.

**Subulites canadensis** Ulrich.

*Subulites canadensis* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1071, pl. 81, fig. 3.

Black River: Gloucester, near Ottawa, Ontario.

*Holotype*.—Cat. No. 46004, U.S.N.M.

**Subulites compactus** Whiteaves.

*Subulites compactus* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 16, pl. 3, fig. 2; pl. 7, fig. 6.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1142, figs.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 96.

*Subulites compactus*? var. *Whiteaves*, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 96, pl. 14, figs. 4, 5.

Niagaran (Guelph): Durham, Ontario.

**Subulites conradi** Ulrich and Scofield.

*Subulites conradi* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1071, pl. 81, figs. 4 and 5.

Black River: Goodhue County, Minnesota (Platteville); near Ottawa, Ontario.

*Holotype*.—Cat. No. 46005, U.S.N.M.

**SUBULITES DAPHNE** Billings. See *Fusispira daphne*.

**Subulites directus** Foerste.

*Subulites directus* Foerste, Geol. Surv. Ohio, Pal. 7, 1893, p. 554, pl. 37A, fig. 3a, b (5).

Upper Medinan (Brassfield): Huffmans Quarry, near Dayton, Ohio.

**Subulites dixonensis** Ulrich and Scofield.

*Subulites dixonensis* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1071, pl. 81, figs. 6-8.

Black River (Platteville): Dixon, Illinois.

*Holotype*.—Cat. No. 46006, U.S.N.M.

**Subulites elongatus** Conrad.

*Subulites elongata* (Conrad MS.) Emmons, Geol. New York, 2, 1842, p. 392, fig. 3.—Owen, Amer. Jour. Sci. Arts, 47, 1844, p. 365, fig. 3.—Hall, Pal. New York, 1, 1847, p. 182, pl. 39, figs. 5a-c.—Roemer, Neues Jahrb. Min., Geol., Pal., 1848, p. 177.—Lineklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 2, fig. 3.—Hall, Rep. Geol. Surv. Wisconsin, 1862, p. 39, fig. 5.—Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 17, 53 (loc. ref.); Geol. Canada, Geol. Surv. Canada, 1863, p. 183, fig. 179.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 157, fig.—Miller, N. A. Geol. Pal., 1889, p. 428, fig. 718.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1142, fig.—Keyes, Missouri Geol. Surv., 5, 1894, p. 215.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 696.

*Subulites* (*Laxonema*) *elongata* Emmons, Manual Geol., 1860, p. 98, fig. 87.

*Laxonema subelongata* D'Orbigny, Prodr. de Pal., 1, 1849, p. 5 (nov. nom. for *Subulites elongata* Hall).—Emmons, Amer. Geol., 1, pt. 2, 1855, p. 163, pl. 6, fig. 21.

**Subulites elongatus**—Continued.

*Subulites* sp. undet. (?*elongatus* Conrad) Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, pl. 81, figs. 1, 2.

Trenton: Watertown, Middleville, etc., New York; Canada.

*Plesiotype*.—Cat. No. 46007, U.S.N.M. (Ulrich and Scofield.)

**Subulites exactus** Sardeson.

*Subulites exactus* Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 101, pl. 6, fig. 14; Jour. Geol., 11, 1903, p. 481, fig. 16.

Canadian (Shakopee): Shakopee, and near Cannon Falls, Minnesota.

**Subulites gracilis** Miller.

*Subulites gracilis* Miller, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 116, pl. 5, fig. 5.

Niagaran (Racine): Chicago, Illinois.

SUBULITES INFLATUS Meek and Worthen. See *Fusispira inflata*.

**Subulites nanus** Ulrich.

*Subulites nanus* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1072, pl. 81, figs. 18, 19.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 697, fig. 1001b.

Black River (Lowville): Lebanon, Tennessee; High Bridge, Kentucky.

*Holotype*.—Cat. No. 46075, U.S.N.M.

SUBULITES NOTATUS Billings. See *Cyrtospira notatus*.

SUBULITES OBESUS Whitfield. See *Fusispira obesa*.

SUBULITES PARVULUS Billings. See *Cyrtospira parvula*.

**Subulites parvus** Ulrich.

*Subulites parvus* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1072, pl. 81, figs. 16, 17.

Black River (Lowville): High Bridge, Kentucky.

*Holotype*.—Cat. No. 46008, U.S.N.M.

**Subulites pergracilis** Ulrich and Scofield.

*Subulites pergracilis* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1072, pl. 81, figs. 12-15.

Trenton (Prosser): Wykoff, Minnesota.

*Cotypes*.—Cat. No. 46009, U.S.N.M.

SUBULITES (POLYPHEMOPSIS) PLANI-LATERALIS Foerste. See *Meekospira planilateralis*.

**Subulites prolongatus** Raymond.

*Subulites prolongatus* Raymond, Amer. Jour. Sci., 4th ser., 20, 1905, p. 378; Ann. Carnegie Mus., 4, 1908, p. 210, pl. 54, fig. 13.

Chazyan (Crown Point): Sloop Bay, Valcour Island, New York.

SUBULITES PSYCHE Billings. See *Fusispira psyche*.

SUBULITES RAYMONDI Hudson. See *Cyrtospira raymondi*.

**Subulites regularis** Ulrich and Scofield.

*Subulites regularis* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1072, pl. 81, figs. 35 and 36; pl. 82, figs. 47 and 48.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 696, fig. 1001a.—Bassler, Bull. Virginia Geol. Surv., 2a, 1909, pl. 23, fig. 5.

Black River: Cannon Falls, Minnesota (Platteville); High Bridge, Kentucky; Southwest Virginia (Lowville); near Ottawa, Ontario.

*Cotypes*.—Cat. No. 46010, U.S.N.M.

**Subulites richardsoni** Billings.

*Subulites richardsoni* Billings, Geol. Surv. Canada, Rep. Progr. for 1853-1856, 1857, p. 306; Cat. Sil. Foss., Anticosti, Geol. Surv. Canada, 1866, p. 17 (loc. ref.).

Richmond (Charleton) and Gamachian: Charleton Point, etc., Anticosti.

**SUBULITES SUBCONICUS** Miller. See *Meekospira subconica*.

**SUBULITES SUBFUSIFORMIS** Billings. See *Fusispira subfusiformis*.

**Subulites terebriformis** Hall and Whitfield.

*Subulites terebriformis* Hall and Whitfield, Geol. Surv. Ohio Pal., 7, 1875, p. 141, pl. 8, fig. 6.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1143, fig.

Niagaran (Guelph): Clinton, Green County, Ohio.

**SUBULITES TORTILIS** Miller. See *Cyrtospira tortilis*.

**SUBULITES VENTRICOSA** Hall. See *Cyrtospira ventricosa*.

**SUBULITES WYKOFFENSIS** Miller. See *Cyrtospira wykoffensis*.

**SUECOCERAS** Holm. See *Cameroceras* Conrad.

**Sulcopora** D'Orbigny.

Not recognized.

*Sulcopora* D'Orbigny, Prodr. de Pal., 1, 1850, p. 22.—Emmons, Amer. Geol., 1, pt. 2, 1855, p. 206.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 169.

Observation.—See Geol. Surv. Illinois, 8, 1890, p. 687, for discussion of this genus.

**SULCOPORA FENESTRATA** Ulrich. See *Rhinidictya fenestrata*.

**SYMBATHOCRINITES TENNESSEÆ** Troost. See *Synbathocrinus tennesseensis*.

**SYMBATHOCRINUS** of authors. See *Synbathocrinus* Phillips.

**SYMPHYSURUS** Goldfuss.

Genotype: *Asaphus palpebrosus* Dalman.

*Symphysurus* Goldfuss, Neues Jahrb. Min., 1843, pp. 541, 552.—Burmeister, Org. Tril., London, 1846, p. 106.—Hawle and Corda, Abh. d. k. böhmischen Gesell. d. Wiss., 5 (extract), 1847, p. 53.—Barrande, Neues Jahrb. Geol. Min. Pal., 1850, p. 778.—Angelin, Pal. Scandinavica, 3d ed. (1854), 1878, p. 60.—Pictet, Traite de Pal., 2d ed., 2, 1854, p. 513.—Salter, Mon. British Tril. Pal. Soc., 1866, p. 147.—Zittel, Handb. Pal., 2, 1885, p. 609.—Miller, N. A. Geol. Pal., 1889, p. 568.—Koken, Die Leitfossilien, Leipzig, 1896, p. 26, fig. 17, fig. 4.—Lindström, Kongl. Sven. Vet.-Akad. Handl., 34, No. 8, 1901, p. 26.—Raymond, Trans. and Proc. Roy. Soc. Canada, 5, 3d ser., sec. 4, 1912, p. 117; Zittel-Eastman Textb. Pal., 1913, p. 719.

**Symphysurus apolonista** Lake.

*Symphysurus apolonista* Lake Quart. Jour. Geol. Soc. London, 62, 1906, p. 427, pl. 40, figs. 2, 3.

Ordovician: Near Apolo, Bolivia.

**Symphysurus convexus** (Cleland).

*Asaphus convexus*? Cleland, Bull. Amer. Pal., 3, 1900, p. 128 (256), pl. 16, fig. 4.

*Bathyrurus* sp. Cleland, Bull. Amer. Pal., 3, 1900, pl. 16, fig. 9.

*Ilænurus columbiana* Weller, Pal. New Jersey, 3, 1903, p. 133, pl. 5, figs. 1-4.

*Bathyrurus levis*. Cleland, Bull. Amer. Pal., 4, 1903, p. 36, pl. 2, figs. 1, 2.

**Symphysurus convexus**—Continued.

*Symphysurus convexus* Raymond, Ann. Carnegie Mus., 7, No. 1, 1910, p. 42, pl. 14, figs. 14-16.

Canadian: Fort Hunter, New York (Tribes Hill); Columbia, New Jersey (Upper Beekmantown).

**Symphysurus eurekaensis** (Walcott).

*Illænus eurekaensis* Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 97, pl. 12, fig. 4, 4a.

*Symphysurus eurekaensis* Frech, Leth. geog., Leth. Pal., 2, 1 Lief., 1897, pl. 1b, fig. 6.

Lower Pogonip: Ridge east of Hamburg Ridge, Eureka District, Nevada.

*Cotypes*.—Cat. No. 24570, U.S.N.M.

**Symphysurus(?) goldfussi** Walcott.

*Smyphysurus?* Goldfussi Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 95, pl. 12, fig. 16.

Upper Pogonip: McCoys Ridge, Eureka District, Nevada.

*Holotype*.—Cat. No. 24648, U.S.N.M.

**Symphysurus illænoïdes** (Billings).

*Asaphus illænoïdes* Billings, Canadian Nat. Geol., 5, 1860, p. 323; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 414.

*Symphysurus illænoïdes* Raymond, Ann. Carnegie Mus., 7, No. 1, 1910, p. 441 (gen. ref); Trans. and Proc. Roy. Soc. Canada, 3d ser., 5, sec. 4, 1912, p. 120, pl. 3, fig. 5.

Ozarkian? (Levis-erratic): Point Levis, Quebec.

**SYNAPTOPHYLLUM MULTICAULE** Grabau. See *Diphyphyllum?* multicaule.

**SYNBATHOCRINITES GRANULATUS** Troost. See *Synbathocrinus granulatus*.

**SYNBATHOCRINITES TENNESSEEÆ** Troost. See *Synbathocrinus troosti*.

**SYNBATHOCRINUS** Phillips.

Genotype: *S. conicus* Phillips.

*Synbathocrinus* Phillips, Geol. Yorkshire, pt. 2, 1836, p. 206.—Austin (part), Mon. Rec. and Foss. Crin., 1847, p. 93.—D'Orbigny, Prodrome Pal. Strat., 1, 1850, p. 156.—Owen and Shumard, Geol. Surv. Iowa, Wisconsin, and Minnesota, 1852, p. 597.—Hall, Geol. Rep. Iowa, 1, pt. 2, 1858, p. 559, fig. 76.—Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1868, p. 324; Amer. Jour. Sci. Arts, 48, 1869, p. 24; Geol. Rep. Illinois, 5, 1873, pp. 324, 437; *ibid.*, 6, 1875, p. 514.—Wachsmuth, Amer. Jour. Sci., 14, 1877, pp. 182, 184; Ann. Mag. Nat. Hist., 5th ser., 1, 1878, p. 454.—Wetherby, Jour. Cincinnati Soc. Nat. Hist., Extr. 7, 1880.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 90 (Rev. Pal., pt. 3, sec. 2, p. 166).—Miller, N. A. Geol. Pal., 1889, p. 284.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 209.

*Synbathocrinus* D'Orbigny, Prodr. de Pal., 1, 1849, p. 157.—Pictet, Traite de Pal., 4, 1857, p. 333.—Schultze, Denk. Kais. Akad. Wiss. Math. Nat. Cl., 26, Abth., 2, 1867, p. 138, fig. 2.—Zittel, Handb. Pal., 1879, p. 349.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1887, p. 106; *ibid.*, 1888, p. 350; *ibid.*, 1890, p. 354.—Bather, Kongl. Sven. Vet.-Akad. Handl., 25, 1893, pp. 21, 25, fig. 4; Nat. Sci., 12, 1898, p. 343; Treatise on Zool. (Lankester), 1900, p. 152, fig. 65.—Zittel, Grundzuge, Pal., 1, 1910, p. 147.

**Synbathocrinus granulatus** (Troost).

*Synbathocrinites granulatus* Troost, Amer. Jour. Sci. Arts, 2d ser., 8, p. 419; Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 61 (nom. nud.).

**Synbathocrinus granulatus**—Continued.

*Synbathocrinus granulatus* Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 397.

*Synbathocrinus granulatus* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 90 (Rev. Pal., pt. 3, sec. 2, p. 166).—Wood, Bull. U. S.

Nat. Mus., 64, 1909, p. 27, pl. 9, figs. 4, 7, 8.

\*Niagaran (Brownsport): Decatur County, Tennessee.

*Holotype* and *plesiotype*.—Cat. No. 39938, U.S.N.M.

**Synbathocrinus tennesseensis** (Roemer).

*Synbathocrinites tennesseæ* Troost (in part), Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 61 (nom. nud.).

*Synbathocrinus tennesseæ* Wachsmuth and Springer, Rev. Pal., 3, 1886, pp. 166, 174.

*Synbathocrinus tennesseensis* Roemer, Die Sil. Fauna West. Tennessee, 1860, p. 55, pl. 4, figs. 6a, b.—Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 26.

Niagaran (Brownsport): Decatur County, Tennessee.

*Plesiotype*.—Cat. No. 39939, U.S.N.M. (Troost's type of *S. tennesseæ*).

**Synbathocrinus troosti** (Wood).

*Synbathocrinites Tennesseeæ* (part) Troost, Amer. Jour. Sci. Arts, 2d ser., 8, 1849, p. 419; Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 61 (nom. nud.).

*Synbathocrinus troosti* Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 27, pl. 9, fig. 9.

Niagaran (Brownsport): Decatur County, Tennessee.

*Holotype*.—Cat. No. 39930, U.S.N.M.

**SYNDYOGRAPTUS** Ruedemann.

Genotype: *S. pecten* Ruedemann.

*Syndyograptus* Ruedemann, Mem. N. Y. State Mus., 11, pt. 2, 1908, p. 266.

**Syndyograptus pecten** Ruedemann.

*Syndyograptus pecten* Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 267–268, pl. 15, figs. 5, 6, fig. 184, 185.

Chazyan (Normanskill): Glenmont, New York.

**SYNHOMALONOTUS** Pompeckj.

Genotype: *Calymmene tristani* Brongniart.

*Synhomalonotus* Pompeckj, Neues Jahrb. Min. Geol. Pal., 1, 1898, p. 240.

**Synhomalonotus christyi** (Hall).

*Calymene christyi* Hall, 13th Rep. New York State Cab. Nat. Hist., 1860, p. 118;

15th Rep., *ibid.*, 1862, pl. 10, figs. 2–5.—Miller, Cincinnati Quart. Jour. Sci.,

1, 1874, p. 141.—Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 107,

pl. 4, figs. 13–15.

*Synhomalonotus christyi* Pompeckj, Neues Jahrb. Min., Geol. Pal., 1, 1898, p. 247.

Richmond (Waynesville): Oxford, Ohio.

**SYNTROPHIA** Hall and Clarke.

Genotype: *Triplesia lateralis* Whitfield.

*Syntrophia* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 270; pt. 2, 1893, p. 216; 13th Ann. Rep. New York State Geol., 1895, p. 836.—Huenc, Verh.

d. Russ.-Kais. Min. Gesell. z. St. Petersburg, 38, 1900, p. 228, fig. 2.—Schu-

chert, Zittel-Eastman Textb. Pal., 1900, p. 320; 2d ed., 1913, p. 392.—Wal-

cott, Proc. U. S. Nat. Mus., 28, 1905, p. 288.—Grabau and Shimer, N. A.

Index Fossils, 1, 1907, p. 270.

**Syntrophia arachne** (Billings).

Stricklandia? *Arachne* Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 85, fig. 77, p. 419 (adv. sheets, 1862).

*Syntrophia arachne* Hall and Clarke, Nat. Hist. New York, 8, pt. 2, 1893, p. 216. Ozarkian? (Levis—erratics): Point Levis, Quebec.

**Syntrophia arethusa** (Billings).

Stricklandinia? *Arethusa* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 85, fig. 78 (adv. sheets, 1862).

*Syntrophia arethusa* Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 216. Ozarkian? (Levis—erratics): Point Levis, Quebec.

**Syntrophia(?) armanda** (Billings).

Orthis *Armanda* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 303, fig. 293.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 217.

*Syntrophia(?) armanda* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 440. Canadian (Beekmantown): Phillipsburg, Quebec.

**Syntrophia calcifera** (Billings).

*Camarella calcifera* Billings, Canadian Nat. Geol., 6, 1861, p. 318, fig. 3; Geol. Canada, 1863, p. 231, fig. 247; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 220.—Meek, 6th Ann. Rep. U. S. Geol. Surv. Terr., 1873, p. 464.

*Triplesia?* *calcifera* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 270.

*Syntrophia?* *calcifera* Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 218, pl. 62, fig. 24.—Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 800, pl. 104, figs. 1a-i.

Canadian: Point Levis, Phillipsburg, etc., Quebec (Beekmantown): Cow Head, Newfoundland (Quebec—P).

*Plesiotypes*.—Cat. Nos. 17279, 52476, U.S.N.M.

SYNTROPHIA CALCIFERA Grabau and Shimer. See *Syntrophia nundina*.

**Syntrophia campbelli** Walcott.

*Syntrophia campbelli* Walcott, Smiths. Misc. Coll., 53, 1908, pp. 107-108, pl. 10, figs. 9, 9a-c; Mon. U. S. Geol. Surv., 51, 1912, p. 801, figs. 73a-f.

Canadian (Beekmantown): Bunker Hill, six miles northeast of Rogersville, Hawkins County, Tennessee.

*Cotypes*.—Cat. No. 52480, U.S.N.M.

**Syntrophia lateralis** (Whitfield).

*Triplesia lateralis* Whitfield, Bull. Amer. Mus. Nat. Hist., 1886, p. 303, pl. 24, figs. 9-11.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1225, figs.—Seely, Vermont State Geol. Rep., 7, 1910, pl. 62, figs. 9-11.

*Syntrophia lateralis* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 270; *ibid.*, 8, pt. 2, 1893, p. 216, pl. 62, figs. 1-10; 13th Ann. Rep. State Geol. New York, 2, 1894, pp. 836, 837, pl. 45, figs. 7-12.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 126, pl. 4, figs. 14, 15.—Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 802, fig. 11, p. 299; pl. 102, figs. 6, 6a-g.

Canadian (Beekmantown): Fort Cassin, Vermont; Fort Hunter, New York; Columbia, New Jersey.

*Plesiotypes*.—Cat. No. 33447, U.S.N.M.

SYNTROPHIA MULTICOSTA Hudson. See *Clitambonites multicostus*.

**Syntrophia nundina** Walcott.

*Triplesia calcifera* Walcott (not Billings), Mon. U. S. Geol. Surv., 8, 1884, pp. 75-76, pl. 11, figs. 7 and 8.

*Syntrophia calcifera* Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 271, fig. 325.

**Syntrophia nudina**—Continued.

- Syntrophia nudina* Walcott, Proc. U. S. Nat. Mus., 28, 1905, p. 292; Mon. U. S. Geol. Surv., 51, 1912, p. 802, pl. 102, figs. 4, 4a-d.  
 Lower Pogonip; Eureka District, Eureka County, Nevada.  
*Holotype* and *plesiotypes*.—Cat. Nos. 17280, 17281, U.S.N.M.

**Syntrophia palmata** Cleland.

- Syntrophia palmata* Cleland, Bull. Amer. Pal., 3, 1900, p. 130 (258), pl. 17, figs. 14-17; *ibid.*, 4, 1903, p. 20.  
 Canadian (Tribes Hill): Fort Hunter, New York.

**Syphonia pyriformis** Owen.

Not recognized.

- Syphonia pyriformis* Owen, Geol. Expl. Iowa, Wisconsin, Illinois, 2d ed., 1844, p. 78, pl. 14, fig. 4.  
 Niagaran: Iowa and Wisconsin.

**SYRINGOCRINUS** Billings. See *Dendrocystites* Barrande.**SYRINGOLITES** Hinde.Genotype: *S. huronensis* Hinde.

- Syringolites* Hinde, Geol. Mag., dec. 2, 6, 1879, p. 244.—Nicholson, Tab. Corals Pal. Period, 1879, p. 178.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 424.—Miller, N. A. Geol. Pal., 1889, p. 205.—Nicholson, Geol. Mag., dec. 3, 4, 1889, p. 433.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 45.

**Syringolites huronensis** (Hinde).

- Syringopora Huronensis* Hinde, Geol. Mag., dec. 2, 6, 1879, p. 245, fig. A-D; p. 246.  
*Syringolites Huronensis* Nicholson, Tab. Corals Pal. Period, 1879, p. 179, fig. 27.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 424, fig. 101.—Nicholson, Geol. Mag., dec. 3, 6, 1889, p. 433, fig. 1.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 45.—Foerste, Bull. Kentucky Geol. Surv., 7, 1906, p. 301, pl. 2, fig. 3, pl. 4, fig. 2.  
 Niagaran: Manitoulin Island, Lake Huron; Irvine, Kentucky, and vicinity (Waco).

**SYRINGOPHYLLUM** Edwards and Haime.Genotype: *Madrepora organum* Linnæus.

- Sarcinula* Dana, Expl. Exp. Zooph., 1846, p. 363 (not Lamarek).  
*Syringophyllum* Milne-Edwards and Haime, British Foss. Corals, Intr., 1850, p. 72; Mon. Polyp. Foss., Terr. Pal., 1851, p. 449 (Arch. Mus. Hist. Nat. 5).

**Syringophyllum organum** (Linnæus).

- Madrepora organum* Linnæus, Syst. Nat., ed. 12, 1767, p. 1278.  
*Sarcinula organon* Schweigger, Handb. der Naturg., 1820, p. 420.—Eichwald, Zool. Spec., 1, 1829, p. 189.  
*Sarcinula organum* Goldfuss, Petref., 1826, p. 73, tab. 24, fig. 10.—Holl, Handb. der Petref., 1830, p. 401.—Blainville, Dict., 60, 1830, p. 314.—Man., p. 348.—Morren, Desc. Corall. Belg., 1832, p. 67.—Hisinger, Leth. succ., 1837, p. 97, tab. 28, fig. 8.—Eichwald, Silur. Schicht. Esthland, 1840, p. 199.—Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 586.  
*Astropora organum* D'Orbigny, Prodr. de Pal., 1, 1850, p. 50.  
*Syringophyllum organum* Milne-Edwards and Haime, British Foss. Corals, Intr., 1850, p. 62; Mon. Polyp. Foss., Terr. Pal., 1851, p. 450 (Arch. Mus. Hist. Nat., 5).  
 Silurian: England, Gothland, etc.; Cape Hilgard, Arctic America.

**SYRINGOPORA** Goldfuss.Genotype: *S. reticulata* Goldfuss.

*Syringopora* Goldfuss, Petr. Germ., 1826, p. 75; *ibid.*, 2d ed., 1862, p. 71.—Eaton, Geol. Textb., 2d ed., 1832, p. 41.—McCoy, Syn. Char. Carb. Foss. Ireland, 1844, p. 189.—Dana, Wilkes's U. S. Expl. Exped., 1838-1842, 7, Zoophytes, 1846, p. 637.—Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal., 1851 (Arch. du Mus. d'Hist. Nat., 5), p. 155, 285.—Hall, Pal. New York, 2, 1862, p. 118.—McCoy, British Pal. Rocks and Foss., 1854, p. 27.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 445.—Billings, Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 169; Canadian Nat. Geol., 3, 1858, p. 423; Canadian Jour., n. s., 4, 1859, p. 115.—Milne-Edwards, Hist. Nat. d. Corall., 3, 1860, p. 290.—Kunth, Zeits. d. d. geol. Gesell., 21, 1869, p. 191.—Koninck, Animaux Foss. Carb. Belgique (Mem. l'Acad. Royale Sci. de Belgique), 39, 1872, p. 118.—Nicholson, Rep. Pal. Prov. Ontario, pt. 1, 1874, p. 39.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 79.—Nicholson, Trans. Royal Soc. Edinburgh, 27, 1876, p. 241.—Lindstrom, Ann. Mag. Nat. Hist., 4th ser., 18, 1876, p. 14.—Nicholson, Tab. Corals Pal. Period, 1879, p. 207.—Thomson, Proc. Royal Soc. Edinburgh, 11, 1881, p. 219; Proc. Phil. Soc. Glasgow, 14, 1883, p. 328.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 489.—Koch, Palaeontographica, 29, 1883, pp. 335, 344.—Nicholson, Ann. Mag. Nat. Hist., 5th ser., 13, 1884, p. 30.—Miller, N. A. Geol. Pal., 1889, p. 206.—Beecher, Trans. Connecticut Acad. Arts Sci., 8, 1891, p. 210.—Sardeson, Neues Jahrb. Min., Geol., Pal., Beilage-Band, 10, 1896, p. 330.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 49.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 82.—Zittel-Eastman Textb. Pal., 1900, p. 101; 2d ed., 1913, p. 116.

*Drymopora* Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 70 (not defined). (Genotype: *D. fascicularis* Davis.)

***Syringopora annulata*** Rominger.

*Syringopora annulata* Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 81, pl. 32, lower tier.

Niagan: Drift of Ann Arbor, Michigan; Point Detour, Lake Huron.

***Syringopora bifurcata*** Lonsdale.

*Syringopora bifurcata* Lonsdale, Murch. Sil. Syst., 1839, p. 685, pl. 15 bis, figs. 11, 11, 11b.—Lambe, Cont. Canadian Pal., 4, pt. 1, Geol. Surv. Canada, 1899, p. 51.

Niagan: Europe; Cape Wingfield, Lake Huron; Isle of Mann (Burnt Island), Lake Temiscaming, Quebec.

Helderbergian: L'Anse a la Vielle, etc., Quebec.

***Syringopora compacta*** Billings.

*Syringopora compacta* Billings, Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 169; Canadian Nat. Geol., 3, 1858, p. 423; Geol. Canada, Geol. Surv. Canada, 1863, p. 306, fig. 307.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 190, fig.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 54.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1147, fig.

Silurian or Helderbergian: L'Anse a la Vielle, Quebec; Wisconsin.

***Syringopora cooperi*** Grabau.

*Syringopora cooperi* Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 118, pl. 14, fig. 1.

Upper Monroan (Flat Rock): Salt shaft, Oakwood (Detroit), Michigan.

***Syringopora dalmani*** Billings.

*Syringopora Dalmanii* Billings, Canadian Nat. Geol., 3, 1858, p. 423; Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 169; Geol. Canada, Geol. Surv. Canada,



**Syringopora dalmani**—Continued.

1863, p. 306, fig. 306.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 190, fig.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 51, pl. 2, fig. 2.

Niagaran: Head of Lake Temiscaming, Quebec; Wisconsin.

**Syringopora debilis** Billings.

Syringopora debilis Billings, Canadian Nat. Geol., 3, 1858, p. 424; Geol. Surv. Canada, Rep. Progr. for 1857, 1859, p. 170.

Silurian or Helderbergian: L'Ause a la Vielle, Quebec.

**Syringopora (Drymopora) fascicularis** (Davis).

Drymopora fascicularis Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 70, figs. 1-4; pl. 74, fig. 7.

Syringopora (Drymopora) fascicularis Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 338.

Niagaran (Louisville): Louisville, Kentucky.

Upper Medinan (Brassfield): Ludlow Falls and Fair Haven, Ohio.

**Syringopora fibrata** Rominger.

Syringopora fibrata Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 82, pl. 30, fig. 3.

Niagaran: Point Detour, Drummond Island, Lake Huron; Louisville, Kentucky (Louisville); Indiana; Iowa.

**SYRINGOPORA HURONENSIS** Hinde. See *Syringodites huronensis*.

**SYRINGOPORA INFUNDIBULA** Whitfield. See *Cystostylus infundibulum*.

**Syringopora lineata** Owen.

Not recognized.

Syringopora (lineata?) Owen, Geol. Expl. Iowa, Wisconsin, Illinois, 2d ed., 1844, p. 76, pl. 13, fig. 2.

Niagaran: Iowa and Wisconsin.

**Syringopora microfundulus** Grabau.

Syringopora microfundulus Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 117, pl. 15, figs. 7, 8.

Upper Monroan (Anderdon): Salt shaft at Detroit, Michigan.

**SYRINGOPORA? MULTICAULIS** Hall. See *Diphyphyllum?* multicaule.

**Syringopora parallela** Etheridge.

Syringopora parallela Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 583, pl. 26, fig. 1.

Niagaran: Dobbin Bay, Arctic America.

**Syringopora ramulosa** Troost.

Not recognized.

Syringopora ramulosa (Goldfuss) Troost, 5th Geol. Rep. Tennessee, 1840, p. 69.

Mountain limestone: Near Nashville, Tennessee.

**Syringopora retiformis** Billings.

Syringopora retiformis Billings, Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 170; Canadian Nat. Geol., 3, 1858, p. 424; Geol. Canada, Geol. Surv. Canada, 1863, p. 306, fig. 304.—Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 139.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1874, p. 58.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 190, fig.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1148, fig.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 52, pl. 2, fig. 3.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 82, fig. 131.

Niagaran: Isthmus Bay, Lake Huron; Owen Sound, etc., Ontario; Wisconsin.

*SYRINGOPORA TENELLA* Rominger. See *Ceratopora tenella*.

***Syringopora verticillata* Goldfuss.**

*Syringopora verticillata* Goldfuss, *Petrefacta Germ.*, 1826, p. 76, pl. 25, figs. 6a, b; 2d ed., 1862, p. 71.—Eaton, *Geol. Textb.*, 2d ed., 1832, p. 41, pl. 5, fig. 63.—Edwards and Haime, *Mon. d. Polyp. Foss. d. Terr. Pal.*, 1851 (*Arch. du Mus. d'Hist. Nat.*, 5), p. 291.—Billings, *Geol. Surv. Canada, Rep. Progr. for 1857, 1858*, p. 170; *Canadian Nat. Geol.*, 3, 1858, p. 423.—Milne-Edwards, *Hist. Nat. d. Corall.*, 3, 1860, p. 291.—Billings, *Geol. Canada, Geol. Surv. Canada, 1863*, p. 306, fig. 305.—Rominger, *Geol. Surv. Michigan*, 3, pt. 2, 1876, p. 80, pl. 30, figs. 1, 2.—Whitfield, *Geol. Wisconsin*, 4, 1882, p. 272, pl. 14, fig. 6.—Chamberlin, *Geol. Wisconsin*, 1, 1883, p. 190, fig.—Hall, *12th Ann. Rep. Indiana Dep. Geol. Nat. Hist.*, 1883, p. 254, pl. 3, fig. 5.—Lambe, *Cont. Can. Pal.*, *Geol. Surv. Canada*, 4, pt. 1, 1899, p. 50.—Lesley, *Geol. Surv. Pennsylvania, Rep. P 4*, 1890, p. 1148, fig.—Grabau and Shimer, *N. A. Index Fossils*, 1, 1906, p. 82.—Lambe, *Cruise of the "Neptune," App. 4*, 1906, p. 325.

Niagaran: Drummond Island, Lake Huron; Point Detour, etc., Michigan; Wisconsin; Lake Temiscaming, Quebec; Anticosti; Southampton Island, Arctic America.

***SYRINGOSTROMA* Nicholson.**

Genotype: *S. columnare* Nicholson.

*Syringostroma* Nicholson, *Geol. Surv. Ohio, Pal.*, 2, 1875, p. 251.—Dawson, *Quart. Jour. Geol. Soc. London*, 35, 1879, p. 56.—Nicholson, *Mon. British Strom.*, *Pal. Soc.*, 1886, p. 97.—Miller, *N. A. Geol. Pal.*, 1889, p. 166.—Girty, *48th Rep. New York State Mus.*, 2, 1895, p. 289; *14th Rep. State Geol. New York for 1894, 1897*, p. 289.—Parks, *Univ. Toronto Studies, Geol. Ser.*, No. 6, 1909, p. 8.

***Syringostroma barretti* Girty.**

*Syringostroma barretti* Girty, *48th Rep. New York State Mus.*, 2, 1895, p. 296, pl. 7, figs. 5, 6.—Parks, *Univ. Toronto Studies, Geol. Ser.*, No. 6, 1909, pp. 16–19.—Swartz, *Maryland Geol. Surv.*, *Low. Dev.*, 1913, p. 224, pl. 28, figs. 3, 4.

*Stromatopora* (*Syringostroma*) *barretti* Grabau and Shimer, *N. A. Index Fossils*, 1, 1909, p. 45, fig. 72.

Helderbergian: Indian Ladder, New York (Coeymans); south of Cookerly, Maryland (Keyser).

***Syringostroma centrotum* Girty.**

*Syringostroma centrotum* Girty, *48th Rep. New York State Mus.*, 2, 1894, p. 293, pl. 7, figs. 1, 2.—Parks, *Univ. Toronto Studies, Geol. Ser.*, No. 6, 1909, p. 12–14.—Swartz, *Maryland Geol. Surv.*, *Low. Dev.*, 1913, p. 225, pl. 28, figs. 5, 6; pl. 30, fig. 2.

*Stromatopora* (*Syringostroma*) *centrota* Grabau and Shimer, *N. A. Index Fossils*, 1, 1909, p. 45, fig. 72.

Helderbergian: Herkimer County, New York; near signal station, Warrior Mountain, Maryland (Keyser).

***Syringostroma niagarensis* Parks.**

*Syringostroma niagarensis* Parks, *Univ. Toronto Studies, Geol. Ser.*, No. 5, 1908, p. 52, pl. 10, figs. 1, 2, 5, 7.

Niagaran: North shore of Lake Michigan; Drummond Island; drift at Ann Arbor, Michigan.

*Holotype*.—Cat. No. 36933, U.S.N.M.

**Syringostroma parallelum** Parks.

*Syringostroma parallelum*, Parks, Univ. Toronto Studies, Geol. Ser., No. 5, 1908, p. 54, pl. 10, figs. 3, 4, 6.

Niagaran: Drummond Island, Lake Huron.

*Holotype*.—Cat. No. 36934, U.S.N.M.

**TENIASTER** Billings.

Genotype: *Palaeocoma spinosa* Billings.

*TeniaSTER* Billings, Geol. Surv. Canada, dec. 3, 1858, p. 80.—Chapman, Canadian Jour., n. s., 6, 1861, p. 517.—Wright, Mon. British Foss. Echinod., Oolitic, 2, pt. 1 (Pal. Soc. for 1861), 1862, pp. 24, 34.—Chapman, Expos. Min. Geol. Canada, 1864, p. 111.—Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 300; rev. ed., 1870, p. 338.—Zittel, Handb. Pal., 1, 1879, p. 445.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1880, p. 323.—Stürtz, Neues Jahrb. Min., Geol., Pal., 2, 1886, p. 150; Palaeontographica, 32, 1886, pp. 78, 83.—Miller, N. A. Geol. Pal., p. 285.—Gregory, Geol. Mag., dec. 3, 6, 1889, p. 26.—Sturtz, Verh. naturh. Ver. preuss. Rheinl., etc., 1893, p. 20.—James, Jour. Cincinnati Soc. Nat. Hist., 18, 1895, pp. 138, 139.—Gregory, Proc. Zool. Soc. London for 1896, 1897, p. 1035; Treat. Zool., 3, Echinoderma, 1900, p. 250.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 715.—Schuchert, Bull. U. S. Nat. Mus., 88, 1915, p. 216.

*Teniura* Gregory (not *Teniura* Muller and Heule, 1837), Proc. Zool. Soc. London, 1897, p. 1035.

**TeniaSTER cylindricus** (Billings).

*Palaeocoma cylindrica* Billings, Geol. Surv. Canada, Rep. Progress for 1853-56, 1857, p. 292.

*TeniaSTER cylindricus* Billings, Geol. Surv. Canada, dec. 3, 1858, p. 81, pl. 10, figs. 4a-b.—Wright, Mon. British Foss. Echinod., Oolitic, 2, pt. 1 (Palaeontogr. Soc. for 1861), 1862, p. 34.—Parks, Trans. Canadian Inst., 8, 1908, p. 371.—Schuchert, Bull. U. S. Nat. Mus., 88, 1915, p. 220, pl. 36, figs. 2, 3, text fig. 18.

*Teniura cylindricus* Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 45 (loc. occ.).—Gregory, Proc. Zool. Soc. London for 1896, 1897, p. 1035.

*Lapworthura cylindrica* Parks, Trans. Canadian Inst., 8, 1908, p. 371.

Trenton (Curdsville): Ottawa and Kirkfield, Ontario.

**TeniaSTER elegans** Miller.

*TeniaSTER elegans* Miller, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 41, pl. 1, figs. 6, 6a, 6b, 6c.—James, *ibid.*, 18, 1895, p. 139.—Parks, Trans. Canadian Inst., 8, 1908, pp. 365, 371.—Schuchert, Bull. U. S. Nat. Mus., 88, 1915, p. 221.

Protaster *elegans* Parks, Trans. Canadian Inst., 8, 1908, p. 368.

Richmond (Waynesville or Liberty): Waynesville, Ohio.

*Cotypes*.—Cat. No. 40878, U.S.N.M.

**TENIASTER GRANULIFERUS** Cumings. See *Alepidaster granuliferus*.

**TeniaSTER meafordensis** Foerste.

*TeniaSTER meafordensis* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 326, pl. 4, figs. 5-7.—Schuchert, Bull. U. S. Nat. Mus., 88, 1915, p. 221.

Richmond: Near Meaford, Ontario.

**TeniaSTER schohariæ** Ruedemann.

*TeniaSTER schohariæ* Ruedemann, Bull. New York State Mus., 162, 1912, pl. 3, fig. 1.—Schuchert, Bull. U. S. Nat. Mus., 88, 1915, p. 220.

Trenton (Schenectady): Near Schoharie Junction, New York.

**Tæniaster spinosus** (Billings).

*Palæocoma spinosa* Billings, Geol. Surv. Canada, Rep. Progr. for 1853-56, 1857, p. 292.

*Tæniaster spinosus* Billings, Geol. Surv. Canada, dec. 3, 1858, p. 81, pl. 10, figs. 3a-3d.—Miller, N. A. Geol. Pal., 1889, p. 285, fig. 439.—Schuchert, Bull. U. S. Nat. Mus., 88, 1915, p. 219, pl. 36, fig. 1, text fig. 17.

Trenton: Falls of Montmorency, Canada.

**TÆNODICTYA** Ulrich.

Genotype: *T. ramulosa* Ulrich.

*Tæniodictya* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 393.—(Ulrich, in press), Miller, N. A. Geol. Pal., 1889, p. 327.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 533.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 47.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 57.

**Tæniodictya schucherti** Bassler.

*Tæniodictya schucherti* Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 57, pl. 27, figs. 10-13.

Clinton (Rochester): Grimsby, Ontario.

*Holotype*.—Cat. No. 35772, U.S.N.M.

**TÆNIURA** Gregory. See *Tæniaster* Billings.

**TANAOCRINUS** Wachsmuth and Springer.

Genotype: *T. typus* Wachsmuth and Springer.

*Tanaocrinus* Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 185.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 193.

**Tanaocrinus typus** Wachsmuth and Springer.

*Tanaocrinus typus*, Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 186, pl. 9, figs. 7a-c.

*Glyptocrinus typus* Miller, N. A. Geol. Pal. (2d app.), 1897, p. 746 (gen. ref.).  
Richmond (Waynesville or Liberty): Warren County, Ohio.

**TAONURUS ARCHIMEDES** Sarle. See *Daedalus archimedes*.

**TARPHYCERAS** Hyatt.

Genotype: *T. prematurum* Hyatt.

*Tarphyceras* Hyatt, Amer. Phil. Soc. Proc., 32, 1894, p. 433.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 778.—Ruedemann, Bull. New York State Mus., 90, 1906, p. 464.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 66.

**Tarphyceras aucoini** Hyatt.

*Tarphyceras aucoini* Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 435, pl. 4, figs. 17-22.

Canadian (Quebec): Port au Port, Newfoundland.

**Tarphyceras calciferus** (Billings).

*Nautilus calciferus* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 258.

*Tarphyceras? calciferus* Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 435 (gen. ref.).  
Canadian (Quebec-F, G): Port au Choix and Cape Norman, Newfoundland.

**Tarphyceras champlainense** (Whitfield).

*Nautilus? champlainensis* Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 329, pl. 31, figs. 1-3.—Seely, Vermont State Geol. Rep., 7, 1910, pl. 53, figs. 1, 3.

*Eurystomites champlainensis* Schröder, Pal. Abhandl., 5, Heft 4, 1891, p. 28.

*Tarphyceras champlainensis* Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 438, pl. 4, figs. 4-11.—Ruedemann, Bull. New York State Mus., 90, 1906, pp. 468, 452.

Canadian (Beekmantown): Fort Cassin, Vermont.

*Plesiotypes*.—Cat. No. 25657, U.S.N.M. (Hyatt).

**Tarphyceras clarkel** Ruedemann.

*Tarphyceras clarkel* Ruedemann, Bull. New York State Mus., 90, 1906, p. 470, pl. 22, figs. 27-31.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 67, fig. 1276.

Canadian (Beekmantown): Valcour and Valcour Island, New York.

**Tarphyceras extensum** Hyatt.

*Tarphyceras extensum* Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 438, pl. 6, figs. 1-4.

Canadian (Quebec): Port au Choix, Newfoundland.

**Tarphyceras farnsworthi** (Billings).

*Lituites farnsworthi* Billings (part), Geol. Surv. Canada Pal. Foss., 1, 1861, p. 21.

*Tarphyceras farnsworthi* Hyatt, Proc. Amer. Phil. Soc., 32, 1893, p. 435.—Ruedemann, Bull. New York State Mus., 90, 1906, p. 465.

Canadian (Beekmantown): Phillipsburg, Quebec.

**Tarphyceras macdonaldi** Hyatt.

*Tarphyceras macdonaldi* Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 435.

Canadian (Beekmantown): Near Lexington, Virginia.

*Holotype*.—Cat. No. 25656, U.S.N.M.

**Tarphyceras multicameratum** Ruedemann.

*Tarphyceras multicameratum* Ruedemann, Bull. New York State Mus., 90, 1906, p. 472, pl. 19, fig. 3; pl. 23, fig. 2, figs. 32, 33.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 67, fig. 1277.

Chazyan (Valcour): Near Chazy and Valcour Island, New York; Isle la Motte, Vermont.

**Tarphyceras perkinsi** (Whitfield).

*Nautilus perkinsi* Whitfield, Bull. Amer. Mus. Nat. Hist., 9, 1897, p. 182, pl. 5, figs. 1, 2.—Seely, Vermont State Geol. Rep., 7, 1910, pl. 55, figs. 1, 2.

*Tarphyceras perkinsi* Ruedemann, Bull. New York State Mus., 90, 1910, pp. 469, 452.

Canadian (Beekmantown): Fort Cassin, Vermont.

**Tarphyceras prematurum** Hyatt.

*Tarphyceras prematurum* Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 437, pl. 4, figs. 12-16.

Canadian (Quebec): Port au Port, Newfoundland.

**Tarphyceras seelyi** (Whitfield).

*Lituites seeleyi* Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 330, pl. 31, fig. 2; pl. 32, fig. 3.—Seely, Vermont State Geol. Rep., 7, 1910, pl. 53, fig. 2; pl. 54, fig. 3.

*Tarphyceras seelyi* Hyatt, Amer. Phil. Soc. Proc., 32, 1894, p. 435 (gen. ref.).—Ruedemann, Bull. New York State Mus., 90, 1906, p. 465, pl. 19, figs. 1, 2; pl. 20, fig. 5, pl. 21; pl. 24, fig. 3, figs. 25, 26.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 67, fig. 1275.

Canadian (Beekmantown): Fort Cassin, Vermont; Valcour, New York.

**TAXOCRINUS ELEGANS** Miller. See *Protaxocrinus elegans*.

**TAXOCRINUS LEVIS** Miller. *Protaxocrinus laevis*.

**TECHNOPHORUS** Miller.

Genotype: *T. faberi* Miller

*Technophorus* Miller, N. A. Geol. Pal., 1889, p. 514.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 612.—Clarke, Mem. New York State Mus., 6, 1904, p. 406, expl. pl. 9.

*Ribeirella* Schubert and Waagen, Jahrb. d. k. k. geol. Reichsanst., 53, 1903, pp. 33, 45.—Clarke, Mem. New York State Mus., 6, 1904, p. 406, expl. pl. 9.

**Technophorus bellistriatus** Branson.

*Technophorus bellistriatus* Branson, Trans. Acad. Sci. St. Louis, 18, 1909, p. 47, pl. 7, fig. 21.

Black River (Auburn-Decorah): Lincoln County, Missouri.

**Technophorus cancellatus** Ruedemann.

*Technophorus cancellatus* Ruedemann, Bull. New York State Mus., 42, 1901, p. 672, pl. 1, figs. 19-25; *ibid.*, Bull. 162, 1912, p. 122.

Trenton (Snake Hill): Snake Hill, Saratoga County, New York.

**Technophorus cincinnatiensis** Miller and Faber.

*Technophorus cincinnatiensis* Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 17, 1894, p. 147, pl. 8, figs. 15, 16.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 785, fig. 1457.

Eden (Economy): Cincinnati, Ohio, and vicinity.

**Technophorus divaricatus** Ulrich.

*Technophorus divaricatus* Ulrich, Amer. Geol., 10, 1892, p. 102, pl. 7, figs. 15, 16.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 702, fig. 1260.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 616, pl. 40, figs. 37, 38.

Black River (Decorah): Near Cannon Falls, Minnesota.

**Technophorus extenuatus** Ulrich.

*Technophorus extenuatus* Ulrich, 19th Ann. Rep. Geol. Minnesota, 1892, p. 222, fig. 8; Geol. Minnesota, 3, pt. 2, 1894, p. 614, pl. 37, fig. 34; p. 611, fig. 45i.

Black River (Decorah): Minneapolis, Minnesota.

**Technophorus faberi** Miller.

*Technophorus faberi* Miller, N. A. Geol. Pal., 1889, p. 514, fig. 930.—Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 17, 1894, p. 27, pl. 1, fig. 20.

Maysville (Fairmount): Sharon, Hamilton County, Ohio.

**Technophorus filistriatus** Ulrich.

*Technophorus filistriatus* Ulrich, Amer. Geol., 10, 1892, p. 101, pl. 7, figs. 11, 12; Geol. Minnesota, 3, pt. 2, 1894, p. 615, pl. 40, figs. 35, 36.

Black River (Decorah): Near Cannon Falls, Minnesota.

*Holotype*.—Cat. No. 46312, U.S.N.M.

**Technophorus plicatus** (Billings).

*Ischyria plicata* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 52.

*Technophorus plicata* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 613 (gen. ref.). Gamachiau (Ellis Bay): Junction Cliff, Anticosti.

**Technophorus punctostriatus** Ulrich.

*Technophorus punctostriatus* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 685, pl. 47, figs. 10-12.

Maysville (Fairmount): Covington, Kentucky.

*Cotypes*.—Cat. No. 46313, U.S.N.M.

**Technophorus punctostriatus quincuncialis** Foerste.

*Technophorus punctostriatus quincuncialis* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 316, pl. 2, figs. 13a, b.

Cincinnati (Pulaski): Chambly, Quebec.

**Technophorus subacutus** Ulrich.

*Technophorus subacutus* Ulrich, Amer. Geol., 10, 1892, p. 101, pl. 7, figs. 13, 14;

Geol. Minnesota, 3, pt. 2, 1894, p. 614, pl. 40, figs. 33, 34.

Black River (Platteville): Minneapolis, Minnesota.

*Plastotype*.—Cat. No. 46314, U.S.N.M.

**Technophorus? yoldiaformis** (Ulrich).

*Nuculites yoldiaformis* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 24, pl. 7, fig. 20.

*Technophorus? yoldiaformis* Ulrich, 19th Ann. Rep. Geol. Nat. Hist. Surv.

Minnesota, 1892, p. 223; Geol. Surv. Ohio, 7, p. 685, pl. 47, figs. 13, 14.

Eden (Economy): Covington, Kentucky.

*Holotype*.—Cat. No. 46315, U.S.N.M.

**TECTULIPORA** Hall. See *Loculipora* Hall.**TEGANIUM** Rauff.

Genotype: *Cyathophycus subsphericum* Walcott.

*Teganium* Rauff, Palæontographica, 40, 1894, p. 256.

*Sphærodictya* Hall and Clarke, Mem. New York State Mus., 11, 1899, p. 26.

(Genotype: *Cyathophycus subsphericum* Walcott.)

**Teganium subsphericum** (Walcott).

*Cyathophycus subsphericum* Walcott, Amer. Jour. Sci. Arts, 3d ser., 22, 1881, p. 395; Trans. Albany Inst., 10, 1883, p. 19, pl. 2, figs. 17 (adv. sheets, 1879).—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 7, 1884, p. 128, pl. 5, fig. 5.—Hall, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 468.—Ulrich, Amer. Geol., 1, 1888, p. 324.

*Teganium subsphericum* Rauff, Palæontographica, 40, 1894, p. 256, pl. 4, figs. 3, 4.

*Sphærodictya subsphærica* Hall and Clarke, Mem. New York State Mus., 11, 1899, p. 766, pl. 1, figs. 14–22.

Utica: Trenton, Oneida County, New York.

*Plasiotype*.—Cat. No. 26441, U.S.N.M.

**TELEPHUS** Barrande.

Genotype: *T. fractus* Barrande.

*Telephus* Barrande, Syst. Sil. du Centre Boheme, 1, 1852, p. 890, pl. 18.—Angelin,

Pal. Scandinavica, 3d ed., Holmiæ (1854), 1878, p. 91.—Pictet, Traite de

Pal., 2d ed., 2, 1854, p. 527.—Zittel, Handb. Pal., 2, 1885, p. 599.—Miller,

N. A. Geol. Pal., 1889, p. 568.—Reed, Geol. Mag., dec. 4, 5, 1898, p. 499.

**Telephus americanus** Billings.

*Telephus Americanus* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 291, fig. 281.

Chazyan (Quebec—N, P): Table Head, four miles northeast Portland Creek and Pistolet Bay, Newfoundland.

**TELLINOMYA** Hall. See *Ctenodonta* Salter.**TELLINOMYA ANATINIFORMIS** Hall. See *Pterotheca anatiniformis*.**TELLINOMYA (PALEONEILO) CUNEATA** Simpson. See *Ctenodonta diminuens*.**TELLINOMYA (NUCULA) LEPIDA** Sardeson. See *Ctenodonta similis*.**TELLINOMYA PULCHELLA** Clarke. See *Ctenodonta clarkei*.**TELLINOMYA (NUCULA?) SOCIALIS** Foerste. See *Ctenodonta ohioensis*.**TELLINOMYA VENTRICOSA** Hall. See *Ctenodonta gibberula*.

**TEMNOGRAPTUS** Nicholson.Genotype: *T. multiplex* Nicholson.

*Temnograptus* Nicholson, *Geol. Mag.*, dec. 2, 3, 1876, p. 248.—Zittel, *Handb. Pal.*, 1, 1879, p. 299.—Wiman, *Bull. Geol. Inst. Univ. Upsala*, 2, pt. 2, 1896, p. 265.—Roemer and Frech, *Leth. geog.*, 1 Theil, *Leth. Pal.*, 1, 3 Lief, 1897, p. 596.—Elles and Wood, *Mon. British Grapt.*, *Pal. Soc.*, 1902, p. 85.—Ruedemann, *Mem. New York State Mus.*, 7, pt. 1, 1904, pp. 618, 619.

**Temnograptus noveboracensis** Ruedemann.

*Temnograptus* cf. *multiplex* (Nicholson) Ruedemann, *New York State Pal. Ann. Rep.*, 1902, p. 556.

*Temnograptus noveboracensis* Ruedemann, *Mem. New York State Mus.*, 7, pt. 1, 1904, pp. 619, 620, pl. 5, figs. 15–20, figs. 35, 36.

Canadian: Deepkill, Rensselaer County, New York (Deepkill, *Tetragraptus* zone); Point Levis, Quebec (Levis, *Diplograptus dentatus* zone).

**Temnograptus ramulus** (Hall).

*Graptolithus ramulus* Hall, *Geol. Surv. Canada*, dec. 2, 1865, p. 108, pl. 12, figs. 9, 10.

*Graptolithus* (*Monoprion*) *ramulus* Hall, 20th Rep. New York State Cab. Hist., 1868, p. 226; rev. ed. 1870, p. 261; p. 223.

*Dichograpsus ramulus* Gurley, *Jour. Geol.*, 4, 1896, p. 95 (gen. ref.).

Canadian (Levis): Point Levis, Quebec.

**TENTACULITES** Schlotheim.Genotype: *T. scalaris* Schlotheim.

*Tentaculites* Schlotheim *Petrefakten*, 1820, p. 377.—Castlenau, *Essai Syst. Sil. l'Amerique Septent.*, 1843, p. 33.—McCoy, *British Pal. Rocks Foss.*, 1854, p. 63.—Pictet, *Traité de Pal.*, 2d ed., 3, 1855, p. 321.—Ludwig, *Palaontographica*, 11, 1864, p. 316.—Barrande, *Syst. Sil. du Centre Boheme*, 3, 1867, p. 110.—Nicholson, *Geol. Mag.*, 9, 1872, p. 446; *Amer. Jour. Sci.*, 3d ser., 3, 1872, p. 205.—Hall, *Pal. New York*, 5, pt. 2, 1879, p. 155, 165.—Vine, *Quart. Jour. Geol. Soc. London*, 38, 1882, pp. 378–385.—Zittel, *Handb. Pal.*, 2, 1882, p. 314.—Walcott, *Mon. U. S. Geol. Surv.*, 8, 1884, p. 196.—Nettelroth, *Kentucky Foss. Shells*, *Geol. Surv. Kentucky*, 1889, p. 156.—Miller, *N. A. Geol. Pal.*, 1889, p. 393.—Nicholson, *Trans. Edinburgh Geol. Soc.*, 6, 1890, p. 66.—Grabau, *Bull. Buffalo Soc. Nat. Sci.*, 6, 1899, p. 282.—Pilsbry, *Zittel-Eastman Textb. Pal.*, 1, 1900, p. 490; 2d ed., 1913, p. 572.—Grabau and Shimer, *N. A. Index Fossils*, 2, 1910, p. 10.

**Tentaculites canadensis** Ami.

*Tentaculites canadensis* Ami, *Proc. and Trans. Nova Scotian Inst. Sci.*, 8, 1895, p. 412.

Silurian: Antigonish County, Nova Scotia.

**TENTACULITES DISTANS** Hall. See *Cornulites distans*.

**TENTACULITES FLEXUOSA** Hall. See *Cornulites flexuosus*.

**Tentaculites gyracanthus** (Eaton).

*Echinus gyracanthus* Eaton, *Geological Textb.*, 1832.

*Tentaculites gyracanthus* Hall, *Pal. New York*, 3, 1859, p. 137, pl. 6, figs. 22, 23; *ibid.*, *Pal.*, 5, pt. 2, 1879, p. 160; *ibid.*, *Pal.*, 7, 1888, p. 5, pl. 114, figs. 7–13.—Weller, *Geol. Surv. New Jersey*, *Pal.*, 3, 1903, p. 264, pl. 24, figs. 19–20.—Grabau, *Bull. New York State Mus.*, 92, 1906, p. 116, fig. 25.—Grabau and Shimer, *N. A. Index Fossils*, 2, 1910, p. 10, fig. 1220.—Maynard, *Maryland Geol. Surv.*, *Low. Dev.*, 1913, p. 486, pl. 87, fig. 11.



**Tentaculites gyraeanthus**—Continued.

*Tentaculites ornatus* (Sowerby?) Vanuxem, Geol. New York, 3, 1842, p. 112, fig. 3.—Hall, Geol. New York, 4, 1843, p. 142, fig. 3; tab. ill. 20, fig. 3.—Mather, Geol. New York, 1, 1843, p. 349, fig. 3.—Oweu, Amer. Jour. Sci. Arts, 2d ser., 1846, p. 47, fig. 3.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 824, fig. 638.—Emmons, Man. Geol., 1860, p. 113, fig. 102.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, p. 58, pl. 9, fig. 3.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 1177, figs.

*Tentaculites irregularis* Castelnau, Essai Syst. Sil. l'Amérique Septent., 1843, p. 34, pl. 10, fig. 5.—Hall, Pal. New York, 5, pt. 2, 1879, p. 156.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 1176, figs.

Cayuga (Manlius): Albany County, etc., New York.

Helderbergian (Manlius transition—Keyser): New York, New Jersey, Pennsylvania, Maryland, etc.

**TENTACULITES INCURVUS** Shumard. See *Cornulites incurvus*.

**TENTACULITES IRREGULARIS** Hall. See *Tentaculites gyraeanthus*.

**Tentaculites minutus** Hall.

*Tentaculites minutus* Hall, Geol. New York, 4, 1843, pp. 72, 74, fig. 11; tab. ill. 7, fig. 11; *ibid.*, Pal., 2, 1852, p. 183, pl. A41, figs. 8a-e; *ibid.*, Pal., 7, Sup., 1888, p. 5, pl. 114, figs. 1, 2.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1177, figs.

Lower Clinton: Clinton, New York.

**Tentaculites neglectus** Nicholson and Hinde.

*Tentaculites neglectus* Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 145.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 48.

Upper Medinan (Cataract): Dundas, Ontario.

**Tentaculites niagarensis** Hall.

*Tentaculites niagarensis* Hall, Pal. New York, 2, 1852, p. 352, pl. 85, figs. 11, 12; *ibid.*, 5, pt. 2, 1879, p. 160.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1177, figs.—Ami, Proc. and Trans. Nova Scotian Inst., 8, 1895, p. 411 (loc. occ.).

Clinton (Rochester): Lockport, etc., New York.

**Tentaculites niagarensis cumberlandiæ** Hall.

*Tentaculites Niagarensis* var. *Cumberlandiæ* Hall, Pal. New York, 7, Sup., 1888, p. 5, pl. 114, figs. 3-6.

Niagaran(?): Cumberland, Maryland.

**Tentaculites obliquus** Ulrich.

*Tentaculites obliquus* Ulrich, Amer. Geol., 1, 1888, p. 109.

Trenton (Flanagan): Near Danville, Kentucky.

**TENTACULITES ORNATUS** VANUXEM. See *Tentaculites gyraeanthus*.

**Tentaculites oswegoensis** Meek and Worthen.

*Tentaculites Oswegoensis* Meek and Worthen, Proc. Acad. Nat. Sci., Philadelphia, 1865, p. 254; Geol. Surv. Illinois, 3, 1868, p. 342, pl. 4, fig. 6a.—Hall, Pal. New York, 5, pt. 2, 1879, p. 163.

Richmond (Maquoketa): Oswego, Kendall County, Illinois.

**Tentaculites regularis** Castelnau.

Not recognized.

*Tentaculites regularis* Castelnau, Essai Syst. Sil. l'Amérique Septent., 1843, p. 34, pl. 10, fig. 6.—Hall, Pal. New York, 5, pt. 2, p. 156.

Trenton(?): New York.

Observation.—Probably the same as *T. gyraeanthus* (Eaton).

TENTACULITES RICHMONDENSIS Miller. See *Cornulites richmondensis*.

**Tentaculites saienzii** Salter.

*Tentaculites Saienzii* Salter, Quart. Jour. Geol. Soc. London, 17, 1861, p. 67, pl. 4, fig. 12.

Silurian: Mount Illampu, Bolivia.

TENTACULITES STERLINGENSIS Meek and Worthen. See *Cornulites sterlingensis*.

**Tentaculites supremus** Salter.

*Tentaculites supremus* Salter, Quart. Jour. Geol. Soc. London, 17, 1861, p. 67, pl. 4, fig. 11.

Silurian: Mount Illampu, Bolivia.

TENTACULITES TENUISTRATUS Meek and Worthen. See *Cornulites tenuistriatus*.

**Tentaculites trombetensis** Clarke.

*Tentaculites trombetensis* Clarke, Archivos Mus. Nac. Rio de Janeiro, 10, author's Eng. ed., 1900, p. 19, pl. 2, figs. 26, 27.

Silurian: Rio Trombetas, Brazil.

**TERATICHNUS** Miller.

Genotype: *T. confertus* Miller.

*Teratichnus* Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1880, p. 221; N. A. Geol. Pal., 1889, p. 454.

**Teratichnus confertus** Miller.

*Teratichnus confertus* Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1880, p. 221, pl. 14, fig. 1.

Eden (Economy): Walker Mill Road, Cincinnati, Ohio.

TEREBRATULA ASPER Schlotheim. See *Atrypa reticularis aspera*.

TEREBRATULA BIDENTATA Hisinger. See *Rhynchonella(?) bidentata*.

TEREBRATULA BOREALIS Castelnau. See *Clitambonites(?) borealis*.

TEREBRATULA BREVIROSTRIS Sowerby. See *Anastrophia brevirostris*.

TEREBRATULA CRISPA Hisinger. See *Spirifer (Delthyris) crispus*.

TEREBRATULA DECEMPPLICATA Sowerby. See *Camarotoechia decemplicata*.

TEREBRATULA GRAYII Davidson. See *Streptis grayi*.

TEREBRATULA LYNX Eichwald. See *Platystrophia lynx*.

TEREBRATULA MARGINALIS Dalman. See *Atrypa marginalis*.

TEREBRATULA NUCULA Sowerby. See *Rhynchonella nucula*.

TEREBRATULA PRISCA Castelnau. See *Atrypa reticularis*.

TEREBRATULA RETICULARIS Hall. See *Atrypa reticularis*.

TEREBRATULA STRICKLANDI Sowerby. See *Uncinulus stricklandi*.

TEREBRATULA TURPIS Verneuil. See *Clitambonites(?) borealis*.

TEREBRATULA WILSONI Sowerby. See *Wilsonia wilsoni*.

TEREBRATULITES BIFORATUS Schlotheim. See *Platystrophia biforata*.

**TETRACYSTIS** Schuchert.

Genotype: *T. chrysalis* Schuchert.

*Tetracystis* Schuchert, Smiths. Misc. Coll., 47, pt. 2, 1904, p. 217.

**Tetracystis chrysalis** Schuchert.

*Tetracystis chrysalis* Schuchert, *Smiths. Misc. Coll.*, 47, pt. 2, 1904, p. 218, fig. 25, pl. 34, figs. 9, 10; pl. 40, figs. 1-3; *Maryland Geol. Surv., Low. Dev.*, 1913, p. 232, pl. 32, figs. 10, 11.

Helderbergian (Keyser): Keyser, West Virginia.

*Holotype*.—Cat. No. 35063, U.S.N.M.

**Tetracystis fenestratus** Schuchert.

*Echinoencrinites fenestratus* Troost, *Amer. Jour. Sci.*, 8, 1849, p. 419; *Proc. Amer. Assoc. Adv. Sci.*, 2, 1850, p. 60. (Not defined.)

*Echinocrinus fenestratus* Yandell, *Proc. Amer. Assoc. Adv. Sci.*, 5, 1851, p. 230.

*Echinoerinites fenestratus* Roemer, *Sil. Fauna d. West Tennessee*, Breslau, 1860, p. 34.

*Tetracystis fenestratus* Schuchert, *Smiths. Misc. Coll.*, 47, 1904, p. 219, pl. 34, figs. 6-8.—Wood, *Bull. U. S. Nat. Mus.*, 64, 1909, p. 8.

Niagaran (Brownport): Decatur County, Tennessee.

*Holotype*.—Cat. No. 35091, U.S.N.M.

**TETRADELLA** Ulrich. Genotypes: *Beyrichia quadrilirata* Hall and Whitfield and *Tetradella subquadrans* Ulrich.

*Tetradella* Ulrich, *Jour. Cincinnati Soc. Nat. Hist.*, 13, 1890, pp. 112-114.—Miller, *N. A. Geol. Pal.*, 1st App., 1892, p. 711.—Ulrich, *Geol. Minnesota*, 3, pt. 2, 1894, p. 677; *Zittel-Eastman Textb. Pal.*, 1, 1900, p. 644.—Ulrich and Bassler, *Proc. U. S. Nat. Mus.*, 35, 1908, p. 306.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1041.—Bonnema, *Mitt. Min. Geol. Inst. Groningen*, 2, 1909, p. 35.—Grabau and Shimer, *N. A. Index Fossils*, 2, 1910, p. 353—Bassler, *Zittel-Eastman Textb. Pal.*, 2d ed., 1913, p. 738.

**TETRADELLA CHAMBERSI** Ulrich. See *Ceratopsis chambersi*.

**Tetradella lunatifera** (Ulrich).

*Strepula lunatifera* Ulrich, *Geol. Surv. Canada, Cont. Micro-Pal.*, pt. 2, 1889, p. 56, pl. 9, figs. 14, 14b.—Lesley, *Geol. Surv. Pennsylvania, Rep. P 4*, 1890, p. 1100, figs.

*Tetradella lunatifera* Ulrich, *Jour. Cincinnati Soc. Nat. Hist.*, 13, 1890, p. 112; *Geol. Minnesota*, 3, pt. 2, 1894, p. 680, pl. 46, figs. 12-14, 51a, 51b.—Whiteaves, *Geol. Surv. Canada, Pal. Foss.*, 3, pt. 2, 1895, p. 127.—Ulrich and Bassler, *Proc. U. S. Nat. Mus.*, 35, 1908, pl. 39, fig. 6.—Grabau and Shimer, *N. A. Index Fossils*, 2, 1910, p. 353, fig. 1658h, i.

Richmond: Stony Mountain, Manitoba; Anticosti; Ohio; Indiana; and Kentucky. Trenton: Cannon Falls, etc., Minnesota; Iowa; Kentucky; Tennessee; etc.

*Plesiotypes*.—Cat. No. 41385, U.S.N.M. (Ulrich).

**TETRADELLA OCLIFERA** Ulrich. See *Ceratopsis oculifera*.

**Tetradella quadrilirata** (Hall and Whitfield).

*Beyrichia quadrilirata* Hall and Whitfield, *Geol. Surv. Ohio, Pal.*, 2, 1875, p. 105, pl. 4, figs. 6, 7.

*Beyrichia regularis* Miller (not Emmons), *Cincinnati Quart. Jour. Sci.*, 2, 1875, p. 351.

*Strepula quadrilirata* Ulrich, *Geol. Surv. Canada, Cont. Micro-Pal.*, pt. 2, 1889, p. 54, pl. 9, fig. 12.—Lesley, *Geol. Surv. Pennsylvania, Rep. P 4*, 1890, p. 1100, figs.

*Tetradella quadrilirata* Ulrich, *Jour. Cincinnati Soc. Nat. Hist.*, 13, 1890, p. 112; *Geol. Minnesota*, 3, pt. 2, 1894, p. 679, pl. 46, figs. 1-11.—Ulrich and Bassler, *Proc. U. S. Nat. Mus.*, 35, 1908, pl. 39, figs. 4, 5.—Cumings, 32d Ann. Rep.

**Tetradella quadrilirata**—Continued.

Dep. Geol. Nat. Res., Indiana, 1908, p. 1048, pl. 53, figs. 4, 4a.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 353, fig. 1658f, g.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 738, fig. 1425j.

Richmond: Waynesville, Clarksville, etc., Ohio; Indiana; Kentucky; etc.

Black River: Kentucky; Tennessee; Minnesota; etc.

*Plesiotype*.—Cat. Nos. 41582, 41583, U.S.N.M.

TETRADELLA QUADRILIRATA var. SIMPLEX. See *Tetradella simplex*.

**Tetradella simplex** (Ulrich).

*Tetradella quadrilirata* var. *simplex* Ulrich, Geol. Surv. Canada, Cont. Micro-Pal., pt. 2, 1889, p. 55, pl. 9, fig. 13.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 2, 1895, p. 127.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res., Indiana, 1908, p. 1049, pl. 53, figs. 5, 5a.

*Tetradella simplex* Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 307.

Richmond: Stony Mountain, Manitoba; Anticosti; Ohio; Indiana; etc.

*Plesiotype*.—Cat. No. 41584, U.S.N.M.

**Tetradella subquadrans** Ulrich.

*Tetradella subquadrans* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 115, figs. 2a-c.—Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, pl. 39, figs. 1-3.

Trenton: Trenton Falls, New York.

*Holotype*.—Cat. No. 41384, U.S.N.M.

**TETRADIUM** Dana.

Genotype: *T. fibratum* Safford.

*Tetradium* Dana, Wilkes' U. S. Expl. Exped. 1838-42, 7, 1846, p. 701.—Safford, Amer. Jour. Sci. Arts, 2d ser., 22, 1856, pp. 236-237.—Hitchcock, Geol. Vermont, 1, 1861, p. 289.—Safford, Geol. Tennessee, 1869, p. 533.—Nicholson, Geol. Surv. Ohio, Pal., 2, 1875, p. 221; Rep. Prov. Ontario, pt. 2, 1875, p. 27.—Nicholson and Etheridge, Ann. Mag. Nat. Hist., 4th ser., 20, 1877, pp. 161, 165; Mon. Sil. Foss. Girvan Dist., 1878, p. 29.—Nicholson, Tab. Corals Pal. Period, 1879, pp. 23, 231.—Zittel, Handb. Pal., 1, 1880, p. 619.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 481.—Miller, N. A. Geol. Pal., 1889, p. 206.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 92.—James, Jour. Cincinnati Soc. Nat. Hist., 15, pt. 4, 1893, p. 153.—Sardeson, Neues Jahrb. Min., Geol. Pal., Beilage-Band, 10, 1896, p. 345.—Ruedemann, Amer. Geol., 22, 1898, p. 16-25.—Lindstrom, Ofvers. K. Vet.-Akad. Forhandl., 56, No. 2, 1899, p. 44; Kongl. Sven. Vet.-Akad. Handl., 32, No. 1, 1899, p. 29.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 99.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res., Indiana, 1908, p. 700.

*Tetradium apertum* Safford.

*Tetradium apertum* Safford, Amer. Jour. Sci. Arts, 2d ser., 22, 1856, p. 238.—

Lindstrom, Ofvers. K. Vet.-Akad. Forhandl., 56, No. 2, 1899, p. 44.

*Tetradium fibratum* var. *apertum* Safford, Geol. Tennessee, 1869, p. 535.

Middle Ordovician: Central Tennessee.

Observation.—Several distinct species, including *T. cellulosum*, are included in Safford's description, and until the subject has been revised, *T. apertum* can not be considered valid.

**Tetradium approximatum** Ulrich.

*Tetradium approximatum* Ulrich, Amer. Geol., 1, 1888, p. 183.

*Tetradium minus* Nicholson (not Safford), Rep. Pal. Province Ontario, pt. 2, 1875, p. 28; Geol. Surv. Ohio, Pal., 2, 1875, p. 222.—Nicholson and Etheridge,

**Tetradium approximatum**—Continued.

Ann. Mag. Nat. Hist., 4th ser., 20, 1877, p. 162, figs. a-g; Mon. Sil. Foss. Girvan Dist., 1878, p. 30, fig. 2.—Nicholson, Tab. Corals Pal. Period, 1879, p. 23, fig. 10; p. 232, figs. 33a-c.—James, Jour. Cincinnati Soc. Nat. Hist., 15, pt. 4, 1893, p. 154.—Foerste, Amer. Geol., 31, 1903, p. 343 (loc. occ.), p. 345.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res., Indiana, 1908, p. 709, pl. 2, figs. 1-1c.—Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 311, pl. 10, figs. 1a-b.

*Tetradium Huronense* Foord (part), Cont. Micro-Pal., Geol. Surv. Canada, 1883, p. 25, pl. 7, figs. 1b-1e (not 1, 1a).

*Tetradium fibratum* Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 139, figs. 71a.—Miller, N. A. Geol. Pal., 1889, p. 206, figs. 224.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 1184, figs.—James, Jour. Cincinnati Soc. Nat. Hist., 15, pt. 4, 1893, p. 153.

Richmond: Ohio; Indiana; Kentucky; Tennessee; Canada; etc.

**Tetradium cellulosum** (Hall).

*Phytopsis cellulosum* Hall, Pal. New York, 1, 1847, p. 39, p. 315, pl. 9, figs. 1, 1a-d.

*Tetradium cellulosum* Dwight, Trans. Vassar Bros. Inst., 5, 1890, p. 76.—Ruedemann, Amer. Geol., 22, 1898, pp. 16-25, pl. 5, figs. 1-16a; Bull. New York State Mus., 49, 1901, p. 10.—Bassler, Bull. Virginia Geol. Surv., 2a, 1909, pl. 23, figs. 15, 16.

*Tetradium fibratum* Billings (not Safford), Geol. Canada, Geol. Surv. Canada, 1863, p. 139, fig. 71b (not a).—Miller, N. A. Geol. Pal., 1889, p. 206, text fig. 225 (not 224).—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1184, fig.

Black River (Lowville): Watertown, etc., New York; Canada; Pennsylvania to Alabama; Kentucky; etc.

**Tetradium columnare** (Hall).

*Chætets columnaris* Hall, Pal. New York, 1, 1847, p. 68, pl. 23, figs. 4, 4a.

*Tetradium columnare* Safford, Amer. Jour. Sci. Arts, 2d ser., 22, 1856, p. 237.—Hitchcock, Geol. Vermont, 1, 1861, p. 289.—Safford, Geol. Tennessee, 1869, p. 535.—James, Jour. Cincinnati Soc. Nat. Hist., 15, pt. 4, 1893, p. 154.

Trenton: Sugar River, Lewis County, New York; Tennessee; etc.

**Tetradium fibratum** Safford.

*Tetradium fibratum* Safford, Amer. Jour. Sci. Arts, 2d ser., 22, 1856, p. 237, fig. 2; Geol. Tennessee, 1869, p. 534, fig. 2.—Lambe (part), Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 93, pl. 2, fig. 5.—Grabau and Shimer (part), N. A. Index Fossils, 1, 1906, p. 99, fig. 160.—Bassler, Bull. Virginia Geol. Surv., 2a, 1909, p. 184, fig. 21.

Trenton and Maysville: Nashville, Columbia, etc., Tennessee; Kentucky; Virginia; etc.

**TETRADIMUM FIBRATUM** of authors. See *Tetradium approximatum*.

**TETRADIMUM FIBRATUM** var. **APERTUM** Safford. See *Tetradium apertum*.

**TETRADIMUM FIBRATUM** MINUS Safford. See *Tetradium minus*.

**Tetradium halysitoides** Raymond.

*Tetradium halysitoides* Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 49, pl. 6, fig. 3; pl. 7, fig. 1.

Black River (Lowville): Carden, Ontario.

**TETRADIMUM HURONENSE** Foord. See *Tetradium approximatum* and *Stromatocerium huronense*.

**Tetradium minus** Safford.

*Tetradium minus* Safford, Amer. Jour. Sci. Arts, 2d ser., 22, 1856, p. 238.

*Tetradium fibratum* var. *minus* Safford, Geol. Tennessee, 1869, p. 535.

Trenton (Hermitage): Various localities in central Tennessee.

**TETRADIDIUM MINUS** of authors. See *Tetradium approximatum*.

**Tetradium ontario** Hall.

Not recognized.

*Tetradium Ontario* Hall, 35th Rep. New York State Mus. Nat. Hist., 1884, pl. 16, fig. 9.

Clinton: Shore of Lake Ontario.

**TETRADIDIUM PEACHII** Nicholson and Etheridge. See *Solenopora compacta*.

**TETRADIDIUM PEACHII** var. **CANADENSE** Foord. See *Solenopora compacta*.

**Tetradium racemosum** Raymond.

*Tetradium racemosum* Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 50, pl. 6, fig. 2.

Trenton: Near Ottawa, Ontario.

**Tetradium syringoporoides** Ulrich.

*Tetradium* sp. Bassler, Bull. Virginia Geol. Surv., 2a, 1909, pl. 4, fig. 2.

*Tetradium syringoporoides* Ulrich, in Stose, Folio U. S. Geol. Surv., 170, 1910, p. 58.

Stones River: Pennsylvania, Maryland, Virginia, etc.

**TETRAGONIS** Eichwald. See *Ischadites Murchison*.

**TETRAGRAPSUS** of authors. See *Tetragraptus* Salter.

**TETRAGRAPSUS BRYONOIDES** Salter. See *Tetragraptus serra*.

**TETRAGRAPTUS** Salter.

Genotype: *T. crucialis* Salter.

*Tetragraptus* Salter, Quart. Jour. Geol. Soc. London, 19, 1863, pp. 136, 140, figs.

8a, b.—Nicholson, Quart. Jour. Geol. Soc. London, 24, 1868, p. 9, 130; Mon. British Grapt., p. 105, fig. 49.

*Tetragraptus* Hall, 20th Rep. New York State Cab. Hist., 1868, p. 217; rev. ed. (1870), p. 251.—Zittel, Handb. Pal., 1, 1879, p. 298.—Tullberg, Sveriges Geol. Unders., Ser. C, No. 55, 1883, p. 12.—Hermann, Geol. Mag., dec. 3, 3, 1886, p. 18.—Barrois, Ann. Soc. geol. du Nord., 21, Lille, 1893, p. 108.—Nicholson and Marr, Geol. Mag., dec. 4, 2, 1895, pp. 530–537, figs.—Holm, Geol. Mag., dec. 4, 2, 1895, pp. 433–484; Sveriges Geol. Unders., Ser. C, No. 150, 1895, p. 23; Geol. Foren Stockholm Forhandl., 17, 1895, p. 339.—Wiman, Bull. Geol. Inst., Univ. Upsala., 2, pt. 2, 1896, p. 265.—Koken, Die Leitfossilien, Leipzig, 1896, p. 328.—Wiman, Nat. Sci., 9, 1896, p. 191.—Walther, Zeits. d. d. geol. Gesell., 49, 1897, p. 256.—Roemer and Frech, Leth. geog., 1 Theil, Leth. Pal., 1, 3 Lief., 1897, p. 600.—Ruedemann, Amer. Nat., 32, 1898, p. 5; Zittel-Eastman Textb. Pal., 1, 1900, p. 118.—Elles and Wood, Mon. British Grapt., Pal. Soc., 1902, p. 55.—Ruedemann, Mem. New York State Mus., 7, 1904, pp. 642–644.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 29.—Ruedemann, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 129.

*Etagraptus* (subgenus of *Tetragraptus*) Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, p. 644.

**Tetragraptus acanthonotus** Gurley.

*Tetragraptus acanthonotus* Gurley, Jour. Geol., 4, 1896, p. 65, pl. 4, figs. 1, 1a.

Canadian (Levis): Near Point Levis, Quebec.

**Tetraraptus alatus** (Hall).

Graptolithus alatus Hall, Canadian Nat. Geol., 3, 1858, p. 162; Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 128; Geol. Surv. Canada, dec. 2, 1865, p. 93, pl. 6, fig. 9.

Tetraraptus (Graptolithus) alatus Nicholson, Mon. British Grapt., 1872, p. 67, fig. 37.

Canadian (Levis): Point Levis, Quebec.

**Tetraraptus amii** (Lapworth).

Graptolithus bryonoides Hall (part), Geol. Surv. Canada, dec. 1, 1865, p. 84, pl. 4, figs. 9, 10.

Tetraraptus amii (Lapworth MS.), Elles and Wood, Mon. British Grapt., pt. 1, Pal. Soc., 1902, p. 60, pl. 5, figs. 4a-c, fig. 36.—Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 647-649, pl. 11, figs. 5-7, figs. 53, 54.

Canadian: Point Levis, Quebec (Levis, Diplograptus dentatus zone); Deepkill, Rensselaer County, New York (Deepkill, Tetraraptus zone); Arkansas; South Wales (Skiddaw).

**Tetraraptus approximatus** (Nicholson).

Tetraraptus approximatus Nicholson, Ann. Mag. Nat. Hist., 4th ser., 11, 1873, p. 136, fig. 2.

Canadian: Point Levis, Quebec (Levis, Clonograptus zone); Arkansas.

**TETRARAPTUS BIGSBYI** of authors. See *Tetraraptus similis*, *T. woodi*, and *T. pygmaeus*.

**TETRARAPTUS BRYONOIDES** Hall. See *Didymograptus (Isograptus) caduceus*, *Tetraraptus serra*, and *T. similis*.

**TETRARAPTUS CADUCEUS** Brögger. See *Didymograptus (Isograptus) caduceus* and *Tetraraptus similis*.

**Tetraraptus clarkei** Ruedemann.

*Tetraraptus fruticosus* mut. (part) Ruedemann, New York State Pal., Ann. Rep., 1902, p. 566.

*Tetraraptus clarkei* Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 652, 653, pl. 11, figs. 11-16.

Canadian: Deepkill, Rensselaer County, New York (Deepkill, *Didymograptus bifidus* zone); Arkansas.

**Tetraraptus crucifer** (Hall).

Graptolithus crucifer Hall, Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 125; Canadian Nat. Geol., 3, 1858, p. 149; Geol. Surv. Canada, dec. 2, 1865, p. 92, pl. 5, figs. 10, 13 (?pl. 6, fig. 7).

Graptolithus (Monoprion) crucifer Hall, 20th Rep. New York State Cab. Hist., 1868, p. 226; rev. ed., 1870, p. 260; p. 223.

*Tetraraptus crucifer* Nicholson, Quart. Jour. Geol. Soc. London, 24, 1868, p. 144.

*Tetraraptus crucifer* Elles, Quart. Jour. Geol. Soc. London, 54, 1898, p. 488, fig. 12.—Elles and Wood, Mon. British Grapt., Pal. Soc., 1902, p. 58, pl. 5, fig. 2.

Canadian (Levis): Point Levis, Quebec; Skiddaw slate of England.

**Tetraraptus denticulatus** (Hall).

Graptolithus denticulatus Hall, Geol. Surv. Canada, Rep. Progress for 1857, 1858, p. 132; Canadian Nat. Geol., 3, 1858, p. 166; Geol. Surv. Canada, dec. 2, 1865, p. 88, pl. 4, figs. 12-16.

Graptolithus (Monoprion) denticulatus Hall, 20th Rep. New York State Cab. Hist., 1868, p. 226; rev. ed., 1870, p. 260.

**Tetragraptus denticulatus**—Continued.

*Tetragraptus denticulatus* Gurley, Jour. Geol., 4, 1896, p. 101 (gen. ref.).

Canadian (Levis, *Didymograptus* zone): Point Levis, Quebec; Newfoundland (Quebec—P).

**Tetragraptus fruticosus** (Hall).

*Graptolithus fruticosus* Hall, Geol. Surv. Canada, Rep. for 1857, 1857, p. 128; Canadian Nat. Geol., 3, 1858, p. 162.—Billings, Geol. Surv. Canada, Pal. Foss., 1, 1865, pp. 366, 375.—Hall, Canadian Org. Rem., dec. 2, 1865, p. 90, pl. 5, figs. 6–8; pl. 6, figs. 1–3; 20th Ann. Rep. New York State Cab. Nat. Hist., 1867, pl. 3, fig. 15; rev. ed., p. 260, pl. 3, fig. 15, pl. 4, fig. 10, p. 223.

*Didymograptus?* *fruticosus* Etheridge, jr., Ann. Mag. Nat. Hist., 4th ser., 14, 1874, 6, pl. 3, fig. 19.

*Graptolites* (*Didymograptus*) *fruticosus* McCoy, Jour. Geol. Surv. Victoria, Prodr. Pal. Victoria, dec. 1, 1874, p. 13, pl. 1, figs. 9–14.

*Tetragraptus* (*Bryograptus*) *fruticosus* Brögger, Die sil. Etagen 2 and 3, etc., 1882, p. 39, Kristiania.

*Tetragraptus fruticosus* Lapworth, Ann. and Mag. Nat. Hist., ser. 5, 6, 1880, p. 20.—Tullberg, Sver. Geol. Und. Afh. och upps. ser. C, no. 50, 1882, p. 22.—Lapworth, Roy. Soc. Canada, Proc. and Trans., 1886, p. 168.—Roemer and Frech, Leth. Pal., 1, 1897, p. 602.—Ruedemann, Bull. New York State Mus., 52, 1902, pp. 554, 556, 566; p. 588, fig. 15.—Elles and Wood, Mon. British Grapt., pt. 1, Pal. Soc., 1902, p. 61, pl. 6, figs. 2a, b.—Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 649–652, pl. 9, figs. 11–14; pl. 10, figs. 1–10.

*Tetragraptus fruticosus* Ami, Geol. Surv. Canada, Rep., 2d ser., 3, pt. 2, 1889, p. 116k.

Canadian: Island of Orleans and Point Levis, Quebec (*Levis*, *Didymograptus* zone); Deepkill, Rensselaer County, New York (*Deepkill*, *Tetragraptus* zone); Arkansas; Newfoundland; Great Britain; Scania; Australia.

**TETRAGRAPTUS FRUTICOSUS** (part) Ruedemann. See *Tetragraptus clarkei*.

**Tetragraptus headi** (Hall).

*Graptolithus headi* Hall, Canadian Nat. Geol., 3, 1858, p. 161; Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 127.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 228, fig. 236.—Hall, Geol. Surv. Canada, dec. 2, 1865, p. 8, fig. 3; p. 94, pl. 6, fig. 8 (?pl. 5, figs. 11, 12).

*Graptolithus* (*Loganograptus*) *headi* Hall, 20th Rep. New York State Cab. Hist., 1868, p. 174, fig. 4; p. 226; rev. ed., 1870, p. 207, fig. 4.

*Tetragraptus headi* Nicholson, Quart. Jour. Geol. Soc. London, 64, 1868, p. 131.—Roemer and Frech, Leth. geog., 1 Theil, Leth. Pal., 1, 3 Lief, 1897, p. 602, fig. 167.—Elles, Quart. Jour. Geol. Soc. London, 54, 1898, p. 486, fig. 11.—Elles and Wood, Mon. British Grapt. Pal. Soc., 1902, p. 59, fig. 35a, b; pl. 5, figs. 3a, b.

*Tetragraptus headi* Nicholson, Mon. British Grapt., 1872, p. 66, fig. 36.

*Tetragraptus* cf. *headi* Hoek, Neues Jahrb. Min. Geol. Pal., 34, 1912, p. 226, pl. 12, fig. 6.

Canadian (*Levis*, *Diplograptus dentatus* zone): Point Levis, Quebec; Newfoundland; Skiddaw slate of Great Britain; Bolivia.

**Tetragraptus (Etagraptus) lentus** Ruedemann.

*Tetragraptus* (*Etagraptus*) *lentus* Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, p. 666, pl. 9, figs. 7–10.

Canadian (*Deepkill*, *Didymograptus bifidus* zone): Deepkill, Rensselaer County, New York.



**Tetragraptus pendens** Elles.

*Tetragraptus pendens* Elles, Quart. Jour. Geol. Soc. London, 54, 1898, p. 491, fig. 13.—Ruedemann, New York State Pal. Ann. Rep., 1902, p. 566.—Elles and Wood, Mon. British Grapt. Pal. Soc., 1902, p. 63, pl. 6, figs. 2a, b.—Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 653–655, pl. 11, figs. 17–20, fig. 55.

Lower Ordovician: England (Skiddaw); Deepkill, Rensselaer County, New York (Deepkill, *Didymograptus bifidus* zone); Point Levis, Quebec (Levis, *D. bifidus* zone); Arkansas.

**Tetragraptus pygmæus** Ruedemann.

*Tetragraptus bigsbyi* Ruedemann (part), New York State Pal. Ann. Rep., 1902, p. 590, fig. 18.

*Tetragraptus pygmæus* Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 664, 665, pl. 12, figs. 11–14.

Canadian (Deepkill, *Tetragraptus*, *Didymograptus*, and *Diplograptus* zones): Deepkill, Rensselaer County, and Mount Moreno, near Hudson, New York.

**Tetragraptus quadribrachiatus** (Hall).

*Graptolithus quadribrachiatus* Hall, Geol. Surv. Canada, Rep. for 1857, 1858, p. 125; Canadian Nat. Geol., 3, 1858, p. 149; Geol. Surv. Canada, Can. Org. Rem., dec. 2, 1865, p. 91, pl. 5, figs. 1–5; pl. 6, figs. 5, 6.

*Graptolites* (*Didymograpsus*) *quadribrachiatus* McCoy, Jour. Geol. Surv. Victoria, Prodr. Pal. Victoria, dec. 1, 1874, p. 15, pl. 2, fig. 1.

*Tetragrapsus crucialis* Salter, Quart. Jour. Geol. Soc., 19, 1863, p. 137, fig. 8b.

*Tetragrapsus quadribrachiatus* Nicholson, Quart. Jour. Geol. Soc. London, 24, 1868, p. 131.—Hopkinson, *ibid.*, 31, 1875, p. 649, pl. 33, figs. 9a, b.

*Tetragraptus quadribrachiatus* Linnarsson, Sver. Geol. Und. Afh. och upps., ser. C, No. 31, 1879, p. 5.—Brögger, Die sil. Etagen 2 and 3, 1882, p. 38, Kristiania.—Törnquist, Sver. Geol. Und. Afh. och upps., ser. C, No. 57, 1883, p. 16.—Herrmann, Quart. Jour. Geol. Soc., ser. 3, 3, 1886, p. 18.—Barrois, Ann. de la Soc. Géol. du Nord, 20, 1892, p. 95.—Matthew, Trans. and Proc. Roy. Soc. Canada, 11, p. 114, 10, sec. 4, 1893, p. 98.—Roemer and Frech, Leth. Pal., 1, 1897, p. 603.—Elles, Quart. Jour. Geol. Soc. London, 54, 1898, p. 485.—Ruedemann, Ann. Rep. New York State Pal., 1902, p. 556.—Elles and Wood, Mon. British Grapt., pt. 1, 1902, p. 57, pl. 5, figs. 1a–d, fig. 34.—Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 645–647, pl. 11, figs. 1–4, figs. 51, 52.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 29, fig. 41.

Canadian: Point Levis, Quebec (*Levis*, *Clonograptus*, *Didymograptus*, and *Diplograptus dentatus* zones); Deepkill, Rensselaer County, and Mount Morena, New York (Deepkill, *Tetragraptus*, and *D. dentatus* zones); St. Johns, New Brunswick; Great Britain (Skiddaw); Scandinavia; France; Australia.

**TETRAGRAPTUS QUADRIBRACHIATUS** Etheridge. See *Tetragraptus serra*.

**Tetragraptus serra** (Brongniart).

*Fucoides serra* Brongniart, Hist. Veget. Foss., 1, 1823, p. 71, pl. 6, fig. 7, 8.

*Tetragraptus serra* Hopkinson and Lapworth, Ann. Mag. Nat. Hist., 4th ser., 31, 1875, p. 650, pl. 33, fig. 10.—Törnquist, Sver. Geol. Und. Afh. och upps., ser. C, No. 57, 1883, p. 16.—Herrmann, Geol. Mag., 3d ser., 3, 1886, p. 19.—Ami, Geol. Surv. Canada, Rep., 2d ser., 3, pt. 2, 1889, p. 116k.—Barrois, Ann. Soc. Geol. du Nord, 20, 1892, p. 94.—Elles, Quart. Jour. Geol. Soc. London, 54, 1898, p. 490.—Ruedemann, New York State Pal., Ann. Rep. 1902, pp. 554, 556, 566.—Elles, Wood, and Lapworth, Mon. British Grapt., pt. 1, Pal. Soc., 1902, p. 65, pl. 6, figs. 4a–f.—Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 655–657, pl. 11, figs. 8–10, figs. 56, 57.

**Tetragraptus serra**—Continued.

- Graptolithus bryonoides* Hall, Geol. Surv. Canada, Rep., 1858, p. 126; Canadian Nat. and Geol., 3, 1858, p. 150; Geol. Surv. Canada, Can. Org. Rem., dec. 2, 1865, p. 84, pl. 4, figs. 1-8, 11.—Billings, Geol. Surv. Canada, Pal. Foss., 1, 1865, p. 366, 375.
- Graptolites (Didymograpsus) bryonoides* McCoy, Geol. Surv. Victoria, Prodr. de Pal. Victoria, dec. 1, 1874, p. 15, pl. 2, figs. 2, 3, 5.
- Tetragrapsus bryonoides* Nicholson, Quart. Jour. Geol. Soc. London, 24, 1868, p. 131.—Salter, *ibid.*, 19, 1863, p. 137, fig. 8a.
- Tetragraptus bryonoides* Etheridge, jr. (part), Ann. Mag. Nat. Hist., 4th ser., 14, 1874, p. 2, pl. 3, fig. 1.—Linnarsson, Sver. Geol. Und. Afh. och upps., ser. C, No. 31, 1879, p. 5.—Brogger, Die sil. Etagen 2 and 3, 1882, p. 38.—Tullberg, Skanes Grap. in Sver. Geol. Und. Afh. och upps., ser. C, No. 50, 1882, p. 22.—Roemer and Frech, Leth. pal., 1, 1897, p. 601.
- Didymograpsus caduceus* Salter (part), Quart. Jour. Geol. Soc. London, 9, 1853, p. 87, fig. 1a.
- Tetragraptus quadribrachiatus* Etheridge, Ann. Mag. Nat. Hist., 4th ser., 14, 1874, p. 3, pl. 3, figs. 5-8.
- Canadian: Point Levis, Quebec (*Levis*, *Clonograptus*, *Didymograptus*, and *Diplograptus dentatus* zones); Newfoundland; Deepkill, Rensselaer County, New York (*Deepkill*, *Tetragraptus* zone); Arkansas; Sweden; France; Australia; Great Britain (*Skiddaw*).

**Tetragraptus similis** (Hall).

- Phyllograptus similis* Hall, Geol. Surv. Canada, Rep. for 1858, p. 140; Canadian Nat. and Geol., 3, 1858, p. 173.—Moberg, Geol. Foren. Stockholm Forhandl., 13, 1891, p. 219.
- Tetragraptus similis* Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 658-662, pl. 12, figs. 2-10; figs. 58-61; p. 642, fig. 48; p. 644, figs. 49, 50.
- Didymograpsus caduceus* Salter, Quart. Jour. Geol. Soc. London, 19, 1863, p. 137, fig. 13b(?).
- Didymograptus caduceus* Nicholson, Quart. Jour. Geol. Soc. London, 24, 1868, p. 138.
- Tetragraptus caduceus* Brogger, Die sil. Etagen 2, 3, 1882, p. 38.—Perner, Etudes sur les Grapt. de Boheme, pt. 2, 1894, p. 20, pl. 6, figs. 9-12.
- Graptolithus bigsbyi* Hall, Geol. Surv. Canada, Can. Org. Rem., dec. 2, 1865, p. 86, pl. 16, figs. 22-30.
- Graptolithus (Monoprion) bigsbyi* Hall, 20th Rep. New York State Cab. Hist., 1868, p. 226, pl. 3, figs. 18-21; rev. ed., 1870, p. 260, pl. 3, figs. 18-21; p. 223.
- Tetragraptus bigsbyi* Linnarsson, Sver. Geol. Und. Afh. och upps., Ser. C, No. 31, 1879, p. 5.—Tullberg, *ibid.*, No. 50, 1882, p. 22.—Ami, Geol. Surv. Canada, Rep., 2d Ser., 3, pt. 2, 1889, p. 116k.—Moberg, Geol. Foren. Stockholm Forhandl., 13, 1891, p. 219.—Holm, Sver. Geol. Und. Afh. och upps., Ser. C, No. 150, 1895, p. 24, pl. 1, figs. 9-16; pl. 2, figs. 1-3; pl. 3, figs. 13-16; p. 25, figs. 1-7; Geol. Mag., dec. 4, 2, 1895, p. 484, pl. 13, figs. 9-16; pl. 14, figs. 13-16; p. 485, figs. 1-3.—Roemer and Frech, Leth. Geog., 1 Theil, Leth. Pal., 1, 1897, pp. 600, 601, fig. 166, pl. A, figs. 4-6b.—Elles, Quart. Jour. Geol. Soc. London, 54, 1898, p. 488.—Ruedemann, Bull. New York State Mus., 52, 1902, pp. 556, 566; p. 590, fig. 18.—Elles and Wood, Mon. British Grapt., pt. 1, Pal. Soc., 1902, p. 68, pl. 6, figs. 6a-e, fig. 42a.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 29, fig. 43.
- Tetragraptus bryonoides* Etheridge, jr., Ann. Mag. Nat. Hist., 4th ser., 14, 1874, p. 2, pl. 3, figs. 1, 2 (not figs. 3, 4).

**Tetragraptus similis**—Continued.

Canadian: Point Levis, Quebec (Levis, *Didymograptus* and *Diplograptus dentatus* zones); Deepkill, Rensselaer County, New York (Deepkill, *Tetragraptus* and *Didymograptus* zones); Great Britain (Skiddaw); Sweden; Bohemia; Australia.

**Tetragraptus taraxacum** Ruedemann.

*Tetragraptus taraxacum* Ruedemann, Bull. New York State Mus., 52, 1902, p. 589, fig. 16; Mem. New York State Mus., 7, pt. 1, 1904, pp. 663, 664, pl. 12, figs. 17–26.

Canadian (Deepkill, *Tetragraptus* and *Diplograptus dentatus* zones): Deepkill, Rensselaer County, and Mount Moreno, near Hudson, New York.

**Tetragraptus woodæ** Ruedemann.

*Tetragraptus bigsbyi* Ruedemann (part), New York State Pal., Ann. Rep., 1902, p. 556.

*Tetragraptus woodi* Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 662, 663, pl. 12, figs. 1, 15, 16. (Changed to *woodæ* in Mem. 11, pt. 2, 1908, p. 136.)

Canadian (Deepkill, *Tetragraptus* zone): Deepkill, Rensselaer County, New York.

**TETRANOTA** Ulrich and Scofield.

Genotype: *Bucania bidorsata* Hall.

*Bucania* (part) Hall, Pal. New York, 1, 1847, p. 186.

*Bellerophon* (part) Whitfield, Geol. Wisconsin, 4, 1874, p. 223.

*Bucanella* (part) Koken, Neues Jahrb. Min., Geol., Pal., Beilageband 6, 1889, p. 389.

*Tetranota* Ulrich and Schofield, Geol. Minnesota, 3, pt. 2, 1897, pp. 849–875.—Koken, Neues Jahrb. Min., Geol., Pal., 1, 1898, p. 5.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 612.—Dall, Zittel-Eastman Textb., Pal., 2d ed., 1913, p. 522.

**Tetranota bidorsata** (Hall).

*Bucania bidorsata* Hall, Pal. New York, 1, 1847, p. 186, pl. 40, figs. 8a–g; Rep. Geol. Surv. Wisconsin, 1862, p. 39, fig. 6.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 158, fig.—Walcott, Mon. U. S. Geol. Surv., 8, 1884, pl. 1, figs. 13, 13a–c.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 96, figs.—Whiteaves, Canadian Rec. Sci., 5, 1893, p. 322 (loc. occ.).—Raymond, Ann. Carnegie Mus., 3, pt. 4, 1906, p. 514.

*Bellerophon bidorsatus* D'Orbigny, Prodr. de Pal., 1, 1849, p. 8 (gen. ref.).—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 165, pl. 6, figs. 8, 9, 27.

*Tetranota bidorsata* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 877, pl. 65, figs. 10–18.—Whiteaves, Pal. Foss. Geol. Surv. Canada, 3, pt. 2, 1897, p. 188.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 176, pl. 12, figs. 18, 19.—Raymond, Ann. Carnegie Mus., 4, 1908, p. 197, pl. L, fig. 5.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 612, figs. 819a–d.

Trenton: Middleville, Watertown, etc., New York; Canada; Minnesota; Kentucky; Tennessee; etc.

Black River: Minnesota, etc.; Upper Pogonip, Eureka District, Nevada.

Stones River (Murfreesboro): Murfreesboro, Tennessee.

*Plesiotypes*.—Cat. Nos. 17301, 46011, U.S.N.M. (Walcott and Ulrich and Scofield).

**Tetranota bidorsata minor** Ulrich and Scofield.

*Tetranota bidorsata* var. *minor*, Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 878.

Black River (Decorah): Minneapolis, Cannon Falls, and near Fountain, Minnesota.

*Cotypes*.—Cat. No. 46012, U.S.N.M.

**Tetranota macra** Ulrich and Scofield.

*Tetranota macra* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 879, pl. 65, figs. 1, 2.

Black River (Platteville): Minneapolis, Minnesota.

*Holotype*.—Cat. No. 46013, U.S.N.M.

**Tetranota obsoleta** Ulrich and Scofield.

*Tetranota obsoleta* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 880, pl. 65, figs. 19–23.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 164.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 613, fig. 819i–k.—Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 140.

Bucania obsoleta Miller, N. A. Geol. Pal., 1897, p. 766 (gen. ref.).

Black River: Minneapolis and St. Paul, Minnesota; Janesville, Wisconsin (Platteville); Chatfield and Cannon Falls, Minnesota (Decorah); Mercer County, Kentucky.

Trenton: Goodhue County, Minnesota; Kentucky; Baffin Land.

Eden: Cincinnati, Ohio, and vicinity.

*Cotypes*.—Cat. Nos. 46014, 46015, U.S.N.M.

**Tetranota sexcarinata** Ulrich and Scofield.

*Tetranota sexcarinata* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 878, pl. 65, figs. 3–9.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 613, fig. 819e–h–l.

Black River (Platteville): Minneapolis, Cannon Falls, etc., Minnesota; Beloit and Janesville, Wisconsin; Dixon, Illinois.

Stones River (Lebanon): Lebanon and Lavergne, Tennessee.

Trenton (Prosser): Fillmore County, Minnesota.

*Cotypes*.—Cat. Nos. 46016–46018, U.S.N.M.

**Tetranota wisconsinensis** (Whitfield).

*Bellerophon wisconsinensis* Whitfield, Ann. Rep. Geol. Surv. Wisconsin, 1878, p. 76; Geol. Surv. Wisconsin, 4, 1882, p. 223, pl. 6, figs. 15, 16.

*Tetranota wisconsinensis* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 881, pl. 65, figs. 26–29.

Black River (Platteville): Beloit and Janesville, Wisconsin; Minneapolis and St. Paul, Minnesota.

*Plesiotype*.—Cat. No. 46019, U.S.N.M.

**THALAMOCRINUS** Miller and Gurley. Genotype: *T. ovatus* Miller and Gurley.

*Thalamocrinus* Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 7, 1895, p. 81.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 754.—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 204.

**Thalamocrinus cylindricus** Miller and Gurley.

*Thalamocrinus cylindricus* Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 7, 1895, p. 82, pl. 5, figs. 32, 33.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 754, fig. 1401.

Niagaran (Brownsport): Decatur County, Tennessee.

**Thalamocrinus ovatus** Miller and Gurley.

*Thalamocrinus ovatus* Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 7, 1895, p. 82, pl. 5, figs. 29–31.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 754, fig. 1402.

Niagaran (Brownsport): Decatur County, Tennessee.

**THALEOPS** Conrad.Genotype: *T. ovatus* Conrad.

*Thaleops* Conrad, Proc. Acad. Nat. Sci. Philadelphia, 1, 1843, pp. 331-2.—Hall, Pal. New York, 1, 1847, p. 259.—Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 716.—Raymond and Narraway, Ann. Carnegie Mus., 4, 1908, p. 247.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 298.—Slocum, Field Mus. Nat. Hist., Geol. Ser., 4, 1913, p. 56.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 720.

***Thaleops arcturus*** (Hall).

*Illænus arcturus* Hall, Pal. New York, 1, 1847, p. 23, pl. 4 (bis), fig. 12.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 235, pl. 3, fig. 12.—Billings, Canadian Nat. Geol., 4, 1859, p. 379.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1859, p. 299, figs.

*Thaleops arctura* Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 718.—Raymond and Narraway, Ann. Carnegie Mus., 4, 1908, p. 248, pl. 61, fig. 8.—Raymond, Ann. Carnegie Mus., 7, 1910, p. 71; 7th Rep. Vermont State Geol., 1910, p. 227, pl. 35, fig. 5.—Grabau and Shimer, N. A. Index Fossils, 1910, p. 298, fig. 1605b.

*Thaleops ovatus* Raymond, Bull. Amer. Pal., 3, 1902, pl. 18, fig. 9; Ann. Carnegie Mus., 3, 1905, p. 352, pl. 13, fig. 5.

Chazy (Day Point—Valcour): Chazy, Crown Point, Valcour, etc., New York; Isle La Motte, Vermont.

***Thaleops clavifrons*** (Billings).

*Illænus clavifrons* Billings, Canadian Nat. Geol., 4, 1859, p. 379.

Chazy (Mingan): Mingan Islands, Canada.

***Thaleops ovatus*** Conrad.

*Thaleops ovata* Conrad, Proc. Acad. Nat. Sci., Philadelphia, 1, 1843, p. 332.—Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 716, fig. 25-28.—Ruedemann, Bull. New York State Mus., 49, 1901, p. 62.—Raymond and Narraway, Ann. Carnegie Mus., 4, 1908, p. 247, pl. 60, figs. 11-13; pl. 61, figs. 6, 7.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 298.—Slocum, Field Mus. Nat. Hist., Geol. Ser., 4, 1913, p. 56, pl. 14, figs. 6-8.

*Thaleops* (*Illænus*) *ovatus* Hall, Pal. New York, 1, 1847, p. 259, pl. 67, figs. 6a, b; p. 318, pl. 67, fig. 6c.

*Illænus ovatus* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 76 (gen. ref.).—Billings, Canadian Nat. Geol., 4, 1859, p. 376 (loc. occ.).—Whitfield, Geol. Wisconsin, 4, 1882, p. 238, pl. 5, figs. 1, 2.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 160, fig.

*Illænus herricki* Foerste, 15th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1887, p. 479, fig. 2.

Black River: Mineral Point, Beloit, Wisconsin; Dixon, Illinois; Minneapolis, Minnesota (Platteville); Ottawa, Ontario.

?Richmond (Maquoketa): Clermont, Iowa.

**THALEOPS OVATUS** Raymond. See *Thaleops arcturus*.

***Thaleops? ptercephalus*** (Whitfield).

*Illænus ptercephalus* Whitfield, Ann. Rep. Geol. Surv., 1878, p. 87; Geol. Wisconsin, 4, 1882, p. 309, pl. 20, figs. 10-12.

Niagaran (Racine): Pewaukee, Wisconsin.

***Thaleops vindex*** (Billings).

*Illænus vindex* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 179, figs. 160a, b.—Raymond, Ann. Carnegie Mus., 3, 1905, p. 353, fig. 2.

Chazy (Mingan): Mingan Islands, Canada.

**THAMNISCUS** King.Genotype: *Ceratophytes dubius* Schlotheim.

*Thamniscus* King, Ann. Mag. Nat. Hist., 2d ser., 2, 1849, p. 389; Perm. Foss. England, 1850, p. 44.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 168.—Eichwald, Leth. Rossica, 1, 1860, p. 386.—Vine, Proc. Geol. Assoc., 4, 1875, p. 120; Geol. Mag., dec. 2, 7, 1880, p. 507; Rep. 50th Meeting British Assoc. Adv. Sci., 1880, p. 81.—Shrubsole, Quart. Jour. Geol. Soc. London, 38, 1882, p. 343.—Vine, Proc. Yorkshire Geol. and Polyt. Soc., n. s., 8, 1884, p. 170; Rep. 53d Meeting British Assoc. Adv. Sci., 1884, p. 195; Proc. Yorkshire Polyt. Soc., 9, 1885, p. 89.—Waagen and Pichl, Pal. Indica, 13th ser., 1885, p. 807.—Ulrich, Contr. Amer. Pal., 1, 1886, p. 5.—Hall and Simpson, Pal. New York, 6, 1887, p. 22.—Miller, N. A. Geol. Pal., 1889, p. 327.—Ulrich, Geol. Surv. Illinois, 7, 1890, pp. 397, 606; Zittel's Textb. Pal. (Eng. ed.), 1896, p. 283.—Simpson, 14th Ann. Rep. State Geol. New York, for 1894, 1897, p. 524.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 40.—Condra, Nebraska Geol. Surv., 2, pt. 1, 1903, p. 82.—Cumings, Amer. Jour. Sci., 17, 1904, p. 73.—Hennig, Archiv. fur Zool., Sven. Vet. Akad. Stockholm, 3, No. 10, 1906, p. 15.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 53; Zittel-Eastman Textb. Pal., 1913, p. 341.

**Thamniscus dichotomus** (Hall).

*Hornera?* *dichotoma* Hall, Pal. New York, 2, 1852, p. 163, pl. 40C, fig. 3d (not figs. 3a, b).

*Subretepora dichotoma* Miller, N. A. Geol. Pal., 1889, p. 326.

*Stictopora dichotoma* Whitfield and Hovey, Bull. Amer. Mus. Nat. Hist., 11, pt. 2, 1899, p. 108.

*Thamniscus dichotomus* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 607.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 54, pl. 18, figs. 17-19; pl. 27, figs. 1-7.

*Clinton* (Rochester): Lockport, Rochester, etc., New York; Grimsby and Hamilton, Ontario.

*Plesiotypes*.—Cat. Nos. 35558, 35751, U.S.N.M.

**THAMNISCUS NIAGARENSIS** Hall. See *Pseudohornera niagarensis*.

**Thamniscus regularis** Ulrich and Bassler.

*Thamniscus regularis* Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 286, pl. 47, figs. 4-6.

Helderbergian (Keyser): Devils Backbone, near Cumberland, Maryland.

*Cotypes*.—Cat. No. 60741, U.S.N.M.

**Thamniscus striatopora** (Billings).

*Helopora striatopora* Billings, Cat. Sil. Foss. Anticosti, 1866, p. 39.

*Nematopora striatopora* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 645; Amer. Geol., 1, 1888, p. 232, footnote.

Anticostian (Jupiter River): Southwest Point, Anticosti.

**THAMNOCELLA** Simpson. See *Pseudohornera Roemer*.

**THAMNOGRAPTUS** Hall.Genotype: *T. typus* Hall=*T. capillaris* Hall.

*Thamnograptus* Hall, Pal. New York, 3, 1859, p. 519; 13th Rep. New York State Cab. Nat. Hist., 1860, p. 62; Geol. Surv. Canada, dec. 2, 1865, p. 141; 20th Rep. New York State Cab. Hist., 1868, p. 218; rev. ed., p. 252.—Nicholson, Ann. Mag. Nat. Hist., 4th ser., 16, 1875, p. 270.—Zittel, Handb. Pal., 1, 1879, p. 290.—Spencer, Bull. Mus. Univ. State Missouri, 1, 1884, p. 39; Trans. Acad. Sci. St. Louis, 4, 1884, p. 563, 589.—Miller, N. A. Geol. Pal., 1889, p. 207.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 165.—Elles and Wood, Mon. British Grapt., Pal. Soc., 1903, p. 41.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 204.

*Thamnograptus* Nicholson, Mon. British Grapt., 1872, p. 130.

**Thamnograptus affinis** Whiteaves.

Thamnograptus affinis Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 148, fig. 10.

Black River or Richmond: Cat Head, Lake Winnipeg, Canada.

**Thamnograptus anna** Hall.

Thamnograptus anna Hall, Geol. Surv. Canada, dec. 2, 1865, p. 141, pl. 21, fig. 9. Canadian (Levis, Didymograptus zone): Three miles above mouth River St. Anne, Canada.

Observation.—See Goniograptus geometricus Ruedemann.

THAMNOGRAPTUS BARRANDII Lapworth. See Thamnograptus capillaris.

**Thamnograptus bartonensis** Spencer.

Thamnograptus bartonensis Spencer, Canadian Nat., 8, 1878, pp. 458, 462.

Thamnograptus bartonensis Spencer, Trans. Acad. Sci. St. Louis, 4, 1884, pp. 565, 589, 590, pl. 6, figs. 4, 5; Bull. Mus. Univ. State Missouri, 1, 1884, pp. 15, 39, 40, pl. 6, figs. 4, 5.—Gurley, Jour. Geol., 4, 1896, pp. 101, 309.—Bassler, Bull. U. S. Nat. Mus., 65, 1909, pp. 62-64, figs. 87-89.

Niagaran dolomite: Hamilton, Ontario.

**Thamnograptus capillaris** (Emmons).

Nemagraptus capillaris Emmons, Amer. Geology, 1, pt. 2, 1855, p. 109, pl. 1, fig. 6.

Nemagraptus capillaris Lapworth, Quart. Jour. Geol. Soc. London, 31, 1875, p. 653, pl. 34, figs. 2a, b.—Hall, Pal. New York, 3, 1859, p. 520, fig. 3.

Thamnograptus capillaris Hall, Pal. New York, 3, 1859, p. 520, fig. 3; 20th Rep. New York State Cab. Nat. Hist., 1868, p. 225.—Walcott, Albany, Inst. Trans., 10, 1883, p. 35 (adv. sheets, 1879); Bull. Geol. Soc. Amer., 1, 1890, p. 338.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1185, fig.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 206-210, pl. 10, figs. 4-8; pl. 12, figs. 9-16; figs. 108-112.

Thamnograptus typus Hall, Pal. New York, 3, 1859, pp. 519, 520, figs. 1, 2; 13th Rep. New York State Cab. Nat. Hist., 1860, p. 62, figs. 1, 2; Geol. Surv. Canada, dec. 2, 1856, p. 17, fig. 24; 20th Rep. New York State Cab. Nat. Hist., 1868, p. 184, fig. 26; rev. ed., p. 214, fig. 26; p. 225.—Nicholson, Mon. British Grapt., 1872, p. 131, fig. 71.—Lapworth, Cat. West Scot. Foss., 1876, p. 7, pl. 4, figs. 95, 96.—Miller, N. A. Geol. Pal., 1889, p. 207, fig. 226.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1185, fig.—Lapworth, Belfast Nat. Field Club Rep. Proc., 1, App., 1877, p. 143, pl. 7, fig. 16.

Rastrites barrandii Hall, Pal. New York, 3, 1859, pp. 521, 522, figs. 1, 2; 13th Rep. New York State Cab. Nat. Hist., 1860, p. 64, figs. 1, 2; 20th Rep. New York State Cab. Nat. Hist., 1868, p. 184, fig. 25; p. 194, fig. 30; rev. ed., p. 214, fig. 25; p. 225.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 852, figs.

Thamnograptus barrandii Lapworth, Roy. Soc. Canada Trans., sec. 4, 1886, p. 178.

Chazyan: Kenwood, Stockport, etc., New York (Normanskill); Virginia and Tennessee (Athens); Arkansas (Stringtown); Great Britain; Australia.

*Plesiotype*.—Cat. No. 54252, U.S.N.M.

**Thamnograptus(?) multiformis** Spencer.

Thamnograptus(?) multiformis Spencer, Canadian Nat., 10, 1882, p. 165; Trans. Acad. Sci. St. Louis, 4, 1884, pp. 565, 590, pl. 6, figs. 2, 3; Bull. Mus. Univ. State Missouri, 1, 1884, pp. 15, 40, pl. 6, figs. 2, 3.—Gurley, Jour. Geol., 4, 1896, p. 101.—Bassler, Bull. U. S. Nat. Mus., 65, 1909, p. 64, fig. 90, 91.

Niagaran dolomite: Hamilton, Ontario.

THAMNOGRAPTUS TYPUS Hall. See Thamnograptus capillaris.

*Theca forbesii* Dawson. Not recognized.  
*Theca Forbesii* (Sharpe) Dawson, Canadian Nat. Geol., 5, 1860, p. 299.  
 Silurian (Arisaig): Nova Scotia.

*Theca niagarensis* Grant. Not recognized.  
*Theca Niagarensis* Grant, Jour. and Proc. Hamilton Assoc., 17, 1901, pp. 73, 74.  
 Niagaran: Near Hamilton, Ontario.

*THECA PARVIUSCULA* Hall. See *Hyolithes parviusculus*.

**THECIA** Edwards and Haime. Genotype: *T. swindernana* Goldfuss.  
*Thecia* Edwards and Haime, Compt. Rend. de l'Acad. Sci., 29, 1849, p. 263;  
 Mon. d. Polyp. Foss. d. Terr. Pal., 1851 (Arch. du Mus. d'Hist. Nat., 5), pp.  
 158, 306.—Pictet, Traité de Pal., 2d ed., 4, 1857, p. 447.—Milne-Edwards,  
 Hist. Nat. d. Corall., 3, 1860, p. 316.—Salter, Cat. Camb. Sil. Foss., 1873,  
 p. 110.—Lindstrom, Ann. Mag. Nat. Hist., 4th ser., 18, 1876, p. 13.—Rominger,  
 Geol. Surv. Michigan, 3, pt. 3, 1876, p. 66.—Nicholson, Tab. Corals Pal-  
 Period, 1879, p. 236.—Zittel, Handb. Pal., 1, 1879, p. 213.—Roemer, Leth.  
 geog., pt. 1, Leth. Pal., 1883, p. 451.—Miller, N. A. Geol. Pal., 1889, p. 207.—  
 Sardeson, Neues Jahrb. Min., Geol. Pal., Beilage-Band, 10, 1896, p. 297.—  
 Lindström, Kongl. Sven. Vet.-Akad. Handl., 32, No. 1, 1899, p. 29.—Pocta,  
 Syst. Sil. du Centre Boheme, 8, pt. 2, 1902, p. 275.—Grabau and Shimer,  
 N. A. Index Fossils, 1, 1906, p. 91.

***Thecia major*** Rominger.

*Thecia major* Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 67, pl. 25, figs.  
 1, 2.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 454.—Hall, 12th Ann.  
 Rep. Indiana Dep. Geol. Nat. Hist., 1883, p. 253, pl. 2, fig. 6.—Davis, Ken-  
 tucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 34, figs. 1-3.—  
 Miller, N. A. Geol. Pal., 1889, p. 207, fig. 227.—Lesley, Geol. Surv. Penn-  
 sylvania, Rep. P 4, 1890, p. 1186, fig.—Grabau and Shimer, N. A. Index  
 Fossils, 1, 1906, p. 91, fig. 146.

Niagaran: Charleston, etc., Indiana; Louisville, Kentucky (Louisville); Decatur  
 County, etc., Tennessee (Brownsport); Drummonds Island, etc., Lake  
 Huron.

***Thecia minor*** Rominger.

*Thecia minor* Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 68, pl. 25, fig. 3.—  
 Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 34,  
 figs. 4, 7.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 91, fig. 147.

*Thecia swindernana* Roemer, Sil. Fauna West Tennessee, Breslau, 1860, p. 26,  
 pl. 2, fig. 4a, b.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky,  
 pt. 2, 1885, pl. 34, figs. 5, 6.

Niagaran: Louisville, Kentucky, and vicinity (Louisville); Decatur County,  
 etc., Tennessee (Brownsport); Drummonds Island, etc., Lake Huron.

Observation.—Considered by some authors as a synonym of *T. swindernana*.

***Thecia swindernana*** (Goldfuss).

*Agaricia Swindernana* Goldfuss, Petref. Germ., 1, 1826, p. 109, pl. 38, figs. 3a, b.  
*Thecia Swindernana* Edwards and Haime, Polyp. Foss. Terr. Pal., 1851, p. 307,  
 pl. 2, figs. 4, 4b.—Holtedah, [Second Arctic Exp. "Fram," 1898-1902, No.  
 32, 1914, p. 15, pl. 6, fig. 4.

Silurian (Wenlock, Ludlow): Europe; southwestern Ellesmereland, Arctic  
 America.

Observation.—See also *Thecia minor* Rominger.



- THECIA SWINDERNANA** Roemer. See *Thecia minor*.
- THECIA VETUSTA** Davis. See *Protaræa richmondensis*.
- THECOCYSTIS** Jaekel. See *Hemicystites* subgenus *Cystaster* Hall.
- THECOCYSTIS SACculus** Jaekel. See *Hemicystites* (*Cystaster*) *granulatus*.
- THECOSTEGITES HEMISPHERICUS** Roemer. See *Fistulipora hemispherica*.
- THLIPSURA SIMPLEX** Krause. See *Octonaria simplex*.
- THRESHERODISCUS** Foerste. Genotype: *T. ramosus* Foerste.  
*Thresherodiscus* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 432.
- Thresherodiscus ramosus** Foerste.  
*Thresherodiscus ramosa* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 432, pl. 1, fig. 8, pl. 3, fig. 3.  
 Trenton (Curdsville): Goat Island, northeast of Little Current, Manitoulin Island, Lake Huron.
- THYSANOCRINUS** Hall. See *Dimerocrinus Phillips*.
- THYSANOCRINUS (RHODOCRINUS) MICROBASILIS** Billings. See *Archæocrinus microbasilis*.
- THYSANOCRINUS MILLIGANÆ** Miller and Gurley. See *Gazacrinus?* *milliganæ*.
- THYSANOCRINUS (RHODOCRINUS) PYRIFORMIS** Billings. See *Archæocrinus pyriformis*.
- THYSANOPYGE** Kayser. Genotype: *Thysanopyge argentina* Kayser.  
*Thysanopyge* Kayser, Zeits. d. d. geol. Gesell., 50, 1898, pp. 425, 427.
- Thysanopyge argentina** Kayser.  
*Thysanopyge argentina* Kayser, Zeits. d. d. geol. Gesell., 50, 1898, p. 425, pl. 16, fig. 2.  
 Middle Ordovician: Salta, Argentina.
- TIGILLITES** Barrois. See *Scolithus* Hall.
- TOLMAIA** Williams. Genotype: *Pterinea lineata* Goldfuss.  
*Tolmaia* Williams, Proc. U. S. Nat. Mus., 34, 1908, p. 86.
- Tolmaia campestris** Williams.  
*Tolmaia campestris* Williams, Proc. U. S. Nat. Mus., 45, 1913, p. 335, pl. 29, fig. 16.  
 Silurian (Edmunds): Field Point, west side Cobscook River, Edmunds Township, Washington County, Maine.  
*Holotype*.—Cat. No. 58956, U.S.N.M.
- TRACHOMATICHNUS** Miller. Genotype: *T. numerosus* Miller.  
*Trachomatichnus* Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1880, p. 219; N. A. Geol. Pal., 1889, p. 454.
- Trachomatichnus cincinnatensis** Miller.  
*Trachomatichnus cincinnatensis* Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1880 p. 220, pl. 14, fig. 3.  
 Eden (Economy): Walker Mill Road, Cincinnati, Ohio.

**Trachomatichnus numerosus** Miller.

Trachomatichnus numerosus Miller, Jour. Cincinnati Soc. Nat. Hist., 1880, p. 219, pl. 13, figs. 2-4.

Eden (Economy): Walker Mill Road, Cincinnati, Ohio.

**Trachomatichnus permultus** Miller.

Trachomatichnus permultus Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1880, p. 220, pl. 13, fig. 5.

Eden (Economy): Walker Mill Road, Cincinnati, Ohio.

**TRACHYUM** Billings.

Genotype: *T. cyathiforme* Billings.

Trachyum Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 211.—Miller, N. A. Geol. Pal., 1889, p. 166.

**Trachyum cyathiforme** Billings.

Trachyum cyathiforme Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 211, fig. 196.—Miller, N. A. Geol. Pal., 1889, p. 166, fig. 127.

Canadian (Quebec—G): Cape Norman, Newfoundland.

**Trachyum rugosum** Billings.

Trachyum rugosum Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 212.

Canadian (Quebec—G): Cape Norman, Newfoundland.

**Trachyum undosum** James.

Not recognized.

Trachyum undosum James, Paleontologist, No. 2, 1878, p. 9.

Clinton: Clinton County, Ohio.

**TRAMORIA** Reed. See *Apatokephalus* Brögger.**TREMANOTUS** Hall. Genotype: *Bellerophon perforatus* Winchell and Marcy.

Tremanotus Hall, 20th Rep. New York State Cab. Hist., 1868, pp. 347, 388 (extras, 1865); rev. ed., 1870, p. 399.—Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 109.—Meek, Proc. Chicago Acad. Sci., 1, 1866, p. 10.—Waagen, Mem. Geol. Surv. India, Pal. Indica, 13th ser., 1, 1880, p. 131.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 19, No. 6, 1881, pp. 70, 85.—Zittel, Handb. Pal., 2, 1882, p. 184.—Koken, Neues Jahrb. Min., Geol., Pal., 6, Beilage-Band, 1889, pp. 381, 386.—Miller, N. A. Geol. Pal., 1889, p. 428.—Newton, Geol. Mag., dec. 3, 9, 1892, p. 337.—Frech, Zeits. d. d. geol. Gesell., 46, 1894, p. 461.—Koken, Die Leitfossilien, Leipzig, 1896, p. 99; Neues Jahrb. Min., Geol., Pal., 1, 1898, p. 7.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 851.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 615.

Tremanotus Pilsbry, Zittel-Eastman Textb. Pal., 1, 1900, p. 445.—Dall, *ibid.*, 2d ed., 1913, p. 521.

**Tremanotus alpehus** (Hall).

Tremanotus alpehus Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 347, pl. 15 (6), figs. 23, 24; p. 389; rev. ed., 1870, p. 399, pl. 15, figs. 23, 24.—McChesney, Trans. Chicago Acad. Sci., 1, 1868, p. 47, pl. 8, fig. 4.—Hall and Whitfield, Geol. Surv. Ohio Pal., 2, 1875, p. 145, pl. 8, fig. 1.—Whiteaves, Geol. Surv. Canada Pal. Foss., 3, pt. 1, 1884, p. 34.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1198, fig.

Tremanotus alpehus Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 54, pl. 5, figs. 20-23; pl. 6, figs. 1-9.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 615, figs. 824, 825.

*Bellerophon* (Bucania) *perforatus* Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 100, pl. 8, fig. 7; p. 109.

Niagaran: Chicago, Illinois, and Racine, Wisconsin (Racine); Shelby and Rochester, New York; Ohio; Ontario (Guelph).

**Tremanotus angustatus** (Hall).

*Bucania angustata* Hall, Pal. New York, 2, 1852, p. 349, pl. 84, figs. 6a, b; 20th Rep. New York State Cab. Nat. Hist., 1868, p. 346; rev. ed., 1870, p. 398.

*Bellerophon angustata* Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 344, fig. 352.

*Tremanotus angustatus* Whiteaves, Pal. Foss. Geol. Surv. Canada, 3, pt. 2, 1895, p. 70.—Clarke and Ruedemann, Mem. New York State Mus., 5, p. 56.

Niagaran (Guelph): Galt, Guelph, Hespeler, etc., Ontario.

Observation.—Probably the same as *Tremanotus alpheus* (Hall).

**Tremanotus chicagoensis** (McChesney).

*Bucania chicagoensis* McChesney, Desc. New Species Fossils, 1859, p. 69; Plates Illust. New Sp. Fossils, 1865, pl. 8, figs. 4-4b, 5-5b; Trans. Chicago Acad. Sci., 1, 1868, p. 46, pl. 8, fig. 5.—Meek, Proc. Chicago Acad. Sci., 1, 1866, p. 10.

*Tremanotus chicagoensis* Miller, N. A. Geol. Pal., 1889, p. 428 (gen. ref.).

*Tremanotus chicagoensis* Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 57.—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, pl. 11, figs. 1, 2, 5; pl. 12, figs. 1, 2.

Niagaran: Chicago, Illinois (Racine); Huntington and Delphi, Indiana.

*Plastotype*.—Cat. No. 52941, U.S.N.M. (Kindle and Breger).

**Tremanotus crassolaris** (McChesney).

*Bucania crassolare* McChesney, Desc. New Species Fossils, 1861, p. 91.

Niagaran (Racine): Chicago, Illinois.

**Tremanotus pervolutus** (McChesney).

*Bucania pervoluta*, McChesney, Desc. New Species Fossils, 1861, p. 91.

Niagaran (Racine): Chicago, Illinois.

**Tremanotus? trigonostoma** Hall and Whitfield.

*Tremanotus? trigonostoma* Hall and Whitfield, Pal. Ohio, 2, 1875, p. 146, pl. 8, fig. 5.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1198, fig.

*Bucania trigonostoma* Whitfield, Geol. Wisconsin, 4, 1882, p. 359.

Niagaran (Guelph): Genoa, Ohio; ?Wisconsin.

**TREMATIS** Sharpe.

Genotype: *Orbicula terminalis* Sharpe.

*Trematis* Sharpe, Quart. Jour. Geol. Soc. London, 4, 1848, p. 66, 68.—Emmons,

Amer. Geol., 1, pt. 2, 1855, pp. 188, 201.—Pictet, Traite de Pal., 2d ed., 4,

1857, p. 69.—Hitchcock, Geol. Vermont, 1, 1862, p. 293.—Dall, Amer. Jour.

Conch., 7, 1871, p. 75; Bull. Mus. Comp. Zool., 3, 1871, p. 37; Bull. U. S. Nat.

Mus., 8, 1877, p. 73.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 14.—

Zittel, Handb. Pal., 1, 1880, p. 665.—Miller, N. A. Geol. Pal., 1889, p. 385.—

Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 138, 168.—Winchell and

Schuchert, Geol. Minnesota, 3, 1893, p. 367.—Hall and Clarke, 11th Ann. Rep.

New York State Geol., 1894, p. 258.—Grabau and Shimer, N. A. Index Fossils,

1, 1907, p. 201.—Koken, Die Leitfossilien, Leipzig, 1896, p. 230, figs. 189,

8, 9.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 895.—

Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 309; 2d ed, 1913, p. 377.

**Trematis crassipuncta** Ulrich.

*Trematis crassipuncta* Ulrich, Amer. Geol., 4, 1889, p. 22; 3, p. 378, fig. 7.

Maysville (Fairmount): Cincinnati, Ohio.

*Plastotype*.—Cat. No. 44999, U.S.N.M.

**Trematis(?) dyeri** Miller.

*Trematis dyeri* Miller, *Cincinnati Quart. Jour. Sci.*, 1, 1874, p. 347, fig. 39; *N. A. Geol. Pal.*, p. 385, fig. 628.—Hall and Clarke, *Pal. New York*, 8, pt. 1, 1892, p. 142.

Maysville (Fairmount): Cincinnati, Ohio.

**TREMATIS FILOSA** Billings. See *Schizocrania filosa*.

**Trematis fragilis** Ulrich.

*Trematis fragilis* Ulrich, *Amer. Geol.*, 4, 1889, p. 21; 3, p. 378, fig. 6.—Hall and Clarke, *Pal. New York*, 8, pt. 1, 1892, p. 142, pl. 4G, fig. 14.—Foerste, *Bull. Sci. Lab. Denison Univ.*, 16, 1910, p. 38, pl. 5, figs. 2-4.

*Trematis punctostriata* Hall and Whitfield (not Hall, 1873), *Pal. Ohio*, 2, 1873, p. 70, pl. 1, figs. 8, 9.

Trenton (upper): West Covington, Kentucky.

**Trematis huronensis** Billings.

*Trematis Huronensis* Billings, *Pal. Foss.*, 1, *Geol. Surv. Canada*, 1865, p. 53, fig. 59 (adv. sheets, 1862); *Geol. Canada*, 1863, p. 159, fig. 130.—Lesley, *Geol. Surv. Pennsylvania*, Rep. P 4, 1889, p. 1198, figs.—?Winchell and Schuchert, *Geol. Minnesota*, 3, 1893, p. 368, fig. 29.

*Productella minneapolis* Sardeson, *Bull. Minnesota Acad. Nat. Sci.*, 3, 1892, p. 332, pl. 4, figs. 11, 12.

Black River: Pallideau Islands, Lake Huron; Minneapolis, Minnesota.

**Trematis millepunctata** Hall.

*Trematis millepunctata* Hall, *Desc. New Species Crin. and Other Foss.*, 1866, p. 14; 24th Rep. New York State Cab. Nat. Hist., 1872, p. 221, pl. 7, figs. 22-25.—Hall and Whitfield, *Pal. Ohio*, 2, 1875, p. 70, pl. 1, figs. 4-7.—Miller, *Cincinnati Quart. Jour. Sci.*, 2, 1875, p. 16; *N. A. Geol. Pal.*, 1889, p. 385, fig. 629.—Lesley, *Geol. Surv. Pennsylvania*, Rep. P 4, 1890, p. 1199, figs.—Huene, *Verh. d. Russ. Kais. Min. Ges. St. Petersburg*, 36, 1899, p. 336, fig. 8.—Hall and Clarke, *Pal. New York*, 8, pt. 1, 1892, p. 139, pl. 4G, figs. 4-10.—Raymond, *Ann. Carnegie Mus.*, 3, 1904, p. 86, fig. 4.—Grabau and Shimer, *N. A. Index Fossils*, 1, 1907, p. 202, figs. 235a, b, d.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 943, pl. 34, figs. 9, 9c.

Eden-Richmond: Cincinnati, Ohio, and vicinity.

Observation.—See *T. quincuncialis* and *T. reticularis* for probable synonyms.

**Trematis montrealensis** Billings.

*Trematis Montrealensis* Billings, *Pal. Fossils*, 1, *Geol. Surv. Canada*, 1865, p. 52, fig. 57 (adv. sheets, 1862); *Geol. Canada*, 1863, p. 159, fig. 128.—Lesley, *Geol. Surv. Pennsylvania*, Rep. P 4, 1890, p. 1199, fig.

Trenton: Montreal, Quebec.

**Trematis oblata** Ulrich.

*Trematis oblata* Ulrich, *Amer. Geol.*, 4, 1889, p. 23; 3, p. 378, fig. 9.—Hall and Clarke, *Pal. New York*, 8, pt. 1, 1892, p. 142, pl. 4G, fig. 20.

Maysville (Fairmount): Cincinnati, Ohio.

*Cotype* and *plastotype*.—Cat. Nos. 451991, 45200, U.S.N.M.

**\*Trematis ottawaensis** Billings.

*Trematis Ottawaensis* Billings, *Geol. Surv. Canada*, *Pal. Foss.*, 1, 1865, p. 53, fig. 58 (adv. sheets, 1862); *Geol. Canada*, 1863, p. 159, fig. 129; *Cat. Sil. Foss. Anticosti*, 1866, p. 11.—Lesley, *Geol. Surv. Pennsylvania*, Rep., P 4, 1890, p. 1199, fig.—Hall and Clarke, *Pal. New York*, 8, pt. 1, 1892, p. 139, pl. 4G,

**Trematis ottawaensis**—Continued.

figs. 15-17.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 369, fig. 30.—Crane, Geol. Mag., dec. 4, 2, 1895, pl. 5, fig. 14.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 202, fig. 235c.

Trenton: Ottawa, Ontario; Trenton Falls, New York; Frankfort, Kentucky; St. Paul, Minnesota.

**TREMATIS PUNCTOSTRIATA** Hall and Whitfield. See *Trematis fragilis*.

**Trematis punctostriata** Hall.

*Trematis punctostriata* Hall, 23d Rep. New York State Cab. Nat. Hist., 1873, p. 243, pl. 13, figs. 17, 18.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 142, pl. 4G, figs. 11-13(?).—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1199, figs.—Foerste, Jour. Geol., 11, 1903, p. 706 (loc. occ.); Bull. Sci. Lab. Denison Univ., 16, 1910, p. 37, pl. 5, fig. 1.

Trenton (Hermitage): Clifton, Tennessee; Frankfort, Kentucky.

**Trematis(?) pustulosa** Hall.

*Trematis? pustulosa* Hall, Descrip. New Species Crin. and other Fossils, 1866, p. 15; 24th Rep. New York State Cab. Nat. Hist., 1872, p. 222.

Richmond (Maquoketa): Near Horicon, Wisconsin.

**Trematis quincuncialis** Miller and Dyer.

*Trematis quincuncialis* Miller and Dyer, Cont. to Pal., 2, 1878, p. 8, pl. 3, fig. 9.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 452.

Richmond (Waynesville): Near Lebanon, Ohio.

Observation.—Probably the same as *T. millepunctata*.

**Trematis reticularis** (Miller).

*Crania reticularis* Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 280, fig. 1; N. A. Geol. Pal., 1889, p. 342, fig. 555.

*Trematis reticularis* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 453.—Cumings, 32d Ann. Rep., Dep. Geol. Nat. Res., Indiana, 1908, p. 944, pl. 34, fig. 10.

Richmond: Brookville, Indiana.

Observation.—Probably the same as *T. millepunctata*.

**TREMATIS RUDIS** Hall. See *Schizocrania(?) rudis*.

**Trematis terminalis** (Emmons).

*Orbicula terminalis* Emmons, Geol. New York, Rep. 2d Dist., 1842, p. 395, fig. 4.—Hall, Pal. New York, 1, 1847, p. 100, pl. 30, fig. 11.

*Trematis terminalis* Sharpe, Quart. Jour. Geol. Soc. London, 4, 1848, p. 68, figs. 1-3.—Emmons, Amer. Geology, 2, 1855, p. 201, fig. 63; pl. 8, fig. 11.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 69, pl. 89, fig. 7.—Emmons, Man. Geol., 1860, p. 99, figs. 88-4a.—Hitchcock, Geol. Vermont, 1, 1862, p. 293, fig. 198.—Billings, Geol. Canada, 1863, p. 159, fig. 127.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1200, figs.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 139, pl. 4G, figs. 1, 2.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 202.

?*Trematis terminalis* Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 14.

Trenton: Middleville, Trenton Falls, Watertown, etc., New York.

**Trematis umbonata** Ulrich.

*Trematis umbonata* Ulrich, Amer. Geol., 4, 1889, p. 23; 3, 1889, fig. 8 on p. 378.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 139, pl. 4G, figs. 18, 19.

Maysville (Corryville): Cincinnati, Ohio, and vicinity.

*Plastotype*.—Cat. No. 44993, U.S.N.M.

**TREMATOCYSTIS** Jaekel.Genotype: *Holocystites subglobosus* Miller.*Trematocystis* Jaekel, Stammesg. *Pelmat.*, 1, *Thecoidea* und *Cystoidea*, Berlin, 1899, p. 413.***Trematocystis hammelli*** (Miller).*Holocystites hammelli* Miller, *N. A. Geol. Pal.*, 1889, p. 254, figs. 336, 337.*Trematocystis hammelli* Jaekel, Stammesg. *Pelmat.*, 1, *Thecoidea* und *Cystoidea*, Berlin, 1899, p. 413.

Clinton (Osgood): Jefferson County, Indiana.

***Trematocystis subglobosus*** (Miller).*Holocystites subglobosus* Miller, *N. A. Geol. Pal.*, 1889, p. 255, fig. 338.*Trematocystis subglobosus* Jaekel, Stammesg. *Pelmat.*, 1, *Thecoidea* und *Cystoidea*, 1899, p. 414, pl. 4, fig. 2.

Clinton (Osgood): Jefferson County, Indiana.

**TREMATONOTUS** of authors. See *Tremanotus* Hall.**TREMATOPORA** Hall.Genotype: *T. tuberculosa* Hall.*Trematopora* Hall, *Amer. Jour. Sci.*, 2d ser., 11, 1851, p. 400; *Pal. New York*, 2, 1852, p. 149.—Zittel, *Handb. Pal.*, 1, 1880, p. 617.—Roemer, *Leth. geog.*, 1, *Leth. Pal.*, 1883, p. 479.—Hall and Simpson, *Nat. Hist. New York*, 6, 1887, p. 14.—Miller, *N. A. Geol. Pal.*, 1889, p. 328.—Ulrich, *Geol. Surv. Illinois*, 7, 1890, pp. 373, 418; *Geol. Minnesota*, 3, 1893, p. 308.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 501.—Nickles and Bässler, *Bull. U. S. Geol. Surv.*, 173, 1900, p. 35.—Grabau, *Bull. New York State Mus.*, 45, 1901, p. 166; *Bull. Buffalo Soc. Nat. Sci.*, 7, 1901, p. 166.—Pocta, *Syst. Sil. du Centre Boheme*, pt. 2, 1902, p. 314.—Bassler, *Bull. U. S. Geol. Surv.*, 292, 1906, p. 43.—Grabau and Shimer, *N. A. Index Fossils*, 1, 1907, p. 139.—Bassler, *Bull. U. S. Nat. Mus.*, 77, 1911, pp. 267, 268.**TREMATOPORA** Ulrich, 1882. See *Homotrypa* Ulrich.**TREMATOPORA ANNULIFERA** Whitfield. See *Lioclemella annulifera*.**TREMATOPORA ASPERA** Hall. See *Acanthoclema asperum*.***Trematopora calloporoides*** Ulrich.*Trematopora calloporoides* Ulrich, *Geol. Surv. Illinois*, 8, 1890, p. 420, pl. 38, figs. 1–1d.Upper Medinan (Girardeau): Alexander County, Illinois.  
*Cotype*.—Cat. No. 43803, U.S.N.M.**TREMATOPORA COALESCENS** Hall. See *Chilotrypa ostiolata*.***Trematopora crebripora*** Hall.

Not recognizable.

*Trematopora* (*Chaetetes*) *crebripora* Hall, *Trans. Albany Inst.*, 10, 1883, p. 59 (abstract 1879, p. 3); 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 236.  
Niagaran (Waldron): Waldron, Indiana.***Trematopora debilis*** Ulrich.*Trematopora debilis* Ulrich, *Geol. Surv. Illinois*, 8, 1890, p. 419, pl. 34, figs. 3–3e.  
Upper Medinan (Girardeau): Alexander County, Illinois.  
Fragment of *holotype*.—Cat. No. 43802, U.S.N.M.**TREMATOPORA ECHINATA** Hall. See *Eridotrypa echinata*.***Trematopora?? granulata*** Whitfield.*Trematopora granulata* Whitfield, *Ann. Rep. Geol. Surv. Wisconsin* for 1877, 1878, p. 68; *Geol. Surv. Wisconsin*, 4, 1882, p. 253, pl. 11, figs. 22, 23.  
Richmond (Maquoketa): Delafield, Wisconsin.

TREMATOPORA GRANULIFERA Hall. See *Batostomella granulifera*.

**Trematopora halli** Ulrich.

*Trematopora halli* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 261, pl. 13, figs. 3, 3a.

Niagaran (Waldron): Waldron, Indiana; Newsom, Tennessee.

*Cotypes*.—Cat. No. 44107, U.S.N.M.

TREMATOPORA INFREQUENS Hall. See *Diamesopora infrequens*.

**Trematopora irregularis** (Billings).

*Helopora irregularis* Billings, Catal. Sil. Foss. Anticosti, 1866, p. 39.

Anticostian (Jupiter River): Chaloupe River, Anticosti.

TREMATOPORA? (TRACHYFORA?) MACROPORA Hall. See *Nematopora macropora*.

TREMATOPORA? (TRACHYFORA?) MINUTA Hall. See *Nematopora minuta*.

TREMATOPORA? NITIDA Ulrich. See *Lioclemella nitida*.

TREMATOPORA ORNATA Ulrich. See *Trematopora? primigenia ornata*.

TREMATOPORA OSCULUM Hall. See *Diamesopora osculum*.

TREMATOPORA OSTIOLATA Hall. See *Chilotrypa ostiolata*.

**Trematopora primigenia** Ulrich.

*Trematopora primigenia* Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 97; Geol. Minnesota, 3, 1893, p. 309, pl. 21, figs. 23-40.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 268, 269, fig. 158.

Black River (Decorah): Minneapolis, St. Paul, etc., Minnesota.

Middle Ordovician (Wassalem): Uxnorn, Esthonia, Russia.

*Cotypes*.—Cat. No. 43615, U.S.N.M.

**Trematopora primigenia ornata** (Ulrich).

*Trematopora ornata* Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 98.

*Trematopora? primigenia* var. *ornata* Ulrich, Geol. Minnesota, 3, 1893, p. 310, pl. 21, figs. 26, 28, 33, 34.

Black River (Decorah): St. Paul, Minnesota, and vicinity.

*Holotype*.—Cat. No. 43616, U.S.N.M.

**Trematopora? primigenia spinosa** Ulrich.

*Trematopora? primigenia* var. *spinosa* Ulrich, Geol. Minnesota, 3, 1893, p. 310, pl. 21, figs. 29, 30, 35, 36.

Black River (Decorah): St. Paul, Minnesota, and vicinity.

*Cotypes*.—Cat. No. 43617, U.S.N.M.

TREMATOPORA?? PUNCTATA Hall. See *Idiotrypa punctata*.

**Trematopora? singularis** (Hall).

*Callopora singularis* Hall, 28th Ann. Rep. New York State Mus., doc. ed., 1876, pl. 10, figs. 1, 2; *ibid.*, mus. ed., 1879, p. 115, pl. 10, figs. 1, 2; 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 237, pl. 9, figs. 1, 2.

*Leioclema singulare* Ulrich, Geol. Surv. Illinois, 8, 1890, p. 425.

*Trematopora? singularis* Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 434.

Niagaran (Waldron): Waldron, Indiana.

TREMATOPORA SOLIDA Hall. See *Eridotrypa solida*.

TREMATOPORA SPARSA Hall. See *Diploclema sparsum*.

**Trematopora spiculata** Miller.

*Trematopora spinulosa* Hall (not Hall, 1852), 28th Ann. Rep. New York State Mus., doc. ed., 1876, pl. 11, figs. 11, 12.

*Trematopora spiculata* Miller, Amer. Pal. Foss., 2d ed., 1877, p. 245.—Hall, 28th Ann. Rep. New York State Mus., mus. ed., 1879, p. 114, pl. 11, figs. 11, 12; 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 235, pl. 10, figs. 11, 12.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 258.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1201, figs.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, pp. 45, 46, pl. 27, figs. 14, 15.

Niagaran: Waldron, Indiana (Waldron); Lockport, New York (Rochester); Osgood, Indiana (Osgood).

*Plesiotype*.—Cat. No. 35760, U.S.N.M.

TREMATOPORA SPINULOSA Hall. See *Bythopora spinulosa*.

TREMATOPORA STRIATA Hall. See *Eridotrypa striata*.

TREMATOPORA SUBIMBRICATA Hall. See *Diamesopora subimbricata*.

TREMATOPORA SUPERBA Billings. See *Lyellia superba*.

**Trematopora tuberculosa** Hall.

*Trematopora tuberculosa* Hall, Pal. New York, 2, 1852, p. 149, pl. 40A, figs. 1a-g.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 259, pl. 13, figs. 2-2b.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, pl. 19, figs. 1-5.—Grabau, Bull. New York State Mus., 45, 1901, p. 166, fig. 65; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 166, fig. 65.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, pp. 43, 44, pl. 13, figs. 15, 16; pl. 17, figs. 1-3; pl. 25, fig. 8.—Grabau and Shimer, N. A. Index Fossils, 1, p. 139, fig. 193.

Clinton: Lockport, Lewiston, Niagara Gorge, etc., New York; Grimsby and Thorold, Ontario (Rochester); Osgood, Indiana (Osgood).

*Plesiotype*.—Cat. No. 43618, U.S.N.M.

TREMATOPORA TUBULOSA Hall. See *Diamesopora? tubulosa*.

TREMATOPORA VARIA Hall. See *Chilotrypa varia*.

TREMATOPORA VARIOLATA Hall. See *Chilotrypa variolata*.

**Trematopora whitfieldi** Ulrich.

*Trematopora whitfieldi* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1888, p. 262, pl. 13, figs. 4, 4a.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, pp. 44, 45, pl. 23, figs. 16, 17; pl. 27, figs. 16, 17.

Niagaran: Waldron, Indiana (Waldron); Lockport, New York (Rochester).

*Cotypes*.—Cat. No. 44108, U.S.N.M.

**TREMATOSPIRA** Hall.

Genotype: *Spirifer? perforatus* Hall.

*Trematospira* Hall, Pal. New York, 3, 1859, p. 207; 12th Rep. New York State Cab. Nat. Hist., 1859, p. 27; 16th Rep., *ibid.*, 1863, p. 54; Pal. New York, 4, 1867, p. 271.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 60.—Davidson, Mon. British Foss. Brach., 5, Sil. Suppl., Pal. Soc., 1882, p. 82.—Miller, N. A. Geol. Pal., 1889, p. 385.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 135.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 124; 13th Ann. Rep. New York State Geol., 1895, p. 798.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 221; *ibid.*, 7, 1901, p. 201; Bull. New York State Mus., 45, 1901, p. 201.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 345.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 337; 2d ed., 1913, p. 414.



**TREMATOSPIRA ACADLE** Hall. See *Rhynchospira(?) acadiaë*.

**Trematospira camura** Hall.

*Atrypa camura* Hall, Pal. New York, 2, 1852, p. 273, pl. 56, fig. 3.

*Rhynchonella camura* Billings, Geol. Canada, 1863, p. 315, fig. 322.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 884, figs.

*Trematospira camura* Hall, Pal. New York, 3, 1859, p. 212, pl. 28A, fig. 1.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 126, pl. 49, figs. 2-4.—Grabau, Bull. New York State Mus., 45, 1901, p. 201, fig. 122; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 201, fig. 122.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 345, fig. 443.

Clinton (Rochester): Lockport and Niagara Falls, New York.

**Trematospira camura pauciplicata** Foerste.

*Trematospira camura-pauciplicata* Foerste, Cincinnati Soc. Nat. Hist., Jour., 21, 1909, p. 18, pl. 2, figs. 9A, B.

Clinton (West Union): West Union, Ohio.

**TREMATOSPIRA? DISPARILIS** Hall. See *Atrypina disparilis*.

**TREMATOSPIRA (RHYNCHOSPIRA) GLOBOSA** Hall. See *Rhynchospira globosa*.

**Trematospira granulifera** Meek.

*Retzia (Trematospira) granulifera* Meek, Proc. Acad. Nat. Sci. Philadelphia, 1872, p. 318; Pal. Ohio, 1, 1873, p. 128, pl. 11, fig. 6.

*Retzia(?) granulifera* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 345.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 930, pl. 36, figs. 5-5c.

*Trematospira(?) granulifera* Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 61.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1204, figs.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, p. 133, pl. 8, fig. 5.

Cincinnati: Cincinnati, Ohio.

Observation.—This name might as well be dropped, for the type is in all probability a specimen of some Devonian species (*T. gibbosa?*).

**TREMATOSPIRA HELENA** Nettelroth. See *Rhynchospira (?) helena*.

**TREMATOSPIRA MATTHEWSONI** McChesney. See *Atrypa marginalis*.

**TREMATOSPIRA? QUADRIPLICATA** Miller. See *Rhynchotrema inaequivalve*.

**Trematospira simplex** Hall.

*Trematospira simplex* Hall, Pal. New York, 3, 1859, p. 211, pl. 28A, fig. 2.—Hall, and Clarke, Pal. New York, 8, pt. 2, 1895, pl. 49, figs. 17, 18.

Niagaran (Brownsport): Decatur County, Tennessee.

**TRENTONASTER** Sturtz. See *Schuchertia* Gregory.

**TRETASPIS** McCoy.

Genotype: *Asaphus seticornis* Hisinger.

*Tretaspis* McCoy, Ann. Mag. Nat. Hist., 2d ser., 4, 1849, pp. 401, 410, fig.—Salter, Mem. Geol. Surv. United Kingdom, dec. 7, 1853, pl. 7.—McCoy, Cont. British Pal., 1854, p. 149, fig.; British Pal. Rocks, Fossils, 1854, p. 146.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1880, p. 188.—Ehler, Bull. Soc. Geol. France, 3d ser., 23, 1895, p. 312, footnote.—Reed, Geol. Mag., dec. 4, 5, 1898, p. 445.—Raymond, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 711.

**Tretaspis diademata** Ruedemann.

*Tretaspis diademata* Ruedemann, Bull. New York State Mus., 49, 1902, p. 49, pl. 3, figs. 13, 14.

Mohawkian (Rysedorph): Rysedorph Hill, Rensselaer County, New York.

**Tretaspis reticulata** Ruedemann.

*Tretaspis reticulatus* Ruedemann, Bull. New York State Mus., 49, 1902, p. 41 pl. 3, fig. 11, 15-20.—Bassler, Bull. Virginia Geol. Surv., 2a, 1909, pl. 3, figs. 20, 21.

Mohawkian: Rysedorph Hill, Rensselaer County, New York (Rysedorph); Maryland and Virginia (Chambersburg).

**TRIACRINUS** D'Orbigny. See *Pisocrinus* DeKoninck.

**Trianisites Rafinesque.**

Not recognized.

*Trianisites Rafinesque*, Amer. Jour. Sci. Arts, 3, 1821, p. 286; Bull. Soc. Geol. France, 10, 1839, p. 380.

**Trianisites cliffordi** Rafinesque.

Not recognized.

*Trianisites cliffordi* Rafinesque, Amer. Jour. Sci. Arts, 3, 1821, p. 286, pl. 1, fig. A; Bull. Soc. Geol. France, 10, 1839, p. 379.

Trenton: Near Lexington, Kentucky.

Observation.—Probably refers to some hemispheric bryozoan.

**Trianisites conradi** Rafinesque.

Not recognized.

*Trianisites Conradi* Rafinesque, Bull. Soc. Geol. France, 10, 1839, p. 379.

Islands of St. Lawrence River.

**TRIARTHURUS** Green.

Genotype: *Triarthrus beckii* Green.

*Triarthrus* Green, Mon. Tril. N. A., 1832, p. 86; Monthly Amer. Jour. Geol., 1, 1832, p. 560; Amer. Jour. Sci., 33, 1838, pp. 343, 344.—Haldeman, *ibid.*, 2d ser., 5, 1848, p. 107.—Barrande, Neues Jahrb. Min. Geol. Pal., 1850, p. 779.—Pictet, *Traite de Pal.*, 2d ed., 1854, p. 492.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 214.—Hitchcock, Geol. Vermont, 1, 1862, p. 308.—Chapman, Canadian Jour., n. s., 8, 1863, p. 32; Expos. Min. Geol. Canada, 1864, p. 140.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 146.—Zittel, Handb. Pal., 2, 1885, p. 598.—Miller, N. A. Geol. Pal., 1889, p. 568.—Beecher, Amer. Jour. Sci., 3d ser., 46, 1893, pp. 378, 467; *ibid.*, 47, 1894, p. 298.—Walcott, Geol. Mag., dec. 4, 1, 1894, p. 247.—Bernard, Quart. Jour. Geol. Soc. London, 51, 1895, p. 352.—Koken, Die Leitfossilien, Leipzig, 1896, p. 19, fig. 11, fig. 1.—Ehlert, Bull. Soc. Geol. France, 3d ser., 24, 1896, p. 111, figs. 25, 26.—Beecher, Geol. Mag., dec. 4, 3, 1896, p. 193; Amer. Jour. Sci., 4th ser., 1, 1896, pp. 251-256; *ibid.*, 3, 1897, p. 184; Zittel-Eastman Textb. Pal., 1, 1900, p. 629.—Jaekel, Zeits. d. d. geol. Gesell., 53, 1901, p. 136; *ibid.*, 54, Brief Mitth., 1902, p. 55.—Beecher, Amer. Jour. Sci., 4th ser., 13, 1902, p. 165; Geol. Mag., dec. 4, 9, 1902, pp. 152-157.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 286.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 715.

**Triarthrus beckii** Green.

*Triarthrus beckii* Green, Mon. Tril. N. A., 1832, p. 87, cast 34, pl. 1, fig. 6; Monthly Amer. Jour. Geol., 1, 1832, p. 560, pl. 1, fig. 3.—Harlan, Trans. Geol. Soc. Pennsylvania, 1, 1835, p. 205, pl. 15, fig. 6; Med. Phys. Res., 1835, p. 400, pl., fig. 6.—Green, Suppl. Tril. N. A., 1835, p. 7; Amer. Jour. Sci. Arts, 33, 1838, p. 142, fig. 2.—Emmons, Geol. New York, 2, 1842, p. 399, text fig. 1; p. 279, text fig. 1.—Vanuxem, *ibid.*, 3, 1842, p. 57, fig. 1.—Mather, *ibid.*, 1, 1843, p. 390, fig. 1.—Burmeister, Org. Tril., Berlin, 1843, p. 133.—Owen, Amer.

**Triarthrus becki**—Continued.

- Jour. Sci., 47, 1844, p. 371, fig. 1; p. 370, fig.—Hall, Amer. Jour. Sci., 2d ser., 5, 1848, pp. 322-327, figs.—Röemer, Neues Jahrb. Min. Geol. Pal., 1848, p. 179.—Haldeman, Amer. Jour. Sci., 2d ser., 8, 1848, p. 137.—Emmons, Amer. Assoc. Adv. Sci., 1849, p. 17; Amer. Geology, 1, pt. 2, 1855, p. 214, pl. 15, fig. 12; pl. 17, fig. 13.—Billings, Canadian Nat. Geol., 4, 1859, p. 383.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, p. 49, pl. 4, fig. 13.—Barrande, Bull. Soc. Geol. de France, 2d ser. 18, 1861, p. 269, pl. 5, figs. 11, 12.—Hitchcock, Geol. Vermont, 1, 1861, pp. 308, 322.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 202, fig. 202.—Chapman, Canadian Jour. n. s., 8, 1863, p. 32, fig. 149; p. 203, fig. 200.—Expos. Min. Geol. Canada, 1864, p. 140, fig. 149; p. 175, fig. 200.—Linnarsson, Kongl. Sven. Vet.-Akad. Handl., 8, No. 2, 1869, p. 70, pl. 1, fig. 27.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 146.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 39.—Walcott, Trans. Albany Inst., 10, 1876 (adv. sheets, 1879), p. 23, pl. 2, figs. 1-15, pp. 3, footnote, 9 (loc. occ.).—Emerson, Narrative Hall's Sec. Arctic Exped., U. S. Navy Dep., 1879, p. 582.—Ford, Amer. Jour. Sci., 3d ser., 19, 1880, p. 152.—Miller, N. A. Geol. Pal., 1889, p. 568, fig. 1062.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1208, figs.—W. D. Matthews, Trans. New York Acad. Sci., 12, 1893, p. 237, pl. 8; Amer. Jour. Sci., 3d ser., 46, 1893, p. 121, pl. 1, figs. 1-7.—Beecher, *ibid.*, 1893, p. 378, fig. 1, p. 467, figs. 1-4.—Walcott, Proc. Biol. Soc. Washington, 9, 1894, pl. 1, figs. 1-6; Geol. Mag., dec. 4, 1, 1894, pl. 8, figs. 1-6.—Bernard, Quart. Jour. Geol. Soc. London, 50, 1894, p. 425, fig. 11; p. 426, fig. 12.—Beecher, Amer. Jour. Sci., 3d ser., 47, 1894, p. 298, fig. 1, pl. 7, figs. 1-4.; Amer. Geol., 13, 1894, pp. 38-43, pl. 3, figs. 1-9; *ibid.*, 15, 1895, pp. 91-100, pl. 4, fig. 1; pl. 5, figs. 1-11; *ibid.*, 16, 1895, p. 172, pl. 8, figs. 12-14; pl. 10, fig. 1; Amer. Jour. Sci., 4th ser., 1, 1896, p. 256, pl. 8, figs. 1, 2.—Barnard, Sci. American Suppl., 40, 1895, p. 16534.—Beecher, Geol. Mag., dec. 4, 3, 1896, pl., figs. 1, 2.—Ehler, Bull. Soc. Geol. France, 3d ser., 24, 1896, pp. 99-108, figs. 1-17; p. 115, figs. 34.—Jaekel, Zeits. d. d. geol. Gesell., 53, 1901, p. 161, fig. 24, p. 162.—Beecher, Amer. Jour. Sci., 4th ser., 13, 1902, pl. 2, figs. 1-5; pl. 3, fig. 1; pl. 4, fig. 1; pl. 5, figs. 2-4; Geol. Mag., dec. 4, 9, 1902, p. 155, figs. 1-3, pls. 9, 10, 11.—Perkins, Rep. State Geol. Vermont, 3, 1902, p. 169, fig.—Bassler, Bull. Virginia Geol. Surv., 2a, 1909, pl. 7, figs. 6-8.—Grabau and Shimer, N. A. Index Fossils, 2, p. 286, fig. 1590.
- Brongniatia careinodea* Eaton, Geol. Textb., 2d ed., 1832, p. 33, pl. 1, fig. 3; Amer. Jour. Sci. Arts, 22, 1832, p. 166.
- Cancer trilobioides* Eaton, Amer. Jour. Sci. Arts., 21, 1832, p. 135.
- Paradoxides triarthrus* Harlan, Trans. Geol. Soc. Pennsylvania, 1, 1835, p. 264, pl. 15, fig. 5; Med. Phys. Res., 1835, p. 401, pl. fig. 5.
- Paradoxides arcuatus* Harlan, Trans. Geol. Soc. Pennsylvania, 1, 1835, p. 265, pl. 15, figs. 1-3; Med. Phys. Res., 1835, p. 401, pl. figs. 1-3.
- Paradoxides Beckii* Hall, Amer. Jour. Sci., 33, 1838, p. 142, fig. 1.
- Paradoxides Eatonii* Hall, Amer. Jour. Sci., 33, 1838, fig. 2.
- Olenus arcuatus* Goldfuss, Neues Jahrb. Min., Geol., Pal., 1843, p. 545 (gen. ref.).
- Olenus triarthrus* Goldfuss, Neues Jahrb. Min., Geol., Pal., 1843, p. 545 (gen. ref.).
- Calymene beckii* Hall, Pal. New York, 1, 1847, pp. 237, 250, pl. 66, figs. 2a-k.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 820, fig. 613.—Emmons, Man. Geol., 1860, p. 100, fig. 89; p. 101, fig. 91.
- Trenton, Utica and Eden: Various localities in the United States and Canada.
- Plastotypos*.—Cat. No. 4966, U.S.N.M.

**Triarthrus becki macasteyensis** Twenhofel.

*Triarthrus becki macasteyensis* Twenhofel, Bull. Victoria Mem. Mus., 3, 1914, p. 35.

Trenton (Macasty): Macasty Bay, Anticosti.

**Triarthrus belli** Matthew.

*Triarthrus belli* Matthew, Bull. Nat. Hist. Soc. New Brunswick, No. 20, 1902, p. 412, pl. 18, fig. 8; Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, p. 230, pl. 18, fig. 8.

Canadian (Bretonian—Div. C 3c 2): McLeod Brook, near Boisdale, Cape Breton, Nova Scotia.

**Triarthrus billingsi** Barrande.

*Triarthrus Billingsi* Barrande, Syst. Sil. du Centre Boheme, 1, Suppl., 1872, p. 427, pl. 32, figs. 4, 5.

Trenton (Collingwood): Cape Tourmente, below Quebec, Canada.

**Triarthrus canadensis** Smith.

*Triarthrus canadensis* Smith, Canadian Jour., n. s., 6, 1861, p. 275, fig.

Trenton (Collingwood): Whitby, Ontario.

**Triarthrus fischeri** Billings.

*Triarthrus Fischeri* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 291, fig. 280.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 286.

*Atops fischeri* Miller, N. A. Geol. Pal., 1889, p. 532 (gen. ref.).

Chazyan (Quebec—N, P): Table Head, Pistolet Bay, and Portland Creek, Newfoundland.

**Triarthrus glaber** Billings.

*Triarthrus glaber* Billings, Canadian Nat. Geol., 4, 1859, pp. 382, 383; Geol. Canada, Geol. Surv. Canada, 1863, p. 202, fig. 198.—Chapman, Expos. Min. Geol. Canada, 1864, p. 140.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1209, fig.—Ami, Canadian Rec. Sci., 1892, p. 29.

Trenton (Collingwood): Lake St John, Quebec.

**Triarthrus spinosus** Billings.

*Triarthrus spinosus* Billings, Geol. Surv. Canada, Rep. Progr. for 1853–1856, 1857, p. 340; Canadian Nat. Geol., 4, 1859, p. 383; Geol. Canada, Geol. Surv. Canada, 1863, p. 202, fig. 199.—Chapman, Expos. Min. Geol. Canada, 1864, p. 140.—Ami, Trans. Ottawa Field Nat. Club, 1, No. 3, 1882, p. 64; *ibid.*, 1883, p. 88, pl. 1, fig.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 1209, fig.

Trenton (Collingwood): Gloucester, Ontario.

**TRIBLIDIUM** of authors. See *Tryblidium* Lindstrom and *Archinacella* Ulrich and Scofield.

**TRIBLIDIUM STRIATUM** Miller. See *Helcionopsis striata*.

**TRIBLIDIUM UNGUIFORME** Miller. See *Vallatotherca unguiformis*.

**TRICHOPHYCUS** Miller and Dyer. Genotype: *T. lanosus* Miller and Dyer.

*Trichophycus* Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 24.—James, *ibid.*, 7, 1884, p. 130, 158.—Miller, N. A. Geol. Pal., 1889, p. 147.

**Trichophycus lanosus** Miller and Dyer.

*Trichophycus lanosus* Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 25, pl. 1, figs. 3, 4.—James, *ibid.*, 7, 1885, p. 158, 159, pl. 9, fig. 4.—Miller, N. A. Geol. Pal., 1889, p. 147, fig. 82.

Maysville (Corryville): Warren County, Ohio.

**Trichophycus silurlanum** (James).

*Cyathophycus siluriana*, James, J. F., Jour. Cincinnati Soc. Nat. Hist., 14, pt. 1, 1891, p. 64, figs. 5a-c.

Maysville (Corryville): Cincinnati, Ohio.

Observation.—Probably the same as *T. lanosum*.

**Trichophycus sulcatum** Miller and Dyer.

*Trichophycus sulcatum* Miller and Dyer, Contr. to Pal., No. 2, 1878, p. 4, pl. 4, fig. 5.—James, Jour. Cincinnati Soc. Nat. Hist., 7, 1884, p. 131, pl. 6, fig. 5; *ibid.*, 14, 1891, p. 46.

Eden (Economy): Cincinnati, Ohio.

**Trichophycus venosum** Miller.

*Trichophycus venosum* Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 112, pl. 9, figs. 5, 5a; *ibid.*, 7, 1884, p. 131; *ibid.*, 14, 1891, p. 46.

Maysville (Fairmount): Cincinnati, Ohio.

**TRICHOSPONGIA** Billings.

Genotype: *T. sericea* Billings.

*Trichospongia* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 357.—Hinde, Quart. Jour. Geol. Soc. London, 45, 1889, p. 145.—Miller, N. A. Geol. Pal., 1889, p. 166.—Rauff, Palæontographica, 40, 1894, p. 242.

**Trichospongia hystrix** Whiteaves.

*Trichospongia hystrix* Whiteaves, Pal. Foss. Geol. Surv. Canada, 3, pt. 3, 1897, p. 147, pl. 17, fig. 3.

Black River or Richmond: Cat. Head, Lake Winnipeg, Canada.

**Trichospongia sericea** Billings.

*Trichospongia sericea* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, pp. 356, 357.—Bornemann, Verst. Cambr. Sardin. N. Act. Leop. Carol. Akad. Naturf., 51, 1886, p. 33.—Hinde, Quart. Jour. Geol. Soc. London, 45, 1889, p. 145.—Rauff, Palæontographica, 40, 1894, p. 242.

Canadian (Romaine): Mingan Islands, Canada.

**TRIGONOCEPHALUS** Zenker. See *Conocephalites* Zenker.**TRIGONODICTYA** Ulrich.

Genotype: *Pachydictya conciliatrix* Ulrich.

*Trigonodictya* Ulrich, Geol. Minnesota, 3, 1893, p. 160.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 49.

**Trigonodictya conciliatrix** (Ulrich).

*Pachydictya conciliatrix* Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 76.

*Trigonodictya conciliatrix* Ulrich, Geol. Minnesota, 3, 1893, p. 160, pl. 9, figs. 11, 12; pl. 10, figs. 15-20.

Black River (Decorah): Cannon Falls, Minnesota.

*Cotypes*.—Cat. No. 43596, U.S.N.M.

**Trigonodictya eatonensis** Ulrich.

*Trigonodictya eatonensis* Ulrich, Geol. Minnesota, 3, 1893, p. 160.—Foerste, Geol. Surv. Ohio, 7, 1895, p. 599.

Upper Medinan (Brassfield): Eaton, Ohio.

*Cotypes*.—Cat. No. 43595, U.S.N.M.

**TRIGONOGRAPTUS** Nicholson.

Genotype: *T. lanceolatus* Nicholson.

*Trigonograptus* Nicholson, Ann. Mag. Nat. Hist., 4th ser., 4, 1869, p. 231; Mon. British Grapt., 1872, p. 122.

**TRIGONOGRAPTUS**—Continued.

*Trigonograptus* Zittel, Handb. Pal., 1, 1879, p. 302.—Koken, Die Leitfossilien, Leipzig, 1896, p. 329.—Roemer and Frech, Leth. geog., 1 Theil, Leth. Pal., 1, 3 Lief., 1897, p. 624.—Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 726, 727.

***Trigonograptus ensiformis*** (Hall).

*Graptolithus ensiformis* Hall, Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 133; Canadian Nat. Geol., 3, 1858, p. 167.

*Retiolites ensiformis* Hall, Geol. Surv. Canada, dec. 2, 1865, p. 114ff, pl. 14, figs. 1-5.—Roemer and Frech, Leth. geog., 1 Theil, Leth. Pal., 1, 3 Lief., 1897, p. 667, footnote.

*Trigonograptus ensiformis* Hopkinson and Lapworth, Quart. Jour. Geol. Soc., 31, 1875, p. 659ff, pl. 34, figs. 8a-c.—Ami, Rep. Geol. Surv. Canada, 2d ser., 3, pt. 2, 1889, p. 117k.—Nicholson, Geol. Mag., 3d ser., 7, 1890, pp. 340, 341, figs. 1, 2.—Elles, Quart. Jour. Geol. Soc. London, 54, 1898, pp. 523, 524, fig. 34.—Ruedemann, Ann. Rep. New York State Pal., 1902, p. 571; Mem. New York State Mus., 7, pt. 1, 1904, pp. 727-729, pl. 17, figs. 1-9.

Canadian: Point Levis, Quebec (Levis, *Diplograptus dentatus* zone); Deepkill, Rensselaer County, and Mount Moreno, New York (*Deepkill, D. dentatus* zone); Arkansas; England (Skiddaw).

**TRIGYRA** Raymond.Genotype: *T. ulrichi* Raymond.

*Trigyra* Raymond, Ann. Carnegie Mus., 4, 1908, p. 198.

***Trigyra ulrichi*** Raymond.

*Trigyra ulrichi* Raymond, Ann. Carnegie Mus., 4, 1908, p. 198, pl. L, fig. 6.

Chazyan (Day Point): Isle La Motte, Vermont.

*Holotype*.—Cat. No. 53630, U.S.N.M.

**TRILOBITES ALATUS** Boeck. See *Sphærophthalmus alatus*.

**TRIMERELLA** Billings.Genotype: *T. grandis* Billings.

*Trimerella* Billings, Pal. Fossils, 1, 1862, p. 166.—Dall, Amer. Jour. Conch., 6, 1870, p. 160; *ibid.*, 7, 1871, p. 79.—Davidson and King, Quart. Jour. Geol. Soc. London, 30, 1874, p. 143.—Dall, Bull. U. S. Nat. Mus., 8, 1877, p. 74.—Zittel, Handb. Pal., 1, 1880, p. 668.—Miller, N. A. Geol. Pal., 1889, p. 386.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 33, 46, 163; 11th Ann. Rep. New York State Geol., 1894, p. 236.—Koken, Die Leitfossilien, Leipzig, 1896, p. 231, fig. 190, 3.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 306; 2d ed., 1913, p. 373.—Whiteaves, Ottawa Nat., 16, 1902, p. 139.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 191.

*Gotlandia* Dall, Amer. Jour. Conch., 6, 1870, p. 160.

***Trimerella acuminata*** Billings.

*Trimerella acuminata* Billings, Pal. Fossils, 1, 1862, pp. 167, 168, fig. 152; Amer. Jour. Sci., 3d ser., 1, 1871, p. 471; Ann. Mag. Nat. Hist., 4th ser., 8, 1871, p. 140.—Dall, Amer. Jour. Conch., 7, 1871, p. 82.—Davidson and King, Quart. Jour. Geol. Soc. London, 30, 1874, p. 146, pl. 15, figs. 4-7; pl. 16, figs. 1, 2.—Nicholson, Pal. Prov. Ontario, 1875, p. 68, fig. 36.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 4B, fig. 6.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 54.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 191.

Niaganan: Galt, New Hope, and Hespelar, Ontario; near Hillsboro, Ohio (Guelph); Port Byron, Illinois; Gotland and Farö.

**Trimerella billingsi** Dall.

*Trimerella billingsi* Dall, Amer. Jour. Conch., 7, 1871, p. 82, pl. 11, figs. 1-3.—  
Davidson and King, Quart. Jour. Geol. Soc. London, 30, 1874, p. 150, pl. 16,  
figs. 8, 9.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 55.  
Niagaran (Guelph): New Hope, Ontario.

**Trimerella borealis** Whiteaves.

*Trimerella borealis* Whiteaves, Ottawa Nat., 16, 1902, p. 142, pl. 3, figs. 2, 3; Geol.  
Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 250, pl. 25, figs. 3, 3a.  
Niagaran: Ekwan River, Canada.

TRIMERELLA CONRADI Dall. See *Dinobolus conradi*.

**Trimerella dalli** Davidson and King.

*Trimerella dalli* Davidson and King, Quart. Jour. Geol. Soc. London, 30, 1874,  
p. 154, pl. 15, figs. 1-3.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl.  
4A, fig. 10.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 56  
(loc. occ.).  
Niagaran (Guelph): Hespelar, Elora, and New Hope, Ontario.

**Trimerella ekwanensis** Whiteaves.

*Trimerella Ekwanensis* Whiteaves, Ottawa Nat., 16, 1902, p. 141, pl. 2, figs. 1, 2;  
pl. 3, fig. 1.  
*Trimerella Ekwanensis* Whiteaves, Geol. Surv. Canada, Ann. Rep., n. s., 16, App.  
F, 1904, p. 41; *ibid.*, Pal. Foss., 3, pt. 4, 1906, p. 249, pl. 24, fig. 7; pl. 25,  
figs. 1, 2.  
Niagaran: Ekwan River, Canada.

TRIMERELLA GALTENSIS Davidson and King. See *Rhinobolus galtensis*.

**Trimerella grandis** Billings.

*Trimerella grandis* Billings, Pal. Fossils, 1, 1862, pp. 166, 167, fig. 151.—Dall,  
Amer. Jour. Conch., 2, 1870, p. 160; *ibid.*, 7, 1871, p. 82.—Hall, 23d Rep.  
New York State Cab. Nat. Hist., 1873, pl. 13, figs. 11-16.—Davidson and King,  
Quart. Jour. Geol. Soc. London, 30, 1874, pl. 13, figs. 2, 3.—Nicholson, Pal.  
Prov. Ontario, 1875, p. 67, fig. 37.—Miller, N. A. Geol. Pal., 1889, p. 386,  
figs. 631, 632.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1221,  
figs.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 4A, figs. 1, 2; pl.  
4B, figs. 2-5.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p.  
53.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 192, fig. 226c, d.  
Niagaran (Guelph): Galt, New Hope, Elora, and Hespelar, Ontario; near Hills-  
boro, Ohio; Wisconsin.

TRIMERELLA MINOR Dall. See *Rhinobolus galtensis*.

**Trimerella ohioensis** Meek.

*Trimerella ohioensis* Meek, Amer. Jour. Sci., 3d ser., 1, 1871, p. 305.—Dall, Amer.  
Jour. Conch., 7, 1871, p. 83.—Davidson and King, Geol. Mag., 9, 1872.—  
Meek, Pal. Ohio, 1, 1873, p. 183, pl. 16, fig. 1; Quart. Jour. Geol. Soc. London,  
30, 1874, p. 153, pl. 16, figs. 3-7; pl. 19, figs. 1-2.—Lesley, Geol. Surv. Penn-  
sylvania, Rep. P 4, 1890, p. 1222, figs.—Hall and Clarke, Pal. New York, 8,  
pt. 1, 1892, pl. 4A, figs. 3-9.—Whiteaves, Pal. Foss. Geol. Surv. Canada, 3,  
pt. 2, p. 54, pl. 10, figs. 1, 1a.—Grabau and Shimer, N. A. Index Fossils, 1,  
p. 191, figs. 226a, b.  
Niagaran (Guelph): Genoa, Ottawa County, Ohio; Port Byron, Illinois; Elora,  
Ontario.

*Holotype*.—Cat. No. 7801, U.S.N.M.

TRIMERES Barrande. See Trimeroceras Hyatt.

**TRIMERO CERAS** Hyatt. Genotype: *Gomphoceras staurostoma* Barrande.  
 Trimorion Barrande, Syst. Sil. Boheme, 2, pt. 1, 1867, p. 265.  
 Trimeres Barrande, Syst. Sil. Boheme, 2, pt. 1, 1867, p. 265.  
 Trimeroceras Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1883, p. 278.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 130.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 245.

**Trimeroceras gilberti** Kindle and Breger.

*Trimeroceras gilberti* Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 475, pl. 15, fig. 1.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 130.

Niagaran: Huntington and Delphi, Indiana.

*Holotype*.—Cat. No. 52950, U.S.N.M.

**TRIMERO CYSTIS** Schuchert. Genotype: *T. peculiaris* Schuchert.  
 Trimerocystis Schuchert, Smiths. Misc. Coll., 47, 1904, p. 237.

**Trimerocystis peculiaris** Schuchert.

*Trimerocystis peculiaris* Schuchert, Smiths. Misc. Coll., 47, pt. 2, 1904, p. 239, fig. 34, pl. 35, figs. 1-3; Maryland Geol. Surv., Low. Dev., 1913, p. 244, pl. 34, figs. 8-10.

Helderbergian (Keyser): Keyser, West Virginia.

*Holotype*.—Cat. No. 35064, U.S.N.M.

TRIMERUS Green. See Homalonotus Koenig.

TRIMORION Barrande. See Trimeroceras Hyatt.

TRINUCLEUS Murchison. See Cryptolithus Green.

TRINUCLEUS CARACTACI Emmons. See Cryptolithus tessellatus.

TRINUCLEUS CONCENTRICA of authors. See Cryptolithus tessellatus.

**TRIPLECIA** Hall. Genotype: *Atrypa extans* Emmons.

*Triplecia* Hall, Pal. New York, 3, 1859, p. 522; 12th Rep. New York State Cab. Nat. Hist., 1859, p. 44.—Davidson, Mon. British Sil. Brach., Pal. Soc., 1869, p. 197.—Zittel, Handb. Pal., 1, 1880, p. 692.—Davidson, Mon. British Foss. Brach., 5, Sil. Suppl., Pal. Soc., 1883, p. 141.—Waagen, Pal. Indica, 13th ser., 1, 1884, p. 576.—Miller, N. A. Geol. Pal., 1889, p. 387.—Koken, Die Leitfossilien, Leipzig, 1896, p. 235.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 387.

*Triplecia* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 269.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 408.—Hall and Clarke, 11th Ann. Rep. New York State Geol., 1894, p. 289.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 315.

*Dicraniscus* Meek, Amer. Jour. Sci., 3d ser., 4, 1872, p. 279; Pal. Ohio, 1, 1873, p. 576. (Genotype: *D. ortonii* Meek.)

*Cliftonia* new subgenus of *Triplecia* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 82.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 387. (Genotype: *C. striata* Foerste.)

*Oxoplecia* Wilson, Bull. Victoria Mem. Mus., 1, 1913, p. 81. (Genotype: *O. calhouni* Wilson.)

TRIPLECIA? CALCIFERA Hall and Clarke. See Syntrophia calcifera.



**Triplecia (Cliftonia) calhouni** (Wilson).

*Oxoplecia calhouni* Wilson, Bull. Victoria Mem. Mus., 1, 1913, p. 82, fig. 4, and pl. 8.

Trenton (Collingwood): Ottawa, Ontario.

**Triplecia cuspidata** (Hall.)

*Atrypa cuspidata* Hall, Pal. New York, 1, 1847, p. 138, pl. 33\*, fig. 1, and p. 318.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 190.

*Triplexia cuspidata* Hall, Pal. New York, 3, 1859, p. 522.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 270.

Trenton: Lowville, New York.

**Triplecia extans** (Emmons).

*Atrypa extans* Emmons, Geol. New York, Rep. 2d Dist., 1842, p. 395, fig. 6.—Hall, Pal. New York, 1, 1847, p. 137, pl. 33, fig. 1.—Owen, Amer. Jour. Sci. Arts, 47, 1844, p. 369, fig. 6.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 189, pl. 10, figs. 1, 11; Man. Geol., 1860, p. 99, fig. 88.

*Triplecia extans* Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 270, pl. 11C, figs. 1-7.—Raymond, Bull. Amer. Pal., 3, 1902, p. 304, pl. 19, fig. 4.

*Triplexia extans* Hall, Pal. New York, 3, 1859, p. 523, figs. 1-3.—Miller, N. A. Geol. Pal., 1889, p. 387, fig. 634.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1225, figs.

*Camarella extans* Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 112, figs.

Trenton: Watertown, Lowville, and Boonville, New York.

**Triplecia insularis anticostiensis** Twenhofel.

*Orthis insularis* Davidson, Mon. British Foss. Brach., 3, pt. 7, 1871, p. 273, pl. 37, figs. 8-15.

*Triplecia ortonii* Schuchert and Twenhofel, Bull. Geol. Soc. Amer., 21, 1910, p. 710.

*Triplecia insularis anticostiensis* Twenhofel, Bull. Victoria Mem. Mus., 3, 1914, p. 26.

Anticostian (Gun River, Jupiter River): Jupiter River, Anticosti.

**Triplecia niagarensis** Hall and Clarke.

*Triplecia niagarensis* Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pl. 83, figs. 16-20; 48th Rep. New York State Mus., 2, for 1895, 1897, p. 351, pl. 7, figs. 1-4; 14th Rep. State Geol. New York for 1894, 1897, p. 351, pl. 7, figs. 1-4.

Niagaran (Racine?): Near Milwaukee, Wisconsin.

**Triplecia nucleus** (Hall).

*Atrypa nucleus* Hall, Pal. New York, 1, 1847, p. 138, pl. 33, fig. 2.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 189, pl. 10, fig. 2.

*Triplexia nucleus* Hall, Pal. New York, 3, 1859, p. 522.

*Triplecia nucleus*, Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 270, pl. 11C, figs. 8, 9.—Ruedemann, Bull. New York State Mus., 49, for 1901, 1902, p. 24.

*Camarella nucleus* Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 112, figs.

Trenton: Middleville and Rysedorph Hill (Rysedorph), New York.

**Triplecia ortonii** (Meek).

*Dicraniscus ortonii* Meek, Amer. Jour. Sci., 3d ser., 4, 1872, p. 280.

*Triplecia ortonii*, Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 270; pl. 11C, figs. 12-20.—Foerste, Geol. Ohio, 7, 1895, p. 585.

**Triplecia ortonii**—Continued.

- Triplecia ortonii* Meek, Pal. Ohio, 1, 1873, p. 178, pl. 15, fig. 1.—Davidson, Mon. British Foss. Brach., 5, Sil. Suppl., Pal. Soc., 1883, p. 142, fig.—Miller, N. A. Geol. Pal., 1889, p. 387, fig. 635.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 1226, fig.—Foerste, Jour. Geol., 11, 1903, p. 707 (loc. occ.).  
Upper Medinan (Brassfield): Dayton, etc., Ohio; Indiana; Kentucky; Tennessee.

**Triplecia(?) radiata** Whitfield.

- Triplecia radiata* Whitfield, Bull. American Mus. Nat. Hist., 2, 1889, p. 43, pl. 7, figs. 5–8.—Lesley, Geol. Surv. Pennsylvania, Rep., P 4, 1890, p. 1225, figs.  
*Triplecia radiata*, Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 271.  
Canadian (Beekmantown): Beekmantown, New York.

**Triplecia (Cliftonia) striata** Foerste.

- Triplecia (Cliftonia) striata* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 81, pl. 3, fig. 42A, B.  
Upper Medinan (Brassfield): Near Clifton, Tennessee.

**Triplecia (Cliftonia) tenax** Foerste.

- Triplecia (Cliftonia) tenax* Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 82, pl. 3, fig. 39; pl. 4, fig. 70A, B.  
Clinton (Osgood): Clifton, Tennessee.

**Triplecia (California) ulrichi** Winchell and Schuchert.

- Triplecia ulrichi* Winchell and Schuchert, Geol. Minnesota, 3, 1893, pl. 409, fig. 34.  
Richmond (Maquoketa): Wykoff and Spring Valley, Minnesota.  
*Cotypes*.—Cat. No. 45545, U.S.N.M.

TRIPLESIA Hall and Clarke. See *Triplecia* Hall.

TRIPLESIA? AMBIGUA Hall. See *Camarella ambigua*.

TRIPLESIA CALCIFERA Walcott. See *Syntrophia nundina*.

TRIPLESIA? CONGESTA Hall. See *Hyattidina congesta*.

TRIPLESIA LATERALIS Whitfield. See *Syntrophia lateralis*.

TRIPLESIA PUTILLUS Hall. See *Mimulus waldronensis*.

TRIPLESIA? QUADRICOSTATA Hall. See *Hyattidina congesta*.

**TRIPLEUROCERAS** Hyatt.

Genotype: *Orthoceras archiaci* Barrande.

- Tripleuroceras* Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1883, p. 289.  
*Tripleuroceroceras* Hyatt, Zittel-Eastman Textb. Pal., 1900, p. 529.

**Tripleuroceras robsoni** Whiteaves.

- Tripleuroceras Robsoni* Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 281, pls. 31, 32,—Ottawa Nat., 12, 1898, p. 123.  
Niaganan: Stonewall, Manitoba.

**TRIPTEROCERAS** Hyatt.

Genotype: *Orthoceras hastatum* Billings.

- Tripteroceras* Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 287.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 103.  
*Trypteroceras* Zittel, Handb. Pal., 2, 1884, p. 370.  
*Triptoceras* Miller, N. A. Geol. Pal., 2d App., 1897, p. 778.—Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 791.

**Tripteroceceras hastatum** (Billings).

*Orthoceras hastatum* Billings, Geol. Surv. Canada, Rep. Progr. for 1853-56, 1857, p. 333.

*Tripteroceceras hastatum* Hyatt, Proc. Boston Soc. Nat. Sci., 22, 1884, p. 287.

Black River (Leray): Pauquettes Rapids, Ottawa River, Canada.

**Tripteroceceras lambi** (Whiteaves).

*Gonioceras lambi* Whiteaves, Trans. Royal Soc. Canada, 9, sec. 4, 1891, p. 86, pl. 11, figs. 1a-b.

*Tripteroceceras lambi* Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 793, pl. 56, figs. 1 and 2.

*Tripteroceceras lambii* Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 213.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 105, fig. 1332.

Black River or Richmond: East Selkirk, Manitoba; Stewartville, Minnesota (?Trenton).

**Tripteroceceras oweni** (Clarke).

*Triptoceras oweni* Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 792, pl. 56, figs. 5-7.

*Tripteroceceras oweni* Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 104, fig. 1330.

Black River (Platteville): Cannon Falls, Minnesota.

**Tripteroceceras planoconvexum** (Hall).

*Orthoceras planoconvexum* Hall, Rep. Supt. Geol. Surv. Wisconsin, 1861, p. 47.—

Whitfield, Geol. Wisconsin, 4, 1882, p. 228, pl. 7, fig. 14; Mem. Amer. Nat. Hist., 1, pt. 2, 1895, p. 72, pl. 8, figs. 24, 25; pl. 9, figs. 1, 2.

*Tripteroceceras planoconvexum* Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 791, pl. 56, fig. 3; pl. 57, fig. 1.

*Tripteroceceras planoconvexum* Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 103, fig. 1329.

Black River: Beloit and Mineral Point, Wisconsin; Cannon Falls, Minnesota (Platteville); Lincoln County, Missouri (Auburn).

Trenton (Prosser): Hader and Wykoff, Minnesota.

**Tripteroceceras planodorsatum** (Whitfield).

*Cyrtoceras planodorsatum* Whitfield, Geol. Wisconsin, 4, 1882, p. 231, pl. 7, figs. 10-12.—Chamberlin, *ibid.*, 1883, p. 159, fig.

*Triptoceras planodorsatum* Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 792, pl. 56, fig. 4; pl. 57, figs. 2-4.

*Tripteroceceras planodorsatum* Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 104, fig. 1331.

Black River (Platteville): Near Beloit, Wisconsin; Minneapolis, Minnesota.

*Plesiotype*.—Cat. No. 46529, U.S.N.M.

**TRIPTEROCERAS SEMIPLANATUM** Whiteaves. See *Jovellania semiplanata*.

**Tripteroceceras servile** (Billings).

*Orthoceras servile* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 252.

*Triptoceras servile* Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 793 (gen. ref.).

Chazyan (Quebec—L): Point Rich, Newfoundland.

**Tripteroceceras xiphias** (Billings).

*Orthoceras xiphias* Billings, Geol. Surv. Canada, Rep. Progr. for 1853-56, 1857, p. 318; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 22 (loc. ref.).

*Triptoceras xiphias* Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 793 (gen. ref.).

Trenton: Ottawa, Ontario.

Richmond (English Head): Cliffs east of English Head, Anticosti.

TRIPTOCERAS Miller. See Tripteroceras Hyatt.

**TROCHOCERAS** Barrande.

Genotype: *T. davidsoni* Barrande.

*Trochoceras* Barrande, Haidinger's Berichte, Wien, 1847, p. 266; Neues Jahrb. Min., Geol., Pal., 1853, p. 343; *ibid.*, 1854, p. 8.—Pictet, Traite de Pal., 2d ed., 2, 1854, p. 640.—Barrande, Neues Jahrb. Min., Geol., Pal., 1855, p. 259, pl. 3, fig. 18; Bull. Soc. Geol. France, 2d ser., 12, 1855, p. 159, pl. 5, figs. 9, 10; Syst. Sil. Boheme, 2, pt. 1, 1867, p. 74.—Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 502.—Foord, Cat. Foss. Ceph. British Mus., 2, 1891, p. 14.—Zittel, Handb. Pal., 2, 1885, p. 384.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 102.

*Sphyradoceras* Hyatt, Boston Soc. Nat. Hist., 22, 1883, p. 298.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 74 (Genotype: *Trochoceras clio* Hall).

TROCHOCERAS Hall. See Mitroceras Hyatt.

**Trochoceras aeneas** Hall.

*Trochoceras aeneas* Hall, 20th Rep. New York State Cab. Nat. Hist., rev. ed., 1868, 1870, footnote expl. of pl. 25, fig. 16.

Niagaran: Lyons, Iowa.

TROCHOCERAS AMERICANUM Foord. See *Gyroceras americanum*.

**Trochoceras anderdonense** Grabau.

*Trochoceras anderdonense* Grabau, Michigan Geol. Surv., Geol., 1st ser., 1909, p. 200, pl. 28, fig. 9; pl. 29, figs. 5, 6.

Upper Monroan (Amherstburg): Detroit River, opposite Amherstburg, Ontario.

TROCHOCERAS BAERI Meek and Worthen. See *Gyroceras baeri*.

TROCHOCERAS (GYRO CERAS) BANNISTERI Hall. See *Gyroceras bannisteri*.

**Trochoceras boreale** Foord.

*Trochoceras boreale* Foord, Cat. Foss. Ceph. British Mus., 2, 1891, p. 23.—Ami, Canadian Rec. Sci., 4, 1891, p. 399.

Niagaran: Wellington Channel, Arctic America.

**Trochoceras costatum** (Hall).

*Trochoceras costatum* Hall, Geol. Surv. Wisconsin, Rep. Prog. for 1860, 1861, p. 61; Trans. Albany Inst., 4, 1863, p. 288; 20th Rep. New York State Cab. Nat. Hist., 1868, p. 360, pl. 16, figs. 1, 2; rev. ed., 1870, p. 402, pl. 25, fig. 15.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 194, fig.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 103, pl. 20, figs. 1, 2.

*Sphyradoceras costatum* Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 74, fig. 1287.

Niagaran: Racine and near Milwaukee, Wisconsin (Racine); Shelby, New York (Guelph).

**Trochoceras desplainense** McChesney.

*Trochoceras desplainense* McChesney, Desc. New Species Fossils, 1860, p. 68; pls., 1865, pl. 8, fig. 2; Trans. Chicago Acad. Sci., 1, 1868, p. 52, pl. 8, fig. 1.—Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 359, pl. 16, figs. 8-10; rev. ed., 1870, p. 401, pl. 16, figs. 8-10.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 36, pl. 5, fig. 5.—Newell, Proc. Boston Soc. Nat. Hist., 23, 1888, p. 486.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 105.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 1228, fig.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 100, pl. 20, fig. 3-9.

**Trochoceras desplainense**—Continued.

*Trochoceras* (*Sphyradoceras*) cf. *desplainense* Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 472.

*Sphyradoceras desplainense* Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 74, fig. 1286.

Niagaran: Joliet, etc., Illinois; Wisconsin (Racine); Shelby and Rochester, New York; Ontario; Wisconsin (Guelph); Huntington, Indiana.

**TROCHOCERAS GEBHARDII** Hall. See *Mitroceras gebhardi*.

**TROCHOCERAS HALLI** Foord. See *Plectoceras halli*.

**Trochoceras? incipiens** Barrande.

*Trochoceras incipiens* Barrande, Syst. Sil. du Boheme, 4me ser., 2, 1870, pl. 433, figs. 5-9.

Lower Ordovician: Newfoundland.

**Trochoceras insigne** Whiteaves.

*Trochoceras insigne* Whiteaves, Geol. Surv. Canada Pal. Foss., 3, pt. 4, 1906, p. 282, pl. 41; Ottawa Nat., 12, 1898, p. 124.

Niagaran: Stonewall, Manitoba.

**Trochoceras mecharlesi** Whiteaves.

*Trochoceras McCharlesii* Whiteaves, Trans. Roy. Soc. Canada, 7, sec. 4, 1889, p. 81, pl. 16; Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 228.

Black River or Richmond: East Selkirk, Manitoba.

**Trochoceras notum** Hall.

*Trochoceras notum* Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 360; rev. ed., 1870, p. 403, pl. 16, figs. 1, 2.

Niagaran (Racine): Bridgeport, Illinois.

**Trochoceras turbinatum** Hall.

*Trochoceras turbinata* Hall, Pal. New York, 2, 1852, p. 336, pl. 77, fig. 1.

Cayugan (Cobleskill): Schoharie, New York.

**Trochoceras waldronense** Hall.

*Trochoceras Waldronense* Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1877, pl. 27, figs. 13-15; mus. ed., 1879, p. 179, pl. 27, figs. 13-15; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 326, pl. 28, figs. 13-15.—Miller, N. A. Geol. Pal., 1889, p. 455, fig. 763.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 1229, figs.

Niagaran (Waldron): Waldron, Indiana.

**TROCHOCRINITES** Portlock. See *Periechocrinus* Austin.

**TROCHOLITES** Conrad.

Genotype: *T. ammonius* Conrad.

*Trocholites* Conrad, 2d Ann. Rep. New York Geol. Surv., 1838, p. 118; Jour. Acad. Nat. Sci. Philadelphia, 8, 1842, p. 274.—Hall, Pal. New York, 1, 1847, p. 192.—D'Orbigny, Prodr. de Pal., 1, 1849, p. 5.—McCoy, British Pal. Rocks Fossils, 1854, p. 323.—Pictet, Traite de Pal., 2d ed., 2, 1854, p. 647.—Emmons, Amer. Geol., 1, pt. 2, 1855, p. 146.—Hitchcock, Geol. Vermont, 1, 1861, 1862, p. 297.—Angelin, Fragmenta Silurica, 1880, p. 10.—Remele, Zeits. d. d. geol. Gesell., 32, 1880, p. 642, footnote; *ibid.*, 33, 1881, p. 4, p. 12.—Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 267.—Zittel, Handb. Pal., 2, 1884, p. 377.—Holm, Palaeont. Abhandl., Dames and Kayser, 3, Heft 1, 1885, p. 9.—Miller, N. A. Geol. Pal., 1889, p. 456.—Schröder, Pal. Abhandl.

**TROCHOLITES**—Continued.

von Dames u. Kayser, Neue Folge, 1, Heft 4, Jena, 1891, p. 5.—Foord, Cat. Foss. Ceph. British Mus., 2, 1891, p. 43.—Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 482.—Koken, Die Leitfossilien, Leipzig, 1896, p. 50, fig. 36, figs. 1, 1a.—Whiteaves, Ottawa Nat., 18, 1904, p. 13.—Ruedemann, Bull. New York State Mus., 90, 1906, p. 478.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 71.

*Palaeoclymenia Remele*, Zeits. d. d. geol. Gesell., 33, 1881, pp. 12, 13.—Foord, Cat. Foss. Ceph. British Mus., 2, p. 44.—Schröder, Pal. Abhandl. von Dames u. Kayser, Neue Folge, 1, Heft 4, Jena, 1891, p. 6. (Genotype: *Trocholites planorbiformis* Conrad.)

*Palaeonutilus Remele*, Zeits. d. d. geol. Gesell., 32, 1881, p. 640.—Schröder, Pal. Abhandl. von Dames u. Kayser, Neue Folge, 1, Heft 4, Jena, 1891, p. 6. (Genotype: *Trocholites planorbiformis* Hall, not Conrad.)

**Trocholites ammonius** Conrad.

*Trocholites ammonius* Conrad, 2d Ann. Rep. New York Geol. Surv., 1838, p. 119.—Emmons, Geol. New York, 2, 1842, p. 279, fig. 3; p. 392, fig. 1; 3, 1842, p. 55.—Owen, Amer. Jour. Sci. Arts, 47, 1844, p. 369, fig. 1 on p. 365.—Hall, Pal. New York, 1, p. 192, pl. 40A, figs. 4a-k; p. 309, pl. 84, figs. 2a-c.—Emmons, Amer. Geol., 1, pt. 2, 1855, p. 146, fig. 29, pl. 12, figs. 13, 14a-d, 15a-c.—Emmons, Man. Geol., 1860, p. 96, fig. 85.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, p. 47, pl. 2, fig. 1.—Hitchcock, Geol. Vermont, 1, 1861, 1862, p. 297, fig. 207.—Remele, Zeits. d. d. geol. Gesell., 33, 1881, pp. 4, 11.—Ami, Canadian Rec. Sci., 3, 1888, p. 105.—Miller, N. A. Geol. Pal., 1889, p. 456, fig. 764.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1229, figs.—Foord, Cat. Foss. Ceph. British Mus., 1891, pl. 2, p. 47.—Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 487.—Whiteaves, Ottawa Nat., 18, 1904, p. 14.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 71, fig. 1282.

*Lituites ammonius* James, Jour. Cincinnati Soc. Nat. Hist., 8, 1886, p. 249.

*Trocholithus uticus Vanuxem*, Geol. New York, 3, 1842, p. 57, fig. 3.

Trenton: Newport, Middleville, Canajoharie, etc., New York; West Covington, Kentucky.

**Trocholites canadensis** Hyatt.

*Trocholites planorbiformis* Foord, Cat. Foss. Ceph. British Mus., pt. 2, 1891, p. 48.

*Palaeonutilus planorbiformis* Remele, Zeits. d. d. geol. Gesell., 33, 1881, p. 13.

*Trocholites canadensis* Hyatt, Proc. Amer. Phil. Soc. 32, 1894, p. 486, pl. 4, figs. 23, 24; pl. 6, figs. 39, 40.—Whiteaves, Ottawa Nat., 18, 1904, p. 16.

Trenton: Falls of Montmorency, near Quebec, Canada.

**Trocholites circularis** Miller and Dyer.

*Trocholites circularis* Miller and Dyer, Cont. to Pal., 2, 1878, p. 9, pl. 3, fig. 10.—Miller, N. A. Geol. Pal., 1889, p. 456, fig. 765.

*Lituites circularis* James, J. F., Jour. Cincinnati Soc. Nat. Hist., 8, 1886, p. 248. Maysville: Near Morrow, Ohio.

**Trocholites dyeri** Hyatt.

*Trocholites dyeri* Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 489. Cincinnati: Cincinnati, Ohio.

**Trocholites internistriatus** (Whitfield).

*Lituites internistriatus* Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 332, pl. 29, figs. 5-8.

**Trocholites internistriatus**—Continued.

*Trocholites internistriatus* Hyatt, Amer. Phil. Soc. Proc., 32, 1894, p. 485, pl. 4, fig. 25.—Ruedemann, Bull. New York State Mus., 90, 1906, p. 479, pl. 24, fig. 2, fig. 38.

*Discoceras internestriatum* Schroder, Pal. Abhandl. von Dames und Kayser, Neue Folge, 1, Heft 4, 1891, p. 23.

Canadian (Beekmantown): Fort Cassin, Vermont.

**Trocholites minusculus** Miller and Dyer.

*Trocholites minusculus* Miller and Dyer, Contr. to Pal., 2, 1878, p. 9, pl. 3, fig. 11.—Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 490.

Eden (Southgate): Cincinnati, Ohio.

**TROCHOLITES MULTICOSTATUS** Whiteaves. See *Discoceras graftonense*.

**Trocholites planorbiformis** Conrad.

*Trocholites planorbiformis* Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1842, p. 274, pl. 17, fig. 1.—Hall, Pal. New York, 1, 1847, p. 310, pl. 84, figs. 3a-f.—McCoy, British Pal. Rocks and Foss., 1854, p. 324.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 147.—Ami, Canadian Rec. Sci., 4, 1891, p. 399.—Whiteaves, Ottawa Nat., 18, 1904, p. 15.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 72, fig. 1283.

*Lituites planorbiformis* James, Jour. Cincinnati Soc. Nat. Hist., 8, 1886, p. 247. Cincinnati (Pulaski): Near Grimsby, Ontario; Pulaski, New York.

**TROCHOLITES PLANORBIFORMIS** Foord. See *Trocholites canadensis*.

**TROCHOLITES UNDATUS** Hyatt. See *Plectoceras? undatus*.

**TROCHOLITHUS UTICUS** Vanuxem. See *Trocholites ammonius*.

**TROCHOLITOCERAS** Hyatt.

Genotype: *T. walcotti* Hyatt.

*Trocholitoceras* Hyatt, Amer. Phil. Soc. Proc., 32, 1894, p. 480.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 778.—Ruedemann, Bull. New York State Mus., 90, 1906, p. 478.

**Trocholitoceras walcotti** Hyatt.

*Trocholitoceras walcotti* Hyatt, Amer. Phil. Soc. Proc., 32, 1894, p. 480, pl. 6, figs. 12-20.—Ruedemann, Bull. New York State Mus., 90, 1906, p. 478, fig. 37.

Canadian (Beekmantown): Fort Cassin, Vermont.

*Holotype*.—Cat. No. 25659, U.S.N.M.

**TROCHONEMA** Salter.

Genotype: *Pleurotomaria umbilicatum* Hall.

*Trochonema* Salter, Geol. Surv. Canada, Can. Org. Rem., dec. 1, 1859, p. 24, 27.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 19, No. 6, 1881, pp. 155-180.—Zittel, Handb. Pal., 2, 1882, p. 196.—Nettelroth, Kentucky, Foss. Shells, Geol. Surv. Kentucky, 1889, p. 189.—Miller, N. A. Geol. Pal., 1889, p. 428.—Koken, Bull. de l'Acad. Imp. Sci. St. Petersburg, 7, 1897, p. 187.—Ulrich and Scofield, Geol. Minnesota Pal., 3, pt. 2, 1897, pp. 1045, 1046.—Koken, Neues Jahrb. Min., Geol., Pal., 1, 1898, p. 24.—Pilsbry, Zittel-Eastman Textb. Pal., 1, 1900, p. 449.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Hist. Surv. Indiana, 1908, p. 952.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 669.

*Trochonemopsis* Meek, Proc. Acad. Nat. Sci. Philadelphia, 1871, p. 83; Geol. Surv. Ohio, Pal., 1, 1873, p. 219.

**TROCHONEMA**—Continued.

*Eunema* Salter, Geol. Surv. Canada, Can. Org. Rem., dec. 1, 1859, pp. 24, 29.—Lindström, Kongl. Sven. Vet. Akad. Handl., 19, No. 6, 1881, p. 155.—Zittel, Handb. Pal., 2, Munich, 1882, p. 189.—Koken, Neues Jahrb. Min., Geol., Pal., 1889, p. 424.—Miller, N. A. Geol. Pal., 1889, p. 403.—Koken, Die Leitfossilien, Leipzig, 1896, p. 118, fig. 98; Neues Jahrb. Min., Geol., Pal., 1, 1898, p. 24; Bull. Acad. Imp. Sci. St. Petersburg, 7, 1897, p. 188.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, pp. 1046–1052.—Pilsbry, Zittel-Eastman Textb. Pal., 1, 1900, p. 449.—Dall, *ibid.*, 2d ed., 1913, p. 530. (Genotype: *E. strigillatum* Salter.)

**Trochonema (Eunema) altisulcatum** (Hudson).

*Eunema altisulcatum* Hudson, Bull. New York State Mus., 80, 1905, p. 291, pl. 5, fig. 3.—Raymond, Ann. Carnegie Mus., 4, 1908, p. 208.

Chazyan (Valcour): Valcour Island, New York.

**Trochonema altum** Ulrich and Scofield.

*Trochonema altum* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1052, pl. 77, figs. 39–41.

Trenton (Prosser): Near Cannon Falls, Minnesota.

*Holotype*.—Cat. No. 46021, U.S.N.M.

**Trochonema (Eunema) arctatum** Ulrich.

*Trochonema (Eunema) arctatum* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1054, pl. 76, figs. 9, 10.

Trenton (Flanagan): Near Burgin, Kentucky.

*Holotype*.—Cat. No. 46022, U.S.N.M.

**Trochonema beachi** Whitfield.

*Trochonema beachi* Whitfield, Ann. Rep. Geol. Surv. Wisconsin, 1878, p. 74; Geol. Wisconsin, 4, 1882, p. 213, pl. 6, fig. 6.—Chamberlin, *ibid.*, 1, 1883, p. 157.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1048, pl. 77, figs. 9–12.

Black River (Platteville): Beloit and Janesville, Wisconsin; Dixon, Illinois; Minneapolis, Minnesota.

*Plesiotypes*.—Cat. Nos. 46023–46025, U.S.N.M.

**Trochonema bellulum** Ulrich.

*Trochonema bellulum* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1050, pl. 77, figs. 26–29.

Stones River (Murfreesboro): Murfreesboro, Tennessee.

*Holotype*.—Cat. No. 46076, U.S.N.M.

**Trochonema beloitense** Whitfield.

*Trochonema beloitense* Whitfield, Ann. Rep. Geol. Surv. Wisconsin, 1878, p. 74; Geol. Wisconsin, 4, 1882, p. 212, pl. 6, figs. 7, 8.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1048, pl. 78, figs. 1–9.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 670, fig. 927.

Black River (Platteville): Beloit and Mineral Point, Wisconsin; Dixon, Illinois; Minneapolis, etc., Minnesota.

*Plesiotypes*.—Cat. Nos. 48011, 48012, U.S.N.M.

**Trochonema biangulatum** (Hall).

*Pleurotomaria biangulata* Hall, Pal. New York, 1, 1847, p. 31, pl. 6, figs. 6a, 6b.

*Trochonema biangulatum* Raymond, Ann. Carnegie Mus., 4, 1908, p. 205, pl. 53, figs. 9, 10.

Chazyan (Day Point): Valcour Island, New York.



**Trochonema (Eunema) cerithioides** (Salter).

*Eunema cerithioides* Salter, Geol. Surv. Canada, Org. Rem., dec. 1, p. 30.—Billings, *ibid.*, Geol. Canada, 1863, p. 145, fig. 89a, b.; *ibid.*, Pal. Fossils, 1, 1865, p. 35, fig. 36 (adv. sheets, 1862).—Miller, N. A. Geol. Pal., 1889, p. 403, fig. 674.

Black River (Leray): Panquettes Rapids, Ottawa River, Canada.

**Trochonema? (Eunema) clivosa** (Sardeson).

*Pleurotomaria clivosa* Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, 1892, p. 337, pl. 6, fig. 9.

*Trochonema?* (*Eunema*) *clivosa* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1054 (gen. ref.).

Black River (Decorah): Minneapolis, Minnesota.

**Trochonema dispar** Raymond.

*Trochonema dispar* Raymond, Amer. Jour. Sci., 4th ser., 20, 1905, p. 378; Ann. Carnegie Mus., 4, pl. 53, figs. 7, 8.

Chazyan (Crown Point, Valcour): Valcour Island and Chazy, New York.

**TROCHONEMA (GYRONEMA) DUPLICATUM** Grabau and Shimer. See *Gyronema duplicatum*.

**Trochonema eccentricum** Ulrich.

*Trochonema eccentricum* Ulrich, Geol.-Minnesota, 3, pt. 2, 1897, p. 1049, pl. 77, figs. 17, 18.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 198.

Stones River (Lebanon): Near Lebanon, Tennessee.

?Trenton: Reindeer Island, Lake Winnipeg.

*Holotype*.—Cat. No. 46077, U.S.N.M.

**Trochonema (Eunema) epitome** (Hudson).

*Eunema epitome* Hudson, Bull. New York State Mus., 80, 1905, p. 290, pl. 4, figs. 6, 7.—Raymond, Ann. Carnegie Mus., 4, 1908, p. 208.

Chazyan (Valcour): Valcour Island, New York.

**Trochonema (Eunema) erigone** (Billings).

*Eunema erigone* Billings, Geol. Surv. Canada, Pal. Fossils, 1, 1865, p. 35, fig. 37 (adv. sheets, 1862); *ibid.*, Geol. Canada, 1863, p. 180, fig. 171.

Black River: Near L'Original, Canada.

**Trochonema exile** Whitfield.

*Trochonema exile* Whitfield, Bull. Amer. Mus. Nat. Hist., 2, 1889, p. 57, pl. 9, figs. 1, 2.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1230, figs.—Sardeson, Jour. Geol., 11, 1903, p. 481, fig. 22.

Canadian (Beekmantown): Beekmantown, New York.

**Trochonema fatuum** (Hall).

*Trochonema (Eunema) fatua* Hall, 20th Rep. New York State Cab. Hist., 1868, p. 345, pl. 15 (6), figs. 7, 8; rev. ed., 1870, p. 394, pl. 15, figs. 7, 8.

*Trochonema fatua* Nettelroth, Kentucky Foss. Shells, Geol. Surv. Kentucky, 1889, p. 189.

*Trochonema cf. fatuum* Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 75, pl. 10, fig. 5.

Niagaran: Racine and Greenfield, Wisconsin (Racine); Shelby, New York (Guelph); Louisville, Kentucky (Louisville).

**Trochonema fragile** Ulrich and Scofield.

*Trochonema fragile* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1050, pl. 77, figs. 13–16.

Trenton (Prosser): Goodhue County, Minnesota; Carroll County, Illinois.

*Cotypes*.—Cat. Nos. 46028, 46029, U.S.N.M.

*Trochonema halei* Miller. See *Euomphalepterus halei*.

***Trochonema hudsoni* Raymond.**

*Holopea hudsoni* Raymond, Amer. Jour. Sci., 4th ser., 20, 1905, p. 378.

*Trochonema hudsoni* Raymond, Ann. Carnegie Mus., 4, 1908, p. 207, pl. 54, figs. 1-3.

Chazyan (Crown Point): Crown Point, Valcour Island, and Chazy, New York.

*Trochonema inornatum* Whiteaves. See *Euomphalus inornatus*.

*Trochonema knoxvillensis* Miller. See *Lophospira(?) knoxvillensis*.

*Trochonema (Gyronema) liratum* Grabau. See *Gyronema liratum*.

***Trochonema madisonense* Ulrich.**

*Trochonema madisonense* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1051, pl. 77, figs. 23-25.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 976, pl. 42, figs. 1-1b.

Richmond (Whitewater-Saluda): Madison, Indiana.

*Holotype*.—Cat. No. 46030, U.S.N.M.

***Trochonema nanum* Foerste.**

*Trochonema nana* Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 94, pl. 14, fig. 16.

Upper Medinan (Brassfield): Huffman's quarry, near Dayton, Ohio.

***Trochonema niota* (Hall).**

*Pleurotomaria niota* Hall, Geol. Surv. Wisconsin, Rep. Prog., 1861, p. 33.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 60, pl. 7, fig. 11.

*Trochonema niota* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1052, pl. 76, figs. 16-18.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 198.

Black River (Platteville): Beloit, Wisconsin; ?Lake Winnipeg, Canada.

*Plesiotype*.—Cat. No. 46031, U.S.N.M.

***Trochonema (Eunema) nitidum* Ulrich.**

*Trochonema (Eunema) nitidum* Ulrich, Geol. Minnesota, 3, 1897, p. 1053, pl. 77, figs. 44, 45.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 670, figs. 928c, d.

Eden (Southgate): Cincinnati, Ohio, and vicinity.

*Holotype*.—Cat. No. 46032, U.S.N.M.

*Trochonema notabile* Miller. See *Lophospira(?) notabilis*.

***Trochonema (Eunema) obsoletum* Ulrich.**

*Trochonema (Eunema) obsoletum* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1054, pl. 76, figs. 6-8.

Trenton (Flanagan): Near Burgin, Kentucky.

*Holotype*.—Cat. No. 46033, U.S.N.M.

***Trochonema ovoides* Grabau.**

*Trochonema ovoides* Grabau, Michigan Geol. Surv., Geol., 1st ser., 1909, p. 193, pl. 23, figs. 3, 4, 12, 13.

Upper Monroan: Detroit River opposite Amherstburg, Ontario (Amherstburg); Salt shaft, Detroit, Michigan (Lucas).

***Trochonema pauper* (Hall).**

*Pleurotomaria pauper* Hall, 20th Rep. New York State Cab. Hist., 1868, p. 343 (extras, 1865).—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, p. 456, pl. 12, figs. 5, 6.

**Trochonema pauper**—Continued.

*Trochonema* (*Pleurotomaria*) *pauper* Hall, 20th Rep. New York State Cab. Hist., 1868, p. 365, pl. 15 (6), figs. 5, 6, 9; p. 387.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 63.

*Trochonema* (*Cyclonema*?) *pauper* Hall, 20th Rep. New York State Mus., Nat. Hist., rev. ed., 1870, p. 395, pl. 15, figs. 5, 6, 9; pl. 25, fig. 13.

Niagaran: Racine, Wisconsin (Racine); Huntington, Indiana.

*Plesiotype*.—Cat. No. 52957, U.S.N.M. (Kindle and Breger).

**Trochonema pauper ohioense** Hall and Whitfield.

*Trochonema pauper ohioensis* Hall and Whitfield, Pal. Ohio, 2, 1875, p. 143, pl. 8, fig. 4.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1230, fig.

Niagaran (Guelph): Greenfield, Ohio.

**TROCHONEMA (GYRONEMA) PULCHELLUM** Grabau and Shimer. See *Gyronema pulchellum*.

**Trochonema rectangulare** (Raymond).

*Lophospira rectangularis* Raymond, Amer. Jour. Sci., 4th ser., 20, 1905, p. 377.

*Trochonema rectangulare* Raymond, Ann. Carnegie Mus., 4, 1908, p. 206, pl. 53, figs. 11, 12.

Chazyan (Day Point): Valcour Island, New York.

**Trochonema retrorsum** Ulrich and Scofield.

*Trochonema retrorsum* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1051, pl. 77, figs. 35–38.

Black River (Decorah): Goodhue County, Minnesota.

*Holotype*.—Cat. No. 46034, U.S.N.M.

**Trochonema (Eunema) robbinsi** Ulrich and Scofield.

*Trochonema* (*Eunema*) *robbinsi* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1053, pl. 76, figs. 11–15.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 167.

Trenton: Wykoff, Minnesota (Prosser); Baffin Land.

*Cotype*.—Cat. No. 46035, U.S.N.M.

**Trochonema rugosum** Ulrich and Scofield.

*Trochonema rugosum* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1049, pl. 77, figs. 19–22.

Black River (Platteville): Minneapolis, etc., Minnesota; Beloit, Wisconsin.

*Cotypes*.—Cat. No. 46036, U.S.N.M.

**Trochonema (Eunema) salteri** Ulrich and Scofield.

*Trochonema* (*Eunema*) *salteri* Ulrich and Scofield, Geol. Minnesota, 3 pt. 2, 1897, p. 1053, pl. 77, figs. 42–43.

Trenton (Prosser): Goodhue County, Minnesota.

*Holotype*.—Cat. No. 46037, U.S.N.M.

**Trochonema (Eunema) simile** Ulrich and Scofield.

*Trochonema* (*Eunema*) *simile* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1053.

Trenton (Prosser): Wykoff, Minnesota.

*Cotypes*.—Cat. No. 46038, U.S.N.M.

**Trochonema (Eunema) strigillatum** (Salter).

*Eunema strigillata* Salter, Geol. Surv. Canada, dec. 1, 1859, p. 29, pl. 6, fig. 4.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 145, fig. 88.—Zittel, Handb. Pal., 2, 1882, p. 189, fig. 235.—Whiteaves, Canadian Rec. Sci., 5, 1893, p. 323 (loc. cit.); Pal. Foss., Geol. Surv. Canada, pt. 3, 1897, p. 199.

**Trochonema (Eunema) strigillatum**—Continued.

*Trochonema (Eunema) strigillatum* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1052 (gen. ref.).

Black River: Pauquette's Rapids, Ottawa River (Leray), near Watertown, New York; (?) Lower Fort Garry, Manitoba.

**Trochonema subcrassum** Ulrich and Scofield.

*Trochonema subcrassum* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1051, pl. 77, figs. 30-34.

Trenton: Mercer and Boyle Counties, Kentucky (Flanagan); near Cannon Falls, Minnesota (Prosser).

*Cotypes*.—Cat. No. 46039, U.S.N.M.

**Trochonema tricarinatum** Billings.

*Trochonema tricarinata* Billings, Canadian Nat. Geol., 4, 1859, p. 356.

Canadian (Romaine): Mingan Islands, Canada.

**Trochonema (Eunema) trilineatum** (Hall).

*Eunema? trilineata* Hall, 20th Rep. New York State Cab. Hist., 1868, p. 346, pl. 15 (6), fig. 3; rev. ed., 1870, p. 397, pl. 15, fig. 3.

Niagaran (Racine): Racine, Wisconsin.

**Trochonema umbilicatum** (Hall).

*Pleurotomaria umbilicata* Hall, Pal. New York, 1, 1847, p. 43, pl. 10, figs. 9a-h; p. 175, pl. 38, figs. 1a-g.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 160, 161, pl. 5, figs. 4a, b.—Billings, Canadian Nat. Geol., 1, 1856, p. 42, figs. 4, 5.—Chapman, Canadian Jour., n. s., 7, 1862, p. 121, fig. 124; Expos. Min. Geol. Canada, 1864, p. 124, fig. 124.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 19, fig. 7e.

*Trochonema umbilicata* Salter, Geol. Surv. Canada, Can. Org. Rem., dec. 1, 1859, p. 27, pl. 6, fig. 3.—Billings [in Hind, Narrative Canadian Red River Expl., Expd. of 1857 and Assiniboine and Saskatchewan Exped. of 1858, 2, 1860, p. 287; Geol. Canada, Geol. Surv. Canada, 1863, p. 145, text fig. 92; p. 180, text fig. 172; Cat. Sil. Foss., Anticosti, Geol. Surv. Canada, 1866, p. 17 (loc. ref.)].—Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 314, pl. 3, figs. 5a, b.—Miller, N. A. Geol. Pal., 1889, p. 429, fig. 719.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1231, figs.—Whiteaves, Canadian Rec. Sci., 5, 1893, p. 323 (loc. occ.).—Keyes, Missouri Geol. Surv., 5, 1894, p. 155.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 124 (loc. occ.); *ibid.*, pt. 3, 1897, p. 198.—Ulrich and Schofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1047, pl. 77, figs. 1-8.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 167.—Ruedemann, Bull. New York State Mus., 49, 1901, p. 35.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 669, fig. 926.

Black River and Trenton: Watertown, Middleville, Trenton Falls, etc., New York; Canada; Kentucky; Tennessee; Illinois; Minnesota; Iowa; etc.

*Plesiotypes*.—Cat. Nos. 46040-46042, U.S.N.M.

**Trochonema umbilicatum canadense** Ulrich.

*Trochonema umbilicatum* var. *canadense* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1048, pl. 77, figs. 4-6.

Black River (Leray): Pauquettes Rapids, Ottawa River, Canada.

*Holotype*.—Cat. No. 46043, U.S.N.M.

**Trochonema umbilicatum latum** Ulrich.

*Trochonema umbilicatum* var. *latum* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1048, pl. 77, figs. 7, 8.

Stones River (Lebanon): Middle Tennessee.

*Holotype*.—Cat. No. 46044, U.S.N.M.

**Trochonema vagrans** Ulrich and Scofield.

*Trochonema vagrans* Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1049, pl. 77, fig. 46; pl. 78, figs. 10-13.—Grabau, Amer. Nat., 1902, p. 939, fig. 15.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 670, fig. 928a, b.  
Black River (Platteville): Minneapolis, Minnesota.  
*Cotype*.—Cat. No. 46045, U.S.N.M.

**TROCHONEMOPSIS** Meek. See *Trochonema* Salter.

**TROCHURUS** Beyrich. See *Staurocephalus* Barrande.

**TROCHUS HELICITES** Sowerby. See *Platyschisma helicites*.

**Trochus huroniensis** Castelnau.

Not recognized.

*Trochus huroniensis* Castelnau, Essai Syst. Sil. l'Amérique Septent., 1843, p. 35.  
"Silurian": Ottawa River, Canada.

**TROCHUS LENTICULARIS** Owen. See *Liospira vitruvia*.

**TROCHUS SARATOGENSIS** Walcott. See *Matherella saratogensis*.

**TROOSTOCRINUS** Shumard.

Genotype: *Pentremites reinwardti* Troost.

*Troostocrinus* Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 384, footnote.—Meek and Worthen, Geol. Surv. Illinois, 5, 1873, p. 507.—Hambach, Trans. Acad. Sci. St. Louis, 4, 1880, p. 153.—Etheridge and Carpenter, Ann. Mag. Nat. Hist., 5th ser., 9, 1882, p. 247.—Barris, Proc. Davenport Acad. Sci., 4, 1884, p. 93, footnote.—Wachsmuth, Proc. Davenport Acad. Sci., 4, 1884, p. 79.—Carpenter, Ann. Mag. Nat. Hist., 5th ser., 15, 1885, p. 290.—Etheridge and Carpenter, Cat. Blastoidea British Mus., 1886, p. 191.—Miller, N. A. Geol. Pal., 1899, p. 287.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 86, fig. 8; Rep. Mus. Assoc., 1900, p. 107.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 195.—Beede, 30th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1906, p. 1264.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 478.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 170.

*Clavæblastus* Hambach, Trans. Acad. Sci. St. Louis, 13, 1903, p. 44.

**Troostocrinus? dubius** Rowley.

*Troostocrinus? dubius* Rowley, Amer. Geol., 34, 1904, p. 274, pl. 16, figs. 28, 29.  
Niagaran or Helderbergian: One mile and a half below Wittenberg, Missouri.

**Troostocrinus reinwardti** (Troost).

*Pentremites reinwardtii* Troost, Trans. Geol. Soc. Pennsylvania, 1, 1835, p. 224, pl. 10, figs. 9-12; 5th Geol. Rep. Tennessee, 1840, p. 55; 6th Rep., *ibid.*, 1841, p. 14.—Yandell and Shumard, Contr. Geol. Kentucky, 1847, p. 6.—Yandell, Proc. Amer. Assoc. Adv. Sci., 5, 1851, p. 232.—Dujardin and Hupe, Hist. Nat. Zooph. Ech., 1862, p. 99.—Meek, Amer. Jour. Sci., 3d ser., 7, 1874, p. 376.

*Pentatrematites Reinwardtii* Roemer, Archiv. f. Naturges., 17, 1, 1851, p. 372, pl. 6, figs. 13a-c.—Bronn, Klassen und Ordn. Thier-Reichs, 2, 1860, pl. 23, fig. 4a, b.—Roemer, Mon. Fossil. Crin., 1852, p. 52, pl. 3, fig. 12a-c; Sil. Fauna d. West. Tennessee, Breslau, 1860, p. 60, pl. 3, figs. 2a-c; Leth. geog., 1, Leth. Pal., Atlas, 1876, pl. 11, fig. 15.

*Pentremites* (*Troostocrinus*) *Reinwardtii* Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, pp. 384-385.

*Troostocrinus Reinwardtii* Etheridge and Carpenter, Ann. Mag. Nat. Hist., 5th ser., 9, 1882, p. 248; Cat. Blastoidea British Mus., 1886, p. 193, fig. 7; p. 194, pl. 12, figs. 11, 12; pl. 17, fig. 17.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 87, fig. 8.—Wood, Bull., U. S. Nat. Mus., 64, 1909, p. 17, pl. 3, figs. 2-4.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 478, fig. 1788.

**Troostocrinus reinwardti**—Continued.

*Troostocrinus* (*Pentatrematites*) *reinwardti* Foerste, Jour. Geol., 11, 1903, p. 712.  
*Clavæblastus reinwardtii* Hambach, Trans. Acad. Sci. St. Louis, 13, 1903, p. 44.  
 Niagaran: Decatur, Wayne, and Perry Counties, Tennessee (Brownsport); Louisville, Kentucky (Louisville).

*Plesiotype*.—Cat. No. 33071, U.S.N.M.

**Troostocrinus subcylindricus** (Hall and Whitfield).

*Pentremites subcylindrica* Hall and Whitfield, Geol. Surv. Ohio Pal., 2, 1875, p. 129, pl. 6, fig. 13.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 622, fig.

*Troostocrinus subcylindrica* (Hall) Etheridge and Carpenter, Ann. Mag. Nat. Hist., 5th ser. 9, p. 249 (gen. ref.).

*Metablastus?* *subcylindrica* Etheridge and Carpenter, Cat. Blastoidea, 1886, p. 198.

Niagaran (Guelph): Yellow Springs, Ohio.

**TROPIDODISCUS** Meek. See *Oxydiscus* Koken.

**TRYBLIDIUM** Lindström.

Genotype: *T. unguis* Lindström.

*Tryblidium* Lindström, Fragmenta Silurica, 1880, p. 15; Kongl. Sven. Vet.-Akad. Handl., 19, 1881, No. 6, p. 52.—Zittel, Handb. Pal., 2, 1882, p. 176.—Whiteaves, Pal. Foss., 3, pt. 1, 1884, p. 30.—Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 303.—Miller, N. A. Geol. Pal., 1889, p. 429.—Koken, Die Leitfossilien, Leipzig, 1896, p. 95, figs. 73A-C; Bull. Acad. Imp. Sci. St. Petersburg, 7, 1897, p. 113.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, pp. 821-824.—Berkey, Amer. Geol., 21, 1898, pp. 279-280.—Pilsbry, Zittel-Eastman Textb. Pal., 1, 1900, p. 442.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 935.—Dall, Zittel-Eastman Pal., 2d ed., 1913, p. 521.

*Triblidium* Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 603.

**Tryblidium?** *acutum* Whitfield.

*Tryblidium?* *acutum* Whitfield, Bull. Amer. Mus. Nat. Hist., 2, 1889, p. 45, pl. 7, figs. 9-11.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1234, fig.

Canadian (Beekmantown): Near Beekmantown, New York.

**Tryblidium barabuensis** (Whitfield).

*Metoptoma barabuensis* Whitfield, Ann. Rep. for 1877, Wisconsin Geol. Surv., 1878, p. 60; Geol. Wisconsin, 4, 1882, p. 195, pl. 3, figs. 16, 17.—Chamberlin, Geol. Wisconsin, 1883, 1, p. 142, fig.—Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 97.

*Tryblidium barabuensis* Berkey, Amer. Geol., 21, 1898, p. 281, pl. 20, figs. 18, 19; also p. 291.—Sardeson, Jour. Geol., 11, 1903, p. 479, fig. 2.

*Triblidium barabuensis* Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 604, figs. 802e, f.

Ozarkian (Mendota): East of Baraboo, Wisconsin.

**TRYBLIDIUM CANADENSE** Whiteaves. See *Archinacella canadensis*.

**TRYBLIDIUM CONICUM** Whitfield. See *Scenella cassinensis*.

**Tryblidium cornutaforme** (Walcott).

*Metoptoma cornutaforme* Walcott, 32d Rep. New York State Mus. Nat. Hist., 1879, p. 129.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 402, figs.

*Triblidium cornutaforme* Walcott, Smiths. Misc. Coll., 57, 1912, p. 263, pl. 41, figs. 12-14.

Ozarkian or Upper Cambrian (Hoyt): Four miles west Saratoga Springs, New York.  
*Plesiotypes*.—Cat. Nos. 58548-58550, U.S.N.M.

**Tryblidium erato** (Billings).

Metoptoma Erato Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 39 (adv. sheets, 1862); Geol. Canada, 1863, p. 145, fig. 145, fig. 95a, b.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 402, figs.

Tryblidium Erato Whiteaves, Pal. Foss. Geol. Surv. Canada, 3, pt. 1, 1884, p. 31 (gen. ref.).

Black River (Leray): Pauquettes Rapids, Ottawa River, Canada.

TRYBLIDIUM? ESTELLA Whiteaves. See Archinacella estella.

**Tryblidium eubule** (Billings).

Metoptoma Eubule Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 38 (adv. sheets, 1862).

Tryblidium Eubule Whiteaves, Pal. Foss. Geol. Surv. Canada, 3, pt. 1, 1884, p. 31 (gen. ref.).—Raymond, Ann. Carnegie Mus., 4, 1908, p. 217.

Chazy or Black River?: Phillipsburg, Quebec.

TRYBLIDIUM EXSERTUM Sardeson. See Stenotheca exserta.

**Tryblidium hyrie** (Billings).

Metoptoma Hyrie Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 87, fig. 79 (adv. sheets, 1862).

Tryblidium Hyrie Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1894, p. 31 (gen. ref.).

Ozarkian? (Levis—erratics): Point Levis, Quebec.

TRYBLIDIUM INDIANENSE Miller. See Archinacella indianense.

TRYBLIDIUM? INSTABILIS Whiteaves. See Archinacella instabilis.

TRYBLIDIUM MADISONENSE Miller. See Cyrtocerina madisonensis.

**Tryblidium modestum** Ulrich and Scofield.

Tryblidium modestum Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 826, pl. 82, figs. 1 and 2.

Black River (Decorah): Near Cannon Falls, Minnesota.

**Tryblidium niobe** (Billings).

Metoptoma Niobe Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 37, figs. 38a, b (adv. sheets, 1862); Geol. Canada, Geol. Surv. Canada, 1863, p. 276, fig. 281a, b.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 402, 2 figs.

Triblidium Niobe Whiteaves, Pal. Foss., Geol. Surv. Canada, pt. 1, 1884, p. 31 (gen. ref.).

Canadian (Beekmantown): Phillipsburg, Quebec.

**Tryblidium nycteis** (Billings).

Metoptoma Nycteis Billings, Pal. Foss., Geol. Surv. Canada, 1865, p. 38, figs. 39a, b (adv. sheets, 1862).

Tryblidium Nycteis Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 31 (gen. ref.).—Miller, N. A. Geol., Pal., 1889, p. 429, fig. 720.—Sardeson, Jour. Geol., 11, 1903, p. 479, fig. 4.

Triblidium nycteis Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 604, fig. 803.

Canadian (Romaine): Mingan Islands, Canada.

**Tryblidium ovale** Whitfield.

Triblidium ovale Whitfield, Bull. Amer. Mus. Nat. Hist., 1886, p. 305, pl. 24, figs. 28–29.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1235, fig.—Seely, Vermont State Geol., Rep. 7, 1910, pl. 62, figs. 28, 29.

Canadian (Beekmantown): Fort Cassin, Vermont.

**Tryblidium ovatum** Whitfield.

*Tryblidium ovatum* Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 305, pl. 24, figs. 23-25.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1235, fig.—Seely, Vermont State Geol., Rep. 7, 1910, pl. 62, figs. 23-25.  
Canadian (Beekmantown): Fort Cassin, Vermont.

**Tryblidium patulum** Cleland.

*Tryblidium patulum* Cleland, Bull. Amer. Pal., 4, 1903, p. 15, pl. 3, figs. 15, 16.  
Ozarkian (Little Falls): Little Falls, New York.

TRYBLIDIUM PILEOLIUM Lesley. See *Archinacella pileolum*.

**Tryblidium repertum** (Sardeson.)

*Tryblidium repertum* Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 102, pl. 5, figs. 21, 22.  
Canadian (Shakopee): Near Argyle, Wisconsin.

**Tryblidium retrorsum** (Whitfield).

*Metoptoma retrorsa* Whitfield, Ann. Rep. for 1879, Wisconsin Geol. Surv., 1880, p. 54; Geol. Wisconsin, 4, 1882, p. 197, pl. 3, fig. 18.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 142, fig.  
*Tryblidium retrorsum* Sardeson, Jour. Geol., 11, 1903, p. 479, fig. 5.  
Ozarkian (Mendota): Near Baraboo, Wisconsin.

TRYBLIDIUM SIMILE Sardeson. See *Archinacella similis*.

TRYBLIDIUM SIMPLEX Whiteaves. See *Archinacella simplex*.

TRYBLIDIUM TRENTONENSIS Whiteaves. See *Archinacella trentonensis*.

TRYBLIDIUM VALIDUM Sardeson. See *Archinacella valida*.

**Tuberculopora** Ringueberg.

Genotype: *T. inflata* Ringueberg.

*Tuberculopora* Ringueberg, Bull. Buffalo Soc. Nat. Sci., 5, 1886, p. 21.

Observation.—Not recognizable without a restudy of the types. Possibly a pathological specimen of crinoid column.

**Tuberculopora inflata** Ringueberg.

*Tuberculopora inflata* Ringueberg, Bull. Buffalo Soc. Nat. Sci., 5, 1886, p. 21, pl. 2, fig. 18.

Clinton (Rochester): Lockport, New York.

TUBIPORA CATENULARIA Linnæus. See *Halysites catenularia*.

TUBIPORA CATENULATUS Gmelin. See *Halysites catenularia*.

**Tubipora lamellosa** Owen.

Not recognized.

*Tubipora lamellosa* Owen, Geol. Expl. Iowa, Wisconsin, Illinois, 2d ed., 1844, p. 78, pl. 14, fig. 13.

Niaganan: Iowa and Wisconsin.

**TUNARIA** Hoek.

Genotype: *T. cochabambina* Hoek.

*Tunaria* Hoek, Neues Jahrb. Min., Geol., Pal., 34, 1912, p. 247.

**Tunaria cochabambina** Hoek.

*Tunaria cochabambina* Hoek, Neues Jahrb. Min., Geol., Pal., 34, 1912, p. 247, pl. 8, fig. 9.

Ordovician: Cochabamba, Bolivia.

TURBINICRINITES VERNEULI Troost. See *Melocrinus roemeri*.



- TURBINOLIA MITRATA** Eaton. See *Streptelasma corniculum*.
- TURBINOLIA PYRAMIDALIS** Hisinger. See *Goniophyllum pyramidale*.
- TURBINOLIA TURBINATA PYRAMIDALE** Hisinger. See *Goniophyllum pyramidale*.
- TURBO AMERICANUS** D'Orbigny. See *Holopea paludiniformis*.
- TURBO BILIX** D'Orbigny. See *Cyclonema bilix*.
- TURBO DILUCULA** Hall. See *Holopea dilucula*.
- TURBO OBLIQUUS** Emmons. See *Holopea obliqua*.
- TURBO? OBSCURA** Hall. See *Holopea obscura*.
- TURBO? PARVULUS** Hall. See *Cyclora parvula*.
- TURBO SYMMETRICUS** Emmons. See *Holopea symmetrica*.
- TURBO TENNESSEENSIS** Roemer. See *Strophostylus tennesseense*.
- TURBO VENTRICOSUS** Emmons. See *Holopea ventricosa*.
- TURRILEPAS** Woodward. Genotype: *Chiton wrightianus* DeKoninck.  
*Turrilepas* Woodward, Quart. Jour. Geol. Soc. London, 21, 1865, p. 489.—Salter, Cat. Camb. Sil. Fossils, 1873, p. 129.—Etheridge, Proc. Royal Phys. Soc. Edinburgh, 4, 1878, p. 164.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1880, pp. 213, 299.—Hall and Clarke, Pal. New York, 7, 1888, p. 63.—Miller, N. A. Geol. Pal., 1889, p. 569.—Vogdes, Annals New York Acad. Sci., 5, 1889, p. 36.—Clarke, Zittel-Eastman Textb. Pal., 1, 1900, p. 649; 2d ed., 1913, p. 744.
- Turrilepas canadensis*** Woodward.  
*Turrilepas canadensis* Woodward, London Geo. Mag., 3d dec., 6, 1889, p. 274.  
 Trenton (Collingwood): Ottawa, Ontario.
- Turrilepas(?) filusos*** Ruedemann.  
*Turrilepas(?) filusos* Ruedemann, Bull. New York State Mus., 42, 1901, p. 577, pl. 2, figs. 13-15.  
 Trenton (Snake Hill): Mechanicsville, Saratoga County, New York.
- Turrilepas gracilissimus*** (Ringueberg).  
*Plumulites gracilissimus* Ringueberg, Proc. Acad. Nat. Sci. Philadelphia, 1888, p. 136, pl. 7, fig. 8.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 723, figs.  
*Turrilepas gracilissimus* Miller, N. A. Geol. Pal., 1889, p. 569 (gen. ref.).  
 Clinton (Rochester): Lockport, New York.
- Turrilepas ottawaensis*** Ami.  
*Turrilepis Ottawaensis* Ami, Geol. Surv. Canada, Ann. Rep., n. s., 12, App. G., 1901, p. 67 (nom. nud.).  
 Trenton: Governor's Bay, Ottawa, Canada.
- TURRITOMA** Ulrich. Genotype: *Murchisonia acrea* Billings.  
*Turritoma* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 959 (*Turritospira* in error on p. 1013).—Koken, Neues Jahrb. Min., Geol., Pal., 1898, 1, p. 20.—Donald, Quart. Jour. Geol. Soc. London, 58, 1902, p. 330.

**Turritoma acrea** (Billings).

Murchisonia acrea Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 232, fig. 216.

Turritoma acrea Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 959 (gen. ref.).

Canadian (Quebec—G): Port aux Choix, Newfoundland.

**Turritoma ada** (Billings).

Murchisonia Ada Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 346, fig. 333.

Turritoma ada Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 959 (gen. ref.).

Canadian (Beckmantown): Leeds and Grenville Counties, Canada.

**Turritoma boylei** (Nicholson).

Murchisonia Boylei Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 71, pl. 3,

fig. 1.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 81.—

Nicholson, Quart. Jour. Geol. Soc. London, 31, 1875, p. 547, pl. 26, fig. 1.

Turritoma boylei Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 959 (gen. ref.).

Hormotoma? Boylei Donald, Quart. Jour. Geol. Soc. London, 55, 1899, p. 263 (gen. ref.).

Niagaran (Guelph): Elora, Ontario.

**Turritoma constricta** (Whiteaves).

Murchisonia constricta Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 25, pl. 4, fig. 4; pt. 2, 1895, p. 82 (loc. occ.).

Turritoma constricta Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 959 (gen. ref.).

Niagaran (Guelph): Durham, Ontario.

**Turritoma laphami** (Hall).

Murchisonia laphami Hall, Rep. Sup. Geol. Surv. Wisconsin, 1, 1861, p. 36; 20th

Rep. New York State Cab. Nat. Hist., 1868, p. 366, pl. 16 (6), fig. 20; rev.

ed., 1870, p. 396, pl. 15, fig. 20.

Turritoma laphami Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 959 (gen. ref.).

Murchisonia (Turritoma) laphami Kindle and Breger, 28th Ann. Rep. Dep. Geol.

Nat. Res. Indiana, 1904, p. 461, pl. 13, fig. 7.

Niagaran: Racine, Wisconsin (Racine); Huntington, Indiana.

*Plesiotype*.—Cat. No. 52942, U.S.N.M.

TURRITOSPIRA Ulrich. See Turritoma Ulrich.

TYLOPTERUS Clarke and Ruedemann. See Eurypterus subgenus Tylopterus.

**TYRRELLIA** Parks.

Genotype: *T. severnensis* Parks.

Tyrrellia Parks in Tyrrell, 22d Rep. Ontario Bur. Mines, 1913, p. 35.

**Tyrrellia severnensis** Parks.

Tyrrellia severnensis Parks in Tyrrell, 22d Rep. Ontario Bur. Mines, 1913, p. 35.

Niagaran (Guelph): Severn River, Ontario.

**ULRICHTIA** Jones.

Genotype: *U. conradi* Jones.

Ulrichia Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 543; 49, 1893, p. 293.—

Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1891, p. 203.—Miller, N. A. Geol.

Pal., 1st App., 1892, p. 711.—Bonnema, Mitt. Min. Geol. Inst. Groningen, 2,

1909, p. 51.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 346.

**Ulrichia bivertex** (Ulrich).

Leperditia bivertex Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 11, pl. 7,

figs. 5, 5a.

**Ulrichia bivertex**—Continued.

*Ulrichia?* *bivertex* Ruedemann, Bull. New York State Mus., 162, 1912, p. 120, pl. 9, figs. 11, 12.

Trenton: Covington, Kentucky, and vicinity; Canajoharie, New York.

*Holotype*.—Cat. No. 41365, U.S.N.M.

**Ulrichia nodosa** (Ulrich).

*Primitia nodosa* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 134, pl. 10, figs. 11a-12b.

*Ulrichia nodosa* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1891, p. 203 (gen. ref.).—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 346, fig. 165So, o'.

Eden-Richmond: Cincinnati, Ohio, and vicinity.

*Cotypes*.—Cat. Nos. 41552, 41553, U.S.N.M.

UNCINULINA Bayle. See *Wilsonia* Kayser.

**UNCINULUS** Bayle.

Genotype: *Rhynchonella subwilsoni* D'Orbigny.

*Uncinulus* Bayle, Explic. de la Carte Geolog. France, 4, 1878, Atlas, pl. 11, figs. 17-200.—Waagen, Pal. Indica, 13th ser., 1, 1883, p. 424.—Ehlert, Fischer's Man. Conch., 1887, p. 1306.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 195; 13th Ann. Rep. New York State Geol., 1895, p. 828.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 324; 2d ed., 1913, p. 397.—Williams, Bull. U. S. Geol. Surv., 165, 1900, p. 60.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 290.

**Uncinulus convexorus** Maynard.

*Uncinulus convexorus* Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 368, pl. 65, figs. 9-14.

Helderbergian (Keyser): Tonoloway, Cash Valley, Cumberland, etc., Maryland; near Cherry Run and Keyser, West Virginia; Hyndman, Pennsylvania.

**Uncinulus gordonii** Maynard.

*Unsinulus gordonii* Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 367, pl. 65, figs. 1-6.

Helderbergian (Keyser): Cash Valley, Maryland.

**Uncinulus keyserensis** Schuchert and Maynard.

*Uncinulus keyserensis* Schuchert and Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 368, pl. 65, figs. 7, 8.

Helderbergian (Keyser): Cumberland, Tonoloway, etc., Maryland; Keyser, West Virginia.

**Uncinulus nucleolatus** (Hall).

*Rhynchonella nucleolata* Hall (part), 10th Ann. Rep. New York State Cab. Nat. Hist., 1857, p. 68; Pal. New York, 3, 1859, p. 227, pl. 31, figs. 2f-2y (not figs. 1a-1c=U. globulus; 1d, f, and 2a-e=?U. globulus).

*Uncinulus nucleolata* Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 199.

*Uncinulus nucleolatus* Schuchert and Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 365, pl. 64, figs. 16, 17.

Helderbergian: New York (New Scotland); Keyser, West Virginia (Keyser).

**Uncinulus nucleolatus angulatus** Maynard.

*Uncinulus nucleolatus* var. *angulatus* Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 366, pl. 64, figs. 18-20.

Helderbergian? (Keyser?): Cumberland, Maryland.

**Uncinulus septentrionalis** Hortedahl.

*Uncinulus septentrionalis* Hortedahl, 2d Arct. Exp. "Fram," 1898-1902, No. 32, 1914, p. 22, pl. 8, fig. 3.

Helderbergian (Lower beds): Seal Bay, Southwest Ellesmereland, Arctic America.

**Uncinulus stricklandi** (Sowerby).

*Terebratula stricklandi* Sowerby, Murchison's Sil. Syst., 1839, pl. 13, fig. 19.

*Rhynchonella tennesseensis* Hall (not Roemer), Trans. Albany Institute, 4, 1860, p. 228; 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1876, pl. 26, figs. 34-40.—White, 2d Ann. Rep. Indiana Bu. Statis. Geol., 1880, p. 496, pl. 3, figs. 2-4; 10th Rep. State Geol. Indiana, 1881, p. 128, pl. 3, figs. 2-4.

*Rhynchonella stricklandi* Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1879, p. 165, pl. 26, figs. 34-40; 11th Rep. State Geol. Indiana, 1882, p. 308, pl. 26, figs. 34-40.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 81, pl. 27, figs. 9-11; pl. 29, figs. 3-6.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 901, figs.

*Uncinulus* (*Uncinulina*) *stricklandi* Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pl. 58, figs. 38-40.

*Uncinulus stricklandi* Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 290, fig. 358.

Silurian: Europe; Waldron and St. Paul, Indiana; Newsom, Tennessee (Waldron and Laurel); Louisville, Kentucky (Louisville); West Tennessee (Brownsport).

*Plesiotype*.—Cat. No. 51356, U.S.N.M. (Nettelroth).

**Uncinulus tennesseensis** (Roemer).

*Rhynchonella tennesseensis* Roemer, Die Sil. Fauna West. Tennessee, 1860, p. 72, pl. 5, fig. 14.—Hall and Whitfield, 27th Rep. New York State Cab. Nat. Hist., 1875, pl. 9, figs. 24-26; Pal. Ohio, 2, 1875, p. 136, pl. 7, figs. 16, 17.—Hall, Trans. Albany Inst., 4, 1863, p. 223 (loc. occ.).—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 902, figs.

Niagaran: Perry, Wayne, and Decatur Counties, Tennessee (Brownsport); Louisville, Kentucky (Louisville); Yellow Springs, Ohio.

**UNIO ORTHONOTUS** Conrad. See *Modiolopsis orthonota*.

**UNIO PRIMIGENIUS** Conrad. See *Modiolopsis primigenia*.

**URASTERELLA** Sturtz (part). See *Stenaster Billings*.

**URASTERELLA** McCoy.

Genotype: *Uraster ruthveni* Forbes.

*Urasterella* McCoy, British Pal. Rocks Foss., 1854, p. 59.—Hall, 20th Rep. New York State Cab. Nat. Hist., 1866, p. 289; rev. ed., 1870, p. 332.—McCoy, Geol. Surv. Victoria, dec. 1, 1874, p. 42.—Zittel, Handb. Pal., 1, 1879, p. 453.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1880, p. 323.—Sturtz, Neues Jahrb. Min. Geol., Pal., 2, 1886, p. 152; Palaeontographica, 36, 1890, p. 219; Verh. naturh. Ver. preuss. Rheinl., etc., 1893, pp. 40, 56.—Gregory, Geol. Mag., dec. 4, 6, 1899, p. 352.—Schuchert, Bull. U. S. Nat. Mus., 88, 1915, p. 173.

*Stenaster Billings* (part), Geol. Surv. Canada, Can. Org. Rem., dec. 3, 1858, p. 77.—Sturtz, Verh. naturh. Ver. preuss. Rheinl., etc., 50, 1893, pp. 40, 56.

*Römeraster* Sturtz, Palaeontographica, 32, 1886, p. 85; *ibid.*, 36, 1890, p. 220; Verh. naturh. Ver. preuss. Rheinl., etc., 50, 1893, pp. 52, 73. (Genotype: *Asterias asperula* Roemer.)

**URASTERELLA**—Continued.

Protasteracanthion Sturtz, Palæontographica, 32, 1886, p. 90; Verh. naturh. Ver. preuss Rheinl., etc., 50, 1893, pp. 54, 75. (Genotype: *P. primus* Sturtz = *Asterias asperula* Roemer.)

Salteraster Sturtz, Verh. naturh. Ver. preuss Rheinl., etc., 50, 1893, pp. 42, 60. (Genotype: *Palæaster asperrima* Salter.)

**Urasterella grandis** (Meek).

*Stenaster grandis* Meek, Amer. Jour. Sci., 3d ser., 3, 1872, p. 258.—Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 66, pl. 3, bis., figs. 7a-c.—Miller, N. A. Geol. Pal., 1889, p. 283, fig. 432.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1051, figs.—James, Jour. Cincinnati Soc. Nat. Hist., 18, 1895, p. 136.

*Urasterella grandis* Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 67.—Cummings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 731, pl. 3, figs. 6-6b.—Schuchert, Bull. U. S. Nat. Mus., 88, 1915, p. 180, pl. 27, figs. 6-8; pl. 28, figs. 1, 2; pl. 30, figs. 1-4.

*Palæaster harrisi* Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 117, pl. 10, figs. 2, 2a.

*Stenaster harrisi* James, *ibid.*, 18, 1895, p. 136.

Richmond: Richmond, Indiana; Waynesville, Ohio.

*Plesiotype*.—Cat. No. 40887, U.S.N.M. (Holotype of *P. harrisi*).

**Urasterella huxleyi** (Billings).

*Stenaster Huxleyi* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 213, fig. 197.

*Urasterella huxleyi* Schuchert, in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 45; Bull. U. S. Nat. Mus., 88, 1915, p. 182, pl. 29, fig. 2.

Chazyan (Quebec—I): Point Rich, Newfoundland.

**Urasterella pulchella** (Billings).

*Palæaster pulchellus* Billings, Geol. Surv. Canada, Rep. Progr. for 1853-56, 1857, p. 292.

*Urasterella* (*Stenaster*) *pulchella* Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 289; rev. ed., 1870, p. 332.

*Urasterella pulchella* Raymond, Ottawa Nat., 26, 1912, p. 106, fig. 1.—Schuchert, Bull. U. S. Nat. Mus., 88, 1915, p. 178, pl. 28, figs. 3, 4; pl. 30, fig. 5.

*Stenaster pulchellus* Billings, Geol. Surv. Canada, dec. 3, 1858, p. 79, pl. 10, fig. 2.—Chapman, Canadian Jour., n. s., 6, 1861, p. 517.—Wright, Mon. British Foss. Echinod., Oolitic, 2, pt. 1 (Pal. Soc. for 1861), 1862, p. 28.

Trenton: Ottawa, Ontario; Trenton Falls, Middleville, etc., New York.

**Urasterella ulrichi** Schuchert.

*Urasterella ulrichi* Schuchert, in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 46 (nom. nud.); Bull. U. S. Nat. Mus., 88, 1915, p. 183, pl. 29, fig. 1; pl. 30, figs. 6, 7.

Black River (Platteville): Minneapolis, Minnesota.

**VAGINOCERAS** Hyatt.

Genotype: *Orthoceras multitubulatum* Hall.

*Vaginoceras* Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 266.—Ruedemann, Bull. New York State Mus., 90, 1906, p. 412.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 41.

**Vaginoceras longissimum** (Hall).

*Endoceras longissimum* Hall, Pal. New York, 1, 1847, p. 59, pl. 18, figs. 1, 1a.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 152.—Barrande, Syst. Sil. du Centre Boheme, 2, pt. 3, 1874, p. 755, pl. 236.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 20, fig. 8.—Zittel, Handb. Pal., 2, Munich, 1884, p. 362 fig. 497.—Miller, N. A. Geol. Pal., 1889, p. 436, fig. 734.

**Vaginoceras longissimum**—Continued.

*Orthoceras* (*Endoceras*) *longissimum* Roemer, Leth. geog., 1, Leth. Pal., 1876, Atlas, pl. 6, fig. 3a.

*Vaginoceras longissimum* Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 658 (gen. ref.).

Black River (Watertown): Watertown, New York.

**Vaginoceras multitubulatum** (Hall).

*Endoceras multitubulatum* Hall, Pal. New York, 1, 1847, p. 59, pl. 18, figs. 2a, b.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 152.—Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1881, p. 25, fig. 2.—Walcott, Mono. U. S. Geol. Surv., 8, 1884, p. 87, figs. 1, 2.

*Vaginoceras multitubulatum* Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 778 (gen. ref.).

Black River (Watertown): Watertown, New York.

**Vaginoceras oppletum** Ruedemann.

*Vaginoceras oppletum* Ruedemann, Bull. New York State Mus., 90, 1906, p. 413, pl. 4, figs. 2, 3; pl. 5, figs. 1-4; pl. 6, fig. 1; pl. 9, figs. 1-3, fig. 4.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 41, fig. 1236, 1237.

Chazyan (Day Point, Valcour): Isle La Motte, Vermont; Valcour Island, etc., New York.

*VALCOUREA* Raymond. See *Dinorthis* subgenus *Valcourea*.

**VALLATOTHECA** Foerste.

Genotype: *V. manitoulini* Foerste.

*Vallatotheca* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 482.

**Vallatotheca manitoulini** Foerste.

*Vallatotheca manitoulini* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 482, pl. 4, fig. 4.

Richmond: Cape Smyth, Manitoulin Island, Lake Huron.

**Vallatotheca unguiformis** (Ulrich).

*Stenotheca unguiformis* Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 843, pl. 61, figs. 42-44.

*Triblidium unguiforme* Miller, N. A. Geol. Pal., 2d App., 1897, p. 771 (gen. ref.).

*Vallatotheca unguiformis* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 482 (gen. ref.).

Trenton (Flanagan): Between Burgin and Danville, Kentucky.

*Holotype*.—Cat. No. 45998, U.S.N.M.

**VANUXEMIA** Billings.

Genotype: *V. inconstans* Billings.

*Vanuxemia* Billings, Canadian Nat. Geol., 3, 1858, p. 438; Canadian Jour., n. s., 6, 1861, p. 256.—Miller, N. A. Geol. Pal., 1889, p. 515.—Ulrich, Geol. Minnesota,

3, pt. 2, 1894, p. 549.—Dall, Zittel-Eastman Textb. Pal., 1, 1900, p. 365; 2d ed., 1913, p. 442.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 412.

**Vanuxemia abrupta** Ulrich.

*Vanuxemia abrupta* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 560, pl. 3, figs. 39-44.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 163.

Trenton: Fillmore and Goodhue Counties, Minnesota (Prosser); Baffin Land.

*Cotypes*.—Cat. Nos. 46316, 46317, U.S.N.M.

**Vanuxemia acutumbona** (Billings).

*Cyrtodonta acutumbona* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 49.

**Vanuxemia acutumbona**—Continued.

- Whitella? acutumbona Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 565 (gen. ref.).  
 Cypricardites acutumbona Miller, N. A. Geol. Pal., 1889, p. 476 (gen. ref.).  
 Gamachian (Ellis Bay): One mile south Junction Cliff, Anticosti.

**Vanuxemia baffinensis** Schuchert.

- Vanuxemia baffinensis Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 163, pl. 13, figs. 26-28.  
 Mohawkian: Head of Frobisher Bay, Baffin Land.  
*Cotypes*.—Cat. No. 28160, U.S.N.M.

**Vanuxemia bayfieldi** Billings.

- Vanuxemia Bayfieldii Billings, Geol. Surv. Canada, Rep. Progr. for 1857, 1857, p. 187, fig. 17; Canadian Nat. Geol., 3, 1858, p. 439, fig. 17; Canadian Jour., n. s., 6, p. 256, fig. 128.—Miller, N. A. Geol. Pal., p. 515, fig. 934.  
 Richmond: Bayfield Sound, Lake Huron.

**Vanuxemia cardinata** Ulrich.

- Vanuxemia cardinata Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 559.  
 Trenton (Curdsville): Mercer County, Kentucky.  
*Cotypes*.—Cat. Nos. 46318, 46319, U.S.N.M.

**Vanuxemia crassa** Ulrich.

- Vanuxemia crassa Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 553, pl. 38, fig. 27.  
 Black River (Decorah): St. Paul, Minnesota.  
*Holotype*.—Cat. No. 46320, U.S.N.M.

**Vanuxemia decipiens** Ulrich.

- Vanuxemia decipiens Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 562, pl. 39, figs. 1-5.  
 Black River (Platteville): Minneapolis, Minnesota.  
*Cotype*.—Cat. No. 46321, U.S.N.M.

**Vanuxemia dixonensis** Meek and Worthen.

- Vanuxemia dixonensis Meek and Worthen, Proc. Chicago Acad. Sci., 1866, 1, p. 16; Geol. Surv. Illinois, 3, 1868, p. 297, pl. 1, fig. 5a, b.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 550, pl. 38, figs. 1-5.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 414, fig. 535a-c.  
 Black River (Platteville): Dixon, Illinois; Janesville, etc., Wisconsin; Minneapolis, St. Paul, and Cannon Falls, Minnesota.  
*Plesiotypes*.—Cat. No. 46322, U.S.N.M.

**Vanuxemia dixonensis insueta** Ulrich.

- Vanuxemia dixonensis var. insueta Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 551, pl. 38, figs. 6, 7.  
 Black River (Platteville): Minneapolis, Minnesota.  
*Holotype*.—Cat. No. 46323, U.S.N.M.

**Vanuxemia fragosa** (Sardeson).

- Cypricardites (Vanuxemia) fragosa Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 70, pl. 2, figs. 1-3.  
 St. Peter: Highland Park and South St. Paul, Minnesota.

**Vanuxemia gibbosa** Ulrich.

- Vanuxemia gibbosa Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 559.  
 Trenton (Curdsville): Mercer County, Kentucky.

**Vanuxemia hayniana** (Safford).

*Cyrtodonta hayniana* Safford, Geol. Tennessee, 1869, pl. 2 (F), fig. 1a-e.

*Cypricardites haynianus* Ulrich, 19th Ann. Rep. Geol. and Nat. Hist. Sur. Minnesota, 1892, p. 240, fig. 25.

*Cypricardites triangularis* Sardeson, Bull. Minn. Acad. Nat. Sci., 3, 1892, p. 338, pl. 6, fig. 23.

*Vanuxemia hayniana* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 557, pl. 38, fig. 32; fig. 36-iv, p. 479; pl. 60, figs. 20-21.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 414, fig. 535k.

Trenton: Central Tennessee (Catheys); Danville, etc., Kentucky (Flanagan); St. Paul, etc., Minnesota (Prosser).

*Cotypes and plesiotypes*.—Cat. Nos. 46324, 46326, U.S.N.M.

**Vanuxemia inconstans** Billings.

*Vanuxemia inconstans* Billings, Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 186, figs. 15, 16; Canadian Nat. Geol., 3, 1858, p. 438, figs. 15, 16.

Black River (Leray): Fourth Chute of the Bonnechere, La Petite Chaudiere Rapids and valley of the Ottawa, Canada.

**Vanuxemia limbata** (Raymond).

*Ctenodonta limbata* Raymond, Amer. Jour. Sci., 20, 1905, p. 371.

Chazyan (Crown Point): Sloop Bay, Valcour Island, New York.

**Vanuxemia media** Ulrich.

*Vanuxemia media* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 553, pl. 38, figs. 23-26.

Black River (Platteville): Minneapolis and Cannon Falls, Minnesota.

*Cotypes*.—Cat. Nos. 46327, 46328, U.S.N.M.

**Vanuxemia montrealensis** Billings.

*Vanuxemia Montrealensis* Billings, Canadian Nat. Geol., 4, 1859, p. 447, figs. 25, 26; Geol. Canada, Geol. Surv. Canada, 1863, p. 131, fig. 61a, b.—Lesley,

Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1247, 2 figs. only.—Whiteaves, Ottawa Nat., 22, 1908, p. 107.

Chazyan (Lower and Upper): Island of Montreal and near L'Original, Canada.

**Vanuxemia nana** (Ulrich).

*Cypricardites nanus* Ulrich, 19th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1892, p. 239, fig. 24.

*Vanuxemia nanus* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 558 (gen. ref.).

Trenton (Flanagan): One mile south of Burgin, Kentucky.

*Cotypes*.—Cat. No. 46329, U.S.N.M.

**Vanuxemia niota** (Hall).

*Cypricardites niota* Hall, Rep. Supt. Geol. Surv. Wisconsin, 1861, p. 29; Geol.

Wisconsin, 1, 1862, p. 33, fig. 8; p. 438.—Whitfield, *ibid.*, 4, 1882, p. 208, pl. 5, fig. 10.—Chamberlin, *ibid.*, 1, 1883, p. 156.—Whitfield, Mem. Amer.

Mus. Nat. Hist., 1, pt. 2, 1895, p. 55, pl. 6, figs. 17-20.

*Vanuxemia niota* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 560, pl. 38, fig. 35.

Black River (Platteville): Beloit and Mineral Point, Wisconsin; Rockton, Illinois.

**Vanuxemia obtusifrons** (Ulrich).

*Cypricardites obtusifrons* Ulrich, 19th Ann. Rep., Geol. and Nat. Hist. Surv. Minnesota (March), 1892, p. 233, figs. 18, 19.

*Cypricardites vicinus* Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, (April), 1892, p. 339, pl. 6, fig. 22.



**Vanuxemia obtusifrons**—Continued.

*Vanuxemia obtusifrons* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 554, pl. 38, figs. 15-19.

Black River (Platteville): Minneapolis, Minnesota.

*Holotype* and *plesiotypes*.—Cat. Nos. 46330, 46331, U.S.N.M.

**Vanuxemia parvula** Whiteaves.

*Vanuxemia parvula* Whiteaves, Ottawa Nat., 22, 1908, p. 111, pl. 3, figs. 11, 12.

Black River (Lowville): Hog Back, Ottawa, Ontario.

**Vanuxemia rectirostris** (Hall).

*Cypricardites rectirostra* Hall, Rep. Supt. Geol. Surv. Wisconsin, 1861, p. 29.—

Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 55, pl. 6, figs. 21-25.

*Vanuxemia rectirostra* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 535 (gen. ref.).

Black River (Platteville): Janesville, Wisconsin.

**Vanuxemia rotundata** (Hall).

*Cypricardites rotundata* Hall, Rep. Supt. Geol. Surv. Wisconsin, 1861, p. 29;

Geol. Rep. Wisconsin, 1, 1862, p. 38, fig. 7; p. 437.—Whitfield, *ibid.*, 4, 1874, p. 208 (not pl. 5, fig. 11=*V. suberecta* Ulrich), Geol. Wisconsin, 4, 1882, p. 208, pl. 5, fig. 11.—Chamberlin, *ibid.*, 1, 1883, p. 156.—Whitfield, Mem.

Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 53, pl. 6, figs. 13-16.

*Vanuxemia rotundata* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 552, pl. 38, figs.

8-14.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 414, fig. 535 j.

Black River (Platteville): Beloit, Wisconsin; Minneapolis, Minnesota.

*Plesiotype*.—Cat. No. 46332, U.S.N.M. (Ulrich).

**Vanuxemia sardesoni** (Ulrich).

*Cypricardites sardesoni* Ulrich, 19th Ann. Rep. Geol. and Nat. Hist. Surv.

Minnesota, 1892, pp. 231, 232, figs. 16, 17.

*Vanuxemia sardesoni* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 555, pl. 37, figs.

17-19; pl. 38, fig. 45.

Black River (Platteville): Minneapolis, Minnesota.

*Holotype*.—Cat. No. 46333, U.S.N.M.

**Vanuxemia suberecta** Ulrich.

*Cypricardites rotundatus* (part) Whitfield, Rep. Geol. Surv. Wisconsin, 4, 1874, p. 208, pl. 5, fig. 11.

*Vanuxemia suberecta* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 553, pl. 38, figs. 20-22.

Black River: Beloit, Wisconsin.

**Vanuxemia subrotunda** Ulrich.

*Vanuxemia subrotunda* Ulrich, Geol. Minnesota, 3, 1894, p. 559, pl. 38, figs. 36-38.

Black River (Decorah): Goodhue County and Chatfield, Minnesota.

*Cotypes*.—Cat. No. 46334, U.S.N.M.

**Vanuxemia terminalis** (Ulrich).

*Cypricardites terminalis* Ulrich, Amer. Geol., 10, 1892, p. 98, pl. 7, figs. 8-10.

*Vanuxemia terminalis* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 556, pl. 38, figs.

33 and 34.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 413, fig. 535 g-i.

Black River (Platteville): Minneapolis and Cannon Falls, Minnesota; Beloit, Wisconsin.

*Cotype*.—Cat. No. 46335, U.S.N.M.

**Vanuxemia umbonata** Ulrich.

*Vanuxemia umbonata* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 556, pl. 38, figs. 28-31.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 414, fig. 535d-f. Black River: Minneapolis and St. Paul, Minnesota (Decorah); Mercer County, Kentucky.  
*Holotype*.—Cat. No. 46336, U.S.N.M.

**Vanuxemia ungulata** (Billings).

*Cyrtodonta?* *ungulata* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 15, fig. 3a, b.  
*Cypricardites ungulata* Miller, N. A. Geol. Pal., 1889, p. 477 (gen. ref.). Richmond (English Head): Macasty Bay, Anticosti.

**Vanuxemia wortheni** (Ulrich).

*Cypricardites*, sp. undet. Meek and Worthen, Illinois Geol. Surv., 3, 1868, p. 311, pl. 3, figs. 9a, 9d.  
*Cypricardites wortheni* Ulrich, Amer. Geol., 1, 1888, p. 180.  
*Vanuxemia wortheni* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 561, pl. 39, figs. 6, 7.  
Trenton (Galena): Mount Carroll, Illinois.  
*Plesiotype*.—Cat. No. 46337, U.S.N.M.

**VERMIPORA** Hall.Genotype: *V. serpuloides* Hall.

*Vermipora* Hall, 26th Rep. New York State Mus. Nat. Hist., 1874, p. 109.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 69.—Nicholson, Tab. Corals Pal. Period, 1879, p. 111.—Zittel, Handb. Pal., 1, 1880, p. 619.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 448.—Hall and Simpson, Pal. New York, 6, 1887, p. 12.—Miller, N. A. Geol. Pal., 1889, p. 207.—Girty, 48th Rep. New York State Mus., 2, 1897, p. 307; 14th Rep. State Geol. New York for 1894, 1897, p. 307.—Sardeson, Neues Jahrb. Min., Geol., Pal., Beilage-Band, 10, 1896, p. 328.

**Vermipora niagarensis** Rominger.

*Vermipora niagarensis* Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 70, pl. 24, fig. 3.  
Niagan: Masonville, Iowa; Point Detour, Lake Huron.

**VESICULARIA** Rominger. See *Cystiphorolites* Miller.

**VEXILLUM** Rouault. See *Dædalus* Rouault.

**VINELLA** Ulrich.Genotype: *V. repens* Ulrich.

*Vinella* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 12, 1890, p. 173.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 685.—Vine, Proc. Yorkshire Geol., Geol. Polyt. Soc., 12, 1892, p. 84.—Ulrich, Geol. Minnesota, 3, 1893, p. 112.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 17.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 604.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 19.—Ulrich and Bassler, Smiths. Misc. Coll., 45, 1904, p. 273.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 12.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 118.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 55; Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 317.

**Vinella?** *multiradiata* Ulrich and Bassler.

*Vinella?* *multiradiata* Ulrich and Bassler, Smiths. Misc. Coll. (quart. issue), 45, 1904, p. 276, pl. 68, fig. 8.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 13, pl. 4, fig. 1.

**Vinella? multiradiata**—Continued.

Clinton (Rochester): Lockport, New York.  
 Anticostian (Jupiter River): Island of Anticosti.  
*Holotype*.—Cat. No. 43144, U.S.N.M.

**Vinella radialis** Ulrich. \*

*Vinella radialis* Ulrich, Geol. Minnesota, 3, 1893, p. 113, fig. 8b.—Ulrich and Bassler, Smiths. Misc. Coll. (quart. issue), 45, 1904, p. 274, pl. 68, fig. 4.  
 Maysville (Corryville): Cincinnati, Ohio.  
*Holotype*.—Cat. No. 43149, U.S.N.M.

**Vinella radiceformis** (Vine).

*Ascodictyon radians* Vine (part), Quart. Jour. Geol. Soc. London, 37, 1881, p. 619.  
*Ascodictyon radiceforme* Vine, *ibid.*, 38, 1882, p. 53, figs. 1, 3; Ann. Mag. Nat. Hist., 5th ser., 14, 1884, p. 83, figs. 1-5; Proc. Yorkshire Geol. Polytech. Soc., 9, 1887, pp. 183-4, pl. 12, fig. 5; *ibid.*, 12, 1892, p. 87.

*Vinella radiceformis* Ulrich, Geol. Nat. Hist. Surv. Minnesota, 3, pt. 1, 1893, p. 113.—Ulrich and Bassler, Smiths. Misc. Coll. (quart. issue), 45, 1904, p. 275, pl. 68, fig. 7.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 12, pl. 4, figs. 2, 3.

Silurian: Shropshire, England (Wenlock); Rochester and Lockport, New York (Rochester); Waldron, Indiana (Waldron); Seven Mile Creek, near Eaton, Ohio (Brassfield); Island of Anticosti (Gun River).

*Plesiotypes*.—Cat. Nos. 35476, 43146, U.S.N.M.

**Vinella radiceformis conferta** Ulrich.

*Vinella radiceformis* var. *conferta* Ulrich, Geol. Minnesota, 3, 1893, p. 113, fig. 8c, d.—Ulrich and Bassler, Smiths. Misc. Coll. (quart. issue), 45, 1904, p. 275, pl. 68, figs. 5, 6.

Niagaran (Waldron): Waldron, Indiana.

*Holotype*.—Cat. No. 43147, U.S.N.M.

**Vinella repens** Ulrich.

*Vinella repens* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 12, 1890, p. 174, fig. 1; Geol. Minnesota, 3, 1893, p. 114, pl. 1, figs. 1-5.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, fig. 222 (p. 604).—Ulrich and Bassler, Smiths. Misc. Coll., 45, 1904, p. 274, pl. 68, figs. 1-3.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 118, fig. 177c, e.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 55, 56, fig. 5; Zittel-Eastman Textb. Pal., 1913, p. 317, figs. 437b, c.

Black River (Decorah): St. Paul, etc., Minnesota.

Ordovician (Jewe and Wesenberg): Wesenberg, etc., Esthonia.

*Cotypes*.—Cat. No. 43148, U.S.N.M.

**VIRGIANA** Twenhofel.

Genotype: *Pentamerus barrandi* Billings.

*Virgiana* Twenhofel, Bull. Victoria Mem. Mus., 3, 1914, p. 28.

**Virglana barrandei** (Billings).

*Pentamerus barrandi* Billings, Geol. Surv. Canada, Rep. Progr. for 1856, 1857, p. 296; Geol. Canada, 1863, p. 316, fig. 327.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 615, figs.

*Barrandella barrandii* Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 243, fig. 174; pl. 71, figs. 17-20.

*Clorinda barrandei* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 184.

*Virgiana barrandei* Twenhofel, Bull. Victoria Mem. Mus., 3, 1914, p. 28.

Anticostian (Becksie River, Gun River): Becksie River Bay, Anticosti.

- VOGDESIA** Raymond. Genotype: *Isotelus bearsi* Raymond.  
*Vogdesia* Raymond, Ann. Carnegie Mus., 7, 1910, p. 70; 7th Rep. Vermont Geol. Surv., 1910, p. 225.
- Vogdesia bearsi** (Raymond).  
*Isotelus?* *bearsi* Raymond, Annals Carnegie Mus., 3, 1905, p. 345, pl. 10, figs. 21-24 (not 25).  
*Vogdesia bearsi* Raymond, Ann. Carnegie Mus., 7, 1910, p. 70, pl. 19, figs. 10-12; 7th Rep. Vermont State Geol., 1910, p. 225, pl. 32, figs. 21-24; pl. 39, figs. 10-12.  
 Chazyan (Crown Point): Sloop Bay, Valcour Island, New York.
- WALCOTTIA** Miller and Dyer. Genotype: *W. rugosa* Miller and Dyer.  
*Walcottia* Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 39.—James, *ibid.*, 7, 1884, p. 144; *ibid.*, 8, 1885, p. 161.—Miller, N. A. Geol. Pal., 1889, p. 522.
- Walcottia?** *cookana* Miller and Dyer.  
*Walcottia?* *cookana*, Miller and Dyer, Contr. to Pal., No. 2, 1878, p. 11, pl. 3, figs. 12, 12a.  
 Maysville (Corryville): Cincinnati, Ohio.
- Walcottia rugosa** Miller and Dyer.  
*Walcottia rugosa* Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 39, pl. 2, figs. 11, 11a.—Miller, N. A. Geol. Pal., 1889, p. 522, fig. 946.  
 Maysville (Fairmount): Cincinnati, Ohio.
- Walcottia sulcata** James.  
*Walcottia sulcata* James, Paleontologist, No. 5, 1881, p. 44.  
 Eden (Economy): Cincinnati, Ohio.
- WALDHEIMIA FORMOSA** Hall. See *Rhynchospira formosa* Hall.
- WALDHEIMIA GLOBOSA** Hall. See *Rhynchospira globosa*.
- WESTONIA** Matthew. See *Obolus* subgenus *Westonia* Matthew.
- WESTONIA ESCASONI** Matthew. See *Obolus* (*Westonia*) *escasoni*.
- WHITEAVESIA** Ulrich. Genotype: *Modiolopsis cincinnatiensis* Hall and Whitfield.  
*Modiolopsis* (part) of various authors.  
*Actinomya* Ulrich, Geol. Surv. Ohio, 7, 1893, p. 656; Geol. Minnesota, 3, pt. 2, 1894, p. 513.  
*Whiteavesia* Ulrich, Geol. Surv. Ohio, 7, 1893, Expl. pl. 56; Geol. Minnesota, 3, 1894, p. 628.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 985.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 517.  
*Pholadomorpha* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 279 (Genotype: *Modiolopsis pholadiformis* Hall).
- Whiteavesia cancellata** (Walcott).  
*Modiolopsis cancellata* Walcott, Trans. Albany Inst., 10, 1883, p. 22, pl. 1, figs. 8, 8a.  
*Actinomya cancellata* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 504 (gen. ref.).  
*Whiteavesia cancellata* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 628 (gen. ref.).  
 Utica: Trenton, Oneida County, New York.  
 Trenton (Upper): West Covington, Kentucky.  
*Plesiotypes*.—Cat. No. 46338, U.S.N.M.

**Whiteavesia chamblensis** (Foerste).

Pholadomorpha chamblensis Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914,  
p. 281, pl. 1, fig. 8.

Cincinnati (Pulaski): Chambly, Quebec.

**Whiteavesia cincinnatiensis** (Hall and Whitfield).

Modiolopsis Cincinnatiensis Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875,  
p. 88, pl. 2, figs. 14-15.

Actinomya cincinnatiensis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, pp. 504, 514,  
text figs. 39a-d.

Whiteavesia cincinnatiensis Ulrich, Rep. Geol. Surv. Ohio, 7, 1893, p. 656, pl. 46,  
figs. 16-17.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908,  
p. 1022, pl. 48, figs. 7, 7a.—Grabau and Shimer, N. A. Index Fossils, 1, 1909,  
p. 517, fig. 695c.

Trenton (Upper): Covington, Kentucky, and vicinity.

*Plesiotypes*.—Cat. No. 46339, U.S.N.M.

**Whiteavesia cincta** Ruedemann.

Whiteavesia cincta Ruedemann, Bull. New York State Mus., 162, 1912, p. 95,  
pl. 5, fig. 1.

Trenton (Snake Hill): Snake Hill, Saratoga County, New York.

**Whiteavesia corrugata** (Miller and Faber).

Modiolopsis corrugata Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 15, 1892,  
p. 79, pl. 1, fig. 1.

Modiolopsis sulcata Miller and Faber, *ibid.*, 15, 1892, p. 80, pl. 1, fig. 4.

Maysville (Corryville): Cincinnati, Ohio.

**Whiteavesia cumingsi** Ruedemann.

Whiteavesia cumingsi Ruedemann, Bull. New York State Mus., 162, 1912, pl.  
5, figs. 2, 3,

Trenton (Snake Hill): Snake Hill, Saratoga County, New York.

**Whiteavesia expansa** Raymond.

Whiteavesia? expansa Raymond, Annals Carnegie Mus., 3, No. 4, 1906, p. 578.

Chazyan (Crown Point): Valcour Island, New York.

**Whiteavesia kentoniensis** (Ulrich).

Actinomya kentoniensis Ulrich, Geol. Surv. Ohio, 7, 1893, p. 658, pl. 56, figs.  
18-20.

Whiteavesia kentoniensis Ulrich, *ibid.*, 7, 1893, pl. 56, figs. 18-20.

Trenton (Upper): Covington, Kentucky, and vicinity.

*Cotypes*.—Cat. No. 46340, U.S.N.M.

**Whiteavesia modioliformis** (Meek and Worthen).

Modiolopsis modioliformis Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p.  
294, pl. 1, figs. 7b, 8.

Actinomya modioliformis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 515, pl.  
36, figs. 19, 20.

Whiteavesia modioliformis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 628 (gen.  
ref.).—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 517, fig. 695d.

Black River (Platteville): Mineral Point and Beloit, Wisconsin.

*Plastotype*.—Cat. No. 46341, U.S.N.M.

**Whiteavesia oblonga** (Ulrich).

Modiolopsis oblonga Ulrich, Amer. Geol., 5, 1890, p. 272, fig. 1a-c.—James, J. F.,

Amer. Geol., 6, 1890, p. 67. (Note regarding synonymy.)

**Whiteavesia oblonga**—Continued.

*Actinomya oblonga* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 504 (gen. ref.).

*Whiteavesia oblonga* Ulrich, Geol. Minnesota 3, pt. 2, 1894, p. 628 (gen. ref.).

Trenton (Upper): West Covington, Kentucky.

*Holotype*.—Cat. No. 46252, U.S.N.M.

**Whiteavesia pholadiformis** (Hall).

*Modiolopsis pholadiformis* Hall, Geol. Lake Superior Land Dist., Foster and Whitney's Rep., 1851, p. 213, pl. 30, figs. 1a-c; pl. 31, fig. 1.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 282.—Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 85, pl. 2, fig. 16.

*Actinomya pholadiformis* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, pp. 504, 514, fig. 39c-d.

*Whiteavesia pholadiformis* Ulrich, Geol. Surv. Ohio, 7, 1893, pl. 56, figs. 21, 22.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1023, pl. 48, fig. 8.

*Pholadomorpha pholadiformis* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 277, pl. 2, fig. 16; pl. 5, fig. 4.

Richmond: Bay des Noquets, Lake Michigan; Lake Huron; Ohio; Indiana.

Cincinnati (Pulaski): Province of Quebec.

*Plesiotypes*.—Cat. No. 46342, U.S.N.M. (Ulrich).

Observation.—See *Sedgwickia divaricata* for a probable synonym.

**Whiteavesia pholadiformis divaricata** (Foerste).

*Pholadomorpha pholadiformis divaricata* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 279, pl. 2, fig. 14.

Cincinnati (Pulaski): Riviere des Hurons, near St. Jean Baptiste, Quebec.

**Whiteavesia pulchella** (Ulrich).

*Modiolopsis pulchella* Ulrich, Amer. Geol., 5, 1890, p. 278, fig. 6a-c.

*Actinomya pulchella* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 514 (gen. ref.).

*Whiteavesia pulchella* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 628 (gen. ref.).

Trenton (Upper): West Covington, Kentucky.

*Holotype*.—Cat. No. 46343, U.S.N.M.

**Whiteavesia saffordi** (Ulrich).

*Orthodesma saffordi* Ulrich, 19th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1892, p. 229, fig. 15.

*Actinomya saffordi* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 514 (gen. ref.).

*Whiteavesia saffordi* Ulrich, *ibid.*, 3, pt. 2, 1894, p. 628 (gen. ref.).

Stones River (Murfreesboro): Murfreesboro, Tennessee.

*Holotype*.—Cat. No. 46344, U.S.N.M.

**Whiteavesia subcarinata** (Ulrich).

*Actinomya subcarinata* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 516, pl. 36, figs. 17, 18.

Trenton (Prosser): Goodhue County, Minnesota.

*Holotype*.—Cat. No. 46345, U.S.N.M.

**Whiteavesia superba** (Hall).

*Modiolopsis? superbus* Hall, Rep. Sup. Geol. Surv. Wisconsin, 1861, p. 31.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 56, pl. 7, figs. 16-18.

*Actinomya superba* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 514 (gen. ref.).

*Whiteavesia superba* Ulrich, *ibid.*, 3, pt. 2, 1894, p. 628 (gen. ref.).

Black River (Platteville): Beloit, Wisconsin.

**Whiteavesia symmetricus** Ulrich.

Whiteavesia symmetricus Ulrich in Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 162, pl. 13, figs. 15-17.

Mohawkian: Head of Frobisher Bay, Baffin Land.

*Holotype*.—Cat. No. 28162, U.S.N.M.

**Whiteavesia? undata** Raymond.

Whiteavesia? undatum Raymond, Ann. Carnegie Mus., 3, 1906, p. 578.

Chazyan (Crown Point): Valcour Island, New York.

**WHITELLA** Ulrich.

Genotype: *W. obliquata* Ulrich.

Whitella Ulrich, Amer. Geol., 6, 1890, p. 176; Geol. Minnesota, 3, pt. 2, 1894, p. 564; Geol. Surv. Ohio, 7, 1893, p. 678.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 702.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 414.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 985.

Rhynchotropis Meek, Proc. Acad. Nat. Sci. Philadelphia, 1872, p. 327; Geol. Surv. Ohio, Pal., 1, 1873, p. 136 (not defined).

**WHITELLA? ACUTUMBONA** Ulrich. See *Vanuxema acutumbona*.

**Whitella arctica** Schuchert.

Whitella arcticus Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 163, pl. 13, figs. 23-25.

Mohawkian: Head of Frobisher Bay, Baffin Land.

*Holotype*.—Cat. No. 33059, U.S.N.M.

**WHITELLA CANADENSIS** Raymond. See *Sowteria canadensis*.

**Whitella carinata** (Meek).

Dolabra carinata Meek, Proc. Acad. Nat. Sci. Philadelphia, 1872, p. 326.

Cypricardites? carinata Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 135, pl. 12, figs. 6a, b (*Rhynchotropis carinata* suggested at end of description).—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 218.

Whitella carinata Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 565 (gen. ref.).

Maysville: Cincinnati, Ohio.

Observation.—Although probably a species of *Whitella*, the type specimen is so crushed that the species can not be said to be recognizable.

**Whitella complanata** Foerste.

Whitella complanata Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 300, pl. 1, fig. 2.

Cincinnati (Pulaski): Riviere des Hurons, Quebec.

**Whitella compressa** Ulrich.

Whitella compressa Ulrich, Amer. Geol., 6, No. 9, 1890, p. 180, figs. 15a-d; Geol. Minnesota, 3, pt. 2, 1894, p. 568, pl. 41, figs. 6-9.

Black River (Decorah): Minneapolis, Minnesota, and vicinity.

*Holotype* and *plesiotype*.—Cat. No. 46346, U.S.N.M.

**Whitella concentrica** Ulrich.

Whitella concentrica Ulrich, 19th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1892, p. 247, fig. 31; Geol. Minnesota, 3, pt. 2, 1894, p. 569, pl. 41, figs. 2 and 3.

Black River (Decorah): Minneapolis, Minnesota.

*Holotype*.—Cat. No. 46347, U.S.N.M.

**Whitella elongata** Ruedemann.

Whitella elongata Ruedemann, Bull. New York State Mus., 162, 1912, pl. 5, figs. 9, 10.

Trenton (Snake Hill): Snake Hill, Saratoga County, New York.

**Whitella goniumbonata** Foerste.

*Whitella goniumbonata* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 301, pl. 1, fig. 3.

Cincinnati (Pulaski): Riviere des Hurons, Quebec.

**Whitella hindi** (Billings).

*Cyrtodonta Hindi* Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 151, figs. 131a, b (Adv. sheets, 1862); Geol. Canada, Geol. Surv. Canada, 1863, p. 214, fig. 218.

*Cypricardites hindi* Miller, N. A. Geol. Pal., 1889, p. 476 (gen. ref.).

*Whitella hindi* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 535 (gen. ref.).

Cincinnati (Pulaski): Near Toronto, Ontario.

**Whitella megambona** (Whitfield).

*Cypricardites megambonus* Whitfield, Ann. Rep. Geol. Surv. Wisconsin, 1877, p. 73; Geol. Wisconsin, 4, 1882, p. 210, pl. 5, figs. 7-8.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 156, fig.

*Whitella megambona* Ulrich, Amer. Geol., 6, 1890, p. 384, Geol. Minnesota, 3, pt. 2, 1894, p. 570, pl. 41, figs. 4-5.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 415, figs. 537a-b.

Black River (Platteville): Beloit, Wisconsin; Minneapolis, Minnesota.

*Plesiotype*.—Cat. No. 46343, U.S.N.M.

**Whitella obliquata** Ulrich.

*Whitella obliquata* Ulrich, Amer. Geol., 6, 1890, pp. 177, 178, figs. 13a-c; Geol. Minnesota, 3, pt. 2, 1894, p. 565, pl. 40, figs. 31-32.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 702, fig. 1261—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana 1908, p. 1024, pl. 48, figs. 10-10d.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 415, fig. 537c.

Richmond: Blanchester, Waynesville, etc., Ohio; Indiana (Waynesville); Spring Valley, Minnesota (Maquoketa).

*Cotypes*.—Cat. Nos. 46349-46352, U.S.N.M.

**Whitella ohioensis** Ulrich.

*Whitella ohioensis*, Ulrich, Geol. Surv. Ohio, 7, 1893, p. 678, fig. 2.

Richmond (Waynesville): Waynesville and Clarksville, Ohio.

*Holotype*.—Cat. No. 46353, U.S.N.M.

**Whitella plebeia** (Billings).

*Cyrtodonta? plebeia* Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 14, figs. 2a, 2c.

*Cypricardites plebeia* Miller, N. A. Geol. Pal., 1889, p. 477 (gen. ref.).

*Whitella plebeia* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 535 (gen. ref.).

Richmond (English Head and Charleton): Charleton Point, etc., Anticosti.

**Whitella præcipita** Ulrich.

*Whitella præcipita* Ulrich, Amer. Geol., 6, 1890, p. 386; 19th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1892, p. 246, fig. 30; Geol. Minnesota, 3, pt. 2, 1894, p. 574, pl. 41, figs. 15, 16.

Trenton (Prosser): Near Cannon Falls, Minnesota.

*Holotype*.—Cat. No. 46354, U.S.N.M.

**Whitella quadrangularis** (Whitfield).

*Cypricardites quadrangularis* Whitfield, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 138, pl. 6, fig. 5.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 566, pl. 40, figs. 28-30.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 415, figs. 536c, d.



**Whitella quadrangularis**—Continued.

Richmond: Clarksville, Waynesville, etc., Ohio (Waynesville); Savannah, Illinois; Spring Valley, Minnesota (Maquoketa).

*Plesiotypes*.—Cat. Nos. 46355, 46356, U.S.N.M.

**Whitella rugatina** Ulrich.

*Whitella rugatina* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 569, pl. 41, fig. 1.

Black River (Decorah): Minneapolis, Minnesota.

*Holotype*.—Cat. No. 46357, U.S.N.M.

**Whitella scofieldi** Ulrich.

*Whitella scofieldi* Ulrich, Amer. Geol., 6, 1890, p. 181, fig. 15e; p. 382, fig. 16a-c;

Geol. Minnesota, 3, pt. 2, 1894, p. 571, pl. 41, figs. 17-21.—Grabau and Shimer, N. A. Index Fossils, 1 (3), 1909, p. 415, fig. 536a-b.

Black River: St. Paul and Cannon Falls, Minnesota (Decorah); Beloit, Wisconsin (Platteville).

*Holotype* and *plesiotype*.—Cat. Nos. 46358, 46359, U.S.N.M.

**Whitella securiformis** Foerste.

*Whitella securiformis* Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 299, pl. 1, fig. 1.

Cincinnatian (Pulaski): Riviere des Hurons, Quebec.

**Whitella? sigmoidea** (Billings).

*Cyrtodonta sigmoidea* Billings, Canadian Nat., Geol., 3, 1858, p. 438; Geol. Surv.

Canada, Rep. Progr. for 1857, 1858, p. 186; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 13, fig. 1a, b.

*Cypriardites sigmoidea* Miller, N. A. Geol., Pal., 1889, p. 477 (gen. ref.).

*Whitella? sigmoidea* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 565 (gen. ref.).

Richmond (English Head and Charleton) and Gamachian (Ellis Bay): Macasty Bay, near West End Lighthouse, etc., Anticosti.

**Whitella(?) siluriana** Kindle and Breger.

*Whitella(?) siluriana* Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res., Indiana, 1894, p. 447, pl. 10, fig. 15.

Niagaran: Wabash, Indiana.

**Whitella sterlingensis** (Meek and Worthen).

*Dolabra sterlingensis* Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1866, p. 260; Geol. Surv. Illinois, 3, 1868, p. 399, pl. 4, fig. 10a-c.

*Rhynchotropis sterlingensis* Meek, Proc. Acad. Nat. Sci. Philadelphia, 1872, p. 327.

*Cypriardites sterlingensis* Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 218.—

Whitfield, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 137.

*Whitella sterlingensis* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 567, pl. 41, figs. 27, 28.

Richmond (Maquoketa): Sterling, Illinois; Spring Valley, Minnesota; ?Richmond, Indiana.

**Whitella subcarinata** Ulrich.

*Whitella subcarinata* Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 572, pl. 41, figs. 22, 23.

Trenton (Prosser): Near Wykoff, Minnesota.

*Holotype*.—Cat. No. 46361, U.S.N.M.

**Whitella suborbicularis** Weller.

Whitella suborbicularis Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 169, pl. 11, fig. 2.

Trenton: Jacksonburg, New Jersey.

**Whitella subovata** Ulrich.

Whitella subovata Ulrich, Amer. Geol., 6, 1890, p. 386, fig. 18.

Richmond (Waynesville): Waynesville, Ohio.

*Cotypes*.—Cat. Nos. 40510, 46920, U.S.N.M.

**Whitella subtruncata** (Hall).

Edmondia subtruncata Hall, Pal. New York, 1, 1847, p. 156, pl. 35, figs. 3a-b (not fig. 3c, or pl. 34, fig. 9).

Cyrtodonta subtruncata Billings, Geol. Surv. Canada, Rep. Progr. for 1857, p. 185; Can. Nat. Geol., 3, 1858, p. 437.

Cypricardia subtruncata Emmons, Amer. Geol., 1, pt. 2, 1855, p. 174, pl. 13, fig. 2.

Whitella subtruncata Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 169, pl. 11, fig. 4.

Trenton: Middleville, Watertown, etc., New York; New Jersey; Canada.

**Whitella truncata** Ulrich.

Whitella truncata Ulrich, Amer. Geol., 6, 1890, p. 385, figs. 17a-c; Geol. Minnesota, 3, pt. 2, 1894, p. 572, pl. 41, figs. 10-14.

Trenton (Prosser): Goodhue County, Minnesota.

*Holotype* and *plesiotypes*.—Cat. No. 46363, U.S.N.M.

**Whitella umbonata** Ulrich.

Whitella umbonata Ulrich, Amer. Geol., 6, 1890, p. 178, figs. 14a-d.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1025, pl. 48, figs. 9-9c.

Richmond (Waynesville): Middletown, etc., Ohio; Indiana.

*Cotypes*.—Cat. Nos. 46364, 46365, U.S.N.M.

**Whitella ventricosa** (Hall).

Edmondia ventricosa Hall, Pal. New York, 1, 1847, p. 155, pl. 35, figs. 1a-f.

Cardiomorpha ventricosa Emmons, Amer. Geology, 1, pt. 2, 1855, p. 174, pl. 14, figs. 5, 6; pl. 13, figs. 13, 15.

Cypricardites ventricosa Miller, N. A. Geol., Pal., 1889, p. 477 (gen. ref.).—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 575, figs.

Bodmania ventricosa Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 17, 1894, p. 24.

Whitella ventricosa Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 573, pl. 41, figs. 24-26.—Ruedemann, Bull. New York State Mus., 49, 1901, p. 28.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 415, fig. 536e, f.

Trenton: Middleville, etc., New York; Goodhue and Fillmore Counties, Minnesota; Canada.

*Plesiotypes*.—Cat. No. 46366, U.S.N.M.

**WHITFIELDDELLA** Hall and Clarke.

Genotype: *Atrypa nitida* Hall.

Whitfieldella Hall and Clarke, Pal. New York, 8, 1893, p. 58; 13th Ann. Rep.

New York State Geol., 1895, p. 766.—Grabau, Bull. New York State Mus., 45, 1901, p. 201; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 201.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 346.

Whitfieldia (in error for Whitfieldella) Schuchert, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 415.

**Whitfieldella acuminata** Savage.

Whitfieldella acuminata Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 116, pl. 7, figs. 11, 12.

Upper Medinan (Channahon): Will County, Illinois.

**Whitfieldella(?) billingsana** (Meek and Worthen).

Centronella billingsana Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 352, figs. a, b, c; pl. 6, fig. 5.

Whitfieldella(?) billingsana Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 460.—Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 90, pl. 5, figs. 11, 12.

Upper Medinan (Edgewood): Near Thebes, Illinois; Edgewood, Missouri.

**Whitfieldella cylindrica** Hall.

Atrypa cylindrica Hall, Pal. New York, 2, 1852, p. 76, pl. 24, fig. 2.

Atrypa crassirostra Hall, Pal. New York, 2, 1852, p. 269, pl. 55, fig. 4.

Merista cylindrica Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 77.

Athyris cylindrica Billings, Geol. Canada, 1863, p. 317, fig. 333; Geol. Canada, 1863, p. 317, fig. 332.

Meristella (?Meristina) cylindrica Meek, Pal. Ohio, 1, 1873, p. 180, pl. 15, fig. 2.

Whitfieldella cylindrica Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 60,

pl. 40, figs. 16-22.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 203, fig. 127; Bull. New York State Mus., 45, 1901, p. 203, fig. 127.—Grabau and

Shimer, N. A. Index Fossils, 1, 1907, p. 347, fig. 445.

Clinton (Irondequoit): Lockport, etc., New York.

**Whitfieldella edmundsi** Williams.

Whitfieldella edmundsi Williams, Proc. U. S. Nat. Mus., 45, 1913, p. 320, pl. 29, figs. 1-4.

Silurian (Edmunds): Burnt Cove, Washington County, Maine.

Cotypes.—Cat. No. 58944, U.S.N.M.

**Whitfieldella erecta** Foerste.

Whitfieldella erecta Foerste, Cincinnati Soc. Nat. Hist., Jour., 21, 1909, p. 19, pl. 1, fig. 9A-C.

Cayugan (Kokomo): Kokomo, Indiana.

**Whitfieldella hyale** (Billings).

Charionella? hyale Billings, Pal. Foss., 1, 1862, p. 166, fig. 150.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, pl. 42, figs. 20, 21.

Whitfieldella hyale Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 60.—

Whiteaves, Pal. Foss. Geol. Surv. Canada, 3, pt. 2, 1895, p. 63.

Niagaran (Guelph): Galt and Elora, Ontario; Wisconsin.

**Whitfieldella intermedia** (Hall).

Atrypa intermedia Hall, Pal. New York, 2, 1852, p. 77, pl. 24, figs. 3, 4, ?6.—

Rogers, Geol. Pennsylvania, 2, 1838, pt. 2, p. 823, fig. 634.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 56, 4 figs.

Merista intermedia Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 77.

Athyris intermedia Nicholson and Hinde, Canadian Jour. Sci., 14, 1874, p. 157.—Nicholson, Pal. Prov. Ontario, 1875, p. 61, fig. 32A.

Whitfieldella intermedia Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 60,

pl. 40, figs. 1, 2.—Grabau, Bull. New York State Mus., 45, 1901, p. 203, fig. 126; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 203, fig. 126.—Grabau and

Shimer, N. A. Index Fossils, 1, 1907, p. 446, fig. 446.

Clinton (Irondequoit): Lockport, etc., New York.

**Whitfieldella(?) julia** (Billings).

Athyris Julia Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 146, text fig. 124 (adv. sheets, 1862).

Meristella julia Miller, N. A. Geol. Pal., 1889, p. 354.

Whitfieldella(?) julia Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 461.

Anticostian (Jupiter River): Jumpers, Anticosti.

**Whitfieldella laevis** (Vanuxem).

Atrypa laevis Vanuxem, Geol. New York, Rep. 3d Dist., 1842, p. 120, fig. 2.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 825, fig. 642.

Merista laevis Hall, 10th Rep. New York State Cab. Nat. Hist., 1857, p. 94, figs. 1-6; Pal. New York, 3, 1859, p. 247, pl. 39, figs. 3, 4.—Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 376, pl. 7, fig. 8.

Meristella laevis Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pl. 43, figs. 3-6; pl. 44, fig. 4.

Whitfieldella laevis Grabau, Bull. Geol. Soc. Amer., 11, 1900, p. 369, pl. 22, figs. 4a-d; Bull. New York State Mus., 45, 1901, p. 204, fig. 130; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 204, fig. 130.

Helderbergian: Albany and Schoharie Counties, New York; Pennsylvania; Maine; New Brunswick; Erie County, New York (Manlius transition beds).

**Whitfieldella lara** (Billings).

Athyris lara Billings, Catalogue Sil. Foss. Anticosti, 1866, p. 47.

Atrypa lara Davidson, Suppl. British Sil. Brach., Pal. Soc., 1882, p. 121.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 152.

Anticostian (Gun River and Jupiter River): Gull Cape, etc., Anticosti.

**Whitfieldella(?) minuta** Maynard.

Whitfieldella(?) minuta Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 442, pl. 78, figs. 41, 42.

Helderbergian (Keyser): Devil's Backbone and Roundtop, Maryland.

**Whitfieldella(?) naviformis** (Hall).

Atrypa naviformis Hall, Geol. New York, Rep. 4th Dist., 1843, p. 71, fig. 3; Pal. New York, 2, 1852, p. 76, pl. 24, fig. 1.—Nicholson and Hinde, Canadian Jour. Sci., n. s., 16, 1874, pp. 144, 157.—Owen, Amer. Jour. Sci. Arts, 48, 1845, p. 303, fig. 3.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 57, figs.

Meristella naviformis Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 78.

Athyris naviformis Billings, Geol. Canada, 1863, p. 317, fig. 320.—Nicholson, Pal. Prov. Ontario, 1875, p. 62, fig. 32E.

Whitfieldella naviformis Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 60, pl. 40, fig. 3.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1255, figs.

Clinton (Irondequoit): Sodus, Rochester, etc., New York.

**Whitfieldella nitida** (Hall).

Atrypa nitida Hall, Geol. New York, Rep. 4th Dist., Tab. Org. Rem., 13, 1843, fig. 5; Pal. New York, 2, 1852, p. 268, pl. 55, fig. 1.—Billings, Canadian Nat. Geol., 1, 1856, p. 137, pl. 2, fig. 9.

Merista nitida Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 78.—Safford, Geol. Tennessee, 1869, p. 315, fig.

Athyris nitida Hall, Geol. Canada, 1863, p. 317, fig. 334.

Meristella nitida Hall, Trans. Albany Inst., 4, 1863, p. 226.—Davidson, Mon. British Sil. Brach., 1867, p. 114, pl. 10, figs. 28-32.

Meristina nitida Hall, Pal. New York, 4, 1867, p. 299; 28th Rep. New York State Mus. Nat. Hist., 1879, p. 169, pl. 25, figs. 1-7; 11th Rep. State Geol. Indiana, 1882, p. 300, pl. 25, figs. 1-7.—Nettelroth, Kentucky Fossil Shells, Mem.

**Whitfieldella nitida**—Continued.

Kentucky Geol. Surv., 1889, p. 102, pl. 33, figs. 10, 11.—Beecher and Clarke, Mem. New York State Mus., 1, 1889, p. 70, pl. 7, figs. 6–10.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 396, figs.—Miller, N. A. Geol. Pal., 1889, p. 354, fig. 584.

*Whitfieldella nitida* Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 59, figs. 43, 44; pl. 40, figs. 4–13.—Grabau, Bull. New York State Mus., 45, 1901, p. 202, fig. 123; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 202, fig. 123.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 44, pl. 4, figs. 32–37.—Grabau, Bull. New York State Mus., 69, 1903, p. 1051, fig. 10.—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 444, pl. 9, figs. 13, 14.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 347, figs. 447–448.—Foerste, Cincinnati Soc. Nat. Hist., Jour., 21, 1909, p. 19.

Niagaran: Lockport, etc., New York; Ontario (Rochester); Waldron, Indiana (Waldron); Louisville, etc., Kentucky (Louisville); Tennessee.

*Plesiotype*.—Cat. No. 51332, U.S.N.M. (Nettelroth).

**WHITFIELDELLA NITIDA VAR. OBLATA** Grabau. See *Whitfieldella oblata*.

**Whitfieldella nitida oblata** (Hall).

*Atrypa nitida* var. *oblata* Hall, Pal. New York, 2, 1852, p. 269, pl. 55, fig. 2.

*Merista nitida* var. *oblata* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 78.

*Whitfieldella nitida* var. *oblata* Grabau, Bull. New York State Mus., 45, 1901, p. 202, fig. 124; Buffalo Soc. Nat. Sci., 7, 1901, p. 202, fig. 124.

Clinton (Rochester): Lockport, etc., New York; Hamilton, etc., Ontario.

**Whitfieldella(?) nucleolata** (Hall).

*Atrypa nucleolata* Hall, Pal. New York, 2, 1852, p. 328, pl. 74, figs. 10a–m.

*Merista nucleolata* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 78.

*Meristella nucleolata* Whitfield, Geol. Wisconsin, 4, 1882, p. 321, pl. 25, fig. 5.

*Whitfieldella(?) nucleolata* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 461;

Amer. Geol., 31, 1903, p. 166.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 241, pl. 21, figs. 33–40.—Shimer, Bull. New York State Mus., 80, 1905, p. 254.—Grabau, Bull. New York State Mus., 92, 1906, p. 109, fig. 12.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 348, fig. 449.—Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 151, pl. 32, figs. 3a–b.—Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 441, pl. 73, figs. 37–40.

*Whitfieldella* cf. *rotundata* Grabau, Bull. Geol. Soc. Amer., 11, 1900, p. 68, pl. 22, figs. 3a, b.

Cayugan: Schoharie and Litchfield, New York (Cobleskill); Akron, New York (Akron).

Helderbergian: Keyser, West Virginia (Keyser); New Jersey.

**Whitfieldella oblata** (Hall).

*Atrypa oblata* Hall, Pal. New York, 2, 1852, p. 9, pl. 4, figs. 4, 5.

*Merista oblata* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 78.

*Whitfieldella(?) oblata* Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 60.—

Grabau, Bull. New York State Mus., 45, 1901, p. 203, fig. 125; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 203, fig. 125.

Upper Medinan: Lockport and Niagara, New York.

**Whitfieldella ovoldes** Savage.

*Meristella?* sp. Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 354, pl. 6, figs. 4a, b.

**Whitfieldella ovoides**—Continued.

*Whitfieldella ovoides* Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 90, pl. 5, figs. 13-15; pl. 7, fig. 13.

Upper Medinan: Near Thebes, Illinois, and Edgewood, Louisiana, etc., Missouri (Edgewood); Will County, Illinois (Channahon).

**Whitfieldella prosseri** Grabau.

*Meristella laevis* Whitfield (not Hall, 1859), Ann. New York Acad. Sci., 5, 1891, p. 510, pl. 5, figs. 6, 7; Ohio Pal., 7, 1893, p. 411, pl. 1, fig. 6.—Sherzer, Michigan Geol. Surv., 7, 1900, p. 223, pl. 17, figs. 6, 7.

*Whitfieldella prosseri* Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 152, pl. 21, figs. 3, 8, 9, 12-13; pl. 30, figs. 6-7.—Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 439, pl. 78, figs. 34-36.

Upper Monroan (Raisin River): Monroe County, Michigan; Lucas County, Ohio. Helderbergian (Keyser): Cherry Run, West Virginia.

**Whitfieldella quadrangularis** Foerste.

*Whitfieldella quadrangularis* Foerste, Bull. Kentucky Geol. Surv., 7, 1906, p. 327, pl. 1, figs. 4a-c.

Clinton (Indian Fields): Near Duncansville, Adams County, Ohio.

**Whitfieldella rotundata** (Whitfield).

*Nucleospira rotundata* Whitfield, Ann. New York Acad. Sci., 2, 1882, p. 194; *ibid.*, 5, 1891, p. 511, figs. 11-14; Geol. Ohio, 7, 1895, p. 413, pl. 1, figs. 11-14.—Sherzer, Michigan Geol. Surv., 7, 1900, pt. 1, p. 223, pl. 17, figs. 11-14.

*Whitfieldella rotundata* Grabau, Bull. New York State Mus., 45, 1901, p. 204, fig. 129; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 204, fig. 129.

*Whitfieldella cf. rotundata* Grabau, Bull. Geol. Soc. Amer., 11, 1900, p. 368, pl. 22, figs. 3a-b.

Monroan: Greenfield, Ohio; Monroe County, Michigan; Erie County, New York.

**Whitfieldella? solitaria** (Billings).

*Athyris solitaria* Billings, Catalogue Sil. Foss. Anticosti, 1866, p. 48.

Anticostian (Gun River, Jupiter River): Southwest Point, Anticosti.

**Whitfieldella? speciosa** Savage.

*Whitfieldella? speciosa* Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 91, pl. 5, figs. 16, 17.

Upper Medinan (Edgewood-Noix): Near Louisiana and south of Clarksville, Missouri; Hamburg, Illinois.

**Whitfieldella subquadrata** Foerste.

*Whitfieldella subquadrata* Foerste, Bull. Kentucky Geol. Surv., 7, 1906, p. 326, pl. 1, figs. 3a-f.

Clinton (Indian Fields): Four miles west of Berea, Kentucky.

**Whitfieldella subsulcata** Grabau.

*Whitfieldella subsulcata* Grabau, Geol. Surv. Michigan, Geol. Ser., 1, 1909, p. 155, pl. 32, figs. 4a-d.

*Whitfieldella cf. laevis* Grabau, Bull. Geol. Soc. Amer., 11, 1900, pp. 369-370, pl. 22, fig. 4a-d; Bull. 45, New York State Mus., Nat. Hist., 1901, p. 204, fig. 130.

Cayugan (Akron): Buffalo, Akron, and Williamsville, New York.

Lower Monroan (Greenfield): Greenfield and Ballville, Ohio.

**Whitfieldella sulcata** (Vanuxem).

*Atrypa sulcata* Vanuxem, Geol. New York Rep., 3d Dist., 1842, p. 112, fig. 5.—Hall, Geol. New York, 1, 1843, p. 349, fig. 5.—Owen, Amer. Jour. Sci. Arts, 2d ser., 1, 1846, p. 47, fig. 5.—Emmons, Man. Geol., 1860, p. 113, fig. 102.

**Whitfieldella sulcata**—Continued.

*Merista sulcata* Miller, Amer. Pal. Foss., 1877, p. 115.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 392, figs.

*Whitfieldella sulcata* Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 204, fig. 128; Bull. Geol. Soc. Amer., 11, 1900, p. 367, pl. 22, figs. 2a-d; Bull. New York State Mus., 45, 1901, p. 204, fig. 128.—Schuchert, Amer. Geol., 31, 1903, p. 167.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 348, fig. 450.—Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 156, pl. 32, figs. 2a-d.

*Merista bisulcata* Hall, Pal. New York, 3, 1859, p. 253.

Cayugan: Vienna, etc., eastern New York (Manlius); Buffalo, etc., western New York (Akron).

**WHITFIELDIA** Davidson. See *Meristina* Hall.

**WHITFIELDIA NAVIFORMIS** Lesley. See *Whitfieldella*(?) *naviformis*.

**WILSONIA** Kayser.

Genotype: *Terebratula wilsoni* Sowerby.

*Wilsonia* Kayser, Zeitschr. d. d. geol. Gesselsch., 23, 1871, p. 502.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 195; 13th Rep. New York State Geol., 1895, p. 827.—Koken, Die Leitfossilien, Leipzig, 1896, p. 245, fig. 207.—Williams, Bull. U. S. Geol. Surv., 165, 1900, p. 60.—Schuchert, Zittel-Eastman Textb. Pal., 1900, p. 324; *ibid.*, 2d ed., 1913, p. 398.

*Ucinulina* Bayle, Explic. de la Carte Geol. France, 4, Atlas, 1878, pl. 13, figs. 13-16.

**Wilsonia globosa** Weller.

*Wilsonia globosa* Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 235, pl. 21, figs. 12-22.—Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 369, pl. 65; figs. 15-17.

Helderbergian: Two miles south Tri States, New York (Decker Ferry); Cumberland, Cash Valley, Maryland (Keyser).

**Wilsonia kokomoensis** (Miller).

*Rhynchonella kokomoensis* Miller, 18th Ann. Rep. Geol. Surv. Indiana, 1894, p. 312, pl. 9, figs. 22-24 (adv. sheets, 1892, p. 58).

*Wilsonia kokomoensis* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 462.—Foerste, Cincinnati Soc. Nat. Hist., Jour., 21, p. 13.

Cayugan (Kokomo): Kokomo, Indiana.

**Wilsonia saffordi** (Hall).

*Rhynchonella saffordi* Hall, Canadian Nat. Geol., 5, 1860, p. 146.—Hall and Whitfield, 27th Rep. New York State Cab. Nat. Hist., 1875, pl. 9, figs. 27-29.—Dawson, Acadian Geol., 3d ed., 1878, p. 598.—Nettelroth, Kentucky Foss. Shells, Mem. Kentucky Geol. Surv., 1889, p. 79, pl. 27, figs. 22-24; pl. 33, figs. 4-6.

*Wilsonia saffordi* Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 198, pl. 58, figs. 5-14.—Foerste, Jour. Geol., 11, 1903, p. 710 (loc. occ.).—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 439, pl. 8, figs. 4-9.—Foerste, Bull. Denison Univ., Sci. Lab., 14, 1909, pl. 3, fig. 49.

Niagaran: Perry County, etc., Tennessee (Brownsport); Louisville, Kentucky (Louisville); Georgetown and Bunker Hill, Indiana.

*Plesiotype*.—Cat. No. 51350, U.S.N.M. (Nettelroth).

**Wilsonia saffordi depressa** (Nettelroth).

*Rhynchonella saffordi* var. *depressa* Nettelroth, Mem. Kentucky Fossil Shells, Kentucky Geol. Surv., 1889, p. 80, pl. 33, figs. 1-3.

Niagaran (Louisville): Louisville, Kentucky.

*Holotype*.—Cat. No. 51316, U.S.N.M.

**Wilsonia wilsoni** (Sowerby).

*Terebratulina wilsoni* Sowerby, Mineral Conch., 1818, p. 118, fig. 3.

*Rhynchonella wilsoni* Roemer, Sil. Fauna West Tennessee, 1860, p. 71, pl. 5, fig. 13.

*Wilsonia wilsoni* Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 198.—Schuchert, Bull. U. S. Geol. Surv., 273, 1897, p. 462.

Middle Silurian: Europe; Decatur County, Tennessee; Louisville, Kentucky; Lake Temiscouata, New Brunswick.

**WINGIA** Seely.

Genotype: *W. congregata* Seely.

*Wingia* Seely, Rep. Vermont State Geol., 5, 1906, p. 178.

Observation.—This genus and all of its species are based on the well-known intraformational (edgewise) conglomerates of the Beekmantown, some of which may be algal in origin.

**Wingia congregata** Seely.

*Wingia congregata* Seely, Rep. Vermont State Geol., 5, 1906, p. 178, pl. 39.

Canadian (Beekmantown): Shoreham, Fort Cassin, etc., Vermont.

**Wingia discoidea** Seely.

*Wingia discoidea* Seely, Rep. Vermont State Geol., 5, 1906, p. 179, pl. 39.

Canadian (Beekmantown): Shoreham, etc., Vermont.

**Wingia lapilla** Seely.

*Wingia lapilla* Seely, Rep. Vermont State Geol., 5, 1906, p. 179, pl. 40.

Canadian (Beekmantown): Shoreham, etc., Vermont.

**XENOCRINUS** Miller.

Genotype: *X. penicillus* Miller.

*Xenocrinus* Miller, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 71.—Carpenter, Proc. Roy. Soc. London, 35, 1883, p. 139; Philadelphia Trans. Roy. Soc. London, 174, 1884, p. 925.—Wachsmuth and Springer, Amer. Jour. Sci., 25, 1883, p. 266; Proc. Acad. Nat. Sci. Philadelphia, 1885, p. 317; Rev. Pal., 3, p. 94.—Miller, N. A. Geol. Pal., 1889, p. 287.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard., 20, 1897, p. 182.—J. F. James, Jour. Cincinnati Soc. Nat. Hist., 19, 1897, p. 106.—Bather, Treatise on Zool., pt. 3, Echinoderma, 1900, p. 165, fig. 78, 3.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 145.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 715.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 193.

**Xenocrinus baeri** (Meek).

*Glyptocrinus Baeri* Meek, Amer. Jour. Sci., 3d ser., 3, 1872, p. 260; Geol. Surv. Ohio, Pal., 1, 1873, p. 37, pl. 2, figs. 1a, b.—Miller, Jour. Cincinnati Soc. Nat. Hist., 3, 1880, p. 234, pl. 7, figs. 3, 4; *ibid.*, 6, 1883, p. 226.—James, *ibid.*, 8, 1885, p. 71.—Dyche, *ibid.*, 15, 1892, p. 101; Amer. Geol., 10, 1892, p. 130; Science, 20, 1892, p. 66.

*Reteocrinus Baeri* Wachsmuth and Springer, Amer. Jour. Sci., 25, 1883, p. 266.

*Xenocrinus Baeri* Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1885, pp. 316–318 (Rev. Pal., pt. 3, sec. 1, pp. 94, 95, 96); Mem. Mus. Comp., Zool., Harvard, 20, 1897, p. 185, pl. 9, figs. 5a–d.—James, Jour. Cincinnati Soc. Nat. Hist., 19, 1897, p. 108.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 734, pl. 4, figs. 1, 1a.

Richmond (Liberty): Richmond, Indiana; Waynesville, Ohio.

*Plesiotypes*.—Cat. No. 40761, U.S.N.M.



**Xenocrinus penicillus** Miller.

*Xenocrinus penicillus* Miller, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 72, pl. 1, figs. 3a-c; p. 176, pl. 4, fig. 6.—Carpenter, Philadelphia Trans. Royal Soc., London, 174, 1884, p. 924, pl. 71, fig. 8.—Miller, N. A. Geol. Pal., 1889, p. 287, fig. 444.—James, Jour. Cincinnati Soc. Nat. Hist., 19, 1897, p. 107.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 183, pl. 9, figs. 6a, b.

Richmond (Liberty): Waynesville, Ohio.

*Cotype* and *plesiotypes*.—Cat. No. 40758, U.S.N.M.

**XENOPHORA TRIGONOSTOMA** Whitfield. See *Diaphorostoma trigonostoma*.

**ZAPHRENTIS** Rafinesque.

Genotype: *Z. phrygia* Rafinesque and Clifford=*Z. cornicula* Leseur.

*Zaphrentis* Rafinesque, Ann. d. Sci. Phys. Bruxelles, 5, 1820, p. 234.—Edwards and Haine, Mon. d. Polyp. Foss. d. Terr. Pal., 1851 (Arch. du Mus. d'Hist. Nat., 5), p. 164, 326.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 452.—Billings, Canadian Nat. Geol., 3, 1858, p. 428; Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 176; Canadian Jour., n. s., 4, 1859, p. 119.—Milne-Edwards, Hist. Nat. d. Corall., 3, 1860, p. 335.—Ludwig, Paleontographica, 10, 1862, p. 204; *ibid.*, 14, 1865, p. 144, pl. 31, figs. 10, 13.—Koninck, Animaux Foss. Terr. Carb. Belgique (Mem. l'Acad. Royale Sci. de Belgique, 39), 1872, p. 80; *ibid.*, pt. 2, 1873, p. 8.—Dybowski, Archiv. f. Natur. Liv-, Ebst-und Kurl., 5, 1873, p. 335.—Nicholson, Rep. Pal. Prov. Ontario, pt. 1, 1874, p. 21.—Thomson and Nicholson, Ann. Mag. Nat. Hist., 4th ser., 16, 1875, p. 426.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 140.—Nicholson and Etheridge, Mon. Sil. Foss., Girvan Dist., 1878, pp. 69-70.—Zittel, Handb. Pal., 1, 1879, p. 228.—Thomson, Proc. Phil. Soc. Glasgow, 13, 1881, p. 216, fig. 4; *ibid.*, 14, 1883, p. 364.—Barrois, Rech. Terr. Anciens Asturies and Galice (Mem. Soc. Geol. Nord, 2), 1882, p. 300.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 362.—Hall and Simpson, Pal. New York, 6, 1887, p. 11.—Barrois, Mem. Soc. Geol. du Nord, 3, Lille, 1889, p. 52; Mem. Soc. Agric. et Arts Lille, 4th ser., 17, 1889, p. 52.—Miller, N. A. Geol. Pal., 1889, p. 208.—Sherzer, Amer. Geol., 7, 1891, pp. 284-289.—James, Jour. Cincinnati Soc. Nat. Hist., 15, pt. 4, 1893, p. 144.—Koken, Die Leitfossilien, Leipzig, 1896, p. 308.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 729.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 123; *ibid.*, 7, p. 137.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 118.—Grabau, Bull. New York State Mus., 45, 1901, p. 137.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 56.—Zittel-Eastman Textb. Pal., 1, 1900, p. 75; 2d ed., 1913, p. 83.

*Caninia* Michelin, Atti della riunione degli Scienziati italiani in Torino, 1841.—Dana, Wilkes's U. S. Expl. Exped., 1838-1842, 7, Zoophytes, 1846, p. 358; Amer. Jour. Sci. Arts, 2d ser., 1, 1846, p. 184.—D'Orbigny, Prodr. de Pal., 1, 1849, p. 105.—McCoy, British Pal. Rocks Foss., 1854, p. 28.—Dybowski, Archiv. natur. Liv-, Ebst-und Kurl., 5, 1873, p. 337.—Zittel, Handb. Pal., 1, 1879, p. 230.

*Polydilasma* Hall, Amer. Jour. Sci. Arts, 2d ser., 11, 1851, p. 399; Pal. New York, 2, 1852, p. 112; 12th Rep. New York State Cab. Nat. Hist., 1859, p. 85.—Sherzer, Amer. Geol., 7, 1891, pp. 284-289. (Genotype: *P. turbinatum* Hall.)

**Zaphrentis affinis** Billings.

*Zaphrentis affinis* Billings, Canadian Nat. Geol., n. s., 2, 1865, p. 430; Cat. Sil. Foss. Anticosti Geol. Surv. Canada, 1866, pp. 7, 34.—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 118, pl. 7, figs. 6, 6a, b.

**Zaphrentis affinis**—Continued.

*Zaphrentis bellistriata* Billings, Canadian Nat. Geol., n. s., 2, 1865, p. 430; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, pp. 8, 34.

Richmond (Charleton) and Gamachian (Ellis Bay): Wreck Point, Gamache Bay, etc., Anticosti.

**Zaphrentis ambigua** Savage.

*Zaphrentis ambigua* Savage, Bull. Geol. Surv., Illinois, 23, 1913, p. 109, pl. 7, fig. 2.

Upper Medinan: Will County, Illinois (Channahon); near Edgewood, Louisiana, and Clarksville, Missouri (Edgewood).

ZAPHRENTIS BELLISTRIATA Billings. See *Zaphrentis affinis*.

ZAPHRENTIS BIGSBYI Billings. See *Omphyma verrucosa*.

**Zaphrentis bilateralis** (Hall).

*Caninia bilateralis* Hall, Pal. New York, 2, 1852, p. 41, pl. 17, figs. 3a-h; p. 113, pl. 32, figs. 3a-c.

*Zaphrentis bilateralis* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 79 (gen. ref.).

Clinton: Reynale's Basin, Lockport, etc., New York.

Early Silurian: Reynale's Basin, Lockport, etc., New York (Clinton); Lake Huron (Cataract).

ZAPHRENTIS CANADENSIS Billings. See *Streptelasma rusticum*.

**Zaphrentis celator** Hall.

*Zaphrentis celator* Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed. for 1875, 1877, pl. 5, figs. 5, 6; mus. ed., 1879, p. 107, pl. 5, figs. 5, 6; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 227, pl. 4, figs. 5, 6.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1267, figs.

Niagaran (Waldron): Waldron, Indiana.

**Zaphrentis celator daytonensis** (Foerste).

*Cyathophyllum celator Daytonensis* Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 339, pl. 9, figs. 9-11; Geol. Surv. Ohio., Pal., 7, 1893, p. 601, pl. 34, figs. 9-11.

Alexandrian (Brassfield): Soldiers' Home, near Dayton, Ohio.

**Zaphrentis charaxata** Foerste.

*Zaphrentis charaxata* Foerste, Bull. Kentucky Geol. Surv., 7, 1906, p. 310, pl. 7, figs. 4a-e.

Clinton (Waco): Near Irvine and Panola, Kentucky.

ZAPHRENTIS CINCTOSA Billings. See *Amplexus shumardi*.

ZAPHRENTIS CONULUS Davis. See *Streptelasma conulus*.

ZAPHRENTIS CORNICULUM Davis. See *Streptelasma rusticum*.

**Zaphrentis cristulata** Hall.

*Zaphrentis cristulata* Hall, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 414 (ext., 1882, p. 10).

Niagaran (Racine): Racine, Wisconsin.

**Zaphrentis denticulata** (Goldfuss).

*Anthophyllum denticulatus* Goldfuss, Petrefacta, 1826, p. 46, pl. 13, fig. 11.

*Zaphrentis denticulata* Edwards and Haime, Mon. Polyp. Foss. Terr. Pal. (Arch. du Mus. Hist. Nat., 5), 1851, p. 412.

Silurian: Vicinity of Niagara River.

Observation.—Not recognizable. Figure represents cast of some cup coral.

- Zaphrentis desori** Edwards and Haime. Not recognized.  
*Zaphrentis desori* Edwards and Haime, Mon. Polyp. Foss. Terr. Pal. (Arch. du Mus. Hist. Nat., 5), 1851, p. 333.  
 Silurian: Perry County, Tennessee.
- ZAPHRENTIS INEQUALIS** Hall. See *Streptelasma divaricans*?
- Zaphrentis intertexta** Foerste.  
*Zaphrentis intertexta* Foerste, Bull. Kentucky Geol. Surv., 7, 1906, p. 307, pl. 7, figs. 1a, b.  
 Clinton (Waco): Near Irvine and Clay City, Kentucky.
- Zaphrentis intertexta irvineusis** Foerste.  
*Zaphrentis intertexta-irvineusis* Foerste, Bull. Kentucky Geol. Surv., 7, 1906, p. 309, pl. 7, figs. 5A, B.  
 Clinton (Waco): Near Irvine, Kentucky.
- Zaphrentis intertexta juvenis** Foerste.  
*Zaphrentis intertexta-juvenis* Foerste, Bull. Kentucky Geol. Surv., 7, 1906, p. 309, pl. 7, figs. 5C-D.  
 Clinton (Waco): Near Irvine, Kentucky.
- Zaphrentis keyserensis** Swartz.  
*Zaphrentis keyserensis* Swartz, Maryland Geol. Surv., Low. Dev., 1913, p. 201, pl. 19, figs. 1-4.  
 Helderbergian (Keyser): Keyser, West Virginia.
- Zaphrentis latisinus** Hall.  
*Zaphrentis latisinus* Hall, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 414 (ext. 1882, p. 10).  
 Niagaran: Drummond Island, Lake Huron.
- Zaphrentis marcoul** Edwards and Haime.  
*Zaphrentis marcoui* Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal. (Arch. du Mus. d'Hist. Nat., 5), 1851, p. 337.—Milne Edwards, Hist. Nat. d. Corall., 3, 1860, p. 344.  
 Clinton: Lockport, New York.
- Zaphrentis obliqua** Davis.  
*Zaphrentis obliqua* Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 133, figs. 15-17.  
 Niagaran (Louisville?): Near Louisville, Kentucky.
- Zaphrentis ofleyensis** Etheridge.  
*Zaphrentis ofleyensis* Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 588, pl. 26, figs. 2, 2a.  
 Niagaran: Ofley Island, Kennedy Channel, Arctic America.
- Zaphrentis? ohioensis** James.  
*Zaphrentis? ohioensis* James, Paleontologist, No. 4, 1879, p. 26; Jour. Cincinnati Soc. Nat. Hist., 15, pt. 4, 1893, p. 145, fig. 8.  
 Maysville (Corryville): Cincinnati, Ohio.  
 Observation.—Not recognized. Possibly based upon the gastropod *Dyeria costata*.
- Zaphrentis patens** Billings.  
*Zaphrentis patens* Billings, Canadian Nat. Geol., n. s., 2, 1865, p. 430; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 33.—?Davis, Kentucky Fossil

**Zaphrentis patens**—Continued.

- Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 133, figs. 10, 11.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 119, pl. 8, figs. 2, 2a.  
 Anticostian (Jupiter River): Cormorant Point, Anticosti.  
 ?Niagaran: Near Brunerstown, Kentucky.

ZAPHRENTIS PATULA Davis. See *Streptelasma patula*.

**Zaphrentis pressula** Hall.

- Zaphrentis pressula Hall, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 414 (ext. 1882, p. 10).  
 Niagaran: St. Charles, Illinois.

**Zaphrentis racinensis** Whitfield.

- Zaphrentis Racinensis Whitfield, Ann. Rep. for 1879, Wisconsin Geol. Surv., 1880, p. 65; Geol. Wisconsin, 4, 1882, p. 277, pl. 14, figs. 1, 2.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 188, fig.  
 Zaphrentis cf. racinensis Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 23, pl. 1, figs. 2, 3.  
 Niagaran: Racine and Wauwatosa, Wisconsin (Racine); Shelby and Rochester, New York (Guelph).

ZAPHRENTIS RADICANS Davis. See *Streptelasma radicans*.

ZAPHRENTIS RUSTICUS Billings. See *Streptelasma rusticum*.

**Zaphrentis scutella** Davis.

- Zaphrentis scutella Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 133, figs. 1-3.  
 Niagaran (Louisville): Near Louisville, Kentucky.

ZAPHRENTIS SHUMARDI Lambe. See *Amplexus shumardi*.

**Zaphrentis socialis** Davis.

- Zaphrentis socialis Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 133, figs. 7-9.  
 Niagaran: Near Brunerstown, Jefferson County, Kentucky.

ZAPHRENTIS SPONGIAXIS Davis. See *Streptelasma spongiaxis*.

**Zaphrentis stokesi** Edwards and Haime.

- Zaphrentis stokesi Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal. (Arch. du Mus. d'Hist. Nat.), 5, 1851, p. 330, pl. 3, fig. 9.—Milne Edwards, Hist. Nat. d. Corall., 3, 1860, p. 337.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 308, fig. 311; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 34.—Nicholson and Ilind, Canadian Jour., n. s., 14, 1874, p. 140.—Nicholson, Pal. Ontar'io, 1875, pp. 43, 58.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 145, pl. 51, lower tier.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1277, fig.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 120, pl. 9, figs. 1, 1a, 2.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 243.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 57.  
 Zaphrentis cf. stokesi Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 63, pl. 3, fig. 4.  
 Niagaran: Drummond Island, etc., Lake Huron; Lake Temiscaming, Canada; Iowa; Michigan.  
 Anticostian (Beesie River, Chicotte): Island of Anticosti.

**Zaphrentis subregularis** Savage.

*Zaphrentis subregularis* Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 62, pl. 3, fig. 5; pl. 7, fig. 1.

Upper Medinan: Pike County, Missouri (Edgewood); Will County, Illinois (Channahon).

**Zaphrentis subvada** Hall.

*Zaphrentis subvada* Hall, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 415 (ext., 1882, p. 11).

Niagaran (Racine): Racine, Wisconsin.

**Zaphrentis subvesicularis** Hall.

*Zaphrentis subvesicularis* Hall, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 414 (ext., 1882, p. 10).

Niagaran (Louisville?): Charlestown, Indiana.

**Zaphrentis turbinata** (Hall).

*Polydidasma turbinatum* Hall, Pal. New York, 2, 1852, p. 112, pl. 32, figs. 2a-i.

*Zaphrentis?* *turbinatum* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 85 (gen. ref.).—Grabau, Bull. New York State Mus., 45, 1901, pp. 137, 138, fig. 30; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 137, fig. 30.

Niagaran (Lockport): Lockport, New York.

**Zaphrentis umbonata** Rominger.

*Zaphrentis umbonata* Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 146, pl. 51, lower tier.

Niagaran: Drummonds Island and Point Detour, Michigan; Louisville, Kentucky.

**Zaphrentis unica** Davis.

*Zaphrentis unica* Davis, Kentucky Foss. Corals, pt. 2, Geol. Surv. Kentucky, 1885, pl. 132, figs. 7-10.

Niagaran (Louisville): Louisville, Kentucky.

**ZDÍMIR** Barraude. See *Conchidium* Linnaeus.**ZITTELELLA** Ulrich and Everett. Genotype: *Z. typicalis* Ulrich and Everett.

*Zittelella* Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 267.—Ulrich and Everett in Miller, N. A. Geol. Pal., 1889, p. 167.

**Zittelella inosculata** Ulrich and Everett.

*Zittelella inosculata* Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 271, pl. 5, figs. 6, 6a.

Black River (Platteville): Near Dixon, Illinois.

**Zittelella lobata** Ulrich and Everett.

*Zittelella lobata*, Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 270, pl. 4, figs. 3a-c.

Black River (Platteville): Near Dixon, Illinois.

Figured sections of *cotype*.—Cat. No. 46575, U.S.N.M.

**Zittelella trentonensis** (Worthen).

*Cnemidium?* *Trentonensis* Worthen, Geol. Surv. Illinois, 6, 1875, pp. 491, 492, fig. Palaeospongia *trentonensis* Miller, N. A. Geol. Pal., 1889, p. 162, fig. 113.

*Zittelella trentonensis* Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 270.

Black River (Platteville): Near Dixon, Illinois.

**Zittelella typicalis** Ulrich and Everett.

*Zittelella typicalis* Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 268, pl. 5, figs. 3, 3a-c, 5, 5a.

Black River (Platteville): Near Dixon, Illinois.

Figured sections of *cotype*.—Cat. No. 46576, U.S.N.M.

**Zittelella typicalis pistilliformis** Ulrich and Everett.

*Zittelella typicalis* var. *pistilliformis* Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 269, pl. 5, fig. 4.

Black River (Platteville): Near Dixon, Illinois.

**Zittelella typicalis subrotunda** Ulrich and Everett.

*Zittelella typicalis* var. *subrotunda* Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 269, pl. 5, figs. 2, 2a.

Black River (Platteville): Near Dixon, Illinois.

**Zittelella typicalis turbinata** Ulrich and Everett.

*Zittelella typicalis* var. *turbinata* Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 269, pl. 5, figs. 7, 7a.

Black River (Platteville): Near Dixon, Illinois.

**Zittelella varians** (Billings).

*Eospongia varians* Billings, Geol. Vermont, 2, 1861, p. 956; Rep. Econ. Geol., etc., Vermont, 1862, p. 228; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 19 (adv. sheets, 1861).

*Zittelella varians* Schuchert and Twenhofel, Bull. Geol. Soc. Amer., 21, 1910, p. 690.

Chazyan: Mingan Islands, Canada (Mingan); East Tennessee (Lenoir).

**ZITTELOCERAS** Hyatt.

Genotype: *Cyrtoceras lamellosum* Hall.

*Zitteloceras* Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 284; Zittel-Eastman Textb. Pal., 1, 1900, p. 522; 2d ed., 1913, p. 603.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 76.

**Zitteloceras billingsi** (Salter).

*Cyrtoceras billingsi* Salter, Geol. Surv. Canada, Canad. Org. Rem., dec. 1, 1859, p. 33, pl. 7, fig. 6 (not 5=*Zitteloceras hallianum*).—Clarke, Geol. Minnesota, Pal., 3, pt. 2, 1897, p. 806, pl. 60, fig. 10.

*Zitteloceras billingsi* Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 76.

Black River: Allumette Island, Ottawa River, Canada (Leray); Cannon Falls, Minnesota (Platteville); Lincoln County, Missouri (Auburn).

**Zitteloceras hallianum** (D'Orbigny).

*Cyrtoceras lamellosum* Hall (not Verneuil, 1842), Pal. New York, 1, 1847, p. 93, pl. 41, figs. 2a-c.

*Cyrtoceras billingsi* Salter, Geol. Surv. Canada, Can. Org. Rem., dec. 1, 1859, p. 33, pl. 7, fig. 5 (not 6=*Zitteloceras billingsi*).

*Cyrtoceras hallianum* D'Orbigny, Prodr. Pal., 1, 1849, p. 1.—Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 805, pl. 60, figs. 11, 12.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1028.

*Zitteloceras hallianum* Ruedemann, Bull. New York State Mus., 49, 1901, p. 41.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 76, fig. 1291.

Trenton: Middleville, etc., New York; Canada.

Black River: Janesville, Wisconsin (Platteville); Minneapolis, Minnesota (Decorah).

**ZOPHOCRINUS** Miller.Genotype: *Z. howardi* Miller.

*Zophocrinus* Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 642 (adv. sheets, 1891, p. 32); N. A. Geol. Pal., 1st App., 1892, p. 683.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 152, fig. 57.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 151, fig. 63.—Slocum, Field Columbian Mus., 2, Geol. Ser., 1908, p. 284, fig. 5.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 474.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 158.

**Zophocrinus globosus** Slocum.

*Zophocrinus globosus* Slocum, Field Columbian Mus., Geol. Ser., 2, 1908, p. 235, pl. 85, figs. 15–19.

Niagaran (Racine): Drainage Canal, near Lemont, Illinois.

**Zophocrinus howardi** Miller.

*Zophocrinus howardi* Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 643, pl. 6, figs. 26–28 (adv. sheets, 1891, p. 33); N. A. Geol. Pal., 1st App., 1892, p. 683, fig. 1254.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 152, pl. 15, fig. 13.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 151, fig. 63.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 474, fig. 1785.

Niagaran: St. Paul, Minnesota (Laurel); Lemont, Illinois (Racine).

**Zophocrinus pyriformis** Slocum.

*Zophocrinus pyriformis* Slocum, Field Columbian Mus., Geol. Ser., 2, 1908, p. 285, pl. 85, figs. 12–14.

Niagaran (Racine): Romeo, Illinois.

**ZYGOSPIRA** Hall.Genotype: *Atrypa modesta* Hall.

*Stenocisma* Hall (not Conrad), Pal. New York, 1, 1847, p. 142.—Meek and Hayden, Pal. Upper Missouri, Smiths. Cont. to Knowl., 14, 1864, p. 16.

*Zygospira* Hall, 15th Rep. New York State Cab. Nat. Hist., 1862, p. 154, figs. 1–2.—Billings, Canadian Nat. Geol., 7, 1862, p. 393.—Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, p. 267.—Meek, Geol. Surv. Illinois, 3, 1868, p. 377.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 58.—Zittel, Handb. Pal., 1, 1880, p. 688.—Davidson, Suppl. British Sil. Brach., Pal. Soc., 1882, pp. 86, 119, 122.—Beecher, Amer. Jour. Sci., 3d ser., 44, 1892, p. 152.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 465.—Beecher and Schuchert, Biol. Soc. Washington, 8, 1893, pp. 71–82.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 154.—Beecher, Bull. U. S. Geol. Surv., 87, 1897, pp. 110, 111.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 307.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 896.—Schuchert, Zittel-Eastman Textb. Pal., 1900, p. 333; 2d ed., 1913, p. 408.

*Anazyga* Davidson, Suppl. British Sil. Brach., Pal. Soc., 1882, p. 128.—Miller, N. A. Geol. Pal., 1889, p. 334. (Genotype: *Atrypa recurvirostra* Hall.)

*Hallina* Winchell and Schuchert, Prel. Desc. Amer. Geol., 9, 1892, pp. 291, 292.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 760. (Genotype: *H. saffordi* Winchell and Schuchert.)

*Protozyga* Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 151; 13th Ann. Rep. New York State Geol., 1895, pp. 809, 810, 812. (Genotype: *Atrypa exigua* Hall.)

*Orthonomæa* Hall, Note in Cont. Pal. New York, 1859 (not defined).—Hall and Clarke, 47th Rep. New York State Mus., 1894, p. 1008. (Genotype: *O. erratica* Hall.)

**Zygospira(?) acutirostris** Hall.

*Atrypa acutirostra* Hall, Pal. New York, 1847, 1, p. 21, pl. 4 bis, fig. 6.—Emmons Amer. Geology, 1, pt. 2, 1855, p. 192, pl. 3, fig. 27.

*Rhynchonella acutirostris* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 65.

*Zygospira(?) acutirostris* Raymond, Ann. Carnegie Mus., 7, 1911, p. 227, pl. 34, figs. 15-22.

Chazyan (Day Point-Valcour): Valcour Island, Valcour, Chazy, and Crown Point, New York; Isle La Motte, Vermont.

*ZYGOSPIRA ANTICOSTIENSIS* Davidson. See *Catazyga anticostiensis*.

*ZYGOSPIRA AQUILA* Sardeson. See *Zygospira nicolleti*.

**Zygospira cincinnatensis** Meek.

*Zygospira cincinnatensis* James, Cat. Foss. Cincinnati Group, 1890, p. 11 (nom. nud.).—Meek, Pal. Ohio, 1, 1873, p. 126, pl. 11, fig. 5.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 59.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1282, 2 figs.—Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pl. 54, figs. 13, 14.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 945, pl. 36, figs. 9-9b.—Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 30, pl. 6, figs. 16a, b.

*Zygospira modesta* var. *cincinnatensis* Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 308.

Maysville (Mount Hope and Fairmount): Cincinnati, Ohio; Vevay, Indiana; north of Mason, Kentucky.

**Zygospira concentrica** Ulrich.

*Zygospira concentrica* Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 14, pl. 7, fig. 10.

Maysville (Fairmount): Cincinnati, Ohio, and vicinity.

**Zygospira deflecta** (Hall).

*Atrypa deflecta* Hall, Pal. New York, 1, 1847, p. 140, pl. 33, fig. 4.—Emmons, Amer. Geology, 1, pt. 2, 1855, pl. 10, fig. 4.

*Zygospira deflecta* Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 157.

Trenton: Lewis County, New York; Ottawa, Ontario.

**Zygospira? erratica** (Hall).

*Orthis? erratica* Hall, Pal. New York, 1, 1847, p. 288, pl. 79, fig. 5.

*Zygospira erratica* Davidson, Suppl. British Sil. Brach., Pal. Soc., 1882, p. 126.

*Catazyga erratica* Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 158, pl. 54, figs. 17-23.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 266.

*Orthonomæa erratica* Hall and Clarke, 47th Rep. New York State Mus., 1894, p. 1008.

Cincinnati (Pulaski): Washingtonville, Pulaski, etc., New York; various localities east of Ottawa, Ontario.

**Zygospira exigua** (Hall).

*Atrypa exigua* Hall, Pal. New York, 1, 1847, p. 141, pl. 33, fig. 6.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 190, pl. 10, fig. 6.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 55, figs.

Genus? *exigua* Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 66.

*Protozyga exigua* Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 149, figs. 137, 138; pl. 54, figs. 47, 48.

*Zygospira exigua* Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 463.

Trenton: Lowville, Watertown, and Martinsburg, New York.



*ZYGOSPIRA HEADI* Hall. See *Catazyga headi*.

*ZYGOSPIRA HEADI* Meek. See *Catazyga headi schuchertana*.

***Zygospira kentuckiensis* James.**

*Zygospira modesta* var. *kentuckiensis* James, *Paleontologist*, 1878, p. 7.

*Zygospira kentuckiensis* Nettelroth, *Kentucky Fossil Shells*, Mem. Kentucky Geol. Surv., 1889, p. 138, pl. 34, figs. 21-25.—Hall and Clarke, *Pal. New York*, 8, pt. 2, 1895, pl. 54, figs. 11, 15, 16.—Foerste, *Amer. Geol.*, 31, 1903, p. 336 (loc. occ.).

Richmond (Waynesville): Oldham and Jefferson Counties, Kentucky.

*Plesiotypes*.—Cat. No. 51187, U.S.N.M. (Nettelroth).

***Zygospira(?) mica* (Billings).**

*Rhynchonella mica* Billings, *Cat. Sil. Foss. Anticosti*, 1866, p. 44.

*Zygospira?* *mica* Hall and Clarke, *Pal. New York*, 8, pt. 2, 1893, p. 157.

Anticostian (Jupiter River): The Jumpers, Anticosti.

***Zygospira(?) minima* Hall.**

*Zygospira minima* Hall, *Desc. new species Foss. Waldron, Indiana*, 1879, p. 14; 11th Rep. *Indiana State Geol.*, 1882, p. 305, pl. 27, fig. 7; *Trans. Albany Inst.*, 10, 1883, p. 70.—Lesley, *Geol. Surv. Pennsylvania*, Rep. P 4, p. 1283, fig.

Niagaran (Waldron): Waldron, Indiana.

***Zygospira modesta* Hall.**

*Atrypa modesta* (Say) Hall, *Pal. New York*, 1, 1847, p. 141, pl. 15, fig. 15.—Emmons, *Amer. Geology*, 1860, 1, pt. 2, p. 192, pl. 10, fig. 15.—Hall, 13th Rep. *New York State Cab. Nat. Hist.*, 1860, p. 69.

*Zygospira modesta* Hall, 15th Rep. *New York State Cab. Nat. Hist.*, 1862, p. 154; 20th Rep., *ibid.*, 1867, p. 267, fig. 12.—Meek, *Pal. Ohio*, 1, 1873, p. 125, pl. 11, fig. 4.—Miller, *Cincinnati Quart. Jour. Sci.*, 2, 1875, p. 58.—Davidson, *Geol. Mag.*, dec. 2, 8, 1881, p. 12, fig. 15.—Chamberlin, *Geol. Wisconsin*, 1, 1883, p. 174, fig.—Miller, *N. A. Geol. Pal.*, 1889, p. 388, fig. 640.—Lesley, *Geol. Surv. Pennsylvania*, Rep. P 4, 1890, p. 1283, figs.—Winchell and Schuchert, *Geol. Minnesota*, 3, 1893, p. 467, pl. 34, figs. 42-44.—Hall and Clarke, *Pal. New York*, 8, pt. 2, 1893, p. 155, figs. 146-149; pl. 54, figs. 7-10, 12.—Keyes, *Geol. Surv. Missouri*, 5, 1895, p. 98.—Grabau and Shimer, *N. A. Index Fossils*, 1, 1907, p. 308, fig. 385f-i.—Cumings, 32d Ann. Rep. *Dep. Geol. Nat. Res. Indiana*, 1908, p. 946, pl. 36, figs. 8-8i.—Foerste, *Bull. Sci. Lab. Denison Univ.*, 16, 1910, p. 29, pl. 2, fig. 15a-b.—Bassler, *Bull. Virginia Geol. Surv.*, 2a, 1909, pl. 14, figs. 13-15.

*Rhynchonella?* *modesta* Billings, *Geol. Canada*, 1863, p. 211, fig. 211.

Eden-Richmond: Cincinnati, Ohio (Fairmount), and vicinity; Ohio; Kentucky; Indiana; Tennessee; Virginia; New York; Iowa, etc.

*ZYGOSPIRA MODESTA* VAR. *CINCINNATIENSIS* Grabau and Shimer. See *Zygospira cincinnatiensis*.

*ZYGOSPIRA MODESTA* VAR. *KENTUCKIENSIS* James. See *Zygospira kentuckiensis*.

***Zygospira nicolleti* Winchell and Schuchert.**

*Hallina nicolleti* Winchell and Schuchert, *American Geol.*, 9, April 1, 1892, p. 293; *Geol. Minnesota*, 3, 1893, p. 474, pl. 34, figs. 59-62.

*Zygospira aquila* Sardeson, *Bull. Geol. Minnesota*, 3, April 9, 1892, p. 335, pl. 4, figs. 15-18.

**Zygospira nicolleti**—Continued.

*Zygospira nicolleti* Beecher and Schuchert, Biol. Soc. Washington, 8, pt. 2, 1893, p. 71, pl. 10, fig. 23; pl. 11, figs. 11, 12.—Weller, Geol. Surv. New Jersey, Pal., 3, p. 161, pl. 10, figs. 27-30.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 308, fig. 386a-c.

Black River: Minneapolis; Rochester, and Fountain, Minnesota; Decorah, Iowa; Beloit, Wisconsin; Auburn, Missouri; New Jersey.

**Zygospira obsoleta** (Foerste).

*Protozyga obsoleta* Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 133, pl. 2, figs. 10a, b.

Trenton (Cynthiana): Near Millersburg, etc., Kentucky.

**Zygospira paupera** Billings.

*Zygospira paupera* Billings, Cat. Sil. Fossils Anticosti, 1866, p. 46.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 157.

Anticostian (Gun River, Jupiter River): Near Jupiter River, etc., Anticosti.

*ZYGOSPIRA PUTILLA* Hall and Clarke. See *Atrypa putilla*.

**Zygospira recurvirostris** (Hall).

*Atrypa recurvirostris* Hall, Pal. New York, 1, 1847, p. 140, pl. 33, fig. 5.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 191, pl. 10, fig. 5.

*Rhynchonella recurvirostris* Billings, Geol. Canada, 1863, p. 168, fig. 152.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 899, figs.

*Anazyga recurvirostra* Davidson, Suppl. British Sil. Brach., Pal. Soc., 1892, p. 219.

*Zygospira recurvirostra* Chamberlin, Geol. Wisconsin, 1, 1883, p. 155, fig.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 466, pl. 34, figs. 38-41.—Beecher and Schuchert, Biol. Soc. Washington, 8, 1893, p. 71, pl. 10, figs. 7-21; pl. 11, figs. 1-10.—Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pl. 54, figs. 1-6.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 3, 1897, p. 180.—Beecher, Bull. U. S. Geol. Surv., 87, 1897, p. 111, fig. 6.—Ruedemann, Bull. New York State Mus., 49, 1902, p. 27.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 161, pl. 10, figs. 23-26.—Grabau and Shirmer, N. A. Index Fossils, 1, 1907, p. 307, fig. 385a-e.—Bassler, Bull. Virginia Geol. Surv., 2a, 1909, pl. 7, figs. 4, 5.—Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 132, pl. 1, fig. 2.

Black River, Trenton: Martinsburg, etc., New York; Kentucky; Iowa; Minnesota; Wisconsin; Ontario; Manitoba, etc.

**Zygospira saffordi** Winchell and Schuchert.

*Hallina saffordi* Winchell and Schuchert, Amer. Geol., 9, 1892, p. 292; Geol. Minnesota, 3, 1893, p. 473, pl. 34, figs. 55-58.—Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pl. 83, figs. 36-38.

*Zygospira saffordi* Beecher and Schuchert, Biol. Soc. Washington, 8, 1893, p. 71, pl. 10, fig. 22; pl. 11, figs. 13, 13a.—Hall and Clarke, Pal. New York, 8, pt. 2, 1895, p. 151, figs. 139-141.

Stones River (Lebanon): Lebanon, Tennessee.

*ZYGOSPIRA UPHAMI* Winchell and Schuchert. See *Catazyga uphami*.

## INDEX OF SPECIFIC NAMES.

The following index shows the specific and varietal names employed for American Ordovician and Silurian fossils and indicates the genera or combinations under which each has been used.

- abbreviata**—Calymene, Cyrtospira, Lep-  
ereditia hisingeri, Lophospira uniangula-  
ta, Murchisonia, Murchisonia uniangula-  
ta, Ruedemannia, Subulites.
- abditā**—Ophileta.
- abnormalis**—Pseudocrinites.
- abnormis** (e)—Actinoceras, Æchmina,  
Clonograptus, Dichograptus, Graptoli-  
thus, Graptolithus (Monoprion), Holo-  
cystites, Lophospira, Orthoceras.
- aboyensis**—Illænus.
- abruptus** (a, um)—Bathyurellus, Colpo-  
mya, Corynotrypa, Ctenodonta, Cyrtoceras,  
Gyroceras, Liospira, Oncoceras,  
Orthoceras, Paleopupa, Pleurotomaria,  
Sericlnites, Tellinomya, Vanuxemia.
- absimilis**—Ctenodonta, Tellinomya.
- acadiæ**—Rhynchospira, Trematospira.
- acadicus** (a, um)—Agnostus, Ctenopyge,  
Cythaspis, Dictyonema flabelliforme,  
Diplaspis, Grammysia, Pteraspis.
- acadiensis**—Crania, Helopora fragilis
- acamas**—Bronteus, Goldius.
- acanthinus**—Callicrinus.
- acanthonotus**—Tetragrapsus.
- acanthoptera**—Stropheodonta, Strophom-  
ena.
- acanthura**—Protopeltura.
- accelerans**—Eurystomites.
- acceleratum**—Cycloceras inceptum, Or-  
thoceras inceptum.
- accola**—Eunoa.
- acervulosa**—Cyphotrypa, Leptotrypa.
- achates**—Dalmanites, Pterygomotopus.
- aciculatus** (a)—Arabellites, Murchisonia.
- acinacellum**—Cyrtoceras.
- acinus**—Camarotoecchia, Rhynchonella.
- acmea** (um)—Fenestella, Semicoscium.
- acrea**—Murchisonia, Turritoma.
- aculeatus**—Ceratiocaris, Cladopora, Dim-  
erocrinus, Diplograptus, Hormotoma,  
Loxonema, Rhodocrinus (Thysanocri-  
nus).
- acuminatus** (a, um)—Ceratiocaris, Daw-  
sonia, Escharopora, Glossina, Lacco-  
phyllum, Lingula, Lingulella, Lingu-  
lepis, Lophospira, Lyrodesma, Maclur-  
rea, Maclurites, Murchisonia, Obolus,  
Orthis, Physetomya, Platystrophia, Pti-  
lodictya, Trimerella, Whitfieldella.
- acuta**—Carinaropsis, Maclurina manito-  
bensis, Pachydictya, Ptilodictya, Ra-  
phistoma, Stictopora, Strophomena,  
Strophomena neglecta.
- acuticaudatus**—Pterygotus.
- acutidens**—Didymograptus.
- acutilirata**—Delthyris, Orthis biforata,  
Platystrophia.
- acutilobus** (a)—Bilobites, Orthis.
- acutiplicata**—Orthis.
- acutirostra**—Ambonychia, Atrypa, Myti-  
larea.
- acutirostris**—Ambonychia, Byssonychia,  
Lingula, Rhynchonella, Zygospira.
- acutumbona**—Cypriocardites, Cyrtodonta,  
Vanuxemia, Whitella.
- acutus** (um)—Bathyurus, Bellerophon,  
Bellerophon bilobatus, Cyrtolites, Dip-  
lograptus, Diplograptus foliaceus, Grap-  
tolithus, Oxydiscus, Sinuites cancellata,  
Tryblidium.
- ada**—Murchisonia, Turritoma.
- adelina**—Ectomaria, Murchisonia, Sole-  
nospira.
- adherens**—Stenopora.
- adipatus**—Holocystites.
- adastica**—Modiolopsis.
- adscendens**—Clitambonites, Orthisina.
- ædilis**—Cladopora, Eridotrypa, Monticu-  
lipora.
- æmulus**—Cyathocrinus (Poteriocrinus),  
Homocrinus.
- æneas**—Trochoceras.
- æqualis** (e)—Eurychilina, Lingula, Melo-  
crinus, Monotrypella, Monticulipora,  
Orthoceras, Orthoceratites, Primitia.

- æquilatera—Beyrichia, Leperditella, Leperditia.  
 æquiradiata—Camarotœchia, Protorhyncha, Rhynchonella.  
 æquivalvis—Orthis, Plectorthis.  
 affinis (e)—Agnostus pisiformis, Ambonychia, Amplexopora, Atrypa, Calathium, Cypricardites, Cyrtodonta, Dicelloccephalus, Didymograptus, Dikelocephalus, Heliolites, Heterotrypa, Holocystites, Lesueurilla, Lichenocrinus, Lingulella, Lingulobolus, Liospira, Lyellia, Maclurea, Maclurites, Modiolopsis, Monticulipora, Nileus, Obolus, Orthodesma, Platycolpus, Prasopora, Propora, Ptychoparia (Euloma), Raphistoma, Remopleurides, Scenella, Schmidella, Thamnograptus, Zaphrentis.  
 agarista—Pleurotomaria.  
 agassizi—Anisophyllum.  
 agave—Pleurotomaria.  
 agellus—Ceramopora.  
 agglomeratiformis—Halysites.  
 agglomeratus (a, um)—Catenipora, Cyathophyllum, Halysites, Rhynchonella.  
 agilis—Ilromotoma, Murchisonia.  
 aiens—Pleurotomaria.  
 ainsliei—Rhynchonella, Rhynchotrema.  
 alabamaensis—Dicellograptus moffatensis, Diplograptus foliaceus, Leptæna transversalis, Plectambonites transversalis.  
 alacer—Asaphus, Brachyaspis, Isotelus.  
 alaricus—Proetus.  
 alatus (a)—Ambonychia, Anomalodonta, Avicula, Ctenobolbina, Cypricardia, Cyrtodonta, Euomphalus, Euomphalopterus, Eurymya, Leptoplastus, Megaptera, Modiolopsis, Olenus, Orthis, Posidonia, Posidonomya, Protograptus, Sphærophthalmus, Tetragraptus, Tetragraptus (Graptolithus), Trilobites.  
 albanensis—Eopolychætus.  
 albersi—Crania, Orthoceras.  
 albertina—Ctenodonta.  
 albionensis—Polypora, Polypora (Fenestella).  
 alceste—Metoptoma.  
 alceus—Oncoceras.  
 alaicornis—Bythopora, Clathropora, Stigmatella.  
 alcyone—Pachydictya, Ptilodictya.  
 alethes—Cyrtoceras.  
 alexandra—Murchisonia, Omospira, Omospira.  
 alienum—Orthoceras.  
 allani—Lingulella.  
 alleghaniensis—Arthropycus, Fucoides.  
 allegoricus—Bellerophon.  
 allenii—Calceocrinus, Deltacrinus.  
 allumettense—Actinoceras, Loxoceras, Orthoceras.  
 alpha—Asaphus.  
 alpheus—Trematodus, Trematodus.  
 alternans—Orthis, Protichnites.  
 alternatus (a, um)—Caryocystites, Ceramopora, Cœloclema, Conchopeltis, Crania, Cyathocrinus, Dendrocrinus, Helioiphrentis, Helopora, Holocystis, Holocystites, Homocrinus, Leptæna, Monticulipora (Fistulipora), Nematopora, Oriostoma huntingtonensis, Poteriocrinus, Rafinesquina, Strophomena.  
 alterniradiata—Schuchertella, Strophomena.  
 alternistriata—Leptæna, Strophomena, Strophomena alternata, Rafinesquina.  
 altidorsata—Fenestella (Cycloporina).  
 atilis—Brachyaspis, Rhynchonella.  
 altirostris—Calymene.  
 altissimus (a)—Clitambonites americanus, Clitambonites diversa.  
 altisulcatum—Eunema, Trochonema.  
 altoides—Leperditia.  
 alturensis—Ophileta.  
 altus (a, um)—Actotreta idahoensis, Callograptus minutus, Ctenodonta, Cyclora, Cytherina, Graptolithus, Homotrypa, Leperditia, Metoptoma, Modiomorpha, Reticularia (Prosserella) subtransversa, Scenella, Tellinomya, Trochonema.  
 alveata—Cuneameya, Hebertella.  
 alveolaris—Favistella, Favosites.  
 alveolatus (a, um)—Byssonychia, Columnaria, Retococrinus, Retiocrinus.  
 amator—Oncoceras.  
 amazonica—Conularia, Orthis callactis.  
 ambiguus (a)—Atrypa, Billingsia, Camarella, Elkania, Fenestella, Hindella, Illæus, Isotrypa, Loculipora, Obolella, Pleurotomaria, Sagenella, Triplesia, Zaphrentis.  
 americanus (a, um)—Acacocrinus, Agnostus, Ampyx, Aphetoceras, Arethusina, Barrandeoceras, Bolboporites, Calceola, Clidochirus, Clitambonites, Cœlaster,

- americanus**—Continued.  
*Crotalocrinus*, *Cyclolituites*, *Cypricardia*, *Cystiphyllum*, *Dawsonoceras* *annulatum*, *Deiphon*, *Encrinurus*, *Eriptychius*, *Gilbertocrinites*, *Gyroceras*, *Harpides*, *Hemipronites*, *Hortholus*, *Illænus*, *Illænus crassicauda*, *Liospira*, *Lituities*, *Lycellia*, *Megalaspis*, *Orthoceras* (*Dawsonoceras*) *annulatum*, *Palæaspis*, *Petraster*, *Pleurotomaria*, *Ptilodictya lanceolata*, *Pycnosaccus*, *Rhynchotreta*, *Rhynchotreta cuneata*, *Sagenocrinus*, *Streptorhynchus*, *Telephus*, *Trochoceras*, *Turbo*.
- amherstburgensis**—*Schuchertella*.
- amiana**—*Isochilina*.
- amii**—*Isochilina*, *Orthograptus*, *Paterula*, *Stromatopora*, *Tetragraptus*.
- ammonis**—*Cyathophyllum*.
- ammonius**—*Lituities*, *Trocholites*.
- amoena** (*um*)—*Cyrtoceras*, *Dalmanella*, *Orthis*, *Pianodema*.
- amphitrite**—*Euconia*, *Pleurotomaria*.
- ampla**—*Callopora*, *Cyrtodonta*, *Drepanella*, *Hallopora*, *Holopea*, *Isochilina*, *Lophospira*, *Murchisonia*, *Opisthoptera*.
- amplectens**—*Eurystomites*.
- amplexicaulis** (*e*)—*Diplograptus*, *Diplograptus* (*Glyptograptus*), *Diplograptus foliaceus*, *Graptolithus*.
- amplicameratum**—*Orthoceras*.
- amplicorne**—*Cyrtoceras* (*Phragmoceras*).
- ampmarginatus**—*Bathyurus*.
- amplitubulata**—*Halysites catenularia*.
- amplus** (*um*)—*Cypricardites*, *Holocystites*, *Modiolodon*, *Ænonites*, *Piloceras*, *Strophostylus*.
- amycus**—*Orthoceras*, *Orthoceras* (*Cycloceras*).
- amygdalina**—*Ambonychia*, *Cleionychia*, *Cypricardites*, *Leperditia*, *Palæarca*, *Posidonomya*.
- anadontoides**—*Lyonsia*.
- analoga**—*Metoptoma*, *Scenella*, *Strophomena*.
- anastomotica**—*Palæodictyota*.
- anatiformis**—*Cheirocrinus*, *Chirocrinus*, *Clidderma*, *Echinoencrinites*, *Glyptocystites*.
- anatiniformis**—*Lyonsia*, *Pterotheca*, *Tellinomya*.
- anceps**—*Gonioceras*, *Obolus*, *Ormoceras*, *Orthoceras*.
- anchoralis**—*Acidaspis*, *Ceratocephala*.
- ancilla**—*Dendrocrinus*, *Homocrinus*.
- anderdonense**—*Cystiphyllum*, *Trochoceras*.
- andina**—*Parabolinella*.
- andrewsi** (*i*)—*Callopora*, *Hallopora*, *Heterotrypa*, *Monticulipora*.
- anelus**—*Orthoceras*, *Spyroceras*.
- angela**—*Ctenodonta*, *Tellinomya*.
- angelini**—*Bathyurus*, *Holometopus*.
- angularis** (*e*)—*Arthroclema*, *Atactopora*, *Callopora*, *Escharopora*, *Eurymyella*, *Gaurocrinus*, *Glyptaster* (*Eucrinus*), *Glyptocrinus*, *Hallopora*, *Leperditia*, *Mesotrypa*, *Moorea*, *Ophileta*, *Ophiletina*, *Ptychocrinus*, *Stictoporella*.
- angulatus** (*a*, *um*)—*Acroculia*, *Camarotæchia semiplicata*, *Cheirocrinus*, *Chirocrinus*, *Cyathocrinus*, *Dendrocrinus*, *Kionoceras*, *Liospira*, *Octonaria*, *Orthoceras*, *Palæocrinus*, *Petraia*, *Platyceras*, *Phylloporina*, *Pleurotomaria*, *Raphistoma*, *Retepora*, *Scalites*, *Stephanocrinus*, *Streptelasma*, *Strophomena*, *Subretepora*, *Uncinulus nucleolatus*.
- angulifera**—*Orthonota*.
- angulosum**—*Conoceras*, *Cypricardia*.
- angustus** (*a*, *um*)—*Bellerophon*, *Bucania*, *Camarotæchia litchfieldensis*, *Ctenodonta*, *Dendrocrinus*, *Homocrinus*, *Hormotoma gracilis*, *Liospira*, *Modiolopsis*, *Murchisonia*, *Streptelasma divaricans*, *Tellinomya*, *Tremanotus*.
- angusticameratum**—*Endoceras*.
- angusticaudus**—*Isotelus*, *Isoteloides*.
- angusticollis**—*Illænus*.
- angustifolius**—*Diplograptus*, *Graptolithus*, *Phyllograptus*, *Phyllograptus*, *Sphenothallus*.
- angustifrons**—*Cypricardites*, *Modiolopsis*.
- angustus** (*a*, *um*)—*Cypricardites*, *Escharopora*, *Fusispira*, *Gomphoceras*, *Phragmoceras*, *Platycrinus*, *Ptilodictya*.
- ann dixonii**—*Platycrinites*.
- anna**—*Apiocystites*, *Crania*, *Hormotoma*, *Leperditia*, *Murchisonia*, *Phyllograptus*, *Thamnograptus*.
- annectans**—*Graptolithus*, *Leptograptus*, *Ptychoparia*.
- annicana**—*Orthis*, *Platystrophia*.
- annulatus** (*a*, *um*)—*Amplexus*, *Cannapora*, *Climacograptus scalaris*, *Cyclenoceras*, *Cyrtoceras*, *Dawsonoceras*, *Endoceras*, *Huronina*, *Maclurea*, *Maclurites*, *Orthoceras*, *Orthoceras* (*Cycloceras*), *Pterygometopus*, *Syringopora*.

- annulifera—Batostomella, Lioclemella, Trematopora.
- anodontoides—Modiolopsis.
- anomala—Faberia, Metoptoma.
- anomalocrinus—Podolithus.
- anstedii—Calathium.
- anteceptus—Cyclocystoides.
- antennarius—Climacograpsus, Climacograptus, Cryptograptus, Diplograpsus.
- anterior—Orthoceras.
- autheloidea—Constellaria, Heliopora, Monticulipora, Stellipora.
- anthonensis (e)—Scenidium, Skenidium.
- anthonii—Asterias.
- anticorum—Gorgonia.
- anticostiana—Anabaia, Leperditia, Leperditia canadensis, Leperditia fabulites, Protozeuga.
- anticostiensis (e)—Actinoceras, Ascoceras, Athyris, Athyris headi, Bairdia, Calapocia, Catazyga, Catazyga headi, Chasmops, Cyathophyllum, Cypricardites, Cyrtodonta, Dalmanites, Dictyonella, Dinorthis (Plasiomys) porcaia, Eichwaldia, Krausella, Leperditia, Orthis, Orthoceras, Pleurocystis, Pleurocystites, Rhynchonella, Rhynchotrema, Stricklandinia, Stropheodonta (Brachyprion), Strophomena, Triplecia insularis, Zygospira.
- antiquatus (a)—Asterias, Bellerophon, Buthotrephis, Cryptophragmus, Eoharpes, Harpes, Harpina, Palæaster, Palasterina, Pleurotomaria, Strophomena.
- antiquus (a, um)—Argaster, Asterias, Camarotoechia, Climacograptus, Conocardium, Crinosoma, Cypridina, Holoepa, Lingula, Littorina, Mesopalæaster, Pachystroma, Palæaster, Petraer, Pleurohynchus, Ptilodietya, Stromatopora, Stropheodonta patersoni.
- apertus (a, um)—Petraia, Pleurotomaria, Poterioceras, Pycnoceras, Raphistoma, Staurograptus dichotomus, Streptelasma, Tetradium, Tetradium fibratum.
- aphæa—Ambonychia, Streptomylus.
- apicalis—Eridonychia, Hemipronites, Orthis, Polytechia.
- aplata—Favosites hisingeri.
- apollo—Anacheirus, Ceraurus (Cyrtometopus), Cheirus, Eurystomites, Lituities.
- apolonista—Symphysurus.
- appressa—Dekayia, Holoepa, Leperditia.
- approximatus (a, um)—Cameroceras, Chætetes, Endoceras, Glossograptus quadrimucronatus, Helopora, Monticulipora, Nemagraptus gracilis, Orthodesma, Palæasterina, Streptorhynchus, Strophomena vetusta, Tetragrapsus.
- approximus—Pseudosphærexochus.
- apriniformis—Homœospira, Rhynchospira.
- aprinis—Atrypa, Rhynchonella, Rhynchospira.
- aquila—Zygospira.
- aquilonaris—Bronteus, Goldius.
- arabella—Pleurotomaria.
- arachne—Lophospira, Murchisonia, Pleurotomaria, Stricklandia, Syntrophia.
- arachnoidea—Aulopora, Stromatopora.
- arana—Dichograpsus.
- aratus (a)—Cypricardina, Leptodomus (Sanguinolites).
- arborea—Monticulipora.
- arborescens—Cyathophyllum, Dimercrinus, Thysanocrinus.
- arbusculus (a, um)—Calyptograptus, Dictyonema, Homotrypa, Inocaulis.
- arca—Plectambonites.
- archimedes—Daedalus, Spirophyton, Tanonurus.
- arcolata—Monticulipora.
- arcta—Cytherella rugosa.
- arctatum—Bythocypris punctulata, Eumema, Trochonema.
- arcticameratum—Cyrtoceras, Mælonoceras.
- arcticus (a, um)—Alveolites, Chætetes, Conchidium, Cromus, Dinorthis meedsi, Grammysia, Holoepa, Leperditia, Leperditia baltica, Modiolodon, Oncoeras, Orthoceras, Orthis (Dinorthis) meedsi, Primitia, Receptaculites, Rhynchotrema deckerensis, Whitella.
- arctipora—Bythopora, Ptilodietya.
- arctiventrum—Endoceras.
- arctostriata—Atrypa, Atrypa reticularis.
- arcturus—Illænus, Thaleops.
- arcuaria—Dalmanella, Orthis.
- arcuatus (a, um)—Bathyrurus, Colpoceras, Cornulites, Cyrtoceras, Didymograpsus, Didymograptus, Drepanodus, Edmondia, Graptolithus, Graptolithus (Monoprion), Ilkenus, Krausella, Modiolopsis, Olenus, Paradoxides, Pontocypris, Strophomena.

- arcuoliratum*—Orthoceras.  
*arcuosus* (a)—Clorinda, Pentamerus.  
*arenaria*—Holoepa, Murchisonia, Plethospira.  
*arenatum*—Endoceras.  
*arenicola*—Isotelus.  
*areolata*—Aspidopora, Spatiopora.  
*arethusa*—Stricklandinia, Strophomena, Syntrophia.  
*areyi*—Barrandella, Clorinda, Dictyonema, Eotomaria.  
*argentea*—Camarotoechia, Rhynchonella.  
*argentinus* (a)—Arethusina, Illænus, Monticulipora, Thysanopyge.  
*argenturica*—Rhynchonella, Rhynchotrema.  
*argo*—Bellerophon, Oxydiscus.  
*argutus* (a, um)—Diploclema sparsum, Glyptocrinus, Modiolopsis, Monograptus, Pachydictya, Ptilodictya, Stelidocrinus.  
*argylensis*—Hormotoma, Murchisonia.  
*arisaigensis*—Murchisonia.  
*aristides*—Cyrtoceas.  
*arkansanus* (a)—Cyphaspsis, Dalmanites, Dalmanites (Synphoria), Dicanopeltis, Odontopleura.  
*arkansasensis*—Dicanograptus nicholsoni, Dicanograptus ramosus.  
*armanda*—Orthis, Syntrophia.  
*armatus* (a, um)—Arthroclema, Bathyrus, Bumastus, Helopora, Heterocystites, Illænus, Isochilina, Isochilina pygmaea, Leperditia, Lumbriconereites, Plethopeltis.  
*armosus*—Eucalyptocrinus, Glyptaster, Glyptocrinus, Siphonocrinus.  
*arnheimensis*—Rhynchotrema dentata.  
*arrectus* (a)—Aparchites, Cyrtia exprorecta, Cyrtia trapezoidalis.  
*artemesia*—Hormotoma, Murchisonia.  
*arthracanthus*—Glossograptus, Glossograptus.  
*articulatus* (um)—Cyathophyllum, Madreporites.  
*articulosus*—Calceocrinus, Castocrinus, Heterocrinus.  
*arundinaceus*—Dicanograptus, Graptolithus, Mastigograptus.  
*aryballium*—Astylomanon cratera.  
*ascialis*—Arbellites.  
*ashmani*—Orthodesma.  
*asper* (a, um)—Acanthoclema, Batostomella, Callopora, Chasmatopora, Cruziana, Dekayia, Eucalyptocrinus, Favosites, Fenestella, Gorgonia, Heterospongia, Holocystites, Leptæna, Lio-clema, Lophospira, Monticulipora, Murchisonia, Paleofavosites, Phylloporina, Plectambonites sericeus, Rusophycus, Spatiopora, Subretopora, Terebratulites, Trematopora.  
*asperatostrata*—Chasmatopora, Phylloporina, Subretopora.  
*asperatus* (a)—Archæocrinus, Conularia, Deocrinus, Spirifer, Spirifer (Eospirifer), Rhodocrinus.  
*asprostriatus*—Straparollina, Straparollus.  
*asperula*—Crania, Monticulipora, Monticulipora wetherbyi, Petigopora.  
*aspinosus*—Dalmanites.  
*astartæformis*—Ctenodonta, Tellinomya.  
*astraformis*—Plasmopora, Porites.  
*astragoletes*—Asaphus.  
*astrodistans*—Clathrodictyon vesiculosum.  
*atava*—Eoorthis, Orthis (Plectorthis), Rafinesquina, Strophomena.  
*atheroidea*—Lissatrypa.  
*atlanticus* (a, um)—Beyrichia, Eceyliomphalus, Endoceras, Harpides, Maclurea, Maclurites.  
*atlas*—Cyathophyllum, Homalonotus.  
*atratus*—Girvanella, Strophochetus.  
*atrypoides*—Eoorthis (Orusia) lenticularis, Orthis lenticularis.  
*attenuatus* (a, um)—Acrotreta, Ambonychia, Aphetoceras, Calceola, Cleionychia, Cloderma, Ctenodonta, Cymatopora, Cyrtospira, Lingula, Pterotheca, Rhizophyllum, Rhopalonaria, Tellinomya.  
*atticus*—Orthoceras.  
*atritus* (a)—Chætetes, Dekayia, Monticulipora.  
*auburnensis*—Platystrophia ponderosa.  
*auconini*—Tarphyceras.  
*augusta*—Metoptoma.  
*augustina*—Lophospira, Murchisonia, Murchisonia (Hormotoma).  
*aulema*—Endoceras, Nanno.  
*auloporoides*—Alecto, Proboscina, Stomatopora.

- aurantium—Crystallocystis, Echinosphæra, Echinosphærites, Echinus, Sphæronites.  
 aureatus—Mariacrinus.  
 auriculatus—Bellerophon.  
 auriformis (e)—Capulus, Fucoides, Platystoma, Stomatis.  
 aurita—Pattersonia, Strobilospongia.  
 aurora—Lingula, Rafinesquina, Strophomena.  
 austini—Agelacrinus, Clisophyllum, Homotrypa, Lumbriconereites, Strephodes.  
 australis (e)—Catazyga uphami, Stromatocarium huronense.  
 austrina—Anodontopsis.  
 autolycus—Orthoceras.  
 avellana—Jaekelocystis.  
 avellanedæ—Maclurea, Maclurites.  
 aviculoidea—Megambonia, Prolobella, Pterinea.  
 aviculoides—Modiolopsis, Pterinea.  
 aviformis—Avicula.  
 avus—Nautilus.  
 axion—Pleurotomaria.  
 bacca—Cococrinus.  
 baccula—Pisocrinus.  
 backii—Actinoceras, Ormoceras, Orthoceras.  
 baconi—Hyolithes.  
 baculus—Holocystites.  
 baeri—Glyptocrinus, Gyroceras, Lituites, Reteocrinus, Trochoceras, Xenocrinus.  
 baffinensis—Ctenodonta, Cycloceras olorus, Cyrtoceras, Vanuxemia.  
 baileyi—Acrotreta.  
 balanoides—Anomalocystites, Ateleocystites, Enopleura, Placocystis.  
 balantium—Astylomanon cratera.  
 balteatum—Orthoceras, Spyroceras.  
 balt(h)ica—Cythere, Leoparditia.  
 bannisteri—Gyroceras, Trochoceras.  
 barabuensis (e)—Dicelloccephalus, Dikeloccephalus, Metoptoma, Platycolpus.  
 barbatulus—Diplograptus.  
 barberi—Corynotrypa.  
 barrandi(i)—Amphion, Asaphus, Barrandella, Basilicus, Calceocrinus, Canadocystis, Clorinda, Cremaecrinus, Malocystites, Ogygia, Pentamerus, Plomerops, Ptychoparia, Rastrites, Reteograptus, Retiograptus, Sigmacystis, Thamnograptus, Virgiana.  
 barretti—Klacedenia, Stromatopora, Syringostroma.  
 barriensis—Bumastus, Illænus.  
 bartonensis (e)—Acanthograptus, Orthoceras, Thamnograptus.  
 basalis—Edriospongia, Lumbriconereites, Rhinidictya, Stictopora.  
 basaltica—Favosites.  
 basilicus—Diplograptus, Diplograptus vulgatus, Orthograptus.  
 bassieri—Clisospira, Cryptozoon, Dalmanella, Homotrypa, Meekopora, Sagenocrinus, Scenidium.  
 bastini—Chonetes.  
 battis—Hebertella, Orthis.  
 bayfieldi(i)—Actinoceras, Illænus, Ormoceras, Orthoceras, Vanuxemia.  
 beachi—Trochonema.  
 beachleri—Callicrinus.  
 beani—Ceramopora, Paleschara.  
 bearsi—Isotelus, Vogdesia.  
 beatrice—Lophospira, Murchisonia.  
 beauharnoisensis—Palæophycus.  
 beaumonti—Actinoceras, Pentamerus.  
 beauportense—Orthoceras, Spyroceras.  
 bebryx—Dalmanites.  
 beckeri—Bumastus, Megalaspis.  
 becki(i)—Calymene, Dictyolites, Dictyophyton, Lithodictyon, Orthoceras, Paradoxides, Triarthrus.  
 beecheri—Conocardium, Homeospira, Lyriocrinus, Mariacrinus.  
 beekmanensis (e)—Cyrtoceras, Euconia, Pleurotomaria.  
 belemuurus—Megalaspis.  
 bella—Actinopteria, Beyrichia, Inocaulis, Lingulella, Meristella, Obolus (Lingulella), Ophileta, Palæodictyota.  
 bellaforma—Rhynchonella.  
 bellapuucta—Bucania.  
 bellarugosa—Hebertella (Glyptorthis), Orthis, Orthis (Hebertella).  
 bellasculptilis—Poleumita.  
 bellatulum—Kionoceras, Orthoceras.  
 bellevillensis—Bumastus, Heterocrinus, Ohioocrinus, Stenocrinus.  
 belli—Anomocarella, Chonophyllum, Dicelloccephalus, Dikeloccephalus, Glosina, Lingula, Obolus, Palæoglossa, Triarthrus.  
 bellicincta—Homotoma, Murchisonia.  
 bellilineata—Pterinea.  
 bellistriatus (a)—Ambonychia, Cornulites, Fenestella, Posidonomya.



- bellulus** (a, um)—Conradella, Cryptolithus, Cyclocystoides, Cyclonema, Dalmanella, Dalmanella (Bathycœlia), Goniophora, Helopora, Mesopalæaster, Orthis, Petrastra, Phragmolites, Pianodema, Promopalæaster, Trinucleus, Trochonema.
- beloitensis** (e)—Actinoceras, Eecyliopecterus, Orthoceras, Scenella, Subulites, Trochonema.
- belti**—Acrotreta, Linnarssonina, Obolella.
- beltrami** (i)—Lingula, Orthoceras.
- benedicti**—Allocrinus, Cyathocrinus, Habrocrinus, Holocystites, Orthis, Piscocrinus, Ptychophyllum, Saccocrinus, Subulites.
- benjamini**—Isotelus, Monotrypa.
- bermensis**—Camarella.
- beta**—Asaphus, Isotelus.
- beudanti**—Actinoceras.
- beverlyensis**—Palæophycus.
- bialveata**—Delthyris.
- biangulatum**—Litoceras, Pleurotomaria, Trochonema.
- bicarinatus** (a)—Lingula, Straparollus.
- bicinota**—Lophospira, Murchisonia, Pleurotomaria.
- bickmoreanus** (um)—Lituites, Lituites (Ophidioceras), Plectoceras.
- biclavata**—Arthriaria.
- biconstrictus**—Receptaculites.
- biconvexa**—Atrypa.
- bicornis**—Amphilichas, Beyrichia, Climacograptus, Climacograptus caudatus, Dalmania, Dalmanites, Dicranella, Diplograptus, Diplograptus, Fenestella, Graptolithus, Lichas (Hoplolichas), Lichas (Platymetopus).
- bicostatus** (a)—Cliopectera, Orthis, Reticularia, Spirifer.
- bicurvatus** (a)—Cyrtospira, Dicellograptus divaricatus.
- bidens**—Atrypa, Rhynchonella.
- bidentatus**—Atrypa, Calceocrinus, Rhynchonella, Terebratula.
- bidorsatus** (a)—Bellerophon, Bucania, Ctenodonta, Tetranota.
- bifidus**—Didymograptus, Graptolithus, Graptolithus (Monoprion).
- biforatus** (a)—Orthis, Platystrophia, Terebratulites.
- bifurca**—Conularia.
- bifurcatus** (a)—Arthropora, Callicrinus, Cladopora, Eschara, Pachydietya, Stictopora, Syringopora.
- bigeneris**—Drepanella.
- bigsbyi**—Actinoceras, Agelacrinites, Cryptolithus, Cyclaster, Edriocaster, Edriocystis, Graptolithus, Graptolithus (Monoprion), Huronia, Maclurea, Maculurites, Orthoceras, Tetragraptus, Zaphrentis.
- bilamellatum**—Anisophyllum.
- bilateralis**—Caninia, Drepanella, Goniotrypa, Scofieldia, Zaphrentis.
- bilex**—Cyclonema, Turbo.
- bilineatus** (a, um)—Conularia, Bellerophon, Orthoceras, Spyroceras.
- bilix**—Cyclonema, Pleurotomaria, Turbo.
- billingsana**—Centronella, Lingulella, Murchisonia, Stricklandinia, Whitfieldella.
- billingsi** (i)—Agelacrinites, Agelacrinus, Aparchites, Archinacella, Arthroclema, Bumastus, Cleiocrinus, Cyrtoceras, Cyrtodonta, Diphyphyllum, Eurychilina, Glyptocrinus, Hemicystites, Leperditia, Lophospira, Metoptoma, Monticulipora, Nieszkowskia, Nyctopora, Orbignyella, Ottawacrinus, Periglyptocrinus, Primitia, Pseudosphærexochus vulcanus, Salterella, Steliella, Strophomena, Triarthrus, Trimerella, Zitteloceras.
- billingsianus**—Castocrinus.
- biloba**—Anomia, Bilobites, Callicrinus, Cryptodiscus, Fucoides, Orthis, Pterygotus, Spirifer.
- bilobatus** (a, um)—Bellerophon, Cruziana, Cyrtolites, Fucoides, Rusophycus.
- biloculare**—Conchidium.
- bimucronatus**—Ceraurus, Diplograptus, Hallograptus, Lasiograptus.
- bipartitus** (a)—Donacrinites, Erisocrinus, Leptana, Stropheodonta, Stropheodonta (Leptostrophia), Strophomena.
- bipennis**—Boliviana.
- biplicata**—Centronella.
- bipunctatus** (a)—Didymograptus, Eschara, Ptilodictya.
- bisecta**—Acrotreta, Agnostus.
- bisinuatus**—Pentamerus, Pentamerus oblongus.
- bispinosus** (a)—Ceraurus, Ctenobolbina.
- bispiralis**—Lophospira, Pleurotomaria.

- bisulcata**—Atrypa, Camarella, Cyclospira, Lingula, Merista, Rhynchonella.  
**bitruncata**—Palaeaspis.  
**bituberculatus**—Bathyurus, Lloydia.  
**bivertex**—Leperditia, Ulrichia.  
**bivia**—Leperditia.  
**bivittata**—Cœlocaulus, Murchisonia.  
**blainvillei**—Actinoceras, Columnaria.  
**blairi**—Ptychoparia.  
**bloomfieldensis**—Sphaerocystites.  
**blumenbachii** (ia)—Calymene, Conocardium, Euchasma.  
**bolivianus** (a, um)—Agnostus, Lingula, Orthoceras.  
**boliviensis**—Asaphus, Cryptolithus, Megalaspis, Trinucleus.  
**boltoni**—Arctinurus, Lichas (Oncholichas), Paradoxides, Platynotus, Pterolichas.  
**bondi**—Cyrtoceras, Plectoceras.  
**borealis** (e)—Aphetoceras, Ascoceras, Athyris, Athyris headi, Calapœcia, Catazyga headi, Clitambonites, Cryptozoon, Duncanella, Hebertella, Orthis, Psiloconcha sinuata, Streptelasma, Terebratula, Trimerella, Trochoceras.  
**borkholmiensis**—Rhindictya.  
**botryoideum**—Cœnostoma.  
**bovinum**—Cyrtoceras.  
**bowdeni**—Lophospira, Murchisonia.  
**boycii**—Cyrtoceras, Cyrtactinoceras.  
**boydi** (i)—Loxonema, Murchisonia.  
**boylei**—Eurypteris, Hormotoma, Murchisonia, Turritoma, Tylopteris.  
**brachiatus**—Dimerocrinus, Glyptaster, Myelodactylus, Thysanocrinus.  
**brachymera**—Phycograptus.  
**brachynota**—Delthyris.  
**brackenbushi**—Megalaspis.  
**bradti**—Pterinea.  
**brainerdi**—Cameroceras, Cameroceras (Proterocameroceras), Girvanella, Lingula, Orthoceras, Strophochetus.  
**brasiliensis**—Bollia lata.  
**brauni**—Holocystites.  
**brazilianus**—Clidophorus.  
**bretonensis**—Obolus, Palæobolus.  
**breva**—Eurymyella shaleri.  
**breviata**—Pontocypris mawii.  
**brevicaudatus**—Dalmanites limulus.  
**breviceps**—Bathyurus, Chasmops, Dalmania, Dalmanites, Dolichopterus, Leio-stegium, Lichas, Metopolichas.  
**brevicorne**—Cyclostomiceras, Cyrtoceras.  
**brevicula**—Dalmanella, Dalmanella emacerata.  
**brevicurvatum**—Oncoceras.  
**brevimarginatus**—Cyphaspis, Haploconus, Proetus.  
**brevior**—Cuneamya scapha.  
**breviplicata**—Camarella.  
**brevirostris**—Anastrophia, Atrypa, Pentamerus, Rhynchonella, Terebratula.  
**brevis** (e)—Matheria, Schmidtella, Streptelasma, Stricklandia, Stricklandinia, Subulites, Subulites (Polyphemopsis).  
**brevispinosa**—Acidaspis.  
**brevispinus**—Bathyurellus.  
**brevispira**—Gyronema.  
**breviuscula**—Cypricardites, Cyrtodonta.  
**briareus** (a)—Chætetes, Eridotrypa, Escharopora, Monotrypella, Monticulipora, Monticulipora (Monotrypa), Ptilodictya.  
**bridgportensis**—Myelodactylus.  
**brisa**—Pterinea.  
**briseis**—Lingula.  
**bristolense**—Endoceras.  
**brittsi**—Cyathocrinus.  
**brocki**—Helicotoma.  
**brongniartia** (i)—Conotubularia, Fucoidea, Ormoceras, Orthoceras.  
**brontes**—Orthoceras.  
**brownii**—Arca.  
**brownsportensis**—Diaphorostoma, Platyceras, Strophonella semifasciata.  
**bryonoides**—Graptolites (Didymograptus), Graptolithus, Tetragraptus, Tetragraptus.  
**buchiana**—Beyrichia.  
**buchii**—Cupellæcrinites.  
**bucklandi** (i)—Calymene, Ceraurus, Orthoceras.  
**buelli** (i)—Bucania, Bucania (Tremantulus), Salpingostoma.  
**buffaloensis**—Pterygotus.  
**bulbosus** (a)—Cyphotrypa, Rhizograptus, Rhizograptus, Stenopora.  
**bulbulus**—Caryocrinites, Caryocrinus.  
**bullifera**—Astylomanon verrucosum, Eurychilina, Palæomanon verrucosum  
**bullulatum**—Cyathophyllum.  
**burginensis**—Bellerophon troosti, Lophospira medialis.  
**bursa**—Astylosporgia, Palæomanon.  
**byrnesanus**—Corydocephalus, Lichas.

- byrnesi—*Echmina*, *Byssonychia*, *Dicranella*, *Leperditia*, *Orthoceras*, *Orthodesma*, *Rhytmya*.
- byronensis—*Phragmoceras*.
- cacabiformis (e)—*Hexameroceras*, *Hexamoceras*.
- cadmus—*Orthoceras*.
- caduceus—*Dendrocrinus*, *Didymograptus*, *Didymograptus*, *Graptolites*, *Graptolithus*, *Poteroocrinus* (*Dendrocrinus*), *Tetragraptus*.
- cæca—*Leperditia*.
- cæcigena—*Leperditia*.
- cælatus—*Climacograptus*, *Eucalyptocrinus*, *Hypanthocrinites*.
- cæspitosa (um)—*Blothrophyllum*, *Buthotrephis*, *Cladopora*, *Diplophyllum*.
- calcaratus—*Diplograptus foliaceus*.
- calceolus (a)—*Glycerites*, *Leptotrypa*, *Monticulipora*, *Monticulipora* (*Monotrypa*).
- calcifer—*Bellerophon*.
- calciferiforme—*Pycnoceras*.
- calciferous—*Conocephalites*.
- calciferus (a)—*Camarella*, *Eccyliomphalus*, *Euomphalus*, *Fusispira*, *Lonchocephalus*, *Lophospira*, *Murchisonia*, *Nautilus*, *Pleurotomaria*, *Ptychoparia*, *Receptaculites*, *Ribeiria*, *Syntrophia*, *Subulites*, *Tarphyceras*, *Triplecia*, *Triplexia*.
- calciforme—*Pycnoceras*.
- calhounensis—*Eurydictya*.
- calicina—*Columnaria*, *Favistella*.
- calicularis (e)—*Corynoides*, *Cyathophyllum*.
- caliculoides—*Helenterophyllum*.
- caliculus (um)—*Cyathophyllum*, *Enterolasma*, *Lecanocrinus*, *Petraia*, *Streptelasma*.
- callactis—*Orthis*.
- callicephalus (a)—*Calymene*, *Calymene*, *Dalmania*, *Dalmanites*, *Phacops*, *Pterygometopus*.
- calligramma—*Orthis*, *Orthis* (*Dinorthis*).
- calloporoides—*Trematopora*.
- callosa (um)—*Homotrypa*, *Pycnopegma*.
- calphurnia—*Pleurotomaria*.
- calvini—*Atrypa*, *Ctenodonta*, *Tellinomya*.
- calyculus (a)—*Aspidopora*, *Chætetes*, *Lecanocrinus*, *Monticulipora*, *Monticulipora* (*Diplotrypa*), *Prasopora*, *Pycnosaccus*.
- calyx—*Pleurotomaria*.
- camdenensis—*Pasceolus*.
- cameolare—*Orthoceras*.
- camerata—*Calymene*, *Strophomena*.
- campana—*Pisocrinus*.
- campanulatus (a, um)—*Dawsonia*, *Diaphorostoma*, *Dimerocrinus*, *Platyceras*, *Thysanocrinus*.
- campbelli—*Syntrophia*.
- campestris—*Tolmaia*.
- camura (um)—*Atrypa*, *Cyrtoceras*, *Rhynchonella*, *Trematospira*.
- canadensis (e)—*Actinoceras*, *Actinodictyon*, *Agnostus*, *Amphion*, *Amplexopora*, *Apicostites*, *Archinacella*, *Aristozoe*, *Asaphus*, *Ascoceras*, *Basilicus*, *Batostoma*, *Bellerophon*, *Billingsites*, *Calapœcia*, *Calathium*, *Calaurops*, *Callocystites*, *Capulus*, *Ceratopyge*, *Chiton*, *Chonophyllum*, *Corynotrypa*, *Cypricardina*, *Cypricardites*, *Cyrtodonta*, *Dictyonema*, *Dinobolus*, *Discoceras*, *Drepanella richardsoni*, *Eccyliomphalus*, *Eccyliomphalus*, *Ectenocrinus*, *Goniatites*, *Hercynella*, *Heterocrinus*, *Ilormotoma salteri*, *Ilonia*, *Inocaulis*, *Ischadites*, *Labechia*, *Leperditia*, *Lichas*, *Lingula*, *Megalomus*, *Metoptoma*, *Obolellina*, *Obolus*, *Ogygites*, *Orthoceras*, *Panenka*, *Paractinoceras*, *Petraia*, *Phænopora fimbriata*, *Phragmoceras nestor*, *Piloceras*, *Pleurotomaria*, *Pliomera*, *Pliomerops*, *Priscochiton*, *Pseudosphærexochus*, *Pterygotus*, *Ptilodictya*, *Ptychophyllum*, *Receptaculites*, *Remipleurides*, *Rhinidictya neglecta*, *Sactoceras*, *Salpingostoma*, *Schizambon*, *Schizambon fissus*, *Siphonotreta scotica*, *Sphærexochus*, *Sphærophthalmus*, *Steganoblastus*, *Stomatopora*, *Stricklandia*, *Stricklandinia*, *Stromatocarium*, *Strophostylus*, *Subulites*, *Tentaculites*, *Triarthrus*, *Trocholites*, *Trochonema umbilicatum*, *Tryblidium*, *Turrilepas*, *Whitella*, *Zaphrentis*.
- canaliculatus (a, um)—*Barrandocrinus*, *Clidderma*, *Cylicocrinus*, *Dermatostroma*, *Dimerocrinus*, *Orthodesma*, *Pterotheca*, *Rhodocrinus* (*Thysanocrinus*).
- canalifera—*Eotomaria*, *Pleurotomaria*.
- canalis—*Asaphus*, *Isotelus*, *Leperditella*, *Leperditia*, *Orthis*.

- cancellatus* (a)—*Acrotreta*, *Actinomya*, *Bellerophon*, *Cyclonema*, *Cyrtoceras*, *Desmograptus*, *Dictyograptus*, *Dictyonema*, *Kionoceras*, *Littorina*, *Lituites*, *Megambonia*, *Melia*, *Modiolopsis*, *Nautilus*, *Orthoceras*, *Protowarthia*, *Sinuities*, *Strophostylus*, *Technophorus*, *Whitcevesia*.  
*candens*—*Ctenodonta*, *Tellinomya*.  
*canneus*—*Holocystites*.  
*cannonensis* (e)—*Lyrodesma*, *Monticulipora*.  
*cantharium*—*Astylomanon cratera*.  
*capax*—*Atrypa*, *Bathyurus*, *Bellerophon*, *Chonophyllum*, *Favosites*, *Leperditia*, *Lituites*, *Modiolopsis*, *Nautilus*, *Platycolpus*, *Rhynchonella*, *Rhynchotrema*.  
*capillaceus*—*Monograptus*.  
*capillaris*—*Nemagrapsus*, *Nemagraptus*, *Thamnograptus*.  
*capitolinum*—*Actinoceras*, *Jovellania*, *Orthoceras*.  
*caponiformis*—*Anomalocrinus*, *Ataxiacrinus*.  
*capricornulus*—*Conilites*, *Cyrtoceras*.  
*caractaci*—*Trinucleus*.  
*carausii*—*Orthis*.  
*carchari(æ)dens*—*Blastiodocrinus*.  
*carcinodea*—*Brongiartia*.  
*cardinalis* (e)—*Streptorhynchus*, *Strophomena*.  
*cardinata*—*Vanuxemia*.  
*caribouensis*—*Asaphus*.  
*carinatus* (a, um)—*Ambonychia*, *Avicula*, *Byssonychia*, *Carinaropsis*, *Ctenodonta*, *Cypricardites*, *Cyrtolites*, *Dolabra*, *Goniophora*, *Glyptocrinus inseparatus*, *Heliophrentis*, *Maclurea*, *Maclurites*, *Modiolopsis*, *Murchisonia*, *Nuculites* (*Orthonota*), *Eonites*, *Pleurotomaria*, *Pterinea*, *Streptotrochus*, *Tellinomya*, *Whitella*.  
*carinifera*—*Bucanopsis*, *Murchisonia*.  
*carleyi*—*Cruziana*, *Dalmanites*, *Dinorthis*, *Glyptocrinus*, *Mariacrinus*, *Orthis*, *Orthoceras*, *Pterygometopus*, *Rusophycus*.  
*carltonense*—*Orthoceras*.  
*carnensis*—*Hemicystites*.  
*carpenteri*—*Ctenodonta*.  
*carrollensis* (e)—*Cyrtoceras*, *Lituites* (*Ophidioceras*) *hercules*, *Modiolopsis*, *Protophragmoceras*.  
*carterensis*—*Columnaria*.  
*carteri*—*Stromatopora*.  
*carveri*—*Oncoceras*.  
*casei*—*Ambonychia*, *Anomalodonta*, *Dendrocrinus*, *Megaptera*, *Poteriocrinites*.  
*caseyi*—*Poteriocrinites*.  
*casii*—*Pleurotomaria*, *Lophospira*.  
*cassandra*—*Murchisonia*, *Seelya*.  
*cassina*—*Eotomaria*, *Holopea*, *Hormotoma*, *Lophospira*, *Murchisonia*, *Plethospira*.  
*cassinensis* (e)—*Bellerophon*, *Cyclostomiceras*, *Eoharpes*, *Gomphoceras*, *Harpes*, *Lituites eatoni*, *Protorthis*, *Protowarthia*, *Scenella*, *Schroederoceras*, *Sinuities*.  
*castellana*—*Stricklandinia*.  
*caswelli*—*Cuneymya*, *Cypricardites*, *Grammysia*.  
*cataline*—*Orthoceras*.  
*cataractensis*—*Mesopalæaster*.  
*catenularia*—*Halysites*, *Tubipora*.  
*catenulatus* (a)—*Halysites*, *Halysites fieldeni*, *Stigmatella*, *Tubipora*.  
*catharina*—*Murchisonia*.  
*catilloides*—*Bucania*, *Euomphalus*, *Oxydiscus*.  
*cato*—*Orthoceras*.  
*catulus*—*Orthoceras*.  
*caudatus* (a)—*Asaphus*, *Bathyurus*, *Climacograptus*, *Dalmania*, *Goniurus*.  
*cavernosa* (um)—*Cœloclema*, *Dermatostroma*.  
*cayleyi*—*Amphion*, *Pliomerops*.  
*celata*—*Primitia*.  
*celator*—*Cyathophyllum*, *Zaphrentis*.  
*cellulata*—*Calamopora*.  
*cellulosus* (a, um)—*Conradella dyeri*, *Cyrtolites dyeri*, *Phragmolites dyeri*, *Phytopsis*, *Tetradium*.  
*celsus*—*Dendrocrinus*.  
*centralis*—*Lophospira*, *Murchisonia*, *Primitia*.  
*centricarinatus*—*Plectambonites*.  
*centricornis*—*Klœdenia*.  
*centrilineata*—*Dalmanella*, *Orthis*.  
*centrosa*—*Orthis*.  
*centrota* (um)—*Stromatopora*, *Syringostroma*.  
*ceralepta*—*Acidaspis*, *Ceratocephala*.  
*ceres*—*Strophomena*, *Rafinesquina*.  
*cerithioides*—*Eunema*, *Trochonema*.  
*cervicornis*—*Arabellites*, *Callopora*, *Cladopora*, *Inocaulis*.  
*cestrotus*—*Eurypterus*, *Stylonurus* (*Ctenopterus*).

- chadwicki**—Eurypterus.  
**chætophorus**—Acanthograptus.  
**chamberlini**—Lophospira, Murchisonia.  
**chambersi**—Beyrichia, Ceratopsis, Tetradella.  
**chambliensis** (e)—Pholadomorpha, Proetus, Whiteavesia.  
**champlainensis** (e)—Bucania, Cyrtactinoceras, Endoceras, Eurystomites, Lichas, Nautilus, Rafinesquina, Tarphyceras.  
**channahonensis**—Proetus.  
**chapmanensis**—Monograptus priodon.  
**chapmani**—Palæocrinus, Palæocystites, Stricklandinia.  
**charaxata**—Zaphrentis.  
**charletona**—Hyattidina.  
**charlottæ**—Leptæna.  
**charlotte**—Orthis.  
**charon**—Bellerophon.  
**chatfieldensis**—Aparchites, Modiolopsis.  
**chazianum**—Stromatocerium lamottense.  
**chaziense**—Goniceras.  
**chazyensis**—Pseudosphærexochus.  
**chemungensis**—Atrypa.  
**chicagoensis**—Arctinurus, Bucania, Bumastus, Cleidophorus, Corymbocrinus, Cyphocrinus, Eucalyptocrinus, Holopea, Ilkenus, Marsupiocrinus, Pentamerus, Periechocrinus, Tremanotus, Trematonotus.  
**chidlensis**—Labyrinthites.  
**chiomorphus**—Eunicites.  
**christiana**—Astylospongia.  
**christyi**—Actinocrinus, Calymene, Cyphaspis, Megistocrinus, Periechocrinus, Saccocrinus, Synhomalonotus.  
**chrysalis**—Calceocrinus, Cheiocrinus, Cremacrinus, Crinocystis, Crinocystites, Eucheiocrinus, Proclivocrinus, Tetracystis.  
**cielia**—Lophospira, Murchisonia.  
**cicerops**—Eurypterus, Eusarcus.  
**ciliatus** (a)—Beyrichia, Ctenobolbina, Diplograpsus, Diplograptus, Glossograptus.  
**cincinnatiæ**—Melia.  
**cincinnatiensis** (e)—Acidaspis, Actinomya, Agelacrinites, Agelacrinus, Ambonychia, Arthropora, Bellerophon, Beyrichia, Ceratocephala, Chætetes, Cyclocystoides, Cythere, Cytheropsis, Dendrocrinus, Elpe, Gomphoceras, Homotrypa, Lepidodiscus, Lingula, Lingulella, Lingulella (Dignomia), Lyro-
- cincinnatiensis**—Continued.  
 desma, Modiolopsis, Monticulipora, Monticulipora (Peronopora), Orthis, Orthoceras, Pholidops, Poteriocrinites, Perinea, Ptilodictya, Spirorbis, Technophorus, Trachomatichnus, Zygospira, Zygospira modesta.  
**cinctosa** (um)—Blothrophyllum, Enallopora, Mitoclema, Zaphrentis.  
**cinctutus** (um)—Amplexus, Cyrtoceras.  
**cingulatus** (a, um)—Amplexopora, Amplexus, Archinacella, Cornulites, Ctenodonta, Cypricardites, Cyrtodonta, Grammysia, Tellinomya, Triblidium.  
**circe**—Chilotrypa, Discina, Helopora, Lophospira, Pleurotomaria, Straparollina, Straparollus.  
**circinalis**—Mastigograptus.  
**circinatus**—Ecculiomphalus, Euomphalus.  
**circinctum**—Lioclema.  
**circularis**—Callopora, Ischadites, Lituities, Monticulipora, Monticulipora (Heterotrypa), Orthis, Orthis (Dalmanella) subæquata, Pentamerus, Pianodema subæquata, Receptaculites, Trocholithes.  
**circulus**—Atrypa, Camarella, Orthis, Rhipidomella.  
**circumcarinatus**—Glyptocrinus.  
**circummiratus**—Euomphalus.  
**cirrifer**—Gnorimocrinus.  
**clara**—Discina.  
**clarkanus**—Palæaster.  
**clarkei**—Beyrichia, Bollia, Colpoceras, Ctenodonta, Endoceras, Klædenella, Palæaster, Stromatopora, Tarphyceras, Tetragraptus.  
**clarki** (i)—Colpoceras, Cyathophyllum, Pseudocynites, Sagenocrinus.  
**clarksvillensis**—Platystrophia, Plectambonites rugosa.  
**clathrata** (um)—Beyrichia, Chasmatopora, Limaria, Lingula, Orthoceras, Phylloporina, Subretepora.  
**clathratulus** (a)—Chætetes, Stictopora.  
**claudei**—Cyclocrinus, Pasceolus.  
**clausus** (a)—Bellerophon, Callopora, Hallopora.  
**clavacoideus** (a)—Chætetes, Leptotrypa, Monticulipora, Monticulipora (Monotrypa).  
**clavatus** (um)—Orthoceras, Orthoceras (Actinoceras), Rusophycus.

- clavelloides—Buthotrephis, Bythotrephis.  
 claviformis—Leptotrypa, Stigmatella.  
 clavifracta—Beyrichia clavigera, Isochilina clavigera.  
 clavifrons—Illænus, Thaleops.  
 clavigera—Beyrichia, Isochilina.  
 clavis—Leptotrypa, Stigmatella.  
 clavus—Gomphocystites.  
 claypolei—Leperditia, Primitiella, Pseudocrinites.  
 claytonensis—Straparollus.  
 cleavelandi—Ptilodictya.  
 clelandi—Proetus.  
 clermontensis—Amphilichas.  
 clevelandi—Arthropora, Echinognathus, Eurypterus, Monticulipora, Monticulipora (Heterotrypa).  
 cliffordi—Trianisites.  
 cliftonensis—Camarotoechia (Stegerhynchus) neglecta, Cyrtia, Diaphorostoma, Hyolithes, Leptobolus lepis, Rhynchonella (Stegerhynchus) neglecta.  
 clintonensis (e)—Acervularia, Brockocystis, Clathropora, Clathropora frondosa, Coleolus, Crauiella, Ctenodonta, Cyphaspis, Cyrtoceras, Diaphorostoma niagarensis, Eunicites, Graptolithus, Ichthyocrinus, Lagenograptus, Lepadocystis, Lichas breviceps, Lingulops, Metapolichas breviceps, Monograptus, Monticulipora, Monticulipora (Heterotrypa), Palæodictyota, Petrocrania, Platyceras niagarensis, Ptilodictya, Rusichnites (Psammichnites), Rhyssophycus, Scolithus, Tellinomya (Nucula).  
 clintoni (i)—Atrypina, Calymene, Cerurus (Pseudosphærexochus), Cornulites, Cornulites serpulæ, Cyphaspis, Hemicypturus, Lingula, Onchus, Orthoceras, Pseudosphærexochus, Retepora, Strophomena, Spyroceras.  
 clipeiformis—Pleurotomaria.  
 clitus—Cyrtoceras.  
 clivosa—Pleurotomaria, Trochonema (Eunema).  
 clochensis—Archinacella, Lingula, Cyrtodonta.  
 clouei—Actinoceras, Orthoceras.  
 clytie—Heterorthis, Orthis.  
 coalescens—Camarotoechia, Ceratocephala, Chilotrypa, Trematopora.  
 cobbi—Pterygotus.  
 cobourgensis—Lingula.  
 cobscooki—Chonetes, Palæopecten.  
 cochabambina—Tunaria.  
 celatus—Eucalyptocrinus.  
 coeymanensis—Gypidula (Sieberella).  
 cognatus—Gaurocrinus, Glyptocrinus, Reteocrinus.  
 colbiensis—Platystrophia.  
 colletti—Conchidium, Holocystites, Pentamerus, Rhynchonella.  
 colliculus—Chonetes.  
 collieana—Asaphus, Hemigyraspis.  
 colon—Orthoceras, Orthoceras (Camero-ceras).  
 coloradoensis—Billingsella, Orthis.  
 columba—Lingula.  
 columbiana—Amplexopora, Illænurus, Platyceras, Raphistoma.  
 columellata—Cyathaxonina, Lindstromia.  
 columnaris (e)—Chætetes, Kionoceras, Orthoceras, Tetradium.  
 cometa—Pontobdellopsis.  
 comma—Corynoides curtus.  
 commodus—Holocystites.  
 communis (e)—Acervularia, Actinopteria, Agnostus, Avicula, Callopora onealli, Cæloclema, Cyclonema, Diamesopora, Eccyliomphalus, Hallopora onealli, Homotrypa, Monograptus, Monograptus convolutus, Monticulipora, Monticulipora (Heterotrypa) o'nealli, Orthostoma.  
 compactus (a, um)—Callograptus, Dendrograptus, Fusispira, Halysites, Halysites agglomeratus, Heterocrinus constrictus, Ohioocrinus, Ohioocrinus constrictus, Ophileta, Platyceras, Solenopora, Stromatopora, Subulites, Syringopora.  
 complanatus (a, um)—Aphetoceras, Cladopora, Dichelograptus, Lituities, Ophileta, Pentamerus, Schizostoma, Straparollus, Whitella.  
 compressus (a, um)—Aulopora precius, Chætetes, Conchopeltis, Conradella, Ctenodonta, Cyrtolites, Eccyliomphalus, Eccyliomphalus, Endodesma, Eschara, Heliophrentis alternatum, Megalomus, Monticulipora, Pentamerella, Pentamerus oblongus, Peronopora, Phragmoceras hoyi, Phragmolites, Raphistoma, Rhytimya, Ribeiria, Scenella, Sedgwickia, Stictopora, Tellinomya, Whitella.  
 comptus—Lampterocrinus.

- conca**—*Helopora*, *Modiolopsis*.  
**concentricus** (a, um)—*Ceramopora*, *Clidophorus*, *Cœlolema*, *Harpides*, *Lichenalia*, *Modiolopsis*, *Nucleospira*, *Nuttainia*, *Stromatopora*, *Trinucleus*, *Whitella*, *Zygospira*.  
**conchidium**—*Pentamerus*.  
**conciliatrix**—*Pachydietya*, *Trigonodictya*.  
**concinna**—*Holopea*, *Leperditia*, *Lophospira*.  
**concinus** (a)—*Anodontopsis*, *Aparchites*, *Camarotœchia*, *Cytheropsis*, *Dalmanella*, *Dictyonella*, *Eichwaldia*, *Eugaster*, *Eugasterella*, *Lingulella*, *Modiolopsis*, *Obolus*, *Orthis*, *Primitia*, *Protowarthia*, *Sinuities*.  
**concordensis**—*Discina*, *Opisthoptera*, *Strophomena*.  
**confertissimum**—*Cyrtoceras*.  
**confertus** (a, um)—*Dictyonema flabelliforme*, *Fenestella*, *Nematopora*, *Polypora*, *Schuchertella*, *Teratichnus*, *Vinella radicularis*.  
**confinis**—*Eunicites*.  
**confluens**—*Ceramopora*, *Ceraurinus*, *Escharopora*, *Homotrypa*, *Monotrypella*.  
**confusus** (a)—*Alecto*, *Halichondrites*, *Hormotoma*, *Murchisonia*, *Proboscina*, *Stomatopora*.  
**congeneris**—*Bathyurus*, *Holasaphus*.  
**congesta**—*Atrypa*, *Camerella*, *Hyattella*, *Hyattidina*, *Triplesia*.  
**conglobatus**—*Cyathocrinites*.  
**congregatus** (a)—*Anoplothea*, *Cœlospira*, *Inocaulis*, *Omphyma*, *Wingia*.  
**congruens**—*Camarotœchia*.  
**conicus** (a, um)—*Bathyurus*, *Clathrospira*, *Coccoerinus*, *Comulites*, *Cupellacrinites*, *Cyathophyllum*, *Cyclonema bilex*, *Cyrtoceras*, *Eucalyptocrinites*, *Eucalyptocrinus*, *Hyboerinus*, *Hystriacus*, *Orbiculoidea*, *Orthoceras*, *Ortonia*, *Porocrinus*, *Prasopora*, *Ptychoparia*, *Scenella*, *Schizotreta*, *Tryblidium*.  
**conifrons**—*Ilænus*.  
**conjugans**—*Cupulocrinus*, *Dendrocrinus*.  
**conjunctus**—*Arthrostylus*.  
**conoidale**—*Cyrtoceras*.  
**conoideus** (a, um)—*Discosorus*, *Holopea*, *Ichthyocrinus*, *Lophospira*, *Murchisonia*, *Orthoceras*, *Prasopora*.  
**conradana**—*Lophospira*.  
**conradi**—*Calymene*, *Cyrtolites*, *Dinobolus*, *Lophospira*, *Lyrodesma*, *Ilænus*, *Murchisonia*, *Obolus*, *Orthis*, *Orthis* (*Dalmanella*) *subæquata*, *Pianodema subæquata*, *Platystrophia cypha*, *Strophomena*, *Subulites*, *Trianisites*, *Trimerella*.  
**consimilaris**—*Hipparionyx*.  
**consimilis**—*Aulopora*, *Bellerophon*, *Berenicea*, *Chætetes*, *Diastopora*, *Diastoporella*, *Goniophora*, *Ilænus*, *Modiolopsis*, *Monticulipora*, *Monticulipora lævis*, *Monotrypella*.  
**consobrinus**—*Ilænus*.  
**constellariformis**—*Homotrypa*.  
**constellatus** (a, um)—*Ceripora*, *Chætetes*, *Cœnostoma*, *Constellaria*, *Constellaria plana*, *Phænopora*, *Stromatopora*.  
**constrictostriatum**—*Cyrtoceras*.  
**constrictus** (a, um)—*Astrocerium*, *Colpomya*, *Cymatopora*, *Cyrtoceras*, *Didymograptus*, *Eucalyptocrinus*, *Favosites*, *Graptolithus*, *Heterocrinus*, *Homocrinus*, *Murchisonia*, *Ohioerinus*, *Oncoceceras*, *Phacelopora*, *Phragmoceras*, *Poterioceras*, *Primitia*, *Primitiella*, *Turritoma*.  
**consuetus** (a, um)—*Clidophorus*, *Endoceras*, *Eoharpes*, *Harpes*, *Nematopora*.  
**contexta** (um)—*Heteronema*, *Homotrypella*, *Monticulipora*.  
**contiguus** (a)—*Conocephalites*, *Eccyliomphalus*, *Modiolopsis*, *Prasopora*.  
**contortus** (a)—*Dicranograptus*, *Eunicites*, *Stromatopora*.  
**contractus** (a, um)—*Calceocrinus*, *Cornulites*, *Ctenodonta*, *Deltacrinus*, *Leperditia balthica*, *Orthodesma*, *Orthonota*, *Tellinomya*.  
**conulus**—*Streptelasma*, *Zaphrentis*.  
**convexus**—*Uncinulus*.  
**convexus** (a, um)—*Acrotreta*, *Amphion*, *Asaphus*, *Camarotœchia acinus*, *Clathrospira*, *Didymograptus*, *Dolichometopus*, *Eurymyella*, *Fusispira*, *Ilænurus*, *Liospira*, *Pliomerops*, *Rhynchonella acinus*, *Rhytimya*, *Schuchertella*, *Strophomena*, *Streptorhynchus*, *Symphysurus*.  
**convolutus** (um)—*Bellerophon*, *Graptolithus*, *Lomatoceras*, *Monograptus*, *Mycelodactylus*, *Prionotus*.  
**convolvans**—*Barrandoceras*, *Lituities*.

- cookana—Walcottia.  
 cooperi—Syringopora.  
 coppingeri—Gypidula, Lomatoceras convolutum, Monograptus convolutus, Pentamerus.  
 cora—Crotalocrinus, Cyathocrinus.  
 corallifera (um)—Atrypa, Dictyonella, Diphyphyllum, Eichwaldia, Orthoceras, Stromatopora.  
 corallinensis—Spirifer (Delthyris), Spirifer modestus.  
 corax—Apatokephalus, Dikelocephalus.  
 corbis—Ichthyocrinus.  
 cordai—Bathyurus, Hystricurus.  
 cordatum—Cyrtoceras.  
 cordieri—Actinoceras, Asaphus.  
 cordiformis—Cypricardites, Cyrtodonta, Palæocardia, Plethocardia.  
 coriformis—Cuncea.  
 corinna—Orthis.  
 corinthium—Cyathophyllum.  
 corinthia—Rhynchonella.  
 cornetti—Stephanocrinus.  
 cornicula (um)—Calceola, Cyrtoceras, Petraia, Piloceras, Streptelasma, Streptoplasma, Zaphrentis.  
 cornigerus—Illænus.  
 cornucopiæ—Bollia.  
 cornulum—Cyrtoceras.  
 cornuoryx—Orthoceras, Orygoceras.  
 cornutaforme—Metoptoma, Triblidium.  
 cornutus (a, um)—Anomalocystis, Anomalocystites, Arbellites, Arthroclema, Callicrinus, Chonetes, Conolichas, Ctenobolbina ciliata, Eucalyptocrinus, Glossograptus, Lichas, Platyceras (Diphrostoma), Strophomena.  
 cornuum—Orthoceras.  
 coronatus (a)—Diagoniella, Eunicites, Protospongia.  
 corporiculus—Platycrinus.  
 corpulenta—Dalmanella, Orthis.  
 corrallinensis—Spirifer crispus.  
 corriganensis—Gypidula (Sieberella) coeymanensis.  
 corroboratus—Merocrinus.  
 corrugatus (a, um)—Avicula, Bellerophon bilobatus, Callicrinus, Conchicolites, Cornulites, Crania, Creseis, Cryptodiscus, Cupellacrinites, Cupellacrinus, Cyphotrypa, Cyrtotheca, Dermatostroma, Favosites, Labechia, Leptæna, Marsipocrinus, Modiolopsis, Monotrypa, Nuculites, Orbicula, Pentamerus oblongus, Proetus, Pterinea, Sinuites  
 corrugatus—continued.  
     cancellata, Stropheodonta, Strophomena, Styliola.  
 cortex—Leptotrypa.  
 corticans—Chætetes, Spatiopora.  
 corticosa—Chasmatopora, Phylloporina, Phyllopora, Subretopora.  
 corticula—Pachydietya fenestelliformis  
 corycæus—Asaphus, Proetus.  
 corydon—Cyrtoceras.  
 coryphæus—Asaphus.  
 costalis—Kokenia, Kokenospira, Orthis.  
 costatus (a, um)—Ambonychia, Amphicecia (Leptodomus), Anomalodonta, Bucania, Camarella, Crania, Cyrtolites, Dyceria, Orthis, Platystrophia, Sarcinula, Strophonella, Sphyradoceras, Trochoceras.  
 costulata (um)—Ascoceras, Ascoceras (Billingsites), Ilionia.  
 covingtonensis—Cylindrocœlia, Isotelus, Lingula, Protoscolex.  
 coxii—Calceola.  
 crassibasalis (e)—Dictyonema, Pachyocrinus.  
 crassicauda—Illænus.  
 crassicaulis—Nemagraptus gracilis, Stephanograptus.  
 crassicosta—Pentamerus nysius.  
 crassimarginatus (a)—Calymene, Proetus, Schmidtella.  
 crassimuralis—Monotrypella, Monticulipora, Rhombotrypa.  
 crassinoda—Drepanella.  
 crassiplica—Conchidium.  
 crassiplicata—Cyclocœlia, Encuclocladema, Plectorthis.  
 crassipuncta—Trematis.  
 crassiradiatum—Conchidium.  
 crassiramus—Inocaulis diffusus.  
 crassirostra—Atrypa.  
 crassisiphonatum—Endoceras, Narthecoceras.  
 crassitestus—Diplograptus.  
 crassolaris (e)—Bucania, Tremanotus.  
 crassoradius—Conchidium, Pentamerus.  
 crassus (a, um)—Atactoporella, Bucania, Buthotrephis gracilis, Cactograptus, Cladopora, Cœnites, Ctenobolbina, Eucalyptocrinus, Glossina, Goniophora, Heterocrinus, Homotrypella hospitalis, Iocrinus, Jonesella, Limaria, Lingula, Maclurea, Maclurites, Nematophycus, Nematophyton, Orthis, Pachydietya,



**crassus**—continued.

*Palæoglossa*, *Platystrophia*, *Platystrophia biforata*, *Porocrinus*, *Ptilodictya*, *Steliella*, *Stictopora*, *Streptelasma*, *Streptoplasma*, *Vanuxemia*.

**cratera**—*Astylomanon*, *Palæomanon*.

**crateriformis**—*Lichenocrinus*.

**crawfordi**—*Orthoceras* (*Kionoceras*).

**crebescens**—*Glyptaster occidentalis*, *Orthoceras*, *Protokionoceras*.

**crebriformis**—*Trematopora* (*Chaetetes*).

**crebripora**—*Trematopora*.

**crebriseptum**—*Actinoceras*, *Ormoceras*, *Orthoceras*.

**crebristriatum**—*Orthoceras*.

**crenatus** (a)—*Eridonychia*, *Eucalyptocrinites*.

**crenulatus** (a)—*Arabellites*, *Callopora*, *Calloporina*, *Cytherina*, *Cytheropsis*, *Halloporina*, *Maclurea*, *Maclurites*, *Po-leumita*, *Polytropis*, *Stigmatella*, *Straparollus*.

**crepidiformis**—*Jonesella*, *Leperditia*

**crevieri**—*Pleurotomaria*.

**cribriformis**—*Calapœcia*, *Columnopora*.

**cribrosa**—*Fenestella*, *Stictoporella*.

**crispatus** (a)—*Dalmanella*, *Hebertella* (*Glyptorthis*), *Orthis*, *Spirifer* (*Delthyris*).

**crispus** (a)—*Delthyris*, *Spirifer*, *Spirifer* (*Reticularia*), *Terebratula*.

**cristatus** (a)—*Arabellites*, *Conokephalina*, *Cyrtolites*, *Dicellocephalus*, *Dikelocephalus*, *Encrinurus*, *Eunicites*, *Favosites*, *Isochilina*, *Oxydiscus*, *Primitia*.

**cristulata**—*Zaphrentis*.

**crocus**—*Cycloceras*, *Orthoceras*.

**crosotus**—*Acidaspis*, *Ceratocephala*, *Ceraurus*, *Odontopleura*.

**crotalifrons**—*Bathyurus*, *Hystricurus*.

**crucialis**—*Tetragrapsus*.

**crucifer**—*Graptolithus*, *Graptolithus* (*Monoprion*), *Tetragrapsus*.

**cruciformis**—*Ptilodictya*.

**crustacea**—*Enoploura*, *Placocystis*.

**crustula**—*Fistulipora*.

**crustulatus** (a)—*Chaetetes*, *Monticulipora*.

**cryptata**—*Pleurotomaria*.

**crypturus**—*Asaphus*.

**cucullus**—*Amphilichas*, *Lichas*, *Lichas* (*Platymetopus*).

**cucurbita**—*Cruziana*.

**cultrata**—*Byssonychia*.

**cumberlandensis**—*Crania granulosa*.

**cumberlandiæ**—*Tentaculites niagarensis*.

**cumberlandica**—*Fenestella*, *Primitia*.

**cummingsi**—*Pterygotus*.

**cumulata**—*Fistuliporella*, *Monotrypa* (*Chaetetes*), *Monticulipora*, *Nicholsonella*.

**cuneatus** (a, um)—*Angellum*, *Atrypa*, *Chondrites* (*Bythotrephes*), *Clidophorus*, *Cyrtoceras*, *Cyrtodonta*, *Endodesma*, *Lingula*, *Lingulella*, *Lingulobolus affinis*, *Maclurea*, *Maclurina*, *Ænonites*, *Plethomytilus*, *Pyrenomœus*, *Rhynchonella*, *Rhynchotreta*, *Tellinomya*, *Tellinomya* (*Palæoneilo*).

**cuneiformis** (e)—*Clathrograptus*, *Ctenodonta*, *Modiolopsis*, *Orthodesma*, *Sphenolium*, *Tellinomya*.

**cuniculus**—*Bumastus*, *Illænus*.

**cunulæ**—*Carinaropsis*, *Phragmostoma*.

**cupressinus**—*Chondrites*, *Chondrites* (*Trichochoondrites*).

**curdsvillensis**—*Plectambonites*.

**curiosus** (a)—*Asaphus*, *Clisospira*, *Pterinea*.

**curtus** (a, um)—*Arthronema*, *Arthrostylus*, *Bythocypris*, *Corynoides*, *Corynotrypa*, *Ctenobolbina*, *Ctenobolbina ciliata*, *Ctenodonta*, *Cuneameya*, *Cypri-cardites*, *Dendrocrinus*, *Ischyrodonta*, *Lingula*, *Lyonsia*, *Merocrinus*, *Modiolopsis*, *Octonaria*, *Orthodesma*, *Ortho-nota*, *Pteronitella*, *Tellinomya*.

**curvatus** (a, um)—*Acrotreta*, *Ambonychia*, *Cameroceras*, *Encrinurus*, *Homotrypa*, *Monticulipora*, *Orthodesma*, *Rhinopora*.

**curvicameratum**—*Cyrtor(h)izoceras*.

**curvicostata**—*Lasiothrix*.

**curvidens**—*Ænonites*.

**curvilatus**—*Caryocaris*.

**curvilineatus**—*Caryocaris*.

**curvistriata**—*Schuchertella*.

**cuspidatus** (a)—*Arabellites*, *Atrypa*, *Didymograptus*, *Triplecia*, *Triplexia*.

**cuvieri** (i)—*Actinoceras*, *Conotubularia*, *Orthoceras*.

**cyane**—*Glossina*, *Lingula*, *Palæoglossa*.

**cyathiformis**—*Ischadites*, *Palæochonia*, *Palæospongia*, *Protospongia*, *Protospongia* (*Diagoniella*), *Trachyum*.

**cybele**—*Bathyurus*, *Petigurus*.

**cyclonemoides**—*Pleurotomaria*.

**cyclops**—*Isotelus*.

- cyclopyge*—Agnostus, Lejopyge.  
*cyclostomus* (a)—Bucania, Pleurotomaria, Strophostylus.  
*cyclus*—Orthis.  
*cylindracea*—Amplexopora.  
*cylindricus* (a, um)—Actinostroma tenuifilatum, Agraulus, Arionellus, Athyris, Atrypa, Beatricea undulata, Bythocypris, Bythocypris (Cytherellina), Caryocystites, Clathrodictyon cystosum, Cymatona, Cytherina, Dendrocrinus, Holocystis, Holocystites, Homocrinus, Homotrypa, Isochilina, Lapworthura, Leperditia, Merista, Meristella (Meristina), Orthodesma, Palæocoma, Pentamerus oblongus, Ptychaspis, Tæniaster, Tæniura, Thalamocrinus, Whitfieldella.  
*cylix*—Astylomanon cratera.  
*cymbula*—Carinaropsis, Orthodesma, Phragmostoma.  
*cypha*—Orthis, Platystrophia, Platystrophia lynx.  
*cyrtodontoidea*—Pterinea.  
*cystata*—Dekayella, Dekayia frondosa.  
*cystosa* (um)—Clathrodictyon, Stromatopora.  
*dactioloidea*—Lunulites.  
*dactyloidea*—Lunulites.  
*dactylodus*—Lumbriconereites.  
*dactyl(i)oides*—Cerionites, Cyclocrinus, Cyrtoceras, Pasceolus.  
*dactylus*—Lyriocrinus, Melocrinus, Marsupiocrinites, Rhodocrinus (Lyriocrinus).  
*dalei* (ii)—Callopora, Chætetes, Hallopora, Monticulipora, Monticulipora ramosa.  
*dalli*—Trimerella.  
*dalmani* (i)—Syringopora.  
*danaanum*—Clisiophyllum.  
*danæ*—Dalmania, Dalmanites.  
*danai*—Acidaspis.  
*danbyi*—Avicula, Palæopecten.  
*danielsi*—Illænus.  
*danvillensis*—Saccospongia.  
*daphne*—Fusispira, Lingula, Straparollina, Straparollus, Subulites.  
*dardanus* (um)—Cyrtoceras, Cyrtor(h)izoceras.  
*darwini* (i)—Bathyurus, Cyclocrinus, Kionoceras, Orthoceras, Pasceolus.  
*davidsoni*—Orthis, Orthis calligramma, Rhinobolus, Stricklandinia.  
*davisi*—Lingula, Lingulella.  
*dawsoni*—Dendrograptus, Homalonotus, Homotrypa, Monticulipora, Monticulipora (Heterotrypa), Palæocystites, Palæosaccus, Phylloporina, Subretepora.  
*daytonensis* (e)—Actinoceras, Cyathophyllum celator, Hebertella, Illænus, Orthis, Orthoceras, Strophonella, Zaphrentis celator.  
*debilis*—Glossograptus ciliatus, Syringopora, Trematopora.  
*decadactylus*—Glyptocrinus, Heterocrinus.  
*decemplicatus* (a)—Delthyris, Spirifer, Spirifera, Rhynchonella.  
*decepiens*—Batostoma, Chætetes, Dicranopeltis, Ischyrodonta, Leptæna, Leptella-Lichas, Liospira, Lyellia, Enonites, Peronopora, Pyrenomæus, Raphistoma, Vanuxemia.  
*deckerensis*—Edmondia, Klœdenia manliensis, Orthothetes, Rhynchonella, Schuchertella, Stenochisma.  
*declinata*—Favosites.  
*declivis*—Agnostus acadicus, Bellerophon, Helicotoma, Modiolodon, Rafinesquina, Strophomena.  
*decorus* (a, um)—Beyrichia, Cyclonema, Emmelezoe, Eucalyptocrinus, Hypanthocrinites, Hypanthocrinus.  
*decreescens*—Orthoceras.  
*decursa*—Lophospira.  
*decurta*—Murchisonia.  
*decussatus* (um)—Conchidium, Dimorphograptus, Pentamerus.  
*deflecta* (um)—Atrypa, Dinorthis (Plæsiomys), Glossina, Leptæna, Lingula, Orthis, Palæoglossa, Plæsiomys, Strepatorhynchus, Strophomena, Zygospira.  
*deformata*—Archinacella, Crania, Orbicula.  
*deformis*—Discina, Metoptoma, Orthis, Orthothetes, Schuchertella, Stephanocrinus, Stricklandinia.  
*defranci*—Conotubularia, Orthoceras, Orthoceratites.  
*deiopia*—Clathrospira, Pleurotomaria.  
*dekayi*—Eurypterus.  
*delafieldi*—Amphidesma.  
*delatatus*—Bellerophon.  
*deleta*—Archinacella, Carinopsis.  
*delicatulus* (a, um)—Archæocrinus, Bythopora, Callithamnopsis, Chætetes, Corynotrypa, Dictyonema, Hippothoa,

- delicatulus**—continued.  
*Labechia*, *Monograptus*, *Monticulipora*,  
*Nematopora*, *Orthis*, *Protospongia*, *Ra-*  
*finesquina*, *Scolithus*, *Stomatopora*,  
*Zaphrentis*.
- delphicolium**—*Hexamerocheras*, *Hexamero-*  
*cheras*.
- delphiensis**—*Orthoceras* (*Kionoceras*).
- delphinocephalus**—*Trimerus*.
- deltoides** (a)—*Encrinurus*, *Leptæna*,  
*Streptorhynchus* (*Strophonella*).
- demissus** (a)—*Avicula*, *Colpomya*, *Fu-*  
*coides*, *Pterinea*, (*Caritodens*).
- denbowensis**—*Eurymyella*.
- dendrina**—*Bythopora*, *Helopora*.
- dendrocrinus**—*Podolithus*.
- densa**—*Corematocladus*.
- densiseptatum**—*Cyathophyllum*.
- dentatus** (a, um)—*Atrypa*, *Crania*, *Cerau-*  
*rus*, *Diplograptus*, *Fucoides*, *Graptol-*  
*ites*, *Graptolithus*, *Orthis*, *Orthis*  
(*Platystrophia*) *biforata*, *Rhynchonella*,  
*Rhynchotrema*.
- denticula**—*Ctenobolbina*.
- denticulatus** (a, um)—*Anthophyllum*,  
*Graptolithus*, *Graptolithus* (*Monopri-*  
*on*), *Monograptus*, *Raphistoma*, *Tetra-*  
*grapsus*.
- dentilineatum**—*Heliophyllum*.
- dentoni**—*Eoharpes*, *Harpes*.
- deparcum**—*Orthoceras*.
- depauperatus** (a)—*Arges* *phlyctenoides*,  
*Ceratocephala*, *Corydocephalus*, *Pleu-*  
*rotomaria*.
- depressus** (a, um)—*Archæocrinus*, *Cy-*  
*clora*, *Eucalyptocrinus*, *Illænus*, *Lep-*  
*tæna*, *Maclurea*, *Maclurites*, *Modiolop-*  
*sis*, *Ophiletina* *sublaxa*, *Platyceras*,  
*Proetus*, *Prosserella* *modestoides*, *Reti-*  
*cularia* (*Prosserella*) *modestoides*,  
*Rhynchonella* *saffordi*, *Strophomena*,  
*Wilsonia* *saffordi*.
- derbyi**—*Lingulops*.
- descriptus**—*Cypricardites*, *Cyrtodonta*.
- desertus**—*Harpides*, *Nautilus*.
- deshayesii**—*Actinoceras*.
- desideratus** (a, um)—*Archæocrinus*, *As-*  
*traspis*, *Billingsia*, *Callicrinus*, *Cyrtol-*  
*ites*, *Elkania*, *Glossoceras*, *Obolella*,  
*Obolus* (*Lingulella*), *Phragmolites*.
- desmograptoides**—*Dictyonema* *flabelli-*  
*forme*.
- desmoides**—*Dictyonema*.
- desmopleura**—*Eoorthis*, *Orthis*, *Orthis*  
(*Plectorthis*).
- desori**—*Zaphrentis*.
- desplainensis** (e)—*Sphyradoceras*, *Tro-*  
*choceras*.
- determinatus**—*Proetus*.
- devinei**—*Conocephalites*, *Dikelocephalus*,  
*Ptychoparia*.
- deweyi**—*Ceratiocaris*, *Ceratiocaris* (*Phas-*  
*ganocaris*), *Nereites*, *Nereograpsus*, *On-*  
*chus*.
- diademata** (um)—*Blastophycus*, *Tretas-*  
*pis*.
- dianthus**—*Eurychilina*.
- diapason**—*Dicranograptus* *nicholsoni*.
- dice**—*Billingsella*.
- dichotomus** (a, um)—*Camarocladia*,  
*Diamesopora*, *Drymotrypa*, *Hornera*,  
*Lithodendron*, *Orthis*, *Plectorthis*,  
*Protovirgularia*, *Pseudohornera*, *Stauro-*  
*graptus*, *Stictopora*, *Stricklandinia*,  
*Subretopora*, *Thamniscus*.
- dickhauti**—*Ischadites*, *Lepidolites*, *Re-*  
*ceptaculites*.
- dicksoni**—*Agelacrinites*, *Agelacrinus*.
- dictæus**—*Modiolopsis*.
- dictyota**—*Polypora*.
- dictys**—*Cyrtoceras*.
- dicyclius**—*Carabocrinus*, *Strophocrinus*.
- difficilis**—*Pattersonia*, *Pleurotomaria*,  
*Seelya*.
- diffidens**—*Loxoceras*, *Orthoceras*.
- diffisa**—*Beyrichia*.
- diffuens**—*Arachnophyllum*, *Strombodes*.
- diffusus** (a)—*Callograptus*, *Dendrograp-*  
*tus*, *Drymotrypa*, *Inocaulis*, *Pseudo-*  
*hornera*, *Retepora*.
- dignus**—*Cypricardites*, *Cyrtodonta*.
- dilatatus** (um)—*Cyathophyllum*, *Cyrtol-*  
*ites*.
- dilucula**—*Holopea*, *Turbo*.
- diminuens**—*Tellinomya* (*Palæoneilo*).
- dinorthis**—*Orthis* *calligramma*.
- diops**—*Calymene*.
- directus**—*Subulites*.
- discoideus** (a)—*Amplexopora*, *Calamo-*  
*pora*, *Chætetes*, *Dianulites*, *Favosites*  
*forbesi*, *Leptotrypa*, *Lyellia*, *Mesotry-*  
*pa*, *Monticulipora*, *Monticulipora* (*Mo-*  
*notrypa*), *Obolella*, *Obolus*, *Obolus*  
(*Lingulella*), *Plasmopora*, *Wingia*.
- discreta**—*Columnaria* *alveolata*.

- disculus**—Bellerophon, Oxydiscus.  
**discus (um)**—Favosites, Ophileta, Rhombodictyon.  
**disjunctus (a)**—Cyrtolites, Ecyliopteris, Ophileta, Strophostylus cyclostomus.  
**dispanum**—Streptelasma.  
**dispar**—Actinopteria, Eophyton, Scolithus, Trochonema.  
**disparilis**—Atrypa, Atrypina, Cœlospira, Leptocelia, Orthia, Trematospira.  
**dissimilaris**—Cladograpsus, Dicranograptus, Diplograptus.  
**dissimilis**—Corynotrypa, Frammia, Stomatopora.  
**dissolutus**—Serpulites.  
**distans**—Actinoceras tenuifilum, Arachnophyllum (Strombodes) mamillare, Cornulites, Ecyliomphalus, Endoceras, Graptolithus (Prionotus) sedgwickii, Heliolites subtubulatus, Monograptus, Nemagraptus gracilis, Ormoceras tenuifilum, Rafinesquina, Tentaculites.  
**distincta (um)**—Ceramoporella, Cyathophyllum, Huronia.  
**distorta**—Carpomanon stellatimulcatum, Escharina.  
**divaricans**—Palæophyllum Streptelasma.  
**divaricatus (a)**—Buthotrephis, Dicellograptus, Dicellograptus moffatensis, Dichograptus, Dicranograptus, Didymograpsus, Didymograptus, Graptolithus, Helopora, Inocaulis, Rhombopteria divaricata, Sedgwickia, Technophorus, Whiteavesia.  
**divergens**—Amphigraptus, Cœnograptus (Pleurograptus, Pterograptus), Columnaria, Dendrograptus, Graptolithus, Hallia Parastrophia, Pentamerus.  
**diversus (a)**—Callopora, Clitambonites, Dermatostroma, Orthisina.  
**dividuum**—Eridophyllum.  
**divisa**—Hallia.  
**dixonensis**—Maclurea bigsbyi, Maclurites bigsbyi, Receptaculites, Subulites, Vanuxemia.  
**dixoni**—Orthostrophia, Strophonella.  
**docens**—Liospira, Pleurotomaria.  
**dodgei**—Schizambon.  
**dolatus (a)**—Lingula, Obolus.  
**dolomiticus (a)**—Orthotropia, Sphærocystites.  
**donaciformis**—Ctenodonta, Nucula, Tellinomya.  
**doneti**—Strophomena.  
**dorsicornis**—Leperditella, Leperditia, Primitia.  
**douglasi**—Oncoceras.  
**dowlingi**—Gyronema.  
**downingiæ**—Phacops, Phacopidella.  
**dresbachense**—Cyrtoceras.  
**drummondense**—Clathrodiction.  
**drummondi**—Omphyma, Orthoceras.  
**dryope**—Eotomaria, Pleurotomaria.  
**dubiaformis**—Ctenodonta.  
**dubius (a, um)**—Ampheristocrinus, Atrypa, Bathyrus, Calymene, Codylocrinus, Crania, Ctenobolbina, Ctenodonta, Dendrograptus, Dianulites, Diplotrypa, Gilbertocrinites, Glossina, Goniophora, Hemitrypa, Homotrypella, Hyolithes, Lampterocrinus, Lichenocrinus, Lingula, Lyonsia, Mesoplaester, Metoptoma, Modiolopsis, Monticulipora, Palæaster, Palæoglossa, Periechocrinus, Peronopora, Phyllograptus, Platycolpus, Platycrinus, Protorhyncha, Ptilodictya, Pycnosaccus, Reticularia, Rhynchonella, Rhynchorthoceras, Spirifer, Stenotheca, Tellinomya, Troostocrinus.  
**dufresnoyi**—Actinoceras.  
**dumalis**—Callopora, Hallopora.  
**dumosa**—Homotrypa, Stictoporella.  
**dunleithense**—Cyrtoceras  
**duplicata (um)**—Cameroceras, Endoceras, Gyronema, Primitia, Trochonema.  
**duplicimuratus**—Schizambon.  
**duplicostatum**—Gyroceras.  
**durhamensis**—Eotomaria, Labechia, Monomerella, Pleurotomaria, Poleumita, Polytrypis.  
**duryi**—Beyrichia, Ctenobolbina.  
**duseri**—Orthoceras.  
**dychei**—Leptotrypa, Modiolopsis, Monticulipora, Monticulipora (Monotrypa), Prioniodus, Stigmatella.  
**dyeri**—Ancistroceras, Asaphoidichnus, Conradella, Crania, Cyrtolites, Dendrocrinus, Glyptocrinus, Holocystites, Lichenocrinus, Orthoceras, Palæaster, Phragmolites, Poteriocrinites, Promopalæaster, Trematis, Trocholites.  
**eatonensis (e)**—Cyrtoceras (Glyptoceras), Glyptodendron, Trigonodictya.

- eatoni**—Dikelocephalus, Discoceras, Lituities, Paradoxides, Platycolpus, Stomatocerium.
- eboraceus**—Dalmanites, Pterygometopus.
- eccentrica (um)**—Aspidopora, Monticulipora, Monticulipora (Heterotrypa), Trochonema.
- echinatus (a)**—Dekayella prænuntia, Eridotrypa, Glossograptus, Mesotrypa, Squamaster, Trematopora.
- edax**—Orthoceras.
- edgewoodensis**—Calvinia, Dalmanella.
- edmundsi**—Chonetes, Whitfieldella.
- eduliformis**—Mytilarea, Streptomytilus.
- edwardsii**—Asaphus.
- effusa**—Primitia mundula.
- egani**—Dimerocrinus, Encrinurus, Endoceras, Eucalyptocrinus, Eucalyptocrinus (Hypanthocrinus), Glyptaster, Monomorella, Perichocrinus, Saccocrinus, Thysanocrinus.
- egena**—Leperditia hisingeri.
- ekwanensis (e)**—Bronteus, Camarotæchia, Goldius, Orthoceras, Trimerella.
- elderi**—Lingula.
- eldonensis**—Hybocystis.
- electra**—Dalmanella, Orthis.
- elegans**—Apicocystis, Apicocystites, Arabellites, Bistramia, Callograptus, Chætetes, Conradella, Cyrtolites, Discotrypa, Fenestella, Helopora, Heliolites, Hercocrinus, Holocystites, Lecanocrinus, Monograpsus, Monograptus, Monticulipora, Nemagraptus, Nucleospira, Pachydictya, Phragmolites, Plasmopora, Pleurocystis, Pleurocystites, Prioniodus, Protaster, Pterinea, Pycnostylus, Sagenella, Strophostylus, Tæniaster, Taxocrinus.
- elegantulus (a, um)**—Aspidopora, Callopora, Conocardium, Dalmanella, Encrinurus, Hallopora, Leptæna transversalis, Lingula, Lingula (Pseudolingula), Orthis, Orthoceras, Ptilodictya, Receptaculites, Stictopora, Strophomena.
- elevatus (a, um)**—Cyclonema, Eotomaria, Holopea obsoleta, Lophospira, Murchisonia, Scævogyra, Scalites.
- elginensis**—Ceraurus.
- ella**—Cybele, Cybeloides, Cyclocælia Encuclodema, Orthis, Plectorthis.
- ellesi**—Didymograptus.
- ellesmerelandi**—Platyceras.
- ellipsiformis**—Lingula.
- ellipticus (a, um)**—Aparchites, Avicula, Bathyrurus, Bucania, Caryocrinites, Caryocrinus, Cleidophorus, Ctenodonta, Cuneameya, Eucalyptocrinus, Lingula, Orthodesma, Palkeaspis, Petigurus, Phragmoceras, Psiloconcha, Pterinea, Receptaculites, Strophomena, Tellinomya.
- ellsii**—Lingulella, Obolus.
- elongatus (a, um)**—Bumastus, Camarium, Cameroceras proteiforme, Clidophorus, Closterocrinus, Corynotrypa, Drepanella, Endoceras, Endoceras proteiforme, Fusispira, Goniurus, Hallicystis, Holopea, Homeospira schucherti, Idiocrinus, Ischadites, Ischyrodonta, Leperditia, Lepidolites, Lingula, Obolus (Westonia), Pseudocrinites, Receptaculites, Stephanocrinus, Stomatopora, Stomatopora dissimilis, Streptorhynchus, Stribalocystis, Strophomena, Strophomena planumbona, Subulites, Subulites (Loxonema).
- elora**—Euomphalopterus, Pleurotomaria, Stomatoporella.
- eloroidea**—Pleurotomaria.
- elrodi**—Acacocrinus, Barrandeoceras, Conocardium, Eucalyptocrinus, Gyrocera.
- emacerata**—Actinopteria, Atrypa, Avicula, Dalmanella, Dalmanella testudinaria, Dicranopora, Orthis, Pterinea, Ptilodictya, Rhynchonella.
- emaciata**—Constellaria, Constellaria florida, Ctenobolbina, Ctenobolbina ciliata, Pachydictya, Strophomena.
- emarcescens**—Ptilodictya expansa.
- emarginatus (a)**—Lichas, Orthis oblata, Rhipidomella.
- eminula**—Lyellia.
- emma**—Cypricardites, Cyrtodonta, Rhytmya.
- emmonsi**—Bucania, Canadocystis, Cytherina, Lesueurilla, Maclurea, Maclurites, Malocystites, Sigmacystis.
- emoryi**—Asaphus, Isotelus, Onchomctopus.
- endoceroidea**—Cylindrocælia.
- ensiformis**—Graptolithus, Phænopora, Ptilodictya, Retiolites, Trigonograptus.
- eos**—Gomphoceras.
- epidermata**—Bythotrypa, Crepipora, Favositella, Monticulipora.
- epitome**—Eunema, Trochonema.
- equanensis**—Trimerella.

- equilatera—Beyrichia, Riberia nuculiformis.  
 equiradiata—Atrypa, Rhynchospira.  
 equisetalis—Cladopora.  
 erastusi—Bumastus, Illænus.  
 erato—Metoptoma, Tryblidium.  
 erectus (a)—Ambonychia, Clidophorus, Clionychia, Crateripora, Dendrograptus, Whitfieldella.  
 eriensis—Eurypterus, Spirifer (Delthyris).  
 erigone — Eunema, Trochonema (Eunema).  
 eriphyle—Cyathophyllum, Omphyma.  
 erraticus (a, um)—Catazyga, Columnaria, Dendrocrinus, Orthis, Orthoceras (Euthoceras), Orthonomæa, Zygospira.  
 cruciforme—Eridophyllum.  
 eryx—Cheirus, Pseudosphærexochus.  
 escanabiæ—Eoharpes, Harpes.  
 escasoni—Lingulella, Obolus, Westonia.  
 escharoides—Catenipora.  
 estella—Archinacella, Cœlocaulus, Metoptoma, Murchisonia, Tryblidium.  
 etheridgii—Diplograptus.  
 etna—Euconia, Pleurotomaria.  
 eubule—Metoptoma, Tryblidium.  
 eucharis—Glossograptus, Helicotoma, Retiograptus, Retiograptus.  
 eucheirocrinus—Podolithus.  
 eudocia—Orthis.  
 eudora—Spirifer (Eospirifer).  
 eugenia—Liospira, Pleurotomaria.  
 eugium—Cyrtoceras.  
 euglyphus (a)—Diplograptus, Diplograptus (Glyptograptus), Leptæna, Strophomena, Strophonella.  
 euodus—Didymograptus, Didymograptus.  
 euorthis—Orthis calligramma, Orthis flabellites.  
 eurekensis—Illænurus, Symphysurus.  
 eurydice—Straparollina, Straparollus.  
 euryone—Cyathophyllum, Orthis.  
 eva—Lingula, Rhynchonella.  
 evadne—Dalmanella, Orthis.  
 evax—Homœospira, Retzia, Rhynchospira.  
 everetti—Pachydictya.  
 exactus—Subulites.  
 excavatus (a)—Ambonychia, Clionychia, Eucalyptocrinus cornutus, Glycerites sulcatus, Leccanocrinus.  
 exceedrinus—Encrinurus.  
 excellens—Modiolopsis, Phænopora, Ptilodictya, Stictoporella.  
 excelsa—Holoepa.  
 excentrica—Crania, Orbicula.  
 excrescens—Cathospongia.  
 excretus—Favosites.  
 exculptus—Palæaster, Promopalæaster.  
 exfoliata—Hebertella, Plectorthis.  
 exiguus (a, um)—Atrypa, Bellerophon, Bucania, Clinoceras, Cyrtoceras, Eridotrypa, Heliolites, Heterocrinus, Lingulella (Lingulepis), Lyellia, Oncoeras, Protocrisina, Protozyga, Rhinidictya, Spirifer, Stictoporella.  
 exilis (e)—Cœnograptus, Dicollograptus sextans, Dicranograptus furcatus, Heterocrinus, Homotrypa, Modiolopsis, Nemagraptus, Ohioocrinus, Stenocrinus, Stephanograptus, Trochonema.  
 eximius (um)—Arachnophyllum, Climacograptus putillus, Strombodes.  
 exornatus (a, um)—Orthoceras, Pleurocystites, Pleurocystites filitextus, Pleurocystis.  
 expansus (a, um)—Alveolites, Anthophyllum, Bathyrellus, Bellerophon, Bucania, Bucanospira, Ceramopora, Chætetes, Clioderma, Crateripora lineata, Dekayia ulrichi, Delthyris, Dictyonema, Euomphalus, Meristina, Oncoceras, Orbignyella, Phænopora, Pterotheca, Ptilodictya, Ptychophyllum, Salpingostoma, Streptelasma, Streptoplasma, Whiteavesia.  
 explanator—Piloceras.  
 explanatus (a, um)—Carinaropsis, Ceramopora, Ceramopora (Lichenalia), Lioclema, Metoptoma, Nemagraptus, Phænopora.  
 explicans—Ptilodictya.  
 explorator—Orthoceras.  
 exponens—Conchidium.  
 exporrectus (a)—Anomites, Cyrtia.  
 exserta (um)—Stenothecha, Tryblidium.  
 exsul—Alveolites, Callopora, Lioclema.  
 extans—Asaphus, Atrypa, Bathyurus, Camarella, Streptelasma (Zaphrentis), Triplecia, Triplesia.  
 extensus (um)—Didymograptus, Eucalyptocrinites, Eucalyptocrinus, Graptolithus, Graptolithus (Monoprion), Tarphyceras.

- extenuatus* (a, um)—*Didymograpsus*, *Ectomaria*, *Ectomaria prisca*, *Graptolithus*, *Murchisonia*, *Opisthoptera*, *Solenospira*, *Solenospira prisca*, *Technophorus*.  
*faba*—*Colpomya*, *Leperditia*, *Lyonsia*, *Modiolopsis*, *Nuculites*.  
*fabiformis*—*Modiolopsis*.  
*faberi*—*Agelacrinites*, *Agelacrinus*, *Chirosporgia*, *Clidophorus*, *Cyrtoceras*, *Gomphoceras*, *Holocystites*, *Lepidodiscus*, *Lichas*, *Modiolopsis*, *Orthodesma*, *Orthototella*, *Palæoconcha*, *Platycystites*, *Pyanomya*, *Rhytimya*, *Sphenolium*, *Technophorus*.  
*fabius*—*Agnostus*.  
*fabula*—*Cleidophorus*, *Clidophorus* (*Nucula*), *Clidophorus* (*Nuculites*).  
*fabulina*—*Leperditia hisingeri*.  
*fabulites*—*Cytherina*, *Leperditia*.  
*facetus*—*Cyathophyllum*.  
*facula*—*Sceptropora*.  
*fairchildi*—*Euomphalus*.  
*fairmountensis*—*Dalmanella*.  
*falcatus*—*Eunicites*.  
*falciformis*—*Escharopora*, *Ptilodictya*.  
*falconeri*—*Glaucocrinus*.  
*falesi*—*Monticulipora*, *Prasopora*.  
*falx*—*Cyrtoceras*, *Mælonoceras*.  
*famelicus*—*Ptilodictya*.  
*fanningana* (um)—*Ditæcholasma*, *Duncanella*, *Petraia*.  
*farci-men*—*Gyroceras*.  
*fartus*—*Pachydictya*, *Ptilodictya*.  
*farnsworthi*—*Aphetoceras*, *Lituites*, *Tarphyceras*.  
*farringtoni*—*Habrocrinus*.  
*fasciatus* (a)—*Cyathocrinus*, *Hebertella*, *Hebertella* (*Schizonema*), *Hebertella* (*Schizoramma*), *Leptæna*, *Lophospira*, *Orthis*, *Orthostrophia* (*Schizoramma*), *Rafinesquina*, *Strophomena*.  
*fascicularis*—*Drymopora*, *Syringopora* (*Drymopora*).  
*fastigiatum*—*Clathrodictyon*.  
*fatua* (um)—*Trichonema*, *Trochonema* (*Eunema*).  
*fausta*—*Hebertella*, *Ophileta*, *Orthis*.  
*favosa*—*Calamopora*, *Favosites*.  
*favosideus* (a)—*Favistella*, *Favosites*.  
*favositiformis*—*Parallelopora*.  
*favositoidea*—*Calapoccia*.  
*favosus*—*Favosites*.  
*favus*—*Nidulites*.  
*fayettensis*—*Calymene*.  
*featherstonhaughi*—*Cyrtoceras*.  
*fecunda*—*Ctenodonta*, *Nucula* (*Tellinomya*).  
*feildeni*—*Stropheodonta*.  
*fenestelliformis*—*Pachydictya*, *Phænopora*, *Ptilodictya*.  
*fenestratus* (a)—*Amplexus*, *Anthaspiddella*, *Echinocrinites*, *Echinocrinus*, *Echinoencrinites*, *Phylloporina*, *Retepora*, *Rhinidictya*, *Stictopora*, *Subretopora*, *Sulcopora*, *Tetracystis*.  
*ferox*—*Nautilus*.  
*ferrisi*—*Metopolichas*.  
*ferruginea* (um)—*Avicula*, *Cypricardites*, *Cyrtodonta*, *Lingulella*, *Nuculites* (*Cleidophorus*).  
*fertilis* (a)—*Batostoma*, *Batostoma circulare*, *Orthis* (*Dalmanella*).  
*ferum*—*Orthoceras*, *Spyroceras*.  
*festinata*—*Camarotæchia*.  
*fibrata* (um)—*Syringopora*, *Tetradium*.  
*fibrosus* (a)—*Alveolites*, *Calamopora*, *Cladopora*, *Hindia*, *Stenopora*.  
*ficellostriata*—*Homœospira*.  
*fidelis*—*Stictopora*.  
*fieldeni*—*Amplexus*, *Halysites catenularia*.  
*filiasa*—*Amplexopora*, *Chætetes*, *Leptotrypa*, *Monotrypa*, *Monticulipora*.  
*filiciformis*—*Buthotrephis*, *Chloephyucus*, *Strophostylus*.  
*filiformis* (a)—*Didymograptus*, *Orthoceras*.  
*filiosa*—*Amplexopora*, *Monticulipora*.  
*filiramus*—*Dictyonema*.  
*filistriatus* (a)—*Ctenodonta*, *Rafinesquina winchesterensis*, *Strophonella*, *Technophorus*.  
*filitextus* (a, um)—*Hemipronites*, *Leptæna*, *Pleurocystis*, *Pleurotomaria*, *Streptorhynchus*, *Strophomena*.  
*fillmorensis*—*Cyrtodonta aslinis*, *Cyrtolites retrorsus*, *Lophospira*, *Primitia*, *Primitiella*.  
*fillmorensis*—*Prasopora insularis*.  
*filosus* (a, um)—*Crania*, *Cyrtoceras*, *Cyrtolites*, *Dalmanella emarcerata*, *Obolus*, *Orbicula*, *Orbiculoidea*, *Rauffella*, *Schizocrania*, *Trematis*, *Turripapas*.

- fimbriatus** (a)—*Acidaspis*, *Alepidaster*, *Aparchites*, *Ceratocephala*, *Conradella*, *Cyrtolites*, *Glyptocrinus*, *Klædenia*, *Leperditia*, *Pachydictya*, *Phænopora*, *Phænopora canadensis*, *Phragmolites*, *Protasterina* (*Protaster*), *Protasterina*, *Ptilodictya*, *Reteocrinus*.
- finalis**—*Apatokephalus*, *Dicellocephalus*.
- finxi**—*Palæaster*, *Mesopalæaster*.
- finitimus**—*Cypricardites*, *Crytodonta*.
- firma**—*Anthaspidella*, *Pachydictya*.
- fiscellostriatus**—*Bellerophon*, *Bucania*.
- fischeri**—*Atops*, *Constellaria*, *Triarthrus*.
- fissicosta**—*Opisthoptera*, *Orthis*, *Plectrothis*.
- fissiplica**—*Dalmanella*, *Hebertella* (*Schizonema*), *Hebertella* (*Schizoramma*), *Orthis*, *Orthostrophia* (*Schizoramma*).
- fissiplicata**—*Orthis flabellites*.
- fissistriata**—*Hebertella* (*Schizonema*), *Hebertella* (*Schizoramma*), *Orthostrophia* (*Schizoramma*).
- fissus**—*Schizambon*.
- fitchi**—*Loxonema*.
- fittoni**—*Calathium*.
- flabella**—*Atrypa*, *Orthis*, *Platystrophia*.
- flabellaris**—*Homotrypa*, *Monticulipora*.
- flabellata**—*Chiloporella*, *Clathropora*, *Diastoporina*, *Fistulipora*, *Lasiotrix*, *Stictoporella*.
- flabellifer**—*Brontes*, *Bronteus*, *Goldius*.
- flabelliformis** (e)—*Dictyonema*, *Fenestella*, *Gorgonia*, *Rhabdinopora*.
- flabellites**—*Orthis*.
- flabellula** (um)—*Orthis*.
- flabellum**—*Inocaulis*, *Licrophycus*, *Orthis*.
- flaccidus**—*Graptolithus*, *Graptolithus* (*Monoprion*), *Leptograptus*, *Mastigograptus*.
- flagellifer**—*Ctenopyge*, *Leptoplastus*, *Olenus*, *Sphærophthalmus*.
- flagellum**—*Ptilodictya*.
- flanaganensis**—*Allonychia*.
- flavius**—*Orthoceras*.
- flemingii**—*Graptolithus*, *Monograptus*.
- fletcheri**—*Chætetes*, *Discina*, *Sphærophthalmus*.
- flaxilis**—*Clonograptus*, *Dichograpsus*, *Graptolithus*, *Graptolithus* (*Dichograptus*), *Graptolithus* (*Monoprion*), *Strophomenes*.
- flexuosus** (a)—*Alepidaster*, *Conchicolites*, *Cornulites*, *Dendrograptus*, *Palæophycus*, *Protaster*, *Protasterina*, *Ptilodictya*, *Seriatopora*, *Spirorbis*, *Stictoporella*, *Striatopora*, *Tentaculites*.
- florealis**—*Amygdalocystis*, *Amygdalocystites*.
- florencevillensis**—*Isotelus*.
- floridensis**—*Pleurotomaria*.
- floridus** (a, um)—*Callopora*, *Constellaria*, *Eucalyptocrinites*, *Lioclema*, *Nicholsonella*.
- florifera**—*Anthaspidella*.
- floriforme**—*Ptychophyllum*.
- flos**—*Cyathophyllum*, *Heliophyllum*.
- fluctuata** (um)—*Cyclonema*, *Cyclonema bilix*.
- fluctuosa**—*Strophomena*.
- fluitans**—*Dendrograptus*.
- foerstei**—*Heterotrypa*, *Mytilarca*.
- foggi**—*Spirifer* (*Eospirifer*).
- foliaceus** (a)—*Ceramopora*, *Dekayella*, *Diplograptus*, *Diprion*, *Graptolithus*, *Meekopora*, *Ptylograpsus*, *Ptylograptus*, *Retepora*.
- foliata**—*Pachydictya*.
- foliosus**—*Diplograpsus*.
- folium**—*Graptolithus*, *Phyllograptus*.
- foliis**—*Plasmopora*.
- fontinalis**—*Dinorthis*, *Strophomena*.
- forbesi**—*Beyrichia*, *Calamopora*, *Cheirocrinus*, *Chirocrinus*, *Deiphon*, *Discina*, *Favosites*, *Glyptocystites*, *Lingula*, *Theca*.
- forcipiformis**—*Didymograptus*.
- formosus** (a, um)—*Bathyuirellus*, *Calathium*, *Conularia*, *Dicranograptus*, *Helopora*, *Licrophycus*, *Nematopora*, *Orthoceras*, *Pterinea*, *Receptaculites*, *Retzia*, *Rhynchonella*, *Rhynchospira*, *Rhynchotrema*, *Stenochisma*, *Trematospira*, *Waldheimia*.
- fornicatus** (a)—*Actinopteria*, *Barrandella*, *Ciorinda*, *Pentamerus*.
- fornshelli**—*Glyptocrinus*.
- fosteri**—*Cyrtoceras*, *Cyrtorhizoceras*, *Orthoceras*.
- fountainensis**—*Modiolopsis*.
- foxense**—*Orthoceras*.
- fracta**—*Rafinesquina alternata*, *Strophomena*, *Strophomena alternata*.
- fragaria**—*Macronotella*.



- fragilis** (e)—Cyrtoceras, Dicranopora, Helopora, Nematopora, Cœnonites, Oncoceras, Ptilodictya, Rhabdaria, Sedgwickia, Stictopora, Trematis.
- fragosus**—Cypricardites, Vanuexmia.
- frankfortensis**—Bucania, Cyphotrypa, Dolichopterus, Hebertella, Leperditia cœcigena, Orthis, Orthoceras (Spyrocera).
- franklinense**—Actinostroma, Clathrodictyon, Orthoceras.
- franklini**—Favistella.
- fraternus** (um)—Bathyporellus, Bellerophon, Illæus.
- fredericus**—Æcylimphalus.
- fredricki**—Pterygometopus.
- freitana**—Dalmanella, Orthis.
- fringilla**—Camarotoechia, Rhynchonella.
- frobisherensis**—Ctenodonta.
- frobisleri**—Cyphaspis, Eurychilina, Primitia.
- frondifera**—Stictoporella.
- frondosus** (a)—Alecto, Aulopora, Callopora, Ceramophylla, Chaetetes, Clathropora, Dekayia, Dendrograptus, Hallopora, Heterotrypa, Homotrypa, Homotrypa flabellaris, Monticulipora, Monticulipora (Peronopora), Proboscina, Phylodictya, Rhinopora, Stomatopora.
- frontalis**—Leperditia.
- fronticola**—Leperditia.
- fruticosus** (a)—Bythopora, Callithamnopsis, Cœnites, Dendrograptus, Didymograptus, Graptolites (Didymograptus), Graptolithus, Graptolithus (Monoprion), Limaria, Oldhamia, Tetragraptus, Tetragraptus, Tetragraptus (Bryograptus).
- fucioidea**—Rauffella.
- fulcrata** (um)—Ctenobolbina, Ptychophyllum.
- fulgur**—Actinoceras, Orthoceras.
- fultonensis**—Cyrtoceras, Dalmanella.
- funata**—Hormotoma, Murchisonia.
- fungiformis**—Astrea, Hexaporites.
- fungosus** (um)—Receptaculites.
- fungulus**—Baryphyllum.
- funiculus**—Palæophycus.
- furcatus** (a)—Dicranograptus, Graptolithus, Prioniodus, Rhabdaria.
- furcifer** (um)—Cruziana, Dictyonema.
- furcillatus**—Calceocrinus, Castocrinus, Didymograptus murchisoni, Didymograptus.
- furtivum**—Orthoceras, Protocycloceras.
- fusibrachiatus**—Macrostylocrinus.
- fusififormis** (e)—Chaetetes, Lioclemella, Monticulipora, Orthoceras.
- fustiformis**—Sceptropora.
- futilis** (e)—Dalmanella, Dalmanella testudinaria, Oncoceras, Orthis.
- gainesi**—Cyathaxonia.
- galba**—Agnostus, Arthrorachis.
- galeatus** (a)—Atrypa, Gypidula, Pentamerus, Sieberella.
- galenensis** (e)—Cyphaspis, Haploconus, Lingula riciniformis, Lingulasma.
- galtensis** (e)—Cœnostroma, Eotomaria, Euomphalus, Ilionia, Obolellina, Obolus, Pleurotomaria, Prolucina, Rhynchobolus, Stromatopora.
- gamma**—Asaphus.
- ganti** (i)—Cypricardites, Cyrtodonta, Modiolodon, Strophonella.
- gaspensis**—Favosites.
- gaspiensis**—Stricklandia, Stricklandinia.
- gattingeri**—Conularia.
- gebhardi**—Apiocystites, Lepocrinites, Lepocrinus.
- geinitzanus**—Clathrograptus, Ptilograptus, Reteograptus, Retiograptus.
- gelasinosa**—Homotrypa, Monticulipora.
- gemelliparum**—Endoceras.
- geminus**—Didymograptus.
- gemma**—Acrotreta.
- gemmatus**—Chaunograptus.
- gemmeus**—Rhaphanocrinus.
- gemmicula**—Orthidium, Orthis.
- gemmiferum**—Heliophyllum.
- gemmiformis**—Piscocrinus, Stephanocrinus.
- gemmulus** (a)—Cystiphyllum, Leptobolus, Obolella.
- geniculatus** (a, um)—Brachyprion, Dicranograptus spinifer, Heterocrinus, Stenocrinus, Stropheodonta, Strophodonta, Strophonella, Strophoprion.
- geometricus**—Carabocrinus, Goniograptus, Streptelasma, Streptelasmacallicula.
- georgiæ**—Conchidium.
- germanus** (a, um)—Aristophycus ramosum, Cypricardites, Cyrtodonta grandis, Dinorthis meedsi, Glyptocrinus shafferi, Leperditella, Leperditia, Orthis meedsi, Orthis (Dalmanella) meedsi, Pycnocrinus.
- geronticus** (a)—Spirifer (Eospirifer), Strophomena planumbona.

- gesneri—Endodesma, Modiolopsis.  
 gibbera—Cyrtodonta, Leperditia, Leperditia hisingeri, Primitia.  
 gibberosum—Ascoceras.  
 gibberulus (a)—Ctenodonta, Didymograptus, Didymograptus (Isograptus), Dolichometopus, Isograptus.  
 gibbosus (a, um)—Arabellites, Atrypa, Ctenodonta, Dalmanella, Dictyonella, Eichwaldia, Eucalyptocrinites, Eucalyptocrinus, Eurystomites, Leptaena, Lingula, Lyonsia, Oncoceras, Orthis, Orthis subaequata, Pianodema subaequata, Plectambonites, Pyanomya, Spirifer, Spirifer (Eospirifer), Strophomena, Tellinomya, Trilobites Vanuxemia.  
 gibbus—Modiolodon.  
 giganteus (a, um)—Anomalodonta, Camarotoechia, Cyrtoceras, Cryptozoon, Eurypterus, Homalotus, Leperditia, Murchisonia, Pachydictya.  
 gigas—Asaphus, Asaphus (Isotelus), Astrea, Isotelus, Rhodocrinus, Strombodes.  
 gilberti—Trimeroceras.  
 gilpeni—Stropheodonta, Strophomena.  
 girardeauensis—Cyphaspis.  
 glabellus (a)—Cypricardites, Cyrtodonta, Pisocrinus.  
 glaber (ra)—Homotrypa, Leperditella, Leptaena, Lyellia, Plectambonites, Primitia, Propora, Sarcinula (Porites), Triarthrus.  
 glacialis—Camarotoechia, Rhynchonella, Shumardia.  
 gladiola—Ptilodictya.  
 glandicephalus—Bathyrurus, Bathyrurus (Bathyurellus).  
 glans—Gomphocystites.  
 glaucus—Ceraurus (Nieszkowskia), Cheirurus, Orthoceras.  
 glenelgensis—Rosenella.  
 globata—Stigmatella.  
 globicaudatus—Pterygotus.  
 globiceps—Pterygotus (Erettopterus).  
 globosus (a)—Bumastus, Caryocrinites, Caryocrinus, Cyathocrinites, Cyathocrinus, Cyclocrinus, Holocystites, Illaenus, Menocephalus, Monotrypa, Pasceolus, Peronosporites, Rhombodictyon, Rhynchospira, Trematospira, Triacrinus, Waldheimia, Wilsonia, Zophocrinus.  
 globularis (e)—Bellerophon, Lioclema, Receptaculites, Sinuites, Sphaerocystites, Stromatotrypa.  
 globulosus (a)—Gypidula, Pentamerus.  
 glomeratus (a)—Clathropora, Sphaerocystites, Stictopora.  
 glypta (um)—Dermatostroma, Orthis.  
 goldfussi (i)—Calamopora, Columnaria, Conotubularia, Cyathophyllum, Eucalyptocrinites, Eucalyptocrinus, Favosites, Lyopora, Ortnoceras, Symphysurus.  
 goliath—Cyathophyllum.  
 goliata—Ceratocéphala.  
 goniocercus—Asaphus, Megalaspis.  
 goniumbonata—Whitella.  
 goniurus—Asaphus, Megalaspis.  
 gonopleura—Pleurotomaria.  
 goodhuensis—Callopora, Hallopora, Hormotoma gracilis.  
 goodlandensis—Eatonia.  
 goodnovi—Sphaerocoryphe.  
 goodridgii—Dalmanites, Pterygometopus.  
 gorbyi—Bellerophon, Cyphocrinus, Eucalyptocrinus, Holocystites, Myelodactylus, Orthoceras, Periechocrinus, Pisocrinus, Saccocrinus, Striatopora, Stribalocystites.  
 gordonii—Aparchites, Pseudocrinites, Unicornulus.  
 gorgonea—Helicotoma.  
 gothlandicus (a, um)—Calamopora, Corallium, Favosites.  
 grabaui—Callograptus.  
 gracia—Holoepa.  
 gracilens—Hormotoma, Murchisonia.  
 gracilis (a)—Acervularia, Actinoceras, Aphylostylus, Arca, Astraeophyllum, Batostomella, Butothrephes, Bythopora, Bythothrephes, Calymene, Catenipora, Chaetetes, Chasmatopora, Cheirocrinus logani, Cladograptus, Clathropora, Coenograptus, Conularia, Cornulites flexuosus, Cornulites clintoni, Corynoides, Crania, Cyathophyllum, Cyclonema, Cyrtoceras, Dendrocrinus, Dendrograptus, Dictyonema, Didymograptus, Discosorus, Eunicites, Fenestella, Fucoides, Graptolites (Didymograptus), Graptolithus, Glyptocystites, Glyptocystites logani, Halysites catenulatus, Helicograptus, Heterocrinus, Homocrinus, Homotrypella, Hormoceras, Hormotoma, Isochilina, Leperditia,

*gracilis*—continued.

Monograptus, Monticulipora, Monticulipora *meecki*, Monticulipora (Heterotrypa), Murchisonia, Nemagraptus, Nereites, Nereograptus, Ormoceras, Piloceras, Poterioceras, Poteriocrinites, Poteriocrinus, Reteocrinus, Retepora, Stephanograptus, Strombodes, Subretepora, Subulites, Triplecia.

*gracilissimus* (m)—Plumulites, Turrilepas.

*gracillimus* (m)—Chondrites, Chondrites (Trichochondrites), Dendrograptus, Mastigograptus, Psilophytum.

*graffonensis* (e)—Bumastus, Discoceras, Illænus, Lituities.

*grahami*—Ptilodictya.

*graminifolia*—Stictopora.

*grandæva*—Billingsella, Orthisina.

*grandis* (e)—Anthaspidella, Byssonychia, Ceratiocaris, Conradella, Cypricardites, Cyrtodonta, Dichotrypa, Dictyonema, Didymograptus nitidus, Ectenocrinus, Eusarcus, Heterocrinus simplex, Holoepora, Homotrypa, Illænus, Isochilina, Leperditia, Leptobolus, Lingulella laevis, Lyrodesma, Monticulipora, Orthodesma, Parabolina, Parabolina heres, Prasopora, Psiloconcha, Pterygotus (Erettopterus), Rhinidictya, Stenaster, Trimerella, Urasterella.

*grandulosum*—Carpomanon.

*granilabiatus*—Aparchites, Leperditia.

*granilineatum*—Cystiphyllum.

*granistriata*—Chasmatopora, Phylloporina, Protowarthia, Sinuities.

*granosa*—Eurychilina, Helicotoma, Nematorpora.

*granti* (i)—Acanthograptus, Acanthograptus, Astroconia, Aulocopina, Buthotrephid, Bythocypris, Callograptus, Eoharpes, Harpes, Inocaulis, Lingulops, Mesopalæaster, Odontocaulis, Palæaster.

*granulatus* (a, um)—Caryocrinites, Chalcidites, Conularia, Cystaster, Haplocrinites, Haplocrinus, Hemicystis, Hemicystites, Symbathocrinus, Synbathocrinites, Synbathocrinus, Trematopora.

*granuliferus* (a)—Alepidaster, Batostomella, Chætetes, Homotrypella, Monticulipora (Fistulipora), Protaster, Retzia, Retzia (Trematospira), Rhombopora, Tæniaster, Trematopora, Trematospira.

*granulosus* (a, um)—Amplexopora, Alveolites, Arachnophyllum, Beyrichia, Calymmene callicephala, Ceraurus, Crania, Crepicephalus (Loganelus), Fenestella, Macrostylocrinus, Macrostylocrinus striatus, Mariacrinus, Palæaster, Pisocrinus, Promopalæaster, Ptilodictya, Ptychoparia, Shumardia.

*graptolithinum*—Dictyonema.

*grayi* (i)—Atrypa, Streptis, Terebratula.

*greenei* (ii)—Anisocrinus, Chonophyllum, Conchidium, Lecanocrinus, Monomorella, Parastrophia.

*gregalis*—Modiolopsis.

*gregarius* (a, um)—Astylospongia, Buthotrephid, Conchicolites, Cyclocrinus, Dendrocrinus, Hindia, Isochilina, Microspongia, Monograptus, Nidulites, Orthoceras, Pasceolus, Petigopora, Pleurotomaria, Primitia.

*gregwa*—Obolus (Lingulepis).

*grenvillensis* (e)—Rusophycus, Rusichnites.

*guelphensis*—Holoepora, Pycnostylus.

*guelphica*—Hermatostroma, Leperditia balthica, Leperditia phaseolus, Lophospira, Murchisonia.

*gurleyi*—Dicellograptus.

*gyracanthus*—Asaphellus, Echinus, Tentaculites.

*gyrinus*—Holocystites.

*gyroceras*—Eccyliomphalus, Euomphalus.

*hæsitans*—Orthoceras.

*hageri*—Cyclonema, Orthoceras.

*haguei*—Crepicephalus (Loganelus), Liostactus, Ptychoparia.

*hainesi*—Cypricardites, Ortonella.

*halei*—Eotomaria, Euomphalopterus, Pleurotomaria, Trochonema.

*hallanus* (m)—Orthoceras, Streptorhynchus.

*halleanus*—Cyrtocheras.

*halli* (i)—Acidaspis, Amphilichas, Ampyx, Asaphus, Beyrichia, Bolia, Bucania, Buthotrephid, Calceocrinus, Ceratocephala, Chasmatopora, Columnaria, Crania, Cyclocrinus, Cyclocystoides, Cypricardites, Cyrtodonta, Dalmanites, Deltacrinus, Dimercrinus, Fistulipora, Gomphoceras, Gonioceras, Harlania, Klødenella, Lichas, Lonchodonus, Odontopleura, Pasceolus, Phylloporina, Plectoceras, Pleuroto-

- halleri**—continued.  
 maria, Raphistoma, Rhodocrinus, Scenidium, Skenidium, Strophomena, Trematopora, Trochoceras, Thysanocrinus.
- haliana (um)**—Anthocystis, Cyclonema, Cyrtoceras, Favosites, Zitteloceras.
- hallie**—Streptorhynchus, Strophomena.
- halysitoides**—Tetradium.
- hamatus**—Arabellites.
- hamburgensis**—Ctenodonta, Dalmanella, Orthis, Tellinomya.
- hammelli**—Allocystites, Beyrichia, Caryocrinites, Caryocrinus, Ctenobolbina, Ctenobolbina ciliata, Holocystites, Lophospira, Murchisonia, Orthoceras (Dawsonoceras), Stephanocrinus, Trematocystis.
- hamptoni**—Pentacrinites.
- handwerki**—Phacops, Proctus.
- hanoverensis (e)**—Lichas, Orthoceras (Euorthoceras), Strophomena, Strophomena (Orthothetes).
- harinensis**—Spirifer.
- harlani**—Arthropycus, Fucoides.
- harmonia**—Holoepa.
- harpa**—Holoepa, Straparollina.
- harperi**—Orthoceras.
- harpya**—Pleurotomaria.
- harrietta**—Cypricardites, Cyrtodonta.
- harrisi**—Arctinurus, Bumastus, Calloporella, Compsocrinus, Glyptocrinus, Helopora, Illænus, Isotelus, Lichas, Lichas (Platynotus), Mariacrinus, Palæaster, Stenaster.
- hart(t)i (i)**—Conocephalites, Dicelloccephalus, Dikelocephalus, Halysites catenularia, Halysites catenulatus, Orbiculoidea.
- hartleyi**—Jaekelocystis, Mesomphalus.
- hartnageli**—Ptilograptus.
- hartsvillensis**—Ctenodonta, Tellinomya.
- hastatus (um)**—Ampyx (Lonchodomus), Orthoceras, Tripteroceras.
- haynianus (a)**—Cypricardites, Cyrtodonta.
- headi**—Athyris, Catazyga, Chiastoclonella, Glassia, Graptolithus, Graptolithus (Loganograptus), Tetragraptus, Tetragraptus.
- hearsti**—Actinoceras.
- hector**—Phragmoceras.
- hecuba**—Strophomena.
- helderbergiæ**—Bellerophon, Columnaria, Favosites.
- helenæ**—Liospira, Pleurotomaria, Rhynchospira, Trematospira.
- helicitæ**—Platyschisma, Trochus.
- helicteres**—Lophospira, Murchisonia.
- heliophylloides**—Cylindroheliolum.
- hemiastræ**—Streptorhynchus.
- hemiplicatus (a)**—Anastrophia, Atrypa, Camarella, Parastrophia, Pentamerus.
- hemisphericus (a, um)**—Alveolites, Anoplothea, Atrypa, Cœlospira, Crepipora, Euomphalus, Fistulipora, Haplocrinites, Ischadites, Lecanocrinus, Leptocœlia, Monotrypa undulata, Monticulipora undulata, Platycrinus, Platystoma, Receptaculites, Straparollus, Thecostegites.
- hennepini**—Cameroceras, Endoceras.
- henrietta**—Orthoceras.
- hepaticus**—Odontocaulis.
- herculaneus**—Homalonotus, Orthoceras.
- hercules**—Cyrtoceras, Gyroceras, Halloceras, Halloceras (Ophidioceras), Litoroceras, Lituites, Nautilus, Orthoceras, Protophragmoceras.
- hercyna**—Murchisonia, Pleurotomaria.
- heres**—Parabolina.
- hermione**—Avicula, Lophospira, Murchisonia, Pleurotomaria, Prolobella.
- hero**—Prasopora.
- heros**—Streptoceras.
- herricki**—Illænus.
- hertzeri**—Cyrtoceras, Gomophoceras, Hexameroceras, Hexamoceras.
- herzeri**—Columnaria, Cyathoxonia, Kiobelasma, Lindstromia.
- hespelerensis**—Lophospira, Murchisonia.
- heterocostalis**—Cupulocrinus, Scyphocrinus.
- heterodactylus**—Heterocrinus, Stenocrinus.
- heterophyllus**—Fucoides.
- hexabrachiatus**—Dichograptus.
- hexagonalis**—Leptotrypa, Pachydictya.
- hexagonus**—Caryocrinites, Caryocrinus.
- hexaporites**—Dianulites petropolitanus.
- hieroglyphicus**—Diabolocrinus.
- higginsportensis**—Strophomena.
- hilli**—Ctenodonta, Escharopora, Ptilodictya, Tellinomya.
- hiltonensis**—Licropycus.
- hincksii**—Asaphus.

- hindei*—Arabellites, Orthoceras, Stromatopora.  
*hindi* (i)—Astropolithon, Cypricardites, Cyrtodonta, Stephanella, Stromatopora, Whitella.  
*hippolyta*—Straparollus.  
*hippolyte*—Orthis.  
*hirsuta*—Atactopora.  
*hisingeri*—Conocephalites, Cytherina, Dictyonema, Dikelocephalus, Favosites, Leperditia, Lisania.  
*hispidus* (a)—Acanthodictya, Favosites.  
*historicum*—Eunema, Gyronema.  
*hitzi*—Cyrtoceras, Orthoceras (Ormoce-ras).  
*hoffmanni*—Cyclora.  
*holbrookii*—Agelacrinites, Agelacrinus.  
*holiensis*—Dalmanella.  
*holopiformis*—Acanthonema.  
*holstoni*—Orthis.  
*homalonotoides*—Asaphus, Isoteloides.  
*homfrayi*—Asaphellus, Asaphus, Asaphus (Isotelus).  
*homolostriata*—Stropheodonta demissa.  
*honeymani*—Avicula, Pterinea.  
*horani*—Acidaspis, Ceratocephala.  
*horridus*—Glossograptus ciliatus.  
*hortensia*—Pleurotomaria, Raphistoma.  
*hoskinsoni*—Streptelasma.  
*hospitalis*—Homotrypella, Monticulipora, Prasopora, Prasopora selwynii.  
*houghtoni*—Cyrtoceras.  
*hoveyi*—Brachiospongia.  
*howardi*—Cyrtoceras, Habrocrinus, Periechocrinus, Saccocrinus, Zophocrinus.  
*howleyi*—Lingula.  
*hoysi*—Orthoceras, Phragmoceras, Pleurotomaria, Pleurotomaria (Trochonema).  
*hoysi*—Pelagiella, Platyceras.  
*hubbardi*—Holoepa.  
*hudsoni*—Ceraurus, Conularia, Endoceras, Holoepa, Trochonema.  
*hudsonicus* (a, um)—Camarotoechia, Caenopora, Conularia, Cyphaspis, Diplograptus, Endoceras, Poleumita, Stromatopora.  
*humboldti* (i)—Orthis.  
*humerosum*—Cyclonema.  
*humilis* (e)—Batostoma, Cyclonema, Cypulocrinus, Dendrocrinus, Diaphorostoma, Lophospira, Murchisonia, Palæactmæa, Rhinidictya.  
*hunterensis*—Pleurotomaria, Polygyrata.  
*huntingtonensis*—Oriostoma.  
*huntingtoni*—Amygdalocystites.  
*hurlbuti*—Lingula (Glossina), Palæoglossa.  
*huron(i)ensis* (e)—Apiocystites, Brockocystis, Calapœcia, Cyclocystoides, Cypricardites, Cyrtoceras, Cyrtodonta, Cystiphyllum, Labechia, Lingula, Oncoceras, Orthis, Orthoceras, Stenopora, Striatopora, Stromatocerium, Strophomena concordensis, Syringolites, Syringopora, Tetradium, Trematis, Trochus.  
*huronica* (um)—Dania, Diphyphyllum, Eridiphyllum, Houghtonia.  
*huttoni*—Asaphus, Basilicus, Ptychopyge.  
*huxleyi*—Anomalocystites, Ateleocystites, Ateleocystites, Stenaster, Urastrella.  
*hyale*—Charionella, Murchisonia, Plethospira, Pleurotomaria, Whitfieldella.  
*hybrida*—Orthis, Rhipidomella.  
*hydei*—Callierinus, Ceraurus, Cheirurus, Cryptodiscus.  
*hydraulicus* (a, um)—Camarotoechia, Cyathophyllum, Orthothetes, Rhynchonella, Schuchertella, Streptorhynchus.  
*hypniformis*—Graptolithus (Diplograptus).  
*hyrie*—Metoptoma, Tryblidium.  
*hystrix*—Glossograptus, Trichospongia.  
*icarus*—Ceraurinus, Ceraurus, Ceraurus (Eccoptochile), Cheirurus.  
*ida*—Acidaspis, Billingsia, Elkania, Obolella.  
*idahensis*—Acrotreta.  
*idia*—Pleurotomaria.  
*ignicula*—Orthis.  
*ignota* (um)—Dalmanella, Dalmanella testudinaria, Orthis, Orthoceras, Orthoceras (Euorthoceras).  
*ilicifolius*—Phyllograptus.  
*illænoides*—Asaphus, Smyphysurus.  
*illinoisensis*—Ambonychia, Cyclocystoides, Dalmanites, Diaphorostoma, Leperditia, Lingulops, Odontopleura, Pontocypris, Rhynchotrema.  
*imago*—Apiocystites, Illicystis.  
*imbecilis*—Strophomena.  
*imbrex*—Rafinesquina, Strophomena.  
*imbricatoarticulata*—Astylospongia, Siphonia.  
*imbricatus* (a, um)—Atrypa, Bucania, Byssonychia, Ceramopora, Cœclolema, Conradella, Cyrtolites, Helopora, Orthoceras, Phragmolites, Salpingostoma.

- immaturus** (a, um)—Conocardium, Cornulites, Diaphorostoma niagarensis, Dimerocrinus, Homœospira, Idiocrinus, Raphistoma, Rhodocrinus, Thysanocrinus.
- imperator**—Bumastus, Eurystomites, Hebertella, Illænus, Lituites, Orthhis.
- imperfectum**—Batostoma, Hemiphragma, Monticulipora.
- implicata** (um)—Batostoma, Chaetetes, Monticulipora, Monticulipora (Heterotrypa).
- impolita**—Anolotichia, Crepipora.
- impressa**—Atrypa, Crepipora, Primitia.
- impudica**—Buthotrephis.
- inæquabile**—Cameroceras, Endoceras, Succoceras.
- inæqualis**—Acervularia, Calceocrinus, Castocrinus, Cladograpsus, Columnaria, Cremacrinus, Cyathophyllum, Dicranograptus, Heterocrinus, Hindia, Krausella, Octonaria, Enonites, Prismatophyllum, Zaphrentis.
- inæquivalvis** (e)—Rhynchotrema, Spirifer.
- incarinatum**—Straparollus.
- incepta** (um)—Chasmatopora, Cycloceras, Fenestella, Orthoceras, Phylloporina, Polypora, Retepora, Spatiopora lineata, Spatiopora maculosa, Subretepora.
- incertus** (a)—Columnaria, Didymograptus, Fletcheria, Holoepa, Illænus, Monotrypa, Orthonota, Strombodes.
- incipiens**—Phaenopora, Trochoceras.
- incisolobata**—Astylospongia, Caryomamon, Spongia.
- incisus** (a)—Diplograptus foliaceus, Lecanocrinus, Primitia mundula.
- inclinata**—Zaphrentis.
- inclusa**—Ceramoporella.
- incognita**—Nelimenia.
- incomptus** (a)—Hudsonaster, Monticulipora, Palæaster, Schmidtella.
- incondita**—Ceramopora.
- inconspectus**—Eucalyptocrinus.
- inconstans**—Spirifer, Vanuxemia.
- incontroversa**—Callopora, Hallopora.
- incrassata**—Leptæna, Paleschara, Rafinesquina, Strophomena.
- increbescens**—Atrypa, Hemithiris, Rhynchonella, Rhynchotrema.
- incrustans**—Ceramopora, Stenopora, Stigmatella.
- incurvata**—Orthhis, Producta, Strophomena.
- incurvus** (a, um)—Anomalocrinus, Archinacella instabilis, Cornulites, Cystiphyllum, Distacodus, Eurychilina reticulata, Heterocrinus, Hybocrinus (Anomalocrinus), Machairodus, Tentaculites.
- indagator**—Orthoceras.
- indentus** (a)—Conularia, Didymograpsus, Didymograptus, Graptolithus (Monoprion), Pleurotomaria.
- indeterminatus**—Bumastus, Illænus.
- indianensis** (e)—Ascoceras, Barrandocrinus, Calceocrinus, Camarotectia, Caryocrinites, Caryocrinus, Cylicocrinus, Cyrtoceras, Deltacrinus, Emperocrinus, Encrinurus, Gomphoceras, Gomphocystites, Holocystites, Macrostylocrinus, Rhynchonella, Stromatopora, Tryblidium.
- inexpectans**—Conocephalina, Diccellocephalus, Pleurotomaria.
- inexpectatus**—Diccellocephalus.
- infelix**—Actinoceras, Calathium (Zitella), Megistocrinus, Orthoceras, Periechocrinus, Saccocrinus.
- inferior**—Petalocrinus.
- infida**—Diplotrypa, Mesotrypa.
- inflatus** (a, um)—Alecto, Balanocrinus, Corynotrypa, Ctenodonta, Cupellæcrinites, Cyclonema, Cypricardinia, Cypricardites, Fusispira, Hippothoa, Lampterocrinus, Leperditia, Leperditella, Nuculites, Orthhis, Orthhis acutilirata, Platystrophia, Platystrophia acutilirata, Stomatopora, Strophostylus, Subulites, Tellinomya, Tuberculopora.
- inflecta**—Actinostroma, Actinostroma tenuifilatum, Dekayia, Heterotrypa, Heterotrypa ulrichi, Monticulipora.
- inflexus**—Periechocrinus, Saccocrinus (Megistocrinus).
- informis**—Cyphotrypa, Leptotrypa.
- infrequens**—Cœloclema, Conularia, Hormotoma, Murchisonia, Enonites, Trematopora.
- infundibularius** (a)—Lamellopora, Strombodes.
- infundibuliformis** (e)—Gorgonia, Sidemina.
- infundibulum** (a)—Cyrtoceras, Cystostylus, Syringopora.

- ingalli—Bathyurus.  
 ingens—Carcinosoma, Lingula.  
 initialis—Beyrichia, Klødenia.  
 inordinata—Heliolites, Porites.  
 inornatus (a, um)—Alveolites, Astylo-  
 spongia, Camarella, Chicagocrinus, Cyr-  
 tolites (Microceras), Dimerocrinus, Eu-  
 calyptocrinus, Euomphalus, Gazacri-  
 nus, Glyptaster, Lingula, Placentula,  
 Psiloconcha, Lyrodesma, Microceras,  
 Spirorbis, Thysanocrinus, Trochonema.  
 inoscula—Zittellella.  
 inquassa—Rafinesquina, minnesotensis,  
 Strophomena.  
 insculptus (a)—Caryocrinites, Hebertella  
 (Glyptothis), Orthis.  
 insectiformis—Cryptograptus tricornis.  
 insignis (e)—Aspidoceras, Bumastus, Ce-  
 raurus, Holoepa, Homotrypa, Homo-  
 trypa subramosa, Illænus, Isochilina  
 amiana, Leptobolus, Litoceras, Trocho-  
 ceras.  
 insolens—Dinorthis carleyi, Dystacto-  
 spongia, Litoceras, Nautilus, Stroma-  
 topora.  
 insolitum—Streptelasma.  
 insperatus—Glyptocrinus.  
 instabilis—Archinacella, Homotrypella,  
 Metoptoma, Pachydictya bifurcata,  
 Tryblidium.  
 inueta (um)—Atactoporella, Avicula,  
 Bodmania, Pterinea, Vanuxemia dixo-  
 nensis.  
 insularis (e)—Amphion, Bronteus, Cyp-  
 ricardites, Cyrtodonta, Endoceras,  
 Goldius, Ischadites, Lingula, Montic-  
 ulipora, Ormoceras, Pliomerops,  
 Prasopora, Receptaculites.  
 intabulata—Monotrypa.  
 integritabulatus—Favosites favosus.  
 integumentum—Diphyphyllum, Diplo-  
 phyllum.  
 intercalaris—Homotrypa.  
 intercellata—Homotrypa wortheni.  
 intermedius (a, um)—Ambonychia, Atac-  
 topora, Athyris, Atrypa, Atrypina,  
 Beatricea nodulifera, Buthotrephis  
 gracilis, Byssonychia, Ceratopsis, Cla-  
 thropora, Clathropora frondosa, Cte-  
 nodonta, Cyclocrinus, Cyphaspis,  
 Cyrtodonta grandis, Dalmanites,  
 Dendrograptus gracillimum, Fusispira,  
 Graptolithus, Isochilina, Leptocœlia,  
 Lyrodesma acuminatum, Merista,  
 Mesopalæaster, Monograptus, Nidulites,  
 intermedius—continued.  
 Onoceras, Pasceolus, Pterygometopus,  
 Rhynchotreta, Stictoporella angularis,  
 Tellinomya, Whitfieldella.  
 internascens—Anastrophia.  
 internestriatus (um)—Discoceras, Litui-  
 tes, Trocholites.  
 internodia—Dicranopora, Ptilodictya.  
 interplicatus (a)—Anastrophia, Atrypa,  
 Orthis, Pentamerus.  
 interporosa—Batostomella, Ceramopo-  
 rella, Stigmatella.  
 interruptum—Cyathophyllum.  
 interstincta—Heliolites, Madrepora, Pa-  
 læopora, Stictoporella.  
 interstriatus (a)—Orthis, Orthothetes,  
 Schuchertella.  
 intertexta (um)—Actinostroma, Zaphren-  
 tis.  
 intertrium—Cyathophyllum.  
 interventa—Columnaria alveolata.  
 intextus (a)—Bellerophon, Bucania.  
 intortus—Dicellograpsus, Dicellograptus,  
 Ecculiomphalus, Eccyliomphalus, Sac-  
 cophycus.  
 intralobatus—Straparollus.  
 intricatus—Desmograptus.  
 inutilis—Diplograptus.  
 invaginatum—Ptychophyllum.  
 invenusta—Leptæna gibbosa.  
 iole—Lingula, Lingulella.  
 ione—Streptotrochus.  
 iowensis—Asaphus (Isotelus), Cardium,  
 Coleolus, Cybeloides, Cypricardites,  
 Ischadites, Isotelus, Lingula, Lingu-  
 lella, Receptaculites, Receptaculites  
 (Ischadites), Sclenoides, Spatipora.  
 ioxus—Bumastus, Illænus.  
 iphgenia—Ctenodonta, Dinorthis, Orthis,  
 Plæsiomys, Tellinomya.  
 iphis—Obolus (Westonia).  
 ipomœa—Ptychophyllum.  
 irene—Lingula.  
 iris—Lingula, Lingulella.  
 irrasa (um)—Batostoma, Hemiphragma.  
 irregularis (e)—Alveolites, Anisocrinus,  
 Ceramopora, Ceramoporella, Chætetes,  
 Cythere, Cytheropsis, Cyrtoceras, Dic-  
 tyonema, Fungispongia, Helopora, Lep-  
 totrypa, Monotrypa, Monticulipora,  
 Orthoceras, Palæacmaea, Palæophycus,  
 Stigmatella, Strepula, Tentaculites,  
 Trematopora.  
 irvinensis—Zaphrentis intertexta.

- islandicus*—Cypricardites.  
*isodactylus*—Heterocrinus.  
*isodorus*—Cyrtoceras, Cyrtorizoceras.  
*isotelea*—Brongniartia.  
*ithacensis*—Strophomena.  
*jacksoni*—Nereites, Nereograpsus.  
*jacobus*—Isotelus.  
*jamesi* (i)—Allonychia, Ambonychia, Batostoma, Chætetes, Cyclopora, Lepidocoleus, Megambonia, Monticulipora, Monticulipora (Heterotrypa), Orthis, Orthoceras, Palæaster, Palæasterina, Petraster, Plectorthis, Plumulites, Spyroceras.  
*janea*—Rhynchonella.  
*janesvillensis*—Cyrtodonta.  
*janus*—Streptoceras.  
*jason*—Nautilus, Plectoceras.  
*jerseyensis*—Chonetes, Ctenodonta, Eurychilina, Klædenia, Liostracus, Modiolopsis, Ptychopyge, Solenopleura.  
*jesica*—Lophospira, Murchisonia.  
*jewetti* (i)—Callocystis, Callocystites, Cupulocrinus, Dendrocrinus.  
*jillsoni*—Ampyx.  
*johannensis*—Clitambonites, Eoorthis, Orthis (Plectorthis), Orthisina.  
*johnstoni*—Bathyrurus.  
*jolietensis* (e)—Holocystites, Orthoceras.  
*jonesi*—Isochilina, Leperditia.  
*josephiana*—Leperditia, Leperditia canadensis, Leperditia fabulites.  
*juglans*—Caryospongia.  
*jugosa*—Dalmanella, Orthis.  
*jukesi* (i)—Amphilichas, Lichas (Platymetopus).  
*julia*—Athyris, Leptæna, Meristella, Strophomena, Whitfieldella.  
*julius*—Amphion, Plimerops.  
*junceum*—Orthoceras.  
*junciformis*—Cannopora.  
*junctum*—Amplexus.  
*junia*—Athyris, Hyattella, Hyattidina congesta.  
*junior* (ius)—Orthoceras (Euorthoceras).  
*juniperanus*—Cœnites.  
*juvenalis*—Cyrtoceras.  
*juvenis*—Heterocrinus, Pterygotus cobbi, Stenocrinus, Zaphrentis intertexta.  
*kagawongensis*—Rhytimya.  
*kalmi*—Eccliopteris, Eceyliomphalus.  
*kankakensis*—Austinella, Orthis, Plectorthis.  
*kassubæ*—Orthis.  
*kayseri*—Eotomaria.  
*keelei*—Actinodictyon.  
*keewatinensis* (e)—Actinoceras, Phænopora.  
*keithi*—Ceratopea.  
*kelloggi*—Eurystomites, Nautilus.  
*kemptotheca*—Climacograptus.  
*kennicotti*—Orthis.  
*kentlandensis*—Orthoceras (Kionoceras).  
*kentonensis*—Actinomya, Whiteavesia.  
*kentuck(i)ensis*—Arthropora, Calceocrinus, Castocrinus, Caryocrinites, Caryocrinus, Cupulocrinus *jewetti*, Monticulipora, Porocrinus, Zygospira, Zygospira modesta.  
*kentuckyensis*—Isochilina, Ptilodictya, Salpingostoma *buelli*.  
*kerbyi*—Cyrtoceras.  
*keyserensis*—Clidochirus, Dalmanites, Rensselaeria, Strophonella, Uncinulus, Zaphrentis.  
*kingi*—Monomorella, Rafinesquina, Strophomena.  
*kingstonensis*—Lingula, Nanno.  
*kirbyi*—Cyrtoceras, Ooceras.  
*kjerulfi*—Bryograptus, Dichograptus, Loganograptus.  
*klædeni*—Beyrichia.  
*knappi*—Conchidium, Pentamerus.  
*knighti* (i)—Conchidium, Pentamerus.  
*knotti*—Gypidula, Heterospongia, Heterospongia subramosa, Pentamerus.  
*knoxensis*—Archæocrinus.  
*knoxvillensis*—Lophospira, Maclurea, Maclurites, Trochonema.  
*kœnigii*—Ischadites.  
*kokomoensis*—Eurypterus, Eurypterus (Onychopterus), Favosites pyriforme, Klædenia, Rhynchonella, Wilsonia.  
*kruegeri*—Cryptolithus, Trinucleus.  
*kummeli*—Beyrichia, Klædenia.  
*labechei*—Alveolites.  
*labecula*—Ceramopora, Ceramopora (Berenicea).  
*labeculosa*—Spatiopora.  
*labellosa*—Isochilina, Leperditella.  
*labiatus* (um)—Maclurea, Phragmoceras, Raphistoma, Straparollus.  
*labiosa*—Eotomaria, Halliella.  
*labrosa*—Isochilina, Leperditia canadensis, Pleurotomaria.  
*labyrinthicus* (a)—Catenipora, Girvanella, Halysites catenulatus, Ptilodictya, Stictopora, Streptospongia.



- lachutense*—Cryptozoon.  
*laciniata*—Diplograpsus.  
*lacinosum*—Platyceras.  
*lacunosus*—Archæocrinus, Glyptocrinus.  
*lacustris*—Eurypterus.  
*lælia*—Crania.  
*læviramus*—Chaetetes.  
*lævis* (e)—Amygdalocystites *florealis*,  
*Atrypa*, *Brachiospongia*, *Cleiocrinus*,  
*Ctenocrinus*, *Cryptonymus*, *Cupella-*  
*crinites*, *Cupellacrinus*, *Cyrtocrinus*,  
*Dalmanella electra*, *Encrinurus* *Euca-*  
*lyptocrinites*, *Eucalyptocrinus*, *Euca-*  
*lyptocrinus cælatus*, *Graptolithus*, *Ich-*  
*thyocrinus*, *Lecanocrinus*, *Lingulella*,  
*Melocrinus*, *Merista*, *Meristella*, *Monti-*  
*culipora*, *Monticulipora consimilis*,  
*Monticulipora hospitalis*, *Orthis electra*,  
*Orthoceras*, *Phycograptus*, *Protaxo-*  
*crinus*, *Rhynchonella*, *Rhynchonella*  
*(Stenoschisma)*, *Strophomena*, *Taxo-*  
*crinus*, *Whitfieldella*.  
*læviusculus*—Ampyx, Ampyx (*Loncho-*  
*domas*).  
*lajensis*—Bathyrus.  
*lamarcki* (i)—Orthoceras, Protocycloce-  
*ras*.  
*lambi* (i)—Gonioceras, Plasmopora, Trip-  
*teroceras*, Tripteroceras.  
*lamellata*—Atrypa, Camarotœchia, Lin-  
*gula*, Rhynchonella.  
*lamellosa* (um)—Ambonychia, Avicula,  
*Clionychia*, *Cypriocardinia*, *Cyrtoceras*,  
*Cyrtodonta*, *Discina*, *Hyattella*,  
*Hyattidina*, *Monticulipora*, *Orbicula*,  
*Orbiculoidea*, *Orbignyella*, *Orthidium*,  
*Orthis*, *Orthoceras*, *Tubipora*.  
*laminata* (um)—Callopora, Cœnites, Fis-  
*tulipora*, *Limaria*, *Lioclema*, *Milleria*,  
*Nicholsonella*.  
*lamottensis* (e)—Agraulos, Sao, Stroma-  
*tocerium*.  
*lanceolatus* (a)—Mesopalæaster, *Nereites*,  
*Nereograptus*, *Ptilodictya*, *Ptilodictya*  
*americana*.  
*lanii*—Pterinea.  
*lanosus* (um)—Trichophycus.  
*laphami*—Bronteus, Eotomaria, Goldius,  
*Murchisonia*, *Orthoceras*, *Pleurotoma-*  
*ria*, *Turritoma*.  
*lapicida*—Raphistoma.  
*lapilla*—Wingia.  
*lapworthi*—Bryograptus.  
*laqueatus* (a, um)—Cladopora, *Conchidi-*  
*um*, *Conularia*, *Kionoceras*, *Orthoceras*,  
*Pentamerus*.  
*lara*—Athyris, Atrypa, Whitfieldella.  
*larrabecii*—Pterygometopus.  
*larvata*—Helicotoma, Liospira, Stropho-  
*mena*.  
*latasulcata*—Hebertella.  
*lateralis* (e)—Cyrtoceras, Syntrophia,  
*Triplexia*.  
*latiannulatum*—Orthoceras.  
*latiaxiatus*—Illænus.  
*latibrachiatus*—Cupulocrinus, *Dendro-*  
*crinus*.  
*laticaulis*—Climacograptus *caudatus*.  
*laticinctus* (a)—Omospira, Ormospira,  
*Scalites*.  
*laticorrugata*—Atrypa.  
*laticosta*—Orthis, Platystrophia, *Platys-*  
*trophia biforata*, *Platystrophia lynx*.  
*laticostata* (um)—Opisthoptera, Orthis,  
*Orthis (Platystrophia) biforata*, *Rhyn-*  
*chonella inæquivalvis*, *Rhynchotrema*  
*inæquivalvis*.  
*laticurvatum*—Cyrtoceras.  
*latidorsata*—Illænus.  
*latifasciata*—Murchisonia.  
*latifolius*—Sphenothallus.  
*latifrons*—Dolichopterus.  
*latimarginatus* (a)—Asaphus, *Eurychi-*  
*lina*, *Isochilina grandis*, *Primitia*,  
*Proetus*.  
*latior*—Diplograptus, *Plectorthis* *equiv-*  
*alvis*.  
*latiplicata*—Parastrophia.  
*laticula*—Petraia.  
*latisculptilis*—Brachyprion, *Stropheo-*  
*donta*.  
*latisinus*—Zaphrentis.  
*latispiralis*—Helicopora.  
*latissimus*—Ogygies.  
*lativentrum*—Cameroceras, *Endoceras*,  
*Ooceras*.  
*lativia*—Primitia.  
*latonummulatum*—Actinoceras.  
*latus* (a, um)—Agnostus, *Beyrichia*, *Bollia*,  
*Ctenodonta*, *Cyclonema bilix*, *Cypri-*  
*cardites*, *Dicranopora*, *Isotelus*, *Lepto-*  
*plastus*, *Modiolopsis*, *Orthoceras* *Acti-*  
*noceras*), *Palæarca*, *Parabolina heres*,  
*Protichnites*, *Rafinesquina*, *Rhinidic-*  
*tya*, *Strophomena*, *Tellinomya*, *Tro-*  
*chonema umbilicatum*.

- latusculum*—Petraia, Streptelasma.  
*laurentina*—Billingsella, Orthhis, Pleurotomaria, Raphistoma.  
*lavinia*—Holoepa.  
*laxatus* (a)—Amplexus, Bythotrypa, Favistella, Fistulipora, Pterinea, Schuchertia.  
*laxiplicatus* (a)—Strophonella.  
*laxus* (a, um)—Acanthonema, Buthograptus, Diplograptus, Heterocrinus, Homocrinus, Ohioocrinus, Spirorbis.  
*lecythium*—Astylomanon cratera.  
*leda*—Brachyprion, Loxonema, Rafinesquina, Stropheodonta, Strophomena.  
*legoensis*—Conchidium.  
*leidyi*—Amphicœlia, Leptodomus.  
*leightoni*—Camarotœchia, Modiolopsis.  
*leiosoma*—Holoepa.  
*leiosomellum*—Raphistoma.  
*lemontensis*—Habrocrinus.  
*lenior*—Cymatonta.  
*lens*—Atrypa, Callopora, Fistulipora, Lingula, Lingulella, Monticulipora, Obolus, Stricklandinia.  
*lenticularis* (e)—Anomites, Camarella, Eoorthis, Orthhis, Orusia, Parastrophia, Pleurotomaria, Prasopora, Raphistoma, Rhipidomella, Trochus.  
*lentiformis*—Atrypa.  
*lentus* (m)—Bryograptus, Orthoceras, Tetragraptus (Etagraptus).  
*leperditioides*—Primitia, Primitia logani.  
*lepida*—Rhynchotretra, Tellinomya (Nucula).  
*lepidodendroides*—Orthoceras.  
*lepis*—Leptobolus, Lingulella.  
*leptænoidea*—Orthhis.  
*leptonota* (um)—Avicula, Eunema, Gyronema.  
*leptorhachis*—Proetus.  
*lesleyi*—Monocraterion.  
*lesquereuxi*—Buthotrephis, Bythotrephis.  
*lesueuri*—Cycloceras.  
*leucothea*—Cypricardites, Cyrtodonta.  
*levatus* (a, um)—Ctenodonta, Leda, Nucula, Ophileta, Schizostoma, Straparollus, Tellinomya.  
*levigata*—Strophomenes.  
*levis*—Bathyurus.  
*levisensis*—Acrothele.  
*lewistonense*—Raphistoma.  
*libanus* (a)—Batostoma, Cleiocrinus, Escharopora, Glyptocrinus, Homotrypa, Ptilodictya, Stenopora.  
*libertatis*—Cryptozoon.  
*lichenoides*—Cladopora, Stromatopora.  
*ligarius*—Cyrtoceras.  
*lilliformis*—Dimerocrinus, Rhodocrinus, Thysanocrinus.  
*limæformis*—Avicula, Limoptera.  
*limatoidea*—Euomphalus alatus.  
*limatula*—Leperditia.  
*limatus* (um)—Cyclonema (Holoepa), Chætetes frondosus.  
*limbatus* (a)—Bumastus, Ctenodonta, Primitia, Primitiella, Stylonurus, Vanuxemia.  
*limitaris* (e)—Constellaria, Dianulites, Diplotrypa, Escharopora, Lingula, Stelipora, Streptelasma (Zaphrentis).  
*limitis*—Olenus (Parabolinella).  
*limulus*—Asaphus, Dalmania, Dalmanities, Phacops.  
*linares*—Homalonotus, Trimerus.  
*lindahli*—Eucalyptocrinus.  
*lindenensis*—Camarotœchia, Conchidium.  
*lindsleyi*—Bellerophon, Bucania.  
*lindstroemii*—Bythocypris.  
*linearis*—Cladograpsus, Cladograptus, Cœlidium, Cœlocaulus, Cœnograptus (Pleurograptus), Dendrograpsus, Fucoides, Gomphoceras, Murchisonia, Nemagraptus exilis, Pleurograpsus, Pleurograptus.  
*lineatus* (a, um)—Clathrodictyon cystosum, Crateripora, Cystiphyllum, Helopora, Lingula, Protichnites, Spatiopora.  
*lineolatum*—Endoceras proteiforme, Orthoceras, Phragmoceras.  
*lineopora*—Helopora.  
*lingualis*—Remopleurides.  
*linguatus*—Remopleurides, Remopleurides (Caphyra).  
*lingulatus* (a)—Eusarcus, Lingula.  
*lingulifera*—Lindstroemia.  
*linneyi*—Leperditia, Orthhis, Orthorhynchula.  
*liquensis*—Hemigraspis, Ogygia.  
*liratus* (a, um)—Bellerophon (Bucania), Clisiospira (Onchocheilus), Clisospira, Gyronema, Lophospira (Seelya), Murchisonia, Spirifer, Stricklandinia, Trochonema.  
*litchfieldensis*—Camarotœchia, Rhynchonella.  
*litoralis*—Modiolopsis.

- litoreus** (a)—*Bathyaurellus*, *Pleurotomaria*.  
**littoni**—*Conchidium*, *Pentamerus*.  
**lituiformis**—*Calaurops*, *Eccyliomphalus*.  
**lobata**—*Ctenopyge*, *Dekayia ulrichi*, *Lep-  
toplastus*, *Zittella*.  
**lockei**—*Schizambon*.  
**lockportensis**—*Dimerocrinus*, *Fistulipora*,  
*Glyptaster* (*Eucrinus*).  
**loculosum**—*Cyrtoceras*.  
**logananus**—*Protiehnites*.  
**logani**—*Beyrichia*, *Chirocrinus*, *Chiro-  
crinus*, *Cœlocaulus*, *Ctenodonta*, *Dal-  
mania*, *Dichograpsus*, *Dichograptus*,  
*Glyptocystis*, *Glyptocystites*, *Graptol-  
ites* (*Didymograptus*), *Graptolithus*  
(*Loganograptus*), *Graptolithus* (*Monop-  
rion*), *Isoarca*, *Loganellus*, *Logano-  
graptus*, *Maclurea*, *Maclurites*, *Murchi-  
sonia*, *Olenus*, *Primitia*, *Ptychoparia*,  
*Tellinomya*.  
**lonensis**—*Hebertella*, *Orthis*, *Pleuroto-  
maria*.  
**longævis**—*Isotelus*.  
**longibrachiatus**—*Palæaster*.  
**longicaudatus**—*Diplograptus*, *Drepanop-  
terus*.  
**longiceps**—*Eusarcus*.  
**longidactylus**—*Dendrocrinus*.  
**longirostris** (a)—*Camarella*.  
**longispinus** (a)—*Bathyrurus*, *Callicrinus*,  
*Climacograptus bicornis*.  
**longispira**—*Cœlocaulus*, *Murchisonia*.  
**longissimus** (m)—*Endoceras*, *Orthoceras*,  
*Serpulites*, *Vaginoceras*.  
**longiuscula**—*Ribeiria*.  
**longula**—*Eurychilina*, *Pachydomella*.  
**longus** (a)—*Conularia*, *Ctenodonta*, *Eur-  
ymyella shaleri*, *Halliella seminulum*,  
*Modiolopsis*, *Petalocrinus*, *Tellinomya*.  
**loomisii**—*Nereites*, *Nereograpsus*.  
**loperi**—*Obolus*.  
**loricatus**—*Caryocrinites*.  
**loricula**—*Orthis*, *Plæsiomys*.  
**loringi**—*Phyllograptus*.  
**lorrainensis**—*Ctenodonta*.  
**louckiana**—*Leperditia*, *Leperditia cana-  
densis*, *Leperditia fabulites*.  
**louisvillensis**—*Alveolites*, *Cystiphyllum*,  
*Eridophyllum*, *Favosites*, *Michelinia*,  
*Stricklandinia*.  
**lovelandensis**—*Spirorbis*.  
**lowi**—*Actinodictyon*, *Boreaster*, *Rhyn-  
chospira*.  
**loxias**—*Orthoceras*.  
**loxorhytis**—*Rafinesquina alternata*, *Stro-  
phomena alternata*.  
**lucasi**—*Prosserella*, *Reticularia*.  
**lucillum**—*Cyrtoceras*.  
**luculentus** (a)—*Cyrtodonta grandis*, *Cyp-  
ricardites*.  
**ludlowensis** (e)—*Orthoceras*, *Stromato-  
pora*.  
**lunatifera**—*Strepula*, *Tetradella*.  
**lunatus** (a)—*Arabellites*, *Bronteus*, *Cœ-  
nites*, *Dalmanella*, *Goldius*, *Orthis*,  
*Stromatopora*.  
**lunulata**—*Rhytimya*, *Sedgwickia*.  
**luthci**—*Cyrtoceras*.  
**lycoperdon**—*Chatetes*, *Favosites*, *Monti-  
culipora*, *Prasopora*, *Stenopora*.  
**lycopodites**—*Chatetes*, *Favosites*.  
**lycus**—*Oncoceras*, *Orthoceras*.  
**lyelli**—*Lingula*.  
**lyncioides**—*Eoorthis* (*Orusia*) *lenticula-  
ris*, *Orthis lenticularis*, *Orusia lenticu-  
laris*.  
**lynx**—*Delthyris*, *Orthis*, *Platystrophia*,  
*Platystrophia biforata*, *Spirifer biforata*,  
*Terebratula*.  
**lyoni** (i)—*Actinoceras*, *Brachiospongia*,  
*Ormoceras*.  
**lysander**—*Cyrtoceras*.  
**macastyensis**—*Triarthrus becki*.  
**maccombi**—*Lioclemella*.  
**maccoyanus**—*Ceratiocaris*.  
**maccoyi**—*Niobe*.  
**macdonaldi**—*Tarphyceras*.  
**macer** (ra)—*Bellerophon*, *Drepanella*, *Le-  
perditella*, *Leperditia*, *Maclurea cras-  
sa*, *Maclurites crassa*, *Oxydiscus*, *Stro-  
pheodonta*, *Strophomena*, *Tetranota*.  
**machæriiformis**—*Nucula*, *Tellinomya*.  
**macleodi**—*Dalmanella*, *Orthis*.  
**maclurii**—*Euomphalus*.  
**macrior**—*Orthis*.  
**macrocheirus**—*Dolichopterus*.  
**macrodictyum**—*Desmograptus*.  
**macrolineatus** (a)—*Euomphalus*, *Poleu-  
mita*.  
**macropetalus**—*Lecanocrinus*.  
**macrophthalmus** (a)—*Calymene*, *Ptery-  
gotus*.  
**macropora**—*Cladopora*.  
**macropleurus**—*Spirifer*.  
**macropora**—*Nematopora*, *Trematopora*  
(*Trachypora*).  
**macrops**—*Nileus*.

- macrospira**—*Cœlidium*, *Cœlocaulus*, *Murchisonia*.  
**macrostoma** (um)—*Cyrtoceras*, *Monilopora*.  
**macrostylus** (a)—*Heliolites*, *Labechia*.  
**macrotheca**—*Leptograptus*.  
**mactraeformis**—*Ctenodonta*, *Nucula*.  
**maculata**—*Atactopora*, *Dekayia*, *Escharopora*, *Fistulipora neglecta*, *Leptotrypa*, *Lichenalia concentrica*, *Monticulipora*, *Paleschara*, *Ptilodictya*, *Spatiopora*.  
**maculosa**—*Amplexopora*, *Crepicephalus* (*Loganellus*), *Ptychoparia*, *Spatiopora*, *Strotospongia*.  
**madisonensis** (e)—*Ctenodonta*, *Cyrtocarina*, *Dystactospongia*, *Entomis*, *Holocystites*, *Trochonema*, *Tryblidium*.  
**madisonianus**—*Illænus*.  
**maera**—*Lingulella*, *Lingulepis*, *Obolus*.  
**magister**—*Cyrtoceras*, *Endoceras*.  
**magnaplicata**—*Cyrtina*.  
**magnicardinalis**—*Rhipidomella*.  
**magnificus** (a)—*Anthaspidella*, *Aspidoceras*, *Cleiocrinus*, *Climacograptus typicalis*, *Conularia*, *Cupellæcrinites*, *Cupellæcrinus*, *Dicelloccephalus*, *Dikeloccephalus*, *Dinobolus*, *Gaurocrinus*, *Gyroceras*, *Hungaria*, *Lituites*, *Marsipocrinus*, *Obolellina*, *Palæaster*, *Promopalæaster*, *Ptilodictya*, *Remopleurides*, *Retiocrinus*, *Scenella*.  
**magnipora**—*Pachydictya*.  
**magnisulcatum**—*Kionoceras*, *Orthoceras*.  
**magniventra** (um)—*Endoceras*, *Holopea*.  
**magnopora**—*Batostoma*, *Callopora*, *Hallopora*, *Orbignyella*.  
**magnus** (a, um)—*Actinoceras richardsoni*, *Cyclocystoides*, *Cyrtolites*, *Dekayia*, *Eucalyptocrinus*, *Heliophrentis alternatum*, *Hughmilleria*, *Loxonema*, *Maclurea*, *Maclurites*, *Monotrypa*, *Oncoceras*, *Oxydiscus*, *Phænopora*, *Protaræa*, *Protoscolex*, *Stictopora*, *Straparollus*.  
**maia**—*Modiolopsis*.  
**major**—*Camarotæchia*, *Cleidophorus*, *Cystiphorolites*, *Dalmanella electra*, *Eunicites*, *Favosites cristatus*, *Gazacrinus*, *Hormotoma*, *Lyrodesma*, *Murchisonia*, *Ononites*, *Orthis electra*, *Petalocrinus*, *Sphærocoryphe*, *Stictopora mutabilis*, *Thecia*, *Vesicularia*.  
**malvernus**—*Conocephalus*.  
**mamillatus** (a)—*Calymene*, *Calymmene*, *Strombodes*.  
**mammata**—*Primitia*.  
**mammiferum**—*Leptopoterion*.  
**manmillanum**—*Dystactophycus*.  
**ma(m)millaris** (e)—*Arachnophyllum*, *As-trea*, *Columnaria*, *Receptaculites*, *Strombodes*.  
**mammillata**—*Stromatopora*.  
**mammillosa**—*Monticulipora*.  
**mammulatus** (a)—*Anthaspidella*, *Chætetes*, *Heterotrypa*, *Monticulipora*, *Stenopora*.  
**manitobensis** (e)—*Batostoma*, *Cyrtoceras*, *Eurychilina*, *Maclurea*, *Maclurina*.  
**manlius**—*Lepocrinites*.  
**manli(us)ensis**—*Klœdenia*.  
**manitouensis**—*Schizambon*.  
**manitoulinensis**—*Rosenella*.  
**manitoulini**—*Villatotheca*.  
**manniensis**—*Platymrella*, *Rhychotrema*, *Rhychotrema capax*.  
**mansonii**—*Atrypa*, *Rhynchonella*.  
**mantelli**—*Lingula*.  
**manticula**—*Lingula*, *Lingulella*.  
**maquoketa**—*Pentamerus oblongus*.  
**maquoketensis**—*Sphærocoryphe*.  
**marcidus**—*Cryptograptus*, *Diplograptus*, *Graptolithus*.  
**marcouanus**—*Megistocrinus*, *Periechocrinus*, *Saccorinus*.  
**marcoui**—*Cameroceras*, *Endoceras*, *Suecoceras*, *Zaphrentes*.  
**marcyæ**—*Gomphoceras*.  
**margaritoides**—*Pleurotomaria*.  
**marginalis**—*Asaphus*, *Atrypa*, *Basilicus*, *Clionychia*, *Cyrtoceras*, *Terebratula*.  
**marginatus** (a)—*Archæocrinus*, *Bathyrrellus*, *Beyrichia*, *Ceraurinus*, *Dicranella*, *Glyptocrinus*, *Helicotoma*, *Leperditia*, *Lingula*, *Placentula*.  
**maria**—*Athyris*, *Eurypterus*, *Hebertella*, *Meristina*, *Meristella*, *Orthis*, *Whitfieldia*.  
**maritimum**—*Cystiphyllum*.  
**markoei**—*Cyrtoceras*.  
**mariana**—*Parabolinopsis*.  
**maro**—*Orthoceras*, *Spyroceras*.  
**mars**—*Cheirurus*, *Nieszkowskia*.  
**marshi** (i)—*Discoceras*, *Lituites*.  
**marylandica** (um)—*Ceratopora*, *Cyathophyllum*, *Fistuliporella*, *Schuchertella*.  
**massiense**—*Cyrtoceras*.

- matacensis**—Megalaspis.  
**matheri**—Ptychoparia.  
**matinalis**—Lingulella, Lingulepis, Obolus.  
**matthewsoni**—Trematospira.  
**matutinus** (a, um)—Actinostroma, Asterias, Coelaster, Cyphaspsis, Hudsonaster, Maclurea, Maclurites, Palæaster, Straparollus.  
**mawii**—Pontocypris.  
**maximus** (a)—Ambonychia, Asaphus, Calamopora, Favosites, Haplocrinites, Haplocrinus, Isotelus.  
**maynardi**—Fistuliporella.  
**maysvillensis**—Batostoma, Strophomena.  
**mcharlesii**—Trochoceras.  
**mchesneyanus**—Clidophorus.  
**mconnelli**—Hemigyraspis.  
**mccoyi**—Barrandia, Cyrtoceras, Dolichometopus, Niobe.  
**meafordensis**—Tæniaster.  
**meandrina**—Catenipora, Halysites.  
**meconideus**—Caryocrinites.  
**media**—Dalmanella elegantula, Orthis, Rhipidomella, Vanuxemia.  
**medialis**—Corynotrypa, Ctenodonta, Cyclonema, Lophospira, Murchisonia, Primitia.  
**mediocardinalis**—Cycloconcha.  
**mediocris**—Cyclonema, Goniophora, Holoepa.  
**medon**—Orthoceras.  
**medullare**—Kionoceras, Orthoceras, Protokionoceras.  
**meedsi**—Dinorthis, Orthis.  
**meekanus**—Ceraurus, Eccoptochile.  
**meeki**—Actinocrinus, Bythopora, Calymene, Chætetes, Dalmanella, Dalmanella testudinaria, Dicranopora, Endymion, Endymionia, Helopora, Homotrypella, Macrostylocrinus, Monticuliopora, Orthis, Orthoceras.  
**megalops**—Conocephalina, Dikellocephalus, Dikellocephalus, Eurypterus, Isotelus.  
**megalophthalmus**—Asaphus.  
**megambonus** (a)—Cypricardites, Whitella.  
**megastomus** (a)—Heliolites.  
**megistos** (us)—Asaphus, Isotelus.  
**melaniaformis**—Homotoma, Murchisonia.  
**melissa**—Lyriocrinus, Metoptoma, Rhodocrinus, Stricklandinia.  
**melita**—Leptæna.  
**melocactus**—Boliviana.  
**membranacea** (um)—Berenicea, Platyceras, Sagenella.  
**menapiæ**—Orthis.  
**menelaus**—Orthoceras.  
**menis**—Cladopora.  
**meniscus**—Astræospongia, Blumenbachium, Lecanocrinus.  
**mensurans**—Dicellograptus.  
**mercerensis**—Glyptocrinus, Pleurocystis, Pleurocystites.  
**mercurius**—Ceraurus (Cyrtometopus), Cheirurus, Cyrtocera, Pseudosphærexochus.  
**meridionale**—Spyroceras.  
**merops**—Orthis, Scenidium.  
**mesicosta**—Leptæna, Rafinesquina.  
**mesistria**—Rafinesquina mesicosta.  
**meta**—Cyrta, Dalmania, Pterygometopus, Spirifer.  
**metellus**—Cyrtoceras, Mælonoceras.  
**metissicus** (a, um)—Chondrites, Hyalostelia, Pyritonema.  
**meyeri**—Modiolopsis.  
**miamiensis**—Alepidaster, Anorthaster, Compsocrinus, Cuneameya, Glyptocrinus, Palæaster, Protaster.  
**mica**—Rhynchonella, Zygospira.  
**micelini**—Catenipora, Cyathophyllum.  
**michiganense**—Meristospira, Stromatocarium.  
**michleranus**—Eccyliopectus, Euomphalus.  
**mickleboroughi**—Orthodesma, Rhytimya.  
**microbasilis**—Archæocrinus, Rhodocrinus, Thysanocrinus.  
**microfundulus**—Syringopora.  
**mierolathrata** (um)—Gyronema, Holoepa.  
**mironema**—Bucania.  
**mieronematodes**—Calypptograpsus, Calypptograptus.  
**microphthalmus**—Eurypterus.  
**micropleurus**—Asaphus.  
**mieropora**—Chilotrypa, Halysites catenularia, Halysites catenulatus, Heliolites.  
**microps**—Calymene, Pterygometopus.  
**microscopium**—Cyrtoceras.  
**microstigma**—Heterotrypa.  
**micula**—Liospira, Pleurotomaria, Primitia, Raphistoma, Siphonotreta.

- milesi* — *Clonograptus*, *Dichograptus*, *Dichograptus*, *Graptolithus*, *Graptolithus* (*Monoprion*).
- milfordensis*—*Callopora*, *Ceramoporella granulosa*, *Monticulipora* (*Fistulipora*).
- militaris*—*Orthis flabellites*.
- millepunctatus* (a)—*Aparchites*, *Leperditia*, *Trematis*.
- millerranus*—*Ceraurus*.
- milleri*—*Anodontopsis*, *Bumastus*, *Cycloconcha*, *Diplotrypa*, *Hudsonaster*, *Illænus*, *Loxoceras*, *Mesotrypa*, *Modiolopsis*, *Modiolopsis* (*Colpomya*), *Murchisonia*, *Orthoceras*, *Orthodontiscus*, *Peronopora*, *Primitia*.
- milliganæ* (i)—*Caryocrinites*, *Caryocrinus*, *Dimerocrinus*, *Eucalyptocrinus*, *Gazacrinus*, *Glyptaster*, *Pisocrinus*, *Thysanocrinus*.
- millionensis*—*Strophomena*.
- minganensis* (a)—*Amphilichas*, *Archæocyathus*, *Archæoscyphia*, *Barrandeoceras*, *Bathyrurus*, *Ethmophyllum*, *Lichas*, *Orthoceras*, *Petraia*, *Platymetopus*.
- minima* (um)—*Amplexopora septosa*, *Carinaropsis*, *Chonetes*, *Columnaria alveolata*, *Ctenodonta*, *Cyclostomiceras*, *Dystactospongia*, *Fistuliporella*, *Gomphoceras*, *Leptotrypa*, *Lingula*, *Maclurea*, *Maclurites*, *Nucula*, *Orthodesma*, *Protorthis*, *Psiloconcha*, *Rhindiactya*, *Straparollina*, *Streptelasma*, *Stromatocerium canadense*, *Tellinomya*, *Zygospira*.
- minna*—*Orthis*.
- minneapolis*—*Cyrtoceras*, *Cyrtorizoceras*, *Orthis*, *Productella*.
- minnesotensis* (e)—*Arenicolites*, *Batosoma*, *Berenicea*, *Bucania*, *Conchopeltis*, *Cryptozoon*, *Cylindrocœlia*, *Cypriocardites*, *Eoharpes*, *Euomphalus*, *Harpina*, *Homotrypa*, *Illænus* (*Nileus*), *Leptæna*, *Lingula*, *Lophospira augustina*, *Oncoceras*, *Orthis*, *Orthoceras*, *Orthodesma*, *Plectambonites*, *Proboscina*, *Psiloconcha*, *Rafinesquina*, *Raphistoma*, *Rhyuchonella*, *Rhynchotrema*, *Scolithus*, *Siphonotreta*, *Straparollus*, *Strophomena*.
- minor* (us)—*Bathyurellus*, *Ceramoporella granulosa*, *Conchicolites*, *Cornulites*, *Cyclocystoides*, *Cyclonema*, *Cylindrocœlia*, *Cyrtolites ornatus*, *Cystiphorolites*, *Dystactospongia*, *Eridotrypa ædi-*
- minor* (us)—continued.  
*lis*, *Eridotrypa mutabilis*, *Eurymyella shaleri*, *Gazacrinus*, *Lichenaria*, *LicropHYCUS*, *Lingulella*, *Lingulella starri*, *Ortonia*, *Pholidops trentonensis*, *Spirifer* (*Delthyris*) *vanuxemi*, *Stictopora mutabilis*, *Stomatopora*, *Streptorhynchus*, *Strophomena*, *Tetradium*, *Tetradium fibratum*, *Tetranota bidorsata*, *Thecia*, *Trimerella*, *Vesicularia*.
- minora*—*Labechia*.
- minuens*—*Huronia*.
- minusculus*—*Trocholites*.
- minutissimus* (a, um)—*Aparchites*, *Calamopora*, *Euomphalus*, *Leperditia*, *Leperditia* (*Isochilina*), *Microceras*, *Pelagiella*, *Platyceras*, *Primitia*.
- minutula*—*Crania*, *Schizotreta*.
- minutus* (a, um)—*Calamopora*, *Callograptus*, *Clathrodictyon vesiculosum*, *Chaetetes*, *Coleoprion*, *Conocephalites*, *Creseis*, *Cyclora*, *Cyrtodonta*, *Discolites*, *Ectomaria*, *Eugyrichnites*, *Holopea*, *Lingulella*, *Lingulepis*, *Linnarssonella*, *Murchisonia*, *Nematopora*, *Nucula*, *Obolella*, *Peronosporites*, *Primitia*, *Ptychoparia*, *Scolithus*, *Solenospira*, *Solenospira compacta*, *Stromatopora*, *Stromatoporella elora*, *Styliola*, *Tentaculites*, *Trematopora*, *Trematopora* (*Trachypora*), *Whitfieldella*.
- mirabilis* (e)—*Anaphragma*, *Caunopora*, *Petalocrinus*.
- mirus* (a, um)—*Capellina*, *Cryptonymus*, *Cybele*, *Cybeloides*, *Encrinurus*, *Gomphoceras*, *Pentameroceras*, *Sphærexochus*.
- miseneri*—*Auoptera*, *Ceraurus*, *Cypriocardites*, *Ischyrodonta*.
- miser* (a)—*Bellerophon*, *Helicotoma*, *Pleurotomaria*.
- missisquoi*—*Cyrtoceras*, *Dikelocephalus*, *Ectomaria*, *Murchisonia*, *Pleurotomaria*, *Solenospira*.
- mississippiensis*—*Climacograptus*.
- missouriensis*—*Orthis*, *Schuchertella*, *Schuchertella convexa*, *Stribalocystis*.
- mitellum*—*Heliophyllum*.
- modestoides*—*Prosserella*, *Reticularia*.
- modestus* (a, um)—*Atrypa*, *Climacograptus*, *Cypriocardites*, *Dalmanella*, *Dendrocrinus*, *Lingula*, *Liospira*, *Lophospira*, *Murchisonia*, *Orthoceras*, *Raphistomina*, *Reticularia*, *Rhindiactya min-*

- modestus**—continued.  
*ima*, *Rhynchonella*, *Saffordia*, *Spirifer*, *Spirifer* (*Delthyris*), *Strophomena*, *Stylonurus*, *Tryblidium*.
- modiolaris**—*Cypricardia*, *Cypricardites*, *Modiolopsis*, *Pterinea*.
- modioliformis**—*Actinomya*, *Modiolopsis*, *Ischyrodonta*, *Whiteavesia*.
- mohawkensis**—*Murchisonia*, *Pleurotomaria*.
- mohri**—*Bellerophon*, *Orthoceras*.
- molesta**—*Monticulipora*, *Monticulipora* (*Peronopora*), *Monticulipora mammulata*.
- mollisonensis**—*Obolus*.
- moniliferum**—*Stromatocerium*.
- moniliformis** (e)—*Actinocrinites*, *Actinocrinus*, *Loxoceras*, *Ormathichnus*, *Ormoceras*, *Orthoceras*, *Periechocrinus*.
- monodon**—*Dawsonia*.
- mononema**—*Protospongia*.
- monroensis**—*Klædenia*, *Pterygotus*.
- monroicum**—*Conocardium*.
- montaguensis**—*Klædenia*.
- montanensis**—*Clarkella*, *Polytechia*.
- montifera**—*Eurydictya*, *Homotrypa minnesotensis*, *Labechia*, *Spatiopora*, *Stromatocerium*.
- montrealensis** (e)—*Cyclonema*, *Endoceras*, *Metoptoma*, *Orthoceras*, *Scenella*, *Trematis*, *Vanuxemia*.
- montuosum**—*Batostoma*.
- moodeyi**—*Beyrichia*.
- moorei**—*Holasaphus*, *Lepadocrinus*, *Lepadocystis*, *Meekocystis*, *Schizolopha*.
- moosensis**—*Lingulella*.
- mopsus**—*Euomphalus*, *Straparollus*.
- morgani**—*Leperditia*.
- moritura**—*Platystrophia*, *Platystrophia lynx*.
- morrisi**—*Asaphus*.
- morrowensis**—*Bellerophon*, *Orthis*, *Platystrophia*, *Protowartha*.
- morsei** (ii)—*Lingula*, *Lingulepis*.
- morsensis**—*Lingulepis*.
- mortoni**—*Spirula*.
- mosia**—*Lingula*, *Lingulella*.
- mucronatus** (a)—*Diplograptus*, *Diplograptus*, *Graptolithus*, *Helopora*, *Lasio-graptus*, *Rafinesquina*.
- multibrachiatus**—*Clematograptus*.
- multicameratus** (a, um)—*Cyrtoceras*, *Orthoceras*, *Tarphyceras*.
- multicaulis** (e)—*Diphyphyllum*, *Syringopora*.
- multicostatus** (a, um)—*Calymmene*, *Conchidium*, *Discoceras*, *Lituities*, *Pentamerus*, *Trocholites*.
- multicostus** (a, um)—*Calymene*, *Clitambonites*, *Syntrophia*.
- multifasciatus**—*Amphigraptus*, *Clematograptus*, *Graptolithus*, *Graptolithus* (*Monopriion*), *Sphærocystis*, *Sphærocystites*.
- multifasciculatus**—*Graptolithus*.
- multifida**—*Eschara*, *Phænopora*, *Stictopora*.
- multiformis**—*Thamnograptus*.
- multigranosa**—*Atactopora*, *Atactoporella*.
- multigruma**—*Lophospria*, *Murchisonia*.
- multilamellosa**—*Streptoplasma*.
- multilineatum**—*Orthoceratites*, *Orthoceras*, *Platystoma niagarense*.
- multilirata**—*Stricklandinia*.
- multinotatus**—*Protichnites*.
- multipartitum**—*Petalichnus*.
- multiplicata** (um)—*Cyathophyllum*, *Cyclocælia sordida*, *Encucloedema sordida*, *Parastrophia*, *Plectorthis sordida*.
- multiporata**—*Homotrypa*.
- multiaporus** (a, um)—*Callocystis*, *Cladopora*, *Dekayella praenuntia*, *Eurydictya*, *Favosites*, *Fistulipora*, *Glyptocystis*, *Glyptocystites*, *Lioclema*, *Phænopora*.
- multiapuncta**—*Conularia*.
- multiapunctata**—*Crania*.
- multiradiata**—*Columnaria*.
- multiramis**—*Ptilodictya*.
- multiramisus**—*Bryograptus*.
- multisecta**—*Dalmanella*, *Dalmanella testudinaria*, *Orthis*, *Orthis emacerata*.
- multisegmentatus**—*Amphion*, *Encrinurus*.
- multiseptarius**—*Ecculiomphalus*, *Eccyliomphalus*.
- multiseptum**—*Orthoceras*.
- multiseriata**—*Cladopora*.
- multispinosus** (a)—*Amplexopora*, *Dekayia*, *Stylonurus* (*Ctenopterus*).
- multispinus**—*Acanthograptus*.
- multistriata**—*Atrypa marginalis*, *Clitambonites*, *Rhynchotretha thebesensis*.
- multistrictum**—*Conocardium*.
- multitabulata** (um)—*Callopora*, *Endoceras*, *Halloporella*, *Monotrypella*, *Vagino-ceras*.
- multituberculata**—*Monticulipora*.

- multivoivatatum*—Raphistoma.  
*multivoivis*—Hormotoma, Hormotoma gracilis, Murchisonia.  
*muniaeforme*—Clinoceras, Oncoceras.  
*mundulus* (a, um)—Aparchites, Atactopora, Atactoporella, Cyclocystoides, Homotrypella, Leperditella, Leperditia, Liospira, Primitia, Seelya, Stropheodonta, Mitoclema.  
*mundum*—Orthodesma, Rhythmya.  
*munsteri* (i)—Lingula.  
*muralis*—Eucalyptocrinus, Pleurotomaria.  
*murchisoni*—Asaphus, Didymograpsus, Heliolites, Litulites, Malocystites, Myri-anites, Staurocephalus.  
*muricata*—Helicotoma, Helicotoma planulata.  
*murryana*—Loxonema.  
*murrayi*—Dictyonema, Lingula, Jovellania, Obolus, Orthoceras.  
*musculosa*—Isochilina.  
*muta*—Primitia.  
*mutabilis*—Eridotrypa, Meganteris, Rensseleria, Rhinidictya, Stictopora.  
*mutata*—Platystrophia colbiensis.  
*mycale*—Orthis.  
*mylitta*—Lophospira, Murchisonia.  
*myops*—Eurypterus, Styronurus.  
*myrice*—Cyrtoceras, Cyrtia, Cyrtia expro-recta.  
*mytiliformis*—Myalina, Mytilarca.  
*mytiloides*—Ambonychia, Cleionychia, Modiolopsis.  
*naevigera*—Dekayella.  
*nais*—Modiolopsis.  
*nanus* (a, um)—Bucanella, Bucania, Callopora, Cypricardites, Dicellomus, Didymograptus, Didymograptus caduceus, Didymograptus indentus, Holoepa, Holoepa (Cyclora), Leperditia, Leperditia canadensis, Modiolopsis, Obolella, Ophileta complanata, Spirifer (Delthyris), Stigmatella, Subulites, Trochone-ma, Vanuxemia.  
*naresii*—Helicotoma.  
*narawayi*—Ceratocephala, Hudsonaster, Protopalaeaster.  
*nashvillae*—Eucalyptocrinites, Eucalyptocrinus.  
*nashvillensis*—Bellerophon, Bucania, Bythopora, Cyrtoceras, Holoepa, Rhinidictya.  
*nasoni*—Pleurotomaria, Raphistoma.  
*nasutus* (a, um)—Calymene, Calymenella, Ctenodonta, Cypricardites, Dicranopeltis, Levisia, Lyonsia, Moniolopsis, Orthodesma, Pterygotus (Eusarcus), Rafinesquina alternata, Strophomena, Strophomena alternata, Tellinomya.  
*natator*—Barrandeoceras, Nautilus, Phragmoceras.  
*naticoides*—Platyceras.  
*natressi*—Idiostroma.  
*nautarum*—Bellerophon.  
*naviformis*—Athyris, Atrypa, Meristella, Whitfieldella, Whitfieldia.  
*navigiolum*—Dendrocrinus.  
*nealli*—Gaurocrinus, Glyptocrinus, Reteocrinus.  
*nearpassi*—Beyrichia, Klædenia, Stropheodonta, Strophodonta.  
*neis*—Megistocrinus, Periechocrinus, Saccocrinus.  
*neenah*—Dictyonema, Rhynchonella, Rhynchotrema.  
*neglectus* (a)—Ambonychia, Amphicce-llia, Aparchites granilabiatum, Atrypa, Camarotæchia, Camarotæchia (Stegerhynchus), Clidophorus, Cœlocaulus, Cuneamya, Dianulites, Diplotrypa, Fis-tulipora, Fistulipora maculata, Gram-mysia, Leptodomus, Monticulipora hos-pitalis, Nuculites, Orthis, Plectorthis, Pterinea, Rhinidictya, Rhynchonella, Rhynchonella (Stegerhynchus), Rhy-nchonella (Stenoschisma), Sedgwickia, Streptorhynchus, Strophomena, Ten-taculites.  
*neleus*—Cyrtoceras, Mælonoceras.  
*nemca*—Strophomena.  
*neptuni*—Actinodictyon, Receptaculites.  
*nercis*—Holoepa.  
*nerepisense*—Ctenopleuron.  
*nereus*—Arctinurus, Encrinurus, Lichas.  
*nerine*—Ophileta.  
*nero*—Bathyrurus, Petigurus.  
*nerus*—Cryptonymus.  
*nervata*—Fenestella, Pterinea, Ptilopo-rella.  
*nestor*—Gomphoceras, Phragmoceras.  
*nettelrothi*—Conchidium, Orthis.  
*nevadaensis*—Amphion, Pliomera, Plio-merops.  
*newberryi*—Acanthonema, Ascoceras, Aspidopora, Chaetetes, Monomorella, Monticulipora, Orthonema, Prasopora.



- newlini**—*Buthotrephis*, *Carcinosoma*, *Eurysona*, *Eusarcus*.
- newportensis**—*Atactoporella*, *Monticulipora*.
- newsomensis**—*Atrypa reticularis*, *Hyolithes*, *Orthostrophia*, *Pterinea*, *Rhipidomella*, *Strophodonta* (*Brachyprion*).
- newtonensis**—*Calvinella*, *Dikelocephalus*, *Eoorthis*, *Orthis*, *Ptychoparia*.
- newtonwinchelli**—*Clarkoceras*, *Piloceras*.
- nexilis**—*Alecto*.
- nexus**—*Halysites*, *Halysites catenulatus*.
- niagarensis** (e)—*Acroculia*, *Actinostroma whiteavesii*, *Alveolites*, *Ampyx*, *Atrypa reticularis*, *Blothrophyllum*, *Bronteus*, *Bumastus*, *Bythocypris punctulata*, *Callograptus*, *Calymene*, *Calymene biumenbachii*, *Calymene*, *Ceramopora*, *Ceraurus*, *Cheirurus*, *Chonophyllum*, *Conocardium*, *Conophyllum*, *Conularia*, *Corymbocrinus*, *Crotalocephalus*, *Cystiphyllum*, *Delthyris*, *Diaphorostoma*, *Drymotrypa*, *Favosites*, *Goldius*, *Holopea*, *Illænus*, *Lituities*, *Michelinia*, *Orthoceras*, *Orthoceras* (*Geisonoceras*), *Palæaster*, *Pholidostrophia*, *Platyceras*, *Platyostoma*, *Platystoma*, *Pseudobornera*, *Quenstedtia*, *Raphistoma*, *Romingeria*, *Spirifer* (*Eospirifer*), *Staurocephalites*, *Straparollus*, *Strophodonta* (*Brachyprion*), *Strophomena*, *Strophostylus*, *Tentaculites*, *Thamniscus*, *Theca*, *Triplecia*, *Vermipora*.
- nicholsoni**—*Ceramopora*, *Chiloporella*, *Dicranograptus*, *Didymograptus*, *Monticulipora* (*Fistulipora*), *Rhinidictya*, *Sphærolithes*.
- nicklesi**—*Hebertella* (*Eridorthis*), *Homotrypa*, *Plectorthis* (*Eridorthis*), *Stigmattella*.
- nicollet(t)i**—*Cycloceras*, *Hallina*, *Orthoceras*, *Zygospira*.
- nilesi**—*Edmondia*, *Modiolopsis*.
- nilssoni**—*Graptolites*.
- niobe**—*Metoptoma*, *Triblidium*.
- niota**—*Cypricardites*, *Pleurotomaria*, *Trochonema*, *Vanuxemia*.
- nisis**—*Hebertella* (*Schizonema*), *Hebertella* (*Schizoramma*), *Orthostrophia* (*Schizoramma*), *Orthis*.
- nitens**—*Leptæna*, *Orthis*, *Rafinesquina*, *Strophomena*.
- nitidulus** (a)—*Aristerella*, *Cyrtolites*, *Cyrtolitina*, *Dicranopora*, *Ptilodictya*, *Rhinidictya*.
- nitidus** (a, um)—*Ambonychia*, *Athyris*, *Atrypa*, *Bathyurellus*, *Cleionychia*, *Clyonychia*, *Ctenodonta*, *Cyclocystoides*, *Didymograptus*, *Didymograptus*, *Drepanella*, *Drepanella nitida*, *Eunema*, *Graptodictya*, *Graptolithus*, *Graptolithus* (*Monoprion*), *Halysites catenularia*, *Homotrypa*, *Homotoma salteri*, *Lecanocrinus*, *Lioclemella*, *Maclurea*, *Maclurites*, *Merista*, *Meristella*, *Meristina*, *Mytilarca*, *Primitia*, *Ptilodictya*, *Tellinomya*, *Trematopora*, *Trochonema*, *Whitfieldella*.
- nobilis** (e)—*Fusispira*, *Glyptocrinus*, *Pentamerus*, *Potrioceras*, *Siphonocrinus*, *Spirifer* (*Eospirifer*).
- nobilissimus**—*Melocrinus*.
- nodobrachiatius**—*Dendrocrinus*.
- nodocostatum**—*Orthoceras*, *Skenidium*.
- nodocostum**—*Orthoceras*.
- nodostriatus** (a)—*Asaphus*, *Atrypa*.
- nodosus** (a)—*Cornulites*, *Echinocystites*, *Escharopora recta*, *Helopora*, *Homotrypella*, *Lysocystites*, *Monotrypa*, *Prasopora*, *Primitia*, *Ptilodictya*, *Schizocrinus*, *Scyphocrinus*, *Ulrichia*.
- nodulata**—*Ceratocephala*.
- nodulifera**—*Beatricea*.
- nodulosus** (a)—*Beatricea*, *Callopora*, *Callopora*, *Chætetes*, *Eridotrypa*, *Eucalyptocrinus*, *Hallopora*, *Homotrypa*, *Monticulipora*, *Monticulipora* (*Heterotrypa*), *Pleurotomaria*.
- normaliana**—*Cyclonema*.
- normalis**—*Ampyx*, *Ampyx* (*Lonchodumus*).
- normanensis**—*Cyrtodonta*.
- normani**—*Pleurotomaria*.
- normanskilleensis**—*Pterygotus*.
- norvegica** (um)—*Dictyonema*, *Dictyonema flabelliforme*.
- norwoodi**—*Cyrtoceras*, *Homotrypella*, *Lingulops*, *Stricklandina*.
- notabilis** (e)—*Lophospira*, *Opisthoptera*, *Trochonema*.
- notans**—*Asaphus*, *Brachyaspis*.
- notatus** (a)—*Beyrichia*, *Cyrtospira*, *Klondenia*, *Subulites*.
- notchensis**—*Obolus* (*Westonia*).
- nothus**—*Ceramopora* (*Paleschara*).

- notum**—Trochoceras.  
**novacarlislensis** (e)—Cycloceras, Orthoceras.  
**novascoticus**—Chonetes.  
**novascotius** (a)—Chonetes, Discina.  
**novaboracensis**—Temnograptus.  
**novaboracum**—Monomarella, Nanno.  
**novellus**—Chaunograptus, Dendrograptus.  
**novicia**—Ctenodonta, Tellinomya.  
**nucella**—Heliolites subbutubulata.  
**nucleiformis**—Ctenodonta, Tellinomya.  
**nucleolatus** (a)—Atrypa, Merista, Meristella, Pleurotomaria, Rhynchonella, Uncinulus, Whitfieldella.  
**nucleus**—Atrypa, Botryocrinus, Camarella, Cyathocrinus, Dendrocrinus, Gypidula, Homocrinus, Pentamerus, Sieberella, Triplecia.  
**nucula**—Rhynchonella, Terebratula.  
**nuculiformis**—Clidophorus, Ctenodonta, Lyonsia, Modiolopsis, Tellinomya.  
**nuculitiformis**—Ribeira.  
**numeria**—Liospira, Pleurotomaria.  
**numerosus**—Trachomatichnus.  
**numitor**—Ceraurus, Cheirurus, Nieszkowskia.  
**nummiformis**—Callopora, Calloporaella, Mesotrypa.  
**nummularium**—Orthoceras.  
**numulatum**—Actinoceras lata, Orthoceras (Actinoceras) lata.  
**numulus**—Orbiculoidea.  
**nundina**—Syntrophia.  
**nuperus**—Ceraurus, Cheirurus.  
**nutans**—Streptorhynchus, Strophomena, Stropomena (Hemipronites).  
**nutrix**—Camarotoechia, Rhynchonella.  
**nuxmoschata**—Astylospongia præmorsa, Caryospongia juglans.  
**nycteis**—Metoptoma, Triblidium, Tryblidium.  
**nympha**—Eorthis desmopleura, Lingula, Orthis (Plectorthis) desmopleura.  
**nymphale**—Cyathophyllum.  
**nysius**—Conchidium, Pentamerus.  
**obconicus**—Comarocystites, Comarocystites shumardi, Eucalyptocrinus, Euspirocrinus, Macrostylocrinus, Mariacrinus, Melocrinus, Stephanocrinus, Streptosolen.  
**obelisca**—Hormotoma, Murchisonia, Murchisonia (Fusispira).  
**oberon**—Orthoceras.  
**obesus** (a, um)—Byssonychia, Cyrtodonta, Eurychilina, Fusispira, Gomphoceras, Holoepa, Olenus scarabaeoides, Pachydictya, Poterioceras, Protowarthia, Sinuites, Sinuoepa, Subulites.  
**oblata**—Atrypa nitida, Lingula, Merista nitida, Orthis, Trematis, Whitfieldella, Whitfieldella nitida.  
**obliquata**—Cardiomorpha, Ceromyopsis, Ptilotrypa, Whitella.  
**obliquior**—Streptelasma.  
**obliquus**—Diplograpsus.  
**obliquus** (a)—Anthaspidella, Arabellites, Conradella, Ctenobolbina, Ctenodonta, Cypricardites, Cyrtodonta, Eurychilina Favosites, Holoepa, Homotrypa, Huronia, Lophospira, Mytilarca, Nucula, Opisthoptera, Palæoconcha, Phragmolites, Ptilodictya, Rhinidictya, Scæogyra, Stictopora, Streptelasma, Tellinomya, Tentaculites, Turbo, Zaphrentis.  
**oblongus** (a)—Actinomya, Aparchites, Bathyrurus, Caryocaris, Cuneameya, Cycloconcha, Lingula, Lloydia, Melocrinus, Modiolopsis, Pentamerus, Pteronitella, Whiteavesia.  
**obovatum**—Dictyonema.  
**obpyramidalis**—Actinocrinus, Melocrinus, Stephanocrinus.  
**obpyriformis**—Favosites, Odontocaulis.  
**obscurus** (a, um)—Avicula, Clidophorus, Cyrtoceras, Dekayella, Dekayia, Holoepa, Jonesella, Leperditella, Leperditia, Leptæna, Palæophycus, Parastrophia, Plectoceras, Porambonites, Pterinopecten, Rafinesquina, Strophomena, Turbo.  
**obsoletus** (a, um)—Acanthonema holopiformis, Acidaspis, Bucania, Conchidium, Cyclonema, Cypricardia, Cypricardites, Eotomaria, Eunema, Euomphalopterusalatus, Holoepa, Lophospira (Seelya) lirata, Modiolopsis, Pleurotomaria, Pleurotomaria (Turritella), Protozyga, Sarcinula, Spirifer (Eospirifer) radiatus, Staurocephalus, Tetranota, Zygospira.  
**obstructum**—Orthoceras.  
**obtusifrons**—Cypricardites, Vanuxemia.  
**obtusiplicata**—Atrypa, Camarotoechia, Rhynchonella.

- obtusus** (a)—*Ambonychia*, *Asaphus*, *Bythocypris*, *Cœlocaulus*, *Conchopeltis* (*Metoptoma*), *Cypricardites*, *Cyrtodonta*, *Isotelus*, *Lingula*, *Liospira*, *Modiola*, *Modiolopsis*, *Murchisonia*, *Onchometopus*, *Orthis*, *Orthonychia*, *Palæarca*, *Posidonomya*, *Raphistoma*, *Scenella*.
- obvius** (a)—*Lichas*, *Lichas* (*Oncholichas*).
- occasus**—*Bronteus*, *Goldius*.
- occidens**—*Favosites*, *Modiolopsis*, *Oldhamia* (*Murchisonites*), *Phanerotrema*, *Pleurotomaria labrosa*.
- occidentalis** (e)—*Arctinurus*, *Clisospira*, *Conchidium*, *Dimerocrinus*, *Ectomaria pagoda*, *Eurystomites undatus*, *Favosites forbesi*, *Glyptaster*, *Hebertella*, *Holopea*, *Leptobolus*, *Lichas boltoni*, *Lituites undatus*, *Nautilus*, *Odontocaulis*, *Orthis*, *Orthodesma*, *Pachydietya*, *Pentamerus*, *Petraia pygmæa*, *Platystrophia*, *Plectoceras undatus*, *Pterinea*, *Receptaculites*, *Solenospira pagoda*, *Strophomena fluctuosa*, *Thysanocrinus*.
- oceanus** (a)—*Maclurea*, *Maclurites*, *Nautilus*.
- ocellatus**—*Girvanella*, *Strephochetus*.
- octobrachiatus**—*Dichograpsus*, *Dichograpsus*, *Graptolites* (*Didymograpsus*), *Graptolithus*, *Graptolithus* (*Loganograptus*).
- octocostatus**—*Spirifer* (*Delthyris*).
- octonarius**—*Dichograpsus*, *Dichograptus*, *Graptolithus*, *Graptolithus* (*Monoprion*).
- octonotatus**—*Protichnites*.
- oculata**—*Prasopora*.
- oculifera**—*Beyrichia*, *Ceratopsis*, *Eurychliina*, *Tetradella*.
- oceanus** (a)—*Heterocrinus*, *Heterocrinus* (*Iocrinus*), *Ohioocrinus*, *Rhytimya*.
- oehlerti**—*Cœlidium*, *Cœlocaulus*, *Murchisonia*.
- oelensis**—*Crisinella*.
- offleyensis**—*Zaphrentis*.
- offula**—*Leptotrypa*, *Paleschara*, *Petigopora*.
- ohioensis**—*Callopora*, *Ceramopora*, *Ceramoporella*, *Ctenodonta*, *Labechia*, *Lio-clemella*, *Lophospria*, *Monticulipora*, *Pleurotomaria*, *Receptaculites*, *Spirifer* (*Delthyris*), *Trimerella*, *Trochomena pauper*, *Whitella*, *Zaphrentis*.
- oligoptychus**—*Spirifer*, *Spirifer* (*Eospirifer*) *niagarensis*.
- oligotheca**—*Climacograptus*.
- olorus**—*Cycloceras*, *Orthoceras*.
- ommanneyi**—*Endoceras*, *Orthoceras*.
- onealli**—*Acidaspis*, *Callopora*, *Callopora sigillaroides*, *Chætetes*, *Hallopora*, *Monticulipora*, *Monticulipora* (*Heterotrypa*), *Odontopleura*, *Reteocrinus*.
- oneidaense**—*Orthoceras*.
- ontario**—*Tetradium*.
- ontarioensis**—*Dendrograptus*.
- opertus**—*Bellerophon* (*Bucania*).
- ophelia**—*Holopea*.
- oppletum**—*Vaginoceras*.
- ops**—*Camarella*, *Parastrophia*.
- orbicauda**—*Illænus*.
- orbicaudatus**—*Bumastus*, *Illænus*.
- orbicularis**—*Ambonychia*, *Atrypa*, *Monomorella*, *Orthis*, *Posidonomya*, *Pterinea*.
- orbiculatus** (a)—*Avicula*, *Carinaropsis*, *Ceramopora*, *Ceramoporella*, *Helcion*, *Mesotrypa*.
- orbiculoides**—*Amphicœlia*, *Lyriopecten*.
- orbignyus**—*Bathyrurus*.
- orbipora**—*Stictopora*, *Stictotrypa*.
- orcus**—*Cyrtoceras*, *Oncoceras*.
- ordinaria**—*Schuchertia*.
- ordinata** (um)—*Cladopora*, *Orthoceras*.
- orestes**—*Acaste*, *Astreopora*, *Cyrtoceras*, *Madrepora*, *Phacopidella*, *Phacops*.
- organum**—*Sarcinula*, *Syringophyllum*.
- orientalis**—*Camarotœchia*, *Discina*, *Prasopora simulatrix*, *Rhynchonella*.
- orion**—*Agnostus*.
- orithyia**—*Metoptoma*, *Scenella*.
- ornatissimus**—*Holocystites*.
- ornatus** (a, um)—*Asaphocrinus*, *Cariocrinites*, *Caryocrinites*, *Caryocrinus*, *Chicagocrinus*, *Conocardium*, *Cryptony-mus*, *Ctenocrinus*, *Cyrtolites*, *Encri-nurus*, *Eopteria*, *Eucalyptocrinus*, *Glyptocrinus*, *Habrocrinus*, *Hercocrinus*, *Holocystites*, *Lecanocrinus*, *Leperditella*, *Leptotrypa*, *Macrostylocrinus*, *Periechocrinus*, *Porcellia*, *Protoscolex*, *Saccocrinus*, *Siderocrinites*, *Siderocrinus*, *Tentaculites*, *Trematopora*, *Trematopora primigenia*.
- orodes**—*Cyclostomiceras*, *Cyrtoceras*.
- orphyne**—*Metoptoma*, *Palaœcmaea*.
- erthambonites**—*Orthis*.
- orthididea**—*Leptæna*, *Strophomena*.

- orthonotus** (a, um)—Cypricardia, Endodesma, Modiolopsis, Unio.
- ortoni**—Acidaspis, Atactopora, Atactoporella, Chætetes, Dicraniscus, Discoceras, Gomphoceras, Lituites, Monomorella, Monticulipora, Monticulipora (Peronopora), Odontopleura, Orthoceras, Triplecia, Triplesia.
- orus**—Kionoceras, Orthoceras.
- osborni**—Palæophonus, Proscorpius, Pterygotus.
- osculum**—Cœloclema, Diamesopora, Trematopora.
- osgoodensis**—Codaster, Monotrypa, Stephanocrinus.
- ostiolata**—Cheilotrypa, Chilotrypa, Clathrodictyon, Clathrodictyum, Stomatopora, Trematopora.
- oswegoensis**—Anisocrinus, Dendrocrinus, Lecanocrinus, Tentaculites.
- otisi**—Dolichopterus, Pterygotus.
- ottawa**—Isochilina, Leperditia.
- ottawaensis** (a)—Astrocystites, Astroporites, Batostoma, Eccclyliopterus, Eoharpes, Harpes, Harpes (Harpina), Hemiphragma, Licropheycus, Murchisonia (Hormotoma) augustina, Ophileta, Orthoceras, Petraia, Porambonites, Rhynchotrema, Steganoblastus, Trematis, Turrilepis.
- ovalis** (e)—Acrotreta, Arabellites, Carabocrinus, Crumenaecrinites, Cyathocrinus, Cypricardites, Eucalyptocrinites, Eucalyptocrinus, Haplocrinites, Haplocrinus, Holoepa, Ischyrodonta, Nematopora, Orbiculoidea, Pentamerus, Pholidops, Schizotreta, Sphaerocystites globularis, Tryblidium.
- ovatipora**—Stictopora.
- ovatus** (a, um)—Allonychia, Ctenodonta, Cycloconcha, Cypricardites, Eucalyptocrinus, Holocystites, Homotrypella, Leperditia, Lingula, Lingulops, Modiolopsis, Monomorella, Pholidops, Stomatotrypa, Tellinomya, Thaleops, Thaleops (Illænus), Thalamocrinus.
- oviformis**—Ctenodonta, Cypricardites, Cyrtodonta, Modiolodon, Modiolopsis.
- ovoidea**—Megambonia.
- ovoides**—Oncoceras, Trochonema, Whitfieldella.
- owatonensis**—Camarella.
- owenanus** (a)—Eccclyliopterus, Ophileta.
- owenensis**—Eccclyliopterus.
- owen**—Agrauros, Anomocarella, Arionellus, Cœloclema, Conaspis, Conocardium, Conocephalitis, Conocoryphe, Diamesopora, Dicellocephalus, Dikēlocephalus, Fistulipora, Lophospira, Modiolopsis, Monticulipora (Fistulipora), Murchisonia, Ptychoparia, Raphistoma, Receptaculites, Tripteroceras, Triptoceras.
- oxfordensis**—Fenestella, Holoepa.
- ozarkensis**—Calvinella, Murchisonia, Orthoceras.
- pachycheirus**—Eurypterus, Eurypterus lacustris.
- pachydermatus**—Proetus.
- pagoda**—Ectomaria, Eunema, Murchisonia, Solenospira.
- palinurus**—Bellerophon, Lituites, Oxydiscus, Schroederoceras.
- palmata**—Buthotrepis, Syntrophia.
- palmipes**—Rauiffella.
- paludiformis**—Holoepa.
- panderi**—Camarella, Remopleurides.
- panderiana**—Orthis.
- pandion**—Oncoceras.
- pannosus** (a, um)—Calathium, Conradella, Crania, Cyrtolites, Phragmolites.
- panolensis**—Isochilina.
- papillatus** (a, um)—Camptolithus, Chætetes, Conularia, Dermatostroma, Hyolithellus, Jaekelocystis, Labechia, Lyellia, Monticulipora, Protarea richmondensis, Stomatopora.
- papilliformis**—Schizotreta.
- papillosus** (a)—Eucalyptocrinus, Holocystites, Lingula, Lophospira, Murchisonia.
- paquettiana**—Solenopora.
- parabola**—Clelandia, Harrisia.
- paradoxicus** (a, um)—Calathium, Dendrocystis, Nipterella, Syringocrinus.
- paradoxus**—Entomolitus, Syringocrinus.
- paraia**—Anabaia.
- parallela** (um)—Beyrichia, Crania, Cymatonta, Dictyonema, Modiolopsis, Orthodesma, Orthonota, Primitia, Ptilodictya, Rhinidictya, Sphenolium, Syringopora, Syringostroma.
- parasiticus** (a, um)—Agelacrinus, Astrocerium, Favosites, Hemicystites, Idiotrypa, Monticulipora, Streptelasma.
- parkensis**—Hebertella maria.
- parmula**—Aspidopora fenestelliformis, Prasopora.

- parmulata*—Discina, Orbicula, Orbiculoidea.  
*parryi*—Catenipora, Halysites.  
*parvanguis*—Dicranograptus nicholsoni.  
*parvidens*—Ctenodonta.  
*parvistellata*—Anthaspidella.  
*parvituba*—Lyellia.  
*parviusculus* (a)—Hyolithes, Mesopalæaster, Modiolopsis, Palæaster, Proetus, Theca.  
*parvulipora* — Eridotrypa, Fenestella, Heterotrypa.  
*parvulus* (a, um)—Acidaspis, Anomocare, Aparchites, Astylospongia, Bythopora, Cyclora, Cyrtospira, Gomphoceras, Helopora, Holocystites, Holoepa, Ilionia, Leperditia, Lichenalia concentrica, Odontopleura, Palæopteria, Pentamerus, Poleumita, Polytropis, Pterinea, Streptelasma, Streptoplasma, Subulites, Turbo.  
*parvus* (a, um)—Archæocrinus, Calloporina, Camerella, Clematocrinus, Climacograptus, Columnaria, Constellaria, Cordylocrinus, Cuneamya, Cyclocystoides, Cyrtodonta, Cyrtolites, Dalmanella, Dalmanella elegantula, Dicranopora, Dinobolus, Glyptocrinus, Halloporina, Hindia, Hindia sphaeroidalis, Holocystites, Homocrinus, Lamptrocrinus, Loxonema, Melocrinus, Microspongia, Modiolopsis, Monticulipora, Murchisonia, Orthis, Orthis elegantula, Orthodesma, Phragmoceras, Platycrinus, Ptychocrinus, Raphistoma planistrium, Ribeiria, Rhynchotreta, Sphaerexochus, Stomatopora, Straparollus, Stylaræa, Subulites.  
*pasithea*—Cyathophyllum.  
*patei*—Caryomanon, Pycnosaccus.  
*patella*—Dianulites, Diplotrypa, Mesotrypa.  
*patelliformis*—Archinacella, Carinaropsis, Helcion.  
*patens*—Zaphrentis.  
*patenta*—Leptæna, Strophomena, Strophonella, Streptorhynchus.  
*patera*—Astylomanon cratera, Prasopora.  
*patersoni*—Bellerophon.  
*pattersoni*—Canistrocrinus, Glyptocrinus, Lichenocrinus, Reteocrinus.  
*patriciaense*—Hormotoma.  
*patronus*—Protophragmoceras.  
*patulus* (a, um)—Achradocrinus, Chondrites (Bythotrephes), Chondrites (Trichochochondrites), Didymograptus, Graptolithus, Modiolodon, Stenopora, Streptelasma, Tryblidium, Zaphrentis.  
*paucicostata*—Eridonychia.  
*pauciplicata*—Platystrophia, Platystrophia lynx, Trematospira camura.  
*paucivolvatum*—Raphistoma.  
*paulianus*—Corydocephalus wesenbergensis, Lichas, Lichas (Arges) wesenburgensis.  
*paululus*—Eunicites.  
*pauper*—Dicelloccephalus, Dikeloccephalus, Pleurotomaria, Ptychaspis, Trochonema (Cyclonema), Trochonema (Pleurotomaria), Dekayia, Heterotrypa, Klædenella clarkei, Rhinidictya, Stictopora, Zygospira.  
*pauquettiana* — Leperditia canadensis, Leperditia fabulites.  
*pavonia*—Chaetetes, Escharopora, Heterodictya, Monotrypa, Monticulipora, Nicholsonia, Peronopora, Ptilodictya.  
*peachii*—Solenopora compacta, Tetradium.  
*pearyi*—Receptaculites.  
*peccatonica*—Helicotoma.  
*pecten*—Ctenopyge, Olenus (Sphaerophthalmus), Strophomena.  
*pectinatus*—Arabellites.  
*pectinella*—Dinorthis, Orthis.  
*pectunculoides*—Ctenodonta, Tellinomya.  
*peculiaris* (e)—Archæocrinus, Lioclema, Nicholsonella, Trimerocystis.  
*pediculata*—Monotrypa, Rhinidictya.  
*pegramensis*—Alveolites, Heliophyllum, Pachypora (Platyaxum), Reticularia.  
*pelagica* (um)—Cyathophyllum, Straparollina.  
*pelias*—Obolus (Lingulella) mcconnelli.  
*pelliculata*—Dekayia, Monticulipora.  
*peloepa*—Discina, Schizotreta.  
*pelops*—Asaphus.  
*peltatum*—Discophyllum.  
*peltifer*—Climacograptus bicornis.  
*pembrokensis*—Grammysia.  
*penicillus*—Xenocrinus.  
*pennanti*—Cyathophyllum.  
*pennatulus*—Didymograptus, Didymograptus, Graptolithus, Graptolithus (Monoprius).

- pennsylvanicus* (a)—*Klœdenella*, *Klœdenia*, *Leperditia*, *Onchus*.  
*pentagonalis*—*Cupellœcrinites*, *Cupellœcrinus*, *Marsipocrinus*.  
*pentagonius*—*Porocrinus*.  
*pentagonus* (a, um)—*Arachnophyllum*, *Glyptocrinus insperatus*, *Heterocrinus*, *Pterotheca*, *Siphonocrinus*, *Stenocrinus*, *Strombodes*.  
*pentalobus*—*Codaster*, *Stephanocrinus*.  
*pentangularis*—*Callicrinus*, *Dimerocrinus*, *Glyptaster*, *Thysanocrinus*.  
*pentolena*—*Palœocystis*.  
*peosta*—*Diplograptus*, *Graptolithus*.  
*pepina*—*Billingsella*, *Orthis*, *Orthis* (*Orthisina*).  
*pepinensis* (e)—*Euomphalus*, *Raphistoma*.  
*peracuta* (um)—*Bucania*, *Ctenodonta*, *Lophospira*, *Murchisonia*, *Raphistoma*.  
*perampla*—*Crepipora*.  
*perangulata* (um)—*Ambonychia*, *Lophospira*, *Murchisonia bicincta*, *Orthoceras*, *Psilonychia*.  
*perantiquus* (a)—*Enallopora*, *Chætetes*, *Gorgonia*, *Protocrisina*.  
*perarmata*—*Acidaspis*.  
*percarinata* (um)—*Crania*, *Cyclonema*, *Pleurotomaria*.  
*percingulata* (um)—*Cyclonema*.  
*percrassus*—*Dictyonema*.  
*perdentatus*—*Eunicites*, *Lumbriconereites*.  
*perdewi*—*Pseudocrinites*.  
*perelegans*—*Graptodictya*, *Heliolites*, *Ptilodictya*.  
*perexilis* (e)—*Dicellograptus sextans*, *Dictyonema*.  
*perflexilis*—*Goniograptus*.  
*perflexus*—*Didymograpsus*.  
*perforator*—*Ceraurus* (*Nieszkowskia*), *Cheirurus*, *Nieszkowskia*.  
*perforatus* (a, um)—*Diaphorostoma*, *Bellerophon* (*Bucania*), *Cliocrinus*, *Lophospira*.  
*perfrondosa*—*Dekayia*, *Dekayella* *prolifera*.  
*pergibbosus*—*Pentamerus*.  
*pergracilis* (e)—*Buthotrephis*, *Dictyonema*, *Desmograptus*, *Subulites*.  
*perinflata*—*Beyrichia*, *Klœdenia*.  
*perkinsi*—*Bathyrurus*, *Cryptozoon*, *Eccyliomphalus*, *Euomphalus*, *Nautilus*, *Nileus*, *Ooceras*, *Tarphyceras*.  
*perlamellosa* (um)—*Lophospira*, *Murchisonia*, *Rhynchonella*, *Rhynchotrema*.  
*perlatus* (a)—*Liospira*, *Modiolopsis*, *Pleurotomaria*, *Retiolites*, *Retiolites* (*Gla-diograptus*).  
*perlongus*—*Holocystites*.  
*perminima*—*Primitia*.  
*perminuta*—*Ctenodonta*.  
*permultus*—*Trachomatichnus*.  
*pernodosus*—*Encrinurus*.  
*pernoides*—*Mytilarca*, *Streptomytilus*.  
*perornata*—*Bucania*.  
*perovalis*—*Archinacella*, *Metoptoma*.  
*perovata*—*Glossina*, *Lingula*, *Palœoglossa*.  
*perparvum*—*Orthoceras*.  
*perplexus* (a)—*Diaboloocrinus*, *Dionide*, *Lingula*, *Moorea*.  
*perroti*—*Orthoceras*.  
*perryi*—*Lingula*.  
*perseus*—*Orthoceras*.  
*persimilis*—*Amplexopora*, *Callopora pulchella*, *Cypricardites*, *Cyrtodonta*, *Hallopore pulchella*, *Leperditella*, *Leperditia*, *Liospira*.  
*persiphonatum*—*Huronia*, *Orthoceras*.  
*personata*—*Stigmatella*.  
*perspicator*—*Bathyrurus*, *Goniurus*.  
*perstriata*—*Helicotoma*.  
*persulcata*—*Beyrichia*, *Bollia*.  
*perternis* (e)—*Cœnograptus*, *Dictyonema*, *Diplograptus amplexicaulis*, *Fenestella*, *Nemagraptus*, *Nemagraptus explanatus*, *Phacelopora*, *Rhopalonia*.  
*pertinax*—*Orthoceras*.  
*perundosa*—*Holoepa*.  
*perungulatus*—*Corynoides gracilis*.  
*pervagata*—*Plectorthis equivalvis*.  
*pervetus* (a)—*Dalmanella*, *Dalmanella subæquata*, *Euomphalus*, *Inachus*, *Orthis*, *Pianodema subæquata*.  
*pervetustus* (a)—*Cyclonema*, *Cyclostoma*, *Euconia*, *Euomphalus*, *Holoepa*, *Holoepa antiqua*, *Pleurotomaria*, *Straparolus*.  
*pervoluta*—*Bucania*, *Tremanotus*, *Protowartha*, *Sinuities*.  
*pesovis*—*Pentamerus*.  
*petalliformis*—*Plasmopora*, *Porites*.  
*petasiformis*—*Amplexopora*, *Amplexopora welchi*, *Monotrypa*, *Monticulipora*, *Monticulipora welchi*.  
*petechialis*—*Chætetes*, *Monticulipora*, *Petigopora*.

- petilus** (a)—*Cœlocaulus*, *Murchisonia*, *Reticularia bicostata*, *Spirifer bicostata*.  
**petræ**—*Orthis*.  
**petropolitanus** (a)—*Chætetes*, *Dianulites*, *Diplotrypa*, *Monticulipora*, *Stenopora*.  
**pettiti**—*Oncoceras*.  
**phædra**—*Cyclonema*.  
**phainotheca**—*Dendrograptus*.  
**phalera**—*Carinaropsis*.  
**phaseolus**—*Cytherina*, *Lepeditia*.  
**phillipsi** (i)—*Archinacella*, *Eucalyptocrinites*, *Eucalyptocrinus*, *Metoptoma*.  
**philomela**—*Lingula*, *Strophomena*.  
**philomena**—*Stropheodonta* (*Brachyprion*).  
**phlyctainoides**—*Arges*, *Calymene*, *Corydocephalus*, *Lichas*.  
**phoca**—*Atrypa*, *Hindella*, *Lissatrypa*, *Rhynchonella*.  
**pholadiformis**—*Actinomya*, *Modiolopsis*, *Pholadomorpha*, *Whiteavesia*.  
**pholadis**—*Cymatonota*, *Orthonota*, *Pterinea*.  
**phosphaticus**—*Sabellarites*.  
**phragmoceras**—*Amplexus*, *Calophyllum*.  
**phycoides**—*Inocaulis*.  
**phylophorus**—*Climacograptus*.  
**pickthorni** (i)—*Cyathophyllum Stropheodes*.  
**pictoense**—*Orthoceras*.  
**piger** (ra)—*Clitambonites*, *Orthis*.  
**pileolum**—*Archinacella*, *Orthoceras*, *Triblidium*.  
**pileus** (m)—*Agelacrinites*, *Agelacrinus*, *Agelacrinus* (*Lepidodiscus*), *Pycnopenema*.  
**pilosum**—*Cyrtoceras*.  
**pinnaformis**—*Lingula*, *Lingulepis*.  
**piriformis**—*Syphonia*.  
**pisa**—*Camarotæchia*, *Rhynchonella*.  
**piscator**—*Orthoceras*.  
**pisiformis**—*Agnostus*, *Arachnocrinus*, *Battus*, *Cyathocrinus*, *Entomolitus paradoxus*, *Entomotracheus*, *Lecanocrinus*, *Nucleospira*, *Poteriocrinus*.  
**piso**—*Orthoceras*.  
**pistilliformis**—*Zittella typicalis*.  
**pisum**—*Deiphon*, *Homeospira*, *Orthis*, *Plectambonites*, *Rhynchonella*, *Sphærexochus*.  
**pittsfordensis**—*Eurypterus*.  
**placidus** (a)—*Cytherodon*, *Murchisonia*.  
**plagosa**—*Beyrichia*.  
**planidorsatum**—*Cyrtoceras*, *Tripteroce-  
ras*.  
**planifrons**—*Anomocarella*, *Dicellocephalus*, *Dikelocephalus*.  
**planilateralis**—*Meekospira*, *Subulites* (*Polyphemopsis*).  
**planisinuosus**—*Prosserella*, *Reticularia*.  
**planistria** (um)—*Raphistoma*, *Scalites*, *Straparollus*.  
**planistriata**—*Ambonychia*.  
**planoconvexa** (um)—*Anoplothecha*, *Atrypa*, *Cœlospira*, *Hemipronites*, *Leptocœlia*, *Orthoceras*, *Strophomena*, *Streptorhynchus*, *Tripteroce-  
ras*, *Triptoceras*.  
**planodorsata** (um)—*Ctenodonta*, *Cyrtoceras*, *Protowarthia*, *Sinuities*, *Strophomena*, *Tellinomya*, *Tripteroce-  
ras*, *Triptoceras*.  
**planorbiformis**—*Lituities*, *Palæonautilus*, *Trocholites*.  
**planostiolata**—*Pachypora* (*Platyaxum*).  
**planulatoides**—*Helicotoma*.  
**planulatus** (a)—*Cleidophorus*, *Clidophorus*, *Fusispira*, *Helicotoma*, *Helicotoma robusta*, *Nuculites*, *Periploma*.  
**planumbonus** (a, um)—*Leptæna*, *Hemipronites*, *Streptorhynchus*, *Strophomena*,  
**planus** (a, um)—*Asaphellus*, *Constellaria constellata*, *Constellaria florida*, *Deltoceras*, *Didymograptus nicholsoni*, *Eurymya*, *Eurymyella*, *Hemigyraspis*, *Isotelus*, *Leda*, *Lyrodesma*, *Modiolopsis*, *Monticulipora parasitica*, *Oriostoma*, *Orthis*, *Semicoscini-  
um*, *Stropheodonta* (*Brachyprion*).  
**platycaudatus**—*Dalmanites*.  
**platycephalus** (a)—*Asaphus*, *Brongniartia*, *Calymene*, *Isotelus*.  
**platymarginatus**—*Isotelus*.  
**platyphylla**—*Phænopora*, *Ptilodictya*.  
**platys**—*Dinorthis*, *Orthis*, *Pachypora* (*Platyaxum*), *Plæsiomys*, *Platyaxum*.  
**platystoma**—*Bellerophon*, *Bellerophon* (*Bucania*).  
**plauta**—*Holopea*.  
**plebeia** (um)—*Cypricardites*, *Cyrtodonta*, *Oncoceras*, *Whitella*.  
**plebia** (um)—*Diaphorostoma*, *Platyostoma*.  
**plenus** (a)—*Atrypa*, *Holocystites*, *Camarotæchia*, *Rhynchonella*.  
**pleurexanthemus**—*Ceraurus*, *Cheirusus*.

- pleuriflexavatam—*Astylomanon*.  
 pleuristriata—*Stropheodonta corrugata*,  
*Strophomena corrugata*.  
 plicatellus (a)—*Atrypa*, *Leptæna*, *Orthis*,  
*Plectambonites*, *Plectorthis*, *Rhynchonella*, *Spirifer*.  
 plicatulum (a)—*Anoplothea*, *Cælospira*,  
*Cyathophyllum*, *Leptocælia*, *Rhynchonella*.  
 plicatus (a, m)—*Anomalodonta*, *Atrypa*,  
*Cyathophyllum*, *Delthyris*, *Eurystomites*,  
*Ischyria*, *Orthis*, *Rhynchonella*, *Spirifer* (*Delthyris*) *modestus*,  
*Strophomena* (*Hemipronites*), *Technophorus*.  
 plicifera—*Atrypa*, *Dalmanella*, *Leptæna*,  
*Rhynchonella*, *Strophomena*.  
 pluma—*Hallia*.  
 plumaria—*Ptilodictya*.  
 plumosus (m)—*Actinocrinus*, *Chloephyucus*,  
*Clematocrinus*, *Cordylocrinus*, *Glyptocrinus*,  
*Platycrinus*, *Ptilograptus*, *Ptilograptus*.  
 plumula—*Chætocladus*.  
 plumulosus—*Inocaulis*.  
 pluto—*Lituities*.  
 poctai—*Ptilograptus*.  
 pognipensis—*Lingulella*, *Modiolopsis*,  
*Obolus*, *Orthis*, *Pianodema*.  
 politus (a)—*Camarella*, *Prionodus*.  
 polydactylus—*Cupulocrinus*, *Dendrocrinus*,  
*Homocrinus*, *Poteriocrinites*, *Poteriocrinus*.  
 polydorus—*Ceraurinus*, *Ceraurus*, *Cheirurus*.  
 polygratus—*Euomphalus*, *Polygrata*.  
 polymorphum—*Dictyonema*.  
 polynema—*Protospongia*.  
 polystomella—*Constellaria*, *Monticulipora*,  
*Stellipora*.  
 polythecatus—*Dicellograptus intortus*.  
 polyzo—*Botryocrinus*, *Cyathocrinus*, *Heterocrinus* (*Iocrinus*), *Homocrinus*,  
*pompilius*—*Ceraurinus*, *Ceraurus*, *Ceraurus* (*Crotalocephalus*), *Cheirurus*.  
 pomponius—*Nautilus*.  
 ponderosa—*Anolotichia*, *Cypricardites*,  
*Cyrtodonta*, *Escharopora*, *Maclurea*,  
*Maclurites*, *Nicholsonella*, *Platystrophia*,  
*Ptilodictya*, *Rafinesquina alternata*.  
 ponepunctus—*Agnostus trisectus*.  
 porcata—*Dinorthis*, *Dinorthis* (*Plæsiomys*),  
*Orthis*.  
 porcia—*Clitambonites*.  
 porrecta—*Dalmanella*, *Dalmanella testudinaria*,  
*Orthis*.  
 porteri—*Orthoceras*.  
 portlocki—*Huronia*, *Orthoceras*.  
 postelegantula—*Dalmanella*.  
 posterus—*Climacograptus caudatus*.  
 posthuma—*Parabolinella*.  
 posticus (a)—*Dendrocrinus*, *Modiolopsis*,  
*Poteriocrinites*, *Poteriocrinus*.  
 postlatum—*Endodesma*.  
 postplicatum—*Modiolopsis*.  
 postremus—*Glossograptus quadrimucronatus*,  
*Goniograptus thureaui*.  
 postriatus (a, um)—*Arca*, *Cardiomorpha*,  
*Lyrodesma*, *Modiolodon*, *Nucula*, *Nuculites*.  
 postumius (a)—*Cyrtoceras*, *Pleurotomaria*.  
 poterium—*Astylomanon cratera*.  
 powersi—*Archinacella*, *Gomphoceras*,  
*Triblidium*.  
 præcedens—*Ceratiocaris* (*Limnocaris*),  
*Favosites helderbergiæ*.  
 præcipita (um)—*Cyclonema* (*Gyronema*),  
*Homotrypa curvata*, *Whitella*.  
 præcursa—*Byssonychia*.  
 præcursor—*Camarotechia* (*Stegerhynchus*)  
*whitii*, *Rhynchonella* (*Stegerhynchus*)  
*whitii*, *Sigmagraptus*.  
 præformosa—*Rhynchospira*.  
 prægracilis—*Dendrograptus*.  
 præmarginalis—*Atrypa*.  
 præmaturus (m)—*Mælonoceras*, *Marsipocrinus*,  
*Marsupiocrinus*, *Phragmoceras*, *Platycrinus*.  
 præmorsa—*Astylosporgia*, *Astylosporgia*  
*pusilla*, *Caryospongia*, *Siphonia*.  
 prænuntia—*Dekayella*, *Dekayella næviger*,  
*Klædenia*, *Meristella*.  
 præplicata—*Stropheodonta*.  
 prævium—*Liospira*, *Raphistoma*.  
 prævolutus—*Clidophorus*.  
 pravum—*Heliophyllum*.  
 precius—*Aulopora*, *Aulopora compressus*.  
 precosis—*Leptæna*, *Plectambonites*.  
 precursor—*Leptæna richmondensis*,  
*Loculipora ambigua*, *Platystrophia colbicensis*,  
*Strophomena vetusta*.  
 prematurum—*Tarphyceras*.  
 prenuntius—*Promopalæaster*.  
 preoblata—*Rhipidomella*.  
 pressula—*Zaphrentis*.  
 pretensa—*Scenella*.



- pretiosa—Acrothele, Billingsia, Elkania, Linnarssonina, Obolella.
- priamus—Orthoceras.
- primævus (a, um)—Leperditia balthica, Nanno, Sphenophyllum, Styliola.
- primigenius (a, um)—Chonetes (Eodevonnaria), Modiolopsis, Orthoceras, Palæarca, Trematopora, Unio.
- primitiva—Berenicea.
- primordialis (e)—Billingsella, Streptorhynchus.
- primus (a)—Chætomorpha, Cybele, Cybeloides, Glaphurus, Lingula, Lingulella, Michelina, Orbicula, Rhinopora.
- princeps—Proetus.
- prinstana—Athyris, Hindella, Meristella.
- prionon—Graptolithus, Lomatoceras, Monograptus, Monograptus (Graptolithus) clintonensis.
- priscus (a, um)—Atrypa, Cyrtendoceras, Dictyorhabdus, Eccyliomphalus, Eccyliomphalus, Ectomaria, Eunema, Fenestella, Glyptocrinus, Monomorella, Periglyptocrinus, Ptychocrinus, Schizambon, Solenospira, Stropheodonta, Strophomena, Terebratula.
- pristiniformis—Diplograptus, Graptolithus.
- pristinus (a, um)—Callonema, Camarotæchia, Eurypterus, Hyboerinus, Oncoceras.
- pristis—Diplograptus, Diplograptus, Graptolithus.
- proavitus (a)—Dinorthis, Mesopaleaster, Orthis, Rensselaeria (Beachia).
- proavium—Coscinium.
- proavus (a)—Coscinium, Gorgonia, Graptodictya.
- problematicus (a)—Dendrograptus, Gisocrinus, Hybocystis, Hybocystites, Inocaulis.
- proboscid(i)alis—Cladopora, Eucalyptocrinus, Striatopora.
- proboscidia—Boliviana.
- proboscidiatus—Dendrocrinus.
- procera—Lophospira.
- procla—Orthis.
- proclivis (e)—Platyceras, Eccyliomphalus, Eccyliopectus.
- procris—Hormotoma, Murchisonia.
- procteri—Lingula, Rhynchonella, Rhynchotrema.
- procursus—Arbellites.
- productifrons—Cymatonota, Orthodesma.
- productus (a)—Lophospira, Plectambonites, Rhytimya.
- profundosulcata—Orthis, Platystrophia.
- profundus (a, um)—Bellerophon, Brachprion, Cyathophyllum, Cyliodolium, Leptæna, Meristina, Ophileta, Petraia, Streptelasma, Streptoplasma, Stropheodonta, Strophodonta, Strophomena.
- progne—Lingula, Liospira, Pleurotomaria.
- prognosticus (a)—Gypidula (Sieberella) coeymanensis, Spirifer (Delthyris) vanuxemi.
- progressum—Orthoceras.
- projectum—Gomphoceras.
- prolatum—Orthodesma.
- prolifera (um)—Cryptozoon, Dekayia, Diphyphyllum, Eridophyllum.
- prolificus (a)—Ceraurus (Pseudosphærexochus), Cheirurus, Dekayella perfrondosa, Favosites, Heterotrypa, Heterotrypa subramosa, Monticulipora, Pterinea, Pterygotus, Schuchertella, Zaphrentis.
- prolixa—Fenestella.
- prolongatus (a)—Leptæna, Leptæna transversalis, Platystrophia acutilirata, Plectambonites transversalis, Strophonella, Subulites.
- prominens—Constellaria, Constellaria constellata, Constellaria florida, Eurypterus, Eurypterus (Dolichopterus), Homotrypa wortheni.
- promiscuum—Astylomanon cratera.
- prona (um)—Crania, Petrocrania, Platyceras.
- propinquus (a, um)—Hemipronites, Heterocrinus heterodactylus, Orthoceras, Schuchertella, Stenocrinus heterodactylus.
- proprius (a)—Archinacella, Cornulites, Metoptoma.
- proserpina—Helicotoma, Holopea.
- prosseri—Schizolopha, Whitfieldella.
- proteiforme—Camroceras, Endoceras.
- proteus—Calceola.
- prototypum—Astylomanon cratera.
- proutana—Stomatopora.
- proxima—Reticularia.
- proximatus—Clonograptus.
- prunus—Girvanella, Strophochetus.
- psyche—Fusispira, Maclurea, Maclurites, Subulites.

- pterocephalus**—Illænus, Thaleops.
- ptyonurus**—Corydocephalus, Lichas (Dicranogmus).
- puadicus** (a)—Cruziana, Rusophycus.
- puella**—Lyellia, Plasmopora.
- pugnax**—Lichas, Metopolichas.
- pugnus**—Nereites, Nereograpsus.
- pulaskiensis** (e)—Archinacella, Orthodesma.
- pulcella**—Cyclora.
- pulchellus** (a, um)—Actinomya, Arthroclema, Callopora, Chætetes, Codaster, Ctenodonta, Cyathocrinus, Gyronema, Hallopora, Leda, Lophospira, Lyrodesma, Modiolopsis, Palæaster, Palæocrinus, Petraia, Phacops, Stenaster, Stephanocrinus, Tellinomya, Urasterella, Urasterella (Stenaster).
- pulcher** (ra)—Acanthograpsus, Acanthograptus, Homotrypa, Nicholsonella, Palæocystites.
- pumila**—Amplexopora, Bollia, Orthis, Pachydictya.
- pumilis**—Straparollus.
- punctatus** (a)—Bucania, Comarocytis, Comarocystites, Constellaria, Cremacrinus, Ctenobolbina, Cybele, Encrinurus, Idiortrypa, Illænus, Indianocrinus, Monticulipora, Moorea, Phænopora, Ptilodictya, Trematopora.
- punctifrons**—Bellerophon, Bucania.
- punctipora**—Stictopora.
- punctostriatus** (a, um)—Fenestella, Orthis, Orthoceras, Polypora, Technophorus, Trematis.
- punctulata**—Bythocypris.
- pungens**—Climacograptus.
- pusillus** (a, um)—Astylosporgia præmorsa, Baltoceras, Battus, Bryograptus, Calceola, Ceratiocaris, Colpomya, Conophrys, Cyathocrinus, Cyrtoceras, Graptospongia, Lecaocrinus, Shumardia.
- pustulatus** (m)—Arionellus, Cyathophyllum (Calophyllum), Glaphurus.
- pustulosus** (a, um)—Amplexopora, Beyrichia, Beyrichia tuberculata, Eoharpes, Eurypterus, Holocystites, Monticulipora, Stromatopora, Trematis, Stromatocerium, Stromatopora (Cænostroma).
- puteatum**—Heliophyllum.
- puteolus**—Lecanocrinus.
- putillus** (a)—Anodontopsis, Atrypa, Climacograptus, Diplograptus, Diplograptus teretiusculus, Graptolithus, Triplesia, Zygospira.
- pygmæus** (a, um)—Diplograptus euglyphus, Petraia, Streptelasma, Strombodes, Tetragraptus.
- pygmœa**—Aulopora.
- pylades**—Orthoceras.
- pyramidalis** (e)—Cyrtina, Goniophyllum, Orthis, Scenidium, Skenidium, Spirifer.
- pyramidata** (um)—Cyclonema, Skenidium.
- pyrene**—Holoepa.
- pyriformis** (e)—Archæocrinus, Astrocerium, Cyathocrinites, Cyathocrinus, Favosites, Heliolites, Periechocrinus, Pisocrinus, Rhodocrinus, Saccocrinus, Thysanocrinus, Triacrinus, Zophocrinus.
- pyrrha**—Camarotæchia, Rhynchonella.
- python**—Actinoceras, Deiroceras, Orthoceras.
- quadrangularis** (e)—Cypricardites, Dictyonema, Strombodes, Whitfieldella, Whitella.
- quadraticaudatus**—Asaphus, Pterygotus.
- quadratus** (a)—Arabellites, Bathyrurus, Chætetes, Conularia, Helopora, Leiostiegium, Lingula, Modiolopsis leightoni, Monotrypella (Rhombotrypa), Monticulipora, Monticulipora (Monotrypa), Nematopora, Parabolinella, Rhombotrypa.
- quadribrachiatus**—Graptolithus, Tetragrapsus, Tetragraptus.
- quadricarinata**—Pleurotomaria.
- quadricostata**—Ampyx, Atrypa, Microdiscus, Rhynchonella, Triplesia.
- quadrifida**—Beyrichia, Ceratopsis.
- quadrilatera**—Cypricardites, Leptæna.
- quadrilirata**—Beyrichia, Strepula, Tetradella.
- quadriloba**—Hemisterias.
- quadrimucronatus**—Diplograpsus, Diplograptus, Glossograptus, Graptolithus, Orthograptus.
- quadripartitum**—Dactylophycus.
- quadriplecata**—Rhynchotreta, Trematospira.
- quadrisulcata**—Conularia, Lophospira, Murchisonia.

- quebecensis** (e)—*Cyathophycus*, *Cyrtoce-  
ras*, *Dianulites*, *Diplotrypa*, *Halysites*  
*catenularia*, *Lingula*, *Loganellus*, *Meso-  
trypa*, *Metoptoma*, *Palæacmæa*, *Pleuro-  
tomaria*.
- quichuana**—Pizarroa.
- quincuncialis**—*Technophorus punctostri-  
atus*, *Trematis*.
- quinquedentata**—*Fistuliporella*.
- quinquelobus**—*Pisocrinus*.
- quinquepartitus**—*Glyptocrinus*, *Stephan-  
ocrinus*.
- quinespinosa**—*Acidaspis*.
- racemosum**—*Tetradium*.
- racinensis**—*Pleurotomaria*, *Mourlonia*,  
*Spirifer*, *Zaphrentis*.
- radialis**—*Scenella*, *Vinella*.
- radians**—*Calamopora*, *Cyrtia*.
- radiatus** (a)—*Ambonychia*, *Amygdalo-  
cystis*, *Amygdalocystites*, *Byssonychia*,  
*Carabocrinus*, *Calyptograpsus*, *Calypto-  
graptus*, *Ceramopora*, *Climacospongia*,  
*Delthyris*, *Elpe*, *Halysites*, *Leperditia*,  
*Rhytimya*, *Scenellopora*, *Spirifer*, *Spi-  
rifer* (*Eospirifer*), *Spirifer plicatella*,  
*Triplecia*, *Triplisia*.
- radicans**—*Prioniodus*, *Streptelasma*, *Za-  
phrentis*.
- radiciformis**—*Vinella*.
- radiculus** (a)—*Calceocrinus*, *Cremacri-  
nus*, *Cyathophyllum*, *Polyorophe*, *Pro-  
clivocrinus*.
- raei**—*Cyrtoceras*, *Ooceras*.
- ramifer**—*Callicrinus*, *Eucalyptocrinus*.
- ramosus** (a, um)—*Aristophycus*, *Butho-  
trephis*, *Callopora*, *Callopora rugosa*,  
*Chætetes*, *Cladograpsus*, *Dicranograp-  
tus*, *Eschara*, *Escharopora*, *Grapto-  
lithus*, *Graptolithus* (*Diplograpsus*), *Hal-  
lopora*, *Heterotrypa*, *Monticulipora*,  
*Peronosporites*, *Thresherodiscus*.
- ramsayi**—*Pleurotomaria*.
- ramulosus** (a, um)—*Archæocrinus*, *Bu-  
thotrephis*, *Bythotrephis*, *Cænites*,  
*Glyptocrinus*, *Homotrypa*, *Inocaulis*,  
*Limaria*, *Lioclema*, *Palæodictyota*,  
*Syringopora*.
- ramulus**—*Dichograpsus*, *Dicranograptus*,  
*Graptolithus*, *Graptolithus* (*Climaco-  
graptus*), *Graptolithus* (*Monoprion*).
- ranilarva**—*Eurypterus*.
- rapax**—*Endoceras*.
- raptor**—*Orthoceras*.
- raricostatus**—*Cryptonymus*, *Encrinurus*.
- rariopora**—*Ceramopora*, *Nematopora*, *Ptilo-  
dictya*, *Stictopora*.
- rarus**—*Bathyurellus*, *Ceraurus*, *Ceraurus*  
(*Cyrtometopus*), *Dolichometopus*, *En-  
crinurus*.
- rauchi**—*Ambonychia*.
- rayi**—*Columnopora*.
- raymondi**—*Cyrtospira*, *Holopea*, *Subuli-  
tes*.
- recedens**—*Leptaena*, *Orthoceras*, *Plectam-  
bonites*.
- recta**—*Cymatopora*, *Escharopora*, *Eury-  
myella*, *Leptaena*, *Modiolopsis*, *Ortho-  
desma*, *Pakæodictyota bella*, *Plæsiomys*,  
*Ptilodictya*, *Rhytimya*, *Stomatopora*,  
*Strophomena*.
- rectangularis** (e)—*Favosites*, *Lophospira*,  
*Monticulipora*, *Protowarthia*, *Sinuities*,  
*Trochonema*.
- rectiannulatum**—*Cycloceras* (*Spyroceras*),  
*Orthoceras*.
- recticameratum**—*Orthoceras*.
- reticulatus**—*Alveolites*, *Favosites*.
- rectiformis**—*Modiolopsis*.
- rectilateralis**—*Lingula*, *Lingula* (*Pseudo-  
lingula*).
- rectilinea**—*Chaunograptus*.
- rectilineata** (um)—*Cladopora*, *Dictyone-  
ma*.
- rectimuralis**—*Monotrypa*.
- rectirostris** (a)—*Cypricardites*, *Meristella*,  
*Meristina*, *Vanuxemia*.
- rectistriata**—*Lophospira*.
- rectus** (m)—*Arabellites*, *Clathrodiction*,  
*Crinocystites*, *Cyrtoceras*, *Dendrograp-  
tus*, *Dicellograptus divaricatus*, *Dicra-  
nograptus*, *Didymograptus*, *Modiolop-  
sis*, *Monograptus*, *Orthoceras*, *Ortho-  
ceras* (*Euorthoceras*), *Orthodesma*, *Rho-  
docrinus*, *Streptorhynchus*.
- recurvirostris** (a)—*Anazyga*, *Atrypa*,  
*Rhynchonella*, *Zygospira*.
- recurvus** (a, um)—*Bellerophon*, *Cteno-  
donta*, *Hypseloconus*, *Metoptoma*, *Tel-  
linomya*.
- refulgens**—*Monobolbina*, *Obolus*.
- regius**—*Cleiocrinus*.
- regularis** (e)—*Beyrichia*, *Bollia*, *Cerato-  
pora*, *Cyrtoceras*, *Diplotrypa*, *Meso-  
trypa*, *Platystrophia*, *Streptotrochus*,  
*Subulites*, *Tentaculites*, *Thamnis-  
cus*.

- reinwardtii—Clavæblastus, Pentatremites, Pentremites, Troostocrinus.
- remipes—Eurypterus.
- remotiseptum—Actinoceras, Hormoceras, Ormoceras.
- remotus (a)—Clonograptus, Dichograptus, Discosorus, Grammysia.
- remus—Orthoceras.
- reniformis (e)—Beyrichia logani, Primitia logani, Rhombodictyon.
- renssælærica—Eurychilina subradiata.
- repens—Alveolites, Aulopora, Millepora, Orthoceras, Vinella.
- repertus (m)—Spirifer (Eospirifer), Tryblidium.
- resplendens—Leperditia.
- reticularis—Anomia, Atrypa, Crania, Terebratula, Trematis.
- reticulatus(a, um)—Actinopteria, Anomaloides, Anomalospongia, Chasmatopora, Cladopora, Cyathodictya, Cyathophycus, Dictyograptus, Dictyonella, Dictyostroma, Eichwalida, Eschara, Eurychilina, Favistella, Intricaria, Leptæna, Orbitolites, Orbituloides, Phylloporina, Receptaculites, Rhynchonella, Strophomena, Subretopora, Tretaspis.
- retiformis—Dictyonema, Gorgonia, Syringopora.
- retractilis—Dendrocrinus.
- retroflexa—Clitambonites (Gonambonites) plana, Gonambonites plana.
- retrorsus (a, um)—Ambonychia, Byssonychia, Calymene meeki, Ctenodonta, Cyrtolites, Dinorthis, Metoptoma, Nematopora, Orthis, Plæsiomys, Trochonema, Tryblidium.
- reversata—Orthis biforata, Platystrophia, Streptaster.
- reversus (a, um)—Anastrophia, Arthropora, Brachymerus, Crania, Cyrtoceras, Holoepa, Parastrophia, Pentamerus.
- revoluta—Pterinea, Rhombopteria (Newsonella).
- rhine—Hyolithes.
- rhinoceros—Amphilichas.
- rhombicus (a)—Chætetes, Micropora.
- rhombiferus—Cyathocrinus, Palæocrinus.
- rhombiforme—Rhombodictyon reniforme.
- rhomboidalis—Conchita, Leptæna, Plectambonites, Strophomena.
- rhomboidea (um)—Avicula, Cleionychia, Clionychia, Leptodesma, Modiolopsis, Posidonomya, Pterinopecten.
- rhombolineare—Gyroceras.
- rhynchonelliformis—Orthis, Rhipidomella, Rhipidomella uberis.
- rhyncocephalus—Acidaspis.
- rhythmoides—Orthoceras (Eu-orthoceras)
- richardsoni (i)—Actinoceras, Arachnophyllum, Beyrichia, Canistrocrinus, Clonograptus, Drepanella, Eopteria, Glyptocrinus, Graptolithus, Graptolithus (Monoprion), Holograptus, Lewisia, Orthoceras, Reteocrinus, Rouvilligraptus, Strombodes, Subulites.
- richmondensis (e)—Archinacella, Bucania, Byssonychia, Conocardium, Cornulites, Girvanella, Hebertella alveata, Homotrypa, Leptæna, Protærea, Raphistoma, Salpingostoma, Strophochetus, Stromatocerium, Tentaculites.
- riciniiformis—Lingula, Lingula (Glossina).
- ridleyana—Protorhyncha, Rhynchonella.
- rigidus (a, um)—Clonograptus, Columnaria alveolata, Cyrtoceras, Dicellograptus, Dicellograptus divaricatus, Dichograpsus, Graptolithus, Graptolithus (Monoprion), Orthoceras, Palæasterina, Petraster, Stictoporella.
- ringuebergi—Nicholsonella.
- robbinsi—Amphilichas, Eunema, Lichas (Hoplolichas), Lichas (Platymetopus), Trochonema (Eunema).
- robertsoni—Eurystomites, Lituites.
- robsoni—Tripleuroceras.
- robustus (a, um)—Ambonychia, Amplexopora, Aparchites minutissimus, Atrypa, Beyrichia, Beyrichia chambersi, Byssonychia, Bythocypris, Ceratopsis chambersi, Ceraurus (Sphærocoryphe), Ctenodonta nasuta, Dekayella, Dekayella ulrichi, Dekayia ulrichi, Dictyonema, Eurypterus, Helicotoma planulata, Hughmilleria socialis, Lampteroocrinus, Licrophycus, Megalomphala, Nereites, Nereograpsus, Pachydictya, Pleurocystis, Pleurocystis squamosa, Pleurocystites, Pleurocystites squamosa, Protaxocrinus, Rhynchonella, Scenella, Sphærocoryphe, Streptelasma.
- roemerana—Brachiospongia.
- roemeri—Caryocrinites, Caryomanon, Cyrtocrinus, Dimerocrinus, (Eospongia), Gypidula, Melocrinus, Meristina maria, Orthothetes, Schuchertella, Sieberella, Strophonella.

- rogata—Dalmanella, Orthis.  
 rogersensis—Bellerophon, Clitambonites, Clitambonites diversus, Conularia tren-tella (Eridorthis), Modiolopsis, Ortho-ceras, Plectorthis (Eridorthis), Ptery-gometopus carleyi.  
 rogersi—Lingulella, Obolus (Lingulella), Obolus (Westonia).  
 rollinii—Cyathophyllum.  
 romingeri—Asaphus, Basilicus, Chala-zodes, Glassia, Huronia, Lophiostroma, Ptychopyge, Sphærexochus.  
 roosevelti—Pseudoniscus.  
 rosaeformis—Cupellæcrinites, Cupella-crinus, Marsipocrinus.  
 rossi—Protowarthia, Sinuites.  
 rostellum—Spirifer, Spirifer (Cyrtia).  
 rostralis—Hindella (Greenfieldia).  
 rostratus (a)—Calymene, Calymenella, Enonites.  
 rotadentatus—Cyclograptus.  
 rotalineatum—Gyronema.  
 rotermundi—Endoceras, Orthoceras.  
 rotulata (um)—Actinoceras, Cyrtodonta, Orthoceras.  
 rotuliformis—Euomphalus (Raphistoma), Raphistoma.  
 rotuloides—Cyclolites, Pleurotomaria.  
 rotundatus (a)—Bellerophon, Bucania, Cypricardites, Maclurea, Maclurites, Megalomphala, Nucleospira, Obolus, Obolus (Lingulella), Vanuxemia, Whit-fieldella.  
 rotundifrons—Cyclognathus.  
 rotundispira—Pleurotomaria.  
 rotundus (a, um)—Acrothele, Anastro-phia hemiplicata, Archinacella, Daw-sonia, Dianulites, Eucalyptocrinus, Eurystomites, Holocystites, Holoepa, Linipora, Parastrophia hemiplicata, Triblidium.  
 rubra—Leiopteria.  
 ruda—Modioloipsis.  
 rudis—Dystactospongia, Pachydictya (Rhinidictya), Primitia, Ptilodictya, Saccospongia, Schizocrania, Trematis.  
 ruedemanni—Dictyonema flabelliforme, Diplograptus.  
 rugælineata (um)—Cyclonema, Euom-phalus (Cyclonema), Poleumita.  
 rugæplicata—Orthis.  
 rugata—Liospira, Raphistomina.  
 rugatina—Archinacella, Bucania, Del-thyris, Whitella.  
 rugatula—Pterinea, Zaphrentis.  
 rugicosta—Delthyris, Rhynchonella, Spirifer (Delthyris).  
 rugiplicata—Orthis.  
 rugosum—Trochonema.  
 rugosus (a, um)—Atrypa, Avicula, Bato-stoma, Bellerophon, Bucania, Calceo-crinus, Callopora, Callopora ramosa, Calymene, Camarocladia, Castocrinus, Chætetes, Columnaria, Conularia, Cru-ziana, Cypricardites, Cyrtodonta, Cy-therella, Cytheropsis, Dendroclonella, Diphyphyllum, Diplograptus, Eridophyllum, Fistulipora, Hallopora, Har-modites, Hudsonaster, Leptena, Loxo-nema, Matheria, Monticulipora, Monti-culipora ramosa, Monticulipora (Hete-rotrypa) ramosa, Murchisonia, Palæaste-rina, Palæophycus, Palæophyllum, Plectambonites, Primitia, Rhyncho-nella, Stromatocerium, Stromatopora, Strophomena, Strophomenes, Trachy-um, Walcottia.  
 rugulifera—Beyrichia, Primitia.  
 rugulosus—Agnostus pisiformis.  
 ruida (um)—Dalmanella, Orthis, Raphi-stoma.  
 rusti—Conotreta.  
 rusticus (a, um)—Dendrocrinus, Gram-mysia, Homotrypella, Monticulipora (Fistulipora), Pachydictya, Petraia, Ptilodictya, Streptelasma, Zaphrentis.  
 rutilius—Ampyx, Ampyx (Lonchodo-mas).  
 rutellum—Eoharpes, Harpina.  
 rutuloides—Palæocyclus.  
 sacculus—Receptaculites, Saccocrinus, Thecocystis.  
 saffordi—Actinomya, Anoplotheca, Ba-thyrus, Clioderma, Cælospira, Cyrtoceras, Cyrtodonta, Cypricardites, Halli-na, Isochilina, Lloydia, Lophospira, Murchisonia, Orthis, Orthodesma, Palæarca, Pterotheca (Clioderma), Rhipi-domella, Rhynchonella, Spirifer (Del-thyris), Whiteavesia, Wilsonia, Zygo-spira.  
 sagittarius—Didymograptus, Graptoli-thus, Monograptus.  
 sagitticaulis—Didymograptus.  
 saienzii—Tentaculites.

- salopiensis*—*Dicellograptus divaricatus*.  
*saltænsis*—*Pterygometopus*, *Orthis*.  
*salteri*—*Amphion*, *Callograptus*, *Cyclocystoides*, *Eunema*, *Hormotoma*, *Loxonema*, *Menocephalus*, *Obolella*, *Obolus*, *Pliomerops*, *Sphærocoryphe*, *Stenaster*, *Stricklandinia*, *Trochonema*, (*Eunema*).  
*sancta*—*Rhynchonella*, *Stephanella*.  
*sanctipauli*—*Primitia*.  
*sandisabæ*—*Euomphalus*, *Straparollus*.  
*sandalina*—*Calceola*.  
*sanguinolaroidea*—*Lyonsia*, *Tellinomya*, *Tellinomya* (*Ctenodonta*).  
*saratogensis*—*Agraulos*, *Billingsia*, *Matharella*, *Plethopeltis*, *Ptychoparia*, *Trochus*.  
*sardesoni*—*Chætocladus*, *Cypricardites*, *Vanuxemia*.  
*sarlei*—*Lepidocoleus*, *Mitoclema*.  
*sarmentosa*—*Cladopora*.  
*sarmienti*—*Maclurea*, *Maclurites*.  
*satyrus*—*Ceraurus* (*Neiszkowskia*), *Cheirurus*, *Nieszkowskia*, *Pseudosphærexochus* (*Nieszkowskia*).  
*sauridens*—*Poterioceras*.  
*savagei*—*Aulocerium*.  
*saxea*—*Leptæna*, *Plectambonites*.  
*saxiroseum*—*Cryptozoon*.  
*sayi*—*Orthoceras*.  
*scabiosa*—*Crania*, *Petigopora*, *Philhedra*.  
*scabra* (um)—*Dermatostroma*, *Labechia*, *Stromatopora*.  
*scala*—*Cyrtodonta*.  
*scalariformis*—*Dictyonema*, *Orthoceras*.  
*scalaris*—*Climacograptus*, *Leperditia*, *Leperditia gibbera*.  
*scalpellum*—*Stictopora*.  
*scammoni*—*Orthoceras*.  
*scamnata*—*Poleumita*.  
*scapha*—*Cuncamya*.  
*scaphula*—*Orthodesma*.  
*scarabæoides*—*Entomostracites*, *Paradoxides*, *Peltura*, *Olenus*, *Trilobites*.  
*scharenbergi*—*Climacograptus*.  
*scheii*—*Lissatrypa*.  
*schizocrinus*—*Podolithus*.  
*schlotheimi*—*Apatokephalus*, *Remopleurides*.  
*schmidti*—*Dalmanites*, *Leperditia*, *Pterygometopus*.  
*schohariae*—*Aulopora*.  
*schoolcrafti*—*Cyrtoceryna*.  
*schuchertana*—*Catazyga headi*, *Glassia*.  
*schucherti*—*Atactoporella*, *Aulopora*, *Bathyurus*, *Cyathophyllum*, *Fusispira*, *Homeospira*, *Lingulasma*, *Lingulelasma*, *Orbiculoidea*, *Orthoceras*, *Orthodesma*, *Schizocrania*, *Tæniodictya*.  
*scitulus* (a)—*Hallia*, *Holocystites*, *Nuculites*, *Pachydictya*, *Stictopora*.  
*scobina*—*Lingula*, *Rhynchonella*, *Rhynchonella neglecta*.  
*scofieldi*—*Anastrophia*, *Ceraurinus*, *Ceraurus*, *Ctenodonta*, *Cyrtoceras*, *Cyrtometopus*, *Isophilina*, *Macronotella*, *Parastrophia*, *Strophomena*, *Tellinomya*, *Whitella*.  
*scoparius* (m)—*Conchidium*, *Dendrocrinus*, *Homocrinus*, *Lasiocrinus*.  
*scorpionis*—*Eurypterus*, *Eusarcus*.  
*scotica*—*Siphonotreta*.  
*scovillei*—*Austinella*, *Dinorthis*, *Hebertella*, *Orthis*, *Plectorthis*.  
*scrinium*—*Gomphoceras*.  
*scrutator*—*Holopea*, *Nileus*.  
*sculptilis*—*Bucania*, *Halliella*, *Lyriocrinus*, *Primitia*, *Rhodocrinus*, *Salpingostoma*.  
*sculptus*—*Æthocystites*, *Archæocrinus*, *Balanocrinites*, *Cleiocrinus*, *Cyathocrinites*, *Cyathocrinus*, *Glyptocrinus*, *Melocrinites*, *Melocrinus*, *Rhaphanocrinus*.  
*scutella*—*Zaphrentis*.  
*scutellatus*—*Arabellites*, *Holocystites*.  
*scutula*—*Anthaspidella*.  
*secalinus*—*Diplograptus*.  
*sectostriata*—*Cyclocælia*, *Encuclocladema*, *Orthis*, *Plectorthis*.  
*securiformis*—*Avicula*, *Pterinea*.  
*securifrons*—*Whitella*.  
*sedentarium*—*Cystiphyllum*.  
*sedgwicki*—*Actinoceras*, *Graptolithus* (*Prionotus*), *Menocephalus*, *Orthoceras*.  
*seelyi*—*Bathyurus*, *Bolbocephalus*, *Isophilina*, *Lituites*, *Lophospira*, *Ooceras*, *Pagodia*, *Primitia*, *Tarphyceras*.  
*selectus* (a, um)—*Dikelocephalus*, *Petraia*, *Pleurotomaria*, *Ptychaspis*, *Strep-telasma*.  
*selenencephala*—*Calymene*.  
*selenoides*—*Receptaculites*.  
*selkirkensis* (e)—*Dianulites*, *Mesotrypa*, *Orthoceras*.  
*selwyni* (i)—*Goniograptus thureau*, *Leperditia*, *Lingula*, *Monticulipora*, *Orthoceras*, *Prasopora*.

- semele**—Plethospira, Pleurotomaria.  
**semicarinata (um)**—Archinacella, Cyclo-nema, Gyronema.  
**semicostata**—Ampyx, Ampyx (Lonchodomas).  
**semifasciata**—Strophomena (Strophodonta), Strophonella.  
**semilunata**—Bollia.  
**seminulum**—Halliella.  
**semiovalis**—Orthis pectinella, Strophomena.  
**semipilaris**—Cyphotrypa, Leptotrypa.  
**sempianata (um)**—Jovellania, Orthoceras, Tripteroceras.  
**semiplicata**—Atrypa, Camarotoechia, Rhynchonella.  
**semiradiatus**—Actinocrinus (Saccocrinus), Clidophorus, Macrostylocrinus, Periechocrinus, Saccocrinus.  
**semistriata (um)**—Cymatona, Orthodesma.  
**senaria**—Calymene, Calymene blumenbachii.  
**senecta**—Modiolopsis, Orthis (Schizophoria), Schizophoria.  
**senex**—Platyceras, Platystrophia acutilirata, Porcellia.  
**senilis**—Rhindictya mutabilis.  
**sentum**—Eridophyllum.  
**separatus (a)**—Homotrypa, Strombodes.  
**septatus (a)**—Amplexus, Strophomena.  
**septembrachiatus**—Agelacrinites, Agelacrinitus.  
**septemnotatus**—Protichnites.  
**septentrionalis**—Ambonychia, Recticularia, Uncinulus.  
**septoris**—Cyrtoceras, Gomphoceras, Septameroceras.  
**septosa**—Amplexopora, Atractopora, Monticulipora.  
**sequens**—Ophileta subluxa.  
**seriata**—Cladopora, Favosites.  
**seriatopora**—Alveolites.  
**serieus (a)**—Leptaena, Plectambonites, Strophomena, Trichospongia.  
**serpens**—Aulopora.  
**serpularis**—Cornulites.  
**serra**—Fucoides.  
**serratus**—Didymograpsus, Didymograptus, Graptolithus, Graptolithus (Monograptus), Graptolithus (Monoprion).  
**serratus**—Enonites.  
**serrulata**—Lophospira, Murchisonia.  
**servile**—Orthoceras, Tripteroceras, Tripteroceras.  
**sesostris**—Dicellocephalus, Dikelocephalus, Ptychaspis.  
**sessilis**—Stigmatella.  
**setaceus**—Glossograptus.  
**setifera**—Crania.  
**setigera**—Crania, Eotrophia.  
**severnensis**—Tyrellia.  
**sevleri**—Batostoma.  
**sexcarinata**—Tetranota.  
**sextans**—Dicellograptus, Dicranograptus, Diplograptus, Didymograpsus, Didymograptus, Graptolithus.  
**sextocatenatus**—Halysites.  
**sha(e)fferi**—Arthropora, Arthropora cleve-landi, Glyptocrinus, Mesopalæster, Palæaster, Ptilodictya, Pycnocrinus, Stictopora.  
**shaleri**—Brachyprion, Eurymyella, Eurymyella breva, Stropheodonta.  
**shawangunk**—Hughmilleria.  
**shawi**—Porocrinus.  
**shelbiensis**—Bellerophon.  
**shepardi**—Heliolites.  
**sheppardi**—Spirifer.  
**sherzeri**—Styloclypeus.  
**shrivieri**—Thecia.  
**shumard**—Amplexus, Camarocystites, Cyathophyllum, Cyrtoceras, Geisonoceras, Orthoceras, Zaphrentis.  
**sidenbladii**—Agnostus.  
**siboldi**—Orthoceras.  
**sigaretoides**—Pleurotomaria.  
**sigilla**—Mytilarca.  
**sigillarioides**—Callopora, Chætetes, Hallopora onealli, Protostigma.  
**sigillaroidea**—Callopora.  
**sigillaroides**—Callopora, Protospongia.  
**sigillata**—Beyrichia, Primitia.  
**sigmoidea**—Cypricardites, Cyrtodonta, Whitella.  
**siliqua**—Cytheropsis, Macrocypris.  
**siliquaria**—Dawsonia, Lockeia.  
**sillimauensis**—Cyrtodonta.  
**sillimani**—Myrianites.  
**siluriana**—Crania, Cyathophycus, Diplostenopora, Escharopora, Fistulipora, Gorgonia, Strophomena, Whitella.  
**siluriceps**—Dolichopterus.  
**siluricus**—Platycrinus, Pollicipes.  
**silurilense**—Ascodypeus.  
**similior**—Pentamerus, Spirifer, Spirifer (Martinia).

- similis** (e)—Arabellites, Archinacella, Bellerophon, Conradella, Dendrocrinus, Didymograptus, Eridotrypa, Eunema, Graptolithus, Helicotoma, Holopea, Homotrypa, Metoptoma, Modiolopsis, Phragmolites, Phyllograptus, Platystrophia, Stictopora, Stictotrypa, Tellinomya, Trochonema (Eunema), Tryblidium.
- simillimus**—Bathyurus.
- simplex**—Archinacella, Arthropora, Azygograptus, Beyrichia, Cyrtoceras, Dekayella preunata, Dendrograptus, Dicranella, Ectenocrinus (Heterocrinus), Eunicites, Fucoides, Gypidula, Heterocrinus, Heterocrinites, Ichthyocrinus, Lecanocrinus, Mastigograptus, Metoptoma, Octonaria, Onchometopus, Palaeaster, Palaeophycus, Protoscolex, Rhynchotreta, Spirifer (Delthyris) crispus, Spirifer (Reticularia) crispus, Tetradella, Tetradella quadrilirata, Thlip-sura, Trematospira, Tryblidium.
- simpsoni**—Endoceras, Narthecoceras, Orthoceras.
- simulans**—Crepidora, Cyclonema, Eurymyella, Orthonota, Primitia, Primitiella.
- simulator**—Illænus, Orthoceras.
- simulatrix**—Archinacella, Batostomella, Bucania, Ctenodonta, Eridotrypa, Hormotoma, Modiolopsis, Monticulipora, Murchisonia, Prasopora.
- sinemurus**—Strombodes.
- singularis** (e)—Bucania, Callopora, Dekayella, Heterotrypa, Leioclema, Monticulipora, Trematopora.
- sinistra**—Polygyrata.
- sinosus**—Meristina profunda.
- sinuatus** (a, um)—Anatina, Cypricardites, Cyrtoceras, Cyrtolites, Delthyris, Euomphalus, Hebertella, Hebertella occidentalis, Hemipronites, Ilonia, Leperditia, Modiolopsis, Orthis, Orthis occidentalis, Orthodesma, Orthothetes deformis, Psiloconcha, Retzia, Rhynchospira, Rhytimya, Schuchertella, Straparollus, Streptorhynchus, Stromphomena.
- sinuosus** (a)—Ctenodonta, Cyrtolites, Nucula.
- siphon**—Acrotreta.
- siphonatus**—Glyptocrinus.
- skiffi**—Stephanocrinus.
- smithi**—Bathyurus, Dalmanella, Dicellograptus, Haploconus, Orthis (Dalmanella), Porocrinus.
- smocki**—Klœdenia.
- sobrina**—Homeospira, Retzia.
- socialis** (e)—Crania, Ctenodonta, Cytherodon, Dictyonema, Graptopora, Hughmilleria, Orthoceras, Orthoceras (Geisonoceras), Tellinomya, Tellinomya (Nucula), Zaphrentis.
- sol**—Cheirus, Heliomera.
- sola**—Orthis, Rhipidomella.
- solaroides**—Pleurotomaria, Pycnophallus.
- solidissima**—Fistulipora, Lioclemella.
- solidus** (a)—Crepidora, Eridotrypa, Eurychilina, Homotrypa, Lecanocrinus, Trematopora.
- solitarius** (a, um)—Athyris, Bathyurus, Bellerophon, Ceraurus, Cheirus, Chonophyllum, Cyathophyllum, Cyrtodonta, Discina, Heterotrypa, Lloydia, Whitfieldella.
- solivaga**—Hyalostelia.
- solutus** (a)—Loxoplocus, Murchisonia.
- sordidus** (a, um)—Atrypa, Cyclocoelia, Encuclocladema, Leptella, Maclurca, Maclurites, Ophileta, Orthis, Orthoceras, Plectorthis, Rhynchonella, Straparollus.
- sororcula**—Lophospira, Murchisonia.
- southwelli**—Ascoceras.
- sowteri**—Modiolopsis.
- spangleri**—Holocystites.
- spania**—Orthis flabellites.
- sparsiplica**—Cyclospira.
- sparsus** (a, um)—Arenicolites, Diplocladema, Heliolites, Trematopora.
- spaskii**—Cyclocrinites, Cyclocrinus.
- spatiosa**—Crepidora.
- speciosus** (a, um)—Actinocrinus, Goniophora, Goniophorus, Gyronema, Heliolites, Lyellia, Maclurea, Maclurites, Orthonota, Palaeaster, Palaeasterina, Periechocrinus, Petraster, Promopalaeaster, Propora, Ptychaspis, Saccocrinus, Whitfieldella.
- spectabilis**—Ctenopyge, Leptoplastus.
- spenceri**—Dictyonema.
- sphaericus**—Holocystites.
- sphaerion**—Leptotrypa, Paleschara, Paleschara (Chaetetes).



- sphaeroidalis** (e)—*Actinoceras*, *Hindia*,  
*Holocystites*, *Huronia*, *Stribalocystites*,  
*Orthoceras*.  
**spicula**—*Fusispira*.  
**spiculata**—*Trematopora*.  
**spindicandum**—*Chalazodes*, *Lophio-*  
*stroma*.  
**spinea**—*Homotrypa*.  
**spinifer** (a, um)—*Calymene*, *Climaco-*  
*graptus typicalis*, *Cypricardites*, *Cyrtod-*  
*donta*, *Dicranograptus*, *Dicranograptus*  
*ramosus*, *Dictyonema*, *Homotrypa*, *fla-*  
*bellaris*, *Leptograptus flaccidus*.  
**spiniformis**—*Arthroclema*, *Helopora*.  
**spiniger**—*Acantholenus*, *Acidaspis*, *Ano-*  
*mocare*, *Bathyurus*, *Leptoplastus*.  
**spinigerus** (a)—*Crania*, *Favosites*, *Favo-*  
*sites niagarensis*.  
**spiniporus**—*Heliolites*.  
**spinosula**—*Monotrypa*.  
**spinosus** (a)—*Æchmina*, *Beyrichia*, *Bry-*  
*ograptus*, *Chonetes jerseyensis*, *Clono-*  
*graptus*, *Cytherina*, *Dendrograptus*, *Di-*  
*cranella*, *Didymograptus*, *Eridotrypa*,  
*Helicotoma*, *Leptoplastus*, *Mesotrypa*,  
*Paleocoma*, *Proetus*, *Stigmatella*, *Tæ-*  
*niaster*, *Trematopora primigenia*, *Tri-*  
*arthrus*.  
**spinulifera**—*Rhombotrypa*.  
**spinulocervix**—*Cyphaspis*.  
**spinulosus** (a, um)—*Bythopora*, *Cysti-*  
*phyllum*, *Diplograptus*, *Entomostri-*  
*cites*, *Glossograptus*, *Graptolithus*, *Ole-*  
*nus*, *Palaæster*, *Parabolina*, *Paradoxid-*  
*es*, *Promopalaæster*, *Trematopora*.  
**spinulus**—*Coleolus*.  
**spiralis**—*Eccyliomphalus*, *Eccyliompha-*  
*lus*, *Eccyliopectus*.  
**spironema**—*Lophospira*, *Murchisonia*.  
**spissiseptum**—*Orthoceras*.  
**spissus** (a)—*Lingulella*, *Obolus* (*Lingulo-*  
*bolus*), *Sphaëbolus*.  
**splendens**—*Dictyonema*, *Gaurocrinus*,  
*Holocystites*, *Homotrypa*, *Pachydict-*  
*ya*, *Ptychocrinus*, *Serpulites*.  
**splendidus** (a)—*Conularia*, *Eucalyptocri-*  
*nites*, *Eucalyptocrinus*.  
**spongaxis**—*Streptelasma*, *Zaphrentis*.  
**spongilla**—*Favosites*.  
**spongioides**—*Solenopora*.  
**spongiosa**—*Calostylis*, *Heliolites*.  
**sponsa**—*Pleurotomaria*.  
**springeri**—*Eucalyptocrinus*.  
**springfieldensis**—*Illænus*.  
**spurlocki**—*Proetus*.  
**spyroceroideus**—*Orthoceras* (*Spyroceras*).  
**squamiformis**—*Craniops*, *Orbicula*, *Pho-*  
*lidops*.  
**squamosus** (a)—*Orthis* (*Hebertella*)  
*fausta*, *Pleurocystis*, *Pleurocystites*.  
**squamula**—*Rafinesquina*, *Strophomena*.  
**stamineus** (a, um)—*Delthyris*, *Raphis-*  
*toma*, *Scalites*, *Spirifer*.  
**starri**—*Lingulella*, *Lingulepis*.  
**steeli**—*Cryptozoon*.  
**stegops**—*Isotelus*.  
**stella**—*Phyllograptus*.  
**stellaris**—*Reteocrinus*, *Retiocrinus*.  
**stellatimulcata** (um)—*Astylospongia*, *Ca-*  
*ryomanon*, *Spongia*, *Carpomanon*.  
**stellatus** (a, um)—*Agelacrinus*, *Ascodic-*  
*tyon*, *Camarocrinus*, *Ceramoporella*,  
*Columnaria*, *Cupellæcrinites*, *Cupellæ-*  
*crinus*, *Eurypterus* (*Dolichopterus*),  
*Favistella*, *Hemicystites*, *Marsipocri-*  
*nus*, *Palaæsterina*, *Pseudocrinites*,  
*Schuchertia*, *Scyphia*, *Trentonaster*.  
**stellifer**—*Protaster*.  
**stelliforme**—*Heliophycus*.  
**stelnzeri**—*Leptæna*, *Maclurea*, *Maclu-*  
*rites*.  
**stenactinotum**—*Dictyonema*.  
**stenosus**—*Diplograpsus*.  
**stenotoides**—*Anomocare*.  
**sterlingensis**—*Cornulites*, *Cypricardites*,  
*Dolabra*, *Eurydictya*, *Rhynchotropis*,  
*Tentaculites*, *Whitella*.  
**stevensoni**—*Platystrophia ponderosa*.  
**stidhami**—*Cyphotrypa*, *Leptotrypa*, *Mon-*  
*ticulipora*.  
**stigmatus** (a)—*Calceocrinus*, *Cheirocri-*  
*nus*, *Deltaocrinus*.  
**stigmata**—*Bucania*.  
**stokesi** (i)—*Asaphus*, *Columnaria* (*Palaë-*  
*phyllum*), *Diphyphyllum*, *Lithostro-*  
*tion*, *Omphyra*, *Phacops*, *Proetus*,  
*Ptychophyllum*, *Zaphrentis*.  
**stokesiana**—*Pleurotomaria*.  
**stoneanus** (a)—*Lingulella*, *Obolus* (*West-*  
*onia*).  
**stonemani** (i)—*Bathyurus*, *Proetus*.  
**stonensis** (e)—*Cyrtoceras*, *Dalmanella*,  
*Orthis*, *Pianodema*.  
**stosei**—*Saukia*.  
**strangulatum**—*Endoceras proteiforme*.  
**strenuus**—*Bathyurus*, *Lloydia*.  
**striæcosta**—*Ambonychia*, *Pterinea*.  
**striælineatum**—*Orthoceras*.

- striatellus (a, um)—Chonetes, Clathrodictyon, Orthis, Stromatopora.  
 striatissimus—Spirifer modestus.  
 striatomarginatus (a)—Beyrichia, Eurychilina.  
 striatopora—Helopora, Nematopora, Thamniscus.  
 striatulus (a, um)—Cyathophyllum, Cyclonema gracile, Orthis, Prolobella, Remopleurides.  
 striatus (a, um)—Arthroclema, Bythopora, Cladopora, Codonocheilus, Ctenocrinus, Cupellæcrinites, Cyathocrinus, Dendrograptus, Eridotrypa, Favastræa, Favosites, Helcionopsis, Leptæna, Lingula, Lyellia, Maclurea, Maclurites, Macrostylocrinus, Marsipocrinus, Marsupiocrinus, Megambonia, Modiolopsis, Nileus, Palæocrinus, Palæophycus, Plethospira, Pleurotomaria, Pterinea, Raphistoma, Sagenella, Scalites, Schizocrinus, Scyphocrinus, Sphenolium, Straparollus, Strombodes, Strophodonta, Strophomena, Strophonella, Strophonella (Amphistrophia), Trematopora, Triblidium, Triplecia (Cliftonia).  
 stricklandi—Terebratula, Uncinulus, Uncinulus (Uncinulina).  
 strictispiralis—Beyrichia tuberculata.  
 strictus—Callograptus, Inocaulis.  
 strigatus (a, um)—Liospira, Orthoceras.  
 strigillata (um)—Eunema, Trochonema.  
 strigosa—Glaucanome, Helopora, Nematopora.  
 strix—Kionoceras, Orthoceras.  
 stromatoporoides—Alveolites, Pycnopegma.  
 strongi—Euomphalus, Oxydiscus, Sinuopea.  
 stropheodontoides—Brachyprion, Stropheodonta.  
 strophocrinus—Podolithus.  
 strophomenoides—Orthis lenticularis, Plesiomys, Valcourea.  
 stylonuroides—Dolichopterus.  
 subabbreviata—Lophospira, Murchisonia.  
 subangulus—Cyrtolites, Oxydiscus, Technophorus.  
 subæqualis—Lichenocrinus, Schmidtella incompta.  
 subæquata—Crepipora, Dalmanella, Eurychilina, Orthis, Orthis (Dinorthis), Pianodema.  
 subalatus (a)—Modiolopsis, Murchisonia.  
 subangularis—Bellerophon, Ichthyocrinus.  
 subangulatus (a, um)—Bucania, Cruziana, Cypricardites, Cyrtodonta, Edmondia, Hormotoma, Palæarca, Pleuronotus, Orthodesma, Rusophycus.  
 subannulatus (a, um)—Cyrtoceras, Endoceras, Endoceras (Cameroceras), Maclurea, Maclurites, Proetus, Spyroceras.  
 subarctica—Fenestella.  
 subarcuatus (a, um)—Avicula, Cyrtoceras, Orthoceras, Modiolopsis.  
 subbaculum—Orthoceras.  
 subbrevis—Fusispira.  
 subcancellatum—Cyrtoceras, Orthoceras.  
 subcarinatus (a)—Actinomya, Ægilops, Carinaropsis, Cypricardites, Cyrtodonta, Cyrtodonta huronensis, Cyrtolites, Hormotoma, Modiolopsis, Whittella.  
 subcentrale—Endoceras.  
 subcircularis—Homœospira.  
 subcirculus (a)—Orthis, Rhipidomella.  
 subclavatus—Arionellus, Ptychaspis.  
 subcompressus (a, um)—Cyrtoceras, Cyrtoceras (Glyptoceras), Cyrtoceras (Glyptodendron), Cyrtolites, Protowartha, Sinuites.  
 subconcaua—Liospira.  
 subconicus (a)—Clathrospira, Holoepa, Meekospira, Pleurotomaria, Subulites.  
 subcostulatum—Barrandoceras.  
 subcrassus (a, um)—Actinocrinus, Ctenobolbina, Heterocrinus, Isocrinus, Trochonema.  
 subcuneatus—Pyrenomœus.  
 subcylindrica—Cytherina, Cytheropsis, Labechia, Leperditia, Macrocypris, Metablastus, Monticulipora, Pentremites, Stromatopora, Troostocrinus.  
 subdepressa—Pleurotomaria.  
 subelliptica (um)—Allodesma, Avicula, Ctenodonta, Cytherina, Cytheropsis, Eccyliomphalus, Lingula, Modiolopsis, Pholidops, Prolobella.  
 subelongata—Loxonema.  
 subelongus—Favosites.  
 suberecta—Byssonychia, Cypricardites, Plethocardia, Vanuxemia.  
 subfrondosa—Dekayia, Heterotrypa.  
 subfusiformis—Fusispira, Lioclemella, Loxonema, Monticulipora (Monotrypa), Murchisonia, Subulites.

- subglobosus** (a)—*Chaetetes*, *Cœlocystis*, *Eucalyptocrinus*, *Glyptocrinus*, *Glyptocrinus dyeri*, *Gypidula*, *Hemicosmites*, *Holocystites*, *Lampteroocrinus*, *Macrostylocrinus*, *Monotrypa*, *Reteocrinus*, *Trematocystis*.
- subglobulus**—*Bellerophon*.
- subgracilis** (e)—*Bythopora*, *Gomphoeceras*, *Homotrypella*, *Poteriocrinus*.
- subimbricatus** (a)—*Diamesopora*, *Hyolithes*, *Trematopora*.
- subjugata**—*Hebertella*, *Orthis*.
- sublævis** (e)—*Cyclonema*, *Cythere*, *Glyptocrinus dyeri*, *Leperditia*, *Orthoceras*.
- sublamellosa**—*Discina*, *Orbignyella*.
- sublata**—*Bucania*, *Pachydictya pumila*.
- sublaxa**—*Chasmatopora*, *Hormotoma gracilis*, *Ophileta*, *Ophileta*, *Phylloporina*.
- sublenticularis**—*Polycope*, *Schmidtella*.
- submarginata**—*Lingula*, *Mesomphalus*.
- submersa**—*Spirifer sulcata*.
- submodiolaris**—*Lyonsia*.
- subnasutus** (a, um)—*Ctenodonta*, *Modiolopsis*, *Orthodesma*.
- subnodosus** (a)—*Buthotrephis*, *Callopora*, *Glyptocrinus*, *Hallopora*, *Isochilina*, *Orthis*, *Rhaphanocrinus*.
- suboblonga**—*Lingula*.
- suborbicularis**—*Whitella*.
- subovalis** (e)—*Modiolodon*, *Orthodesma*, *Psilococoncha*.
- subovatus** (a)—*Bellerophon*, *Clidophorus*, *Ctenodonta*, *Cypricardinia*, *Cypricardites*, *Cyrtodonta*, *Holocystites*, *Maclurea*, *Whitella*.
- subparallela**—*Modiolopsis*.
- subpatula**—*Bucania nana*.
- subplanus** (a, um)—*Avicula*, *Callopora*, *Cyrtolites*, *Discina tenuilamellata*, *Eurymya*, *Fusispira angusta*, *Hallopora*, *Hemipronites*, *Leptæna*, *Leiopteria*, *Liopteria*, *Lyrodesma*, *Orbiculoidea*, *Orthothetes*, *Pterinea*, *Pteronites*, *Raphistoma*, *Schuchertella*, *Streptorhynchus*, *Streptorhynchus* (*Strophodonta*), *Strophomena*.
- subpulchellus** (a)—*Chaetetes*, *Dekayia*, *Dekayia perfrondosa*, *Heterotrypa*, *Monticulipora*.
- subquadrans**—*Tetradella*.
- subquadratus** (a)—*Christiania*, *Cypricardinia*, *Dinorthis*, *Helicotoma*, *Leptæna*, *Monotrypella*, *Monticulipora quadrata*, **subquadratus**—continued.  
*Orthis*, *Plæsiomys*, *Platystrophia*, *Pseudocrinites*, *Pterinea*, *Ptychopteria*, *Rhombotrypa*, *Whitfieldella*.
- subquadrilateralis**—*Modiolopsis*.
- subradiata**—*Eurychilina*.
- subramosa** (um)—*Atactopora*, *Dekayia*, *Heterospongia*, *Heterotrypa*, *Homotrypa*, *Lioclema*.
- subrectus** (a, um)—*Avicula*, *Aviculopecten*, *Ctenodonta*, *Escharopora*, *Modiolodon*, *Oncoceras*, *Pentamerus oblongus*, *Psilococoncha*, *Ptilodictya*, *Tellinomya*.
- subregularis**—*Zaphrentis*.
- subretiformis** (e)—*Calypptograpsus*, *Calypptograptus*, *Dictyonema*.
- subrhomboidea**—*Camarotoëchia acinus*, *Modiolopsis*.
- subrotundus** (a)—*Allonychia*, *Archinacella*, *Astylospongia*, *Chaetetes*, *Ctenobolina*, *Ctenodonta*, *Cytherella*, *Eccyliomphalus*, *Hindia sphaeroidalis*, *Holocystites*, *Maclurea*, *Maclurina*, *Microspongia*, *Schmidtella*, *Tellinomya*, *Vannuxemia*, *Zittelella typicalis*.
- subrugosa**—*Avicula*, *Pterinea*.
- subspatulatus** (a)—*Cypricardites*, *Lyonsia*, *Modiolopsis*, *Palæarca*, *Probellia*.
- subsphericus** (a, um)—*Cyathophycus*, *Sphaerodictya*, *Teganium*.
- subsulcatus** (a, um)—*Spirifer* (*Delthyris*), *Streptorhynchus*, *Whitfieldella*.
- subtenta** (um)—*Hemipronites*, *Leptæna*, *Streptorhynchus*, *Strophomena*, *Strophomena planumbona*, *Strophomena rugosa*.
- subtenuis**—*Didymograptus*, *Graptolithus*, *Leptograptus*.
- subtilistriata**—*Liospira*, *Pleurotomaria*, *Raphistoma*.
- subtransversa**—*Prosserella*, *Reticularia*.
- subtrigona**—*Ctenodonta*, *Nucula*.
- subtrigonalis**—*Atrypa*, *Eichwaldia*, *Hemithiris*, *Rhynchonella*, *Rhynchotrema inaequalvis*.
- subtruncatus** (a)—*Cypricardia*, *Cypricardites*, *Cyrtodonta*, *Edmondia*, *Lyonsia*, *Modiolopsis*, *Orbicula*, *Pholidops*, *Whitella*.
- subtubulatus** (a)—*Heliolites*, *Heliolites nucella*.
- subturbيناتus** (a, um)—*Cyrtoceras*, *Ischadites*, *Omphyma*, *Receptaculites*, **subulata**—*Hormotoma*, *Holopella*, *Loxonema*.

- subundata — Ambonychia, Clionychia.  
 Posidonomya.  
 subvada—Zaphrentis.  
 subvesicularis—Zaphrentis.  
 succulens—Buthotrephis, Microphycus.  
 succulentus—Dendrograptus.  
 succulosa—Buthotrephis.  
 sulcatus (a)—Bellerophon, Bucania.  
 sulcatus (a, um)—Atrypa, Beatricea, Coscinopora, Cyclonema, Delthyris, Eumphalus, Fusispira, Glycerites, Hemipronites, Leperditella, Leperditia, Lepæna, Merista, Modiolopsis, Palæocrinus, Poleumita, Polytropis, Productus, Ptilodictya, Spirifer, Streptorhynchus, Streptotrochus, Strophomena, Trichophycus, Walcottia, Whitfieldella.  
 sulcifer—Productus.  
 sulcocarinata—Protozoega.  
 sulcodorsata—Cuneamya, Saffordia.  
 sumnerensis—Lophospira, Murchisonia.  
 superbus (a, um)—Actinomya, Ambonychia, Amplexopora, Batostoma, Bathyrurus, Cleionychia, Eccuiliomphalus, Ecccylomphalus, Lyellia, Metoptoma, Modiolopsis, Phænopora, Ptilodictya, Scenella, Trematopora, Whiteavesia.  
 superectes—Didymograptus.  
 supracingulata—Eotomaria, Pleurotomaria.  
 supraplana—Holoepa.  
 supremus—Tentaculites.  
 sureularis—Cenograptus, Graptolithus gracilis, Nemaograptus gracilis, Stephanograptus.  
 surgens—Cyrtoceras.  
 susae—Asaphus, Isotelus, Onchometopus.  
 sussexensis—Beyrichia, Klædenia.  
 sutherlandi—Columnaria.  
 swallowensis—Spirifer (Delthyris).  
 swanana—Ambonychia.  
 swartzi—Nucleospira.  
 sweeneyi—Dinorthis, Orthis, Orthis (Dinorthis) pectinella.  
 swezeyi—Scævogyra.  
 swindernana—Thecia.  
 sybillina—Pleurotomaria.  
 sylpha—Maclurea, Maclurites, Murchisonia.  
 symmetra—Ptilodictya.  
 symmetricus (a)—Beyrichia, Bollia, Drepanella, Eurychilina, Holoepa, Klædenella, Leperditia, Turbo, Whiteavesia.  
 syphax—Cyrtoceras, Eremoceras.  
 tæniola—Lingula.  
 talacastrensis—Strophomena.  
 tantulus—Fenestella, Polypora.  
 taraxacum—Tetragraptus.  
 tarijense—Dictyonema murrayi.  
 tarquinius—Ceraurus, Cheirurus.  
 taurifrons—Bathyrurus.  
 taurus—Illænus.  
 tecumseth (i)—Apicocystites, Brockocystites.  
 tegulum—Conocardium.  
 telleri—Dicranopeltis, Harpes.  
 tenax—Gomphocystis, Gomphocystites, Triplecia (Cliftonia).  
 tenellus (a, um)—Atactopora, Atactoporella, Ceratopora, Cypricardites, Cyrtodonta, Dictyonema, Ptilodictya, Syringopora.  
 tener (a)—Dendrocrinus, Matheria, Orthoceras, Hormotoma, Plectambonites, Ptilodictya.  
 tennesseæ—Actinocrinites, Cyathocrinites, Cyathocrinus, Eucalyptocrinites, Eucalyptocrinus, Limaria, Symbathocrinites, Smybathocrinus.  
 tennesseensis (e)—Calceola, Centrocrinus, Corynotrypa, Cyclonema, Cystocrinus, Helicotoma, Hormotoma salteri, Idiocrinus, Lampteroocrinus, Lecanocrinus, Marsipocrinus, Marsupiocrinus, Merista, Ormocrinus, Periechocrinus, Platycrinus, Platycrinus (Cupellacrinus), Plectambonites, Rhizophyllum, Rhynchonella, Saccocrinus, Stephanocrinus, Strophostylus, Symbathocrinites, Symbathocrinus, Turbo, Ucinulus.  
 tennesseus—Cyathocrinus.  
 tentaculatus—Graptolithus, Reteograptus, Retiograptus.  
 tenuibrachiatus—Pycnosaccus.  
 tenuiceps—Fenestella, Semicoscium.  
 tenuicosta—Pentamerus nysius.  
 tenuicostatus (m)—Conchidium, Pentamerus, Pentamerus nysius.  
 tenuidens—Orthis.  
 tenuifiliata—Actinostroma, Stromatopora.  
 tenuifilum—Actinoceras, Hormoceras, Orthoceras, Orthoceras (Ormoceras).  
 tenuilamellatus (a)—Avicula, Aviculopecten, Discina, Orbicula, Orbiculoidea (Schizotreta), Schizotreta.

- tenuilineata* (um)—Dawsonoceras, Lep-  
tæna, Rhipidomella, Strophomena.  
*tenuiliratum*—Platyceras.  
*tenuimurale*—Batostoma, Hemiphragma.  
*tenuiradiatus*—Actinocrinus, Palæocys-  
tites.  
*tenuiramosus*—Dendrograptus, Desmo-  
graptus, Mastigograptus.  
*tenuis* (e)—Arthronema, Arthrostylus,  
Buthotrephid, Bythotrephid, Dicello-  
graptus, Didymograptus, Diorychopora,  
Fenestella, Graptolithus, Heliolites,  
Helopora, Heterocrinus, Leptograptus,  
Orthothetes, Protarea, Protoscolex,  
Schuchertella, Stenocrinus, Strepto-  
rhyndus, Strophomena.  
*tenuisculpta*—Calvinella.  
*tenuiseptum*—Cameroceras, Cyrtoceras,  
Orthoceras.  
*tenuisiphonatum*—Orthoceras.  
*tenuissimus* (a)—Actinostroma, Nema-  
podia, Protowarthia, Ptilograptus, Sin-  
uities, Stomatopora, Stomatopora deli-  
catula.  
*tenuistriatus* (a, um)—Ambonychia,  
Amygdalocystites, Byssonchia, Cho-  
netes, Cornulites, Cyrtoceras, Daw-  
sonia, Discina, Endoceras proteiforme,  
Leptæna, Lophospira, Orbiculoidea,  
Orthoceras, Orthodesma, Psiloconcha,  
Spirifer, Strophomena, Strophonella,  
Tentaculites.  
*tenuitextum*—Endoceras proteiforme,  
Orthoceras.  
*terebialis*—Cœlocaulus, Murchisonia.  
*terebriformis*—Fusispira, Hormotoma,  
Subulites.  
*teres*—Constellaria, Ptilodictya.  
*teretiformis* (e)—Cycloceras, Hormotoma,  
Murchisonia, Murchisonia bellicincta,  
Orthoceras.  
*teretiunculus*—Diplograptus.  
*tersus* (a)—Dalmanella, Orthis.  
*tessellatus*—Campanulites, Cleiocrinus,  
Cryptolithus, Ischadites, Receptacu-  
lites, Trinucleus.  
*testudinaria*—Dalmanella, Orthis.  
*testudineus*—Dolichopterus.  
*tetracanthura*—Protopeltura.  
*tetragonocephalus*—Asaphus, Paradox-  
ides.  
*tetragonum*—Cyathophyllum.  
*tetranema*—Protospongia.  
*teucer*—Oncoceras.  
*textilis* (e)—Cyclonema, Holoepa, Mur-  
chisonia, Orthoceras, Schizolopha,  
Stropheodonta, Stropheodonta (Lepto-  
strophia), Strophostylus.  
*thales*—Oncoceras.  
*thalia*—Cyclonema, Pleurotomaria, Stro-  
phomena.  
*thallosus*—Inocaulis.  
*thebesensis*—Clorinda, Lophospira, Lyel-  
lia, Pterinea, Rhynchotreta.  
*thisbe*—Pterinea.  
*thomii*—Columnaria (Palæophyllum),  
Cyathophylloides.  
*thompsoni*—Cyrtoceras.  
*thoroldensis* (e)—Alveolites, Cyathophyl-  
lum.  
*thresheri*—Encrinurus.  
*thureaui*—Dichograptus, Didymograptus,  
Goniograptus, Graptolites.  
*timidus*—Lasiograptus bimucronatus.  
*timon*—Bathyrurus.  
*tityrus*—Orthoceras.  
*tonolowayensis*—Anoplothea concava.  
*torquisti*—Cœlospira concava, Didymo-  
graptus.  
*tortilis*—Cyrtospira, Subulites.  
*tortuosum*—Palæophycus.  
*fortus*—Dicellograptus sextans.  
*townsendii*—Ascoceras, Pleurotomaria.  
*tranceps*—Cyrtodonta, Endodesma.  
*transiens*—Goniophora.  
*transitionis*—Maclurea, Maclurites.  
*transversalis*—Anomites, Bumastus, Illæ-  
nus, Leptæna, Palæopecten, Plectam-  
bonites, Strophomena.  
*transversus* (a, um)—Conularia, Cyclo-  
nema, Encrinurus, Orthoceras, Ptero-  
thea.  
*trapezoidalis*—Cyrtia, Spirifer.  
*trentonensis* (e)—Acidaspis, Actino-  
stroma, Amphilichas, Aparchites mi-  
nutissimus, Archinacella, Asaphus, Au-  
lopora, Brongniartia, Bumastus, Cam-  
eroceras, Ceratocephala, Ceraurinus,  
Ceraurus, Chasmatopora, Christiania,  
Cnemidium, Cœlolema, Conularia,  
Crania, Cryptonymus, Cyphaspis, Cyr-  
toceras, Cyrtolites, Dekayella, Dekayia,  
Diamesopora, Dicranopora, Diplolema,  
Ecculiomphalus, Eccyliomphalus, En-  
crinurus, Endodesma, Eridotrypa, Glos-  
sina, Homalonotus, Hormotoma, Illæ-  
nus, Iocrinus, Leptograptus flaccidus,  
Leptograptus flaccidus spinifer, Lichas,

trentonensis—continued.

Lingula, Lyonsia, Metoptoma, Modiolopsis, Monotrypella, Monticulipora (Heterotrypa), Odontopleura, Oncoceras, Orthoceras, Orthoceratites, Palæoglossa, Pholidops, Phylloporina, Platymetopus, Platynotus, Plectorthis plicatella, Primicorallina, Prolobella, Protowartha cancellata, Pseudosphærexochus, Pterinea, Retepora, Rhinidictya, Romingeria, Sabellarites, Sinuites cancellata, Spirifer, Strophomena, Subretepora, Tryblidium, Zittella.

trescottii—Pterinea (Tolmaia).

triangularis—Conradella, Cypricardites, Lumbriconereites, Phragmolites.

triangulatus (a)—Asaphus, Conularia,

\*Eusarcus, Grammysia, Orthonota.

triangulus—Eccyliomphalus, Eccyliomphalus, Eccyliopterus.

triarthrus—Paradoxides.

tribulis—Atrypa, Dicelloccephalus, Dikeloccephalus.

tricarinatus (a)—Hormotoma, Lophospira, Murchisonia, Pleurotrochus, Trochomena, Straparollus.

tricenaria—Orthis, Platystrophia.

trichomanes—Strophograptus.

tricornis—Cryptograptus, Cryptograptus (Idiograptus), Diplograptus,

tridactylus—Ichnophycus.

tridens—Dawsonia.

tridentatus—Climacograptus bicornis.

tridigitatum—Dactylophycus.

trifidus—Asaphoidichnus, Diplograptus, Diplograptus foliaceus, Leptograptus flaccidus spinifer.

trifurcatum—Anisophyllum.

trigonostoma—Diaphorostoma, Platystostoma, Platystostoma niagarensis, Trematostoma, Bucania, Xenophora.

trilineata—Eunema, Pleurotomaria.

triliratus—Euomphalus.

triloba—Ceramoporella, Illænoidea.

trilobatus (a, um)—Bellerophon, Bucanella, Bucania, Bucaniella, Conchidium, Leptæna, Planorbis, Streptelasma latuscolum, Streptelasma rusticum, Strophomena.

trilobioides—Cancer.

trinucleus—Orthis.

tripectinatus—Callocystites.

tripha—Bucania.

triplesiana—Stricklandinia.

triplicata—Beyrichia lata, Halliella.

triplicatella—Orthis, Orthis plicatella, Plectorthis, Plectorthis fissicosta, Plectorthis plicatella.

triquetra—Avicula.

trisectus—Agnostus.

triserialis—Pachydietya.

trisinuatus (a)—Athyris, Meristina, Pentamerus.

trisulcatus (a)—Beyrichia, Calymene, Klædenella, Phacops.

triton—Piloceras.

tritionia—Helicotoma, Orthis.

trochiscus—Euomphalus, Polygyrata, Raphistoma.

trochonemoides—Lophospira.

trombetana—Pholidops.

trombetensis—Tentaculites.

troosti—Bellerophon, Chasmops, Columnaria, Dalmanites, Favosites, Pterygometopus, Symbathocrinus.

tropidophora—Murchisonia, Pleurotomaria, Pleurotomaria (Scalites).

truncatula—Cuneamya.

truncatus (a)—Bolbocephalus, Discinia, Eurymya, Ischyrodonta, Modiolodon, Modiolopsis, Orbicula, Orbiculoidea, Whitella.

trusitum—Orthoceras, Protokionoceras.

tuber—Bellerophon.

tuberculatus (a)—Arges, Bathyrurus, Beyrichia, Brachiospongia, Carabocrinus, Chætetes, Climacograptus bicornis, Corydocephalus, Eucalyptocrinus, Homotrypa, Hystricurus, Lichenocrinus, Monticulipora, Monticulipora (Monotrypa), Spatiopora.

tuberculosis (a)—Encrinurus, Fistulipora, Rhinopora, Trematopora.

tuberoidea—Favosites.

tuberosus (a)—Pattersonia, Scolithus, Strobilospongia.

tubularis (e)—Cyathodietya, Cyathophycus, Palæophycus, Stromatopora.

tubulistriata—Atrypa.

tubulosa (um)—Ceramoporella, Diamesopora, Phytopsis, Rhinopora, Trematopora.

tumidifrons—Illænus.

tumidosus—Agnostus.

tumidula—Athyris, Leperditia, Primitia.

- tumidus (a, um)**—*Astylospongia*, *Beyrichia*, *Ctenobolbina*, *Holocystites*, *Hybocrinus*, *Leperditella*, *Leperditia*, *Meristella*, *Oncoceras*, *Pasceolus*, *Remopleurides*, *Stribalocystites*.
- tumifrons**—*Beyrichia*.
- tumulosa**—*Proboscina*.
- tunicatus**—*Calceocrinus*, *Deltacrinus*.
- turbidum**—*Orthoceras*.
- turbinatus (a, um)**—*Chætetes*, *Cyathocrinus*, *Cyathophyllum*, *Eucalyptocrinus*, *Holocystites*, *Huronina*, *Monotrypa*, *Monticulipora*, *Polydilasma*, *Trochoceras*, *Zaphrentis*, *Zittelella typicalis*.
- turgida**—*Athyris*, *Corynotrypa*, *Holopea*, *Klædenella*, *Leperditia*, *Pachydictya*, *Pleurotomaria*, *Ribeiria*, *Sinuopea*, *Stomatopora*.
- turgidonummulatum**—*Orthoceras* (*Actinoceras*).
- turpis**—*Terebratula*.
- turricula**—*Murchisonia*.
- turritiformis**—*Cœlocaulus*.
- typicalis**—*Atactoporella*, *Atactoporella præcipita*, *Chænodomus*, *Climacograptus*, *Cymatonta*, *Discophycus*, *Schizambon*, *Zittelella*.
- typicus (a)**—*Climacograptus*, *Cyrtocarina*, *Cystostylus*, *Eopteria*, *Palæacmæa*.
- typus (a)**—*Alloocrinus*, *Ampheristocrinus*, *Bollia*, *Calceocrinus*, *Camarium*, *Deltacrinus*, *Dilobella*, *Glyptocrinus*, *Hyptiocrinus*, *Lichenaria*, *Merista*, *Merocrinus*, *Ottawacrinus*, *Phyllograptus*, *Phyllograptus folium*, *Tanaocrinus*, *Thamnograptus*.
- tyrans**—*Nautilus*, *Plectoceras*.
- tyronensis**—*Dermatostroma*, *Orthoceras*.
- tyrrelli (i)**—*Aparchites*, *Euomphalopterus*, *Poterioceras*.
- uberis**—*Orthis*, *Rhipidomella*.
- ulrich(i)ana**—*Gerasaphes*, *Isochilina gregaria*.
- ulrichi (i)**—*Amphicoelia*, *Asaphus*, *Climacograptus*, *Craniella*, *Cyrtograptus*, *Dekayella*, *Dekayia*, *Dinorthis*, *Dinorthis (Plesiomys)*, *Elpe*, *Hemitrypa*, *Heterotrypa*, *Loculipora*, *Macronotella*, *Monticulipora*, *Pattersonia*, *Petrocrania*, *Primitia*, *Primitiella*, *Ptychopyge*, *Rafinesquina*, *Rhombopteria (Newsomella)*, *Seelya (Plethospira)*, *Trigrya*, *Triplecia*, *Urasterella*.
- umbellifera**—*Aulopora*, *Quenstedtia*, *Romingeria*.
- umbilicata (um)**—*Helicotoma*, *Pleurotomaria*, *Trochonema*.
- umbonata**—*Athyris*, *Hindella*, *Meristella*, *Plethocardia*, *Schmidtella*, *Trematis*, *Vanuxemia*, *Whitella*.
- umbrosus**—*Periechocrinus*, *Saccocrinus*.
- undatus (a, um)**—*Ambonychia*, *Avicula*, *Cleionychia*, *Clionychia*, *Cryptoceras*, *Eurystomites*, *Inachus*, *Lituites*, *Plectoceras*, *Pterinea*, *Trocholites*, *Whiteavesia*.
- undosus (a, um)**—*Alveolites*, *Avicula*, *Endodesma*, *Trachyum*.
- unduavi**—*Cruziana*.
- undulatus (a, um)**—*Ambonychia*, *Beatricea*, *Callopora*, *Chætetes*, *Chonetes*, *Clioderma*, *Cyathophyllum*, *Dawsonoceras*, *Dictyostroma*, *Eccuiliomphalus*, *Eccyliomphalus*, *Hallopora*, *Leptodus*, *Monotrypa*, *Monticulipora*, *Orthoceras*, *Pterotheca*, *Raphistomina*, *Strophomena*.
- undulosa**—*Strophomena*.
- undulostriatus (a, um)**—*Cypricardinia*, *Cyrtodonta*, *Modiolopsis*, *Olenus*, *Orthoceras*.
- unguiformis (e)**—*Conchidium*, *Gypidula*, *Platyceras*, *Stenotheca*, *Triblidium*, *Vallathotheca*.
- ungulata**—*Cypricardites*, *Cyrtodonta*, *Vanuxemia*.
- unguloidea**—*Bollia*.
- uniangulatus (a)**—*Euomphalus*, *Helicotoma*, *Lophospira*, *Murchisonia*, *Ophileta*, *Straparollus*.
- unicornis**—*Aparchites*, *Leperditia*, *Primitia*, *Primitiella*.
- unicosta**—*Cliopecteria*.
- unicostata**—*Leptæna*, *Platystrophia*, *Rafinesquina*, *Strophomena*.
- unicus (a)**—*Strombodes*, *Zaphrentis*.
- uniformis (e)**—*Amplexus*, *Monticulipora*, *Peronopora*.
- unilamellosus**—*Prosserella*, *Reticularia*.
- unilargum**—*Anisophyllum*.
- unilateralis**—*Dendrograptus*.
- unionensis**—*Orthoceras*, *Platystrophia*.
- unionoides**—*Anodontopsis*, *Ischyrodonta*, *Modiolopsis*.
- uniplicatus (a)**—*Gypidula*, *Pentamerus*, *Sieberella*.

- unisulcatus*—Crepicephalus (Loganellus), Ptychoparia.  
*uphami*—Catazyga, Primitia, Zygospira.  
*urceolus*—Demirastrites, Monograptus, Rastrites.  
*urniformis*—Periechocrinus, Saccocrinus.  
*uticus*—Trochololithus.  
*uva*—Romingeria.  
*vacua*—Columnaria.  
*vadum*—Chonophyllum.  
*vagabunda*—Clintonella.  
*vagens*—Licrophycus, Streptelasma.  
*vagrans*—Barrandeoceras, Ecyliopterus, Gyroceras (Lituites), Helicotoma, Pleurotomaria, Trochonema.  
*vagum*—Orthoceras.  
*valeourensis*—Cybele.  
*valerius* (a)—Euomphalopteris, Euomphalopterus, Pleurotomaria.  
*validus* (a, um)—Agnostus pisiformis, Archinacella, Bathyurellus, Modiolopsis, Tryblidium.  
*vallandighami*—Cyrtocheras.  
*valvatiiformis*—Straparollus.  
*vancelevii*—Aulopora, Stictopora.  
*vancortlandti*—Carcabocrinus.  
*vanhorn(e)i*—Acidaspis, Crotalocrinus, Cyathocrinus, Lingula.  
*vaningeni*—Deltoceras, Eusarcus.  
*vannulus* (a)—Encrinurus, Romingeria.  
*vanuxemi*—Diploceras, Discina, Hyolithes, Endoceras, Spirifer (Delthyris).  
*vara*—Chilotrypa, Constellaria, Diamesopora, Phyllodictya, Trematopora.  
*variabilis* (e)—Batostoma, Glassia, Matthevia, Ptilodictya.  
*varians*—Batostoma, Camarella, Chaetetes, Cyclonema, Eospongia, Eunicites, Gnorimocrinus, Lophospira, Monticulipora, Murchisonia, Nereidavus, Zittella.  
*varicosa* (um)—Cyclonema, Cyclonema bilix, Murchisonia, Pleurotomaria.  
*variolaris* (e)—Clathrodictyon, Stromatopora.  
*variolata*—Chilotrypa, Phyllopora, Phylloporina, Subretopora, Trematopora.  
*variolosa*—Cystiphorolites, Vesicularia.  
*varipora* (um)—Helopora, Lioclema.  
*varistriata*—Pterinea, Stropheodonta, Strophodonta, Strophomena.  
*varium*—Batostoma.  
*varro*—Orthoceras.  
*vasculosa*—Stropheodonta.  
*vasiforme*—Oncoceras.  
*vassarina*—Cyrtocheras.  
*vaticinus*—Euomphalus.  
*vaupeli*—Diamesopora, Heterocrinus, Heterotrypa, Monticulipora, Nicholsonella, Ohioerinus.  
*vegetabilis*—Inocaulis.  
*velaris*—Euomphalopterus.  
*velox*—Cameroceras, Orthoceras.  
*venilia*—Metoptoma, Scenella.  
*vennori*—Diphyphyllum, Eridophyllum.  
*venosus* (a, um)—Gladiolites, Graptolites, Retiolites, Retiolites geinitzianus, Rhinopora, Rhopalonaria, Ropalonaria, Trichophycus.  
*ventralis*—Cypriocardites, Leperditia, Saffordia.  
*ventricornis*—Leperditella sulcata.  
*ventricosus* (a, um)—Barrandella, Bodmania, Cardimorpha, Clorinda, Cyclonema, Cypriocardites, Cyrtocheras, Cyrtospira, Edmondia, Fusispira, Fusispira inflata, Gazacrinus, Holocystites, Holoepa, Idiocrinus, Klædenia notata, Lophospira, Murchisonia, Nucleospira, Omospira, Palæarca, Pentamerus, Pentamerus (Pentamerella), Phragmoceras, Pleurotomaria, Ribeiria, Seelya, Spirifer, Stropheodonta, Strophostylus, Subulites, Tellinomya, Turbo, Whittella.  
*ventriliabiata*—Schmidtella crassimarginata.  
*ventrosa*—Eurychilina, Klædenella turrida.  
*venustus* (a, um)—Astrocerium, Beyrichia, Calamopora, Chaetetes, Crepipora, Favosites, Monticulipora (Fistulipora), Orthonota, Pterinotella.  
*vera*—Byssouychia, Peronopora.  
*verneuili* (i)—Actinocrinites, Anastrophia, Calamopora, Calymene, Cupellacrinites, Euomphalus, Marsipocrinus, Melocrinus, Orthisina, Protarea, Turbinicrinites.  
*verrucosus* (a, um)—Astylomanon, Dalmania, Dalmanites, Monticulipora, Omphyma, Palæomanon, Rhinopora.  
*versaillesensis*—Hyolithes, Lingula procteri, Modiolopsis, Platystrophia cypha.  
*versutus* (m)—Litoceras, Nautilus.  
*vertebralis* (e)—Huronina, Orthoceras.  
*vertebratum*—Actinoceras, Ormoceras, Orthoceras.



- verticalis*—Fucoides, Helicotoma, Scolithus.  
*verticillata*—Cladopora, Cœnites, Limaria, Syringopora.  
*vesiculosa* (um)—Berenicea, Clathrodictyon, Cyathophyllum, Stromatopora.  
*vesperalis*—Diablocrinus, Rhodocrinus.  
*vespertillo*—Orthis.  
*vespertinus*—Diplograptus foliaceus.  
*vesta*—Hormotoma, Murchisonia.  
*veterator*—Orthoceras.  
*vetulus* (m)—Bathyurus, Platyceras.  
*vetustus* (a)—Agelacrinus, Asaphus, Astræopora, Basilicus, Cardiomorpha, Chonetes, Cuneamya, Cypricardites, Heliolites, Ogygia, Porites, Protarea, Streptorhynchus, Strophomena, Thecia.  
*vevayensis*—Eridotrypa.  
*vicinus* (a, um)—Camarotœchia, Cyathophyllum, Cypricardites, Eotomaria, Rhynchonella, Strophomena.  
*vigilans*—Asaphus (Isotelus), Ceraurus, Cryptonymus, Cybele, Dalmania, Dalmanites, Dalmanites (Odontochile), Dalmanites (Synphoria), Encrinurus, Nileus, Vogdesia.  
*vindex*—Ilænus, Thaleops.  
*viola*—Pleurotomaria, Poleumita.  
*virgatus* (m)—Colpoceras, Endoceras, Orthoceras, Planolites.  
*virginianus* (a)—Eurystomites.  
*virginiensis*—Protaxocrinus.  
*virgo*—Pleurotomaria.  
*virgulatum*—Orthoceras, Orthoceras (Euthoroceras).  
*virguncula*—Pleurotomaria.  
*viromundo*—Bucaniella trilobata.  
*vitellia*—Cœlocaulus, Cœlidium.  
*vitruvia*—Liospira, Pleurotomaria.  
*vittata*—Fusispira, Loxonema, Murchisonia.  
*vogdesi*—Calymene, Calymene blumenbachii.  
*volans*—Pterinea.  
*volborthi*—Camarella.  
*volutatus*—Ecculiomphalus, Ecyliopterus.  
*volutus* (a)—Bellerophon, Holopœa.  
*vorticellatus* (a)—Agelacrinites, Agelacrinus, Streptaster.  
*vulcanius*—Chonophyllum (Craterophyllum), Ptychophyllum.  
*vulcanus* (a)—Actinostroma, Pseudosphærexochus.  
*vulgaris*—Hebertella, Planolites.  
*vulgatus* (m)—Diplograptus, Orthoceras.  
*wabashiensis* (e)—Anodontopsis, Gomphoceras, Streptomylus.  
*wahlenbergii*—Cyathophyllum.  
*walcotti*—Azygograptus, Cheirocrinus, Chirocrinus, Cyathophycus, Dictyophytra, Leptobolus, Trocholitoceras.  
*waldronensis* (e)—Actinocrinus, Allonema, Beyrichia, Chonetes novascotia, Cyathocrinus, Dimerocrinus, Entomis, Favosites forbesi, Macrostylocrinus, Mimulus, Spirifera, Streptis, Trochoceras.  
*walkerensis*—Byssonychia.  
*walkeri*—Acanthograptus, Caunopora, Diplotrypa, Inocaulis, Protarea.  
*wallowayi*—Platystrophia.  
*wallpackensis*—Klœdenia.  
*warrenensis*—Agelacrinites, Agelacrinus.  
*warteni*—Mariacrinus.  
*waukoma*—Cyathocrinus, Lecanocrinus.  
*wauwatosense*—Orthoceras.  
*waynensis* (e)—Enterolasma, Enterolasma (Petraia), Petraia, Streptelasma.  
*waynesboroensis*—Lingula.  
*websteri*—Dictyonema.  
*welchi*—Avicula, Megalograptus, Monticulipora (Monotrypa).  
*welchi*—Ptilodictya.  
*welleri*—Pycnosaccus.  
*wemplei*—Dalmanella, Dalmanella (Orthis).  
*wenti*—Chirospongia.  
*werthneri*—Dalmanites.  
*wesenbergensis*—Corydocephalus, Lichas (Arges).  
*westoni*—Amphion, Diplotrypa, Monticulipora, Orthoceras, Pliomerops.  
*wetherbyi*—Belemnocystites, Holocystites, Mitrocrinus, Monticulipora, Orbignyella.  
*wetherilli*—Asaphus.  
*whiteavcsi* (i)—Actinostroma, Aparchites, Hormotoma, Isochilina, Leperditia, Lindstroemia, Litoceras, Mesotrypa, Monticulipora, Monticulipora (Diplotrypa), Oncoceras, Ptilodictya.  
*whiteavcsiana*—Helicotoma, Protaster.  
*whitehallensis*—Conocephalites.

- whitei** (ii)—*Actinoceras*, *Camarotoechia*, *Camarotoechia* (*Stegerhynchus*), *Ceramopora*, *Ceramoporella*, *Ormoceras*, *Rhynchonella*.
- whitfieldi**—*Actinocrinus*, *Actinocrinus* (*Saccocrinus*), *Amplexus*, *Austinella*, *Avicula*, *Batostoma* (*Hemiphragma*), *Diplograpsus*, *Diplograptus*, *Graptolithus*, *Hemiphragma*, *Hindella*, (*Greenfieldia*), *Isoteloides*, *Lingula*, *Lingulops*, *Monticulipora*, *Monticulipora* (*Chaetetes*), *Orthis*, *Periechocrinus*, *Plectorthis*, *Primitia*, *Primitiella*, *Protocycloceras*, *Ptilodictya*, *Trematopora*.
- whitianus** (a)—*Dicranograptus nicholsoni*, *Graptolithus*, *Rhynchonella*.
- whitneyi**—*Cyrtoceras*, *Phragmoceras*.
- wichitaensis**—*Eoorthis*, *Orthis* (*Plectorthis*).
- wilberanus**—*Mesopalaeaster*, *Palaeaster*, *Petraster*.
- wilkinsi**—*Conularia*.
- williamsi**—*Strophonella*.
- wilmingtonensis** (e)—*Cyphotrypa*, *Leioclema*, *Lioclema*, *Monticulipora*, *Phænopora*, *Strombodes mamillare*.
- wilsoni**—*Climactichnites*, *Palaeaster*, *Polygonathus*, *Promopalaeaster*, *Rhynchonella*, *Stromatopora*, *Terebratula*, *Wilsonia*.
- winchelli**—*Amplexopora*, *Batostoma*, *Batostoma nodosa*, *Batostoma spinulosum*, *Cybele*, *Cybeloides*, *Cypricardites*, *Cyrtodonta*, *Holocystites*, *Ischyria*, *Modiolodon*, *Monticulipora*, *Monticuli-*
- winchelli**—Continued.  
*pora* (*Heterotrypa*), *Piloceras*, *Strophomena*.
- winchesterensis**—*Rafinesquina*.
- wingi**—*Cryptozoon*.
- winiskensis**—*Camarotoechia*.
- winnipegensis** (e)—*Aulocopella*, *Hormotoma*, *Loxonema*, *Murchisonia*, *Orthoceras*.
- winonensis**—*Euomphalus*.
- winonicum**—*Cyrtoceras*.
- wisconsinensis**—*Asaphus*, *Bellerophon*, *Cyathaxonia*, *Liindstrœmia*, *Lophospira*, *Lophospira helicteres*, *Platyce-  
ras*, *Strophomena*, *Tetranota*.
- wittenbergensis**—*Melocrinus*.
- woodae**—*Tetragraptus*.
- woodworthi**—*Orthoceras*.
- worthenanus** (a)—*Illænus* (*Bumastus*), *Mourlonia*, *Murchisonia*.
- wortheni**—*Cypricardites*, *Eucalyptocrinus*, *Homotrypa*, *Monticulipora*, *Monticulipora* (*Monotrypa*), *Piloceras*, *Vannuxemia*.
- wrightii**—*Caryocaris*.
- wykoffensis**—*Cyrtospira*, *Subulites*.
- wykoffi**—*Holocystites*, *Palaeaster*, *Promopalaeaster*.
- xanthippe**—*Lophospira*, *Murchisonia*.
- xerxes**—*Orthoceras*.
- xiphias**—*Orthoceras*, *Tripteroceras*, *Tripteroceras*.
- yoldiaformis**—*Nuculites*, *Technophorus*.
- youngi**—*Cyrtolites*, *Orthoceras* (*Actinoceras*).
- zenkeri**—*Conocephalites*, *Ptychoparia*.
- zitteli**—*Anomoclonella*.

## BIOLOGICAL CLASSIFICATION OF GENERA.

The following biological classification is introduced for the sake of convenience to aid in quickly classifying any of the genera considered in the Bibliographic List. Like the latter it includes only American Ordovician and Silurian genera.

### ANIMAL KINGDOM.

#### Phylum PORIFERA.

#### Class SPONGIÆ.

#### Subclass SILICISPONGIÆ.

#### Order TETRACTINELLIDA.

#### Family ASTYLOSPONGIDÆ Rauff.

Astylospongia Roemer, Caryospongia Rauff, Caryomanon Rauff, Carpospongia Rauff, Cyathospongia Hall, Carpomanon Rauff, Palæomanon Rauff.

#### Family HINDIIDÆ Rauff.

Hindia Duncan.

#### Family ANOMOCLONELLIDÆ Rauff.

Anomoclonella Rauff, Pycnopegma Rauff.

#### Family CHIASTOCLONELLIDÆ Rauff.

Chiastoclonella Rauff.

#### Family AULOCOPIDÆ Rauff.

Aulocopella Rauff, Aulocopium Oswald, Dendroclonella Rauff.

#### Family ARCHÆOSCYPHIDÆ Rauff.

Archæoscyphia Hinde.

#### Family RHIZOMINNIDÆ Zittel.

Nipterella Hinde.

#### Family ANTHASPIDELLIDÆ Ulrich and Everett.

Anthaspidella Ulrich and Everett, Calathium Billings, Climacospongia Hinde, Edriospongia Ulrich and Everett, Eospongia Billings, Streptosolen Ulrich and Everett, Streptospongia Ulrich, ?Trachyum Billings, Zittlella Ulrich and Everett.

#### Family DYSTACTOSPONGIDÆ Miller.

Dystactospongia Miller, Heterospongia Ulrich, Saccospongia Ulrich, Strotospongia Ulrich and Everett.

#### Order HEXACTINELLIDA.

#### Family PROTOSPONGIDÆ Hinde.

?Halichondrites Dawson and Hinde, ?Lasiothrix Dawson and Hinde, Phormosella Hinde, Protospongia Salter, Stephanella Hinde.

## Family PLECTOSPONGIDÆ Rauff.

Acanthodictya Hinde, Cyathophycus Walcott, Palæosaccus Hinde, Plectoderma Hinde, Teganium Rauff.

## Family HYALONEMATIDÆ Schulze.

Pyritonema McCoy.

## Family PATTERSONIIDÆ Rauff.

Pattersonia Miller.

## Family BRACHIOSPONGIIDÆ Marsh.

Brachiospongia Marsh.

## POSITION UNCERTAIN.

Astræospongia Roemer, Astroconia Sollas, Aulocopina Billings, Camarocladia Ulrich, Cyliandrocellia Ulrich, Fungispongia Ringueberg, Graptospongia Ruedemann, Hyalostelia Zittel, Rauffella Ulrich, Rhabdaria Billings, Rhombodictyon Whitfield, Stelliella Hinde, Trichospongia Billings.

## SPONGES? (CALCAREOUS ALGÆ?).

Anomaloides Ulrich, Cerionites Meek and Worthen, Cyclocrinites Eichwald, Ischadites Murchison, Lepidolites Ulrich, Leptopoterion Ulrich, Nidulites Salter, Pasceolus Billings, Receptaculites Roemer.

## Phyllum CŒLEENTERATA.

## Subphyllum CNIDARIA.

## Class ANTHOZOA.

## Subclass TETRACORALLA.

## Family CYATHAXONIDÆ Edwards and Haime.

Duncanella Nicholson, Petraia Munster.

## Family PALÆOCYCLIDÆ Dybowski.

Baryphyllum Edwards and Haime, Palæocyclus Edwards and Haime.

## Family ZAPHRENTIDÆ Edwards and Haime.

Amplexus Sowerby, Anisophyllum Edwards and Haime, Aphylostylus Whiteaves, Ditecholasma Simpson, Enterolasma Simpson, Helenterophyllum Grabau, Heliophrentis Grabau, Laccophyllum Simpson, Lindströmia Nicholson and Thompson, Polyorophe Lindström, Pycnostylus Whiteaves, Streptelasma Hall, Zaphrentis Rafinesque.

## Family CYATHOPHYLLIDÆ Edwards and Haime.

Acervularia Schweigger, Blothrophyllum Billings, Boreaster Lambe, Chonophyllum Edwards and Haime, Clisiophyllum Dana, Columnaria Goldfuss, Cyathophyllum Goldfuss, Cyliandrohelium Grabau, Cystiphorolites Miller, Diphyphyllum Lonsdale, Eridophyllum Edwards and Haime, Hallia Edwards and Haime, Heliophyllum Hall, Lyopora Nicholson and Etheridge, Lichenaria Winchell and Schuchert, Nyctopora Nicholson, Omphyma Rafinesque, Ptychophyllum Edwards and Haime, Prismaticophyllum Simpson, Strombodes Schweigger.

## Family CYSTIPHYLLIDÆ Edwards and Haime.

Calceola Lamarck, Cystiphyllum Lonsdale, Cystostylus Whitfield, Goniophyllum Edwards and Haime.

## Subclass HEXACORALLA.

## Order MADREPORARIA.

Family EUPSAMMIDÆ Edwards and Haime.

*Calostylis* Lindström.

## Subclass ALCYONARIA (OCTOCORALLA).

Family HELIOLITIDÆ Lindström.

*Calvinia* Savage, *Heliolites* Dana, *Lyellia* Edwards and Haime, *Plasmopora* Edwards and Haime, *Protarea* Edwards and Haime, *Stylarea* Seebach, *Thecia* Edwards and Haime.

## Suborder TABULATA.

Family FAVOSITIDÆ Edwards and Haime.

*Alveolites* Lamarck, *Calapœcia* Billings, *Cladopora* Hall, *Cœnites* Eichwald, *Dictyostroma* Nicholson, *Favosites* Lamarck, *Michelinia* DeKoninck, *Palæofavosites* Twenhofel, *Parallelopora* Høltedahl, *Platyaxum* (Davis) Foerste, *Striatopora* Hall, *Syringolites* Hinde.

Family AULOPORIDÆ Nicholson.

*Aulopora* Goldfuss, *Fletcheria* Edwards and Haime, *Romingeria* Nicholson.

Family SYRINGOPORIDÆ Edwards and Haime.

*Cannapora* Hall, *Ceratopora* Grabau, *Diorychopora* Davis, *Syringopora* Goldfuss, *Vermipora* Hall.

Family HALYSITIDÆ Edwards and Haime.

*Halysites* Fischer, *Labyrinthites* Lambe.

Family CHÆTETIDÆ Edwards and Haime.

*Chætetes* Fischer, *Dania* Edwards and Haime, *Tetradium* Dana.

## Class HYDROZOA.

## Order STROMATOPOROIDEA.

Family ACTINOSTROMIDÆ Nicholson.

*Actinodictyon* Parks, *Actinostroma* Nicholson and Murie, *Clathrodactyon* Nicholson and Murie, *Stylodactyon* Nicholson.

Family LABECHIIDÆ Nicholson.

*Aulocerium* Parks, *Dermatostroma* Parks, *Labechia* Edwards and Haime, *Lophiostroma* Nicholson, *Rosenella* Nicholson, *Stromatocerium* Hall.

Family BEATRICEIDÆ Ulrich.

*Beatricea* Billings, *Cryptophragmus* Raymond.

Family STROMATOPORIDÆ Nicholson.

*Stromatopora* Goldfuss, *Stromatoporella* Nicholson, *Syringostroma* Nicholson and Murie.

Family IDIOSTROMIDÆ Nicholson.

*Hermatostroma* Nicholson, *Idiostroma* Winchell.

## Class GRAPTOLITOIDEA.

## Order DENDROIDEA.

## Family DENDROGRAPTIDÆ Roemer.

Acanthograptus Spencer, Cactograptus Ruedemann, Callograptus Hall, Calyptograptus Spencer, Cyclograptus Spencer, Desmograptus Hopkinson, Dendrograptus Hall, Dictyonema Hall, Inocaulis Hall, Mastigograptus Ruedemann, Odontocaulis Lapworth, Paleodictyota Whitfield, Ptilograptus Hall, Rhizograptus Spencer, Thamno-graptus Hall.

POSITION UNCERTAIN.

Chaunograptus Hall, Corynoides Nicholson, Protovirgularia McCoy.

## Order GRAPTOLOIDEA.

## Suborder AXONOLIPA.

## Family DICHOGRAPTIDÆ Lapworth.

Azygograptus Nicholson, Bryograptus Lapworth, Clonograptus Hall, Dichograptus Salter, Didymograptus McCoy, Goniograptus McCoy, Loganograptus Hall, Phyllo-graptus Hall, Staurograptus Emmons, Temnograptus Nicholson, Tetragraptus Salter.

## Family LEPTOGRAPTIDÆ Lapworth.

Amphigraptus Lapworth, Leptograptus Lapworth, Nemagraptus Emmons, Pleuro-graptus Nicholson, Sigmagraptus Ruedemann, Syndyograptus Ruedemann.

## Family DICELLOGRAPTIDÆ Lapworth.

Dicellograptus Hopkinson, Dieranograptus Hall.

## Suborder AXONOPHORA.

## Family DIPLOGRAPTIDÆ Lapworth.

Climacograptus Hall, Cryptograptus Lapworth, Diplograptus McCoy, Glyptograptus Lapworth, Orthograptus Lapworth, Trigonograptus Nicholson.

## Family GLOSSOGRAPTIDÆ Lapworth.

Glossograptus Emmons, Lasiograptus Lapworth, Retiograptus Hall.

## Family RETIOLITIDÆ Lapworth.

Retiolites Barrande.

## Family DIMORPHOGRAPTIDÆ Lapworth.

Dimorphograptus Lapworth.

## Family MONOGRAPTIDÆ Lapworth.

Cyrtograptus Carruthers, Monograptus Geinitz, Rastrites Barrande.

POSITION UNCERTAIN.

Dawsonia Nicholson, Strophograptus Ruedemann.

## Phyllum VERMES.

## Order MISKOA.

Eopolychætus Ruedeman, Eotrophonia Ulrich, Pontobdellopsis Ruedeman, Pro-toscolex Ulrich.

## Order ERRANTIA.

Arabellites Hinde, Eunicites Ehlers, Glycerites Hinde, Lumbriconerites Ehlers, Nereidavus Grinnel, Eononites Hinde, Staurocephalites Hinde.

## Order TUBICOLA.

Conchicolites Nicholson, Cornulites Nicholson, Ortonia Nicholson, Serpulites Murchison, Spirorbis Daudin.

## WORM BURROWS, etc.

Arenicolites Salter, Arthropycus Hall, Climactichnites Logan, Dædalus Rouault, Eugyrichnites Ami, Myrianites MacLeay, Nemapodia Emmons, Nereites MacLeay, Planolites Nicholson, Protichnites Owen, Sabellarites Dawson, Særichnites Billings, Scolithus Haldeman, Walcottia Miller and Dyer.

## "TRAILS."

Asaphoidichnus Miller. (Trail of crustacean possibly.)  
 Ormathichnus Miller. (Supposed to be trail of gastropod.)  
 Petalichnus Miller. (Possibly trail of cephalopod.)  
 Teratichnus Miller. (Possibly cephalopod trail.)  
 Trachonotichnus Miller. (Possibly trail of cephalopod.)

## Phyllum ECHINODERMATA.

## Subphyllum PELMATOZOA.

## Class CYSTOIDEA.

## Order AMPHORIDEA.

## Family ARISTOCYSTIDÆ Neumayr.

Holocystites Hall.

## Family ANOMALOCYSTIDÆ Meek.

Anomalocystites Hall, Ateleocystites Billings, Belemnocystites Miller and Gurley, Dendrocystites Barrande.

## Family MALOCYSTIDÆ Bather.

Amygdalocystites Billings, Canadocystis Jaekel, Comarocystites Billings, Malocystites Billings, Platycystis Miller.

## Order RHOMBIFERA.

## Family ECHINOSPHERITIDÆ Neumayr.

Echinosphærites Wahlenberg, Palæocystites Billings.

## Family CARYOCRINIDÆ Bernard.

Caryocrinites Say, Heterocystites Hall, Stribalocystis Miller.

## Family CALLOCYSTIDÆ Bernard.

Apiocystites Forbes, Callocystites Hall, Cheirocrinus Eichwald, Cælocystis Schuchert, Glyptocystites Billings, Hallicystis Jaekel, Hybocystites Wetherby, Jaekelocystis Schuchert, Lepadocystis Carpenter, Lepocrinites Conrad, Pleurocystites Billings, Pseudocrinites Pearce, Sphærocystites Hall, Tetracystis Schuchert, Trimerocystis Schuchert.

## Order DIPLOPORITA.

## Family SPHERONITIDÆ Neumayr.

Allocystites Miller, Trematocystis Jaekel.

## Family GOMPHOCYSTIDÆ Bather.

Gomphocystites Hall.

Order APORITA.

Family CRYPTOCRINIDÆ Zittel.

Lysocystites Miller.

Family MACROCYSTELLIDÆ Bather.

Æthocystis Miller.

Family TIARACRINIDÆ Bather.

Zophocrinus Miller.

Order EDRIOASTEROIDEA.

Family AGELACRINIDÆ Hall.

Agelacrinites Vanuxem, Cystaster Hall, Hemicycystites Hall, Streptaster Hall.

Family EDRIOASTERIDÆ Bather.

Æsiocystis Miller and Gurley, Edrioaster Billings.

Family STEGANOBLASTIDÆ Bather.

Astrocystites Whiteaves.

POSITION UNCERTAIN.

Crinocystites Hall, Cyclocystoides Billings and Salter, Lichenocrinus Hall.

Class BLASTOIDEA.

Order PROTOBLASTOIDEA.

Family BLASTOIDOCRINIDÆ Bather.

Blastoidocrinus Billings.

Order EUBLASTOIDEA.

Family TROOSTOBLASTIDÆ Etheridge and Carpenter.

Troostocrinus Shumard.

Class CRINOIDEA.

Order CAMERATA.

Family CLEIOCRINIDÆ Springer.

Cleiocrinus Billings.

Family RETEOCRINIDÆ Wachsmuth and Springer.

Reteocrinus Billings.

Family DIMEROCRINIDÆ Bather.

Cyphocrinus Miller, Dimerocrinus Phillips, Gazacrinus Miller, Lampterocrinus Roemer, Ptychocrinus Wachsmuth and Springer, Siphonocrinus Miller.

Family RHODOCRINIDÆ Roemer.

Archæocrinus Wachsmuth and Springer, Deocrinus Hudson, Diabolocrinus Wachsmuth and Springer, Heroocrinus Hudson, Lyriocrinus Hall, Rhaphanocrinus Wachsmuth and Springer, Siderocrinus Troost.

Family MELOCRINIDÆ Zittel.

Alloocrinus Wachsmuth and Springer, Cystocrinus Roemer, Glyptocrinus Hall, Macrostylocrinus Hall, Mariacrinus Hall, Melocrinus Goldfuss, Periglyptocrinus Wachsmuth and Springer, Pycnocrinus Miller, Schizocrinus Hall, Scyphocrinus Zenker (Camarocrinus Hall), Stelidiocrinus Angelin.



## Family CALYPTOCRINIDÆ Angelin.

Callicrinus Angelin, Chicagocrinus Weller, Eucalyptocrinus Goldfuss.

## Family BATOCRINIDÆ Wachsmuth and Springer.

Acacocrinus Wachsmuth and Springer, Barrandocrinus Angelin, Compsocrinus Miller, Habrocrinus Angelin, Periechoerinus Austin, Saccocrinus Hall, Tanaocrinus Wachsmuth and Springer, Xenocrinus Miller.

## Family PLATYCRINIDÆ Roemer.

Cococrinus Müller, Cordylocrinus Angelin, Marsipocrinus Bather, Platycrinus Miller.

## Order FLEXIBILIA.

## Suborder SAGENOCRINOIDEA.

## Family LECANOCRINIDÆ Springer.

Anisocrinus Angelin, Asaphocrinus Springer, Lecanocrinus Hall, Ormocrinus Springer, Pycnosaccus Angelin.

## Family SAGENOCRINIDÆ Springer.

Sagenocrinus Austin, Temnocrinus Springer.

## Family ICHTHYOCRINIDÆ Wachsmuth and Springer.

Clidochirus Angelin, Ichthyocrinus Conrad.

## Suborder TAXOCRINOIDEA.

## Family TAXOCRINIDÆ Bather.

Eutaxocrinus Springer, Gnorimocrinus Wachsmuth and Springer, Protaxocrinus Springer.

## Order INADUNATA.

## Suborder LARVIFORMIA.

## Family STEPHANOCRINIDÆ Wachsmuth and Springer.

Stephanocrinus Conrad.

## Family PISOCRINIDÆ Angelin.

Pisocrinus Dekoninck.

## Family HAPLOCRINIDÆ Roemer.

Haplocrinus Steininger.

## Family SYNATHOCRINIDÆ Wachsmuth and Springer.

Synathocrinus Phillips.

## Suborder FISTULATA.

## Family HYBOCRINIDÆ Zittel.

Hyboerinus Billings, Hybocystis Wetherby.

## Family HETEROCRINIDÆ Zittel.

Ectenocrinus Miller, Heterocrinus Hall, Iocrinus Hall, Myelodactylus Hall, Ohioerinus Wachsmuth and Springer.

## Family ANOMALOCRINIDÆ Wachsmuth and Springer.

Anomalocrinus Meek and Worthen, Glaucoerinus Parks.

## Family CREMACRINIDÆ Ulrich.

Cremaerinus Ulrich, Deltaerinus Ulrich, Eucheiroerinus Meek and Worthen.

Family DENDROCRINIDÆ Bather.

Cupulocrinus D'Orbigny, Dendrocrinus Hall, Merocrinus Walcott, Ottawacrinus Billings.

Family CROTALOCRINIDÆ Angelin.

Crotalocrinus Austin, Petalocrinus Weller.

Family CYATHOCRINIDÆ Roemer.

Achradocrinus Schultze, Ampheristocrinus Hall, Carabocrinus Billings, Closterocrinus Hall, Cyathocrinus Miller, Euspirocrinus Angelin, Gissocrinus Angelin, Homocrinus Hall, Lasiocrinus Kirk, Palæocrinus Billings, Porocrinus Billings.

Family BOTRYOCRINIDÆ Bather.

Botryocrinus Angelin.

UNCERTAIN PLACE.

Astroporites Lambe (Base of crinoid ?Clicocrinus), Bolboporites Pander, Emperocrinus Miller and Gurley, Indianocrinus Miller and Gurley, Mitrocrinus Miller and Gurley, Pachyocrinus Billings, Podolithus Sardeson, Thalamocrinus Miller and Gurley.

Subphyllum ASTEROZOA.

Class STELLEROIDEA.

Subclass ASTEROIDEA.

Order PHANEROZONIA.

Family HUDSONASTERIDÆ Schuchert.

Hudsonaster Sturtz.

Family PALÆASTERIDÆ Gregory.

Palæaster Hall.

Family PROMOPALÆASTERIDÆ Schuchert.

Anorthaster Schuchert, Mesopalæaster Schuchert, Promopalæaster Schuchert.

Family PALASTERINIDÆ Gregory.

Petraster Billings.

Family STENASTERIDÆ Schuchert.

Stenaster Billings.

Family URASTERELLIDÆ Schuchert.

Urasterella McCoy.

Family SCHUCHERTIIDÆ Schuchert.

Schuchertia Gregory.

Subclass AULUROIDEA.

Order LYSOPHIURÆ.

Family PROTASTERIDÆ Miller.

Alepidaster Meek, Protaster Forbes, Tæniaster Billings.

Family PALÆOPHIURIDÆ Gregory.

Eugasterella Schuchert.

Order STREPTOPHIURÆ.

Family LAPWORTHURIDÆ Gregory.

Squamaster Ringueberg.

## Phyllum MOLLUSCOIDEA.

## Class BRYOZOA.

## Subclass GYMNOLÆMATA.

## Order CTENOSTOMATA.

Family RHOPALONARIIDÆ Nickles and Bassler.

Rhopalonaria Ulrich.

Family VINELLIDÆ Ulrich and Bassler.

Allonema Ulrich and Bassler, Heteronema Ulrich and Bassler, Vinella Ulrich.

Family ASCODICTYONIDÆ Ulrich.

Ascodictyon Nicholson and Etheridge.

## Order CYCLOSTOMATA.

## Suborder TUBULIPORINA.

Family DIASTOPORIDÆ Busk.

Berenicea Lamouroux, Corynotrypa Bassler, Diastoporina Ulrich, Proboscina Audouin, Stomatopora Bronn.

Family IDMONEIDÆ Busk.

Protocrisina Ulrich.

Family ENTALOPHORIDÆ Reuss.

Diplolema Ulrich, Mitoclema Ulrich.

Family PHACELOPORIDÆ Ulrich.

Phacelopora Ulrich.

## Suborder CERAMOPORIDEA.

Family CERAMOPORIDÆ Ulrich.

Anolotichia Ulrich, Ceramophylla Ulrich, Ceramopora Hall, Ceramoporella Ulrich, Chiloporella Ulrich, Cœlolema Ulrich, Crepipora Ulrich, Favositella Etheridge and Foord, Scenellopora Ulrich, Spatiopora Ulrich.

Family FISTULIPORIDÆ Ulrich.

Chilotrypa Ulrich, Fistalipora McCoy, Fistuliporella Simpson, Meekopora Ulrich.

## Order TREPOSTOMATA.

## Suborder AMALGAMATA.

Family MONTICULIPORIDÆ Nicholson.

Aspidopora Ulrich, Atactoporella Ulrich, Homotrypa Ulrich, Homotrypella Ulrich, Mesotrypa Ulrich, Monticulipora D'Orbigny, Orbignyella Ulrich and Bassler, Peronopora Nicholson, Prasopora Nicholson and Etheridge.

Family HETEROTRYPIDÆ Ulrich

Atactopora Ulrich, Cyphotrypa Ulrich and Bassler, Dekayella Ulrich, Dekayia Edwards and Haime, Heterotrypa Nicholson, Leptotrypa Ulrich, Petigopora Ulrich, Stigmatella Ulrich and Bassler.

Family CONSTELLARIIDÆ Ulrich.

Constellaria Dana, Dianulites Eichwald, Idiortrypa Ulrich, Nicholsonella Ulrich, Stellipora Hall.

Family BATOSTOMELLIDÆ Ulrich.

Batostomella Ulrich, Bythopora Miller and Dyer, Diplostenopora Ulrich and Bassler, Eridotrypa Ulrich, Lioclema Ulrich, Lioclemella Foerste, Stenopora Lonsdale.

Suborder INTEGRATA.

Family AMPLEXOPORIDÆ Ulrich.

Amplexopora Ulrich, Discotrypa Ulrich, Monotrypella Ulrich, Rhombotrypa Ulrich and Bassler.

Family HALLOPORIDÆ Bassler.

Calloporella Ulrich, Hallopora Bassler, Halloporina Bassler.

Family TREMATOPORIDÆ Ulrich.

Anaphragma Ulrich and Bassler, Batostoma Ulrich, Diplotrypa Nicholson, Hemiphragma Ulrich, Monotrypa Nicholson, Stromatotrypa Ulrich, Trematopora Hall.

Order CRYPTOSTOMATA.

Family PHYLLOPORINIDÆ Ulrich.

Chasmatopora Eichwald, Pseudohornera Roemer.

Family FENESTELLIDÆ King.

Fenestella Lonsdale, Helicopora Claypole, Hemitrypa Phillips, Loculipora Hall, Polypora McCoy, Ptiloporella Hall, Semicoscinium Prout, Thamniscus King.

Family ARTHROSTYLIDÆ Ulrich.

Arthroclema Billings, Arthrostylus Ulrich, Glauconome Goldfuss, Helopora Hall, Nematopora Ulrich, Sceptropora Ulrich.

Family RHABDOMESONTIDÆ Vine.

Acanthoclema Hall.

Family PTILODICTYONIDÆ Ulrich.

Arthropora Ulrich, Clathropora Hall, Escharopora Hall, Graptodictya Ulrich, Phænopora Hall, Ptilodictya Lonsdale.

Family STICTOPORELLIDÆ Nickles and Bassler.

Ptilotrypa Ulrich, Stictopora Hall, Stictoporella Ulrich, Tæniodictya Ulrich.

Family RHINIDICTYONIDÆ Ulrich.

Dicranopora Ulrich, Eurydictya Ulrich, Goniotrypa Ulrich, Pachydictya Ulrich, Phyllodictya Ulrich, Rhinidictya Ulrich, Trigonodictya Ulrich.

Family RHINOPORIDÆ Ulrich.

Diamesopora Hall, Lichenalia Hall, Rhinopora Hall, Stictotrypa Ulrich.

Order CHEILOSTOMATA.

?Paleschara Hall.

Class BRACHIOPODA.

Order ATREMATA.

Superfamily OBOLACEA.

Family OBOLIDÆ King.

Dicellomus Hall, Elkania Ford, Leptobolus Hall, Lingulella Salter (subgenus Lingulepis Hall), Obolus Eichwald (subgenera, Bræggeria Walcott, Lingulobolus Matthew, Palæobolus Matthew, Westonia Walcott), Paterula Barraude.

## Family TRIMERELLIDÆ Davidson and King.

Dinobolus Hall, Monomorella Billings, Rhinobolus Hall, Trimereila Billings.

## Superfamily LINGULACEA.

## Family LINGULIDÆ Gray.

Lingula Bruguiere (subgenera, Palæoglossa Cockerell, Pseudolingula Mickwitz), Tunaria, Pizarroa and Bistramia Hoek (described as asymmetrical Lingulæ, but probably pelecypods).

## Family LINGULASMATIDÆ Winchell and Schuchert.

Lingulasma Ulrich, Lingulops Hall.

## Order NEOTREMATA.

## Superfamily SIPHONOTRETACEA.

## Family SIPHONOTRETIDÆ Kutorga.

Schizambon Walcott, Siphonotreta Verneuil.

## Superfamily ACROTRETACEA.

## Family ACROTRETIDÆ Schuchert.

Acrothele Linnarsson, Acrotreta Kutorga, Conotreta Walcott, Linnarssonella Walcott.

## Superfamily DISCINACEA.

## Family TREMATIDÆ Schuchert.

Eunoa Clarke, Schizocrania Hall and Whitfield, Trematis Sharpe.

## Family DISCINIDÆ Gray.

Orbiculoidea D'Orbigny, Schizotreta Kutorga.

## Superfamily CRANIACEA.

## Family CRANIIDÆ King.

Crania Retzius, Petrocrania Raymond, Pholidops Hall.

## Order PROTREMATA.

## Superfamily ORTHACEA.

## Family BILLINGSSELLIDÆ Schuchert.

Billingsella Hall and Clarke, Eoorthis Walcott (subgenus Orusia Walcott), Protorthis Hall and Clarke.

## Family ORTHIDÆ Woodward.

Dalmanella Hall and Clarke, Hebertella Hall and Clarke (subgenus Eridorthis Foerste), Orthis Dalman, Orthostrophia Hall (subgenus Schizoramma Foerste), Platystrophia King, Plectorthis Hall and Clarke (subgenera Austinella and Encucloclodema Foerste).

## Family RHIPIDOMELLIDÆ Schuchert.

Bilobites Linnæus, Dinorthis Hall and Clarke (subgenera Plesiomys Hall and Clarke, Valcourea Raymond, Heterorthis Hall and Clarke, Pianodema Foerste, Rhipidomella Ehlert, Schizophoria King).

## Superfamily STROPHOMENACEA.

## Family STROPHOMENIDÆ King.

Christiania Hall and Clarke, Leptæna Dalman, Leptella Hall and Clarke, Mimulus Barrande, Orthidium Hall and Clarke, Pholidostrophia Hall and Clarke, Plectambonites Pander, Rafinesquina Hall and Clarke, Schuchertella Girty, Streptis Davidson, Stropheodonta Hall (subgenera Brachyprion Shaler, Leptostrophia Hall and Clarke, Strophomena Blainville, Strophonella Hall (subgenus Strophoprian Twenhofel), Triplecia Hall (subgenus Cliftonia Foerste).

## Family PRODUCTIDÆ Gray.

Chonetes Fischer.

## Superfamily PENTAMERACEA.

## Family SYNTROPHIDÆ Schuchert.

Clarkella Walcott, Syntrophia Hall and Clarke.

## Family CLITAMBONITIDÆ Winchell and Schuchert.

Clitambonites Pander, Polytoechia Hall and Clarke, Scenidium Hall.

## Family PORAMBONITIDÆ Davidson.

Anastrophia Hall, Camarella Billings, Parastrophia Hall and Clarke, Porambonites Pander.

## Family PENTAMERIDÆ McCoy.

Capellinia Hall and Clarke, Clorinda Barrande, Conchidium Linnæus, Gypidula Hall (subgenus Sieberella Ehlert), Orthotropia Hall and Clarke, Pentamerella Hall, Pentamerus Sowerby, Platymerella Foerste, Stricklandinia Billings, Virgiana Twenhofel.

## Family EICHWALDIDÆ Schuchert.

Dictyonella Hall, Eichwaldia Billings.

## Order TELOTREMATA.

## Superfamily RHYNCHONELLACEA.

## Family PROTORHYNCHIDÆ Schuchert.

Protorhyncha Hall and Clarke.

## Family RHYNCHONELLIDÆ Gray.

Camarotoechia Hall and Clarke (subgenus Stegerhynchus Foerste), Eatonia Hall, Orthorhynchula Hall and Clarke, Rhynchonella Fischer, Rhynchotrema Hall, Rhynchotreta Hall, Uncinulus Bayle, Wilsonia Kayser.

## Superfamily TEREBRATULACEA.

## Family CENTRONELLIDÆ Hall and Clarke.

Centronella Billings, Rensselæria Hall.

## Family PROTOZEUGIDÆ Twenhofel.

Protozeuga Twenhofel.

## Superfamily SPIRIFERACEA.

## Family ATRYPIDÆ Gill.

Atrypa Dalman, Atrypina Hall and Clarke, Catazyga Hall and Clarke, Clintonella Hall and Clarke, Glassia Davidson, Lissatrypa Twenhofel, Zygospira Hall.

## Family CYCLOSPIRIDÆ Schuchert.

Cyclospira Hall and Clarke.

## Family SPIRIFERIDÆ King.

Cyrtia Dalman, Reticularia McCoy (subgenus Prosserella Grabau), Spirifer Sowerby (subgenera Delthyris Dalman, Eospirifer Schuchert).

## Family SUESSIDÆ Waagen.

Cyrtina Davidson.

## Family RHYNCHOSPIRIDÆ Hall and Clarke.

Homœospira Hall and Clarke, Rhynchospira Hall and Clarke, Trematospira Hall.

## Family MERISTELLIDÆ Hall and Clarke.

Hindella Davidson (subgenus Greenfieldia Grabau), Hyattidina Schuchert, Merista Suess, Meristella Hall, Meristina Hall, Meristospira Grabau, Nucleospira Hall, Whitfieldella Hall and Clarke.

## Family CÆLOSPIRIDÆ Hall and Clarke.

Anabaia Clarke, Cœlospira Hall.

## Family ATHYRIDÆ Phillips.

Athyris McCoy.

## Phylum MOLLUSCA.

## Class PELECYPODA.

## Order PRIONODESMACEA.

## Family SOLENOMYIDÆ Gray.

Clinopistha Meek and Worthen, Solenomya Lamarck.

## Family GRAMMYSIDÆ Fischer.

Cuneamya Hall and Whitfield, Edmondia DeKoninck, Grammysia Verneuil, Leptodomus McCoy, Saffordia Ulrich, Sedgwickia McCoy.

## Family CTENODONTIDÆ Dall.

Ctenodonta Salter, Nuculites Conrad, Pyrenomœus Hall.

## Family PARARCIDÆ Ulrich.

Panenka Barrande.

## Family LEDIDÆ Adams.

Clidophorus Hall, Cytherodon Hall.

## Family MEGALODONTIDÆ Zittel.

Megalomus Hall, Plethocardia Ulrich.

## Family CYRTODONTIDÆ Ulrich.

Bodmania Miller, Cyrtodonta Billings, Ischyrodonta Ulrich, Matheria Billings, Ortonella Ulrich, Sowteria Whiteaves, Vanuxemia Billings, Whitella Ulrich.

## Family AVICULIDÆ D'Orbigny.

Actinopteria Hall, Avicula Klein, Cliopteria Williams, Leptodesma Hall, Limoptera Hall, Leiopteria Hall, Palæopecten Williams, Pterinea Goldfuss, Pteronitella Billings, Ptychopteria Hall, Rhombopteria Jackson, Tolmaia Williams.

## Family AMBONYCHIDÆ Miller.

Allonychia Ulrich, Ambonychia Hall, Amphicœlia Hall, Anomalodonta Miller, Anoptera Ulrich, Byssonychia Ulrich, Clionychia Ulrich, Ectenoptera Ulrich, Eridonychia Ulrich, Mytilarca Hall, Opisthoptera Meek, Palæocardia Hall, Plethomytilus Hall, Psilonychia Ulrich, Streptomytilus Kindle and Preger.

- Family CHÆNOCARDIIDÆ Miller.  
 Megambonia Hall.  
 Family CONOCARDIIDÆ Neumayr.  
 Conocardium Brown.  
 Family LYRODESMIDÆ Ulrich.  
 Lyrodesma Conrad.  
 Family PECTINIDÆ Lamarck.  
 Aviculopecten McCoy, ?Palæopteria Whiteaves, Pterinopecten Hall.  
 Family MODIOLOPSIDÆ Fischer.  
 Aristerella Ulrich, Colpomya Ulrich, Corallidomus Whitfield, Cymatonota Ulrich, Endodesma Ulrich, Eurymya Ulrich, Eurymyella Williams, Goniophora Phillips, Modiolodon Ulrich, Modiolopsis Hall, Modiomorpha Hall, Orthodesma Hall and Whitfield, Orthonota Conrad, Parallelodus Branson, Prolobella Ulrich, Psilococoncha Ulrich, Pyanomya Miller, Sphenolium Miller, Whiteavesia Ulrich.

Order ANOMALODESMACEA.

- Family PHOLADELLIDÆ Miller.  
 Physetomya Ulrich, Rhytimya Ulrich.

Order TELEODESMACEA.

- Family CYCLOCONCHIDÆ Ulrich.  
 Allodesma Ulrich, Anodontopsis McCoy, Cycloconcha Miller.  
 Family PLEUROPHORIDÆ Dall.  
 Cypricardinia Hall.  
 Family LUCINIDÆ Fleming.  
 Prolocina Dall.  
 Family PALÆANATIDÆ Miller.  
 Ilionia Billings.

POSITION UNCERTAIN. .

- Orthonotella Miller and Faber (Crustacean?).

Class AMPHINEURA.

Order POLYPLACOPHORA,

- Family GRYPHOCHITONIDÆ Dall.  
 Priscochiton Dall.

Class GASTROPODA.

Order ASPIDOBANCHIA.

Family ACMEIDÆ Dall.

- Archinacella Ulrich and Scofield, Conchopeltis Walcott, Helcionopsis Ulrich and Scofield, Hypseloconus Berkeley, Mctoptoma Phillips, Palæacmæa Hall, Scenella Billings.

Family TRYBLIDIIDÆ Pilsbury.

- Tryblidium Lindström.

Family CYRTOLITIDÆ Ulrich and Scofield.

- Cyrtolites Conrad, Cyrtolitina Ulrich, Microceras Hall, Trigyra Raymond.

Family SINUITIDÆ Bassler.

- Bucanella Meek, Sinuites Koken.



## Family BUCANIIDÆ Ulrich and Scofield.

Bucania Hall, Kokenospira Bassler, Megalomphala Ulrich, Oxydiscus Koken, Phragmolites Conrad, Salpingostoma Roemer, Tetranota Ulrich and Scofield, Tremantus Hall.

## Family BELLEROPHONTIDÆ McCoy.

Bellerophon Montfort, Bucanopsis Ulrich.

## Family CARINAROPSIDÆ Ulrich and Scofield.

Carinaropsis Hall.

## Family PLEUROTOMARIIDÆ D'Orbigny.

Cataschisma Branson, Clathrospira Ulrich and Scofield, Cœlocaulus Ehlert, Ectomaria Koken, Eotomaria Ulrich, Euconia Ulrich, Hormotoma Salter, Liospira Ulrich and Scofield, Lophospira Whitfield, Loxoplocus Fischer, Mourlonia Dekoninek, Murchisonia D'Archiac and Verneuil, Phanerotrema Fischer, Plethospira Ulrich, Pleurotomaria Sowerby, Schizolopha Ulrich, Seelya Ulrich, Sinuoepa Ulrich, Turritoma Ulrich.

## Family EUOMPHALIDÆ Dekoninek.

Ceratopea Ulrich, Eccioliomphalus Portlock, Ecciolioputerus Remele, Euomphalus Sowerby, Helicotoma Salter, Maclurina Ulrich and Scofield, Maclurites Lesueur, Ophileta Vanuxem, Ophiletina Ulrich and Scofield, Pleuronotus Hall, Polygyrata Weller, Straparollina Billings, Straparollus Montfort.

## Family RAPHISTOMIDÆ Ulrich and Scofield.

Euomphalopterus Roemer, Omospira Ulrich, Raphistoma Hall, Raphistomina Ulrich and Scofield, Scalites Emmons.

## Family TURBINIIDÆ Adams.

Omphalotrochus Meek.

## Family TROCHONEMATIDÆ Ulrich.

Acanthonema Grabau, Bucanospira Ulrich, Callonema Hall, Cœnonocheilus Whiteaves, Cyclonema Hall, Cyclora Hall, Dyeria Ulrich, Eunema Salter, Gyronema Ulrich, Holoepa Hall, Pleurotrochus Grabau, Polcumita Clarke and Ruedemann, Streptotrochus Perner, Strophostylus Hall, Trochonema Salter.

## Order CTENOBRANCHIATA.

## Suborder HETEROPODA.

Pelagiella Matthew.

## Suborder PLATYPODA.

## Family LOXONEMATIDÆ Ulrich.

Loxonema Phillips, Meekospira Ulrich.

## Family SUBULITIDÆ Miller.

Cyrtospira Ulrich, Fusispira Hall, Subulites Conrad.

## Family CAPULIDÆ Cuvier.

Diaphorostoma Fischer, Hercynella Barrande, Orthonychia Hall, Platyceras Conrad, Stepotheca Salter, Vallatotheca Foerste.

## UNCERTAIN PLACE.

Clisospira Billings, Matherella Walcott, Omphalopterus Roemer, Pakeopupa Foerste, Pycnomphalus Lindström, Scœvogyra Whitfield.

Order OPISTHOBRANCHIA.

Suborder PTEROPODA.

Family CAVOLINIDÆ Fischer.

Coleoprion Sandberger, Styliola Lesueur.

Family HYOLITHIDÆ Nicholson.

Hyolithes Eichwald, Matthevia Walcott, Pterotheca Salter.

Suborder CONULARIIDA.

Family TENTACULITIDÆ Walcott.

Tentaculites Schlotheim.

Family TORELLELLIDÆ Holm.

Coleolus Hall, Hyolithellus Billings, Salterella Billings.

Family CONULARIIDÆ Walcott.

Conularia Miller, Sphenothallus Hall.

Class CEPHALOPODA.

Subclass TETRABRANCHIATA.

Order NAUTILOIDEA.

Family ENDOCERATIDÆ Hyatt.

Cameroceras Conrad, Cyclendoceras Grabau and Shimer, Endoceras Hall, Narthecoceras Hyatt, Nanno Clarke, Suecoceras Holm, Vaginoceras Hyatt.

Family PILOCERATIDÆ Hyatt.

Clarkoceras Ruedemann, ? Cyrtocerina Billings, Piloceras Salter.

Family CYRTENDOCERATIDÆ Hyatt.

Cyrtendoceras Remele.

Family ASCOCERATIDÆ Barrande.

Ascoceras Barrande, Glossoceras Barrande.

Family MESOCERATIDÆ Hyatt.

Billingsites Hyatt.

Family ORTHOCERATIDÆ McCoy.

Baltoceras Holm, Geisonoceras Hyatt, Orthoceras Breynius.

Family CYCLOCERATIDÆ Hyatt.

Cycloceras McCoy, Dawsonoceras Hyatt, Orygoceras Ruedemann, Protocycloceras Hyatt, Spyroceras Hyatt, Kionoceras Hyatt, Protokionoceras Grabau and Shimer.

Family TAPHYCERATIDÆ Hyatt.

Aphetoceras Hyatt, Barrandeoceras Hyatt, Deltoceras Hyatt, Eurystomites Schröder, Taphyceras Hyatt.

Family TROCHOLITIDÆ Hyatt.

Apsidoceras Hyatt, Discoceras Barrande, Gyroceras Dekoninek, Litoceras Hyatt, Mitroceras Hyatt, Pyncoceras Hyatt, Schroederoceras Hyatt, Trochoceras Barrande, Trocholites Conrad, Trocholiticeras Hyatt.

## Family PLECTOCERATIDÆ Hyatt.

Plectoceras Hyatt, Sphyradoceras Hyatt.

## Family LITUITIDÆ Noetling.

Ancistroceras Ball, Cyclolituities Remele, Lituities Breynius, Rhynchorthoceras Remele.

## Family HALLOCERATIDÆ Hyatt.

Zitteloceras Hyatt.

## Family NAUTILIDÆ Owen.

Nautilus Linnæus.

## Family LOXOCERATIDÆ Hyatt.

Loxoceras McCoy.

## Family ACTINOCERATIDÆ Saemann.

Actinoceras Brown, Cyrtactinoceras Hyatt, Deiroceras Hyatt, Discosorus Hall, Gonioceras Hall, Huronia Stokes, Paractinoceras Hyatt, Tripteroceas Hyatt.

## Family JOVELLANIDÆ Hyatt.

Jovellania Bayle, Tripleuroceras Hyatt.

## Family RIZOCERATIDÆ Hyatt.

Cyrtorizoceras Hyatt, Rizoceras Hyatt.

## Family OOCERATIDÆ Hyatt.

Cyrtoceras Goldfuss, Ooceras Hyatt.

## Family ONCOCERATIDÆ Hyatt.

Cyclostomiceras Hyatt, Eremoceras Hyatt, Meloceras Hyatt, Oncoceras Hall.

## Family POTERIOCERATIDÆ Foord.

Clinoceras Mascke, Poterioceras McCoy, Streptoceras Billings.

## Family TRIMEROCERATIDÆ Hyatt.

Hexameroceras Hyatt, Pentameroceras Hyatt, Septameroceras Hyatt, Trimeroceras Hyatt.

## Family PHRAGMOCERATIDÆ Hyatt.

Gomphoceras Sowerby, Phragmoceras Sowerby, Protophragmoceras Hyatt.

## Phyllum ARTHROPODA.

## Subphyllum BRANCHIATA.

## Class CRUSTACEA.

## Subclass TRILOBITA.

## Order HYPOPARIA.

## Family AGNOSTIDÆ McCoy.

Agnostus Brongniart, Arthrorachis Corda, Lejopyge Corda.

## Family SHUMARDIIDÆ Lake.

Shumardia Billings.

## Family HARPEDIDÆ Corda.

Eoharpes Raymond, Harpes Goldfuss, Harpides Beyrich.

## Family TRINUCLEIDÆ Emmrich.

Cryptolithus Green, Dionide Barrande, Tretaspis McCoy, Trinucleus Murchison.

## Family RAPHIOPHORIDÆ Angelin.

Ampyx Dalman (subgenus Lonchodomas Angelin).

## Order OPISTHOPARIA.

## Family OLENIDÆ Burmeister.

Acantholenus Matthew, Aulacopleura Corda, Conocephalites Zenker, Ctenopyge Linnaarsson, Loganellus Devine, Lonchocephalus Owen, Parabolina Salter, Parabolina Brögger, Parabolinoopsis Hoek, Peltura Milne-Edwards, Ptychoparia Corda, Sphærophthalmus Angelin, Triarthrus Green.

## Family SOLENOPLEURIDÆ Angelin.

Hystricurus Raymond, Solenopleura Angelin.

## Family CERATOPYGIDÆ Raymond.

Ceratopyge Corda.

## Family ELLIPSOCEPHALIDÆ Matthew.

Plethopeltis Raymond.

## Family REMOPLEURIDÆ Corda.

Remopleurides Portlock.

## Family BATHYURIDÆ Walcott.

Bathyurellus Billings, Bathyurus Billings, Bolbocephalus Whitfield, Petigurus Raymond.

## Family ASAPHIDÆ Burmeister.

Asaphellus Callaway, Asaphus Brongniart, Basilicus Salter, Brachyaspis Salter, Gerasaphes Clarke, Hemigyraspis Raymond, Holasaphus Matthew, Illænurus Hall, Isotelooides Raymond, Isotelus DeKay, Megalaspis Angelin, Nileus Dalman, Oygites Tromelin and Lebesconte, Onchometopus Schmidt, Ptychopyge Angelin, Symphysurus Goldfuss, Vogdesia Raymond.

## Family ILLÆNIDÆ Corda.

Bumastus Murchison, Illænoides Weller, Illænus Dalman, Thaleops Conrad.

## Family DIKELOCEPHALIDÆ Miller.

Apatokephalus Brögger, Calvinella Walcott, Conocephalina Brögger, Dikelocephalus Owen, Platycolpus Raymond, Saukia Walcott.

## Family GOLDIIDÆ Raymond.

Goldius Dekoninck.

## Family PROETIDÆ Corda.

Cyphaspis Burmeister, Haploconus Raymond, Proetus Steininger.

## Family LICHADIDÆ Corda.

Amphilichas Raymond, Arctinurus Castelnau, Conolichas Dames, Corydocephalus Corda, Dicranopeltis Corda, Lichas Dalman, Metopolichas Gurich.

## Family ODONTOPLEURIDÆ Burmeister.

Acidaspis Murchison, Ceratocephala Warder, Glaphurus Raymond, Odontopleuar Emmrich.

## Order PROPARIA.

## Family ENCRINURIDÆ Angelin.

Cybeloides Slocom, Encrinurus Emmrich.

## Family CALYMENIDÆ Milne-Edwards.

Calymene Brongniart, Calymenella Bergeron, Frammia Høltedahl, Homalonotus Koenig, Synhomalonotus Pompeckj, Trimerus Green.

## Family CHEIRURIDÆ Salter.

Anacheirus Reed, Ceraurus Barton, Ceraurus Green, Cheirus Beyrich, Deiphon Barrande, Heliomera Raymond, Nieszkowskia Schmidt, Plimerops Raymond, Pseudosphærexochus Schmidt, Sphærexochus Beyrich, Sphærocoryphe Angelin, Staurocephalus Barrande.

## Family PHACOPIDÆ Corda.

Chasmops McCoy, Dalmanites Barrande, Phacopidella Reed, Phacops Emmrich, Pterygometopus Schmidt.

## UNPLACED GENERA.

Anomocare Angelin, Anomocarella Walcott, Arionellus Barrande, Clelandia Cossman, Dolichometopus Angelin, Endymionia Billings, Goniurus Raymond, Holometopus Angelin, Hungaia Walcott, Leiostegium Raymond, Lisania Walcott, Levisia Walcott, Leptoplastus Angelin, Lloydia Vogdes, Menocephalus Owen, Pagodia Walcott, Ptychaspis Hall, Telephus Barrande, Thysanopyge Kayser.

## Class EUCRUSTACEA.

## Superorder BRANCHIOPODA.

## Order NOTOSTRACA.

Eopteria Billings, Euchasma Billings, Ischyria Billings, Ribeirella Shubert and Waagen, Ribeiria Sharpe, Technophorus Miller.

## Superorder OSTRACODA.

## Family LEPERDITIDÆ Jones.

Aparchites Jones, Isochilina Ulrich, Leperditella Ulrich, Leperditia Roualt, Schmidtella Ulrich.

## Family BEYRICHIIDÆ Jones.

Aechmina Jones and Holl, Beyrichia McCoy, Bollia Jones and Holl, Ceratopsis Ulrich, Ctenobolbina Ulrich, Dicranella Ulrich, Dilobella Ulrich, Drepanella Ulrich, Eurychilina Ulrich, Halliella Ulrich, Jonesella Ulrich, Klødenella Ulrich and Bassler, Klødenia Jones and Holl, Macronotella Ulrich, Mesomphalus Ulrich and Bassler, Moorea Jones and Kirkby, Placentula Jones and Holl, Primitia Jones and Holl, Primitiella Ulrich, Scofieldia Ulrich and Bassler, Strepula Jones and Holl, Tetradella Ulrich, Ulrichia Jones.

## Family THILIPSURIDÆ Jones.

Octonaria Jones, Thlipsura Jones and Holl.

## Family CYPRIDÆ Zenker.

Bairdia Bosquet, Bythocypris Brady, Cytheropsis McCoy, Krausella Ulrich, Macrocypris Brady, Pontocypris Sars.

## Family CYTHERELLIDÆ Sars.

Cytherella Jones, Cytherellina Jones and Holl, Pachydomella Ulrich.

Family ENTOMIDÆ Jones.

Elpe Barrande, Entemidella Jones, Entomis Jones.

Family CYPRIDINIDÆ Sars.

Cypridina Milne-Edwards.

POSITION UNCERTAIN.

Faberia Miller.

Superorder CIRRIPEDIA.

Order THORACICA.

Family LEPIDOCOLEIDÆ Clarke.

Lepidocoleus Faber.

Family TURRILEPADIDÆ Clarke.

Turrilepas Woodward.

Family LEPADIDÆ Darwin.

Pollicipes Leach.

Superorder MALACOSTRACA.

Division PHYLLOCARIDA.

Family CERATIOCARIDÆ Salter.

Caryocaris Salter, Ceratiocaris McCoy.

Family ECHINOCARIDÆ Clarke.

Aristozoe Barrande, Emmelezoe Jones and Woodward.

Class ARACHNIDA.

Subclass MEROSTOMATA.

Order SYNXIPHOSURA.

Family HEMIASPIDÆ Zittel.

Pseudoniscus Nieszkowski.

Order EURYPTERIDA.

Family EURYPTERIDÆ Burmeister.

Dolichopterus Hall, Echinognathus Walcott, Eurypterus Dekay, Eusarcus Grote and Pitt, Megalograptus Miller, Onychopterus Clarke and Ruedemann, Stylonurus Page (subgenera Ctenopterus Clarke and Ruedemann and Drepanopterus Laurie), Tylopterus Clarke and Ruedemann.

Family PTERYGOTIDÆ Lankester.

Hughmilleria Salter, Pterygotus Agassiz.

Subclass EMBOLOBRANCHIATA.

Order SCORPIONIDA.

Proscorpius Whitfield.

Phyllum VERTEBRATA.

Class PISCES.

Astraspis Walcott, Ctenopleuron Matthews, Cyathaspis Lankester, Dictyorhabdus Walcott, Eriptychius Walcott, Onchus Agassiz, Palæaspis Clappole.

FISH PLATES AND TEETH? (CONODONTS).

Drepanodus Pander, Polygnathus Hinde, Prioniodus Pander, Distacodus Hinde.

## PLANT KINGDOM.

## ALGÆ, etc.

Buthograptus Hall (alga).  
 Callithamnopsis Whitfield (alga).  
 Chætocladus Whitfield (alga).  
 Corematocladus Ruedemann (alga).  
 Cryptozoon Hall (alga).  
 Girvanella Nicholson and Etheridge (alga).  
 Nematophycus Carruthers.  
 Oldhamia Forbes (alga?).  
 Peronosporites Smith.  
 Phytopsis Hall  
 Primicorallina Whitfield (alga).  
 Protostigma Lesquereux.  
 Sphærococcites Sternberg.  
 Solenopora Billings (alga).  
 Sphenophyllum Koenig.  
 Sphenophycus Ruedemann (alga).  
 Wingia Seely (possibly algal in part).  
 See also under Sponges for other possible algæ.

## "FUCOIDS."

Arthraria Billings.  
 Blastophycus Miller and Dyer.  
 Boliviana Salter.  
 Buthotrephis Hall.  
 Chondrites Sternberg.  
 Cruziana D'Orbigny.  
 Dactylophycus Miller and Dyer.  
 Discophycus Walcott.  
 ?Discophyllum Hall.  
 Dystactophycus Miller.  
 Heliophycus Miller and Dyer.  
 Ichnophycus Hall.  
 Licrophycus Billings.  
 Lockeia James.  
 Palæophycus Hall.  
 Rusophycus Hall.  
 Trichophycus Miller and Dyer.





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Retiolites .....	1410	Scyphocrinus .....	1412
Rhabdaria .....	1408	Sedgwickia .....	1419
Rhaphanocrinus .....	1412	Seelya .....	1421
Rhinidictya .....	1416	Semicoscinium .....	1416
Rhinobolus .....	1417	Septamerocheras .....	1423
Rhinopora .....	1416	Serpulites .....	1411
Rhipidomella .....	1417	Shumardia .....	1423
Rhizograptus .....	1410	Siderocrinus .....	1412
Rhombodictyon .....	1408	Sieberella .....	1418
Rhombopteria (subgenus Newsom- ella) .....	1419	Sigmagraptus .....	1410
Rhombotrypa .....	1416	Sinuities .....	1420
Rhopalonaria .....	1415	Sinuoepa .....	1421
Rhynchonella .....	1418	Siphonocrinus .....	1412
Rhynchorthoceras .....	1423	Siphonotreta .....	1417
Rhynchospira .....	1419	Solenomya .....	1419
Rhynchotrema .....	1418	Solenopleura .....	1424
Rhynchotreta .....	1418	Solenopora .....	1427
Rhytimya .....	1420	Sowteria .....	1419
Ribeiria .....	1425	Spatiopora .....	1415
Ribeirella .....	1425	Sphærexochus .....	1425
Rizoceras .....	1423	Sphærococcites .....	1427
Romingeria .....	1409	Sphærocoryphe .....	1425
Rosenella .....	1409	Sphærocystites .....	1411
Rusophycus .....	1427	Sphærophthalmus .....	1424
Sabellarites .....	1411	Sphenolium .....	1420
Saccocrinus .....	1413	Sphenophycus .....	1427
Saccospongia .....	1407	Sphenophyllum .....	1427
Særichnites .....	1411	Sphenothallus .....	1422
Saffordia .....	1419	Sphyradoceras .....	1423
Sagenocrinus .....	1413	Spirifer (subgenera Delthyris and Eospirifer) .....	1419
Salpingostoma .....	1421	Spirorbis .....	1411
Salterella .....	1422	Spyroceras .....	1422
Saukia .....	1424	Squamaster .....	1414
Sævogyra .....	1421	Staurocephalites .....	1410
Scalites .....	1421	Staurocephalus .....	1425
Scenella .....	1420	Staurograptus .....	1410
Scenellopora .....	1415	Stegerhyncus .....	1418
Scenidium .....	1418	Stelidiocrinus .....	1412
Sceptropora .....	1416	Steliella .....	1408
Schizambon .....	1417	Stellipora .....	1415

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Stenopora.....	1416	Tæniaster.....	1414
Stenotheca.....	1421	Tæniodictya.....	1416
Stephanella.....	1407	Tanaocrinus.....	1413
Stephanocrinus.....	1413	Tarphyceras.....	1422
Stictopora.....	1416	Technophorus.....	1425
Stictoporella.....	1416	Teganium.....	1408
Stictotrypa.....	1416	Telephus.....	1425
Stigmatella.....	1415	Temnocrinus.....	1413
Stomatopora.....	1415	Temnograptus.....	1410
Straparollina.....	1421	Tentaculites.....	1422
Straparollus.....	1421	Teratichnus.....	1411
Streptaster.....	1412	Tetracystis.....	1411
Streptelasma.....	1408	Tetradella.....	1425
Streptis.....	1418	Tetradium.....	1409
Streptoceras.....	1423	Tetragraptus.....	1410
Streptomytilus.....	1419	Tetranota.....	1421
Streptosolen.....	1407	Thalamocrinus.....	1414
Streptospongia.....	1407	Thaleops.....	1424
Streptotrochus.....	1421	Thamniscus.....	1416
Strepula.....	1425	Thamnograptus.....	1410
Striatopora.....	1409	Thecia.....	1409
Stribalocystites.....	1411	Thlipsura.....	1425
Stricklandinia.....	1418	Thysanopyge.....	1425
Stromatocerium.....	1409	Tolmaia.....	1419
Stromatopora.....	1409	Trachomatichnus.....	1411
Stromatoporella.....	1409	Trachyum.....	1407
Stromatotrypa.....	1416	Tremanotus.....	1421
Strombodes.....	1408	Trematis.....	1417
Stropheodonta (subgenus Brachy- prion).....	1418	Trematocystis.....	1411
Strophograptus.....	1410	Trematopora.....	1416
Strophomena.....	1418	Trematospira.....	1419
Strophonella (subgenus Stropho- prion).....	1418	Tretaspis.....	1424
Strophoprion.....	1418	Triarthrus.....	1424
Strophostylus.....	1421	Trichophycus.....	1427
Strotospongia.....	1407	Trichospongia.....	1408
Stylaræa.....	1409	Trigonodictya.....	1416
Styliola.....	1422	Trigonograptus.....	1410
Stylodictyon.....	1409	Trigyra.....	1420
Stylonurus (subgenera Ctenopte- rus and Drepanopterus).....	1426	Trimerella.....	1417
Subulites.....	1421	Trimeroceras.....	1423
Succoceras.....	1422	Trimerocystis.....	1411
Symphysurus.....	1424	Trimerus.....	1425
Synbathocrinus.....	1423	Trinuclens.....	1424
Syndyograptus.....	1410	Triplecia.....	1428
Synhomalonotus.....	1425	Tripleuroceras.....	1423
Syntrophia.....	1418	Tripteroceras.....	1423
Syringolites.....	1407	Trochoceras.....	1422
Syringopora (subgenus Drymo- pora).....	1409	Trocholites.....	1422
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Turrilepas.....	1426	Walcottia.....	1411
Turritoma.....	1421	Westonia.....	1416
Tylopterus.....	1426	Whiteavesia.....	1420
Ulrichia.....	1425	Whitella.....	1419
Uncinulus.....	1418	Whitfieldella.....	1419
Urasterella.....	1414	Wilsonia.....	1418
Vaginoceras.....	1422	Wingia.....	1427
Valcourea.....	1417	Xenocrinus.....	1413
Vallatotheca.....	1421	Zaphrentis.....	1408
Vanuxemia.....	1419	Zittelella.....	1407
Vermipora.....	1409	Zitteloceras.....	1423
Vinella.....	1415	Zophocrinus.....	1412
Virgiana.....	1418	Zygospira.....	1418

# FAUNAL LISTS OF AMERICAN OZARKIAN TO LOWEST HELDERBERGIAN.

## OZARKIAN FAUNAS.

### OZARKIAN OF UPPER MISSISSIPPI VALLEY.

(Oneota=O.; Mendota=M.)

- Archinacella similis* (Whitfield). (M.)  
*Ascoceras gibberosum* Sardeson. (O.)  
*Billingsella coloradoensis* (Shumard). (O.)  
*Climactichnites fostri* Todd (Upper Cambrian?).  
*Climactichnites wilsoni* Todd (Upper Cambrian?).  
*Cyrtoceras dresbachense* Sardeson. (O.)  
*Cyrtoceras loculosum* Hall. (O.)  
*Cyrtoceras luthi* Calvin. (O.)  
*Cyrtoceras(?) winonicum* Sardeson. (O.)  
*Euomphalus winonensis* Sardeson. (O.)  
*Hypseloconus recurvus* (Whitfield). (M.)  
*Hilanurus convexus* Whitfield. (M.)  
*Lingulella mosia* (Hall). (O.)  
*Murchisonia?? pufilla* Sardeson. (O.)  
*Obolus dolatus* (Sardeson). (O.)  
*Ophileta alturensis* Sardeson. (O.)  
*Piloceras corniculum* Sardeson. (O.)  
*Platycolpus barabuensis* (Whitfield). (M.)  
*Platycolpus catoni* (Whitfield). (M.)  
*Raphistoma leiosomellum* Sardeson. (O.)  
*Raphistoma lewistonense* Sardeson. (O.)  
*Raphistoma minnesotense* (Owen). (O.)  
*Raphistoma multivolatum* Calvin. (O.)  
*Raphistoma oweni* Sardeson. (O.)  
*Raphistoma paucivolatum* Calvin. (O.)  
*Raphistoma pepinense* (Meek). (O.)  
*Seceogyra elevata* Whitfield. (M.)  
*Seceogyra obliqua* Whitfield. (M.)  
*Seceogyra swezeyi* Whitfield. (M.)  
*Sinuopea obesa* (Whitfield). (O.)  
*Sinuopea strongi* (Whitfield). (O.)  
*Sinuopea turgida* (Hall). (O.)  
*Straparollus claytonensis* Calvin. (O.)  
*Straparollus intralobatus* Sardeson. (O.)  
*Straparollus pristiniiformis* Calvin. (O.)  
*Tryblidium barabuensis* (Whitfield). (M.)  
*Tryblidium retrorsum* (Whitfield). (M.)

### OZARKIAN OF MIDDLE APPALACHIAN VALLEY. (? UPPER CAMBRIAN)

(Potsdam=P.; Kittatiny=K.; Hoyt=H.; Conococheague=C.)

- Anomocare parvula* Weller. (K.)  
*Calvinella newtonensis* (Weller). (K.)  
*Climactichnites wilsoni* Logan. (P.)  
*Conocephalina whitehallensis* (Walcott). (P.)  
*Cryptozoon bassleri* Wieland.  
*Cryptozoon proliferum* Hall. (H.)  
*Dikelocephalus harii* (Walcott). (H.)  
*Dikelocephalus tribulis* (Walcott). (H.)  
*Eoorthis newtonensis* (Weller). (K.)  
*Hyalithellus papillatus* Walcott. (P.)  
*Hyalithes gibbosus* Hall and Whitfield. (P.)

- Lingulella (Lingulepis) acuminata* (Conrad). (H., P.)  
*Lingulella prima* (Conrad). (P.)  
*Lonchocephalus calciferus* (Walcott). (K., H.)  
*Matherella saratogensis* (Walcott). (H.)  
*Matthavia variabilis* Walcott. (H.)  
*Obolus (Westonia) stoneanus* (Whitfield). (K.)  
*Pagodia seelyi* Walcott. (P.)  
*Palaeomaxa typica* Hall and Whitfield. (H.)  
*Pelagiella hoyti* (Walcott). (H.)  
*Pelagiella minutissima* (Walcott). (H.)  
*Plethopeltis saratogensis* (Walcott). (H., K.)  
*Protichnites alternans* Owen. (P.)  
*Protichnites lineatus* Owen. (P.)  
*Protichnites loganensis* (Marsh). (P.)  
*Protichnites multinotatus* Owen. (P.)  
*Protichnites septemnotatus* Owen. (P.)  
*Ptychaspis speciosus* Walcott. (H.)  
*Ptychoparia blairi* Weller. (P.)  
*Ptychoparia matheri* Walcott. (P.)  
*Ptychoparia minuta* (Bradley). (P.)  
*Ptychoparia newtonensis* Weller. (K.)  
*Saukia stosi* Walcott. (C.)  
*Scolithus canadensis* Billings. (P.)  
*Scolithus linearis?* Haldeman. (P.)  
*Solenopleura jerseyensis* (Weller). (K.)  
*Tryblidium cornutaforme* (Walcott). (H.)

### OZARKIAN (LITTLE FALLS) OF NEW YORK.

- Cryptozoon proliferum* Hall. (Base of Little Falls.)  
*Helicotoma uniangulata* (Hall). (Chert bed at top.)  
*Holopea ditucula* Hall. (Chert bed at top.)  
*Holopea raymondia* Cleland. (Chert bed at top.)  
*Holopea? voluta* Cleland. (Chert bed at top.)  
*Lingulepis acuminata* Conrad. (Base of Little Falls.)  
*Sinuopea turgida* (Hall). (Chert bed at top.)  
*Tryblidium patulum* Cleland. (Chert bed at top.)

### OZARKIAN? (ERRATICS IN LEVIS) POINT LEVIS, QUEBEC.

- Acrotreta ovalis* Walcott  
*Agnostus americanus* Billings.  
*Agnostus canadensis* Billings.  
*Agnostus orion* Billings.  
*Anacheirus? apollo* (Billings).  
*Anomocarella belli* (Billings).  
*Anomocarella oweni* (Billings).  
*Anomocarella planifrons* (Billings).  
*Apatokephalus corax* (Billings).  
*Arionellus? cylindricus* Billings.  
*Arionellus subclavatus* Billings.  
*Bathyurellus litoreus* Billings.  
*Bathyurellus rarus* Billings.  
*Calathium? pannosum* Billings.  
*Conocephalina? cristata* (Billings).  
*Conocephalina megalops* (Billings).  
*Cyrtoceras aethes* Billings.

- Elkania ida* (Billings).  
*Eopteria? ornata* Billings.  
*Hebertella battis* (Billings).  
*Helicotoma misera* Billings.  
*Holopca leiosoma* Billings.  
*Hungaria magnifica* (Billings).  
*Leptella decipiens* (Billings).  
*Leptella sordida* (Billings).  
*Levisia nasuta* Walcott.  
*Levisia richardsoni* Walcott.  
*Lingulella iris* (Billings).  
*Lisania? hisingcri* (Billings).  
*Lloydia bituberculatus* (Billings).  
*Lloydia oblongus* (Billings).  
*Loganellus logani* (Devine).  
*Lophospira jessica* (Billings).  
*Megalaspis gonivurus* (Billings).  
*Menocephalus globosus* Billings.  
*Menocephalus salteri* Devine.  
*Menocephalus sedgwicki* Billings.  
*Metoptoma?? anomala* Billings.  
*Metoptoma?? augusta* Billings.  
*Metoptoma melissa* Billings.  
*Murchisonia? sylvia* Billings.  
*Ophileta profunda* Billings.  
*Orthidium gemmicula* (Billings).  
*Orthis? apicalis* (Billings).  
*Orthis(?) eudocia* Billings.  
*Orthis euryone* Billings.  
*Orthis(?) mycale* Billings.  
*Orthis pandariana* Hall and Clarke.  
*Orthis(?) tritonia* Billings.  
*Orthoceras autolytus* Billings.  
*Palæacmæa orphyne* (Billings).  
*Platycolpus affinis* (Billings).  
*Platycolpus capax* (Billings).  
*Platycolpus dubius* (Billings).  
*Plethopeltis armatus* (Billings).  
*Pleurotomaria postumia* Billings.  
*Pleurotomaria (Euconia?) quebecensis* (Billings).  
*Pleurotomaria rotundispira* Billings.  
*Pleurotomaria (Eccyliomphalus?) vagrans* (Billings).  
*Pseudosphærezochus? cryx* (Billings).  
*Ptychaspis? pauper* (Billings).  
*Ptychaspis? slectus* (Billings).  
*Ptychaspis sesostris* (Billings).  
*Ptychoparia? devinei* (Billings).  
*Ptychoparia zenkeri* (Billings).  
*Scenella? venillia* (Billings).  
*Seelya cassandra* (Billings).  
*Synphyrus illænoideus* (Billings).  
*Syntrophia arachne* (Billings).  
*Syntrophia arcthusa* Billings.  
*Tryblidium hyrie* (Billings).
- CANADIAN FAUNAS.
- CANADIAN OF THE APPALACHIAN REGION.
- (Phillipsburg, Quebec=P.; Beekmantown, New York=B.; Fort Cassin, Vermont=C.; Tribes Hill formation=T. II. The symbols D1-D4 and E refer to the divisions of the Beekmantown. Species unplaced in the general section are followed by the locality.)
- Aphroceras attenuatum* Hyatt. (P.)  
*Aphroceras farnsworthi* (Billings). (P.) (D4.)  
*Archinacella pileolum* (Whitfield). (B.) (D1.)  
*Archinacella simplex* (Billings). (Ontario.)
- Asaphellus gyrocantus* Raymond. (T. H.; New Jersey.)  
*Asaphus? curiosus* Billings. (Quebec.)  
*Asaphus(?) pelops* Billings. (Quebec.)  
*Baltoceeras(?) pusillum* Ruedemann. (C.)  
*Bathyrellus expansus* Billings. (Quebec.)  
*Bathyurus angelini* Billings. (Quebec.)  
*Bathyurus arcuatus* Billings. (Quebec.)  
*Bathyurus glandicephalus* Whitfield. (C.) (E.)  
*Bathyurus perkinsi* Whitfield. (Vermont.) (D4.)  
*Bathyurus taurifrons* Dwight. (Rochdale County, N. Y.)  
*Bellerophon calcifer* Cleland. (T. H.)  
*Bellerophon subovatus* Cleland. (T. H.)  
*Billingsella dice* Walcott. (Vermont.)  
*Billingsella(?) primordialis* (Whitfield). (C.) (D4.)  
*Bolbocephalus seelyi* (Whitfield). (C., B.) (D4.)  
*Bolbocephalus? truncatus* Whitfield. (C.) (D4.)  
*Bucania tripla* (Whitfield). (Vermont.) (E.)  
*Camarella breviplicata* Billings. (Quebec.)  
*Camarella(?) costata* Billings. (Quebec.)  
*Camarella polita* Billings. (Quebec.)  
*Cameroceras (Proterocameroceras) brainerdi* (Whitfield). (C.) (D4.)  
*Cameroceras marcoui* (Barrande). (P.)  
*Ceratopca keithi* Ulrich. (Va., Tenn., Md.)  
*Ceraurus?? solitarius* Billings. (Quebec.)  
*Clelandia parabola* (Cleland). (T. H.)  
*Clisospira curiosa* Billings. (Quebec.)  
*Clisospira lirata* Whitfield. (C.) (D4.)  
*Cryptozoon lachutense* Dawson. (Quebec.)  
*Cryptozoon saziroscum* Seely. (B.)  
*Cryptozoon stecli* Seely. (New York, etc.) (B.)  
*Cryptozoon wingi* Seely. (Vermont.)  
*Cyclonema phædra* Billings. (Quebec.)  
*Cyclostomiceras cassinense* (Whitfield). (C.) (D4.)  
*Cyclostomiceras minimum* (Whitfield). (C.) (D4.)  
*Cyrtodoceras(?) priscum* Ruedemann. (B.) (D.)  
*Cyrtoceras? acinacellum* Whitfield. (C.) (D4.)  
*Cyrtoceras aristides* Billings. (P.) (D2.)  
*Cyrtoceras beckmanense* Whitfield. (B.) (D1.)  
*Cyrtoceras? confertissimum* (Whitfield). (C.) (D4.)  
*Cyrtoceras? dactyloides* Dwight. (Rochdale, N. Y.)  
*Cyrtoceras gracilis* Cleland. (T. II.)  
*Cyrtoceras microscopicum* Dwight. (Rochdale, N. Y.)  
*Cyrtoceras missisquoi* Billings. (P.) (D2.)  
*Cyrtoceras vassarina* Dwight. (Rochdale, N. Y.)  
*Cyrtolites sinuatus* Hall and Whitfield. (New Jersey.)  
*Dalmanella electra* (Billings). (New Jersey.)  
*Dalmanella(?) evadne* (Billings). (C.) (D4.)  
*Dalmanella holiensis* Cleland. (T. H.)  
*Dalmanella macleodi* (Whitfield). (B.) (D1.)  
*Dalmanella wemplei* Cleland. (T. II.)  
*Dictyonema furciferum* Ruedemann. (Pennsylvania.)  
*Dikelocephalus? missisquoi* Billings. (P.) (D2.)  
*Dolichometopus(?) rarus* Billings. (Oxford, Canada.)  
*Eccyliomphalus calciferus* (Whitfield). (B.) (D1.)  
*Eccyliomphalus (Orthostoma) canadensis* (Billings). (P.)  
*Eccyliomphalus compressus* (Whitfield). (Vermont.)  
*Eccyliomphalus intortus* (Billings). (P.)  
*Eccyliomphalus (Orthostoma) lituiformis* (Whitfield). (C.) (D4.)

- Eccyliomphalus multiseptarius* (Cleland). (T. II.)  
*Eccyliomphalus perkinsi* (Whitfield). (C.) (D4.)  
*Eccyliomphalus priscus* (Whitfield). (B.) (D1.)  
*Eccyliomphalus spiralis* (Billings). (P.)  
*Eccyliomphalus subellipticus* Weller. (New Jersey.)  
*Eccylopterus disjunctus* (Billings). (Ontario.)  
*Eccylopterus triangulus* (Whitfield). (Vermont.) (D4.)  
*Eccylopterus volutatus* (Whitfield). (C.) (D4.)  
*Ectomaria missisquoi* (Billings). (Quebec.)  
*Edmondia?* *arcuata* Cleland. (New York.)  
*Endoceras(?) champlainensis* Ruedemann. (B.) (D.)  
*Endoceras montrealense* (Billings). (Quebec, Canada.) (D4.)  
*Eoharpes cassinensis* (Whitfield). (Vermont.) (D4.)  
*Eoharpes granti* (Billings). (Quebec.)  
*Eopteria richardsoni* Billings. (Quebec.)  
*Eotomaria?* *cassina* (Whitfield). (C.) (D4.)  
*Faunia beckmanensis* (Whitfield). (B.) (D1.)  
*Euomphalus?* *circumcliratus* Whitfield. (C.) (D4.)  
*Eurystomites accelerans* Ruedemann. (Valcour, N. Y.) (D4.)  
*Eurystomites amplectens* Ruedemann. (Valcour, N. Y.) (D4.)  
*Eurystomites imperator* (Billings). (P.) (D4.)  
*Eurystomites kelloggi* (Whitfield). (C.) (D4.)  
*Eurystomites rotundus* Hyatt. (C.) (D4.)  
*Eurystomites virginianus* Hyatt. (Virginia; C.)  
*Fusispira obsca* (Whitfield). (C.) (D4.)  
*Fusispira psyche* (Billings). (Quebec.)  
*Goniurus caudatus* (Billings). (C.)  
*Goniurus elongatus* Raymond. (P.)  
*Goniurus perspicator* (Billings). (Quebec.)  
*Harpides(?) desertus* Billings. (Quebec.)  
*Helicotoma similis* Whitfield. (Vermont.) (E.)  
*Hemigyaspis colliciana* Raymond. (Pennsylvania.)  
*Holasaphus moorci* Raymond. (Quebec.)  
*Holopca obscura* (Hall). (Fort Plain, N. Y.)  
*Holopca ovalis* Billings. (Quebec.)  
*Holopca proserpina* Billings. (P.) (D4.)  
*Hormotoma?* *artemesia* (Billings). (Ontario; Virginia.)  
*Hormotoma?* *cassina* (Whitfield). (C.) (D4.)  
*Hormotoma confusa* (Whitfield). (Vermont.) (E.)  
*Hormotoma gracilens* (Whitfield). (B.) (D1.)  
*Hormotoma obliqua* (Whitfield). (C.) (D4.)  
*Hormotoma resta* (Billings). (P.)  
*Hystericurus conicus* (Billings). (Canada; C.) (D4.)  
*Hystericurus cordai* (Billings). (P.)  
*Hystericurus crotalifrons* (Dwight). (Rochdale, N. Y.)  
*Illænus incertus* Billings. (Quebec.)  
*Illænus simulator* Billings. (Quebec.)  
*Isochilina cristata* (Whitfield). (Vermont.) (E.)  
*Isochilina gregaria* Whitfield. (C.) (E.)  
*Isochilina ottawa* (Jones). (Quebec.)  
*Isochilina seelyi* (Whitfield). (Vermont.) (E.)  
*Isoteloidea whitfieldi* Raymond. (C.) (D4.)  
*Kionoceras laqueatum* (Hall). (New York.)  
*Leperditia anna* Jones. (Quebec.)  
*Leperditia canadensis* Jones. (Quebec.)  
*Leperditia nana* (Jones). (Quebec.)  
*Lingula mantelli* Billings. (Quebec.)  
*Lingula?* *orata* Cleland. (T. H.)  
*Lingulella (Lingulepis) acuminata sequens* Walcott. (Essex County, N. Y.)  
*Liospira prævia* (Whitfield). (B.) (D1.)  
*Liospira strigata* Collie. (Pennsylvania.)  
*Lloydia saffordi* (Billings). (P.)  
*Lloydia?* *strenuus* (Billings). (Quebec.)  
*Lophospira calcifera* Whitfield. (B.) (D1.)  
*Maclurites acuminatus* (Billings). (C.) (D4.)  
*Maclurites affinis* (Billings). (Vermont.) (D4.)  
*Maclurites matutinus* (Hall). (T. II.)  
*Maclurites oceanus* (Billings). (Virginia.)  
*Maclurites sordidus* (Hall). (C.) (D1.)  
*Monocraterion lesleyi* Prime. (Pennsylvania.)  
*Murchisonia?* *mohawkensis* Cleland. (T. II.)  
*Murchisonia?* *prava* (Whitfield). (C.) (D4.)  
*Nanno primaevus* Whiteaves. (Ontario.)  
*Nautilus?* *pomponius* Billings. (P.) (D4.)  
*Nileus striatus* (Whitfield). (C.) (D4.)  
*Ooceras vasiforme* Dwight. (Rochdale, N. Y.)  
*Ooceras kirbyi* (Whitfield). (B., T. II.) (D1.)  
*Ooceras(?) raei* (Whitfield). (B.)  
*Ophileta abdita* Billings. (P.)  
*Ophileta bella* Billings. (Quebec.)  
*Ophileta compacta* Salter. (Quebec.)  
*Ophileta complanata* Vanuxem. (B., Pa., Md., Va.)  
*Ophileta levata* Vanuxem. (T. II.)  
*Ophileta uniangulata* (Hall). (Saratoga Co., N. Y.)  
*Orthis corinna* Billings. (Quebec.)  
*Orthis hippolyte* Billings. (P.)  
*Orthis(?) minna* Billings. (Quebec.)  
*Orthoceras atticus* Billings. (Quebec.)  
*Orthoceras cataline* Billings. (P.) (D2.)  
*Orthoceras cato* Billings. (P.) (D2.)  
*Orthoceras catulus* Billings. (P.) (D2.)  
*Orthoceras edax* Billings. (Ontario.)  
*Orthoceras glaucus* Billings. (Ontario.)  
*Orthoceras hageri* Hall. (Vermont.)  
*Orthoceras henrietta* Dwight. (Rochdale, N. Y.)  
*Orthoceras ordinatum* Billings. (Ontario.)  
*Orthoceras perscus* Billings. (P.) (E.)  
*Orthoceras?* *primigenium* Vanuxem. (T. II.)  
*Orthoceras repens* Billings. (P.) (D2.)  
*Orthoceras savi* Billings. (P.) (D2.)  
*Orthoceras spissiscriptum* Dwight. (Rochdale, N. Y.)  
*Orthoceras lityrus* Billings. (P.) (D2.)  
*Orthoceras vateri* Billings. (Ontario.)  
*Orthoceras zerxes* Billings. (P.) (E.)  
*Orygoceras cornuoriz* (Whitfield). (C.) (D4.)  
*Oxydiscus macer* (Billings). (Quebec.)  
*Oxydiscus palinurus* (Billings). (Quebec.)  
*Paleophycus beaumarhousense* Billings. (Quebec.)  
*Paleophycus beverlyense* Billings. (Quebec.)  
*Paleophycus funiculus* Billings. (L'Original, Canada.)  
*Paleophycus irregularis* Hall. (Chazy, N. Y.)  
*Paleophycus tubularis* Hall. (T. II.)  
*Petigurus cybe* (Billings). (Quebec.)  
*Petigurus ellipticus* (Cleland). (T. II.)  
*Piloceras amplum* Dawson. (Quebec.)  
*Piloceras explanator* Whitfield. (C.) (D4.)  
*Plethospira arenaria* (Billings). (Quebec; C.) (D4.)  
*Plethospira cassina* (Whitfield). (C.) (D4.)  
*Pleurotomaria arabella* Billings. (Quebec.)  
*Pleurotomaria calcifera* Billings. (Quebec.)  
*Pleurotomaria canadensis* Billings. (Quebec.)  
*Pleurotomaria floridensis* Cleland. (T. II.)

- Pleurotomaria gregaria* Billings. (Quebec.)  
*Pleurotomaria missisquoi* Billings. (P.)  
*Pliomocrops convervus* (Billings). (Quebec.)  
*Pliomocrops salteri* (Billings). (P.)  
*Pliomocrops westoni* (Billings). (Quebec.)  
*Polygyrata hunterensis* (Cleland). (F. H.)  
*Polygyrata sinistra* Weller. (New Jersey.)  
*Polytaechia apicalis* (Whitfield). (C.) (D4.)  
*Primitia logani* (Jones). (Quebec.)  
*Primitia logani leperditioideus* (Jones). (Quebec.)  
*Primitia logani reniformis* (Jones). (Quebec.)  
*Protocycloceras(?) furtivum* (Billings).  
*Protocycloceras lamarcki* (Billings). (B., Quebec, etc.)  
*Protocycloceras whitfieldi* Rudemann. (C.) (D4.)  
*Protorthis? cassinensis* Whitfield. (C.) (D4.)  
*Protorthis? minima* Whitfield. (C.) (D4.)  
*Pycnoceras calciferiforme* Hyatt. (P.)  
*Raphistoma compressum* Whitfield. (C.) (D4.)  
*Raphistoma hortensia* (Billings). (C.) (D4.)  
*Raphistoma obtusum* Cleland. (T. H.)  
*Remopleurides affinis* Billings. (Quebec.)  
*Ribeiria calcifera* Billings. (Quebec.)  
*Ribeiria compressa* Whitfield. (C.) (D4.)  
*Ribeiria? longiuscula* Billings. (Quebec.)  
*Ribeiria? nuculitiformis* Cleland. (T. H.)  
*Ribeiria nuculitiformis equilatera* Cleland. (T. H.)  
*Ribeiria parva* Collie. (Pennsylvania.)  
*Ribeiria turgida* Cleland. (T. H.)  
*Ribeiria ventricosa* Whitfield. (C.) (D4.)  
*Secnella? alta* (Whitfield). (B.) (D1.)  
*Secnella cassinensis* Bassler. (C.) (D4.)  
*Secnella conica* Ulrich and Scofield. (C.) (D4.)  
*Secnella orithyia* (Billings). (P.)  
*Schraderoeras cassinense* (Whitfield). (C.) (D4.)  
*Schraderoeras catoni* (Whitfield). (C.) (D4.)  
*Scolithus minutus* Brainerd and Seely. (Vermont.) (C.)  
*Scelya difficilis* (Whitfield). (C.) (D4.)  
*Scelya ventricosa* Ulrich. (C.) (D4.)  
*Sinuities cassinensis* (Whitfield). (C.) (D4.)  
*Sinuities rossi* (Collie). (Pennsylvania.)  
*Straparollina minima* Whitfield. (Vermont.)  
*Straparollus parvus* Cleland. (T. H.)  
*Symphysurus convervus* (Cleland). (T. H.)  
*Syntrophia(?) armada* (Billings). (P.) (D2.)  
*Syntrophia calcifera* (Billings). (P.)  
*Syntrophia campbelli* Walcott. (Tennessee.)  
*Syntrophia lateralis* (Whitfield). (C.; Fort Hunter, N. Y.; N. J.) (D4, etc.)  
*Syntrophia palmata* Cleland. (T. H.)  
*Tarphyceras champplaincense* (Whitfield). (C.) (D4.)  
*Tarphyceras clarki* Ruedemann. (Valcour, N. Y.) (D4.)  
*Tarphyceras jarnsworthi* (Billings). (P.)  
*Tarphyceras macdonaldi* Hyatt. (Virginia.)  
*Tarphyceras perkinsi* (Whitfield). (C.) (D4.)  
*Tarphyceras scelyi* (Whitfield). (C.) (D4.)  
*Triplexia(?) radiata* Whitfield. (B.) (D1.)  
*Trocholites internistriatus* (Whitfield). (C.) (D4.)  
*Trocholiticeras walcotti* Hyatt. (C.) (D4.)  
*Trochocma exile* Whitfield. (B.) (D1.)  
*Tryblidium? acutum* Whitfield. (B.) (D1.)  
*Tryblidium niobe* (Billings). (P.)  
*Tryblidium ovale* Whitfield. (C.) (D4.)  
*Tryblidium ovatum* Whitfield. (C.) (D4.)  
*Turritoma ada* (Billings). (Quebec.)
- Wingia congregata* Seely. (C.)  
*Wingia discoidea* Seely. (Vermont.)  
*Wingia lapilla* Seely. (Vermont.)
- CANADIAN OF MISSISSIPPI VALLEY AND WESTERN NORTH AMERICA.
- Aphrocera complanatum* Shumard. (Missouri.)  
*Bucanella nana* Meek. (Colorado.)  
*Caryocaris wrighti* Salter. (Arkansas.)  
*Ceratopyge canadensis* Walcott. (Goodsir of British Columbia.)  
*Clarkella montanensis* Walcott. (Montana.)  
*Clarkoceras newton winchelli* (Clarke). (Shakopee of Minnesota.)  
*Cryptozoon giganteum* Chaney. (Shakopee of Minnesota.)  
*Cryptozoon minnesotense* Winchell (Shakopee of Minnesota.)  
*Cryptozoon minnesotense liberatis* Winchell. (Shakopee of Minnesota.)  
*Dendrograptus serpens* Hopkinson. (Nevada.)  
*Dicelomus nanus* (Meek and Hayden). (Wyoming.)  
*Didymograptus euodus* Lapworth.  
*Didymograptus perplexus* Gurley. (Nevada.)  
*Eccyliomphalus gyroceras* (Roemer). (Texas.)  
*Eccyliopterus michleranus* (Hall). (Texas.)  
*Endoceras consuetum* Sardeson. (Shakopee of Minnesota.)  
*Eoorthis desmopleura* (Meek). (Colorado.)  
*Eoorthis desmopleura nympha* Walcott. (Colorado.)  
*Eoorthis wichtaensis* Walcott. (Colorado.)  
*Glossograptus ciliatus horridus* Ruedemann. (Nevada.)  
*Helicotoma(?) peccatonica* Sardeson. (Shakopee of Minnesota.)  
*Hemigyrapis mcconnelli* Raymond. (Goodsir of British Columbia.)  
*Hormotoma argylenis* (Sardeson). (Shakopee of Minnesota.)  
*Hormotoma melaniaformis* (Shumard). (Missouri.)  
*Lingulella? allani* Walcott. (Goodsir of British Columbia.)  
*Lingulella desiderata* (Walcott). (Colorado.)  
*Lingulella moosensis* Walcott. (Goodsir of British Columbia.)  
*Megalaspis gonioerca* (Meek). (Utah.)  
*Murchisoni? carinifera* Shumard (Missouri).  
*Murchisonia ozarkensis* Shumard (Missouri).  
*Obolus discoidea* (Hall and Whitfield). (Utah.)  
*Obolus (Westonia) elongatus* (Walcott). (Utah.)  
*Obolus topcri* Walcott (Colorado).  
*Obolus matinalis* (Hall). (Colorado.)  
*Obolus mollisonensis* Walcott. (Goodsir of British Columbia.)  
*Obolus (Westonia) notchensis* Walcott. (Utah.)  
*Obolus (Westonia) rogersi* Walcott. (Drift, Mass.)  
*Obolus rotundatus* Walcott.  
*Ophileta complanata nana* Meek. (Utah.)  
*Orthoceras colon* White. (Utah.)  
*Orthoceras ozarkense* Shumard. (Missouri.)  
*Phyllograptus loringi* White. (Utah.)  
*Polygyrata polygyrata* (Roemer). (Texas.)  
*Polygyrata rotuliformis* (Meek). (Nevada.)  
*Polygyrata trochiscus* (Meek). (Nevada.)  
*Raphistoma ruidum* Sardeson. (Shakopee of Minnesota.)  
*Raphistoma subplanum* Shumard. (Missouri.)



*Schizambon manitouensis* Walcott. (Colorado.)  
*Straporollus sanctisabæ* (Roemer). (Texas.)  
*Straporollus valvataformis* Shumard. (Missouri.)  
*Subulites exactus* Sardeson. (Shakopee of Minnesota.)  
*Tryblidium repertum* Sardeson. (Shakopee of Minnesota.)

## CANADIAN (LEVIS AND SILLERY) OF QUEBEC.

(Unless otherwise marked all are from the Levis.)

*Acanthodictya hispida* Hinde. (Metis.)  
*Acrothele levisensis* Walcott.  
*Acrothele pretiosa* (Billings). (Levis and Sillery.)  
*Acrothele rotunda* (Nicholson).  
*Agnostus sidebladii* Linnarsson.  
*Arionellus subclavatus* Billings.  
*Buthotrephis pergracilis* Dawson.  
*Callograptus diffusus* (Hall).  
*Callograptus elegans* Hall.  
*Callograptus salteri* Hall.  
*Caryocaris curvilatus* Gurley.  
*Caryocaris oblongus* Gurley.  
*Chondrites metissicus* Dawson. (Metis.)  
*Climacograptus pungens* Ruedemann.  
*Clonograptus abnormis* (Hall).  
*Clonograptus flexilis* (Hall).  
*Clonograptus milesi* (Hall).  
*Clonograptus remotus* (Gurley).  
*Clonograptus rigidus* (Hall).  
*Cryptograptus? antennarius* (Hall).  
*Cyathophycus quebecensis* Dawson. (Metis.)  
*Cyrtoceras dictys* Billings.  
*Cyrtoceras quebecensis* Whiteaves.  
*Cyrtoceras surgens* Barrande.  
*Cyrtocera mercurius* Billings.  
*Dalmanella electra* (Billings).  
*Dalmanella(?) evadne* (Billings).  
*Dawsonia acuminata* Nicholson.  
*Dawsonia monodon* Gurley.  
*Dawsonia tenuistriata* Nicholson.  
*Dawsonia tridens* Gurley.  
*Dendrograptus divergens* Hall.  
*Dendrograptus erectus* Hall.  
*Dendrograptus flexuosus* Hall.  
*Dendrograptus fruticosus* Hall.  
*Dendrograptus gracilis* Hall.  
*Dendrograptus striatus* Hall.  
*Dendrograptus(?) succulentus* Ruedemann.  
*Desmograptus cancellatus* (Hopkinson).  
*Dichograptus octonarius* (Hall).  
*Dictyonema furciferum* Ruedemann.  
*Dictyonema grande* Nicholson.  
*Dictyonema irregulare* Hall.  
*Dictyonema murrayi* Hall.  
*Dictyonema perezile* Gurley.  
*Dictyonema quadrangulare* (Hall).  
*Dictyonema rectilineatum* Ruedemann.  
*Dictyonema robusta* Hall.  
*Didymograptus arcuatus* (Hall).  
*Didymograptus bifidus* (Hall).  
*Didymograptus bipunctatus* Gurley.  
*Didymograptus caduceus nanus* Ruedemann.  
*Didymograptus extensus* (Hall).  
*Didymograptus extenuatus* (Hall).  
*Didymograptus forcipiformis* Ruedemann.  
*Didymograptus furcillatus* Lapworth.  
*Didymograptus indentus* (Hall).

*Didymograptus nitidus* (Hall).  
*Didymograptus patulus* (Hall).  
*Didymograptus pennatulus* (Hall).  
*Didymograptus similis* (Hall).  
*Diplograptus dentatus* (Brongniart).  
*Diplograptus inutilis* Hall.  
*Elkania desiderata* (Billings).  
*Endymionia meeki* (Billings).  
*Eremoceras syphax* (Billings).  
*Goniograptus periferilis* Ruedemann.  
*Goniograptus thureaui* McCoy.  
*Halicondrites conjusus* Dawson and Hinde.  
*Holograptus richardsoni* (Hall).  
*Holometopus angelini* Billings.  
*Hyalostelia? metissica* Dawson. (Metis.)  
*Hystericurus cordai* (Billings).  
*Lasiothrix curvicostata* Dawson and Hinde. (Metis.)  
*Lasiothrix flabellata* Dawson and Hinde. (Metis.)  
*Lciostegium quadratum* (Billings).  
*Leptograptus macrotheca* Gurley.  
*Lingula quebecensis* Billings.  
*Lingulella ellsii* (Walcott). Sillery.  
*Lingulella irene* (Billings).  
*Loganograptus logani* (Hall).  
*Mylonoceras metellus* Billings.  
*Ophileta abdita* Billings.  
*Orthis hippolyte* Billings.  
*Palaeomea quebecensis* (Billings).  
*Palaeosaccus dawsoni* Hinde. (Metis.)  
*Phyllograptus angustifolius* Hall.  
*Phyllograptus anna* Hall.  
*Phyllograptus ilicifolius* Hall.  
*Phyllograptus typus* Hall.  
*Protospongia (Diagoniella) coronata* (Dawson and Hinde). (Metis.)  
*Protospongia (Diagoniella) cyathiformis* (Dawson and Hinde). (Metis.)  
*Protospongia delicatula* Dawson and Hinde. (Metis.)  
*Protospongia mononema* Dawson and Hinde. (Metis.)  
*Protospongia polynema* Dawson and Hinde. (Metis.)  
*Protospongia tetranema* Dawson. (Metis.)  
*Ptilograptus geinitzianus* Hall.  
*Ptilograptus plumosus* Hall.  
*Retiograptus tentaculatus* (Hall).  
*Sabellurites phosphaticus* Dawson. (Metis.)  
*Shumardii granulosa* Billings.  
*Shumardia pusilla* (Sars).  
*Siphonotreta(?) micula* McCoy.  
*Stephanella hindi* Dawson. (Metis.)  
*Syntrophia calcifera* (Billings).  
*Tennograptus noveboracensis* Ruedemann.  
*Tennograptus rumulus* (Hall).  
*Tetragraptus acanthonotus* Gurley.  
*Tetragraptus alatus* (Hall).  
*Tetragraptus amii* (Lapworth).  
*Tetragraptus approximatus* (Nicholson).  
*Tetragraptus crucifer* (Hall).  
*Tetragraptus denticulatus* (Hall).  
*Tetragraptus fruticosus* (Hall).  
*Tetragraptus headi* (Hall).  
*Tetragraptus pendens* Fles.  
*Tetragraptus quadribrachiatus* (Hall).  
*Tetragraptus scerra* (Brongniart).  
*Tetragraptus similis* (Hall).  
*Thamnograptus anna* Hall.  
*Trigonograptus ensiformis* (Hall).

CANADIAN (BRETONIAN) OF CAPE BRETON AND  
NEW BRUNSWICK.

- (C3a=Parabolina zone. C3b=Peltura zone. C3c=Dietyonema zone. C3c2=Asaphellus zone. C3d=Lower Tetragraptus zone. C3e=Lingulella (Lep-tobolus) grandis zone.)
- Acantholenus spiniger* (Matthew). (C3b.)  
*Aerotreta belli* (Matthew). (C3c.)  
*Aerotreta bisecta* Matthew. (C3c.)  
*Aerotreta convexa* Walcott. (C3c.)  
*Agnostus acadicus declivus* Matthew. (C3b.)  
*Agnostus bisectus* Matthew. (C3b.)  
*Agnostus pisiformis* (Linnaeus). (C3a.)  
*Agnostus pisiformis affinis* Matthew. (C3a.)  
*Agnostus pisiformis rugulosus* Matthew. (C3a.)  
*Agnostus pisiformis valida* Matthew. (C3a.)  
*Agnostus trisetus* Salter. (C3b.)  
*Agnostus trisetus germanus* Matthew. (C3b.)  
*Agnostus trisetus ponepunctus* Matthew. (C3b.)  
*Anomocare stenotoides* (Matthew). (C3a.)  
*Asaphellus homfrayi* (Salter). (C3c2.)  
*Bellerophon bretonensis* Matthew. (C3c.)  
*Bellerophon insulae* Matthew. (C3c2.)  
*Bellerophon semisculptus* Matthew. (C3c2.)  
*Bryograptus spinosus* Matthew. (C3c.)  
*Camarella parva* Billings. (C3a.)  
*Clitambonites planus retroflexus* (Verneuil).  
*Clonograptus flexilis* (Hall). (C3d.)  
*Clonograptus? spinosus* Matthew. (C3b.)  
*Conocephalites(?) contiguus* Matthew. (C3a.)  
*Ctenopyge acadica* Matthew. (C3b.)  
*Ctenopyge? lobata* (Brögger). (C3b.)  
*Ctenopyge pecten* (Salter). (C3a.)  
*Ctenopyge spectabilis* (Brögger). (C3b.)  
*Cyclognathus rotundifrons* Matthew. (C3d.)  
*Dalmanella electra* Billings.  
*Dalmanella electra levis* (Matthew). (C3d.)  
*Dalmanella electra major* (Matthew). (C3d.)  
*Dietyonema flabelliforme* (Eichwald). (C3c.)  
*Dietyonema perexile* Gurley. (C3d.)  
*Dietyonema quadrangulare* (Hall). (C3d.)  
*Didymograptus indentus* (Hall). (C3d.)  
*Didymograptus nitidus* (Hall). (C3d.)  
*Didymograptus patulus* (Hall). (C3d.)  
*Eoorthis atava* (Matthew). (C3a.)  
*Eoorthis johannensis* (Matthew). (C3a.)  
*Eoorthis (Orusia) lenticularis* (Wahlenberg). (C3ac.)  
*Eoorthis (Orusia) lenticularis atrypoides* (Matthew) (C3a.)  
*Eoorthis (Orusia) lenticularis lyncoioides* (Matthew) (C3a.)  
*Hemigraspis plana* (Matthew). (C2, C3.)  
*Lejopyge cyclopyge?* (Tullberg). (C3b.)  
*Leptoplastus latus* Matthew. (C3b.)  
*Leptoplastus spinosus* Matthew. (C3b.)  
*Lingulella concinna* Matthew. (C3c.)  
*Lingulella davisii* (McCoy). (C3c2.)  
*Lingulella (Lingulepsis) exigua* (Matthew). (C3b.)  
*Lingulella ferruginea* Salter. (C3c.)  
*Lingulella grandis* (Matthew). (C3e.)  
*Lingulella levis* Matthew. (C3a.)  
*Lingulella levis grandis* Matthew. (C3a.)  
*Lingulella lens* (Matthew). (C3a?)  
*Lingulella lepis* (Salter). (C3a and C3c.)  
*Lingulella minor* (Matthew). (C3d.)  
*Loganograptus logani* (Hall). (C3d.)
- Obolus (Palzobolus) bretonensis* (Matthew). (C3a.)  
*Obolus (Westonia) escaconi* (Matthew). (C3ab.)  
*Obolus refulgens* Matthew. (C3a.)  
*Obolus (Bröggeria) salteri* (Hall). (C3a.)  
*Orthis carausii* Salter. (C3a.)  
*Orthis euryone* Billings. (C3d.)  
*Orthis menapiæ* Hicks. (C3d.)  
*Orthis panderiana* Hall and Clarke. (C3d.)  
*Orthoceras catulus* Billings. (C3d.)  
*Orthoceras priamus* Billings. (C3d.)  
*Parabolina dawsoni* Matthew. (C3b.)  
*Parabolina grandis* (Matthew). (C3b.)  
*Parabolina heres lata* Matthew. (C3b.)  
*Parabolina spinulosa* (Wahlenberg). (C3a.)  
*Parabolinella limitis* (Brögger). (C3c2.)  
*Parabolinella posthuma* Matthew. (C3d.)  
*Parabolinella quadrata* Matthew. (C3c2.)  
*Peltura scarabeoides* (Wahlenberg). (C3b.)  
*Protopeltura acanthura tetracanthura* Matthew. (C3a.)  
*Retiograptus tentaculatus* (Hall). (C3d.)  
*Schizambon priscus* Matthew. (C3c.)  
*Sphærophthalmus alatus* (Boeck). (C3b.)  
*Sphærophthalmus alatus canadensis* Matthew. (C3b.)  
*Sphærophthalmus flagellifer* Angelin. (C3b.)  
*Sphærophthalmus fletcheri* Matthew. (C3b.)  
*Staurograptus dichotomus* Emmons. (C3c.)  
*Styliola corrugata* (Matthew). (C3d.)  
*Styliola minuta* (Matthew). (C3d.)  
*Styliola primæva* Matthew. (C3d.)  
*Tetragraptus quadibrachiatus*. (C3d.)  
*Triarthrus belli* Matthew. (C3c2.)

## CANADIAN (DEEPRILL) OF EASTERN NEW YORK.

- Bryograptus lapworthi* Ruedemann.  
*Bryograptus pusillus* Ruedemann.  
*Callograptus diffusus* (Hall).  
*Callograptus salteri* Hall.  
*Climacograptus pungens* Ruedemann.  
*Clonograptus flexilis* (Hall).  
*Cryptograptus? antennarius* (Hall).  
*Dawsonia monodon* Gurley.  
*Dawsonia tridens* Gurley.  
*Dendrograptus fuscus* Hall.  
*Dendrograptus fluitans* Ruedemann.  
*Dendrograptus(?) succulentus* Ruedemann.  
*Desmograptus intricatus* Ruedemann.  
*Dichograptus octobrachiatus* (Hall).  
*Dietyonema furciferum* Ruedemann.  
*Dietyonema rectilincatum* (Ruedemann).  
*Didymograptus acutidens* Lapworth.  
*Didymograptus bifidus* (Hall).  
*Didymograptus (Isograptus) caduceus* (Salter).  
*Didymograptus cuspidatus* Ruedemann.  
*Didymograptus ellesæ* Ruedemann.  
*Didymograptus extensus* (Hall).  
*Didymograptus filiformis* Tullberg.  
*Didymograptus foretipiformis* Ruedemann.  
*Didymograptus gracilis* Tornquist.  
*Didymograptus incertus* Ruedemann.  
*Didymograptus nanus* Lapworth.  
*Didymograptus nitidus* Hall.  
*Didymograptus nitidus grandis* Ruedemann.  
*Didymograptus patulus* (Hall).  
*Didymograptus similis* (Hall).  
*Didymograptus spinosus* Ruedemann.

*Didymograptus tornquisti* Ruedemann.  
*Diplograptus dentatus* (Brongniart).  
*Diplograptus inutilis* Hall.  
*Diplograptus longicaudatus* Ruedemann.  
*Eunoa acola* Clarke.  
*Glossograptus hystrix* Ruedemann.  
*Goniograptus geometricus* Ruedemann.  
*Goniograptus perfectus* Ruedemann.  
*Goniograptus thureaui* McCoy.  
*Loganograptus logani* (Hall).  
*Phyllograptus angustifolius* Hall.  
*Phyllograptus anna* Hall.  
*Phyllograptus ilicifolius* Hall.  
*Phyllograptus typus* Hall.  
*Ptilograptus geimitzianus* Hall.  
*Ptilograptus plumosus* Hall.  
*Ptilograptus tenuissimus* Ruedemann.  
*Rctiograptus tenticulatus* (Hall).  
*Sigmagraptus praecursor* Ruedemann.  
*Strophograptus trichomanes* Ruedemann.  
*Tennograptus novaboracensis* Ruedemann.  
*Tetragraptus amii* (Lapworth).  
*Tetragraptus clarkei* Ruedemann.  
*Tetragraptus fruticosus* (Hall).  
*Tetragraptus (Etagraptus) lentus* Ruedemann.  
*Tetragraptus pendens* Elles.  
*Tetragraptus pygmaeus* Ruedemann.  
*Tetragraptus quadribrachiatus* (Hall).  
*Tetragraptus serræ* (Brongniart).  
*Tetragraptus similis* (Hall).  
*Tetragraptus taraxacum* Ruedemann.  
*Tetragraptus woodæ* Ruedemann.  
*Trigonograptus ensiformis* (Hall).

CANADIAN (SCHAGHTICOKE) OF EASTERN NEW YORK.  
 (DICTYONEMA FLABELLIFORME BED.)

*Dictyonema flabelliforme* (Eichwald).  
*Staurograptus dichotomus* Emmons.

CANADIAN (ROMAINE) OF MINGAN ISLANDS, QUEBEC.

*Archæoseyphia minganensis* (Billings).  
*Bathyurus acutus* Raymond.  
*Bathyurus angulini* Billings.  
*Billingsella(?) grandæva* (Billings).  
*Euconia ramsayi* (Billings).  
*Eurystomites apollo* Billings.  
*Fusispira calcifer* (Billings).  
*Hormotoma anna* Billings.  
*Lophospira? hermione* (Billings).  
*Nautilus? scrox* Billings.  
*Nipterella paradoxica* (Billings).  
*Orthoceras becki* Billings.  
*Orthoceras deparcum* Billings.  
*Orthoceras indagator* Billings.  
*Orthoceras sordidum* Billings.  
*Pleurotomaria canadensis* Billings.  
*Pleurotomaria miscra* Billings.  
*Raphistomina laurentina* (Billings).  
*Receptaculites calciferus* Billings.  
*Receptaculites? elegantulus* Billings.  
*Rhabdaria fragilis* Billings.  
*Rhabdaria furcata* Billings.  
*Schræderoceras palinurus* (Billings).  
*Trichospongia sericea* Billings.  
*Trochonema tricarinatum* Billings.  
*Tryblidium nycteis* (Billings).

CANADIAN (QUEBEC) OF NEWFOUNDLAND.

(Divisions D.-H. and N.-P., in part.)

*Acrotreta gemma* Billings. (P.)  
*Aphetoceras americanum* Hyatt.  
*Aphetoceras boreale* Hyatt.  
*Bathyuirellus abruptus* Billings. (E., G., H.)  
*Bathyuirellus marginatus* Billings. (F., G., H.)  
*Bathyrurus timon* Billings. (G., H.)  
*Calathium affine* Billings. (G.)  
*Calathium anstedii* Billings. (H.)  
*Calathium formosum* Billings. (G.)  
*Callograptus elegans* Hall. (P.)  
*Cyclotulites americanus* Hyatt.  
*Dalmanella electra* (Billings).  
*Deltoeceras planum* Hyatt.  
*Dolichometopus(?) convexus* Billings. (G.)  
*Dolichometopus(?) gibberulus* Billings. (G.)  
*Eccyliomphalus atlanticus* (Billings). (F., G.)  
*Ectomaria adelina* (Billings). (G.)  
*Endymionia meeki* (Billings). (N., P.)  
*Eopteria typica* Billings. (G.)  
*Euchasma blumenbachii* (Billings). (G., H.)  
*Euconia etna* (Billings). (G., H.)  
*Eurystomites gibbosus* Hyatt.  
*Goniurus caudatus* (Billings). (G., H.)  
*Helicotoma gorgonea* Billings. (H.)  
*Helicotoma proserpina* Billings. (G.)  
*Helicotoma tritonia* Billings. (G.)  
*Holometopus angelini* Billings. (N., P.)  
*Hormotoma agilis* (Billings). (G., H.)  
*Hystericurus conicus* (Billings). (P.)  
*Hystericurus cordai* (Billings). (F., G., H., N.)  
*Lepræditia turgida* Billings. (F., H.)  
*Leptella decipiens* (Billings). (P.)  
*Lingula havelyi* Mathew.  
*Lingula murrayi* Billings.  
*Lingula quebecensis* Billings. (P.)  
*Lingulella bella* (Walcott).  
*Liospira numcria* (Billings). (G.)  
*Litoceras biangulatum* Hyatt.  
*Litoceras versutus* (Billings). (H.)  
*Litoceras whitcavsi* (Hyatt).  
*Lloydia saffordi* (Billings). (P.)  
*Lloydia solitarius* (Billings).  
*Maclurites acuminatus* (Billings). (K., N.) (Che-  
 zyan?)  
*Maclurites affinis* (Billings). (F.)  
*Maclurites oceanus* (Billings). (P., H.)  
*Maclurites psyche* (Billings). (G.)  
*Maclurites rotundatus* (Billings). (G.)  
*Maclurites speciosus* (Billings). (G., M.)  
*Maclurites sylpha* (Billings). (G.)  
*Murchisonia? placida* Billings. (G.)  
*Nautilus? avus* Barrande.  
*Nileus affinis* Billings. (P.)  
*Obolus (Lingulobolus) affinis* (Billings).  
*Obolus? murrayi* Billings.  
*Obolus (Lingulobolus) spissus* (Billings).  
*Ophileta bella* Billings. (P.)  
*Ophileta nerine* Billings. (F.)  
*Orthis hippolyte* Billings. (P.)  
*Orthoceras explanator* (Billings).  
*Orthoceras recedens* Barrande.  
*Petigurus nero* (Billings). (F., G., H., N.)  
*Phyllograptus typus* Hall. (P.)  
*Piloceras canadense* Billings. (F., H.)

- Piloceras gracile* Billings. (H.)  
*Piloceras triton* Billings. (G., H.)  
*Piloceras wortheni* Billings. (H.)  
*Pleurotomaria agarista* Billings. (H.)  
*Pleurotomaria* (*Trochoneca*?) *calphurnia* (Billings). (G.)  
*Pleurotomaria harpya* Billings. (G.)  
*Pleurotomaria hyale* Billings. (F.)  
*Pleurotomaria normani* Billings. (G.)  
*Pliomacrops insularis* (Billings). (G.)  
*Ptilograptus plumosus* (Hall). (P.)  
*Pycnoceras apertum* Hyatt.  
*Pycnoceras calciferiforme* Hyatt.  
*Raphistoma hortensia* (Billings). (H.)  
*Shumardia glacialis* Billings. (P.)  
*Straparollina pelagica* Billings. (P.)  
*Syntrophia calcifera* (Billings). (P.)  
*Tarphycceras aueoini* Hyatt.  
*Tarphycceras calciferus* (Billings). (F., G.)  
*Tarphycceras extensum* Hyatt.  
*Tarphycceras prematurum* Hyatt.  
*Tetragraptus denticulatus* (Hall). (P.)  
*Tetragraptus fruticosus* (Hall). (P.)  
*Tetragraptus headi* (Hall). (P.)  
*Tetragraptus serra* (Hall). (P.)  
*Trachyum cyathiforme* Billings. (G.)  
*Trachyum rugosum* Billings. (G.)  
*Trochoceras*? *incipiens* Barrande.  
*Turrinitoma aerea* (Billings). (G.)
- ORDOVICIAN FAUNAS.
- ST. PETER SANDSTONE OF MISSISSIPPI VALLEY.
- Crania*(?) *reversa* Sardeson.  
*Ctenodonta absimilis* (Sardeson).  
*Ctenodonta noricia* (Sardeson).  
*Cyrtodonta descriptus* (Sardeson).  
*Cyrtodonta dignus* (Sardeson).  
*Cyrtodonta finitimus* (Sardeson).  
*Leperditia sublævis* (Shumard). (Joachim Is.)  
*Modiolopsis affinis* Sardeson.  
*Modiolopsis contigua* Sardeson.  
*Modiolopsis fountainensis* Sardeson.  
*Modiolopsis gregalis* Sardeson.  
*Modiolopsis litoralis* Sardeson.  
*Modiolopsis postica* Sardeson.  
*Ophileta fausta* Sardeson.  
*Orthoceras minnesotense* Sardeson.  
*Platyceras retulum* Sardeson.  
*Pleurotomaria aicens* Sardeson.  
*Psilocoelha senecta* (Sardeson).  
*Rauffella*? *fucoida* Sardeson.  
*Scolithus minnesotensis* James.  
*Vanuzemia fragosa* (Sardeson).
- CHAZYAN OF CHAMPLAIN AND OTTAWA VALLEYS.
- (Day Point=D.; Crown Point=C.; Valcour=V.; Aylmer=A.)
- Ambonychia*? *curvata* Raymond. (D., C.)  
*Ampillichas minganensis* (Billings). (D., V., C.)  
*Ampyz* (*Lonchodomas*) *halli* (Billings). (C.)  
*Archæocrinus*? *denticulatus* Hudson. (V.)  
*Archinacella deformata* (Hall). (D., V.)  
*Archinacella propria* Raymond. (C., D.)  
*Barrandoceras natator* (Billings). (V.)  
*Basilicus marginalis* (Hall). (D., C.)  
*Bathyrullus brevispinus* Raymond. (D.)  
*Bathyrullus minor* Raymond. (C.)  
*Blastoidocrinus carchariædens* Billings. (V.)  
*Bucania sulcatina* (Emmons). (D., V.)  
*Bumastus erastusi* (Raymond). (C., V.)  
*Bumastus globosus* (Billings). (D., V.)  
*Bumastus limbatus* Raymond. (V.)  
*Buthotrephis antiquata* Hall.  
*Camarella longirostris* Billings. (D., V.)  
*Camarella varians* Billings. (C., V.)  
*Camarotoechia major* Raymond. (V.)  
*Camarotoechia orientalis* (Billings). (A.)  
*Camarotoechia plena* Hall. (A., V.)  
*Camarotoechia pristina* Raymond. (C., V.)  
*Cameroceeras curvatum* Ruedemann. (V.)  
*Cameroceeras tenuiscriptum* (Hall). (D., V.)  
*Cameroceeras velox* (Billings). (A.)  
*Canadocystis barrandi* (Billings). (A.)  
*Canadocystis emmonsii* (Hudson). (C., V.)  
*Carabocrinus geometricus* Hudson. (V.)  
*Ceratocphala narrawayi* Raymond. (C.)  
*Ceraurus granulatus* Raymond and Barton. (C.)  
*Ceraurus hudsoni* Raymond. (C.)  
*Chasmatopora gracilis* (Hall).  
*Chasmatopora incerta* (Hall).  
*Cheirocrinus forbesi* (Billings). (A.)  
*Cleioocrinus perforatus* (Hudson). (V.)  
*Clidophorus obscurus* Raymond. (C.)  
*Clionychia marginalis* Raymond. (D.)  
*Clionychia mytiloides* (Hall).  
*Clitambonites multicoelus* (Hudson). (V.)  
*Clitambonites porcia* (Billings). (A.)  
*Clisospira bassleri* Raymond. (D.?)  
*Conocardium beecheri* Raymond. (V.)  
*Conularia triangulata* Raymond. (V.)  
*Cryptozoon perkinsi* Seely.  
*Ctenodonta bidorsata* Raymond. (C.)  
*Ctenodonta dubiaformis* Raymond. (C.)  
*Ctenodonta parvidens* Raymond. (A.)  
*Cybeloides primus* (Raymond). (D., C.)  
*Cycloceras*? *rectiannulatum* (Hall).  
*Cyrtactinoceras boycii* (Whitfield). (C., V.)  
*Cyrtactinoceras champlainense* Ruedemann. (V.)  
*Cyrtoceras mecoyi* Billings.  
*Cyrtodonta jamesvillensis* Ulrich. (V.)  
*Cyrtodonta scala* Raymond. (C.)  
*Cyrtodonta solitaria* Raymond. (C.)  
*Cyrtospira raymondi* (Hudson). (C., V.)  
*Deltoceeras vaningeni* Ruedemann. (C.)  
*Deocrinus asperatus* (Billings). (A.)  
*Diaphorostoma auriforme* (Hall).  
*Dinorthis* (*Plaxiomys*) *platys* (Billings). (C.)  
*Dinorthis* (*Valcouria*) *strophomenoides* (Raymond). (C.)  
*Eccyliomphalus fredricus* Raymond. (C.)  
*Eccyliomphalus kalmi* (Raymond). (C.)  
*Eccyliomphalus proclivis* (Raymond). (C.)  
*Eccylopterus vagrans* (Raymond). (C.)  
*Endoceras*(?) *hudsoni* Ruedemann. (V.)  
*Endoceras magister* Ruedemann. (V.)  
*Endoesma transeps* (Raymond). (C.)  
*Eoharpes antiquatus* (Billings). (D., C.)  
*Eoharpes ottawaensis* (Billings). (D.)  
*Eotomaria obsoleta* Raymond. (D., C.)  
*Eurychilina latimarginata* (Raymond). (D. C. V.)  
*Fletcheria incerta* (Billings).  
*Geisonoceras shumardi* (Billings). (D. C.)  
*Girvanella atrata* (Seely). (C.)  
*Girvanella brainerdi* (Seely). (C.)  
*Girvanella ocellata* (Seely). (C.)

- Girvanella prunus* (Seely). (C.)  
*Glaphurus pustulatus* (Walcott). (C., D.)  
*Gonioceras chaziense* Ruedemann. (C.)  
*Gyronema historicum* (Hudson). (V.)  
*Gyronema leptonotum* (Raymond). (D.)  
*Gyronema microclathratum* (Hudson). (V.)  
*Gyronema? rotalinum* Raymond. (C.)  
*Hebertella borealis* (Billings). (A., V.)  
*Hebertella imperator* (Billings). (A.)  
*Hebertella vulgaris* Raymond. (C., V., A.)  
*Hercocrinus elegans* Hudson. (V.)  
*Hercocrinus ornatus* Hudson. (V.)  
*Holopea harpa* Hudson. (V.)  
*Holopea? plauta* Raymond. (C.)  
*Holopea scrutator* Raymond. (D., C.)  
*Hormotoma infrequens* (Billings). (A.)  
*Hybocrinus pristinus* Billings. (A.)  
*Illenus punctatus* Raymond. (C., V.)  
*Isoteloides angusticaudus* (Raymond). (C., V.)  
*Isotelus arenicola* Raymond. (A.)  
*Isotelus beta* Raymond. (C., V.)  
*Isotelus canalis* Hall.  
*Isotelus harrisi* Raymond. (C., V.)  
*Isotelus platymarginatus* Raymond. (C. V.)  
*Leperditia canadensis labrosa* Jones. (A.)  
*Leperditia limatula* Raymond. (C.)  
*Leperditia nana* (Jones). ?Chazyan.  
*Leptaena incrassata* Hall. (C., V.)  
*Lingula (Palaeoglossa) belli* (Billings). (A., V.)  
*Lingula brainerdi* Raymond. (D., C.)  
*Lingula columba* Raymond. (D., C., V.)  
*Lingula lyelli* Billings. (A.)  
*Lophospira billingsi* Raymond. (A.)  
*Lophospira perangulata* (Hall).  
*Lophospira rectistriata* Raymond. (D., C.)  
*Lophospira seelyi* Raymond. (V.)  
*Loxoceras moniliforme* (Hall). (C., V.)  
*Lyriocrinus beecheri* Hudson. (V.)  
*Maclurites magnus* Lesueur. (C.)  
*Malocystites murchisoni* Billings.  
*Modiolopsis fabaeformis* Raymond. (A., V.)  
*Modiolopsis parviscula* Billings. (A.)  
*Modiolopsis souteri* Raymond. (A.)  
*Modiolopsis subquadrilateralis* Hudson. (V.)  
*Monticulipora? insularis* Seely.  
*Nanno noveboracum* Ruedemann. (V.)  
*Nieszkowskia billingsi* (Raymond). (V.)  
*Nieszkowskia glaucus* (Billings). Chazyan?  
*Nieszkowskia mars* (Hudson). (V.)  
*Nieszkowskia satyrus* (Billings). (V.)  
*Nileus perkinsi* (Raymond). (V.)  
*Onchomctopus obtusus* (Hall). (D., C., V.)  
*Oncoceras pristinum* Ruedemann. (V.)  
*Ooceras(?) lativentrum* Ruedemann. (V.)  
*Ooceras(?) perkinsi* Ruedemann. (V.)  
*Ooceras seelyi* Ruedemann. (V.)  
*Orithidium lamellosum* Raymond. (C., V.)  
*Orthis(?) acuminata* Billings. (A.)  
*Orthis acutiplicata* Raymond. (D.)  
*Orthis costalis* Hall. (Middle Chazyan or Black River.)  
*Orthis ignicula* Raymond. (C.)  
*Orthoceras antenor* Billings.  
*Orthoceras lentum* Ruedemann. (V.)  
*Orthoceras modestum* Ruedemann. (V.)  
*Orthoceras progressum* Ruedemann. (V.)  
*Orthoceras(?) vagum* Ruedemann. (V.)  
*Orydiscus catilloides* (Raymond). (C.)
- Pachyocrinus crassibasalis* Billings. (A.)  
*Palaeocma irregularis* Raymond. (D.)  
*Palaeocrinus chapmani* (Billings). (A.)  
*Palaeocrinus striatus* Billings. (A.)  
*Palaeocystites dawsoni* Billings. (A.)  
*Palaeocystites tenuiradiatus* (Hall).  
*Plectoceras jason* (Billings). (C.)  
*Plectorthis exfoliata* (Raymond). (D.)  
*Plethospira hyale* (Billings). (Chazyan or Black River.)  
*Pleurotomaria antiquata* Hall.  
*Prioniodus radicans* Hinde.  
*Proetus clelandi* Raymond. (C.)  
*Pterygometopus annulatus* Raymond. (D. C.,)  
*Pseudosphærocochus approximatus* Raymond. (C.)  
*Pseudosphærocochus chazyensis* Raymond. (C.)  
*Rafinesquina distans* Raymond. (C., V.)  
*Rafinesquina incrassata* (Hall). (C.)  
*Raphistoma immaturum* (Billings). (D., A.)  
*Raphistoma stamineum* (Hall). (D., C., V.)  
*Raphistoma striatum* (Emmons). (D., C., V., A.)  
*Raphistomina undulata* Raymond. (C.)  
*Remopleurides canadensis* Billings. (C.)  
*Rhaphanocrinus gemmeus* Hudson. (V.)  
*Rhynchidictya fenestrata* (Hall).  
*Rusophycus grevillense* Billings.  
*Scalites angulatus* Emmons. (D.)  
*Scenella montcalensis* (Billings). (D., C., V.)  
*Scenella pretensa* Raymond. (D.)  
*Scenella robusta* Raymond. (C.)  
*Schizambon duplimumuratus* Hudson. (V.)  
*Schmidtleia crassimarginata* Ulrich. (V.)  
*Serpulites splendens* Billings. (A.)  
*Sphærocochus parvus* Billings. (C.)  
*Sphærocochus goodnowi* Raymond. (C.)  
*Spyroceras clintoni* (Miller). (D., C., V.)  
*Spyroceras maro* (Billings). (M.)  
*Stictopora? glomerata* Hall.  
*Stromatocentrum catoni* Seely. (C., V.)  
*Stromatocentrum lamottense* Seely. (C., V.)  
*S'romatocentrum lamottense chazyanum* Seely. (C., V.)  
*Stromatocentrum? moniliferum* Seely. (C., V.)  
*Strophomena prisca* Raymond. (D.)  
*Stylarax parva* (Billings).  
*Subulites prolongatus* Raymond. (C.)  
*Tarphyoceras multicameratum* Ruedemann. (V.)  
*Thaleopsis arcturus* (Hall). (D., C., V.)  
*Trigyna ulrichi* Raymond. (D.)  
*Trochonema (Eunema) altisulcatum* (Hudson). (V.)  
*Trochonema biangulatum* (Hall). (D.)  
*Trochonema dispar* Raymond. (C., V.)  
*Trochonema (Eunema) epitome* (Hudson). (V.)  
*Trochonema hudsoni* Raymond. (C.)  
*Trochonema rectangulare* Raymond. (D.)  
*Tryblidium eubule* (Billings).  
*Vaginoceras opplctum* Ruedemann. (D., V.)  
*Vanuxemia limbata* (Raymond). (C.)  
*Vanuxemia montcalensis* Billings.  
*Vogdesia bearsi* Raymond. (C.)  
*Whiteavesia expansa* Raymond. (C.)  
*Whiteavesia? undata* Raymond. (C.)  
*Zygospira(?) acutirostris* Hall. (D., C., V.)

## CHAZYAN (LENOIR) OF VIRGINIA AND TENNESSEE.

- Bucania sulcatina* Emmons.  
*Eumastus globosus* (Billings).  
*Camarilla longirostris* Billings.  
*Camarilla varians* Billings.

*Dinorthis (Plasiomys) platys* (Billings).  
*Dinorthis strophomenoides* Raymond.  
*Eurychilina latimarginata* (Raymond).  
*Hebertella borealis* (Billings).  
*Hebertella vulgaris* Raymond.  
*Holopea scrutator* Raymond.  
*Illenus globosus* (Billings).  
*Leperditia limatula* Raymond.  
*Lophospira? knoxvillensis* Ulrich.  
*Maclurites knoxvillensis* (Ulrich).  
*Maclurites magnus* Lesueur.  
*Rafinesquina champlainensis* Raymond.  
*Rafinesquina incrassata* (Hall).  
*Raphistoma staminea* (Hall).  
*Scenella pretensa* Raymond.  
*Scenella robusta* Raymond.  
*Stylarza parva* (Billings).  
*Zittella varians* (Billings).

CHAZYAN (STONES RIVER) OF APPALACHIAN AND  
 MISSISSIPPI VALLEYS.

(Murreesboro=M.; Pierce=P.; Ridley=R.; Lebanon=L.; Pamela=Pa.)

*Bathyrurus acutus* Raymond. (Pa.)  
*Batostoma libana* (Safford). (L.)  
*Ceraurinus scofieldi* (Clarke). (L.)  
*Chasmatopora sublaxa* (Ulrich). (L., P.)  
*Cleioerinus tessellatus* (Troost). (L.)  
*Columnaria alvcolata* Goldfuss. (L.)  
*Corynotrypa delicatula* (James). (P., L.)  
*Corynotrypa tennesseensis* Bassler. (P.)  
*Ctenobolbina subcrassa* Ulrich. (R.)  
*Ctenodonta gibberula* Salter. (M.)  
*Cyclonema (?Gyronema) praeputium* Ulrich. (M.)  
*Cyrtoceras? stonense* Safford. (M.)  
*Cyrtodonta breviscula* Billings. (Pa.)  
*Cyrtospira tortilis* Ulrich. (M.)  
*Dinorthis deflecta* (Conrad).  
*Drepanella ampla* Ulrich. (?R.)  
*Drepanella elongata* Ulrich. (L.)  
*Drepanella macra* Ulrich. (L.)  
*Eccyliomphalus contiguus* Ulrich.  
*Ectomaria prisca extenuata* Ulrich. (M.)  
*Eotomaria canalifera* Ulrich. (M.)  
*Eotomaria labiosa* Ulrich. (M.)  
*Escharopora briareus* (Ulrich). (L.)  
*Escharopora libana* (Safford). (L.)  
*Escharopora ramosa* (Ulrich). (L.)  
*Eurychilina aequalis* Ulrich. (?R.)  
*Eurychilina granosa* Ulrich. (R.)  
*Eurychilina subradiata* Ulrich.  
*Helicotoma declivis* Ulrich. (M.)  
*Helicotoma subquadrata* Ulrich. (M.)  
*Helicotoma tennesseensis* Ulrich and Scofield. (M.)  
*Helicotoma whiteavesiana* Raymond. (Pa.)  
*Holopora spiniformis* (Ulrich). (L.)  
*Hudsonaster narrawayi* (Hudson). (L.)  
*Isocillina? clavifera* (Jones). (Pa.)  
*Isocillina clavifera clavifracta* (Jones). (Pa.)  
*Leperditella squilatera* (Ulrich). (R.)  
*Leperditella inflata* (Ulrich). (R.)  
*Leperditella? labellosa* (Jones). (Pa.)  
*Leperditella mundula* (Ulrich). (R.)  
*Leperditia amygdalina* Jones. (Pa.)  
*Leperditia balthica primaeva* Jones. (Pa.)

*Leperditia fabulites* (Conrad).  
*Liospira abrupta* Ulrich and Scofield. (M.)  
*Liospira americana* (Billings).  
*Liospira convexa* Ulrich and Scofield. (R.)  
*Liospira decipiens* Ulrich. (M.)  
*Liospira docens* (Billings). (Pa.)  
*Liospira progne* (Billings).  
*Liospira subconcaeva* Ulrich. (M.)  
*Lophospira biceincta* (Hall).  
*Lophospira centralis* Ulrich. (M.)  
*Lophospira procera* Ulrich. (M.)  
*Lophospira(?) trochonemoides* Ulrich. (M.)  
*Maclurites magnus* Lesueur.  
*Maclurites nitidus* (Ulrich and Scofield). (M.)  
*Mitoclema cinctosum* Ulrich. (R.)  
*Modiolopsis(?) consimilis* Ulrich. (M.)  
*Nanno kingstonensis* Whiteaves. (Pa.)  
*Nicholsonella pulchra* Ulrich. (P.)  
*Ophilelina sublaxa depressa* Ulrich and Scofield. (M.)

*Orbignyella sublamellosa* Ulrich and Bassler. (P.)  
*Orthis tricenaria* Conrad.  
*Palaeocrinus sulcatus* Safford. (P.)  
*Phragmolites grandis* (Ulrich). (L.)  
*Pianodema stonensis* (Safford). (P.)  
*Pianodema subequata* (Conrad).  
*Plectoceras bondi* (Safford). (M.)  
*Protorhynchia ridleyana* (Safford). (P., R.)  
*Pterotheca saffordi* (Hall). (L.)  
*Pterygomotopus troosti* (Safford).  
*Raphistomina modesta* Ulrich. (M.)  
*Rhinidictya basalis* (Ulrich). (L.)  
*Rhinidictya nashvillensis* (Miller). (P.)  
*Rhinidictya trentonensis* (Ulrich). (L.)  
*Salterella billingsi* Safford. (M.)  
*Solenopora compacta* (Billings). (L.)  
*Strophomena incurvata* (Shepard).  
*Tetradium syringoporoides* Ulrich.  
*Tetranota bidorsata* (Hall). (M.)  
*Tetranota sczarinata* Ulrich and Scofield. (L.)  
*Trochonema bellulum* Ulrich. (M.)  
*Trochonema eccentricum* Ulrich. (L.)  
*Trochonema umbilicatum latum* Ulrich. (L.)  
*Whitcavria saffordi* (Ulrich). (M.)  
*Zygospira saffordi* Winchell and Schuchert. (L.)

CHAZYAN (OTTOSEE) OF APPALACHIAN VALLEY IN  
 VIRGINIA AND TENNESSEE.

*Archaeocrinus knoxensis* Miller and Gurley.  
*Archaeocrinus parvus* Miller and Gurley.  
*Archaeocrinus peculiaris* Miller and Gurley.  
*Batostoma scriveri* Bassler.  
*Cheirocrinus angulatus* (Wood).  
*Corynotrypa barberi* Bassler.  
*Diabolocrinus asperatus* (Miller and Gurley).  
*Diabolocrinus perplexus* Wachsmuth and Springer.  
*Diabolocrinus vesperalis* (White).  
*Echinospherites aurantium* (Gyllenhal).  
*Mitrocrinus wetherbyi* Miller and Gurley.  
*Orthis(?) holstoni* Safford.  
*Orthis(?) saffordi* Hall and Clarke.  
*Pachydictya robusta* Ulrich.  
*Platycystites faberi* Miller.  
*Receptaculites biconstrictus* Ulrich.  
*Scenellopora radiata* Ulrich.

## CHAZYAN (NORMANSKILL, ETC.) OF APPALACHIAN VALLEY, ARKANSAS, AND OKLAHOMA.

(Normanskill=N.; Athens=A.; Stringtown=S.)

- Amphigraptus divergens* (Hall). (N.)  
*Amphigraptus multifasciatus* (Hall). (N.)  
*Amphy americanus* Safford and Voydes. (A.)  
*Azygograptus? simplex* Ruedemann. (N.)  
*Azygograptus? walcottii* Lapworth. (N.)  
*Climacograptus antiquus* Lapworth. (N.)  
*Climacograptus bicornis* (Hall). (N., S.)  
*Climacograptus modestus* Ruedemann. (N., S.)  
*Climacograptus parvus* Hall. (N.)  
*Climacograptus (Mesograptus) putillus eximius* Ruedemann. (N.)  
*Climacograptus scharenbergi* Lapworth. (N., A.)  
*Corynoides calicularis* Nicholson. (N.)  
*Corynoides gracilis perungulatus* Ruedemann. (N.)  
*Cryptograptus tricornis* (Carruthers). (N., A., S.)  
*Desmograptus tenuirammosus* Ruedemann. (N.)  
*Dicellograptus divaricatus* (Hall). (N.)  
*Dicellograptus divaricatus bicurvatus* Ruedemann. (N., S.)  
*Dicellograptus divaricatus rectus* Ruedemann. (N.)  
*Dicellograptus divaricatus rigidus* Lapworth. (S.)  
*Dicellograptus divaricatus salopiensis* Elles and Wood. (N.)  
*Dicellograptus gurleyi* Lapworth. (N., S.)  
*Dicellograptus intortus* Lapworth. (N., S.)  
*Dicellograptus mensurans* Ruedemann. (N., A.)  
*Dicellograptus moffattensis alabamensis* Ruedemann. (A.)  
*Dicellograptus sextans* (Hall). (N., S.)  
*Dicellograptus sextans exilis* Elles and Wood. (N.)  
*Dicellograptus sextans pterexilis* Ruedemann. (N.)  
*Dicellograptus sextans tortus* Ruedemann. (N.)  
*Dicellograptus smithi* Ruedemann. (A.)  
*Dicranograptus contortus* Ruedemann. (N.)  
*Dicranograptus furcatus* (Hall). (N.)  
*Dicranograptus furcatus exilis* Ruedemann. (N.)  
*Dicranograptus nicholsoni diapason* Gurley. (N., S.)  
*Dicranograptus nicholsoni parvungulus* Gurley. (N., S.)  
*Dicranograptus nicholsoni whitianus* Miller. (N.)  
*Dicranograptus ramosus* (Hall). (N.)  
*Dicranograptus ramosus arkansascensis* (Gurley). (S.)  
*Dicranograptus rectus* Hopkinson. (S.)  
*Dicranograptus spinifer* (Lapworth) Elles and Wood. (N.)  
*Dictyonema obovatum* Gurley. (S.)  
*Dictyonema spiniferum* Ruedemann. (N.)  
*Didymograptus sagitticaulis* Gurley. (N., A., S.)  
*Didymograptus serratulus* (Hall). (N.)  
*Didymograptus serratulus juvenalis* Ruedemann. (N.)  
*Didymograptus subtennis* (Hall). (N.)  
*Didymograptus superceticus* Lapworth. (S.)  
*Diplograptus acutus* (Elles and Wood). (S.)  
*Diplograptus (Glyptograptus) angustifolius* (Hall). (N., A., S.)  
*Diplograptus basilicus* (Elles and Wood). (S.)  
*Diplograptus foliaceus* (Murchison). (N.)  
*Diplograptus foliaceus acutus* Lapworth. (N.)  
*Diplograptus foliaceus alabamensis* Ruedemann. (A.)

- Diplograptus foliaceus incisus* Lapworth. (N.)  
*Diplograptus foliaceus trifidus* Gurley. (N.)  
*Diplograptus vespertinus* (Ruedemann). (N.)  
*Dolichopterus breviceps* Clarke and Ruedemann. (N.)  
*Eurypterus chadwicki* Clarke and Ruedemann. (N.)  
*Eusarcus lingulatus* Clarke and Ruedemann. (N.)  
*Glossograptus ciliatus* Emmons. (N., A., S.)  
*Glossograptus ciliatus debilis* Ruedemann. (N.)  
*Glossograptus whitfieldi* (Hall). (N., A., S.)  
*Graptospongia pusilla* Ruedemann. (N.)  
*Lasiograptus bimucronatus* (Nicholson). (N., S.)  
*Lasiograptus mucronatus* (Hall). (N., S.)  
*Leptobolus walcottii* Ruedemann. (N., A., S.)  
*Leptograptus flaccidus spinifer* Elles and Wood. (N.)  
*Leptograptus flaccidus trentonensis* Ruedemann. (N.)  
*Nemagraptus exilis* (Lapworth). (N.)  
*Nemagraptus exilis linearis* Ruedemann. (N.)  
*Nemagraptus gracilis* (Hall). (N., A., S.)  
*Nemagraptus gracilis approximatus* Ruedemann. (N.)  
*Nemagraptus gracilis crassicaulis* (Gurley). (N.)  
*Nemagraptus gracilis distans* Ruedemann. (N.)  
*Nemagraptus gracilis surcularis* (Hall). (N.)  
*Odontocaulis hepaticus* Ruedemann. (N., S.)  
*Patricula amii* Schuchert. (N.)  
*Prototirigularia dichotoma* McCoy. (N.)  
*Pterygotus (Eusarcus) nasutus* Clarke and Ruedemann. (N.)  
*Pterygotus normanskillensis* Clarke and Ruedemann. (N.)  
*Ptilograptus poctai* Ruedemann. (N.)  
*Retiograptus geintzianus* Hall. (N., A., S.)  
*Rhombodictyon discum* Whitfield. (N.)  
*Rhombodictyon reniforme* Whitfield. (N.)  
*Rhombodictyon reniforme rhombiforme* Whitfield. (N.)  
*Schizotreta papilliformis* Ruedemann. (N.)  
*Stylonurus modestus* Clarke and Ruedemann. (N.)  
*Syndyograptus pecten* Ruedemann. (N.)  
*Thamnograptus capillaris* (Emmons). (N., A., S.)

## CHAZYAN (MINGAN) OF MINGAN ISLANDS, QUEBEC.

- Barrandoceras minganense* Hyatt.  
*Barrandoceras matator* (Billings).  
*Bathyurellus brevispinus* Raymond.  
*Batostoma varium* Ulrich.  
*Bumastus crastusi* (Raymond).  
*Bumastus globosus* (Billings).  
*Calathium canadense* Billings.  
*Camarella longirostris* Billings.  
*Camarella varians* Billings.  
*Camarotochia orientalis* (Billings)  
*Cameroceeras velox* (Billings).  
*Ceraurinus pomplius* (Billings).  
*Chasmatopora aspera* (Hall).  
*Chasmatopora sublaxa* (Ulrich).  
*Calocaulus linearis* (Billings).  
*Conocardium beccheri* Raymond.  
*Cyrtoceras subtruncatum* Billings.  
*Eccyliomphalus fredericus* Raymond.  
*Ectomaria prisca* (Billings).  
*Eoharpes antiquatus* (Billings).  
*Eospongia rocmeyeri* Billings.

*Euconia amphitrite* (Billings).  
*Grissonoceras shumardi* (Billings).  
*Helicotoma perstriata* Billings.  
*Ilænus bayfieldi* Billings.  
*Ilænus conifrons* (Billings).  
*Leptæna incrassata* Hall.  
*Lophospira aspera* (Billings).  
*Loxoceras diffidens* (Billings).  
*Maclurites atlanticus* (Billings).  
*Modiolopsis parviuscula* Billings.  
*Orthis(?) piger* Billings.  
*Orthoceras cornuum* Billings.  
*Orthoceras minganense* Billings.  
*Palæocystites pulcher* Billings.  
*Plectoceras jason* (Billings).  
*Plectoceras tyrans* (Billings).  
*Pleurotomaria abrupta* Billings.  
*Pliomerops canadensis* (Billings).  
*Schizambon duplicimuratus* Hudson.  
*Thalcoops clavifrons* (Billings).  
*Thalcoops vindex* (Billings).  
*Zittella varians* (Billings).

## CHAZYAN (QUEBEC) OF NEWFOUNDLAND.

(Divisions I-M and N-P, in part; I may be in part Canadian.)

*Actinoceras clouei* (Barrande).  
*Agnostus fabius* Billings. (N., P.)  
*Amphilichas jukesi* (Billings). (P.)  
*Ampyx (Lonchodomas) læviusculus* (Billings). (N.)  
*Ampyx (Lonchodomas) normalis* (Billings). (N., P.)  
*Ampyx (Lonchodomas) rutilius* (Billings). (P.)  
*Ampyx (Lonchodomas) semicostatus* (Billings). (N., P.)  
*Archinacella instabilis* (Billings). (L.)  
*Arthrorachis galba* (Billings). (M., N., P.)  
*Asaphus(?) quadraticaudatus* Billings. (N., P.)  
*Basiliculus huttoni* (Billings). (N., P.)  
*Bathyurellus formosus* Billings. (P.)  
*Bathyurellus fraternus* Billings. (P.)  
*Bathyurellus nitidus* Billings. (P.)  
*Bathyurellus validus* Billings. (L.)  
*Bathyrurus perplexus* Billings.  
*Bathyrurus vetulus* Billings.  
*Beyrichia atlantica* Billings. (L., M.)  
*Calathium fittoni* Billings. (K.)  
*Camarclla parva* Billings. (N., P.)  
*Camarclla varians* Billings. (N., P.)  
*Ceraurinus polydorus* (Billings). (N.)  
*Crenodonta angela* Billings. (M.)  
*Cybeloides mirus* (Billings). (N., P.)  
*Eccyliomphalus distans* (Billings). (P.)  
*Eccyliomphalus superbus* (Billings). (P.)  
*Endoceras atlanticus* (Barrande).  
*Endoceras insulare* (Barrande).  
*Fusispira daphne* (Billings). (L.)  
*Harpides atlanticus* Billings. (P.)  
*Harpides concentricus* Billings. (P.)  
*Helicotoma eucharis* Billings. (L., M.)  
*Heliomera sol* (Billings). (N., P.)  
*Holopea ophelia* Billings. (L.)  
*Hormotoma simulatrix* (Billings). (H., N.)  
*Ilænus arcuatus* Billings. (P.)  
*Ilænus consimilis* Billings. (L., M., N.)  
*Ilænus consobrinus* Billings. (P.)  
*Ilænus fraternus* Billings. (L., N., P.)  
*Ilænus tumidifrons* Billings. (P.)

*Leiostegium breviceps* (Billings). (N.)  
*Leperditia concinnula* Billings. (L., M.)  
*Leperditia ventralis* Billings. (N.)  
*Lingula nymphe* Billings. (N.)  
*Lingulella iole* (Billings). (P.)  
*Litoceras? insolens* (Billings). (L.)  
*Lituites?? pluto* Billings. (L.)  
*Lophospira augustina* (Billings). (H., N.)  
*Lophospira cicelia* (Billings). (L.)  
*Lophospira sorocula* (Billings). (H., M.)  
*Loxoceras allumettense* (Billings). (M., N.)  
*Maclurites crenulatus* (Billings). (L., N.)  
*Maclurites emmonsii* (Billings). (L., N.)  
*Maclurites ponderosus* (Billings). (P.)  
*Maclurites transitionis* (Billings). (K., L.)  
*Murchisonia?? catharina* Billings. (K.)  
*Nautilus? desertus* Billings. (L.)  
*Nieszkowskia perforator* (Billings). (N.)  
*Nileus macrops* Billings. (N.)  
*Nileus scrutator* Billings. (N., P.)  
*Obolus cyane* (Billings). (P.)  
*Orthis? delicatula* Billings. (N., P.)  
*Orthoceras flavius* Billings. (L.)  
*Orthoceras hæsitans* Billings. (L.)  
*Orthoceras piscator* Billings. (L., N.)  
*Orthoceras priamus* Billings. (L., M.)  
*Pleurotomaria (Eotomaria) selecta* Billings. (H., I., K., L.)  
*Pleurotomaria sponsa* Billings. (N., P.)  
*Pleurotomaria virgo* Billings. (H., I., K., L.)  
*Pleurotomaria virguncula* Billings. (H., I., K., L.)  
*Pliomerops barrandei* (Billings). (L., K., N., P.)  
*Pliomerops julius* (Billings). (P.)  
*Pseudosphærezochus mercurius* (Billings). (P.)  
*Pseudosphærezochus vulcanus* (Billings). (P.)  
*Rafinesquina auroa* (Billings). (K., N., P.)  
*Remopleurides panderi* Billings. (N.)  
*Remopleurides schlotheimi* Billings. (N., P.)  
*Rhynchonella(?) corinthia* Billings. (N.)  
*Solenopora compacta* (Billings). (L.)  
*Strophomena(?) imbecilis* Billings. (P.)  
*Telephus americanus* Billings. (N., P.)  
*Triarthrus fischeri* Billings. (N., P.)  
*Triptoceras scrvile* (Billings). (L.)  
*Urastrerella huxleyi* (Billings). (I.)

## BLACK RIVER OF APPALACHIAN AND MISSISSIPPI VALLEYS AND CANADA.

(L.=Lowville; W.=Watertown; D.=Decorah; P.=Platteville; A.=Auburn; K.=Kimmswick; Le.=Leray; H.=Harding.)

*Actinoceras beloitense* (Whitfield) (P.)  
*Actinoceras bigsbyi* Bronn. (P., D., L.)  
*Actinoceras gracile* (Hall). (W.)  
*Actinoceras remotiseptum* (Hall). (P., W.)  
*Actinoceras tenuifilum* (Hall). (W., L.)  
*Actinoceras tenuifilum distans* (Hall). (W.)  
*Actinostroma? trentonense* Ulrich and Everett. (P.)  
*Ambonychia planistriata* Hall. (P.)  
*Anolotichia impolita* (Ulrich). (D.)  
*Anthaspidella firma* Ulrich and Everett. (P.)  
*Anthaspidella florifera* Ulrich and Everett. (P.)  
*Anthaspidella grandis* Ulrich and Everett. (P.)  
*Anthaspidella? magnifica* Ulrich and Everett. (P.)  
*Anthaspidella mammulata* Ulrich and Everett. (P.)  
*Anthaspidella obliqua* Ulrich and Everett. (P.)  
*Anthaspidella parvistellata* Ulrich and Everett. (P.)



- Anthaspidella scutula* Ulrich and Everett. (P.)  
*Aparchites arrectus* Ulrich. (D.)  
*Aparchites chatfieldensis* Ulrich. (D.)  
*Aparchites concinnus* Jones. (Le.)  
*Aparchites ellipticus* Ulrich. (D.)  
*Aparchites granilabiatus neglectus* Ulrich. (D.)  
*Aparchites millepunctatus* (Ulrich). (D.)  
*Aparchites minutissimus trentonensis* Ulrich. (D.)  
*Archinacella billingsi* (Walcott). (L.)  
*Archinacella clochensis* Foerste. (L.)  
*Archinacella delcta* (Sardeson). (D.)  
*Archinacella depressa* Ulrich and Scofield. (P.)  
*Archinacella instabilis incurva* Ulrich and Scofield. (P.)  
*Archinacella patelliformis* (Hall). (L., A., D.)  
*Archinacella perovalis* (Whitfield). (P.)  
*Archinacella powersi* Ulrich and Scofield. (P.)  
*Archinacella simulatrix* Ulrich and Scofield. (D.)  
*Archinacella subrotunda* Ulrich and Scofield. (D.)  
*Aristerella nitidula* Ulrich. (D.)  
*Arthroclma cornutum* Ulrich. (D.)  
*Arthroclma pulchellum* Billings. (D.)  
*Arthroclma striatum* Ulrich. (D.)  
*Arthropora bifurcata* Ulrich. (D.)  
*Arthropora simplex* Ulrich. (P., D.)  
*Arthrostylus conjunctus* Ulrich. (D.)  
*Arthrostylus obliquus* Ulrich. (D.)  
*Aspidopora parasitica* (Ulrich). (D.)  
*Astrapis desiderata* Walcott. (H.)  
*Atactoporella insueta* Ulrich. (D.)  
*Atactoporella ramosa* Ulrich. (D.)  
*Atactoporella typicalis præcipita* Ulrich. (D.)  
*Aulopora(?) trentonensis* Winchell and Schuchert. (D.)  
*Barrandoceras americanum* (D'Orbigny). (W.)  
*Barrandoceras vagrans* (Billings). (Le.)  
*Basilicium barrandi* (Hall). (L., P.)  
*Basilicium? vetusius* (Hall). (L.)  
*Bathyurus extans* (Hall). (L., P.)  
*Bathyurus johnstoni* Raymond. (L.)  
*Bathyurus longispinus* Walcott. (L.)  
*Bathyurus schucherti* Clarke. (P.)  
*Bathyurus spiniger* (Hall). (L., P., A.)  
*Bathyurus superbus* Raymond.  
*Batostoma canadense* (Foord). (L.)  
*Batostoma? declipiens* Ulrich. (D.)  
*Batostoma fertile* Ulrich. (D.)  
*Batostoma fertile circulare* Ulrich. (D.)  
*Batostoma magnopora* Ulrich. (D.)  
*Batostoma minnesotense* Ulrich. (D.)  
*Batostoma montuosum* Ulrich. (D.)  
*Batostoma varium* Ulrich. (D.)  
*Batostoma winchelli nodosum* Ulrich. (D.)  
*Bellerophon charon* Billings. (Le.)  
*Bellerophon subglobosus* Ulrich. (L., Le.)  
*Berenicea minnesotensis* Ulrich. (D.)  
*Bucania emmonsii* Ulrich and Scofield. (P., D.)  
*Bucania halli* Ulrich and Scofield. (P., D., L., A., Le.)  
*Bucania minnesotensis* Ulrich and Scofield. (P.)  
*Bucania sublata* Ulrich and Scofield. (P., D.)  
*Bumastus indeterminatus* (Walcott). (L., P.)  
*Bumastus milleri* (Billings). (L.)  
*Buthograptus laxus* Hall. (P.)  
*Bythocypris(?) curta* Ulrich. (D.)  
*Bythocypris granti* Ulrich. (D.)  
*Bythocypris(?) robusta* Ulrich. (P.)  
*Bythopora alcornis* Ulrich. (D.)  
*Bythopora herricki* (Ulrich). (D.)  
*Bythopora subgracilis* (Ulrich). (D.)  
*Calapocia anticostiensis* Billings.  
*Calathium(?) Zittelella* infelix Ulrich and Everett. (P.)  
*Callithamnopsis delicatula* Ruedemann. (L.)  
*Callithamnopsis fruticosa* Whitfield. (P.)  
*Camarella panderi* Billings. (Le.)  
*Camarella volborthi* Billings. (Le.)  
*Camarocladia dichotoma* Ulrich and Everett. (P.)  
*Camarocladia rugosa* Ulrich. (D.)  
*Camerella inornata* Weller (New Jersey.)  
*Carabocrinus dicyclicus* (Sardeson). (D.)  
*Carinaropsis acuta* Ulrich and Scofield. (D., A.)  
*Carinaropsis minima* Ulrich and Scofield. (S.)  
*Carinaropsis phalera* (Sardeson). (D., A.)  
*Catachisma typa* Branson. (A.)  
*Ceramophylla frondosa* Ulrich. (D.)  
*Ceramoporella distincta* Ulrich. (D.)  
*Ceramoporella granulosa minor* Bassler. (D.)  
*Ceramoporella inclusa* Ulrich. (D.)  
*Ceratopsis chamberi* (Miller). (D.)  
*Ceraurinus scofieldi* (Clarke). (P.)  
*Ceraurus bispinosus* Raymond and Barton. (L.)  
*Ceraurus pleuracanthemus* Green. (P., D., A.)  
*Chaetocladus plumula* Whitfield. (P.)  
*Chaetomorpha?? prima* Whitfield. (P.)  
*Chasmatopora corticosa* (Ulrich). (D.)  
*Chasmatopora reticulata* (Hall). (D.)  
*Chasmatopora sublata* (Ulrich). (P.)  
*Clathrospira conica* Ulrich and Scofield. (D.)  
*Clathrospira conveza* Ulrich and Scofield. (P.)  
*Clathrospira subconica* (Hall). (P., L., D.)  
*Clinoceras mumiforme* (Whitfield). (P.)  
*Clionychia erecta* (Hall). (P.)  
*Clionychia? gibbosa* Whiteaves. (L.)  
*Clionychia lamellosa* (Hall). (P.)  
*Clionychia nitida* Ulrich. (P.)  
*Clionychia ottawensis* Whiteaves. (L.)  
*Clionychia rhomboides* (Ulrich). (P.)  
*Clisospira occidentalis* Whitfield. (P.)  
*Ceoloclema trentonensis* (Ulrich). (D.)  
*Colpomyia demissa* Ulrich. (D.)  
*Columnaria alveolata discreta* Foerste. (L.)  
*Columnaria carterensis* Safford. (L.)  
*Columnaria halli* Nicholson. (L.)  
*Comarocystites obconicus* (Meek and Worthen). (K.)  
*Comarocystites shumardi* Meek and Worthen. (K.)  
*Conocardium immaturus* Billings. (Le.)  
*Corematocladus densa* Ruedemann. (L.)  
*Corynotrypa delicatula* (James). (P., L., D.)  
*Corynotrypa inflata* (Hall). (D.)  
*Crania granulosa* N. H. Winchell. (P.)  
*Crania granulosa cumberlandensis* Foerste. (L.)  
*Crania setigera* Hall. (D., P.)  
*Cremacrinus punctatus* Ulrich. (D.)  
*Crepipora per ampla* Ulrich. (P.)  
*Crepipora subzequala* Ulrich. (D.)  
*Gryptophragmus antiquatus* Raymond. (L.)  
*Ctenobolbina crassa* (Ulrich). (D.)  
*Ctenobolbina fulcrata* Ulrich. (D.)  
*Ctenodonta abrupta* Billings. (Le.)  
*Ctenodonta astartziformis* Salter. (Le., D.)  
*Ctenodonta auburnensis* Branson. (A.)  
*Ctenodonta canadensis* (Sardeson). (D.)  
*Ctenodonta compressa* (Ulrich). (D.)

- Ctenodonta contracta* Salter. (Lø.)  
*Ctenodonta costata* Branson. (A.)  
*Ctenodonta cuneiformis* Ulrich. (D.)  
*Ctenodonta gibberula* Salter. (Le., D., L., P.)  
*Ctenodonta hamburgensis* (Walcott). (D.)  
*Ctenodonta inflata* (Hall). (P.)  
*Ctenodonta jerseyensis* Weller. (New Jersey.)  
*Ctenodonta logani* Salter. (Le., P.)  
*Ctenodonta longa* (Ulrich). (D.)  
*Ctenodonta medialis* Ulrich. (D., A.)  
*Ctenodonta nasuta* (Hall). (P. D., A., Le., L.)  
*Ctenodonta nasuta robusta* Ulrich. (P.)  
*Ctenodonta nitida* (Ulrich). (D.)  
*Ctenodonta ovata* (Hall). (P.)  
*Ctenodonta oviformis* Ulrich. (D., A.)  
*Ctenodonta planodorsata* (Ulrich). (D.)  
*Ctenodonta scofieldi* Ulrich. (D.)  
*Ctenodonta socialis* Ulrich. (D.)  
*Cybeloides ella* (Raymond and Narraway).  
*Cycloceras lescurei* (Clarke). (P.)  
*Cycloceras nicolleti* (Clarke). (P.)  
*Cycloceras olorus* (Hall). (P.)  
*Cyclocystoides antecessus* Hall.  
*Cyclonema hallianum* Salter. (Le.)  
*Cyclora hoffmani* Miller.  
*Cyclora minuta* Hall.  
*Cyclora parvula* (Hall).  
*Cylindrocella endoceroidea* Ulrich. (L.)  
*Cylindrocella minnesotensis* Ulrich. (D.)  
*Cyphotrypa informis* (Ulrich). (D.)  
*Cyrtoceras camurum* Hall. (P.)  
*Cyrtoceras dunleithense* Miller and Gurley. (P.)  
*Cyrtoceras eugium* Hall. (P.)  
*Cyrtoceras featherstonhaughii* Clarke. (P.)  
*Cyrtoceras houghtoni* Clarke. (P.)  
*Cyrtoceras macrostomum* Hall. (P.)  
*Cyrtoceras norwoodi* Clarke. (P.)  
*Cyrtoceras regulare* Billings. (Le.)  
*Cyrtoceras scofieldi* Clarke. (P.)  
*Cyrtoceras shumardi* Clarke. (P.)  
*Cyrtoceras simplex* Billings.  
*Cyrtoceras sinuatum* Billings. (Le.)  
*Cyrtoceras tenuistriatum* Hall. (P., D.)  
*Cyrtocerina(?) schoolcrafti* Clarke. (D.)  
*Cyrtocerina typica* Billings. (Le.)  
*Cyrtodonta affinis* Ulrich. (D.)  
*Cyrtodonta ampla* Ulrich. (P.)  
*Cyrtodonta billingsi* Ulrich. (D., P., A.)  
*Cyrtodonta canadensis* Billings. (L., Le.)  
*Cyrtodonta cingulata* Ulrich. (D.)  
*Cyrtodonta clochensis* Foerste. (L.)  
*Cyrtodonta glabella* (Ulrich). (D., P.)  
*Cyrtodonta huronensis* Billings. (L., D.)  
*Cyrtodonta jancsevillensis* Ulrich. (P.)  
*Cyrtodonta leucocha* Billings. (Le.)  
*Cyrtodonta obesa* Ulrich. (D.)  
*Cyrtodonta oviformis* (Ulrich). (P.)  
*Cyrtodonta persimilis* Ulrich. (P.)  
*Cyrtodonta rotulata* Ulrich. (D.)  
*Cyrtodonta spinifera* Billings. (Le.)  
*Cyrtodonta subcarinata* Billings.  
*Cyrtodonta subovata* Ulrich. (D., P.)  
*Cyrtodonta tenella* (Ulrich). (D.)  
*Cyrtolites dilatatus* Ulrich and Scofield. (D.)  
*Cyrtolites retrorsus fillmorensis* Ulrich and Scofield. (D.)  
*Cyrtorizoceras isodorus* (Billings). (L.)  
*Cyrtorizoceras minneapolis* (Clarke). (P.)
- Cyrtospira bicurvata* Ulrich. (L.)  
*Cyrtospira parvula* (Billings). (Le.)  
*Cytherella(?) rugosa* (Jones). (Le., D.)  
*Cytherella(?) subrotunda* Ulrich. (D.)  
*Dalmanella hamburgensis* (Walcott). (D., L.)  
*Dalmanella rogata* (Sardeson). (D.)  
*Dalmanella testudinaria* Dalman. (D.)  
*Dekayella prænuntia* Ulrich. (D.)  
*Dekayella prænuntia cchinata* Ulrich. (D.)  
*Dekayella prænuntia multipora* Ulrich. (D.)  
*Dekayella prænuntia nœvigera* Ulrich. (D.)  
*Dekayia trentonensis* Ulrich. (D.)  
*Dermatostroma tyronensis* Foerste. (L.)  
*Dicranella bicornis* Ulrich. (D.)  
*Dicranella marginata* Ulrich. (D.)  
*Dicranella(?) simplex* Ulrich. (D.)  
*Dicranella spinosa* Ulrich. (D.)  
*Dictyonema necnah* Hall. (P.)  
*Dictyorbudus priscus* Walcott. (H.)  
*Dilobella typa* Ulrich. (D.)  
*Dinobolus canadensis* (Billings). (Le.)  
*Dinobolus magnificus* (Billings). (Le.)  
*Dinorthis deflecta* (Conrad). (P., L.)  
*Dinorthis pectinella* (Emmons). (D., Le.)  
*Dinorthis pectinella swcenyi* (N. H. Winchell). (D.)  
*Drepanella bigeneris* Ulrich. (P.)  
*Drepanella crassinoda* Ulrich. (L.)  
*Drepanella nitida* (Ulrich). (L.)  
*Dystactospongia minor* Ulrich and Everett. (L., P.)  
*Dystactospongia rudis* Ulrich and Everett. (P.)  
*Eccyliomphalus undulatus* (Hall). (P.)  
*Eccyliopterus beloitensis* Ulrich and Scofield. (L., P.)  
*Echinospirites aurantium* (Gyllenhal). (L., K.)  
*Ectomaria pagoda* (Salter). (Le., P., D.)  
*Ectomaria prisca* (Billings). (Le., P., L.)  
*Edriospongia basalis* Ulrich and Everett. (P.)  
*Eichwaldia subtrigonalis* Billings. (Le.)  
*Encrinurus raricosatus* Walcott. (P.)  
*Encrinurus rarus* (Walcott). (P.)  
*Encrinurus trentonensis* Walcott.  
*Encrinurus vannulus* Clarke. (P.)  
*Endoceras gemelliparum* Hall.  
*Endoceras proteiforme* Hall. (L., P., D.)  
*Endoceras rapax* Billings.  
*Endoceras rottermundi* (Barrande).  
*Endoceras subannulatum* (Whitfield). (P.)  
*Endoceras subcentrale* Hall. (W.)  
*Endoceras virgatum* (Hall). (L.)  
*Endodesma gesneri* (Billings).  
*Endodesma orthonotum* (Meeke and Worthen). (P.)  
*Endodesma nodosum* Ulrich. (P.)  
*Eoharpes pustulosus* (Hall).  
*Eotomaria dryope* (Billings). (D., P., A.)  
*Eotomaria supracingulata* (Billings). (P., D.)  
*Eotomaria vicina* Ulrich and Scofield. (P.)  
*Eridotrypa ædilis minor* Ulrich. (D.)  
*Eriptychius americanus* Walcott. (H.)  
*Escharopora angularis* Ulrich. (D., P.)  
*Escharopora confusus* Ulrich. (D.)  
*Escharopora? limitaris* Ulrich. (D.)  
*Escharopora subrecta* (Ulrich). (D.)  
*Eurychilina longula* Ulrich. (L.)  
*Eurychilina obesa* Ulrich. (L.)  
*Eurychilina reticulata* Ulrich. (D., P.)  
*Eurychilina reticulata incurva* Ulrich. (D.)  
*Eurychilina? subæquata* Ulrich. (D.)  
*Eurychilina subradiata* Ulrich. (D., P.)

- Eurychilina symmetrica* Ulrich. (D.)  
*Eurydictya calhounensis* Ulrich. (K.)  
*Eurydictya multipora* (Hall).  
*Eurymya plana* (Hall). (P.)  
*Eurystomites robertsoni* (Hall). (P.)  
*Favositella laxata* (Ulrich). (D.)  
*Fusispira schucherti* Ulrich and Scofield. (P.)  
*Fusispira* (?) *spicula* Sardeson. (D.)  
*Gomphoceras powersi* J. F. James. (P.)  
*Gonioceras anceps* Hall. (P. W.)  
*Gonioceras occidentalis* Hall. (P.)  
*Gyroceras duplicostatum* Whitfield. (P.)  
*Gyronema duplicatum* Ulrich and Scofield. (P.)  
*Gyronema liratum* Ulrich and Scofield. (D.)  
*Gyronema pulchellum* Ulrich and Scofield. (D.)  
*Gyronema semicarinatum* (Salter). (L.)  
*Hallopora ampla* (Ulrich). (D.)  
*Hallopora angularis* (Ulrich). (D.)  
*Hallopora dumalis* (Ulrich). (D.)  
*Hallopora incontenta* (Ulrich). (D.)  
*Hallopora multitalulata* (Ulrich). (D.)  
*Hallopora pulchella* (Ulrich). (D.)  
*Hallopora pulchella persimilis* (Ulrich). (D.)  
*Halloporina crenulata* (Ulrich). (D.)  
*Halloporina parva* (Ulrich and Bassler). (D.)  
*Hebertella* (*Glyptorthis*) *bellarugosa* (Conrad). (P. D.)  
*Helicotoma granosa* Ulrich. (L.)  
*Helicotoma missouriensis* Branson. (A.)  
*Helicotoma muricata* (Salter). (Le.)  
*Helicotoma planulata* Salter. (Le., L., D.)  
*Helicotoma planulata robusta* Ulrich and Scofield. (P.)  
*Helicotoma planulatoidea* Ulrich. (L.)  
*Helicotoma* ? *spinosa* Salter. (Le.)  
*Helicotoma umbilicata* (Ulrich and Scofield). (P.)  
*Helicotoma verticalis* Ulrich. (L.)  
*Helopora alternata* Ulrich. (D.)  
*Helopora divaricata* Ulrich. (D.)  
*Hemiphragma irrasum* (Ulrich). (D.)  
*Hemiphragma ottawaense* (Foord). (L. D.)  
*Hindia inaequalis* Ulrich and Everett. (P. D.)  
*Hindia parva* Ulrich. (D. A.)  
*Holopea ampla* (Ulrich and Scofield). (P.)  
*Holopea concinnula* (Ulrich and Scofield). (P.)  
*Holopea insignis* Ulrich and Scofield. (D. P. A.)  
*Holopea nereis* Billings. (Le.)  
*Holopea pyrene* Billings. (Le.)  
*Holopea rotunda* Ulrich. (P.)  
*Holopea similis* (Ulrich and Scofield). (D.)  
*Homotrypa* ? *arbuscula* Ulrich. (P. L.)  
*Homotrypa exilis* Ulrich. (D.)  
*Homotrypa* ? *intercalaris* Ulrich. (D.)  
*Homotrypa minnesotensis* Ulrich. (D.)  
*Homotrypa separata* Ulrich. (D.)  
*Homotrypa subramosa* Ulrich. (D.)  
*Homotrypa tuberculata* Ulrich. (D.)  
*Homotrypa instabilis* Ulrich. (D.)  
*Homotrypa multiporata* Ulrich. (D.)  
*Homotrypa ovata* Ulrich. (D.)  
*Hormotoma fasciata* Branson. (A.)  
*Hormotoma gracilis* (Hall). (D. L., P.)  
*Hormotoma gracilis angustata* (Hall). (L., P.)  
*Hormotoma gracilis goodhuensis* Ulrich and Scofield. (D.)  
*Hormotoma gracilis sublaxa* (Ulrich and Scofield). (A.)  
*Hormotoma latiaugularia* Branson. (A.)  
*Hormotoma proceris* (Billings). (Le.)  
*Hormotoma salteri canadensis* Ulrich. (Le.)  
*Hormotoma salteri tennesseensis* Ulrich. (L.)  
*Hormotoma subangulata* (Ulrich and Scofield). (D.)  
*Hudsonaster narrawayi* (Hudson). (D., L.)  
*Hyalithes baconi* Whitfield. (P.)  
*Ilænus angusticollis* Billings. (L., Le.)  
*Ilænus conradi* Billings. (Le.)  
*Ilænus latiatatus* Raymond and Narraway. (L.)  
*Isochilina armata* (Walcott). (L.)  
*Isoteloides homalonotoidea* (Walcott). (L., P.)  
*Jovellania murrayi* (Billings). (L.)  
*Kladenia initialis* (Ulrich). (D.)  
*Krausella arcuata* Ulrich. (L., D.)  
*Krausella inaequalis* Ulrich. (P., D.)  
*Leperditella canadis* Ulrich. (P.)  
*Leperditella germana* (Ulrich). (P.)  
*Leperditella macra* Ulrich. (D.)  
*Leperditella persimilis* Ulrich. (D.)  
*Leperditella sulcata* (Ulrich). (L.)  
*Leperditella sulcata ventricosa* Ulrich. (L.)  
*Leperditella tumida* (Ulrich). (L.)  
*Leperditia canadensis pauquetiana* Jones. (Le.)  
*Leperditia fabulites* (Conrad). (P., L., D.)  
*Leptaena charlottæ* Winchell and Schuchert. (D.)  
*Leptotrypa hexagonalis* Ulrich. (P.)  
*Lichenaria typa* Winchell and Schuchert. (D., A.)  
*Licophycus hiltonense* Billings.  
*Lingula clathrata* Winchell and Schuchert. (D.)  
*Lingula clochensis* Foerste. (L.)  
*Lingula elderi* Whitfield. (P., D.)  
*Lingula eva* Billings. (D.)  
*Lingula huronensis* Billings.  
*Lingula kingstonensis* Billings.  
*Lingula morsei* (N. H. Winchell). (P.)  
*Lingula perryi* Billings.  
*Lindströmia whiteavesi* Foerste. (Le.)  
*Liospira americana* Billings. (P., L., D.)  
*Liospira angulata* Ulrich. (L., Le.)  
*Liospira angustata* Ulrich and Scofield. (P.)  
*Liospira eugenia* (Billings).  
*Liospira larvata* (Salter). (Le.)  
*Liospira modesta* Ulrich. (D.)  
*Liospira* (?) *mundula* Ulrich. (Le.)  
*Liospira obtusa* Ulrich and Scofield. (P.)  
*Liospira progne* (Billings). (L.)  
*Liospira vitruvia* (Billings). (P., L., D.)  
*Lophospira* ? *arachne* (Billings). (Le.)  
*Lophospira bicincta* Hall. (P., D., L.)  
*Lophospira concinnula* Ulrich and Scofield. (D.)  
*Lophospira conradana* Ulrich and Scofield. (P.)  
*Lophospira helicteres* (Salter). (Le.)  
*Lophospira helicteres wisconsinensis* (Ulrich and Scofield). (P.)  
*Lophospira* (?) *notabilis* Ulrich. (L., Le.)  
*Lophospira obliqua* Ulrich. (D., L., A., Le.)  
*Lophospira oweni* Ulrich and Scofield. (D., L., A., Le.)  
*Lophospira peracuta* Ulrich and Scofield. (D.)  
*Lophospira perangulata* (Hall). (D., L., P., A.)  
*Lophospira pulchella* Ulrich and Scofield. (D.)  
*Lophospira serrulata* (Salter). (P., L., Le.)  
*Lophospira spironecma* Ulrich and Scofield. (D.)  
*Lophospira tricarinata* (Hall). (P.)  
*Lophospira ventricosa* (Hall).  
*Loxoceras allumettense* (Billings). (Le.)  
*Lozonema* ? *murrayana* Salter. (Le.)

- Lyrodessa acuminatum* Ulrich. (D.)  
*Lyrodessa acuminatum intermedium* Ulrich. (D.)  
*Maclurites bigsbyi* (Hall). (P.)  
*Maclurites bigsbyi dixonensis* (Ulrich). (P.)  
*Maclurites depressus* (Ulrich and Scofield). (P.)  
*Maclurites logani* (Salter). (Le.)  
*Maclurites nitidus* (Ulrich and Scofield). (P.)  
*Macrocypris? siliqua* (Jones). (Le.)  
*Macronotella scofieldi* Ulrich. (P., L.)  
*Maclonoceras falz* (Billings). (Le.)  
*Maclonoceras neleus* (Hall). (P.)  
*Maclonoceras præmaturos* (Billings). (Le.)  
*Mastigograptus? flaccidus* Ruedemann. (L.)  
*Matheria rugosa* Ulrich. (D.)  
*Mesotrypa infida* (Ulrich). (D.)  
*Mesotrypa? spinosa* Ulrich. (D.)  
*Modiolodon(?) gibbus* Ulrich. (D.)  
*Modiolodon subrhomboides* Branson. (A.)  
*Modiolopsis adrastia* Billings.  
*Modiolopsis arguta* Ulrich. (D.)  
*Modiolopsis chaifieldensis* Ulrich. (D.)  
*Modiolopsis concava* Ulrich. (D.)  
*Modiolopsis expansa* Branson. (A.)  
*Modiolopsis nais* Billings. (Le.)  
*Modiolopsis obsoleta* Ulrich. (D.)  
*Modiolopsis obtusa* (Hall). (L.)  
*Modiolopsis parviuscula* Billings.  
*Modiolopsis similis* Ulrich. (D.)  
*Monotrypa magna* Ulrich. (P.)  
*Monticulpora incompta* Ulrich. (D.)  
*Moorea angularis* Ulrich. (D.)  
*Moorea? perplexa* Ulrich. (D.)  
*Moorea punctata* Ulrich. (D.)  
*Murchisonia? varicosa* Hall. (L.)  
*Nanno aulema* Clarke. (D.)  
*Nicholsonella laminata* Ulrich. (D.)  
*Nicholsonella ponderosa* Ulrich. (P.)  
*Nileus vigilans* (Meek and Worthen). (P., D.)  
*Omospira alexandra* (Billings). (Le.)  
*Omospira laticincta* Ulrich. (L.)  
*Onchometopus simplex* Raymond. (P.)  
*Oncoceras abruptum* Hall. (P.)  
*Oncoceras aleus* Hall. (P.)  
*Oncoceras brevicurvatum* Whitfield. (P.)  
*Oncoceras carveri* Clarke. (P.)  
*Oncoceras huronense* (Billings).  
*Oncoceras lycus* (Hall). (P.)  
*Oncoceras pandion* Hall. (P.)  
*Oncoceras plebeium* Hall. (P.)  
*Ophiletina angularis* Ulrich and Scofield. (D.)  
*Ophiletina sublara* Ulrich and Scofield. (P.)  
*Orbignyella wetherbyi* (Ulrich). (L., P.)  
*Orthis tricenaria* Conrad. (P., D., L., A.)  
*Orthoceras amplicameratum* Hall. (P.)  
*Orthoceras decreescens* Billings. (Le.)  
*Orthoceras drummondii* Billings.  
*Orthoceras fusiforme* Hall.  
*Orthoceras junceum* Hall. (D., P.)  
*Orthoceras menelaus* Billings.  
*Orthoceras multicameratum* Emmons. (D.)  
*Orthoceras ottawaense* Billings. (Le.)  
*Orthoceras perparum* Billings.  
*Orthoceras pertinax* Billings. (Le.)  
*Orthoceras reticameratum* Hall. (L.)  
*Orthoceras tenerum* Billings. (Le.)  
*Orthoceras tenuistriatum* (Hall). (P.)  
*Orthoceras tyronense* Foerste. (L.)  
*Orthodesma antiquum* Whiteaves. (L.)  
*Orthodesma minnesotense* Ulrich. (D.)  
*Orydiscus argo* (Billings). (Le.)  
*Orydiscus disculus* Billings.  
*Pachydictya ecretti* Ulrich. (P.)  
*Pachydictya fimbriata* Ulrich. (D.)  
*Pachydictya foliata* Ulrich. (D.)  
*Pachydictya occidentalis* Ulrich. (D.)  
*Palæacma humilis* Ulrich and Scofield. (D., P.)  
*Parallelodus obliquus* Branson. (A.)  
*Petrocerania ulrichi* (Hall and Clarke). (D.)  
*Phragmolites fimbriatus* (Ulrich and Scofield). (P.)  
 D., A.)  
*Phragmolites obliquus* (Ulrich and Scofield). (D.)  
*Phragmolites similis* (Ulrich). (L., Le.)  
*Phragmolites triangularis* (Ulrich and Scofield). (P.)  
*Phyllodictya frondosa* Ulrich. (L.)  
*Phyllodictya varia* Ulrich. (D.)  
*Phytopsis tubulosa* (Hall). (L.)  
*Pianodema subæquata* (Conrad). (L., D., P., A.)  
*Pianodema subæquata circularis* (N. H. Winchell). (D.)  
*Pianodema subæquata conradi* (N. H. Winchell). (P.)  
*Pianodema subæquata gibbosa* (Billings). (D.)  
*Pianodema subæquata perreta* (Conrad). (P., D.)  
*Platyeras depressum* Ulrich and Scofield. (D.)  
*Platyeras(?) wisconsinensis* Ulrich and Scofield. (P.)  
*Plectambonites sericeus?* Sowerby.  
*Plectoceras halli* (Poord).  
*Plectoceras? undatum* (Conrad). (W.)  
*Plectoceras undatum occidentale* (Hall). (P.)  
*Plethocardia? cordiformis* (Billings).  
*Plethocardia umbonata* Ulrich. (D., L., Le.)  
*Pleurotomaria mohawkensis* Miller. (L.)  
*Pleurotomaria? nuculata* Hall. (L.)  
*Pleurotomaria? obsoleta* Hall. (L.)  
*Pleurotomaria quadricarinata* Hall. (L.)  
*Podolithus dendrocinus* Sardeson. (D.)  
*Podolithus euchiocirinus* Sardeson. (D.)  
*Podolithus schizocirinus* Sardeson. (D.)  
*Porocirinus pentagonius* Meek and Worthen. (P.)  
*Prasopora conoidea* Ulrich. (D.)  
*Prasopora contigua* Ulrich. (D.)  
*Prasopora grandis* (Ulrich). (D.)  
*Prasopora lenticularis* Ulrich. (D.)  
*Prasopora simulatrix* Ulrich. (D.)  
*Primitia eclata* Ulrich. (D.)  
*Primitia duplicata* Ulrich. (D.)  
*Primitia mammata* Ulrich. (D.)  
*Primitia minutissima* Ulrich. (D.)  
*Primitia sanctipauli* Ulrich. (D.)  
*Primitiella constricta* Ulrich. (L., P.)  
*Primitiella fillmorensis* Ulrich. (D.)  
*Primitiella limbata* Ulrich. (D.)  
*Primitiella simulans* Ulrich. (D.)  
*Priscociton canadensis* (Billings). (Le.)  
*Proboscina tumulosa* Ulrich. (D.)  
*Promopalæaster? wilsoni* (Raymond). (L.)  
*Pterotheca attenuata* (Hall). (L., P., D.)  
*Pterotheca expansa* (Emmons). (L., P., A.)  
*Pterygomotopus callicephalus* Hall. (P., D.)  
*Pterygomotopus intermedius* (Walcott). (P., D., A.)  
*Pterygomotopus lincolncensis* Branson. (A.)  
*Pterygomotopus schmidti* Clarke. (P.)  
*Rafinesquina alternata?* Conrad.

- Rafinesquina minnesotensis* (N. H. Winchell). (P.)  
*Rafinesquina minnesotensis iniquassa* (Sardeson). (D.)  
*Raphistoma apertum* Salter. (Le.)  
*Raphistoma peracutum* Ulrich and Scofield. (D.)  
*Raphistomina lapicida* (Salter). (Le.)  
*Rauffella filosa* Ulrich. (D.)  
*Rauffella palmipes* Ulrich. (D.)  
*Receptaculites occidentalis* Salter. (Le.)  
*Receptaculites oweni* Hall.  
*Rhindietya czigua* Ulrich. (D.)  
*Rhindietya fidelis* (Ulrich). (D.)  
*Rhindietya grandis* Ulrich. (P.)  
*Rhindietya mutabilis* (Ulrich). (D.)  
*Rhindietya mutabilis major* (Ulrich). (D.)  
*Rhindietya mutabilis scutilis* Ulrich. (D.)  
*Rhindietya nicholsoni* Ulrich. (L.)  
*Rhindietya paupera* Ulrich. (D.)  
*Rhindietya pediculata* Ulrich. (P.)  
*Rhindietya trentonensis* (Ulrich). (P., D.)  
*Rhynchotrema ainsliei* N. H. Winchell. (D.)  
*Rhynchotrema minnesotense* (Sardeson). (D., P.)  
*Rhynchotrema ottawaense* (Billings). (Le.)  
*Romingeria trentonensis* Weller (New Jersey).  
*Sabellarites trentonensis* Dawson.  
*Salpingostoma buelli* (Whitfield). (P.)  
*Scenella affinis* Ulrich and Scofield. (D.)  
*Scenella beloitensis* Ulrich and Scofield. (P.)  
*Scenella compressa* Ulrich and Scofield. (P.)  
*Scenella magnifica* Ulrich and Scofield. (P.)  
*Scenella obtusa* (Sardeson). (D.)  
*Scenella superba* (Billings). (Le., P.)  
*Scenidium anthoneense* Sardeson. (P., D.)  
*Schizocrania filosa* Hall. (D.)  
*Schmidtella brevis* Ulrich. (D.)  
*Schmidtella crassimarginata* Ulrich. (P.)  
*Schmidtella incompta* Ulrich. (D.)  
*Schmidtella subrotunda* Ulrich. (D.)  
*Schmidtella umbonata* Ulrich. (D.)  
*Scofieldia bilateralis* (Ulrich). (D.)  
*Serpulites dissolutus* Billings. (P.)  
*Sinuities cancellatus* Hall. (D., P., L.)  
*Sinuities percolutus* (Ulrich and Scofield). (D.)  
*Sinuities rectangularis* (Ulrich and Scofield). (P.)  
*Siphonotreta(?) minnesotensis* Hall and Clarke. (P.)  
*Solenopora compacta* Billings. (L., D.)  
*Soweria canadensis* (Raymond). (L.)  
*Spatiopora labeculosa* Ulrich. (D.)  
*Sphenolium parallelum* Ulrich. (P.)  
*Spyroceras anellus* (Conrad). (D.)  
*Spyroceras bilineatum* (Hall). (L., P., D., A.)  
*Stellipora antheloidea* Hall. (D.)  
*Stenotheca exserta* (Sardeson). (P.)  
*Stictopora? labyrinthica* Hall. (L.)  
*Stictopora? ramosa* Hall. (L.)  
*Stictoporella angularis* Ulrich. (D.)  
*Stictoporella angularis intermedia* Ulrich. (D.)  
*Stictoporella cribrosa* Ulrich. (D.)  
*Stictoporella dumosa* Ulrich. (D.)  
*Stictoporella frondifera* Ulrich. (D.)  
*Stictoporella rigida* Ulrich. (D.)  
*Stigmatella claviformis* (Ulrich). (D.)  
*Straparollina asperostriata* (Billings). (Le.)  
*Straparollina circe* (Billings). (Le.)  
*Straparollina eurydice* (Billings). (Le.)  
*Streptelasma (Petraia) apertum* (Billings). (Le.)  
*Streptelasma breve* Winchell and Schuchert. (P.)  
*Streptelasma(?) parasiticum* Ulrich. (D., P.)  
*Streptelasma (Petraia) profundum* (Conrad). (L., P., D., Le.)  
*Streptosolen obconicus* Ulrich and Everett. (P.)  
*Stromatocerium canadense* Nicholson and Murio. (L.)  
*Stromatocrium rugosum* Hall.  
*Stromatotypa ovata* Ulrich. (D.)  
*Strophomena incurvata* (Shepard). (L., P., D., A.)  
*Strophomena levis* Emmons.  
*Strophomena septata* Winchell and Schuchert. (D.)  
*Strophomena trentonensis* Winchell and Schuchert. (D.)  
*Strophomena winchelli* Hall and Clarke. (P.)  
*Strophostylus textilis* (Ulrich and Scofield). (D., A.)  
*Strotospongia maculosa* Ulrich and Everett. (P.)  
*Subulites beloitensis* Ulrich and Scofield. (P.)  
*Subulites canadensis* Ulrich.  
*Subulites conradi* (Ulrich and Scofield). (P.)  
*Subulites dixonsensis* Ulrich and Scofield. (P.)  
*Subulites nanus* Ulrich. (L.)  
*Subulites parvus* Ulrich. (L.)  
*Subulites regularis* Ulrich and Scofield. (L., P.)  
*Technophorus bellistriatus* Branson. (A.)  
*Technophorus divaricatus* Ulrich. (D.)  
*Technophorus extenuatus* Ulrich. (D.)  
*Technophorus filistriatus* Ulrich. (D.)  
*Technophorus subacutus* Ulrich. (P.)  
*Tetradella quadrilirata* (Hall and Whitfield).  
*Tetradium cellulorum* (Hall). (L.)  
*Tetradium columnare* Hall. (L.)  
*Tetradium halysitoides* Raymond. (L.)  
*Tetranota bidorsata* Hall.  
*Tetranota bidorsata minor* (Ulrich and Scofield) (D., Le.)  
*Tetranota macra* Ulrich and Scofield. (P.)  
*Tetranota obsoleta* Ulrich and Scofield. (D., P.)  
*Tetranota sezarinata* Ulrich and Scofield. (P.)  
*Tetranota warrinensis* (Whitfield). (P.)  
*Thaleops ovata* Conrad. (P.)  
*Trematis huronensis* Billings. (P., D.)  
*Trematopora primigenia* Ulrich. (D.)  
*Trematopora (Eunema) ornata* Ulrich. (D.)  
*Trematopora primigenia spinosa* Ulrich. (D.)  
*Trigonodictya conciliatrix* (Ulrich). (D.)  
*Tripteroceras hastatum* (Billings). (Le.)  
*Tripteroceras oweni* (Clarke). (P.)  
*Tripteroceras planoconvexum* (Hall). (D., P.)  
*Tripteroceras planodorsatum* (Whitfield). (P.)  
*Trochonema beachi* Whitfield. (P., D.)  
*Trochonema beloitense* Whitfield. (P.)  
*Trochonema (Eunema) cerithioides* (Salter). (Le.)  
*Trochonema (Eunema) elivosa* (Sardeson). (D.)  
*Trochonema (Eunema) erigone* (Billings).  
*Trochonema niota* (Hall). (P., D.)  
*Trochonema retrorsum* (Ulrich and Scofield). (D.)  
*Trochonema rugosum* Ulrich and Scofield. (P.)  
*Trochonema (Eunema) strigillatum* (Salter). (Le.)  
*Trochonema umbilicatum* (Hall). (P.)  
*Trochonema umbilicatum canadense* Ulrich. (Le.)  
*Trochonema vagrans* Ulrich and Scofield. (P.)  
*Tryblidium crato* (Billings). (Le.)  
*Tryblidium modestum* (Ulrich and Scofield). (D.)  
*Urasterella ulrichi* Schuchert. (P.)

- Vaginoceras longissimum* (Hall). (W.)  
*Vaginoceras multitubulatum* (Hall). (W.)  
*Vanuzemia crassa* Ulrich. (D.)  
*Vanuzemia decipiens* Ulrich. (P.)  
*Vanuzemia dixonensis* Meek and Worthen. (P.)  
*Vanuzemia dixonensis insueta* Ulrich. (P.)  
*Vanuzemia inconstans* Billings. (L.e.)  
*Vanuzemia media* Ulrich. (P.)  
*Vanuzemia nota* (Hall). (P., D.)  
*Vanuzemia obtusifrons* (Ulrich). (P.)  
*Vanuzemia parvula* Whiteaves. (L.)  
*Vanuzemia rectirostris* (Hall). (P.)  
*Vanuzemia rotundata* (Hall). (P.)  
*Vanuzemia sardesoni* (Ulrich). (P.)  
*Vanuzemia suberecta* Ulrich. (D.)  
*Vanuzemia subrotunda* Ulrich. (D.)  
*Vanuzemia terminalis* (Ulrich). (P.)  
*Vanuzemia umbonata* Ulrich. (D., L.e.)  
*Vincila repens* Ulrich. (D.)  
*Whiteavesia modioliformis* (Meek and Worthen). (P.)  
*Whiteavesia superba* (Hall). (P.)  
*Whitella compressa* Ulrich. (D.)  
*Whitella concentrica* Ulrich. (D.)  
*Whitella megambona* (Whitfield). (P.)  
*Whitella rugatina* Ulrich. (D.)  
*Whitella scofieldi* Ulrich. (D.)  
*Zittella inosculata* Ulrich and Everett. (P.)  
*Zittella lobata* (Ulrich and Everett). (P.)  
*Zittella trentonensis* (Worthen). (P.)  
*Zittella typicalis* Ulrich and Everett. (P.)  
*Zittella typicalis pistilliformis* Ulrich and Everett. (P.)  
*Zittella typicalis subrotunda* Ulrich and Everett. (P.)  
*Zittella typicalis turbinata* Ulrich and Everett. (P.)  
*Zittloceras billingsi* (Salter). (L.e., P., A.)  
*Zittloceras hallianum* (D'Orbigny). (D.)  
*Zygospira nicolleti* Winchell and Schuchert. (P., A.)  
*Zygospira recurvirostris* (Hall). (P., L., D., A.)

## BLACK RIVER OR RICHMOND (MANITOBA).

## POGONIP OF NEVADA.

(Lower = L.; upper = U.)

- (This list includes the species from the Cat Head and associated formations in Manitoba. Although recorded as of Mohawkian age by Whiteaves, it is probable that many of them were derived from Richmond strata.)
- Actinoceras (Paractinoceras) canadense* (Whiteaves).  
*Actinoceras richardsoni* Stokes.  
*Actinoceras richardsoni magnum* Parks.  
*Aparchites granilabiatus* (Ulrich).  
*Aparchites parvulus* Jones.  
*Aparchites whiteavesi* Jones.  
*Ascoceras boreale* Parks.  
*Ascoceras costulatum* Whiteaves.  
*Aulocopella winnipegensis* Raufl.  
*Chaetetes perantiquus* Whiteaves.  
*Chondrites (Buthotraphis) cuneatus* Whiteaves.  
*Chondrites cupressinus* Whiteaves.  
*Chondrites gracillimus* Whiteaves.  
*Chondrites (Buthotraphis) patulus* Whiteaves.  
*Clonipistha antiqua* Whiteaves.  
*Corynotrypa canadensis* Whiteaves.  
*Cyrtoceras laticurvatum* Whiteaves.  
*Cyrtoceras manitobense* Whiteaves.  
*Dietyonema canadense* (Whiteaves).  
*Discoceras canadense* Whiteaves.  
*Ectomaria pagoda occidentalis* (Whiteaves).  
*Edmondia? vetusta* Whiteaves.  
*Eurytomites plicatus* Whiteaves.  
*Halysites catenularia* (Linnæus).  
*Halysites catenularia gracilis* (Hall).  
*Hornotoma winnipegensis* Whiteaves.  
*Jorellania semiplanata* (Whiteaves).  
*Lozonema winnipegense* Whiteaves.  
*Maclurina manitobensis* Whiteaves.  
*Maclurina manitobensis acuta* Parks.  
*Maclurites subovatus* (Parks).  
*Mesotrypa selkirkensis* Whiteaves.  
*Modiolopsis angustifrons* Whiteaves.  
*Nartheoceras crassiphonatum* (Whiteaves).  
*Nartheoceras simpsoni* (Billings).  
*Oncoceras magnum* Whiteaves.  
*Oncoceras magnum intermedium* Whiteaves.  
*Oncoceras whiteavesi* Miller.  
*Orthoceras lepidodendroides* Parks.  
*Orthoceras selkirkense* Whiteaves.  
*Orthoceras winnipegense* Whiteaves.  
*Orthodesma affine* Whiteaves.  
*Palæopteria parvula* Whiteaves.  
*Pleurotomaria (?) margaritoides* Whiteaves.  
*Pleurotomaria stokesiana* Whiteaves.  
*Poterioceras apertum* Whiteaves.  
*Poterioceras gracile* Whiteaves.  
*Poterioceras nobile* Whiteaves.  
*Poterioceras tyrelli* Parks.  
*Rhynchidictya obliqua* (Ulrich).  
*Rhytmya recta* Whiteaves.  
*Serpulites dissolutus* (Billings).  
*Solenopora compacta* Billings.  
*Thamnograptus affinis* Whiteaves.  
*Trichospongia hystrix* Whiteaves.  
*Triptoceras lambi* (Whiteaves).  
*Trochoceras mecharlesi* Whiteaves.  
*Trochonema cecentricum* Ulrich.

- Eotomaria supracingulata* (Billings). (U.)  
*Fusispira compacta* Hall and Whitfield. (U.)  
*Haploconus brevimarginatus* (Walcott). (U.)  
*Hebertella lonensis* (Walcott). (U.)  
*Holasaphus congeneris* (Walcott). (U.)  
*Hyalithes vanuzemi* Walcott. (L.)  
*Hystericurus tuberculatus* (Walcott). (U.)  
*Leperditia biviva* White. (U.)  
*Lingulella manticula* (White). (L.)  
*Lingulella pogonipensis* Walcott. (L.)  
*Linnarssonella minuta* Hall and Whitfield. (L.)  
*Lophospira bicincta* (Hall). (U.)  
*Maclurites annulatus* (Walcott). (U.)  
*Maclurites carinatus* (Walcott). (U.)  
*Maclurites minimus* (Hall and Whitfield).  
*Maclurites subannulatus* (Walcott). (U.)  
*Megalaspis belcmurus* White. (U.)  
*Modiolopsis occidens* Walcott. (U.)  
*Modiolopsis pogonipensis* Walcott. (U.)  
*Obolus anceps* Walcott. (L.)  
*Obolus discoideus* (Hall and Whitfield). (L.)  
*Obolus (Westonia) iphis* Walcott. (L.)  
*Obolus macra* (Hall and Whitfield). (L.)  
*Orthis tricenaria* Conrad. (U.)  
*Parastrophia(?) obscura* (Hall and Whitfield).  
*Pianodema pogonipensis* (Hall and Whitfield). (U.)  
*Pianodema subequata perreta* (Conrad). (U.)  
*Pleurotomaria lonensis* Walcott. (U.)  
*Pliomerops nevadensis* (Walcott). (U.)  
*Ptychoparia affinis* Walcott. (L.?)  
*Ptychoparia? annectans* Walcott. (L.)  
*Ptychoparia granulatus* (Hall and Whitfield). (L.?)  
*Ptychoparia laguci* (Hall and Whitfield). (L.?)  
*Ptychoparia maculosa* (Hall and Whitfield). (L.?)  
*Ptychoparia ovcni* (Hall and Whitfield). (L.?)  
*Raphistoma acutum* Hall and Whitfield.  
*Receptaculites ellipticus* Walcott. (U.)  
*Receptaculites elongatus* Walcott. (U.)  
*Receptaculites mammillaris* Walcott. (U.)  
*Scenella analoga* (Walcott). (U.)  
*Schizambon typicalis* Walcott. (L.)  
*Strophomena(?) minor* (Walcott). (U.)  
*Symphysurus eurckensis* (Walcott). (L.)  
*Symphysurus(?) goldfussi* Walcott. (U.)  
*Syntrophia nundina* Walcott. (L.)  
*Tetranota bidorsata* (Hall). (U.)
- TRENTON OF CANADA, NEW YORK, ETC., AND OHIO  
 VALLEY.
- (Either the formation or locality is denoted in  
 parentheses after each species.)
- Actinoceras(?) cuciveri* (Troost) (Bigby.)  
*Actinoceras distans* (Hall). (N. Y.)  
*Actinoceras (Dicroceras) python* (Billings). (Can-  
 ada.)  
*Agelacrinites vetustus* (Foerste). (Cynthiana.)  
*Allodesma subcllipitum* (Ulrich). (Canajoharie.)  
*Allonychia stanaganensis* Foerste. (Cynthiana.)  
*Ambonychia amygdalina* Hall. (N. Y.)  
*Ambonychia bellistriata* Hall. (N. Y.)  
*Ambonychia orbicularis* (Emmons). (N. Y.)  
*Amphilichas trentonensis* (Conrad). (Pa., N. Y.,  
 etc.)  
*Amplexopora cylindracea* Ulrich and Bassler. (Ca-  
 theys.)
- Aparchites minutissimus trentonensis* Ulrich. (Ky.,  
 Tenn., etc.)  
*Aparchites mundulus* Jones. (Quebec.)  
*Archinacella simulatrix* Ulrich and Scofield. (Her-  
 mitage.)  
*Archinacella trentonensis* (Billings). (Canada.)  
*Aristozoe canadensis* Whitfield. (Ontario.)  
*Arthostylus tenuis* (James). (Upper Trenton-Ky.)  
*Arthroclima billingsi* Ulrich. (Ontario.)  
*Arthroclima pulchellum* Billings. (Ontario.)  
*Arthropora bifurcata* Ulrich. (Ky., Tenn., etc.)  
*Arthropora kentuckiensis* (James). (Upper Tren-  
 ton-Ky.)  
*Asaphus micropleurus* Green. (N. Y.)  
*Aspidopora calycula* (James). (Upper Trenton-  
 Ky.)  
*Astylospongia parvula* Billings. (Ontario.)  
*Batostoma superbum* (Foord). (Quebec.)  
*Bellerophon bilineatus* Ulrich. (Flanagan.)  
*Bellerophon clausus* Ulrich. (Catheys and Perry-  
 ville.)  
*Bellerophon declivis* Conrad. (Pa.)  
*Bellerophon platystoma* (Meek and Worthen).  
 (Galena.)  
*Bellerophon profundus* Emmons. (N. Y.)  
*Bellerophon rogersensis* Foerste. (Upper Trenton-  
 Ky.)  
*Bellerophon troosti* D'Orbigny. (Catheys, Flana-  
 gan, Perryville.)  
*Bellerophon troosti burginensis* Ulrich. (Flanagan.)  
*Beyrichia bella* Walcott. (N. Y.)  
*Brachiospongia digitata* (Owen). (Bigby.)  
*Bucania frankfortensis* Ulrich. (Cynthiana.)  
*Bucania interta* Hall. (N. Y.)  
*Bucania lindsleyi* (Safford). (Catheys.)  
*Bucania micronema* Ulrich. (Flanagan.)  
*Bucania nana* Ulrich. (Flanagan.)  
*Bucania nashvillensis* Ulrich. (Catheys.)  
*Bucania praeclata* Ulrich. (Catheys.)  
*Bucania punctifrons* (Emmons). (N. Y., Canada,  
 Tenn., etc.)  
*Bucania rugatina* Ulrich. (Flanagan.)  
*Bucania singularis* Ulrich. (Catheys.)  
*Bucania subangulata* Ulrich. (Flanagan.)  
*Bucania sublata* Ulrich and Scofield. (Flanagan.)  
*Bucanopsis carinifera* Ulrich. (Flanagan.)  
*Bumastus billingsi* Raymond and Narraway  
 (Quebec.)  
*Bumastus elongatus* Weller. (N. J.)  
*Bumastus transversalis* Weller. (N. J.)  
*Buthotrochis caspitosa* Hall. (N. Y.)  
*Buthotrochis gracilis* Hall. (N. Y.)  
*Buthotrochis succulens* Hall. (N. Y.)  
*Buthotrochis tenuis* (Hall). (N. Y.)  
*Byssonychia(?) bynesi* Ulrich. (Upper Trenton-  
 Ky.)  
*Byssonychia vera* Ulrich. (Upper Trenton-Ky.)  
*Bythocypris cylindrica* (Hall). (Ky., Tenn., etc.)  
*Calymene abbreviata* Foerste. (Cynthiana.)  
*Calymene platycephala* Foerste. (Hermitage.)  
*Camarella ambigua* (Hall). (N. Y.)  
*Cameroeras approximatus* (Hall). (N. Y.)  
*Cameroeras duplicatum* (Hall). (N. Y.)  
*Cameroeras lativentrum* (Hall). (N. Y.)  
*Cameroeras trentonensis* Conrad. (N. Y.)  
*Carinaropsis carinata* Hall. (N. Y.)

- Carinaropsis cumulae* (Hall). (Flanagan, Catheys.)  
*Carinaropsis cymbula* (Hall). (Catheys.)  
*Carinaropsis explanata* Ulrich. (Upper Trenton-Ky.)  
*Ceratocphala horani* (Billings). (Canada.)  
*Ceratopsis chambersi* (Miller). (Minn., etc.)  
*Ceratopsis intermedia* Ulrich. (Ky.)  
*Ceratopsis? quadrifida* (Jones). (Quebec.)  
*Ceraurinus confluent* Barton. (Picton.)  
*Ceraurus dentatus* Raymond and Barton. (N. Y., Ontario.)  
*Ceraurus pleurexanthemus* Green. (N. Y., etc.)  
*Chatetes? rugosus* Hall (N. Y.)  
*Chasmatopora dawsoni* (Ulrich). (Canada, Vt.)  
*Chasmatopora fenestrata* (Hall). (N. Y., N. J., Canada.)  
*Chasmatopora reticulata* (Hall). (N. Y.)  
*Chaunograptus gemmatus* Ruedemann. (Canajoharie.)  
*Cheirocrinus anatiformis* (Hall). (N. Y.)  
*Cheirocrinus walcotti* (Jaekel). (N. Y.)  
*Clathrospira conica* Ulrich and Scofield. (Ky., etc.)  
*Cleioerinus grandis* Billings. (Ontario.)  
*Cleioerinus magnificus* Billings. (Ontario.)  
*Clidophorus neglectus* Hall. (N. J., Mo.)  
*Climacograptus caudatus* Lapworth. (Magog.)  
*Climacograptus caudatus laticaulis* Gurley. (Magog.)  
*Climacograptus kamptolheca* Gurley. (Magog.)  
*Climacograptus oligolheca* Gurley. (Magog.)  
*Climacograptus putillus* (Hall). (Canada, N. Y., etc.)  
*Climacograptus spiniferus* (Ruedemann). (Canajoharie.)  
*Climacograptus typicalis* Hall. (N. Y., Canada, Ohio, Minn.)  
*Clionychia subundata* (Ulrich). (Upper Trenton-Ky.)  
*Clionychia undata* (Emmons). (N. Y.)  
*Clitambonites multistriata* Foerste. (Perryville.)  
*Clitambonites rogersensis* (Foerste). (Upper Trenton-Ky.)  
*Colpomya constricta* Ulrich. (Perryville.)  
*Colpomya faba* Emmons. (N. J., N. Y.)  
*Columnaria alveolata* Goldfuss. (N. Y., Ky., etc.)  
*Columnaria alveolata intervena* Foerste. (Cynthiana.)  
*Columnaria alveolata minima* Foerste. (Cynthiana.)  
*Columnaria halli* Nicholson. (Canada, N. Y., Ky., etc.)  
*Conchopeltis alternata* Walcott. (N. Y.)  
*Conolichas cornutus* (Clarke). (N. Y., Canada.)  
*Conotreta rusti* Walcott. (N. Y., Ky.)  
*Constellaria emaciata* (Ulrich and Bassler). (Cynthiana, Bigby, Perryville.)  
*Constellaria fischeri* Ulrich. (Cynthiana, Catheys.)  
*Constellaria teres* Ulrich and Bassler. (Catheys, Cynthiana, Bigby.)  
*Conularia gattingeri* Safford. (Tenn.)  
*Conularia gracilis* Hall. (N. Y.)  
*Conularia granulata* Hall. (N. Y.)  
*Conularia indentata* Conrad. (Ill.)  
*Conularia papillata* Hall. (N. Y.)  
*Conularia quadrata* Walcott. (N. Y.)  
*Conularia trentonensis* Hall. (N. Y., Canada, etc.)  
*Conularia trentonensis rogersensis* Foerste. (Upper Trenton-Ky.)  
*Cornulites flexuosus* (Hall). (N. Y.)  
*Corydocphalus tuberculatus* (Weller). (N. J.)  
*Corynotrypa delicatula* (James). (N. Y., Ky., etc.)  
*Corynotrypa inflata* (Hall). (N. Y., Ky., etc.)  
*Cremaerinus barrandei* (Walcott). (N. Y.)  
*Cremaerinus billingsianus* (Ringueberg). (Ontario, ?Curdsville.)  
*Cremaerinus furcillatus* (Billings). (Ontario, ?Curdsville.)  
*Crepipora spatiosa* Ulrich. (Cynthiana.)  
*Crepipora venusta* (Ulrich). (Upper Trenton-Ky.)  
*Cryptolithus tessellatus* (Greene). (N. Y., Canada, etc.)  
*Crypzocon boreale* Dawson. (Quebec.)  
*Ctenodonta alta* (Hall). (Galena.)  
*Ctenodonta donaciformis* (Hall). (N. Y.)  
*Ctenodonta dubia* (Hall). (N. Y.)  
*Ctenodonta gibbosa* (Hall). (N. Y.)  
*Ctenodonta hartsvillensis* Safford. (Flanagan, Catheys.)  
*Ctenodonta levata* (Hall). (N. Y., N. J., Pa., Ky.)  
*Ctenodonta nasuta* (Hall). (N. Y.)  
*Ctenodonta obliqua* (Hall). (Ky., Tenn., etc.)  
*Ctenodonta pulchella* (Hall). (N. Y.)  
*Ctenodonta retrorsa* Ulrich. (Hermitage.)  
*Ctenodonta sanguinolaroidea* (Hall). (N. Y.)  
*Ctenodonta socialis* Ulrich. (Hermitage.)  
*Cuncameya acutifrons* Ulrich. (Upper Trenton-Ky.)  
*Cuncameya oblonga* Ulrich. (Galena.)  
*Cuncameya vetusta* (Hall). (N. Y.)  
*Cupulocrinus heterocostalis* (Hall). (N. Y.)  
*Cyathophycus? tubulare* (Ruedemann). (Canajoharie.)  
*Cycloceras olorus* (Hall). (N. Y.)  
*Cycloceras teretiforme* (Hall). (N. Y.)  
*Cycloconcha oblonga* Foerste. (Upper Trenton-Ky.)  
*Cyclocystoides saltrei* Hall. (N. Y.)  
*Cyclonema hageri* Billings. (Quebec.)  
*Cyclonema montrealense* Billings. (Canada.)  
*Cyclonema varicosum* Hall. (Catheys.)  
*Cyclora hoffmani* Miller. (Ky., Tenn., etc.)  
*Cyclora minuta* Hall. (Ky., Tenn., etc.)  
*Cyclora parvula* Hall. (Ky., Tenn., etc.)  
*Cyclospira bisulcata* (Emmons). (N. Y., etc.)  
*Cylindrocecia minor* Ulrich. (Ky.)  
*Cyphaspis trentonensis* Weller. (N. J.)  
*Cyphotrypa aceruulosa* (Ulrich). (Ky., etc.)  
*Cyphotrypa frankfortensis* Ulrich and Bassler. (Cynthiana.)  
*Cypridina antiqua* Jones. (Ontario.)  
*Cyrtoceras camurum* Hall. (N. Y.)  
*Cyrtoceras carrollense* Worthen. (Galena.)  
*Cyrtoceras constrictotriatum* Hall. (N. Y.)  
*Cyrtoceras filosum* (Conrad). (N. Y.)  
*Cyrtoceras juvenale* Billings. (Quebec.)  
*Cyrtoceras massiensae* Safford. (Tenn.)  
*Cyrtoceras multicameratum* Hall. (N. Y.)  
*Cyrtoceras saffordi* Miller. (Catheys.)  
*Cyrtoceras subarcuatum* D'Orbigny. (N. Y.)  
*Cyrtoceras trentonense* (Emmons). (N. Y.)  
*Cyrtodonta grandis intermedia* Ulrich. (Catheys.)  
*Cyrtodonta obliqua* (Meek and Worthen). (Galena.)  
*Cyrtodonta obtusa* (Hall). (N. Y., Canada.)  
*Cyrtodonta saffordi* (Hall). (Catheys.)  
*Cyrtodonta subangulata* (Hall). (N. Y.)  
*Cyrtolites ornatus minor* Ulrich and Scofield. (N. J.)  
*Cyrtolites parvus* Ulrich. (Upper Trenton-Ky.)  
*Cyrtolites retrorsus* Ulrich and Scofield. (Ky., Tenn.)



- Cyrtolites subplanus* Ulrich. (Catheys.)  
*Cyrtolitina nitidula* Ulrich. (Upper Trenton-Ky.)  
*Cyrtospira abbreviata* (Hall). (N. Y.)  
*Cytheropsis crenulata* (Emmons). (N. Y.)  
*Cytheropsis emmonsii* (Vogdes). (N. Y.)  
*Cytheropsis subelliptica* Emmons. (N. Y.)  
*Dalmanella bassleri* Foerste. (Upper Trenton-Ky.)  
*Dalmanella fertilis* Bassler. (Hermitage.)  
*Dalmanites bebrzyz* Billings. (Ontario.)  
*Dekayella foliacea* Ulrich and Bassler. (Cynthiana.)  
*Dekayella trentonensis* (Ulrich). (Wilmore.)  
*Dendrocrinus alternatus* (Hall). (N. Y.)  
*Dendrocrinus dyeri* (Meek). (Upper Trenton-Ky.)  
*Dendrocrinus gracilis* (Hall). (N. Y.)  
*Dendrocrinus gregarius* Billings. (Ontario.)  
*Dendrocrinus retractilis* Walcott. (N. Y.)  
*Dendrocrinus rusticus* Billings. (Ontario.)  
*Dendrocrinus similis* Billings. (Ontario.)  
*Dendrocystites? paradorica* (Billings). (Canada.)  
*Dendrograptus unilateralis* Gurley. (Magog.)  
*Dermatostoma cavernosum* Parks. (Catheys.)  
*Dicranograptus nicholsoni* Hopkinson. (N. Y.)  
*Dicranograptus nicholsoni porvulus* Ruedemann. (Canajoharie.)  
*Dinorthis (Plesiomys) iphigenia* (Billings). (Ontario.)  
*Dinorthis pectinella* (Emmons). (Hermitage.)  
*Dinorthis (Plesiomys) ulrichi* Foerste. (Flanagan.)  
*Diploclema trentonense* Ulrich. (N. Y.)  
*Diplograptus (Glyptograptus) amplexicaulis* (Hall).  
*Diplograptus euglyphus pygmaeus* Ruedemann. (Canajoharie.)  
*Diplograptus (Amplexograptus) macer* Ruedemann. (Canajoharie.)  
*Diplograptus (Mesograptus) mohawkensis* Ruedemann. (Canajoharie.)  
*Diplograptus vesperlinus* (Ruedemann). (Canajoharie.)  
*Eccyliomphalus (Orthostoma) communis* (Conrad). (N. Y.)  
*Eccyliomphalus contiguus* Ulrich. (N. J.)  
*Eccyliomphalus trentonensis* (Conrad). (N. J.; Pa., N. Y.)  
*Eccyliopterus ottawaensis* (Billings). (Ontario.)  
*Eccyliopterus ovenanus* (Meek and Worthen). (Galena.)  
*Ectenocrinus canadensis* (Billings). (Canada, Ky.)  
*Ectenocrinus grandis* (Meek). (Upper Trenton-Ky.)  
*Encrinurus trentonensis* Walcott (N. J.)  
*Encrinurus tuberculatus* Collie. (Pa.)  
*Encrinurus vigilans* (Hall). (N. Y.)  
*Endoceras angusticaemeratum* Hall. (N. Y.)  
*Endoceras annulatum* Hall. (N. Y., Canada.)  
*Endoceras arciventrum* Hall. (N. Y.)  
*Endoceras magniventrum* Hall. (N. Y.)  
*Endoceras proteiforme* Hall. (N. Y., etc.)  
*Endoceras proteiforme elongatum* Hall. (N. Y.)  
*Endoceras proteiforme strangulatum* Hall. (N. Y.)  
*Endoceras vanuzemi* (Conrad). (N. Y.)  
*Endodesma gesneri* (Billings). (Ontario.)  
*Endodesma postulatum* Ulrich. (Galena.)  
*Endodesma trentonense* Hall. (N. Y.)  
*Eoharpes escanabiz* (Hall). (Mich.)  
*Eoharpes ottawaensis* (Billings). (Canada, N. Y., N. J.)  
*Eotomaris elevata* Ulrich. (Catheys.)  
*Eridotrypa æditis* (Eichwald). (Ky., Tenn., etc.)  
*Eridotrypa briarcus* (Nicholson). (Catheys.)  
*Eridotrypa trentonensis* (Nicholson). (Canada, etc.)  
*Escharopora powderosa* (Ulrich). (Upper Trenton-Ky.)  
*Escharopora recta* Hall. (N. Y., Canada.)  
*Escharopora recta nodosa* Hall. (N. Y.)  
*Eurychilina jerscyensis* Weller. (N. J.)  
*Eurychilina oculifera* Weller. (N. J.)  
*Eurychilina subradiata* Ulrich. (Canajoharie.)  
*Eurydictya multipora* (Hall). (Wilmore.)  
*Eurymya subplana* Ulrich. (Hermitage.)  
*Eurypterus megalops* Clarke and Ruedemann. (N. Y.)  
*Euspirocrinus obconicus* W. R. Billings. (Quebec.)  
*Favositella laxata* (Ulrich). (Canada, etc.)  
*Fusispira inflata* (Meek and Worthen). (Galena.)  
*Fusispira subfusiformis* (Hall). (Wilmore, etc.)  
*Fusispira sulcata* Ulrich. (Upper Trenton-Ky.)  
*Gerasaphes ulrichiana* Clarke. (Upper Trenton-Ky.)  
*Glossia romingeri* Hall and Clarke. (Mich.)  
*Glossograptus arthracanthus* Gurley. (Va.)  
*Glossograptus quadrimucronatus* Hall (Collingwood.)  
*Glossograptus (Orthograptus) quadrimucronatus approximatius* Ruedemann. (Canajoharie.)  
*Glossograptus (Orthograptus) quadrimucronatus cornutus* Ruedemann. (Canajoharie.)  
*Glossograptus (Orthograptus) quadrimucronatus postremus* Ruedemann. (Canajoharie.)  
*Glyptocrinus plumosus* (Hall). (N. Y.)  
*Goldius lunatus* (Billings). (Canada, etc.)  
*Goniophora carinata* (Hall). (N. Y., N. J.)  
*Gyronema pecarinata* (Hall). (N. Y.)  
*Hallicella sculptilis* (Ulrich). (Perryville.)  
*Hallopora multitabulata* (Ulrich). (Lower Wilmore.)  
*Haploconus smithi* (Billings). (Ontario.)  
*Hebertella frankfortensis* Foerste. (Bigby, Wilmore.)  
*Hebertella latisulcata* Foerste. (Upper Trenton-Ky.)  
*Hebertella maria parkensis* Foerste. (Cynthiana, Perryville.)  
*Hebertella (Eridorthis) nicklesi* Foerste. (Upper Trenton-Ky.)  
*Hebertella (Eridorthis) rogersensis* (Foerste). (Upper Trenton-Ky.)  
*Hebertella subjugata* (Hall).  
*Hemicystites billingsi* (Chapman). (Ontario.)  
*Hemicystites carnensis* Foerste. (Upper Trenton-Ky.)  
*Heterorthis clytie* Hall. (Hermitage.)  
*Heterotrypa foerstei* Nickles. (Upper Trenton-Ky.)  
*Heterotrypa parvulipora* Ulrich and Bassler. (Catheys.)  
*Holopea incerta* Foerste. (Upper Trenton-Ky.)  
*Holopea lavinia* Billings. (Canada.)  
*Holopea nashvillensis* Ulrich. (Catheys.)  
*Holopea obliqua* Hall. (N. Y.)  
*Holopea parvula* Ulrich. (Flanagan.)  
*Holopea symmetrica* Hall. (N. Y., N. J.)  
*Holopea ventricosa* Hall. (N. Y.)  
*Homalonotus trentonensis* Simpson. (Pa.)  
*Homotrypa callosa* Ulrich. (Wilmore.)  
*Homotrypa similis* Foord. (Canada.)  
*Homotrypella granulifera* (Ulrich). (Wilmore.)

- Homotrypella norwoodi* Nickles. (Cynthiana?)  
*Hormotoma bellicincta* (Hall). (N. Y.)  
*Hormotoma gracilis* (Hall). (N. Y., Ky., etc.)  
*Hormotoma salteri* Ulrich. (Flanagan.)  
*Hormotoma salteri nitida* Ulrich. (Flanagan.)  
*Hormotoma terebriformis* Foerste. (Upper Trenton-Ky.)  
*Hudsonaster matutinus* (Hall). (N. Y., Canada.)  
*Hudsonaster milleri* Schuchert. (Wilmore.)  
*Hyalithes pinniformis* Ruedemann. (Canajoharie.)  
*Ilænus americanus* (Billings). (Canada.)  
*Ilænus latidorsatus* Hall. (N. Y.)  
*Iocrinus subcrassus* (Meek and Worthen). (Ky., etc.)  
*Iocrinus trentonensis* Walcott. (N. Y.)  
*Isophilina amii* Jones. (Quebec.)  
*Isophilina ampla* Ulrich. (Catheys.)  
*Isophilina gracilis* (Jones). (Canada.)  
*Isophilina gregaria ulrichiana* Jones. (Ontario.)  
*Isophilina jonesi* Wetherby. (Perryville.)  
*Isophilina saffordi* Ulrich. (Catheys.)  
*Isophilina? subnodosa* Ulrich. (Perryville.)  
*Isophilina whitcavesi* Jones. (Quebec.)  
*Isoteloides homalonotoides* (Walcott). (N. Y.)  
*Isotelus benjamini* Ulrich. (Upper Trenton-Ky.)  
*Isotelus covintonensis* Ulrich. (Upper Trenton-Ky.)  
*Isotelus gigas?* Dekay. (Ky., Tenn., etc.)  
*Isotelus jacobus* Clarke. (N. Y.)  
*Isotelus maximus?* Locke. (Ky., Tenn., etc.)  
*Isotelus megalops* Green. (N. Y.)  
*Kladenia prænuntia* Ulrich and Bassler. (Hermitage.)  
*Labechia macrostyla* Parks. (Mich.)  
*Lasiograptus (Thysanograptus) eucharis* (Hall). (Collingwood.)  
*Leperditella? obscura* (Jones). (Quebec.)  
*Leperditia appressa* Ulrich. (Perryville.)  
*Leperditia exsigena frankfortensis* Ulrich. (Perryville.)  
*Leperditia canadensis louekiana* Jones (Canada.)  
*Leperditia linneyi* Ulrich. (Perryville.)  
*Leperditia ovata* Jones. (Pa.)  
*Leperditia tumidula* Ulrich. (Perryville.)  
*Lepidocoleus jamesi* (Hall and Whitfield). (Ky., Tenn., etc.)  
*Leptæna tenuistriata* Sowerby. (Hermitage.)  
*Leptobolus lepis* Hall. (Upper Trenton-Ky.)  
*Leptobolus lepis cliftonensis* Foerste. (Hermitage.)  
*Leptograptus flaccidus* Hall. (Collingwood.)  
*Lichenocrinus pattersoni* Miller. (Upper Trenton-Ky.)  
*Lichenocrinus subæqualis* Foerste. (Upper Trenton-Ky.)  
*Licropheycus minor* Billings. (Canada.)  
*Licropheycus ottowacense* Billings. (Canada.)  
*Lingula æqualis* Hall. (N. Y.)  
*Lingula briscis* Billings. (Canada.)  
*Lingula cincinnatiensis* Hall and Whitfield. (Upper Trenton-Ky.)  
*Lingula cobourgensis* Billings. (Canada.)  
*Lingula covingtonensis* Hall and Whitfield. (Upper Trenton-Ky.)  
*Lingula (Palæoglossa) crassa* (Hall). (N. Y.)  
*Lingula curta* Conrad. (N. Y., Pa.)  
*Lingula elliptica* Emmons. (Va.)  
*Lingula elongata* Hall. (N. Y., Ontario.)  
*Lingula modesta* Ulrich. (Upper Trenton and Hermitage.)  
*Lingula obtusa* Hall. (N. Y., Canada.)  
*Lingula papillosa* Emmons. (N. Y.)  
*Lingula philomela* Billings. (Canada, N. J.)  
*Lingula proeteri* Ulrich. (Upper Trenton-Ky.)  
*Lingula proeteri versaillesensis* Foerste. (Flanagan.)  
*Lingula progne* Billings. (Collingwood.)  
*Lingula riciniiformis* Hall. (N. Y., etc.)  
*Lingula striata* Emmons. (Va.)  
*Lingula (Palæoglossa) trentonensis* (Conrad). (N. Y., etc.)  
*Lingula waynesboroensis* Foerste. (Hermitage.)  
*Lingula whitfieldi* Ulrich. (Upper Trenton-Ky., N. J.)  
*Lingulops norwoodi* (James). (Upper Trenton-Ky., N. J.)  
*Liospira americana* Billings. (Canada, N. Y., etc.)  
*Liospira micula* (Hall). (Ky., Tenn., etc.)  
*Liospira(?) mundula* Ulrich. (Ky.)  
*Liospira persimilis* Ulrich. (Catheys.)  
*Liospira progne* Billings. (Canada.)  
*Liospira subtilistriata* (Hall). (N. Y.)  
*Liospira vitruvia* Billings. (Canada, N. Y., etc.)  
*Lockeia siliquaria* James. (Upper Trenton-Ky.)  
*Lophospira abnormis* Ulrich. (Upper Trenton-Ky.)  
*Lophospira bicincta* (Hall). (N. Y., etc.)  
*Lophospira bowdleri* (Safford). (Tenn., Ky., etc.)  
*Lophospira conoidea* Ulrich. (Catheys.)  
*Lophospira æcura* Ulrich. (Wilmore?)  
*Lophospira elevata* Ulrich and Scofield. (Flanagan.)  
*Lophospira humilis* Ulrich. (Catheys and Flanagan.)  
*Lophospira medialis* Ulrich and Scofield. (Flanagan and Perryville.)  
*Lophospira medialis burginensis* Ulrich. (Flanagan.)  
*Lophospira producta* Ulrich. (Catheys.)  
*Lophospira pulchella* Ulrich and Scofield. (Flanagan.)  
*Lophospira saffordi* Ulrich. (Catheys.)  
*Lophospira sumncrensis* (Safford). (Catheys, Flanagan.)  
*Lophospira uniangulata* (Hall). (N. Y.)  
*Loxoceras milleri* (Foerste). (Perryville.)  
*Lyrodosma acuminatum intermedium* Ulrich. (Ky.)  
*Lyrodosma subplanum* Ulrich. (Upper Trenton-Ky.)  
*Maelurina cuneata* (Whitfield). (Galena.)  
*Mastigograptus arundinaceus* (Hall). Canajoharie.)  
*Matheria brevis* Whiteaves. (Ontario.)  
*Matheria tenera* Billings. (Canada.)  
*Meroerinus corroboratus* Walcott. (N. Y.)  
*Meroerinus typus* Walcott. (N. Y., Ky.)  
*Mesopalæaster antiquus* (Troost). (Catheys.)  
*Mesopalæaster dubius* (Miller and Dyer). Upper Trenton-Ky.)  
*Mesotrypa angularis* Ulrich and Bassler. (Hermitage.)  
*Mesotrypa echinata* Ulrich and Bassler. (Hermitage.)  
*Mesotrypa quebecensis* (Ami). (Hermitage.)  
*Mesotrypa regularis* (Foord). (Ontario.)

- Mesotrypa whiteavesi* (Nicholson). (Ontario.)  
*Modiolon ganti* (Safford). (Hermitage.)  
*Modiolon oviformis* (Ulrich). (Hermitage.)  
*Modiolon oviformis amplus* Ulrich. (Hermitage.)  
*Modiolon winchelli* (Safford). (Hermitage.)  
*Modiolopsis arcuata* Hall. (N. Y.)  
*Modiolopsis depressa* Weller. (N. J.)  
*Modiolopsis latus* Hall. (N. Y.)  
*Modiolopsis maia* Billings. (Canada.)  
*Modiolopsis meyeri* Billings. (Ontario.)  
*Modiolopsis rogersensis* Foerste. (Upper Trenton-Ky.)  
*Monotrypa globosa* Weller. (N. J.)  
*Monotrypa undulata* (Nicholson). (Ontario.)  
*Monticulipora arborea* Ulrich. (Wilmore.)  
*Monticulipora westoni* Foord. (Ontario.)  
*Nyctopora billingsi* Nicholson. (Ontario, N. J.)  
*Odontopleura parvula* (Walcott). (N. Y.)  
*Odontopleura trentonensis* (Hall). (Ontario.)  
*Ogygites canadensis* (Chapman). (Collingwood.)  
*Ohiocrinus exilis* Foerste. (Upper Trenton-Ky.)  
*Oncoceras constrictum* Hall. (N. Y.)  
*Orbicula excentrica* Emmons. (Va.)  
*Orbignyella billingsi* (Foord). (Ontario.)  
*Orthoceras æquale* (Emmons). (N. Y.)  
*Orthoceras albersi* Miller. (Upper Trenton-Ky.)  
*Orthoceras amplicameratum* Hall. (N. Y.)  
*Orthoceras arcuolincatum* Ruedemann. (Canajoharie.)  
*Orthoceras arcuoliratum* Hall. (N. Y.)  
*Orthoceras brongniarti* (Troost). (Tenn.)  
*Orthoceras clathratum* Hall. (N. Y.)  
*Orthoceras hudsonicum* Ruedemann. (Canajoharie.)  
*Orthoceras huronense* Billings. (Canada.)  
*Orthoceras junceum* Hall. (N. Y.)  
*Orthoceras latiannullatum* Hall. (N. Y.)  
*Orthoceras lineolatum* Hall. (N. Y.)  
*Orthoceras ludlowense* Miller and Faber. (Upper Trenton-Ky.)  
*Orthoceras multilincatum* (Emmons). (N. Y.)  
*Orthoceras rogersense* Foerste. (Upper Trenton, Ky.)  
*Orthoceras strigatum* Hall. (N. Y.)  
*Orthoceras tenuistriatum* (Hall). (N. Y., N. J.)  
*Orthoceras tenuitextum* (Hall). (N. Y., N. J.)  
*Orthoceras textile* Hall. (N. Y.)  
*Orthoceras undulostriatum* Hall. (N. Y.)  
*Orthoceras vulgatum* Billings. (Ontario.)  
*Orthodesma canaliculatum* Ulrich. (N. J.)  
*Orthod esma nasutum* (Conrad). (N. J.)  
*Orthodesma subnasutum* (Meek and Worthen). (Cincinnati.)  
*Orthorhynchula linneyi* (James). (Perryville-Cynthiana.)  
*Orydiscus cristatus* (Safford). (Catheys.)  
*Orydiscus subacutus* Ulrich. (Flanagan.)  
*Pachydictya acuta* (Hall). (N. Y., etc.)  
*Pachydictya triscialis* Ulrich. (Quebec.)  
*Palæophycus obscurum* Billings. (Ont.)  
*Palæophycus rugosum* Hall. (N. Y.)  
*Palæophycus simplex* Hall. (N. Y.)  
*Parastrophia hemiplicata* Hall. (N. Y.)  
*Pascocolus globosus* Billings. (Canada, etc.)  
*Pattersonia aurita* (Beecher). (Bigby.)  
*Pronopora milleri* Nickles. (Cynthiana.)  
*Pholidops trentonensis* Hall. (N. Y.)  
*Phragmolites compressus* Conrad. (N. Y.)  
*Platystrophia colbiensis* Foerste. (Cynthiana.)  
*Platystrophia colbiensis mutata* Foerste. (Cynthiana.)  
*Platystrophia colbiensis precursor* Foerste. (Cynthiana.)  
*Plectambonites curdsvillensis* Foerste. (Cynthiana.)  
*Plectambonites sericeus?* Sowerby. (N. Y., Ky., etc.)  
*Pleurocystites elegans* Billings. (Ontario.)  
*Pleurocystites exornatus* Billings. (Quebec.)  
*Pleurotomaria agave* Billings. (Canada.)  
*Pleurotomaria (Trochonema?) ambigua* (Hall) (N. Y.)  
*Pleurotomaria indenta* Hall. (N. Y.)  
*Porocrinus smithi* Grant. (Ontario.)  
*Prasopora falsi* (James). (Hermitage.)  
*Prasopora nodosa* Ulrich. (Catheys.)  
*Prasopora oculata* Foord. (Canada.)  
*Prasopora patra* Ulrich. (Hermitage.)  
*Prasopora selwyni* (Nicholson). (Canada, etc.)  
*Prasopora simulatrix* Ulrich. (Wilmore.)  
*Prasopora simulatrix orientalis* Ulrich. (Ontario, N. Y.)  
*Primicorallina trentonensis* Whitfield. (N. Y.)  
*Primitia centralis* Ulrich. (Upper Trenton-Ky.)  
*Primitia mundula incisa* Jones. (Quebec.)  
*Primitia nitida* Ulrich. (Perryville.)  
*Primitia pcrminima* Ulrich. (Upper Trenton-Ky.)  
*Primitiella ulrichi* (Jones). (Collingwood.)  
*Præus brevimarginatus* Weller. (N. J.)  
*Præus latimarginatus* Weller. (N. J.)  
*Probellia aviculoides* (Hall). (N. Y.)  
*Probellia hermione* (Billings). (Quebec.)  
*Probellia subelliptica* (D'Orbigny). (N. Y.)  
*Probellia subspatulata* (Hall). (N. Y.)  
*Probellia trentonensis* (Conrad). (N. Y.)  
*Promopalæaster prenuntius* Schuchert.  
*Protaræa vetusta* (Hall). (N. Y., etc.)  
*Protoerisina perantiqua* (Hall). (N. Y., Quebec.)  
*Pseudohornera dichotoma* (Ulrich). (Quebec.)  
*Pseudosphærezochus trentonensis* Clarke. (N. Y.)  
*Pterotheca anatiniformis* (Hall). (N. Y.)  
*Pterotheca canaliculata* (Hall). (N. Y.)  
*Pterotheca expansa* (Emmons). (N. Y.)  
*Pterotheca undulata* (Hall). (N. Y.)  
*Pterygomotopus achates* (Billings). (Ontario, N. Y., etc.)  
*Pterygomotopus callicephalus* (Hall). (N. Y., Ontario, etc.)  
*Pterygomotopus carleyi rogersensis* (Foerste). (Cynthiana.)  
*Pterygomotopus eboraccus* Clarke. (N. Y.)  
*Pterygomotopus meta* (Hall). (Wis.)  
*Pyrenomæus subcuneatus* Ulrich. (Upper Trenton, Ky.; N. Y.)  
*Rafinesquina alternata* (Emmons). (N. Y., Tenn., etc.)  
*Rafinesquina declivis* (James). (Cynthiana.)  
*Rafinesquina deltoidea* (Conrad). (N. Y.)  
*Rafinesquina tenuilineata* (Conrad). (N. Y.)  
*Rafinesquina winchestrensis* Foerste. (Cynthiana.)  
*Rafinesquina winchestrensis filistriata* Foerste. (Cynthiana.)  
*Raphistoma rotuloides* (Hall). (N. Y.)

- Receptaculites dixonensis* Miller and Gurley. (Galena.)
- Remploceroides striatulus* Walcott. (N. Y.)
- Rhaphanoerinus subnodosus* (Walcott). (N. Y.)
- Rhinidictya neglecta* Ulrich. (Wilmore.)
- Rhinidictya neglecta canadensis* Ulrich. (Ky., Tenn.)
- Rhynchonella sordida* Hall. (N. Y.)
- Rhynchotrema dentatum* Hall. (N. Y., N. J.)
- Rhynchotrema increbescens* (Hall). (N. Y., Canada, etc.)
- Rhynchotrema procteri* Ulrich. (Flanagan.)
- Rhynchotrema subtrigonale* (Hall). (N. Y., Ky., etc.)
- Rusophycus biloba* Vanuxem. (N. Y., etc.)
- Saccospongia danvillensis* Ulrich. (Perryville.)
- Saccospongia rudis* Ulrich. (Cynthiana.)
- Salpingostoma expansum* (Hall). (N. Y., Canada.)
- Scenidium(?) merope* (Billings). (Canada, Ky.)
- Schizambon canadensis* (Aml). (Canajoharie, Collingwood.)
- Schizambon? dodgei* Winchell and Schuchert. (N. Y.)
- Schizocrania filosa* Hall. (Ontario, etc.)
- Schizocrania(?) rudis* Hall. (Hermitage.)
- Schizocrania schucherti* Hall and Clarke. (Upper Trenton-Ky.)
- Schizocerinus nodosus* Hall. (N. Y.)
- Schizocerinus striatus* Hall. (N. Y.)
- Schizolopha textilis* Ulrich. (Catheys.)
- Schizotreta conica* (Dwight). (N. Y.)
- Schizotreta ovalis* Hall and Clarke. (N. Y.)
- Schizotreta picea* (Billings). (Canada.)
- Schuchertia stellata* (Billings). (Ontario.)
- Sinuities cancellatus* (Hall). (N. Y., Ky., Tenn., etc.)
- Sinuities cancellatus acutus* (Sowerby?) Hall. (N. Y.)
- Sinuities cancellatus corrugatus* (Hall). (N. Y.)
- Sinuities cancellatus trentonensis* (Ulrich and Scofield); (Ohio, etc.)
- Sinuities obesus* (Ulrich). (Hermitage.)
- Sinuities tenuissimus* (Collie). (Pa.)
- Solenopora compacta* (Billings). (Russki, Canada, and U. S.)
- Spatiopora? arcolata* Ford. (Quebec.)
- Sphaerocoryphe robustus* Walcott. (N. Y.)
- Sphenothallus angustifolius* Hall. (Canajoharie.)
- Spyroceras anellus* (Conrad). (N. Y.)
- Spyroceras beauportense* (Whiteaves). (Canada.)
- Spyroceras bilineatum* (Hall). (N. Y., Canada, Minn.)
- Spyroceras subannulatum* (D'Orbigny). (N. Y.)
- Stelidicerinus argutus* (Walcott). (N. Y.)
- Stelliella billingsi* Hinde. (Ontario.)
- Stelliella crassa* Hinde. (Ontario.)
- Stellipora antheloidea* Hall. (N. Y., Ontario.)
- Stephanella sancta* Hinde. (Collingwood.)
- Stictopora elegantula* Hall. (N. Y.)
- Stictipora exigua* Ulrich. (Quebec.)
- Stomatopora arachnoidea* (Hall). (N. Y., Ohio, Ky., etc.)
- Streptelasma corniculatum* Hall. (N. Y., etc.)
- Stromatocerium michiganense* Parks. (Drift, Mich.)
- Stromatocerium pustulosum* (Safford). (Bigby, Catheys.)
- Strophomena conradi* Hall and Clarke. (N. Y.)
- Strophomena hallie* (Miller). (Upper Trenton-Ky.)
- Strophomena higginsportensis* Foerste. (Upper Trenton-Ky.)
- Strophomena thalia* Billings. (Ontario.)
- Strophomena trilobata* (Owen). (Iowa, etc.)
- Strophostylus textilis* Ulrich and Scofield. (Flanagan.)
- Strophostylus vicina* Foerste. (Wilmore-Perryville.)
- Subulites elongatus* Conrad. (N. Y., Canada.)
- Syproceras bilineatum frankfortense* Foerste. (Hermitage.)
- Taniaster spinosus* (Billings). (Canada.)
- Teganium subsphericum* (Walcott). (N. Y.)
- Tetradella lunatifera* (Ulrich). (Ky., Tenn., etc.)
- Tetradella subquadrans* Ulrich. (N. Y.)
- Tetradium columnare* (Hall). (N. Y., Tenn.)
- Tetradium fibratum* Safford. (Tenn., Ky., Va.)
- Tetradium minus* Safford. (Hermitage.)
- Tetradium racemosum* Raymond. (Ontario.)
- Tetranota bidorsata* (Hall). (N. Y., Ky., etc.)
- Tetranota obsoleta* Ulrich and Scofield. (Ky., etc.)
- Trematis fragilis* Ulrich. (Upper Trenton-Ky.)
- Trematis montrealensis* Billings. (Quebec.)
- Trematis ottawaensis* Billings. (Ontario, N. Y., etc.)
- Trematis punctistriata* Hall. (Hermitage.)
- Trematis terminalis* (Emmons). (N. Y.)
- Triarthrus becki* Green. (U. S. and Canada.)
- Triarthrus billingsi* Barrande. (Collingwood.)
- Triarthrus canadensis* Smith. (Collingwood.)
- Triarthrus glaber* Billings. (Collingwood.)
- Triarthrus spinosus* Billings. (Collingwood.)
- Triplécia (Cliftonia) cathoumi* (Wilson). (Collingwood.)
- Triplécia cuspidata* Hall. (N. Y.)
- Triplécia extans* (Emmons). (N. Y.)
- Triplécia nucleus* Hall. (N. Y.)
- Tripterocecras ziphas* (Billings). (Ontario.)
- Trocholites ammonius* Conrad. (N. Y., Ky.)
- Trocholites canadensis* Hyatt. (Canada.)
- Trochonema (Eunema) arcatum* Ulrich. (Flanagan.)
- Trochonema (Eunema) obsoletum* Ulrich. (Flanagan.)
- Trochonema subcrassum* Ulrich and Scofield. (Flanagan.)
- Trochonema umbilicatum* (Hall). (N. Y., Canada, etc.)
- Turrilepas canadensis* Woodward. (Collingwood.)
- Ulrichia bivertex* (Ulrich). (Ky., N. Y.)
- Ustercella pulchella* (Billings). (Ontario, N. Y.)
- Vallatotheca unguiformis* (Ulrich). (Flanagan.)
- Vanuzemia hayniana* (Safford). (Flanagan, Catheys.)
- Vanuzemia nana* (Ulrich). (Flanagan.)
- Vanuzemia wortheni* (Ulrich). (Galena.)
- Whiteavesia cancellata* (Walcott). (Upper Trenton-Ky.)
- Whiteavesia cincinnatiensis* (Hall and Whitfield). (Upper Trenton-Ky.)
- Whiteavesia kentonensis* (Ulrich). (Upper Trenton-Ky.)
- Whiteavesia oblonga* (Ulrich). (Upper Trenton-Ky.)
- Whiteavesia pulchella* (Ulrich). (Upper Trenton-Ky.)
- Whitella suborbicularis* Weller. (N. J.)

- Whitella subtruncata* (Hall). (N. Y., N. J., Canada.)  
*Whitella ventricosa* (Hall). (N. Y., Minn., Canada.)  
*Zitteloceras hallianum* (D'Orbigny). (N. Y., Canada.)  
*Zygospira exigua* (Hall). (N. Y.)  
*Zygospira obsolita* (Foerste). (Cynthiana.)  
*Zygospira recurvirostris* (Hall). (N. Y., Ky., etc.)  
 TRENTOPIA (PROSSER) OF UPPER MISSISSIPPI VALLEY.  
*Allodesma subellipticum* (Ulrich).  
*Ambonychia affinis* Ulrich.  
*Ambonychia amygdalina* Hall.  
*Ambonychia bellistriata* Hall.  
*Amphilichas cucullus* (Meek and Worthen).  
*Amphilichas robbinsi* (Ulrich).  
*Aparchites minutissimus trentonensis* Ulrich.  
*Archinaecla senecarinata* Ulrich and Scofield.  
*Archinaecla valida* (Sardeson).  
*Arthroclema armatum* Ulrich.  
*Arthroclema pulchellum* Billings.  
*Arthropora bifurcata* Ulrich.  
*Arthropora reversa* Ulrich.  
*Aspidopora elegantula* (Ulrich).  
*Batostoma humile* Ulrich.  
*Bellerophon platystoma* (Meek and Worthen).  
*Bellerophon similis* Ulrich and Scofield.  
*Bollia subaequala* Ulrich.  
*Bollia unguiloidea* Ulrich.  
*Bucania elliptica* Ulrich and Scofield.  
*Bucania lindsleyi* (Safford).  
*Bucania sublata* Ulrich and Scofield.  
*Byssonychia intermedia* (Meek and Worthen).  
*Bythocypris cylindrica* (Hall).  
*Calymene senaria* Conrad.  
*Camerocecras hennepini* Clarke.  
*Catazyga uphamsi* (Winchell and Schuchert).  
*Ceramoporella interporosa* Ulrich.  
*Ceraurus pleurcaxanthemus* Green.  
*Chasmatopora reticulata* (Hall).  
*Cathrospira conica* Ulrich and Scofield.  
*Climophorus consuetus* Ulrich.  
*Clinychia undata* (Emmons).  
*Clitambonites diversus* (Shaler).  
*Clitambonites diversus altissimus* Winchell and Schuchert.  
*Calocaulus nyclectus* Ulrich and Scofield.  
*Caloclema trentonensis* (Ulrich).  
*Conostellaria varia* Ulrich.  
*Corydocephalus wesenbergensis paulianus* (Clarke).  
*Corynotrypa delicatula* (James).  
*Crania trentonensis* Hall.  
*Ctenobolbina obliqua* Ulrich.  
*Ctenodonta alta* (Hall).  
*Ctenodonta carinata* Ulrich.  
*Ctenodonta intermedia* (Ulrich).  
*Ctenodonta oviformis* Ulrich.  
*Ctenodonta subnasuta* Ulrich.  
*Cuncameya truncatula* Ulrich.  
*Cybeloides? winchelli* (Clarke).  
*Cycloceras olorus* (Hall).  
*Cyclonema varicosum* Hall.  
*Cyclospira bisulcata* (Emmons).  
*Cyphotrypa acervulosa* (Ulrich).  
*Cyrtodonta affinis* Ulrich.  
*Cyrtodonta gibbera* Ulrich.  
*Cyrtodonta grandis* (Ulrich).  
*Cyrtodonta grandis germana* (Ulrich).  
*Cyrtodonta parva* Ulrich.  
*Cyrtolites ornatus minor* Ulrich and Scofield.  
*Cytherella? rugosa* (Jones).  
*Cytherella? rugosa arcta* Ulrich.  
*Cyrtospira wykoffensis* Ulrich and Scofield.  
*Dalmanella rogata* (Sardeson).  
*Dalmanella testudinaria* (Dalman).  
*DeKayia trentonensis* (Ulrich).  
*Dianulites petropolitana* Dybowski.  
*Diastoporina stabelata* Ulrich.  
*Dinobolus(?) parvus* (Whitfield).  
*Dinorthis meedsi* (Winchell and Schuchert).  
*Dinorthis meedsi germana* (Winchell and Schuchert).  
*Diplotrypa limitaris* Ulrich.  
*Diplotrypa neglecta* Ulrich.  
*Eccyliophthalmus subrotundus* Ulrich and Scofield.  
*Eccyliopterus owenanus* (Meek and Worthen).  
*Edrioaster bigsbyi* (Billings).  
*Endoceras proteifer mc Hall*.  
*Endodesma compressum* Ulrich.  
*Endodesma cuneatum* Ulrich.  
*Eoharpes minnesotensis* (Clarke).  
*Eoharpes rutrellum* (Clarke).  
*Eridotrypa ædilis* (Eichwald).  
*Eridotrypa ædilis minor* (Ulrich).  
*Eridotrypa exigua* Ulrich.  
*Eurychilina ventrosa* Ulrich.  
*Favositella laxata* (Ulrich).  
*Fusispira angusta* Ulrich and Scofield.  
*Fusispira angusta subplana* Ulrich and Scofield.  
*Fusispira convexa* Ulrich and Scofield.  
*Fusispira elongata* Hall.  
*Fusispira inflata* (Meek and Worthen).  
*Fusispira intermedia* Ulrich and Scofield.  
*Fusispira nobilis* Ulrich and Scofield.  
*Fusispira planulata* Ulrich and Scofield.  
*Fusispira subbrevis* Ulrich and Scofield.  
*Fusispira subfusiformis* (Hall).  
*Fusispira vittata* (Hall).  
*Goldius lunatus* (Billings).  
*Graptodictya proava* (Eichwald).  
*Gyronema pœcarinata* (Hall).  
*Hallicella labiosa* Ulrich.  
*Hallopora ampla* (Ulrich).  
*Hallopora dumalis* (Ulrich).  
*Hallopora goodhueensis* (Ulrich).  
*Hallopora multitabulata* (Ulrich).  
*Halloporina crenulata* (Ulrich).  
*Hu plocoonus galencensis* (Clarke).  
*Hebertella frankfortensis* Foerste.  
*Helcionopsis subcarinata* Ulrich and Scofield.  
*Helopora mucronata* Ulrich.  
*Helopora quadrata* Ulrich.  
*Hemiphragma irrasum* (Ulrich).  
*Hemiphragma ottawaense* (Foord).  
*Hemiphragma tenuimurale* Ulrich.  
*Hindia parva* Ulrich.  
*Holopea appressa* Ulrich and Scofield.  
*Holopea cœclsa* Ulrich and Scofield.  
*Holopea paludiniformis* Hall.  
*Holopea pyrene* Billings.  
*Holopea similis* Ulrich.  
*Holopea supraplana* Ulrich and Scofield.  
*Homotrypa callosa* Ulrich.  
*Homotrypa? similis* Foord.

- Homotrypa subramosa insignis* (Ulrich).  
*Homotrypella hospitalis crassa* (Ulrich).  
*Homotrypella mundula* Ulrich.  
*Homotrypella? ovata* Ulrich.  
*Hormotoma bellicincta* (Hall).  
*Hormotoma gracilis* (Hall).  
*Hormotoma(?) major* (Hall).  
*Hormotoma salteri* (Ulrich).  
*Hormotoma trentonensis* Ulrich and Scofield.  
*Ilænus americanus* (Billings).  
*Ischaðites iowensis* (Owen).  
*Isotelus gigas?* Dekay.  
*Isotelus maximus?* Locke.  
*Jonesella obscura* Ulrich.  
*Kokenospira costalis* Ulrich and Scofield.  
*Lichenaria minor* Ulrich.  
*Licorhynchus ottawaense* Billings.  
*Lingula? canadensis* Billings.  
*Lingula (Palæoglossa) defecta* (Winchell and Schuchert).  
*Lingula (Palæoglossa) hurlbuti* (N. H. Winchell).  
*Lingula (Pseudolingula) iowensis* (Owen).  
*Lingula riciniiformis* Hall.  
*Lingula riciniiformis galenensis* Winchell and Schuchert.  
*Lingulasma galenense* Winchell and Schuchert.  
*Liospira americana* Billings.  
*Liospira angustata* Ulrich.  
*Liospira prognæ* Billings.  
*Lophospira bicincta* Hall.  
*Lophospira elevata* Ulrich and Scofield.  
*Lophospira fillmorensis* Ulrich and Scofield.  
*Lophospira medialis* Ulrich and Scofield.  
*Lophospira perforata* Ulrich and Scofield.  
*Lyrodesma cannonense* Ulrich.  
*Maclurites crassus macla* (Ulrich and Scofield).  
*Maclonoceras neleus* (Hall).  
*Mesotrypa discoidea* Ulrich.  
*Mesotrypa quebecensis* (Ami).  
*Mesotrypa? rotunda* Ulrich.  
*Mitoclema? mundulum* Ulrich.  
*Modiolodon patulus* Ulrich.  
*Modiolopsis mytiloides* Hall.  
*Modiolopsis nana* Ulrich.  
*Modiolopsis oweni* Ulrich.  
*Monotrypa intabulata* Ulrich.  
*Monticulipora arborea* Ulrich.  
*Monticulipora? cannonensis* Ulrich.  
*Nematopora conferta* Ulrich.  
*Nematopora consuetæ* Bassler.  
*Nematopora granosa* Ulrich.  
*Nematopora ovalis* Ulrich.  
*Nileus vigilans* (Meek and Worthen).  
*Odontopleura parvula* (Walcott).  
*Oncoceras douglassi* Clarke.  
*Oncoceras eriguum* (Billings).  
*Oncoceras minnesotense* Clarke.  
*Ophiletitina sublaza sequens* Ulrich and Scofield.  
*Orthoceras beltrami* Clarke.  
*Orthoceras junceum* Hall.  
*Orthodesma schucherti* Ulrich.  
*Orydiscus subacutus* Ulrich.  
*Pachydictya acuta* (Hall).  
*Pachydictya elegans* Ulrich.  
*Pachydictya magnipora* Ulrich.  
*Pachydictya pumila* Ulrich.  
*Pachydictya pumila sublata* Ulrich.
- Parastrophia hemiplicata* Hall.  
*Parastrophia hemiplicata rotunda* Winchell and Schuchert.  
*Parastrophia scofieldi* (Winchell and Schuchert).  
*Pasceolus globosus* Billings.  
*Petrocrania ulrichi* (Hall and Clarke).  
*Phænopora incipiens* Ulrich.  
*Pholidops trentonensis minor* Winchell and Schuchert.  
*Phragmolites dyeri cellulosus* (Ulrich and Scofield).  
*Plectambonites gibbosus* Winchell and Schuchert.  
*Plectambonites minnesotensis* (Sardeson).  
*Plectambonites sericeus* Sowerby.  
*Plectorthis plicatella trentonensis* Foerste.  
*Plethocordia suberecta* Ulrich.  
*Pleurocystites squamosus* Billings.  
*Podolithus anomalocrinus* Sardeson.  
*Podolithus dendrocrinus* Sardeson.  
*Podolithus euehirocrinus* Sardeson.  
*Poterioceras apertum* Whiteaves.  
*Prasopora affinis* Foord.  
*Prasopora grandis* (Ulrich).  
*Prasopora insularis* Ulrich.  
*Prasopora insularis fillmorensis* Ulrich.  
*Prasopora oculata* Foord.  
*Prasopora selwyni* (Nicholson).  
*Prasopora simulatrix* Ulrich.  
*Primitia micula* Ulrich.  
*Primitia uphami* Ulrich.  
*Prolobella striatula* Ulrich.  
*Protaraxa vetusta* (Hall).  
*Psilocoelma minnesotensis* Ulrich.  
*Pterygometopus achates* (Billings).  
*Pterygometopus callicephalus* (Hall).  
*Pterygometopus schmidti* Clarke.  
*Rafinesquina alternata* (Emmons).  
*Rafinesquina deltoidea* (Conrad).  
*Raphistomina rugata* Ulrich and Scofield.  
*Receptaculites oweni* Hall.  
*Rhinidictya minima* Ulrich.  
*Rhinidictya minima modesta* Ulrich.  
*Rhinidictya mutabilis* (Ulrich).  
*Rhynchotrema increbescens* (Hall).  
*Rhynchotrema increbescens laticostatum* (Winchell and Schuchert).  
*Rhytimya sinuata* Ulrich.  
*Saffordia modesta* (Ulrich).  
*Salpingostoma sculptile* Ulrich and Scofield.  
*Scenella affinis* Ulrich and Scofield.  
*Scenella affinis obsoleta* Ulrich and Scofield.  
*Scenella radialis* Ulrich and Scofield.  
*Schizotreta pelopea* (Billings).  
*Schmidella affinis* Ulrich.  
*Schmidella incompta subæqualis* Ulrich.  
*Sinuities cancellatus* (Hall).  
*Sinuities cancellatus trentonensis* (Ulrich and Scofield).  
*Sphenolium striatum* Ulrich.  
*Stomatopora arachnoidea* (Hall).  
*Streptelasma corniculum* Hall.  
*Strophomena billingsi* Winchell and Schuchert.  
*Strophomena emaciata* Winchell and Schuchert.  
*Strophomena scofieldi* Winchell and Schuchert.  
*Strophomena trentonensis* Winchell and Schuchert.  
*Strophomena trilobata* (Owen).  
*Strophostylus textilis* Ulrich and Scofield.  
*Subulites pergracilis* Ulrich and Scofield.

*Tetradella lunatifer* (Ulrich).  
*Tetranota bidorsata* (Hall).  
*Tetranota obsoleta* Ulrich and Scofield.  
*Tetranota sczarzinata* Ulrich and Scofield.  
*Trematis ottawaensis* Billings.  
*Tripterocecras planocorvum* (Hall).  
*Trochonema altum* Ulrich and Scofield.  
*Trochonema fragile* Ulrich and Scofield.  
*Trochonema (Eucema) robbinsi* Ulrich and Scofield.  
*Trochonema (Eucema) salteri* Ulrich and Scofield.  
*Trochonema (Eucema) simile* Ulrich and Scofield.  
*Trochonema subcrassum* Ulrich and Scofield.  
*Trochonema umbilicatum* (Hall).  
*Vanuzemia abrupta* Ulrich.  
*Vanuzemia hayniana* (Safford).  
*Whiteavesia subcarinata* (Ulrich).  
*Whitella praecipua* Ulrich.  
*Whitella subcarinata* Ulrich.  
*Whitella truncata* Ulrich.  
*Zygospira recurvirostris* (Hall).

TRENTON (STEWARTVILLE) OF UPPER MISSISSIPPI  
VALLEY.

*Colocaulus ahlerti* Ulrich and Scofield.  
*Fusispira inflata* (Meek and Worthen).  
*Fusispira inflata ventricosa* (Hall).  
*Fusispira subbrevis* Ulrich and Scofield.  
*Hormotoma (?) major* (Hall).  
*Hormotoma trentonensis* Ulrich and Scofield.  
*Lophospira augustina* (Billings).  
*Lophospira augustina minnesotensis* Ulrich and Scofield.  
*Maclurina cuneata* (Whitfield).  
*Maclurina manitobensis* (Whiteaves).  
*Maclurina subrotunda* (Whitfield).  
*Maclurites crassus* (Ulrich and Scofield).  
*Tripterocecras lambi?* Whiteaves.  
*Trochonema umbilicatum* (Hall).

TRENTON (CURDSVILLE) OF OHIO VALLEY AND  
CANADA.

*Aesiocystites priscus* Miller and Gurley.  
*Aglaocrinites dicksoni* Billings.  
*Ammydalocystites floralis* Billings.  
*Ammydalocystites floralis laevis* Billings.  
*Ammydalocystites huntingtoni* Wetherby.  
*Ammydalocystites radiatus* Billings.  
*Ammydalocystites tenuistriatus* Billings.  
*Archæocrinus desideratus* W. R. Billings.  
*Archæocrinus lucinosus* (Billings).  
*Archæocrinus marginatus* (Billings).  
*Archæocrinus microbasilis* (Billings).  
*Archæocrinus pyriformis* (Billings).  
*Archinacella cingulata* Ulrich.  
*Astrocystites ottawaensis* Whiteaves.  
*Astroporites ottawaensis* Lambe.  
*Atlocystites huxleyi* Billings.  
*Bathyurus ingalli* Raymond.  
*Belemnocystites wetherbyi* Miller and Gurley.  
*Carabocrinus ovalis* Miller and Gurley.  
*Carabocrinus radiatus* Billings.  
*Carabocrinus vancouverlandi* Billings.  
*Cerawrinus trentonensis* Barton.  
*Cheirocrinus logani* (Billings).  
*Cheirocrinus logani gracilis* (Billings).  
*Cheirocrinus regius* Billings.  
*Cheirocrinus sculptus* Springer.  
*Comarocystites punctatus* Billings.  
*Cremaocrinus articulosus* (Billings).  
*Cremaocrinus inaequalis* (Billings).  
*Cremaocrinus rugosus* (Billings).  
*Ctenodonta subrotunda* (Ulrich).  
*Cupulocrinus conjugans* (Billings).  
*Cupulocrinus humilis* (Billings).  
*Cupulocrinus jewetti* (Billings).  
*Cupulocrinus jewetti kentuckiensis* Springer.  
*Cyclocystoides halli* Billings.  
*Dendrocrinus acutidactylus* Billings.  
*Dendrocrinus proboscidiatus* Billings.  
*Dinorthis pectinella* (Hall).  
*Edrioaster bigsbyi* (Billings).  
*Endoceras clarki* (Wetherby).  
*Endoceras gracile* (Wetherby).  
*Eoharpes dentoni* (Billings).  
*Glaucocrinus falconeri* Parks and Alcock.  
*Glyptocrinus circumcarinatus* Parks.  
*Glyptocrinus mercerensis* Miller and Gurley.  
*Glyptocrinus ornatus* Billings.  
*Glyptocrinus ramulosus* Billings.  
*Glyptocystites multiporus* Billings.  
*Heterocrinus milleri* Wetherby.  
*Heterocrinus tenuis* Billings.  
*Hyboocrinus conicus* Billings.  
*Hyboocrinus tumidus* Billings.  
*Hybocystites eldonensis* (Parks).  
*Hybocystites problematicus* Wetherby.  
*Lophospira bicincta* (Hall).  
*Ohiocrinus bellvillensis* (W. R. Billings).  
*Omospira alexandra* (Billings).  
*Orthis tricenaria* Conrad.  
*Ottawaocrinus billingsi* Springer.  
*Ottawaocrinus typus* W. R. Billings.  
*Palæocrinus angulatus* (Billings).  
*Palæocrinus pulchellus* Billings.  
*Palæocrinus rhombiferus* Billings.  
*Periglyptocrinus billingsi* Wachsmuth and Springer.  
*Periglyptocrinus priscus* (Billings).  
*Petraster rigidus* (Billings).  
*Plectambonites curdsvillensis* Foerste.  
*Pleurocystites filitextus* Billings.  
*Pleurocystites mercerensis* Miller and Gurley.  
*Pleurocystites squamosus* Billings.  
*Pleurocystites squamosus robustus* (Billings).  
*Porocrinus conicus* Billings.  
*Porocrinus kentuckiensis* Miller and Gurley.  
*Protaster whiteavesiana* Parks.  
*Protæocrinus elegans* (Billings).  
*Protæocrinus laevis* (Billings).  
*Raphistomina denticulata* Ulrich.  
*Reteocrinus alveolatus* Miller and Gurley.  
*Reteocrinus stellaris* Billings.  
*Rhynchotrema subtrigonale* (Hall).  
*Salpingostoma buelli kentuckiensis* Ulrich and Scofield.  
*Sinuities cancellatus* (Hall).  
*Sinuities perivolatus* (Ulrich and Scofield).  
*Stenaster salteri* Billings.  
*Streptelasma corniculum* Hall.  
*Tæniaster cylindricus* (Billings).  
*Tetranota obsoleta* Ulrich.  
*Thresherodiscus ramosus* Foerste.  
*Vanuzemia cardinata* Ulrich.  
*Vanuzemia gibbosa* Ulrich.  
*Zygospira recurvirostris* Hall.

TRENTON (RYSEDORPH CONGLOMERATE) OF EASTERN  
NEW YORK.

*Ampyz (Lonchodoma) hastatus* Ruedemann.  
*Aparchites minutissimus robustus* Ruedemann.  
*Bolboporites americanus* Billings.  
*Bollia cornucopie* Ruedemann.  
*Bythocypris cylindrica* (Hall).  
*Calymene senaria* Conrad.  
*Carinaropsis carinata* Hall.  
*Ceraurus pleurexanthemus* (Green).  
*Christiania trentonensis* Ruedemann.  
*Clathrospira subconica* Hall.  
*Climacograptus scharenbergi* Lapworth.  
*Conularia trentonensis* Hall.  
*Corynotrypa inflata* (Hall)  
*Cyphaspis matutina* Ruedemann  
*Cyrtospira attenuata* Ruedemann.  
*Dalmanella testudinaria* var. (Dalman).  
*Dinorthis pectinella* (Emmons).  
*Diplograptus foliaceus* (Murchison).  
*Eccylopterus spiralis* Ruedemann  
*Eurychilina bulbifera* Ruedemann  
*Eurychilina dianthus* Ruedemann.  
*Eurychilina obliqua* Ruedemann.  
*Eurychilina reticulata* Ulrich.  
*Eurychilina? solida* Ruedemann.  
*Eurychilina subradiata reussclerica* Ruedemann.  
*Gerasaphes ulrichana* (Clarke).  
*Goldius lunatus* (Billings).  
*Hallopora multitabulata* (Ulrich).  
*Holopea paludiformis* Hall.  
*Hyalolithes rhine* Ruedemann.  
*Illanus americanus* Billings.  
*Ischilina armata pygmaea* Ruedemann.  
*Isotelus maximus* Locke.  
*Leperditia fabulites* Conrad.  
*Leperditia resplendens* Ruedemann.  
*Leptaena rhomboidalis* var. (Wilckens).  
*Liospira americana* (Billings).  
*Liospira subtilistriata* (Hall).  
*Lophospira bicincta* (Hall).  
*Lophospira perangulata* (Hall).  
*Macronotella fragaria* Ruedemann.  
*Macronotella ulrichi* Ruedemann.  
*Orthis tricenaria* Conrad.  
*Parastrophia hemiplicata* Hall.  
*Pholidops trentonensis* Hall.  
*Phragmolites compressus* (Conrad).  
*Pianodema subaequata perveta* (Conrad).  
*Platystrophia biforata* var. Schlotheim.  
*Plectambonites pisum* Ruedemann.  
*Plectambonites sericeus* var. (Sowerby).  
*Prasopora simulatrix orientalis* Ulrich.  
*Primitia joncsi* (Ruedemann).  
*Protobella aviculoides* (Hall).  
*Pterygometopus achates* (Billings).  
*Pterygometopus callicephalus* Hall.  
*Pterygometopus eboraceus* Clarke.  
*Rafinesquina alternata?* (Emmons).  
*Rafinesquina deltoidea* (Conrad).  
*Remopleurides linguatus* Ruedemann.  
*Remopleurides tumidus* Ruedemann.  
*Schmidtella crassimarginata ventrilabiata* Ruedemann.  
*Sinuities cancellata* (Hall).  
*Siphonotreta? minnesotensis* Hall and Clarke.  
*Sphaerocoryphe major* Ruedemann.

*Spyroceras bilineatum* (Hall).  
*Spyroceras subannulatum* (Hall).  
*Streptelasma corniculatum* Hall.  
*Thalcoops ovata* Conrad.  
*Tretaspis diademata* Ruedemann.  
*Tretaspis reticulatus* Ruedemann.  
*Triplecia nucleus* Hall.  
*Trochonema umbilicatum* (Hall).  
*Whitella ventricosa* (Hall).  
*Zitteloceras hallianum* (D'Orbigny).  
*Zygospira exigua* (Hall).  
*Zygospira recurvirostris* Hall.

## TRENTON (SNAKE HILL) OF EASTERN NEW YORK.

*Archinacella orbiculata* (Hall).  
*Azygograptus? campanulata* Nicholson.  
*Calymene senaria* Conrad.  
*Carabocrinus radiatus* Billings.  
*Chaunograptus rectilinea* Ruedemann.  
*Clathrospira subconica* Hall.  
*Clidophorus foerstei* Ruedemann.  
*Clidophorus ventricosus* Ruedemann.  
*Climacograptus caudatus* Lapworth.  
*Climacograptus (Mesograptus) putillus* Hall.  
*Climacograptus scharenbergi* Lapworth.  
*Climacograptus spiniferus* Ruedemann.  
*Clitambonites diversus* (Salter).  
*Conularia trentonensis multicolta* Ruedemann.  
*Corynoides calicularis* Nicholson.  
*Corynoides curtus* Lapworth.  
*Corynoides curtus comma* Ruedemann.  
*Corynoides gracilis* Hopkinson.  
*Cryptolithus tessellatus* (Greene).  
*Cryptograptus tricornis insectiformis* Ruedemann.  
*Ctenobolbina ciliata* (Emmons).  
*Ctenobolbina ciliata cornuta* Ruedemann.  
*Ctenobolbina subrotunda* Ruedemann.  
*Ctenodonta declivis* Ruedemann.  
*Ctenodonta levata* (Hall).  
*Ctenodonta prosseri* Ruedemann.  
*Ctenodonta radiata* Ruedemann.  
*Ctenodonta recta* Ruedemann.  
*Ctenodonta subcuneata* Ruedemann.  
*Cuneameya acutifrons* Ulrich.  
*Cyclonema cushingi* Ruedemann.  
*Cyclonema montrealense* Billings.  
*Cyclospira bisulcata* (Emmons).  
*Dalmanella testudinaria* (Dalman.)  
*Dicranograptus nicholsoni* Hopkinson.  
*Dinorthis (Plaxiomys) retrorsa* (Salter).  
*Diplograptus (Glyptograptus) amplexicaulis* Hall.  
*Diplograptus amplexicaulis pertenuis* Ruedemann.  
*Discophyllum peltatum* Hall.  
*Edrioaster saratogensis* Ruedemann.  
*Eoharpes ottawaensis* (Billings).  
*Eopolychetus albancensis* Ruedemann.  
*Glossograptus (Orthograptus) quadrimucronatus* Muller.  
*pertenuis* Hall.  
*Heterocrinus? gracilis* Hall.  
*Isotelus gigas* DeKay.  
*Lasiograptus (Thysanograptus) eucharis* (Hall).  
*Lepidocoleus jamesi* (Hall and Whitfield).  
*Leptobolus insignis* Hall.  
*Lingula curta* Conrad.  
*Lophospira uniangulata abbreviata* (Hall).  
*Lyrodosma schucherti* Ruedemann.  
*Odontopleura trentonensis* Hall.



*Orthoceras lineolatum* (Hall).  
*Orthoceras tenuitextum* (Hall).  
*Orthodesma subcarinatum* Ruedemann.  
*Pachydactyla acuta* (Hall).  
*Palaechara ulrichi* Ruedemann.  
*Parastrophia hemiplicata* Hall.  
*Pholidops trentonensis* Hall.  
*Platystrophia biforata* var. (Schlothheim)  
*Plectambonites scriccus* (Sowerby).  
*Plectrothis plicatella* Hall.  
*Pleurotomaria lenticularis* (Hall).  
*Pollicipes siluricus* Ruedemann.  
*Pontobdellopsis cometa* Ruedemann.  
*Proetus undulostriatus* (Hall).  
*Pterotheca canaliculata* (Hall).  
*Pterygomctopus callicephalus* (Hall).  
*Rafinesquina alternata* (Emmons).  
*Rhynchotrema increbescens* Hall.  
*Schizocrania filosa* Hall.  
*Schizocrinus nodosus* Hall.  
*Sinuities cancellatus* (Hall).  
*Solenomya? insperata* Ruedemann.  
*Spyroceras bilineatum* (Hall).  
*Technophorus cancellatus* Ruedemann.  
*Triarthrus becki* Greeu.  
*Turrilcpas? filiosus* Ruedemann.  
*Whiteavesia cineta* Ruedemann.  
*Whiteavesia cumingsi* Ruedemann.  
*Whitella elongata* Ruedemann.  
*Zygospira recurvirostris* (Hall).

TRENTON (SCHENECTADY) OF EAST CENTRAL NEW YORK.

*Climacograptus typicalis* Hall.  
*Conularia trentonensis multicocta* Ruedemann.  
*Cyrtolithus tessellatus* (Greene).  
*Dalmanella testudinaria* (Dalman).  
*Dictyonema multiramosum* Ruedemann.  
*Diplograptus vespertinus* (Ruedemann).  
*Dolichopteris frankfortensis* Clarke and Ruedemann.  
*Dolichopteris latifrons* Clarke and Ruedemann.  
*Eurypterus megalops* Clarke and Ruedemann.  
*Eurypterus pristinus* Clarke and Ruedemann.  
*Eurypterus? (Dolichopteris) stellatus* Clarke and Ruedemann.  
*Eusarcus longiceps* Clarke and Ruedemann.  
*Eusarcus triangulatus* Clarke and Ruedemann.  
*Hughmilleria magna* Clarke and Ruedemann.  
*Isotelus gigas* DeKay.  
*Lasiograptus (Thysanograptus) eucharis* (Hall).  
*Lectambonites insignis* Hall.  
*Lingula (Pseudolingula) rectilabralis* Emmons.  
*Mastigograptus simplex* Walcott.  
*Plectrothis plicatella* Hall.  
*Pterygotus (Eusarcus?) nasutus* Clarke and Ruedemann.  
*Pterygotus prolificus* Clarke and Ruedemann.  
*Rafinesquina ulrichi* James.  
*Saffordia ulrichi* Ruedemann.  
*Sphenophycus latifolius* (Hall).  
*Spyroceras bilineatum* (Hall).  
*Stylonurus? limbatu*s Clarke and Ruedemann.  
*Tamaster schoharzi* Ruedemann.  
*Triarthrus becki* Green.  
*Trocholites ammonius* Conrad.

TRENTON (MACASTY) OF ANTICOSTI ISLAND, QUEBEC.  
*Climacograptus spiniferus* Ruedemann.  
*Climacograptus typicalis magnificus* Twenhofel.  
*Leptobolus insignis* Hall.  
*Triarthrus becki macastyensis* Twenhofel.

MOHAWKIAN (JACKSONBURG) OF NEW JERSEY.  
 (Species with \* are from Black River portion; rest are of Trenton age.)

*Amphilichas trentonensis* (Hall).  
*Archinacella patelliformis* (Hall).  
*Bucania punctifrons* Emmons.  
*Bumastus milleri* (Billings).  
*Calymenca senaria* Conrad.  
 \**Camarclla inornata* Weller.  
 \**Ceraurus pleurexanthemus* Green.  
*Chasmatopora fenestrata* (Hall).  
*Cleidophorus neglectus* Hall.  
*Conularia trentonensis* Hall.  
*Cryptolithus tessellatus* Green.  
 \**Ctenodonta jerseyensis* Weller.  
 \**Ctenodonta nasuta* (Hall).  
*Cyphaspis trentonensis* Weller.  
*Cyrtodonta billingsi* Ulrich.  
*Cyrtodonta canadensis* Billings.  
*Cyrtolites ornatus minor* Ulrich and Scofield.  
*Dalmanella testudinaria* (Dalman).  
*Dinorthis pectinella* (Emmons).  
*Eccyliomphalus trentonensis* (Conrad).  
*Enocrinurus trentonensis* Walcott.  
*Eoharpes ottawaensis* (Billings).  
*Goniophora carinatus* (Hall).  
*Hindia parva* Ulrich.  
*Hormotoma saltrei* Ulrich.  
*Isotelus gigas* DeKay.  
 \**Leporditia fabulites* (Conrad).  
*Lingula riciniiformis* Hall.  
*Liospira micula* (Hall).  
*Lophospira medialis* Ulrich and Scofield.  
 \**Lophospira oweni* Ulrich and Scofield.  
*Modiolopsis depressa* Weller.  
*Modiolopsis faba* (Conrad).  
 \**Modiolopsis jerseyensis* Weller.  
*Nyctopora billingsi* Nichols.  
*Orbiculoida lamellosa* (Hall).  
 \**Orthis tricenaria* Conrad.  
*Orthoceras tenuistriatum* (Hall).  
*Orthodesma canaliculatum* Ulrich.  
*Parastrophia hemiplicata* (Hall).  
*Pianodema subequata* Conrad.  
*Platystrophia biforata* var. (Schlothheim).  
*Plectambonites scriccus* (Sowerby).  
*Plectrothis plicatella* (Hall).  
*Prasopora simulatrix* Ulrich.  
*Proetus brevimarginatus* Weller.  
*Proetus latimarginatus* Weller.  
*Protowarthia cancellata* (Hall).  
 \**Pseudospherozochus trentonensis* Clarke.  
*Pterygomctopus callicephalus* (Hall).  
 \**Pterygomctopus intermedicus* (Walcott).  
 \**Ptychopyge jerseyensis* Weller.  
*Rafinesquina alternata* (Emmons).  
 \**Raphistoma peracuta* Ulrich and Scofield.  
*Rhynchotrema increbescens* (Hall).  
 \**Romingeria? trentonensis* Weller.  
 \**Scenidium anthonensis* Sardeson.

*Schizocrania filosa* (Hall).  
*Solenopora compacta* Billings.  
*Streptelasma corniculum* Hall.  
*Strophomena incurvata* (Shepard).  
*Tetranota bidorsata* (Hall).  
*Whitella subtruncata* (Hall).  
*Zygospira recurvirostris* (Hall).

## MOHAWKIAN OF BAFFIN LAND.

(This list probably includes some Richmond species.)

*Bellerophon similis* Ulrich and Scofield.  
*Calapocia anticostiensis* Billings.  
*Ceraurus pleurexanthemus* Green.  
*Clathrospira conica* Ulrich and Scofield.  
*Ctenodonta baffinensis* Schuchert.  
*Ctenodonta carpenteri* Schuchert.  
*Ctenodonta frobisherensis* Schuchert.  
*Ctenodonta subnasuta* Ulrich.  
*Cyloceras olorus baffinensis* Schuchert.  
*Cyrtoceras baffinensis* Schuchert.  
*Cyrtoceras cornulum* Schuchert.  
*Cyrtoceras manitobense* Whiteaves.  
*Cyrtodonta gibbera* Ulrich.  
*Cyrtodonta sillimanensis* Schuchert.  
*Dalmanella testudinaria* (Dalman).  
*Dinorthis mecdsi* Winchell and Schuchert.  
*Dinorthis mecdsi arctica* (Schuchert).  
*Endoceras proteiforme* (Hall).  
*Eurytomites plicatus* Whiteaves.  
*Fusispira inflata* (Meek and Worthen).  
*Fusispira nobilis* Ulrich and Scofield.  
*Halyticus gracilis* (Hall).  
*Hebertella bellirugosa* (Conrad).  
*Hebertella borcalis* (Billings).  
*Holopea arctica* Schuchert.  
*Ilænus americanus* (Billings).  
*Ischadites iowensis* (Owen).  
*Isotelus gigas* Dekay.  
*Kokenia costalis* Ulrich and Scofield.  
*Lichenocrinus affinis* Miller.  
*Liospira americana* (Billings).  
*Liospira larvata* (Salter).  
*Lophospira spironecma* Ulrich and Scofield.  
*Lyellia affinis* (Billings).  
*Maclurites crassus* (Ulrich and Scofield).  
*Maclurina cuneata* (Whitfield).  
*Maclurina manitobensis* (Whiteaves).  
*Modiolodon arctica* Schuchert.  
*Nileus vigilans* (Meek and Worthen).  
*Oncoceras arcticum* Schuchert.  
*Oncoceras exiguum* (Billings).  
*Oncoceras tumidum* Schuchert.  
*Orthis tricenaria* Conrad.  
*Orthoceras porteri* Schuchert.  
*Orthoceras scalariformis* Schuchert.  
*Parastrophia hemiplicata* Hall.  
*Plasmapora lambii* Schuchert.  
*Plectorthis plicatella* (Hall).  
*Porocrinus shawi* Schuchert.  
*Pterygomotopus goodridgii* Schuchert.  
*Receptaculites oweni* Hall.  
*Rhynchotrema increbescens* (Hall).  
*Saffordia modesta* Ulrich.  
*Scelya(?) ulrichi* Schuchert.  
*Sinuities pervalvus* Ulrich and Scofield.  
*Spyroceras bilineatum* (Hall).

*Streptelasma corniculum* Hall.  
*Tetranota obsolcta* Ulrich and Scofield.  
*Trochoncma (Eunema) robbinsi* Ulrich and Scofield.  
*Trochoncma umbilicatum* (Hall).  
*Vanuzemia abrupta* Ulrich.  
*Vanuzemia baffinensis* Schuchert.  
*Whitcavesia symmetrica* Schuchert.  
*Whitella arctica* Schuchert.

## CINCINNATIAN (UTICA) OF NEW YORK, ETC.

(See also Eden fauna, Fulton division.)

*Asaphus latimarginatus* Hall.  
*Buthotrephis ramulosa* Miller.  
*Buthotrephis subnodosa* (Hall).  
*Callograptus compactus* (Walcott).  
*Cornulites immaturus* Hall.  
*Cryptolithus tessellatus* Green.  
*Ctenodonta nuculiformis* (Hall).  
*Cyathophycus reticulatus* Walcott.  
*Cyathophycus(?) walcotti* (Rauff).  
*Dicranograptus nicholsoni* Hopkinson.  
*Discophycus typicalis* Walcott.  
*Echinognathus clevelandi* (Walcott).  
*Elpe radiata* (Ulrich).  
*Lasiograptus bimucronatus timidus* Ruedemann.  
*Leptobolus insignis* Hall.  
*Leptograptus annectans* (Walcott).  
*Leptograptus flaccidus* (Hall).  
*Lingula (Pseudolingula) retilateralis* (Emmons).  
*Mastigograptus simplex* (Walcott).  
*Mastigograptus tenuiramosus* (Walcott).  
*Mesopalaeaster(?) lanceolatus* Schuchert.  
*Orthoceras coralliferum* Hall.  
*Orthoceras oncidense* Walcott.  
*Pleurograptus linearis* (Carruthers).  
*Pterinea insucta* (Emmons).  
*Schizocrania filosa* (Hall).  
*Triarthrus becki* Green.  
*Whitecavesia cancellata* (Walcott).  
*Zygospira modesta* (Say).

## CINCINNATIAN (EDEN) OF APPALACHIAN AND OHIO VALLEYS.

(Economy=E.; Southgate=S.; McMicken=M.; Indian Ladder=I.; Fulton (Utica)=F.; Frankfurt=Fr.)

*Alcidaster fimbriatus* (Ulrich). (E.)  
*Amplexopora persimilis* Nickles. (E.)  
*Amplexopora petasiformis* (Nicholson). (E., S., M.)  
*Amplexopora petasiformis welchi* (James). (E., S., M.)  
*Amplexopora sepiosa* (Ulrich). (M.)  
*Aparchites minutissimus* (Hall). (E., S., M.)  
*Archinacella patclliformis* (Hall). (E., S., M.)  
*Arthrvria biclavata* Miller. (E., S., M.)  
*Arthropora clevelandi* (James). (E., S., M.)  
*Arthrostylus tenuis* (James). (E., S., M., I.)  
*Asa phoidichnus dyeri* Miller. (E.)  
*Asa phoidichnus trifidus* Miller. (E.)  
*Asaphus gigas* Dekay. (E., S., M.)  
*Asaphus maximus* Locke. (E., S., M.)  
*Aspidopora areolata* Ulrich. (F.)  
*Aspidopora cecentrica* (James). (S.)  
*Aspidopora newberryi* (Nicholson). (F., E.)  
*Atactopora angularis* Ulrich and Bassler. (E.)  
*Atactopora hirsuta* Ulrich. (E., S., M.)  
*Atactopora intermedia* Cumings and Galloway. (M.)

- Atactoporella newportensis* Ulrich. (E.)  
*Atactoporella typicalis* Ulrich. (E.)  
*Batostoma implicatum* (Nicholson). (E., S., M.)  
*Batostoma jamesi* (Nicholson). (E., S., M.)  
*Berenicea vesiculosa* Ulrich. (M.)  
*Blastophycus diadematum* Miller and Dyer. (E.)  
*Bollia persulcata* (Ulrich). (M.)  
*Buthotrephis ramulosus* Miller. (F.)  
*Byssonychia vera* Ulrich. (E., S., M.)  
*Bythocypris cylindrica* (Hall). (F., E., S., M.)  
*Bythopora arctipora* (Nicholson). (E., S., M.)  
*Bythopora parvula* (James). (M.)  
*Calymene granulosa* (Foerste). (E., S., M., I.)  
*Ceramoporella distincta* Ulrich. (E., S., M.)  
*Ceramoporella granulosa milfordensis* (James). (E., S., M.)  
*Ceramoporella ohioensis* (Nicholson). (E., S., M.)  
*Ceramoporella triloba* Cumings and Galloway. (M.)  
*Ceramoporella tubulosa* Cumings and Galloway. (M.)  
*Ceratoccephala cincinnatiensis* (Meek). (E., S., M.)  
*Ceratopsis chambersi* (Miller). (F., E., S., M., I.)  
*Chasmotopora variolata* (Ulrich). (M.)  
*Chaunograptus gemmatus* Ruedemann. (E.)  
*Chlorophycus plumosus* Miller and Dyer.  
*Clidophorus ellipticus* (Ulrich). (E.)  
*Clidophorus fabula* (Hall). (F., E., S., M.)  
*Clidophorus planulatus* (Conrad). (E., S., M.)  
*Climacograptus putillus* (Hall). (F.)  
*Climacograptus typicalis* (Hall). (F., E., S., M., Fr.)  
*Caloclema alternatum* (James). (M.)  
*Caloclema commune* (Ulrich). (E., S.)  
*Constellaria florida prominens* Ulrich. (M.)  
*Corynotrypa delicatula* (James). (E., S., M.)  
*Crania albersi* Miller and Faber. (E.)  
*Crania dyeri* Miller. (E.)  
*Crania scabiosa* Hall. (E., S., M.)  
*Crania socialis* Ulrich.  
*Crepidopora? solida* Ulrich. (E.)  
*Crepidopora venusta* (Ulrich). (E.)  
*Cryptolithus bellulus* (Ulrich). (E., I.)  
*Cryptolithus tessellatus* Green. (F., E., S., M., Fr.)  
*Ctenobolbina alata* Ulrich. (M.)  
*Ctenobolbina bispinosa* Ulrich. (M.)  
*Ctenobolbina ciliata* (Emmons). (E., S., M.)  
*Ctenobolbina curta* (Ulrich). (M.)  
*Ctenodonta filistriata* Ulrich. (E., S.)  
*Ctenodonta obliqua* (Hall). (F., E., S., M.)  
*Ctenodonta pectunculoides* (Hall). (E., S.)  
*Ctenodonta perminuta* Ulrich. (E., S., M.)  
*Cuneameya parva* Miller. (S.)  
*Cycoconcha mediocardinalis* Miller. (S.)  
*Cycoconcha ovata* Ulrich. (S.)  
*Cyclora depressa* Ulrich. (F., E., S., M.)  
*Cyclora hoffmani* Miller. (F., E., S., M.)  
*Cyclora minuta* Hall. (F., E., S., M.)  
*Cyclora parvula* Hall. (F., E., S., M.)  
*Cymatobotrya productifrons* Ulrich. (E.)  
*Cyrtoceras magister* Miller. (S.)  
*Cyrtoceras ventricosum* Miller. (S.)  
*Cyrtolites carinatus* Miller. (S.)  
*Dactylophycus quadripartitum* Miller and Dyer. (E.)  
*Dactylophycus tridigitatum* Miller and Dyer. (E.)  
*Dalmanella emacerata* (Hall). (F., E., S.)  
*Dalmanella emacerata brevicula* (Foerste). (S.)  
*Dalmanella fultonensis* Foerste. (F.)  
*Dalmanella multisecta* (Meek). (E., S., M., I.)  
*Dekayella obscura* Ulrich. (M.)  
*Dekayella ulrichi* (Nicholson). (E., S., M.)  
*Dekayia maculata* James. (M.)  
*Dendrocinrus navigiolum* Miller. (F.)  
*Dermatostroma scabrum* (James). (E., S., M.)  
*Dieranella? byrnesi* (Miller). (F.)  
*Dietyonema arbusculum* (Ulrich). (I., S.)  
*Diacina sublamellosa* Ulrich. (E.)  
*Ectenoerinus grandis* (Meek). (E., S., M.)  
*Ectenoerinus simplex* (Hall). (E., S., M.)  
*Elpe radiata* (Ulrich). (F.)  
*Etophonia setigera* Ulrich. (E.)  
*Escharopora acuminata* (James). (E., S., M.)  
*Fusispira terebriformis* Hall. (E.)  
*Glyptocrinus? pattersoni* Miller. (E.)  
*Hallopora nodulosa* (Nicholson). (M.)  
*Hallopora onealli* (James). (E., I.)  
*Hallopora onealli communis* (James). (E., S., M.)  
*Hallopora onealli sigillaroides* (Nicholson). (E., S., M.)  
*Hemiphragma whitfieldi* (James). (E., S.)  
*Heterocrinus exilis* Hall. (E., S., M.)  
*Heterocrinus exilis exiguus* (Meek).  
*Heterocrinus? geniculata* Ulrich. (F.)  
*Heterocrinus heterodactylus* Hall. (E., S., M.)  
*Heterocrinus heterodactylus propinquus* Meek. (E., S., M.)  
*Homotrypa curvata praecepta* Bassler. (S.)  
*Homotrypa glabra* Cumings and Galloway. (M.)  
*Hormotoma gracilis* (Hall).  
*Iocrinus subcrassus* (Meek and Worthen).  
*Jonesella crepidiformis* (Ulrich). (E., S.)  
*Jonesella pedigera* Ulrich. (E.)  
*Lepidocoleus jamesi* (Hall). (E., S., M., I.)  
*Lepidolites dickhauti* Ulrich. (S.)  
*Leptæna gibbosa* (James). (E.)  
*Leptæna gibbosa invenusta* Foerste. (F. or E.)  
*Leptobolus insignis* Hall. (F., Fr.)  
*Leptotrypa cortex* Ulrich. (E.)  
*Lichenocrinus crateriformis* Hall. (S., M.)  
*Lichenocrinus dubius* Miller. (E.)  
*Lingula bisulcata* Ulrich. (E.)  
*Liospira micula* (Hall). (E., S., M.)  
*Lophospira bicincta* (Hall).  
*Lophospira (?Seelya) lirata* Ulrich. (E., S.)  
*Lophospira (?Seelya) lirata obsoleta* Ulrich. (E., S.),  
*Lophospira tenuistriata* Ulrich. (S.)  
*Lophospira tropidophora* (Meek). (E., S., M.)  
*Lyrodesma cincinnatiense* Hall. (E.)  
*Lyrodesma conradi* Ulrich. (S.)  
*Mastigograptus gracillimus* (Lesquereux). (E., S., M.)  
*Meroerinus curtus* (Ulrich). (F.)  
*Mesopalæaster finci* (Ulrich). (F.)  
*Mesopalæaster proavitus* Schuchert. (E.)  
*Microceras inornatum* (Hall). (E., S., M.)  
*Modiolopsis angustata* Ulrich. (S.)  
*Modiolopsis parva* Ulrich. (S.)  
*Modiolopsis simulatrix* Ulrich. (S.)  
*Modiolopsis subtruncata* Ulrich. (E.)  
*Monotrypa subglobosa* (Ulrich). (E.)  
*Monotrypa pella æqualis* Ulrich. (F.)  
*Nerclilavus varians* Grinnell. (E., S., M.)  
*Odontopleura crossoata* (Loeck). (E., S., M., I.)  
*Orbiculoida tenuistriata* (Ulrich). (E., Fr.)

- Ormathichnus moniliformis* Miller. (E.)  
*Orthoceras ortonii* Meek. (S.)  
*Orthoceras transversum* Miller. (E., S., M.)  
*Orthocisma occidentale* Miller. (S.)  
*Polzophycus flexuosum* James.  
*Peronopora vbra* Ulrich. (E., S., M.)  
*Petalichnus multipartitus* Miller. (E.)  
*Pholidops cincinnatiensis* Hall. (E., S., M.)  
*Placentula inornata* Ulrich. (E.)  
*Plectambonites centricarinatus* Ruedemann. (I.)  
*Plectambonites plicatellus* (Ulrich). (F., I.)  
*Plectambonites rugosus* (Meek). (E., S., M.)  
*Primitia centralis* Ulrich. (F., E., S., M.)  
*Primitia rudis* Ulrich. (E.)  
*Primitiella clappolei* (Ulrich). (F.)  
*Primitiella unicornis* (Ulrich). (F.)  
*Primitiella whitfieldi* (Jones). (F.)  
*Proboscina confusa* (Nicholson). (E., S., M.)  
*Proetus spurlocki* Meek. (E., S.)  
*Protoscolcx covingtonensis* Ulrich. (E.)  
*Protoscolcx magnus* Miller and Faber. (F.)  
*Protoscolcx ornatus* Ulrich. (E.)  
*Protoscolcx simplex* Ulrich. (E.)  
*Protoscolcx tenuis* Ulrich. (E.)  
*Protostigma sigillaroides* Lesquereux. (M.)  
*Psilocoelha minima* Ulrich. (S.)  
*Psilocoelha tenuistriata* Ulrich. (F.)  
*Pterinea mucronata* Ulrich. (E.)  
*Rafinesquina alternata* (Conrad).  
*Rafinesquina squamula* (James). (S., M.)  
*Rafinesquina ulrichi* (James). (E., I.)  
*Rhinidictya parallcla* (James). (E.)  
*Rhombodictyon globosum* James.  
*Rhytimya radiata* Ulrich. (S.)  
*Rusophycus asperum* Miller and Dyer. (E.)  
*Rusophycus carleyi* (James).  
*Scrupulites dissolutus* Billings. (E., S., M.)  
*Scolithus dispar* James. (E.)  
*Sinuiles cancellatus* (Hall). (E., S., M.)  
*Sinuiles globularis* (Miller and Faber).  
*Sinuiles granistriatus* (Ulrich). (S.)  
*Sinuiles planodorsatus* (Ulrich). (S.)  
*Sphenophyllum primacvum* Lesquereux.  
*Stictoporella flexuosa* (James). (E.)  
*Stigmatella clavis* (Ulrich). (E., M.)  
*Stigmatella nana* Ulrich and Bassler. (E.)  
*Streptaster reversata* Foerste. (S.)  
*Stromatopora arachnoidea* (Hall). (E., S., M.)  
*Strophomena hallie* (Miller). (E.)  
*Strophomena millionensis* Foerste.  
*Technophorus cincinnatiensis* Miller and Faber. (E.)  
*Technophorus yoldiaformis* Ulrich. (E.)  
*Tetrachinus confertus* Miller. (E.)  
*Tetranota obsoleta* Ulrich and Scofield.  
*Trachomatichnus cincinnatiensis* Miller. (E.)  
*Trachomatichnus numerosus* Miller. (E.)  
*Trachomatichnus permultus* Miller. (E.)  
*Trematis millepunctata* Hall. (E., S., M.)  
*Triarthrus becki* Green. (F., Fr.)  
*Trichophycus sulcatum* Miller and Dyer. (E.)  
*Trocholites minusculus* Miller and Dyer. (S.)  
*Trochonema (Eunema) nitidum* Ulrich. (S.)  
*Ulrichia nodosa* (Ulrich). (F., E., S., M.)  
*Walcottia sulcata* James. (E.)  
*Zygospira modesta* Hall. (E., S., M.)
- CINCINNATIAN (MAYSVILLE) OF OHIO VALLEY, NEW YORK, AND CANADA.  
 (Mount Hope = H.; Fairmount = F.; Bellevue = B.; Corryville = C.; Mount Auburn = A.; Leipers = L.; Pulaski = P.)  
*Actinoceras crebriseptum* (Hall). (P.)  
*Aglacrinites cincinnatiensis* (Roemer). (F., B., C.)  
*Aglacrinites holbrookii* (James). (C?)  
*Aglacrinites pilcus* (Hall). (C.)  
*Aglacrinites warrenensis* (James). (F.)  
*Alcpidaster flexuosus* (Miller and Dyer).  
*Allonychia jamesi* (Meek). (C.)  
*Allonychia ovata* Ulrich. (F.)  
*Allonychia subrotunda* Ulrich. (C.)  
*Amphilichus halli* (Foerste). (C.)  
*Amplexopora ampla* Ulrich and Bassler. (L., F.)  
*Amplexopora cingulata* Ulrich. (F.)  
*Amplexopora columbiana* Ulrich and Bassler. (L.)  
*Amplexopora? discoidea* (Nicholson). (F.)  
*Amplexopora filiosa* (D'Orbigny). (F., B., C.)  
*Amplexopora robusta* Ulrich. (B.)  
*Amplexopora septosa* Ulrich. (H., F.)  
*Anomalocrinus caponiformis* (Lyon). (C.)  
*Anomalocrinus incurvus* (Meek and Worthen). (F.)  
*Anomalodonta plicata* Ulrich. (C.)  
*Anomaloides reticulata* Ulrich. (H.)  
*Aparchites minutissimus* (Hall). (H., F., B., C., A., L.)  
*Arabellites aciculatus* James. (F.)  
*Arabellites ascialis* Hinde. (P.)  
*Arabellites cervicornis* (Hinde). (P.)  
*Arabellites cornutus* Hinde. (P.)  
*Arabellites ercunulatus* Hinde. (P.)  
*Arabellites cristatus* Hinde. (P.)  
*Arabellites cuspidatus* Hinde. (P.)  
*Arabellites gibbosus* Hinde. (P.)  
*Arabellites hamatus* Hinde. (P.)  
*Arabellites hindei* James. (P.)  
*Arabellites lunatus* Hinde. (P., H.)  
*Arabellites? obliquus* Hinde. (P.)  
*Arabellites ovalis* Hinde. (P.)  
*Arabellites pectinatus* Hinde. (P.)  
*Arabellites quadratus* Hinde. (P., H.)  
*Arabellites rectus* Hinde. (P.)  
*Arabellites scutellatus* Hinde. (P.)  
*Archinacella pulaskiensis* Foerste. (P.)  
*Arthrvria biclavata* Miller. (H., F., B., C., A., )  
*Arthropora cincinnatiensis* (James). (H.)  
*Arthropora shafferi* (Meek).  
*Atactopora hirsuta* Ulrich. (F.)  
*Atactopora maculata* Ulrich. (F.)  
*Atactoporella multigranosa* (Ulrich). (F., B., C.)  
*Atactoporella mundula* (Ulrich). (F.)  
*Atactoporella ortonii* (Nicholson). (B., C.)  
*Atactoporella tenella* (Ulrich). (F.)  
*Ateleocystites balanoides* (Meek). (C.)  
*Arthrostylus curtus* (Ulrich). (H.)  
*Batostoma maysvillense* Nickles. (H.)  
*Bellerophon capax* Ulrich. (F.)  
*Bellerophon cincinnatiensis* Miller and Faber.  
*Bellerophon gorbnyi* Miller.  
*Bellerophon recurvus* Ulrich. (C.)  
*Bellerophon rugosus* Emmons. (P.)  
*Berenicea primitiva* Ulrich.

- Bollia persulcata* (Ulrich). (H., F., B., C., A.)  
*Brachiospongia laevis* Foerste. (H.)  
*Bucanopsis carinifera* Ulrich. (F.)  
*Buthotrephis subnodosa* Hall. (P.)  
*Byssonychia acutirostris* Ulrich. (F.)  
*Byssonychia alveolata* Ulrich. (C.)  
*Byssonychia carinata* (Goldfuss). (P.)  
*Byssonychia imbricata* Ulrich. (C.)  
*Byssonychia praeursa* Ulrich. (F., P.)  
*Byssonychia radiata* (Hall). (H., F., B., C., A.)  
*Byssonychia retrorsa* (Miller). (F.)  
*Byssonychia walkerensis* Grabau. (Ba.)  
*Bythocypris cylindrica* Hall. (H., F., B., C., A.)  
*Bythopora dendrina* (James). (F., C.)  
*Bythopora gracilis* (Nicholson). (F., B., C., A.)  
*Calymene meeki* Foerste.  
*Ceramoporella distincta* Ulrich. (H., F.)  
*Ceramoporella granulosa* Ulrich. (F., B., C., A.)  
*Ceramoporella ohioensis* (Nicholson). (F., B., C., A.)  
*Ceramoporella whitei* (James). (F., B., C.)  
*Ceratocephala anchoralis* (Miller).  
*Ceratocephala cerealepta* Anthony.  
*Ceratopsis oculifera* (Hall). (C.)  
*Ceraurus milleranus* Miller and Gurley. (C.)  
*Chasmatopora clathrata* (Miller and Dyer). (F.)  
*Chiloporella flabellata* Ulrich. (C.)  
*Clathrospira conica* Ulrich and Scofield. (F.)  
*Clidophorus jabula* Hall. (H., F., B., C., A.)  
*Clidophorus planulatus* (Conrad). (P.)  
*Clidophorus praelotulus* Foerste. (P.)  
*Caloclema oenei* (James). (A.)  
*Colpomya faba pusilla* Foerste. (P.)  
*Constellaria florida* Ulrich. (F.)  
*Constellaria florida prominens* Ulrich. (F.)  
*Constellaria plana* Ulrich. (F.)  
*Conularia formosa* Miller and Dyer.  
*Conularia hudsoni* Emmons. (P.)  
*Cornulites conicus* (Nicholson).  
*Cornulites corrugatus* (Nicholson).  
*Cornulites flexuosus* Hall.  
*Cornulites minor* (Nicholson).  
*Corynotrypa delicatula* (James). (H., F., B., C., A.)  
*Corynotrypa inflata* (Hall). (B., C., A.)  
*Cuneameya coriformis* Miller. (C.)  
*Crania laelia* Hall. (H., F., B., C., A.)  
*Crania scabiosa* Hall. (H., F., B., C., A.)  
*Crepidopora impressa* Ulrich. (F.)  
*Crepidopora simulans* Ulrich. (F.)  
*Cryptolithus tessellatus* (Greene).  
*Ctenobolbina duryi* (Miller). (C., A.)  
*Ctenodonta lorrainensis* Foerste. (P.)  
*Ctenodonta obliqua* (Hall). (H., F., B., C., A.)  
*Ctenodonta pectenuloides* (Hall). (H., F.)  
*Ctenodonta perminuta* Ulrich. (A., F., B., C.)  
*Cuneameya coriformis* Miller. (C.)  
*Cuneameya elliptica* Miller. (C.)  
*Cuneameya scapha brevior* Foerste. (P.)  
*Cyclocystoides bellulus* Miller and Dyer. (F.)  
*Cyclocystoides cincinnatiensis* Miller and Faber. (C.)  
*Cyclocystoides magnus* Miller and Dyer.  
*Cyclocystoides nitidus* Faber. (C.)  
*Cyclonema gracile* Ulrich. (H.)  
*Cyclonema gracile striatulum* Ulrich. (H.)  
*Cyclonema humerosum* Ulrich. (B., C., A.)  
*Cyclonema inflatum* Ulrich. (F.)  
*Cyclonema (?Holoepa) limatum* Ulrich. (F.)  
*Cyclonema mediale* Ulrich. (F.)  
*Cyclonema pyramidatum* James. (F.)  
*Cyclonema simulans* Ulrich. (C.)  
*Cyclonema sublaevae* Ulrich. (H.)  
*Cyclonema transversum* Ulrich. (F.)  
*Cyclora depressa* Ulrich. (H., F., B., C., A.)  
*Cyclora hoffmanni* Miller. (H., F., B., C., A.)  
*Cyclora minuta* Hall. (H., F., B., C., A.)  
*Cyclora parvula* (Hall). (H., F., B., C., A.)  
*Cylindrocœlia covingtonensis* Ulrich. (F.)  
*Cymatopora lenior* Foerste. (P.)  
*Cymatopora parallela* (Hall). (P.)  
*Cymatopora pholadis* (Conrad). (F., P.)  
*Cymatopora recta* Ulrich. (B., C.)  
*Cyphotrypa semipilaris* (Ulrich). (F.)  
*Cyrtoceras conoidale* Wetherby. (F., L.)  
*Cyrtoceras vallandinghami* Miller. (F., L.)  
*Cyrtolites ornatus* Conrad. (H., F., B., C., A., P.)  
*Dalmanella centrilineata* (Hall). (P.)  
*Dalmanella fairmountensis* Foerste. (B.)  
*Dekayia appressa* Ulrich. (C.)  
*Dekayia aspera* Milne-Edwards and Haime. (F.)  
*Dekayia magna* Cumings. (B.)  
*Dekayia multispinosa* Ulrich. (C.)  
*Dekayia pelliculata* Ulrich. (F.)  
*Dendrocinrus cincinnatiensis* (Meek). (F.)  
*Dermatostroma papillatum* (James). (H., F., B., C., A.)  
*Dermatostroma papillatum diversum* Parks. (C.)  
*Dermatostroma scabrum* (James). (H., F., B., C., A.)  
*Dicranopora emacerata* (Nicholson). (H., F.)  
*Dicranopora internodia* (Miller and Dyer). (F.)  
*Dicranopora meeki* (James). (H.)  
*Diplograptus hudsonicus* Nicholson. (P.)  
*Discotrypa elegans* (Ulrich). (F.)  
*Distacodus incurvus* (Pander). (P.)  
*Drepanodus arcuatus* Pander. (P.)  
*Dyeria costata* (James). (C.)  
*Dystactophycus mamillanum* Miller and Dyer. (C.)  
*Dystactospongia insolens* Miller. (F.)  
*Ectenocrinrus grandis* (Meek). (H., F.)  
*Ectenocrinrus simplex* (Hall). (F.)  
*Elpe cincinnatiensis* (Meek). (C.)  
*Elpe irregularis* (Miller). (C.)  
*Endoceras arcuatum* (J. F. James).  
*Eridonychia apicalis* Ulrich. (F.)  
*Eridonychia paucicostata* Ulrich. (F.)  
*Escharopora falciformis* (Nicholson). (H., F., L.)  
*Escharopora hilli* (James).  
*Escharopora maculata* (Ulrich). (F.)  
*Escharopora pavonia* (D'Orbigny). (F., L.)  
*Eunicites contortus* Hinde. (P.)  
*Eunicites? digitatus* Hinde. (P.)  
*Eunicites gracilis* Hinde. (P.)  
*Eunicites major* Hinde. (P.)  
*Eunicites perdentatus* Hinde. (P.)  
*Eunicites simplex* Hinde. (P., H.)  
*Eurymya alata* (Ulrich). (F.)  
*Foberia anomala* Miller.  
*Glycerites sulcatus* Hinde. (P.)  
*Glycerites sulcatus excavatus* Hinde. (P.)  
*Glyptocrinrus decadactylus* Hall. (F.)  
*Glyptocrinrus dyeri* Meek. (C.)  
*Glyptocrinrus dyeri sublaxus* Miller. (C.)  
*Glyptocrinrus subglobosus* (Meek). (C.)

- Gomphoceras eincinnatiense* Miller. (C.)  
*Gomphoceras faberi* Miller. (C.)  
*Hallopora andrewsi* (Nicholson). (B., C.)  
*Hallopora dalei* (Milne-Edwards and Haine). (H., F., L.)  
*Hallopora ramosa* (D'Orbigny). (B., C., A.)  
*Hallopora rugosa* (Milne-Edwards and Haime). (B., C., A.)  
*Hallopora subplana* (Ulrich). (H., F.)  
*Hebertella (Glyptorthis) crispata* (Emmons). (P.)  
*Hebertella occidentalis* Hall.  
*Hebertella occidentalis sinuata* Hall.  
*Heliophycus stelliforme* Miller and Dyer. (F.)  
*Hemiecystites (Cystaster) granulatus* Hall. (F.)  
*Hemiecystites stellatus* Hall. (F.)  
*Heterocerinus juvenis* Hall. (C.)  
*Heterocerinus pentagonus* Ulrich. (C.)  
*Heteronema? contextum* Ulrich and Bassler. (C.)  
*Heterotrypa frondosa* D'Orbigny. (M.)  
*Heterotrypa infecta* Ulrich. (C.)  
*Heterotrypa lobata* (Cumings). (F.)  
*Heterotrypa paupera* (Ulrich). (C.)  
*Heterotrypa solitaria* Ulrich. (F.)  
*Heterotrypa subfrondosa* (Cumings). (F.)  
*Heterotrypa subpulehlla* (Nicholson). (F.)  
*Hindia gregaria* (Miller and Dyer).  
*Homotrypa alta* Cumings and Galloway. (H., F.)  
*Homotrypa eincinnatiensis* Bassler. (F.)  
*Homotrypa curvata* Ulrich. (F.)  
*Homotrypa dumosa* Bassler. (F.)  
*Homotrypa flabellaris spinifera* Bassler. (F.)  
*Homotrypa grandis* Bassler. (L.)  
*Homotrypa obliqua* Ulrich. (F., B., C.)  
*Homotrypa pulchra* Bassler. (A.)  
*Homotrypa spinea* Cumings and Galloway. (H., F.)  
*Homotrypella dubia* (Cumings and Galloway). (B.)  
*Homotrypella nodosa* Ulrich and Bassler. (L.)  
*Hudsonaster incomptus* Meek. (C.)  
*Iocrinus subcrassus* (Meek and Worthen).  
*Ischadites circularis* (Emmons).  
*Ischyrodonta unionoides* (Meek). (B.)  
*Isotelus gigas* Dekay.  
*Isotelus maximus* Locke.  
*Lepidocoleus jamesi* (Hall and Whitfield). (H., F., B., C., A., L., P.)  
*Leptoplerion mammiferum* Ulrich. (C.)  
*Leptotrypa calcicola* (Miller and Dyer). (C.)  
*Leptotrypa clavacoidea* (James). (C.)  
*Leptotrypa minima* Ulrich. (B.)  
*Leptotrypa ornata* Ulrich. (C.)  
*Lichenocerinus dyeri* Hall. (C.)  
*Lierophycus flabellum* Miller and Dyer. (C.)  
*Lingula eincinnatiensis* Hall and Whitfield. (F.)  
*Lophospira abbreviata* (Hall). (P.)  
*Lophospira bicincta* (Hall).  
*Lophospira bowdeni* (Safford).  
*Lophospira tropidophora* (Meek).  
*Lumbriconerites dactyloides* Hinde. (H.)  
*Lyrodesma grande* Ulrich. (B.)  
*Lyrodesma inornatum* Ulrich. (F.)  
*Lyrodesma major* (Ulrich). (C.)  
*Lyrodesma planum* Conrad. (P.)  
*Lyrodesma poststriatum* (Emmons). (P.)  
*Mastigograptus gracillimus* (Lesquerreux). (F.)  
*Mesopalæaster intermedius* Schuchert.  
*Mesopalæaster shafferi* (Hall). (F.)  
*Microceras inornatum* Hall. (H., F., B., C., A.)  
*Microceras minutissimum* Ulrich. (F.)  
*Modiolodon obtusus* Ulrich. (B.)  
*Modiolodon postriatus* Foerste. (P.)  
*Modiolodon truncatus* (Hall). (F., B., C., P.)  
*Modiolopsis faberi* Miller. (F.)  
*Modiolopsis longa* Miller and Faber. (F.)  
*Modiolopsis? (Colpomya?) milleri* Ulrich. (F.)  
*Modiolopsis modiolaris* (Conrad). (F., P.)  
*Modiolopsis postplicata* Foerste. (P.)  
*Modiolopsis sinuata* (Emmons). (P.)  
*Modiolopsis subparallela* Ulrich. (F.)  
*Modiolopsis? terminalis* Hall.  
*Monticulipora eincinnatiensis* (James). (C.)  
*Monticulipora mammulata* (D'Orbigny). (F.)  
*Monticulipora molesta* Nicholson. (B., L.)  
*Nereidæus varians* Grinnell.  
*Nicholsonella vaupeli* (Ulrich). (B.)  
*Oenonites? carinatus* Hinde. (P.)  
*Oenonites euneatus* Hinde. (P.)  
*Oenonites curvidens* Hinde. (P.)  
*Oenonites inæqualis* Hinde. (P.)  
*Oenonites rostratus* Hinde. (P.)  
*Oenonites serratus* Hinde. (P.)  
*Ohioerinus compactus* (Meek). (C.)  
*Ohioerinus constrictus* (Hall). (C.)  
*Ohioerinus lazus* (Hall). (F.)  
*Opisthoptera ampla* Ulrich. (F.)  
*Opisthoptera notabilis* Ulrich. (F.)  
*Orthis(?) pumila* Ulrich. (C.)  
*Orthoceras byrnesi* Miller. (F.)  
*Orthoceras eincinnatiense* Miller. (F.)  
*Orthoceras dyeri* Miller. (C.)  
*Orthoceras harperi* Miller. (C.)  
*Orthoceras lamellosum* Hall. (P.)  
*Orthoceras meeki* Miller. (F.)  
*Orthoceras turbidum* Hall and Whitfield. (F.)  
*Orthodesma approxinatum* Foerste. (P.)  
*Orthodesma contractum* (Hall).  
*Orthodesma nasutum* (Conrad). (P.)  
*Orthodesma parvum* Ulrich. (C.)  
*Orthodesma prolatum* Foerste. (P.)  
*Orthodesma pulaskiense* Foerste. (P.)  
*Orthonotella faberi* Miller. (F.)  
*Orthorhynchula linneyi* (James). (L., F.)  
*Pascocolus claudii* Miller. (B.)  
*Pascocolus darwini* Miller. (B.)  
*Pattersonia difficilis* Miller. (C.)  
*Pattersonia tuberosa* (Beecher). (B.)  
*Pattersonia ulrichi* Rauff. (C.)  
*Peronopora compressa* (Ulrich). (B., C., A.)  
*Peronopora decipiens* (Rouinger). (B., C., A.)  
*Peronopora vera* Ulrich. (H., F.)  
*Petigopora asperula* Ulrich. (B.)  
*Petigopora gregaria* Ulrich. (F., B., C.)  
*Petigopora petechialis* (Nicholson). (F., B., C., A.)  
*Petraster? americanus* (D'Orbigny). (F.)  
*Pholidops eincinnatiensis* Hall. (H., F.)  
*Pholidops subtruncata* Hall. (P.)  
*Phragmolites bellulus* (Ulrich). (F.)  
*Phragmolites elegans* (Miller). (C.)  
*Physetomya acuminata* Ulrich. (F.)  
*Pianodema bellula* (Meek). (F.)  
*Placentula marginata* Ulrich. (C.)  
*Platystrophia acuminata* (James). (A.)  
*Platystrophia crassa* (James). (F., B., C.)  
*Platystrophia cypha* (James). (B.)

- Platystrophia laticosta* (Meek). (F., B., C.)  
*Platystrophia morrocanensis* (James). (C.)  
*Platystrophia pauciplicata* (Cumings). (F.)  
*Platystrophia ponderosa* Foerste. (M., B., C., A.)  
*Platystrophia ponderosa auburnensis* Foerste. (A.)  
*Platystrophia ponderosa stevensoni* Grabau. (Ba.)  
*Platystrophia profundosulcata* (Meek). (F., II.)  
*Platystrophia unio-costata* Cumings. (B.)  
*Plectorthis aequalis* (Hall). (F.)  
*Plectorthis aequalis latior* Foerste. (F.)  
*Plectorthis aequalis pervagata* Foerste. (F.)  
*Plectorthis (Encuclocloma) crassiplicata* (Foerste). (F.)  
*Plectorthis fissicosta* (Hall). (F.)  
*Plectorthis fissicosta triplicatella* (Meek). (F.)  
*Plectorthis jamesi* (Hall). (C.)  
*Plectorthis neglecta* (James). (II.)  
*Plectorthis plicatella* (Hall). (F.)  
*Plectorthis (Encuclocloma) sectostrata* (Ulrich). (F.)  
*Plectorthis sordida* (Hall). (F.)  
*Plectorthis sordida multiplicata* Foerste. (F.)  
*Polygnathus wilsoni* James. (C.)  
*Primitia centralis* Ulrich.  
*Prioniodus dychei* James. (C.)  
*Prioniodus elegans* Pander. (P.)  
*Prioniodus furcatus* Hinde. (P.)  
*Prioniodus? politus* Hinde. (P.)  
*Proboscina auloporoides* (Nicholson). (B., C., A.)  
*Proboscina frondosa* (Nicholson). (B., C., A.)  
*Proctus parviusculus* Hall. (C.)  
*Promopalaeaster dycri* (Meek). (F.)  
*Promopalaeaster speciosus* (Meek).  
*Protowarthia cancellata* Hall. (H., F., B., C.)  
*Psilooncha inornata* Ulrich. (B., P.)  
*Psilooncha sinuata* Ulrich. (B.)  
*Psilooncha sinuata borcalis* Foerste. (P.)  
*Psilooncha subovalis* (Ulrich). (B., P.)  
*Psilonychia perangulata* Ulrich. (C.)  
*Pterinea cincinnatiensis* Miller and Faber. (F.)  
*Pterinea (Caritodens) demissa* (Conrad). (P., H., F., B., C., A.)  
*Pterinea insucta* (Emmons).  
*Pterinea rugatula* Miller and Faber. (F.)  
*Pterotheca pentagona* Foerste. (P.)  
*Pterygomctopus carleyi* (Meek). (F.)  
*Pterygomctopus microps* (Green).  
*Ptychocrinus parvus* Hall. (F.)  
*Pyanomya fabri* Miller. (F.)  
*Pyanomya gibbosa* Miller. (F.)  
*Pycnocrinus germanus* (Miller). (C.)  
*Pycnocrinus shafferi* (Miller). (C.)  
*Pycnomaus decipiens* Ulrich. (C.)  
*Rafinesquina alternata* (Conrad). (II., F., B., C., A.)  
*Rafinesquina alternata alternistriata* (Hall).  
*Rafinesquina alternata fracta* (Meek). (F., B., C.)  
*Rafinesquina alternata ponderosa* Ulrich. (B.)  
*Rafinesquina mucronata* Foerste. (P.)  
*Rafinesquina nasuta* (Conrad). (P., C.)  
*Rafinesquina squamula* (James). (F.)  
*Raphistoma halli* (Miller). (F.)  
*Rhytimya compressa* Ulrich. (F.)  
*Rhytimya convexa* Ulrich. (F., C?)  
*Rhytimya mickleboroughi* (Whitfield). (F., C?)  
*Rhytimya munda* (Miller and Faber). (C.)  
*Rhytimya ahana* Ulrich. (P., F.)  
*Rhytimya producta* Ulrich. (F.)  
*Rhytimya scaphula* (Miller and Faber). (F.)  
*Rusophycus bilobatus* Vanuxem.  
*Rusophycus puidium* Hall.  
*Schizambon? lockei* Winchell and Schuchert. (F.)  
*Schizocrania filosa* Hall. (F., B., C.)  
*Schizolopha moarci* Ulrich. (II., F., B., C., A., L., P.)  
*Scolithus tuberosus* Miller and Dyer. (II.)  
*Sedgwickia? compressa* Meek. (F.)  
*Scelya mundula* Ulrich. (F.)  
*Serpulites dissolutus* Billings. (II., F., B., C., A., L., P.)  
*Spatiopora aspera* Ulrich. (B.)  
*Spatiopora lineata* Ulrich. (B.)  
*Spatiopora maculosa* Ulrich. (C.)  
*Spatiopora tuberculata* (Milne-Edwards and Haime) (F., C.)  
*Sphenolium fabri* Miller.  
*Sphenophyllum primævum* Lesquereux.  
*Spirorbis cincinnatiensis* Miller and Dyer.  
*Spirorbis? lovlandensis* James.  
*Stigmatella aleicornis* Cumings and Galloway (F.)  
*Stigmatella dychei* (James). (A.)  
*Stigmatella irregularis* (Ulrich). (B.)  
*Stigmatella nicklesi* Ulrich and Bassler. (F.)  
*Stigmatella sessilis* Cumings and Galloway. (F.)  
*Stomatopora arachnoidea* (Hall). (II., F., B., C., A., L., P.)  
*Streptaster vorticellatus* (Hall). (F., C.)  
*Stromatocerium huronense australe* Parks. (L.)  
*Strophomena maysvillensis* Foerste. (F., II.)  
*Strophomena planoconvexa* Hall. (F.)  
*Strophomena sinuata* James. (F.)  
*Technophorus fabri* Miller. (F.)  
*Technophorus punctostriatus* Ulrich. (F.)  
*Technophorus punctostriatus quincuncialis* Foerste. (P.)  
*Tetradium fibratum* Safford. (L.)  
*Trematis crassipuncta* Ulrich. (F.)  
*Trematis(?) dycri* Miller. (F.)  
*Trematis millepunctata* Hall. (II., F., B., C., A.)  
*Trematis oblata* Ulrich. (F.)  
*Trematis umbonata* Ulrich. (C.)  
*Trichophycus lanosum* Miller and Dyer. (C.)  
*Trichophycus silurianum* (James). (C.)  
*Trichophycus venosum* Miller. (F.)  
*Trocholites circularis* Miller and Dyer.  
*Trocholites dycri* Hyatt.  
*Trocholites planorbiformis* Conrad. (P.)  
*Ulrichia nodosa* (Ulrich). (II., F., B., C., A.)  
*Vinella radialis* Ulrich. (C.)  
*Walcottia? cookana* Miller and Dyer. (C.)  
*Walcottia rugosa* Miller and Dyer. (F.)  
*Whitcevesia chamblensis* (Foerste). (P.)  
*Whitcevesia corrugata* (Miller and Faber). (C.)  
*Whitcevesia phaladiformis* (Hall). (P.)  
*Whitcevesia phaladiformis divaricata* (Foerste). (P.)  
*Whitella complanata* Foerste. (P.)  
*Whitella goniumbonata* Foerste. (P.)  
*Whitella hindi* Foerste. (P.)  
*Whitella securiformis* Foerste. (P.)  
*Zygospira cincinnatiensis* Meek. (II., F.)  
*Zygospira? erratica* (Hall). (P.)  
*Zygospira modesta* Hall. (II., F., B., C., A.)

## ORDOVICIAN OF SOUTH AMERICA.

*Agnostus bolivianus* Hoek.  
*Arca*? *gracilis* Hoek.  
*Archusina argentina* Kayser.  
*Bathyrurus*? *darwini* Kayser.  
*Bathyrurus*? *lajensis* Kayser.  
*Bathyrurus*? *orbignyianus* Kayser.  
*Bistramia elegans* Hoek.  
*Boliviana bipennis* Salter.  
*Boliviana melocactus* Salter.  
*Boliviana proboscidea* Salter.  
*Calymene callicephalo* Green.  
*Calymene diops* Green.  
*Cruziana cucurbita* Salter.  
*Cruziana fureifera* D'Orbigny.  
*Cruziana unduavi* Salter.  
*Cryptolithus boliviensis* Lake.  
*Cryptolithus kruegeri* (Hoek).  
*Dietyonema murrayi tartjense* Hoek.  
*Hemigraspis liquensis* (Hoek).  
*Homalonotus*? *bistrami* Hoek.  
*Illænus argentinus* (Kayser).  
*Leptæna*(?) *stelzneri* Kayser.  
*Lingula boliviana* Hoek.  
*Lingula ellipsiformis* Hoek.  
*Lingula inornata* Hoek.  
*Lingula lineata* Hoek.  
*Maclurites avellanae* (Kayser).  
*Maclurites sarmienti* (Kayser).  
*Megalaspis*? *americana* Hoek.  
*Megalaspis brackenbuschi* Kayser.  
*Megalaspis*? *matacensis* Hoek.  
*Monticulipora*? *argentina* Kayser.  
*Orthis calligramma* Kayser.  
*Orthis disparilis* (Kayser).  
*Orthis*? *saltensis* Kayser.  
*Orthis vesperilio* Sowerby.  
*Orthoceras bolivianum* Hoek.  
*Parabolimella andina* Hoek.  
*Parabolimopsis mariana* Hoek.  
*Pizarroa quichuana* Hoek.  
*Pterygomætopus saltensis* Kayser.  
*Strophomena*(?) *talacastensis* Kayser.  
*Thysanopyge argentina* Kayser.  
*Tunavria cochambambina* Hoek.

## ORDOVICIAN (MISCELLANEOUS).

(Exact horizon unknown.)

*Asaphus*? *astragalotes* Green.  
*Bellerophon allegoricus* White. (Utah.)  
*Dinorthis fontalis* (White). (Utah.)  
*Girvanella antiqua* Dawson. (Quebec.)  
*Isotelus cyclops* Green. (N. Y.)  
*Labyrinthites chidlensis* Lambe. (Arctic America.)  
*Myrianites murchisoni* Emmons. (Me.)  
*Myrianites sillimani* Emmons. (Me.)  
*Nemapodia tenuissima* Emmons. (N. Y.)  
*Nereites deweyi* Emmons. (Me.)  
*Nereites gracilis* Emmons. (Me.)  
*Nereites jacksoni* Emmons. (Me.)  
*Nereites lanccolatus* Emmons. (Me.)  
*Nereites loomisii* Emmons. (Me.)  
*Nereites pugnus* Emmons. (Me.)  
*Nereites robustus* (Emmons). (N. Y.)  
*Nidulites favus* Salter. (Quebec City.)  
*Oldhamia* (*Murchisonites*) *occidens* (Walcott). (N. Y.)

*Orthoceras goldfussi* (Troost). (Tenn.)  
*Primitia mundula effusa* Jones. (Quebec City.)  
*Receptaculites arcticus* Etheridge. (Arctic America.)

## SILURIAN FAUNAS.

## RICHMOND OF AREAS ADJACENT TO CINCINNATI AXIS.

(Arnheim=A.; Waynesville=W.; Liberty=L.;  
 Whitewater=Wh.; Elkhorn=E.)  
*Aglaclerinites austini* (Foerste). (W.)  
*Aglaclerinites faberi* (Miller). (W.)  
*Alepidaster granuliferus* (Meek). (R.)  
*Alepidaster miamiensis* (Miller). (W. or L.)  
*Amplexopora granulosa* Cummings and Galloway. (L.)  
*Amplexopora pumila* Cummings and Galloway. (L.)  
*Amplexopora pustulosa* Ulrich. (W.)  
*Anomalodonta alata* (Meek). (A., W.)  
*Anomalodonta casei* (Meek and Worthen). (Wh.)  
*Anomalodonta costata* (Meek). (A., W.)  
*Anomalodonta gigantea* Miller. (W.)  
*Anoptera miscneri* Ulrich. (W.)  
*Anorthaster miamiensis* Schuchert. (W. or L.)  
*Aparchites minutissimus* (Hall). (A., W., L., Wh., E.)  
*Aparchites oblongus* Ulrich. (A.)  
*Arabellites procursus* Foerste. (E.)  
*Archinacella indianensis* (Miller). (Wh?)  
*Archinacella richmondensis* Ulrich. (Wh.)  
*Archinacella rugatina* Ulrich. (A.)  
*Arctinurus harrisi* (Miller). (L.)  
*Arthriaria biclavata* Miller. (A., W., L., Wh., E.)  
*Atactopora angularis* Ulrich and Bassler. (W.)  
*Atactoporella schucherti* Ulrich. (W., Wh.)  
*Batostoma prosscri* Cummings and Galloway. (W., L.)  
*Batostoma variable* (Ulrich). (W., E.)  
*Batostoma varians* (James). (A.)  
*Beatricea nodulifera* Foerste. (L.)  
*Beatricea nodulifera intermedia* Foerste. (L.)  
*Beatricea nodulosa* Billings.  
*Beatricea undulata* Billings.  
*Beatricea undulata cylindrica* Foerste. (L., E.)  
*Bellerophon mohri* Miller. (Wh.)  
*Bellerophon subangularis* Ulrich. (Wh.)  
*Berenica primitiva* Ulrich. (A., W.)  
*Beyrichia parallela* (Ulrich). (Wh.)  
*Beyrichia tumida* (Ulrich). (A. or W.)  
*Bodmania insuctum* Miller and Faber. (Wh.)  
*Bollia persulcata* (Ulrich). (A., W., L., Wh., E.)  
*Bollia pumila* Ulrich. (W.)  
*Bollia regularis* (Emmons). (A.)  
*Brachiospongia tuberculata* James. (L.)  
*Bucania crassa* Ulrich. (E.)  
*Bucania simulatrix* Ulrich. (W.)  
*Buthotrephis gracilis* Hall. (A., W., L., Wh., E.)  
*Buthotrephis gracilis crassa* Hall. (A., W., L., Wh., E.)  
*Byssonychia cultrata* Ulrich. (W.)  
*Byssonychia grandis* Ulrich. (W.)  
*Byssonychia obsca* Ulrich. (Wh.)  
*Byssonychia radiata* (Hall).  
*Byssonychia richmondensis* Ulrich. (Wh.)  
*Byssonychia robusta* (Miller). (Wh.)  
*Byssonychia subrecta* Ulrich. (W.)  
*Byssonychia tenuistriata* Ulrich. (Wh.)  
*Bythocypris cylindrica* (Hall). (A., W., L., Wh., E.)



- Bythopora delicatula* (Nicholson). (W., L.)  
*Bythopora meeki* (James). (W.)  
*Bythopora striata* Ulrich. (A., W.)  
*Calapacia cribriformis* (Nicholson). (W., L., Wh., E.)  
*Calloporella circularis* (James). (W.)  
*Calymene meeki* Foerste. (A., W., L., Wh., E.)  
*Calymene meeki retrorsa* Foerste. (W.)  
*Cameroeceras inaequabile* (Miller). (W.)  
*Catazypa headi schuchertana* (Ulrich). (W.)  
*Ceramoporella granulosa* Ulrich. (A.)  
*Ceramoporella ohioensis* (Nicholson). (A., W., L., Wh., E.)  
*Ceramoporella whitei* James. (A.)  
*Ceratopsis robusta* (Ulrich). (W., L., Wh., E.)  
*Ceraurinus icarus* (Billings).  
*Ceraurus miscnri* Foerste. (Wh.)  
*Chasmops breviceps* (Hall). (W., L.)  
*Clidophorus faberi* Miller.  
*Clidophorus fabula* (Hall).  
*Clionychia excavata* Ulrich. (Wh.)  
*Colcolus iowensis* James. (A., W., L., Wh., E.)  
*Columnaria alveolata* Goldfuss. (W., L., Wh., E.)  
*Columnaria celicina* Nicholson.  
*Columnaria vacua* Foerste. (W., L., Wh., E.)  
*Compsocrinus harrisi* (Miller). (L.)  
*Compsocrinus miamiensis* (Miller). (L.)  
*Conocardium richmondensis* Foerste. (E.)  
*Constellaria limitaris* (Ulrich). (W., Wh.)  
*Constellaria polystomella* Nicholson. (W., Wh., E.)  
*Conularia formosa* Miller and Dyer. (W., Wh.)  
*Corallidomus concentricus* Whitfield. (L.)  
*Cornulites richmondensis* (Miller). (Wh.)  
*Corynotrypa delicatula* (James). (A., W., L., Wh., E.)  
*Corynotrypa inflata* (Hall). (A., W., L., Wh., E.)  
*Crania lalia* Hall. (A., W., L., Wh., E.)  
*Crania scabiosa* Hall. (A., W., L., Wh., E.)  
*Ctenobolbina hammelli* (Miller and Faber). (W.)  
*Ctenodonta albertina* Ulrich. (W.)  
*Ctenodonta cingulata* (Ulrich). (A.)  
*Ctenodonta? hilli* (Miller). (Wh.)  
*Ctenodonta madisonensis* Ulrich. (A.)  
*Ctenodonta recurva* (Ulrich.)  
*Ctenodonta similis* (Ulrich). (W.)  
*Cuncameya curta* Whitfield. (W.)  
*Cuncameya miamiensis* Hall and Whitfield. (W.)  
*Cuncameya neglecta* (Meek). (W.)  
*Cuncameya scapha* Hall and Whitfield. (W.)  
*Cupulocrinus polydactylus* (Shumard). (W., L., Wh.)  
*Cyloconcha milleri* (Meek). (W.)  
*Cyclocystoides magnus* Miller and Dyer. (W.)  
*Cyclocystoides minus* Miller and Dyer. (W.)  
*Cyclocystoides mundulus* Miller and Dyer. (W.)  
*Cyclocystoides parvus* Miller and Dyer. (W.)  
*Cyclonema bilix* (Conrad). (A., Wh.)  
*Cyclonema bilix fluctuatum* (James). (A., W.)  
*Cyclora depressa* Ulrich. (A., W., L., Wh., E.)  
*Cyclora hoffmani* Miller. (A., W., L., Wh., E.)  
*Cyclora minuta* Hall. (A., W., L., Wh., E.)  
*Cyclora parvula* (Hall). (A., W., L., Wh., E.)  
*Cyclora pulchella* Miller. (A., W.)  
*Cymatonota attenuata* Ulrich. (W.)  
*Cymatonota constricta* Ulrich. (W., A.)  
*Cymatonota cylindrica* (Miller and Faber). (W., A.)  
*Cymatonota scmiistriata* Ulrich. (W.)  
*Cymatonota typicalis* Ulrich. (W.)  
*Cyphotrypa stidhami* (Ulrich). (Wh. or E.)  
*Cyphotrypa wilmingttonensis* Ulrich and Bassler. (F.)  
*Cyrtoceras amicum* Miller. (Wh.)  
*Cyrtoceras faberi* J. F. James. (W.)  
*Cyrtoceras hitzi* Foerste. (Wh., S.)  
*Cyrtoceras irregulare* Wetherby. (W.)  
*Cyrtoceras tenuiseptum* Faber. (W.)  
*Cyrtoceras thompsoni* Miller.  
*Cyrtocerina madisonensis* Miller. (Wh., S.)  
*Cyrtodonta cuneata* (Miller). (Wh.)  
*Cyrtodonta halli* (Nettelroth).  
*Cyrtolites ornatus* Conrad. (W.)  
*Dalmanella meeki* (Miller). (A., W., L., Wh., E.)  
*Dawsonoceras hammelli* (Foerste). (Wh., S., E.)  
*Dendrocrinus caduceus* (Hall). (W., L.)  
*Dendrocrinus casei* Meek. (Wh.)  
*Dendrocrinus erraticus* Miller. (W.)  
*Dendrocrinus posticus* (Hall). (W., L.)  
*Dermatostroma canaliculatum* Parks. (W.)  
*Dermatostroma corrugatum* (Foerste). (Wh.)  
*Dermatostroma glyptum* (Foerste). (Wh.)  
*Dermatostroma papillatum* (James). (W., L., Wh., E.)  
*Dermatostroma scabrum* (James).  
*Dieranopora emacerata* (Nicholson).  
*Dinorthis carleyi* (Hall). (A.)  
*Dinorthis carleyi insolens* Foerste. (W.)  
*Dinorthis subquadrata* (Hall). (Wh.)  
*Drepanella richardsoni* (Miller). (Wh.)  
*Dystactospongia madisonensis* Foerste. (Wh., S.)  
*Dystactospongia minima* Ulrich. (W.)  
*Entomis madisonensis* Ulrich. (Wh., S.)  
*Eridonychia crenata* Ulrich. (W.)  
*Eridotrypa simulatrix* (Ulrich). (W.)  
*Eunicites confinis* Foerste. (E.)  
*Eunicites falcatus* Foerste. (E.)  
*Eunicites paululus* Foerste. (E.)  
*Eurychilina? striatormarginata* (Miller). (Wh., S.)  
*Faberia anomala* Miller.  
*Fenestella granulosa* Whitfield. (W., Wh.)  
*Girvanella richmondensis* (Miller). (Wh.)  
*Glyptocrinus? forshellii* Miller. (W.)  
*Glyptocrinus? richardsoni* Wetherby.  
*Gomphoceras eos* Hall and Whitfield. (Wh?)  
*Gomphoceras indianense* Miller and Faber. (W.)  
*Graptodictya prelegans* (Ulrich). (W., L.)  
*Gyroceras baeri* (Meek and Worthen). (L.)  
*Hallopora frondosa* (Cumings). (Wh.)  
*Hallopora subnodosa* (Ulrich). (W.)  
*Hebertella alveata* Foerste. (L., Wh.)  
*Hebertella alveata richmondensis* Foerste. (Wh.)  
*Hebertella (Glyptorthis) insculpta* (Hall). (W.)  
*Hebertella occidentalis* Hall. (A., W., L., Wh., E.)  
*Hebertella occidentalis sinuata* Hall.  
*Helcionopsis striata* Ulrich. (Wh.)  
*Helicotoma marginata* Ulrich. (Wh.)  
*Helopora elegans* Ulrich. (Wh.)  
*Helopora harrisi* James. (W., L.)  
*Heterospongia aspera* Ulrich. (A.)  
*Heterospongia knotti* Ulrich. (A.)  
*Heterospongia subramosa* Ulrich. (A.)  
*Heterotrypa microstigma* Cumings and Galloway. (W.)  
*Heterotrypa subramosa* (Ulrich). (W.)  
*Heterotrypa subramosa prolifica* Ulrich. (W.)  
*Holopea hubbardi* Miller. (Wh., S.)  
*Holopea oxfordensis* Ulrich. (W.)

- Homotrypa austini* Bassler. (Wh.)  
*Homotrypa bassleri* Nickles. (A.)  
*Homotrypa communis* Bassler. (W.)  
*Homotrypa cylindrica* Bassler. (Wh.)  
*Homotrypa dawsoni* (Nicholson). (W.)  
*Homotrypa flabellaris* Ulrich. (A., W., L., Wh., E.)  
*Homotrypa flabellaris frondosa* Bassler. (A.)  
*Homotrypa flabellatis spinifera* Bassler. (Wh.)  
*Homotrypa libana* Bassler. (A.)  
*Homotrypa nicklesi* Bassler.  
*Homotrypa nodulosa* Bassler. (Wh.)  
*Homotrypa ramulosa* Bassler. (Wh.)  
*Homotrypa richmondensis* Bassler. (Wh.)  
*Homotrypa wortheni* (James). (Wh.)  
*Homotrypa wortheni interceclata* Bassler. (Wh.)  
*Homotrypa wortheni prominens* Bassler. (E.)  
*Homotrypella dubia* (Cumings and Galloway). (A.)  
*Homotrypella hospitalis* (Nicholson). (W., L., Wh., E.)  
*Hudsonaster incomptus* Meek.  
*Hyalithes(?) dubius* Miller and Faber.  
*Hyalithes parviusculus* Hall.  
*Hyalithes versaillesensis* Miller and Faber.  
*Iocrinus subcrassus* Meek and Worthen. (W.)  
*Ischyrodonta decipiens* Ulrich. (E.)  
*Ischyrodonta elongata* Ulrich. (Wh.)  
*Ischyrodonta miseneri* Ulrich. (Wh.)  
*Ischyrodonta modioliiformis* Ulrich. (Wh.)  
*Ischyrodonta ovalis* Ulrich. (Wh.)  
*Ischyrodonta truncata* Ulrich. (Wh.)  
*Isotelus gigas* Dekay.  
*Isotelus megistos* Locke.  
*Jonesella digitata* Ulrich. (A.)  
*Labechia subcylindrica* (James). (W.)  
*Lepadocystis moorei* (Meek). (Wh.)  
*Leperditella glabra* (Ulrich). (Wh.)  
*Leperditia coccigena* Miller. (Wh., S.)  
*Leptæna richmondensis* Foerste.  
*Leptæna richmondensis precursor* Foerste. (A.)  
*Lichenocrinus affinis* Miller. (W.)  
*Lichenocrinus tuberculatus* Miller. (Wh.)  
*Lingula vanhorni* Miller. (W.)  
*Liolelmella subfusiformis* (James). (W.)  
*Liospira rugata* Ulrich. (A.)  
*Lophospira acuminata* Ulrich. (Wh.)  
*Lophospira ampla* Ulrich. (Wh?)  
*Lophospira bicincta* (Hall).  
*Lophospira bowdeni* Safford. (A., W., L., Wh., E.)  
*Lophospira hammelli* (Miller). (Wh., S.)  
*Lophospira perlammellosa* Ulrich. (W.)  
*Lophospira pulchella* Ulrich and Scofield.  
*Lophospira tropidophora* (Meek). (A., W., L., Wh., E.)  
*Lumbriconcrites austini* Foerste. (E.)  
*Lyrodesma major* (Ulrich). (W.)  
*Megalograptus welchi* Miller. (L.)  
*Mesopalæaster shafferi* (Hall). (W.)  
*Mesopalæaster wilberanus* (Meek and Worthen).  
*Mesotrypa orbiculata* Cumings and Galloway. (A.)  
*Mesotrypa patella* (Ulrich). (Wh.)  
*Microceras inornatum* Hall. (A., W., L., Wh., E.)  
*Modiolodon declivis* Ulrich. (Wh.)  
*Modiolodon subovalis* Ulrich. (A., W.)  
*Modiolodon subrectus* Ulrich. (Wh.)  
*Modiolopsis capax* Miller.  
*Modiolopsis concentrica* Hall and Whitfield. (W.)  
*Modiolopsis valida* Ulrich. (W.)  
*Modiolopsis versaillesensis* Miller. (W.)  
*Monticulipora cleavelandi* James. (Wh.)  
*Monticulipora epidermata* Ulrich and Scofield. (Wh.)  
*Monticulipora levis* Ulrich. (Wh.)  
*Monticulipora levis consimilis* Ulrich. (Wh.)  
*Monticulipora parasitica* Ulrich. (Wh.)  
*Nereidæus varians* Grinnell. (A., W., L., Wh.)  
*Nicholsonella peculiaris* Cumings and Galloway. (A.)  
*Odontopleura onealli* (Miller). (W.)  
*Enonites decipiens* Foerste. (E.)  
*Opisthoptera alternata* Ulrich. (W.)  
*Opisthoptera casei* (Meek and Worthen). (Wh.)  
*Opisthoptera concordensis* Foerste. (A.)  
*Opisthoptera extenuata* Ulrich. (W.)  
*Opisthoptera fissicosta* (Meek). (W.)  
*Opisthoptera laticostata* Ulrich. (W.)  
*Opisthoptera obliqua* Ulrich. (Wh.)  
*Orthoceras carleyi* Hall and Whitfield. (?W.)  
*Orthoceras duseri* Hall and Whitfield. (W.)  
*Orthoceras gorbyi* Miller.  
*Orthoceras hallanum* Miller. (W.)  
*Orthoceras (Ormoceras?) hitzi* Foerste. (Wh., S.)  
*Orthoceras mohri* Miller. (A.)  
*Orthodesma canaliculatum* Ulrich.  
*Orthodesma curvatum* (Hall and Whitfield). (W.)  
*Orthodesma rectum* Hall and Whitfield. (W.)  
*Orthodesma subangulatum* Ulrich. (Wh.)  
*Ortonella hainesi* (Miller). (Wh.)  
*Orydiiscus magnus* (Miller). (Wh?)  
*Pachydictya fenestelliformis* (Nicholson). (W., L.)  
*Paleschara beani* (James). (W.)  
*Pascoelus camdenensis* Foerste.  
*Peronopora decipiens* (Rominger). (A., E.)  
*Petigopora offula* Ulrich and Bassler. (A.)  
*Petraster speciosus* (Miller and Dyer).  
*Phragmolites dyeri* (Hall). (W.)  
*Platystrophia acutilirata* (Conrad). (Wh.)  
*Platystrophia acutilirata prolongata* Foerste. (Wh.)  
*Platystrophia acutilirata senex* (Cumings). (Wh.)  
*Platystrophia annicæna* Foerste. (W.)  
*Platystrophia clarksvillensis* Foerste. (W., L.)  
*Platystrophia cypha conradi* Foerste. (A.)  
*Platystrophia cypha versaillesensis* Foerste. (W., L.)  
*Platystrophia laticosta* (Meek). (W.)  
*Platystrophia moritura* (Cumings). (E.)  
*Platystrophia wallowayi* Foerste. (A.)  
*Plectambonites rugosus clarksvillensis* Foerste. (W.)  
*Plectrothis (Austinella) scovilli* (Miller). (Wh.)  
*Plethospira striata* Ulrich. (W.)  
*Primitia cincinnatiensis* (Miller). (A., W.)  
*Primitia lutivia* Ulrich. (Wh.)  
*Primitia medialis* Ulrich. (W?)  
*Primitia milleri* Ulrich. (W.)  
*Proboscina auloporoides* (Nicholson).  
*Proboscina frondosa* (Nicholson). (A., W.)  
*Promopalæaster bellulus* Schuchert. (W.)  
*Promopalæaster exculptus* (Miller). (W. or L.)  
*Promopalæaster granulatus* (Hall).  
*Promopalæaster magnificus* (Miller). (W. or L.)  
*Promopalæaster spinulosus* (Miller and Dyer). (W.)  
*Promopalæaster wykoffi* (Miller and Gurley).  
*Protaræa richmondensis* Foerste. (W., L., Wh., E.)  
*Protaræa richmondensis papillata* Foerste. (Wh.)  
*Protostigma sigillaroides* Lesquereux.  
*Psiloconcha elliptica* Ulrich. (W.)

- Psiloconcha grandis* Ulrich. (W.)  
*Psiloconcha subrecta* Ulrich. (W.)  
*Pterinea corrugata* (James). (W.)  
*Pterinea* (*Caritodens*) *demissa* (Conrad). (A., W., L., Wh., E.)  
*Pterinea subquadrata* James. (W.)  
*Ptilodictya flagellum* Nicholson. (L.)  
*Ptilodictya magnifica* Miller. (Wh.)  
*Ptilodictya nodosa* James. (L., Wh.)  
*Ptilodictya plumaria* James. (Wh.)  
*Rafinesquina alternata* Conrad var. (A., W., L., Wh., E.)  
*Raphistoma richmondense* Ulrich. (Wh.)  
*Reteocrinus magnificus* Miller. (W.)  
*Reteocrinus nealli* (Hall). (W., L.)  
*Rhaphanocrinus sculptus* (Miller). (L.)  
*Rhinidictya lata* (Ulrich). (W.)  
*Rhombotrypa quadrata* (Rominger). (W., L., Wh., E.)  
*Rhombotrypa subquadrata* (Ulrich). (W.)  
*Rhopalonaria venosa* Ulrich. (A., W.)  
*Rhynchotrema capax* (Conrad). (W., L., Wh., E.)  
*Rhynchotrema dentatum* Hall. (Wh.)  
*Rhynchotrema dentatum arnheimense* Foerste. (A.)  
*Rhynchotrema perlamellosum* (Whitfield). (W., L., Wh., E.)  
*Rhytymya byrnesi* (Miller). (W., Wh.)  
*Rhytymya faberi* (Miller).  
*Rhytymya lunulata* (Whitfield).  
*Rusophycus biloba* Vanuxem. (A., W., L., Wh., E.)  
*Salpingostoma richmondense* Ulrich. (Wh.)  
*Schizolophia moorei* Ulrich. (W., Wh.)  
*Schuchertia laxata* Schuchert. (W.)  
*Scolithus delicatulus* James.  
*Sinuities cancellata* (Hall). (A., W., L., Wh., E.)  
*Sinuities subcompressus* (Ulrich). (W.)  
*Spatiopora corticans* (Nicholson). (W.)  
*Spatiopora montifera* Ulrich. (W.)  
*Spatiopora tuberculata* (Milne-Edwards and Haime). (W.)  
*Sphenolium cuneiforme* (Miller). (W.)  
*Sphenolium richmondense* Miller. (Wh.)  
*Stigmatella catenulata* Cumings and Galloway. (A.)  
*Stigmatella crenulata* Ulrich and Bassler. (W.)  
*Stigmatella incrustans* Cumings and Galloway. (L.)  
*Stigmatella interporosa* Ulrich and Bassler. (W.)  
*Stigmatella personata* Ulrich and Bassler. (W.)  
*Stigmatella spinosa* Ulrich and Bassler. (W.)  
*Streptaster septembrachiatus* (Miller and Dyer). (L., E.)  
*Streptelasma dispandum* Foerste. (W.)  
*Streptelasma divaricans* (Nicholson). (W., L., Wh.)  
*Streptelasma divaricans angustatum* Foerste. (Wh.)  
*Streptelasma insolitum* Foerste. (Wh.)  
*Streptelasma rusticum* Billings. (W., L., Wh., E.)  
*Streptospongia labyrinthica* Ulrich. (A.)  
*Stromatocerium huronense* (Billings).  
*Stromatocerium montiferum* (Ulrich). (Wh., S.)  
*Strophomena concordensis* Foerste. (A., W.)  
*Strophomena neglecta* (James). (W.)  
*Strophomena nutans* Meek. (W.)  
*Strophomena planumbona* (Hall). (W., L.)  
*Strophomena planumbona elongata* (James). (W.)  
*Strophomena planumbona gerontica* Foerste. (W.)  
*Strophomena planumbona subtenta* (Hall). (W., L.)  
*Strophomena sulcata* (Verneuil). (W., L., Wh.)  
*Strophomena vetusta* (James). (W., Wh.)  
*Strophomena vetusta approximata* (James). (L. or Wh.)  
*Strophomena vetusta precursor* Foerste. (W.)  
*Synhomalonotus christyi* (Hall). (W.)  
*Taniaster elegans* Miller. (W. or L.)  
*Tanocerinus typus* Wachsmuth and Springer. (W. or L.)  
*Tetradella lunatifer* (Ulrich). (W., L., Wh., E.)  
*Tetradella* [quadrilirata (Hall and Whitfield). (W., L., Wh., E.)  
*Tetradella simplex* (Ulrich). (W., L., Wh., E.)  
*Tetradium appropinquatum* Ulrich. (W., L., Wh., E.)  
*Trematis millepunctata* Hall. (A., W., L., Wh., E.)  
*Trematis quincuncialis* Miller and Dyer. (W.)  
*Trematis reticularis* (Miller).  
*Trochomena madisonense* Ulrich. (Wh., S.)  
*Ulrichia nodosa* (Ulrich). (A., W., L., Wh., E.)  
*Urasterella grandis* (Meek).  
*Whiteavesia photadiformis* (Hall). (W.)  
*Whitella obliqua* Ulrich. (W.)  
*Whitella ohioensis* Ulrich. (W.)  
*Whitella quadrangularis* (Whitfield). (W.)  
*Whitella subovata* Ulrich. (W.)  
*Whitella umbonata* Ulrich. (W.)  
*Xenocrinus bacri* (Meek). (L.)  
*Xenocrinus penicillus* Miller. (L.)  
*Zygospira kentuckiensis* James. (W.)  
*Zygospira modesta* Hall. (A., W., L., Wh., E.)

RICHMOND (MAQUOKETA) OF UPPER MISSISSIPPI VALLEY.

(Maquoketa is here used in a broad sense for the Richmond shales of the Upper Mississippi Valley.)

- Ambonychia illinoisensis* Worthen.  
*Amphilichas bicornis* (Ulrich).  
*Amphilichas clermontensis* Slocom.  
*Amphilichas rhinoceros* Slocom.  
*Anaphragma mirabile* Ulrich and Bassler.  
*Archites fimbriatus* (Ulrich).  
*Archinacella rotunda* Ulrich and Scofield.  
*Batostoma? rugosum* (Whitfield).  
*Batostoma varians* (James).  
*Bellerophon lirata* Hall.  
*Bellerophon patersoni* Hall.  
*Bumastus beckeri* Slocom.  
*Byssonychia tenuistriata* Ulrich.  
*Calloporella? lens* (Whitfield).  
*Calloporella? nodulosa* Ulrich.  
*Calymene fuyetensis* Slocom.  
*Calymene gracilis* Slocom.  
*Calymene mammillata* Hall.  
*Ceramoporella? irregularis* (Whitfield).  
*Ceramoporella stellata* Ulrich.  
*Ceravrus clymeneis* Slocom.  
*Clidophorus neglectus* Hall.  
*Climacograptus putillus* (Hall).  
*Climacograptus ulrichi* Ruedemann.  
*Constellaria polystomella* Nicholson.  
*Constellaria punctata* (Whitfield).  
*Colcolus iowensis* James.  
*Cornulites sterlingensis* (Meek and Worthen).  
*Corynotrypa abrupta* Bassler.  
*Corynotrypa curta* Bassler.  
*Corynotrypa medialis* Bassler.  
*Crepidopora hemispherica* Ulrich.

- Ctenobolbina emaciata* (Ulrich).  
*Ctenodonta calvini* Ulrich.  
*Ctenodonta fecunda* (Hall).  
*Ctenodonta simulatrix* Ulrich.  
*Cybeloides iowensis* Slocum.  
*Cycloceras perroti* (Clarke).  
*Cyrtoceras whitneyi* Hall.  
*Cyrtodonta grandis luculenta* (Sardeson).  
*Cyrtolites conradi* Hall.  
*Cyrtolites disjunctus* Ulrich and Scofield.  
*Dalmanella corpulenta* (Sardeson).  
*Dalmanella futilis* (Sardeson).  
*Dalmanella ignota* (Sardeson).  
*Dalmanella inacrior* (Sardeson).  
*Dalmanella porrecta* (Sardeson).  
*Dendrocrinus angustatus* (Meek and Worthen).  
*Dendrocrinus oswegoensis* Meek and Worthen.  
*Dicranopora fragilis* (Billings).  
*Dimorphis proavita* (Winchell and Schuchert).  
*Diplograptus peosta* Hall.  
*Encrinurus cristatus* Clarke.  
*Encrinurus pernodosus* Slocum.  
*Endoceras bristolense* Miller.  
*Endoceras egani* Miller.  
*Eurydictya sterlingensis* Ulrich.  
*Fenestella granulosa* Whitfield.  
*Halysites gracilis* Hall.  
*Hormotoma gracilis multivoltis* Ulrich and Scofield.  
*Homotrypella rustica* Ulrich.  
*Hyalolithes parviusculus* (Hall).  
*Iocrinus crassus* (Meek and Worthen).  
*Iotelus iowensis* (Owen).  
*Leptaena unicastata* (Meek and Worthen).  
*Leptobolus occidentalis* Hall.  
*Lingula beltrami* Winchell and Schuchert.  
*Lingula (Palaeoglossa) deflecta* (Winchell and Schuchert).  
*Lingula philomela* Billings.  
*Lingulasma schucherti* Ulrich.  
*Lingulops whitfieldi* Hall.  
*Lioclemella annulifera* (Whitfield).  
*Lioclemella fusiformis* (Whitfield).  
*Lioclemella nitida* (Ulrich).  
*Lioclemella solidissima* (Whitfield).  
*Lophospira acuminata* Ulrich and Scofield.  
*Lophospira quadrisulcata* Ulrich and Scofield.  
*Meekospira subconica* Ulrich and Scofield.  
*Megalaspis beckeri* Slocum.  
*Modiolopsis excellens* Ulrich.  
*Monotrypa? nodosa* Ulrich.  
*Nileus vigilans* (Meek and Worthen).  
*Onchometopus susse* (Whitfield).  
*Orbiculoidea lamellosa* (Hall).  
*Orthoceras sociale* Hall.  
*Platystrophia acutillrata* (Conrad).  
*Plectambonites precosis* (Sardeson).  
*Plectambonites recedens* (Sardeson).  
*Plectambonites saezus* (Sardeson).  
*Plectorthis (Austinella) whitfieldi* (N. H. Winchell).  
*Plethospira semele* (Hall).  
*Pleuronomaria (? Lophospira) depauperata* Hall.  
*Porocrinus crassus* Meek and Worthen.  
*Primitia dorsicornis* (Ulrich).  
*Primitia gibbera* Ulrich.  
*Primitia impressa* Ulrich.  
*Primitia tumidula* Ulrich.  
*Pterygomotopus fredericki* Slocum.  
*Pterygomotopus larrabeei* Slocum.
- Rafinesquina kingi* (Whitfield).  
*Rhynchotrema neneah* (Whitfield).  
*Saffordia sulcodorsata* (Ulrich).  
*Saffordia ventralis* Ulrich.  
*Salpingostoma imbricatum* Ulrich and Scofield.  
*Schizotreta minutula* Winchell and Schuchert.  
*Schizotreta pelopea* (Billings).  
*Sinuiles concinna* (Ulrich and Scofield).  
*Spatiopora iowensis* Ulrich.  
*Spharocoryphe maquoketensis* Slocum.  
*Strophomena acuta* (Winchell and Schuchert).  
*Strophomena cardinalis* (Whitfield).  
*Strophomena fluctuosa occidentalis* Foerste.  
*Strophomena neglecta* (James).  
*Strophomena planodorsata* Winchell and Schuchert.  
*Strophomena wisconsinensis* Whitfield.  
*Tentaculites oswegoensis* Meek and Worthen.  
*Thaleops ovata* Conrad.  
*Trematis(?) pustulosa* Hall.  
*Trematopora?? granulata* Whitfield.  
*Triplexia ulrichi* Winchell and Schuchert.  
*Whitella obliqua* Ulrich.  
*Whitella quadrangularis* (Whitfield).  
*Whitella sterlingensis* (Meek and Worthen).

RICHMOND (FERNVALE) OF ILLINOIS, TENNESSEE,  
MISSOURI, ARKANSAS, AND OKLAHOMA.

- Anolotichia ponderosa* Ulrich.  
*Arthroclasma angulare* Ulrich.  
*Constellaria parva* Ulrich.  
*Constellaria polystomella* Nicholson.  
*Corynotrypa turgida* (Ulrich).  
*Crepipora hemispherica* Ulrich.  
*Cyphotrypa wilmingtonensis* Ulrich and Bassler.  
*Dalmanella tersa* (Sardeson).  
*Dekayella singularis* (Ulrich).  
*Dinorthis subquadrata* (Hall).  
*Diplotrypa? dubia* Ulrich.  
*Eurydictya montifera* Ulrich.  
*Favositella epidermata* (Ulrich).  
*Helopora imbricata* Ulrich.  
*Hemiphragma imperfectum* (Ulrich).  
*Heterotrypa affinis* (Ulrich).  
*Homotrypa gelasinosa* Ulrich.  
*Homotrypa splendens* Bassler.  
*Homotrypella contexta* Ulrich.  
*Lingulasma schucherti* Ulrich.  
*Lingulops clifftonensis* Foerste.  
*Lioclema wilmingtonense* Ulrich.  
*Nicholsonella peculiaris* Cummings and Galloway.  
*Orbignyella lamellosa* (Ulrich).  
*Pachydictya fenestelliformis corticulu* Ulrich.  
*Pachydictya? firma* Ulrich.  
*Pachydictya gigantea* Ulrich.  
*Pachydictya? splendens* Ulrich.  
*Parastrophia divergens* Hall and Clarke.  
*Phaenopora wilmingtonensis* Ulrich.  
*Platystrophia oculitirata* (Conrad).  
*Plectorthis (Austinella) kankakensis* (McChesney).  
*Protocrisina exigua* Ulrich.  
*Ptilodictya magna* Miller.  
*Ptilotrypa obliquata* Ulrich.  
*Rhombotrypa crassimuralis* (Ulrich).  
*Rhombotrypa quadrata* (Rominger).  
*Rhynchotrema manniense* Foerste.  
*Rhynchotrema perlammellousum* (Whitfield).  
*Sinuiles cancellata* (Hall).  
*Strophomena planodorsata* Winchell and Schuchert.

## RICHMOND OF ISLAND OF ANTICOSTI, QUEBEC.

(English Head=E.; Charleton=C.)

- Actinoceras anticostiense* Billings. (E., C.)  
*Actinoceras fulger* (Billings). (C.)  
*Actinoceras sedgwicki* (Billings). (E., C.)  
*Aparchites minutissimus* (Hall). (C.)  
*Apsidoceras magnificum* (Billings). (C.)  
*Archinacella estella* (Billings). (E.)  
*Arthroclema angulare* Ulrich. (E., C.)  
*Ascoceras newberryi* Billings. (E., C.)  
*Beatricea nodulosa* Billings. (C.)  
*Beatricea undulata* Billings. (C.)  
*Bellerophon misera* Billings. (E.)  
*Bellerophon solitarius* Billings. (E.)  
*Beyrichia parallela* (Ulrich). (C.)  
*Billingsites canadensis* (Billings). (E., C.)  
*Bollia semilunata* Jones. (E., C.)  
*Brachyaspis alacer* (Billings). (C.)  
*Brachyaspis altilis* Raymond. (E., C.)  
*Brachyaspis notans* (Billings). (E.)  
*Bumastus orbicaudatus* (Billings). (E., C.)  
*Bythocypris cylindrica* (Hall). (E., C.)  
*Bythocypris? lindstræmi* Jones. (E., C.)  
*Bythocypris? obtusa* Jones. (E., C.)  
*Bythopora striata* Ulrich. (C.)  
*Calaparcia anticostiensis* (Billings). (E., C.)  
*Carabocrinus(?) tuberculatus* Billings. (E., C.)  
*Catazyga headi anticostiensis* (Billings). (E., C.)  
*Ceraurinus icarus* (Billings). (E., C.)  
*Ceraurus numitor* (Billings). (E.)  
*Chasmops anticostiensis* (Billings). (C.)  
*Chasmatopora granistriata* (Ulrich). (C.)  
*Chonetes primigenius* Twenhofel. (C.)  
*Clathrospira subconica* Ulrich. (E., C.)  
*Climacograptus (Mesograptus) putillus* (Hall). (E.)  
*Clitambonites diversus* (Shaler). (C.)  
*Columnaria calcinea* Nicholson.  
*Conularia asperata* Billings. (E.)  
*Conularia splendida* Billings. (C.)  
*Cornulites flexuosus* Hall. (E., C.)  
*Corynotrypa dissimilis* (Vine). (C.)  
*Ctenobolbina hammecli* (Miller). (C.)  
*Cu pulocrinus latibrachiatus* (Billings).  
*Cycloceras crocus* (Billings). (E.)  
*Cyclonema thalia* Billings. (C.)  
*Cyrtodonta anticostiensis* Billings. (E., C.)  
*Cyrtodonta? harricetta* Billings. (E., C.)  
*Cyrtodonta? insularis* Billings. (E.)  
*Dalmanella meeki* (Miller). (E., C.)  
*Dicranopora emacrata* (Nicholson). (C.)  
*Dicranopora fragilis* (Billings). (E., C.)  
*Dictionella anticostiensis* (Billings). (C.)  
*Encrinurus multisegmentatus* (?Portlock) Billings.  
 (E.)  
*Eridotrypa simulatrix* (Ulrich). (C.)  
*Goniotrypa bilateralis* Ulrich. (C.)  
*Halysites gracilis* Hall.  
*Hebertella maria* (Billings). (E., C.)  
*Helopora imbricata* Ulrich. (C.)  
*Hormotoma gracilis* (Hall). (E., C.)  
*Hormotoma multivolvis* (Billings).  
*Hormotoma terctiformis* (Billings). (C.)  
*Hudsonaster rugosus* (Billings). (C.)  
*Hyattidina charletona* Twenhofel. (C.)  
*Ischyrinia winchelli* Billings. (E., C.)  
*Isotelus gigas* Dekay. (E., C.)  
*Kionoceras magnisutcatum* (Billings). (C.)  
*Krausella anticostiensis* (Jones). (E., C.)  
*Leptæna nitens* (Billings). (E., C.)  
*Leptæna reticulata* (Shaler). (C.)  
*Licrophycus formosum* Billings. (E.)  
*Licrophycus robustum* Billings. (E.)  
*Licrophycus vagans* Billings. (E., C.)  
*Lingula(?) canadensis* Billings. (C.)  
*Lingula (Pseudolingula) elegantula* (Shaler). (E., C.)  
*Lingula forbesi* Billings. (E., C.)  
*Lioclemella nitida* (Ulrich). (C.)  
*Liospira americana* (Billings). (E., C.)  
*Litoceras hercules* (Billings). (C.)  
*Lophospira circe* (Billings). (E.)  
*Lophospira modesta* (Billings). (E., C.)  
*Lophospira varians* (Billings). (E.)  
*Lyellia affinis* (Billings). (C.)  
*Lyopora goldfussi* (Billings). (C.)  
*Macrocypris? subcylindrica* Jones. (E.)  
*Metoptoma? alceste* Billings. (E.)  
*Nematopora lineata* (Billings). (C.)  
*Orthoceras formosum* Billings. (C.)  
*Orthoceras lyelli* Billings. (C.)  
*Orthoceras sicholdi* Billings. (E., C.)  
*Pachydictya? firma* Ulrich. (C.)  
*Pachydictya hexagonalis* Ulrich. (C.)  
*Paleofavosites asper* (D'Orbigny). (E., C.)  
*Parastrophia lenticularis* (Billings). (E., C.)  
*Phaclopora portenvis* Ulrich. (P.)  
*Phragmolites desideratus* (Billings). (E.)  
*Phragmolites pannosus* (Billings). (E., C.)  
*Plectambonites scrieus* (Sowerby). (E., C.)  
*Pleurocystites anticostiensis* (Billings). (C.)  
*Poterioceras obtusum* (Billings). (E., C.)  
*Primitia lativia* Ulrich. (C.)  
*Prætus alaricus* Billings. (C.)  
*Protocrisina exigua* Ulrich. (C.)  
*Protozuga anticostiana* Twenhofel. (E., C.)  
*Pterinea bellilineata* Billings. (E., C.)  
*Pterinea prolifica* Billings. (E., C.)  
*Pterinea varistriata* Billings. (C.)  
*Pterotheca transversa* (?Salter) Billings. (E., C.)  
*Ptilodictya canadensis* Billings. (C.)  
*Ptilodictya flagellum* Nicholson. (C.)  
*Ptilodictya magnifica* Miller. (E., C.)  
*Ptilodictya whitcavsi* Ulrich. (E., C.)  
*Rafinesquina cecres* (Billings). (E., C.)  
*Rafinesquina imbrax* (?Pander). (C.)  
*Retocrinus fimbriatus* Billings. (C.)  
*Rhynchotrema? nitidula* (Billings). (C.)  
*Rhipidomella sola* (Billings). (C.)  
*Rhynchotrema? anticostiense* (Billings). (E., C.)  
*Rhynchotrema? jancu* Billings. (C.)  
*Rhynchotrema perlamellosum* (Whitfield). (E., C.)  
*Rhytimya emma* (Billings). (E., C.)  
*Serichnites abruptus* Billings. (E.)  
*Salpingostoma canadense* (Billings). (E., C.)  
*Salpingostoma fraternum* (Billings). (E.)  
*Sceptropora facula* Ulrich. (E., C.)  
*Schizocrania filosa* (Hall). (C.)  
*Schmidella sublenticularis* (Jones). (E., C.)  
*Schuchertella pecten* (Roemer). (C.)  
*Spyroceras balcatum* (Billings). (C.)  
*Spyroceras ferum* (Billings). (E., C.)  
*Streptelasma angulatum* (Billings). (E., C.)  
*Streptelasma rusticum* (Billings). (C.)  
*Strophomena antiquatum* Sowerby. (C.)

*Strophomena fluctuosa* Billings. (E., C.)  
*Strophomena hecuba* Billings. (E., C.)  
*Subulites richardsoni* Billings. (C.)  
*Tetradella lunatifer* (Ulrich). (C.)  
*Tetradella simplex* (Ulrich). (C.)  
*Tripteroceras ziphias* (Billings). (E.)  
*Ulrichia nodosa* Ulrich. (C.)  
*Vanuxemia unguolata* (Billings). (E.)  
*Whitella plebeia* (Billings). (E., C.)  
*Whitella? sigmoidica* (Billings). (E., C.)  
*Zaphrentis affinis* Billings. (C.)

RICHMOND (GAMACHIAN—ELLIS BAY) ISLAND OF  
 ANTICOSTI, QUEBEC.

*Actinocras anticostiense* (Billings).  
*Actinocras sedgwicki* (Billings).  
*Ascocras anticostiense* Billings.  
*Ascocras ucwberryi* Billings.  
*Atrypa marginalis* Dalman.  
*Beatricea nodulosa* Billings.  
*Beatricea undulata* Billings.  
*Brachyaspis alacer* (Billings).  
*Brachyaspis notans* (Billings).  
*Bumastus orbicaudatus* Billings.  
*Calapocia anticostiensis* Billings.  
*Camerotoechia nutrix* (Billings).  
*Ceraurinus icarus* (Billings).  
*Chasmatopora angulata* (Hall).  
*Chasmops anticostiensis* (Billings).  
*Chonetes primigenius* Twenhofel.  
*Clathrodictyon vesiculosum* Nicholson and Murie.  
*Clathrospira subconica* Ulrich and Scofield.  
*Clionychia superba* (Billings).  
*Clitambonites diversus* (Shaler).  
*Columnaria alveolata* Goldfuss.  
*Corynotrypa dissimilis* (Vine).  
*Cycloceras crocus* (Billings).  
*Cyclonema thalia* Billings.  
*Cyphotrypa bulbosa* (Billings).  
*Cyrtospira notata* (Billings).  
*Dalmanella meeki* (Miller).  
*Dalmanella ruida* (Billings).  
*Diaphrostoma humile* (Billings).  
*Dinorthis porcata anticostiensis* (Shaler).  
*Enerinurus multisegmentatus* Billings.  
*Favosites forbesi* Edwards and Haime.  
*Glauconome strigosa* Billings.  
*Halysites catenularia* Linnaeus.  
*Hebertella maria* Billings.  
*Helopora formosa* Billings.  
*Helopora lincopora* Billings.  
*Hindella prinstana* (Billings).  
*Hindella umbonata* (Billings).  
*Hormotoma gigantea* (Billings).  
*Hormotoma gracilis* (Hall).  
*Ischadites insularis* Billings.  
*Isotelus gigas* Dekay.  
*Leptæna nitens* (Billings).  
*Leptæna reticulata* (Shaler).  
*Leptæna rhomboidalis* (Wilkins).  
*Lingula (Pseudolingula) elegantula* (Shaler).  
*Lingula forbesi* Billings.  
*Lingula insularis* Billings.  
*Liospira americana* (Billings).  
*Liospira helena* (Billings).  
*Lophospira? papillosa* (Billings).  
*Lophospira sybellina* (Billings).  
*Lyellia affinis* (Billings).  
*Lyellia exigua* (Billings).  
*Lyellia speciosa* (Billings).  
*Nematopora lineata* (Billings).  
*Oncoceras fragile* (Billings).  
*Orthis lamellosa* Twenhofel.  
*Orthis laurentina* (Billings).  
*Orthoceras sieboldi* Billings.  
*Oxydiscus acutus* (?Sowerby) Billings.  
*Pachydietya crassa* (Hall).  
*Palcofavoites aspera* (D'Orbigny).  
*Parastrophia lenticularis* (Billings).  
*Parastrophia reversa* (Billings).  
*Pascoelus halli* Billings.  
*Phænopora ensiformis* Hall.  
*Phænopora excellens* (Billings).  
*Phragmolites desideratus* (Billings).  
*Platystrophia regularis* Shaler.  
*Plectambonites sericeus* (Sowerby).  
*Protarca tenuis* (Billings).  
*Pterinea striata* Billings.  
*Pterinea varistriata* Billings.  
*Ptilodictya gladiola* Billings.  
*Rafinesquina ceres* (Billings).  
*Rafinesquina imbrex* (Pander).  
*Rhipidomella uberis* Billings.  
*Rhipidomella uberis rhynchonelliformis* (Shaler).  
*Rhynchonella? junca* Billings.  
*Rhynchotrema anticostiensis* (Billings).  
*Salpingostoma canadense* (Billings).  
*Schuchertella pecten* (Roemer).  
*Sphærocoryphe salteri* Billings.  
*Streptelasma selectum* (Billings).  
*Strombodes diffuens* Edwards and Halme.  
*Strophomena fluctuosa* Billings.  
*Strophomena hecuba* Billings.  
*Strophomena semiovalis* Shaler.  
*Subulites richardsoni* Billings.  
*Technophorus plicatus* (Billings).  
*Vanuxemia acutumbona* (Billings).  
*Whitella? sigmoidica* (Billings).  
*Zaphrentis affinis* Billings.

RICHMOND (MISCELLANEOUS).

*Arthroclema angulare* Ulrich. (Manitoba.)  
*Batostoma manitobense* Ulrich. (Manitoba.)  
*Beyrichia parallela* (Ulrich). (Manitoba.)  
*Bythopora striata* Ulrich. (Manitoba.)  
*Catazyga headi* (Billings). (Quebec.)  
*Catazyga headi borealis* (Billings). (Quebec.)  
*Ceraurinus icarus* (Billings). (Manitoba.)  
*Ceraurinus marginatus* Barton. (Lake Huron.)  
*Climacograptus mississippiensis* Ruedemann. (Okla.)  
*Climacograptus ulrichi* Ruedemann. (Okla.)  
*Columnaria alveolata rigida* (Billings). (Quebec.)  
*Columnaria calicina* (Nicholson). (Ontario.)  
*Columnaria (Palæophyllum) stokesi* (Edwards and Haime). (Manitoba.)  
*Columnaria (Palæophyllum) thomi* (Hall). (Tex.)  
*Conocardium antiquum* (Owen). (Manitoba.)  
*Ctenodonta iphigenia* (Billings). (Lake Huron.)  
*Cyclocystoides huronensis* Billings. (Lake Huron.)  
*Cyphaspis(?) frobisherii* Emerson. (Arctic America.)  
*Cyrtoceras ligarius* Billings. (Lake Huron.)  
*Cyrtoceras lysander* Billings. (Lake Huron.)

*Cyrtoceras postumius* Billings. (Lake Huron.)  
*Cyrtodonta ponderosa* Billings. (Lake Huron.)  
*Dicranopora fragilis* Billings. (Manitoba.)  
*Diplograptus crassitectus* Ruedemann. (Okla.)  
*Drepanella richardsoni canadensis* Ulrich. (Ontario.)  
*Drepanella symmetrica* (Emerson). Arctic America.)  
*Eurychilina frobisheri* (Emerson). (Arctic America.)  
*Eurychilina manitobense* Ulrich. (Manitoba.)  
*Goniotrypa bilateralis* Ulrich. (Manitoba.)  
*Halysites catenularia quebecensis* Lambe. (Quebec.)  
*Halysites gracilis* (Hall). (Manitoba, etc.)  
*Helicotoma brocki* Foerste. (Lake Huron.)  
*Leperditia subcylindrica* Ulrich. (Manitoba.)  
*Leptaena nitens* Billings. (Manitoba.)  
*Leptobolus occidentalis* Hall. (Okla.)  
*Licophycus hudsonicum* Billings. (Lake Huron.)  
*Liospira helena* (Billings). (Quebec.)  
*Litoceras insigne* (Whiteaves). (Manitoba.)  
*Lophospira beatrix* Foerste. (Quebec.)  
*Lyopora goldfussi* (Billings). (Ontario.)  
*Monticullipora parasitica plana* Ulrich. (Manitoba.)  
*Onchometopus emoryi* (Hall). (Tex.)  
*Onchometopus susac* (Whitfield). (Manitoba.)  
*Orthoceras piso* Billings. (Lake Huron.)  
*Pachydietya hexagonalis* Ulrich. (Manitoba.)  
*Petigopora scabiosa* Ulrich. (Manitoba.)  
*Pleurotomaria muralis* Owen. (Manitoba.)  
*Primitia lativia* Ulrich. (Manitoba.)  
*Protaræa vetusta magna* Whiteaves. (Manitoba.)  
*Ptilodictya whiteavesi* Ulrich. (Manitoba.)  
*Rafinesquina ceres* (Billings). (Manitoba.)  
*Rafinesquina lata* Whiteaves. (Manitoba.)  
*Rhynchotrema argenturibica* (White). (N. Mex.)  
*Rhytimya? kagawongensis* Foerste. (Lake Huron.)  
*Streptelasma latusculum trilobatum* (Whiteaves). (Manitoba.)  
*Streptelasma robustum* Whiteaves. (Manitoba.)  
*Strophomena concordensis huronensis* Foerste. (Lake Huron.)  
*Strophomena fluctuosa* Billings. (Manitoba.)  
*Taxinaster meafordensis* Foerste. (Ontario.)  
*Vallatotheca manitoulini* Foerste. (Lake Huron.)  
*Vanuxemia bayfieldi* Billings. (Lake Huron.)

## UPPER MEDIAN (GIRARDEAU) OF MISSOURI AND ILLINOIS.

*Calymene dubia* Savage.  
*Camarotæchia? festinata* Savage.  
*Cornulites substriatatus* (Meek and Worthen).  
*Cyclocoyptoides illinoisensis* Miller and Gurley.  
*Cyphaspis girardeauensis* Shumard.  
*Dalmanella modesta* Savage.  
*Diaphorostoma niagaraense immaturum* Savage.  
*Encrinurus deltoideus* Shumard.  
*Glyptocrinus? fimbriatus* Shumard.  
*Lingulops ovata* Savage.  
*Modiolopsis concinna* Savage.  
*Monotrypa rectimuralis* Ulrich.  
*Nematopora alternata* Ulrich.  
*Nematopora delicatula* Ulrich.  
*Nematopora fragilis* Ulrich.  
*Nematopora retrorsa* Ulrich.  
*Odontoptera halli* (Shumard).  
*Phacelopora pertinuis* Ulrich.

*Phragmolites tmbricatus* (Meek and Worthen).  
*Proetus princeps* Savage.  
*Pterinea formosa* Savage.  
*Ptychocrinus splendens* (Miller).  
*Rafinesquina? delicatula* Savage.  
*Rafinesquina mesicosta* (Shumard).  
*Rhynchotrema? illinoisense* Savage.  
*Schuchertella missouriensis* (Shumard).  
*Schuchertia ordinaria* Schuchert.  
*Trematopora calloporoides* Ulrich.  
*Trematopora debilis* Ulrich.

## UPPER MEDIAN (EDGEWOOD) OF ILLINOIS AND MISSOURI.

*Atrypa præmarginalis* Savage.  
*Atrypa putilla* (Hall and Clarke.)  
*Atrypa tubulistriata* Savage.  
*Bellerophon consimilis* Savage.  
*Bucania cizgia* Foerste.  
*Calapæcia favositidea* Savage.  
*Calvinia edgewoodensis* Savage.  
*Camarotæchia antiqua* Savage.  
*Camarotæchia? concinna* Savage.  
*Clathrodictionyon vesiculosum* Nicholson and Murie.  
*Clorinda? thebesensis* Savage.  
*Colpomya abrupta* Savage.  
*Ctenodonta subelliptica* Savage.  
*Cyclonema daytonense* Foerste.  
*Cypricardinia subquadrata* Savage.  
*Dalmanella edgewoodensis* Savage.  
*Dalmanites danæ* Meek and Worthen.  
*Dawsonoceras tenuilincatum* Savage.  
*Deltacrinus alleni* (Rowley).  
*Diaphorostoma niagaraense* (Hall).  
*Favosites sublongus* Savage.  
*Gissocrinus? problematicus* Rowley.  
*Glyptocrinus inseparatus* Rowley.  
*Glyptocrinus inseparatus carinatus* (Rowley).  
*Glyptocrinus inseparatus pentagonus* Rowley.  
*Hindella? ambigua* Savage.  
*Holopca minuta* Savage.  
*Homocospira fuscilobriata* Savage.  
*Homocospira subcircularis* Savage.  
*Homotoma tenra* Savage.  
*Isotelus longæus* Savage.  
*Leptaena rhomboidalis* (Wilekens).  
*Liospira affinis* (Foerste).  
*Lophospira fasciata* Savage.  
*Lophospira thebesensis* Savage.  
*Lyellia thebesensis* Foerste.  
*Metopolichs breviceps clintonensis* (Foerste).  
*Orthis flabellites fessipicata* (Foerste).  
*Pentamerus parvulus* Savage.  
*Platystrophia daytonensis* (Foerste).  
*Potomita bellasculptilis* Savage.  
*Proetus determinatus* Foerste.  
*Protozuga sulcocarinata* Savage.  
*Pterinea thebesensis* Meek and Worthen.  
*Rafinesquina mesicosta* (Shumard).  
*Rafinesquina mesicosta mesistria* Savage.  
*Rhipidomella tenuilincata* Savage.  
*Rhynchonella? jana* Billings.  
*Rhynchotrema parva* Savage.  
*Rhynchotrema thebesensis* Foerste.  
*Rhynchotrema thebesensis multistriata* Savage.  
*Schuchertella missouriensis* (Shumard).  
*Schuchertella missouriensis convexa* Savage.

*Schuchertella propinqua* (Meek and Worthen).  
*Straparollus pumilis* Savage.  
*Stropheodonta (Brachyprion) laticulptilis* (Savage).  
*Stropheodonta (Brachyprion) stropheodontoides*  
 (Savage).  
*Whitfieldella(?) billingsana* (Meek and Worthen).  
*Whitfieldella ovoides* Savage.  
*Whitfieldella? speciosa* Savage.  
*Zaphrentis ambigua* Savage.  
*Zaphrentis subregularis* Savage.

## UPPER MEDINAN (CHANNAHON) OF ILLINOIS.

*Callonema pristina* Savage.  
*Cyphaspis intermedia* Weller.  
*Dawsonoceras tenuilicatum* Savage.  
*Diaphorostoma illinoisensis* Savage.  
*Leperditia illinoisensis* Savage.  
*Lingulops illinoisensis* Savage.  
*Metopolichas ferrisi* Weller.  
*Pholidops subelliptica* Savage.  
*Proctus channahonensis* Weller.  
*Pterinea elegans* Savage.  
*Rhynchotreia intermedia* Savage.  
*Rhynchotreia lepida* Savage.  
*Schuchertella curvistriata* Savage.  
*Whitfieldella acuminata* Savage.  
*Whitfieldella ovoides* Savage.  
*Zaphrentis ambigua* Savage.  
*Zaphrentis subregularis* Savage.

UPPER MEDINAN (BRASSFIELD) OF KENTUCKY, OHIO,  
TENNESSEE, MISSOURI, ILLINOIS, ARKANSAS, AND  
OKLAHOMA.

*Acerularia clintonensis* Nicholson.  
*Acidaspis brevispinosa* Foerste.  
*Actinoceras daytonense* (Foerste).  
*Actinoceras latonummulatum* (Foerste).  
*Actinoceras turgidonummulatum* (Foerste).  
*Actinoceras youngi* (Foerste).  
*Aspidopora parmula* (Foerste).  
*Aspidopora parmula fenestrelliformis* Foerste.  
*Atrypa laticorrugata* Foerste.  
*Atrypa marginalis* Dalman.  
*Aulopora precius compressus* Foerste.  
*Bucania exigua* Foerste.  
*Bucania fiscoelostriata* Foerste.  
*Bucania opertus* (Foerste).  
*Bumastus niagarensis* (Whitfield).  
*Calymene niagarensis* Hall.  
*Calymene vogdesi* Foerste.  
*Camarotecthia(?) acinus convexa* (Foerste).  
*Camarotecthia (Stegerhynchus) neglecta* (Hall).  
*Camarotecthia (Stegerhynchus) neglecta cliftonensis*  
 Foerste.  
*Camarotecthia (Stegerhynchus) whitei precursor*  
 (Foerste).  
*Ceramopora? expansa* (James).  
*Chasmatopora angulata* (Hall).  
*Clathropora frondosa clintonensis* (Hall and Whit-  
 field).  
*Clidochirus americanus* Springer.  
*Clidophorus ferrugineum* (Foerste).  
*Coleolus clintonensis* Foerste.  
*Conularia bilineata* Foerste.  
*Conularia nagiarensis* Hall.  
*Cornulites distans* Hall.  
*Corynotrypa clongata* (Vine).  
*Crania? dubia* Foerste.  
*Ctenodonta elliptica* (Hall).  
*Ctenodonta minima* (Foerste).  
*Ctenodonta ohioensis* Bassler.  
*Cuneamya caswelli* (Foerste).  
*Cyathophyllum facetus* Foerste.  
*Cycloceras amycus* (Hall).  
*Cycloceras inceptum* (Foerste).  
*Cycloceras inceptum accelcratum* (Foerste).  
*Cycloceras novacarlisleense* (Foerste).  
*Cyclora alta* Foerste.  
*Cyclospira(?) sparsiplica* Foerste.  
*Cyphaspis clintoni* Foerste.  
*Cypriocardinia undulostriata* (Hall).  
*Cyrtoceras clintonense* Foerste.  
*Cyrtoceras (Glyptoceras) eatonense* (Claypole).  
*Cyrtoceras (Glyptoceras) subcompressum* Beecher.  
*Cyrtodontia? ferruginca* (Hall and Whitfield).  
*Cyrtolites youngi* Foerste.  
*Dalmanella elegantula* (Dalman).  
*Dalmanella elegantula parva* (Foerste).  
*Dalmanites wertheri* Foerste.  
*Deiphon forbesi* Barande.  
*Diaphorostoma niagarensis* (Hall).  
*Dictyonema pertense* Foerste.  
*Dictyonema scalariforme* Foerste.  
*Dictyonella reticulata* Hall.  
*Discosurus conoideus* Hall.  
*Elpe ulrichi* Foerste.  
*Encrinurus thresheri* Foerste.  
*Enterolasma geometricum* (Foerste).  
*Favosites favosideus* (Hall).  
*Favosites niagarensis* Hall.  
*Gomphoceras ortonii* Foerste.  
*Hallopora magnopora* (Foerste).  
*Hebertella daytonensis* Foerste.  
*Hebertella fausta* (Foerste).  
*Hemitrypa ulrichi* Foerste.  
*Hindella umbonata* (Billings).  
*Homotrypa? confluens* (Foerste).  
*Hormotoma subulata* (Conrad).  
*Ilænus ambiguus* Foerste.  
*Ilænus daytonensis* Hall and Whitfield.  
*Kionoceras crawfordi* (Foerste).  
*Leptæna rhomboidalis* (Wilekens).  
*Lindströmia gainesi* (Davis).  
*Lioclemella ohioensis* (Foerste).  
*Liospira affinis* (Foerste).  
*Meekospira planilateralis* (Foerste).  
*Metopolichas breviceps clintonensis* (Foerste).  
*Modiolopsis rhomboidea* (Conrad).  
*Modiolopsis subrhomboidea* Simpson.  
*Mytilarca foerstei* Clarke and Ruedemann.  
*Odontopleura ortonii* (Foerste).  
*Orthis flabellites* Foerste.  
*Orthis flabellites dinorthis* (Foerste).  
*Orthis flabellites euorthis* (Foerste).  
*Orthis flabellites fissiplicata* (Foerste).  
*Orthis flabellites militaris* Foerste.  
*Orthoceras? clavatum* Hall.  
*Orthoceras erraticum* Foerste.  
*Orthoceras hanoverense* Foerste.  
*Orthoceras ignotum* Foerste.  
*Orthoceras rectum junius* Foerste.  
*Orthoceras rhythmoides* (Foerste).  
*Orthoceras (Spyroceras?) spyroceroideis* Foerste.  
*Orthoceras tenuisiphonatum* Foerste.  
*Pachydictya bifurcata* (Hall).



*Pachydietya bifurcata instabilis* Foerste.  
*Pachydietya crassa* (Hall).  
*Pachydietya emaciated* Foerste.  
*Pachydietya? famelica* (Foerste).  
*Pachydietya obesa* Foerste.  
*Pachydietya turgida* Foerste.  
*Paleopupa abrupta* Foerste.  
*Phacops pulchellas* Foerste.  
*Phænopora ensiformis* Hall.  
*Phænopora expansa* Hall and Whitfield.  
*Phænopora fimbriata* (James).  
*Phænopora magna* (Hall and Whitfield).  
*Phænopora multijida* (Hall).  
*Platymrella manniensis* Foerste.  
*Platystrophia reversata* (Foerste).  
*Plectambonites transversalis* (Wahlenberg).  
*Plectambonites transversalis prolongatus* (Foerste).  
*Pleurotomaria filitexta* Foerste.  
*Pleurotomaria inexpectans* Hall and Whitfield.  
*Proetus determinatus* Foerste.  
*Pseudosphæroechus? clintoni* (Foerste).  
*Ptilodictya expansa* Hall.  
*Ptilodictya expansa emarcescens* Foerste.  
*Ptilodictya whitfieldi* Foerste.  
*Ptychophyllum ipomoea* Davis.  
*Rhinopora verrucosa* Hall.  
*Rhipidomella hybrida* (Sowerby).  
*Rhynchotretra simplex* Foerste.  
*Schuchertella tenuis* (Hall).  
*Spyroceras jamesi* (Hall and Whitfield).  
*Straparollus incurvatum* Foerste.  
*Streptelasma hoskinsoni* Foerste.  
*Streptelasma obliquus* Foerste.  
*Striatopora (Cladopora?) proboscidiatis* Foerste.  
*Stricklandinia (?) dichotoma* Foerste.  
*Stricklandinia triplesiana* Foerste.  
*Stromatopora indianensis* Parks.  
*Strophonella daytonensis* Foerste.  
*Strophonella striata* Hall.  
*Strophostylus cancellatus* (Hall).  
*Strophostylus cyclostomus* (Hall).  
*Subulites directus* Foerste.  
*Syringopora (Drymopora) fascicularis* Foerste.  
*Trigonodictya catonensis* Ulrich.  
*Triplecia ortonii* Meek.  
*Triplecia (Cliftonia) striata* Foerste.  
*Vincilla radiceformis* (Vine).  
*Zophrentis celator daytonensis* (Foerste).

## UPPER MEDIAN OF NEW YORK, NEW JERSEY, ETC.

(Shawangunk—S.)

*Arthropycus alleghaniensis* (Harlan).  
*Bucanella trilobata* (Conrad).  
*Daxdalu archimedes* (Ringueberg).  
*Dolichopterus otisius* (Clarke). (S.)  
*Euconia? pervetusta* (Conrad).  
*Eurypterus moria* Clarke. (S.)  
*Eusarcus? cicrops* (Clarke). (S.)  
*Fucoides auriformis* Hall.  
*Fucoides heterophyllum* Hall.  
*Holopea conoidea* (Hall).  
*Hughmilleria shawangunk* Clarke. (S.)  
*Leporditia cylindrica* (Hall).  
*Lingula cuneata* Conrad.  
*Modiolopsis orthonota* (Conrad).  
*Modiolopsis primigenia* (Conrad).  
*Oncoceras gibbosum* Hall.

*Orbiculoidea parmulata* (Hall).  
*Orthoceras multiscriptum* Hall.  
*Pleurotomaria litorea* Hall.  
*Pterygotus (Erectopterus) globiceps* Clarke and Ruedemann. (S.)  
*Rhynchonello? plicata* Hall.  
*Rhynchotretra cuneata americana* Hall.  
*Scolithus verticalis* Hall.  
*Stylonurus (Ctenopterus) cestrotus* (Clarke). (S.)  
*Stylonurus myops* Clarke. (S.)  
*Whitfieldella oblata* (Hall).

## UPPER MEDIAN (CATARACT) OF ONTARIO.

*Acerularia gracilis* (Billings).  
*Arcebolites elegans* Hinde.  
*Arcebolites sparsus* Salter.  
*Brockocystis clintonensis* (Parks).  
*Brockocystis? huronensis* (Billings).  
*Brockocystis tecumseth* (Billings).  
*Bucanella trilobata* (Conrad).  
*Buthotrephis gracilis crassa* Hall.  
*Buthotrephis gracilis intermedia* Hall.  
*Camarotoechia (Stegerhynchus) neglecta* (Hall).  
*Chasmatopora angulata* (Hall).  
*Chonophyllum belli* Billings.  
*Clathrodactylon vesiculosum* Nicholson and Murie.  
*Clathropora frondosa clintonensis* Hall and Whitfield.  
*Calospira planiconvexa* (Hall).  
*Cornulites distans* Hall.  
*Cyclonema daytonense* Foerste.  
*Cyrtoceras orestes* Billings.  
*Dalmanella edgewoodensis* Savage.  
*Dalmanella elegantula* (Dalman).  
*Diphyphyllum caespitosum* (Hall).  
*Diphyphyllum multicaule* Hall.  
*Eunicites chromorphus* Hinde.  
*Eunicites clintonensis* Hinde.  
*Eunicites coronatus* Hinde.  
*Halysites catenularia* Linneus.  
*Halysites catenularia microporus* (Whitfield).  
*Hebertella fausta* (Foerste).  
*Holopora fragilis* Hall.  
*Leptaena rhomboidalis* (Wilckens).  
*Lingula clintoni* Vanuxem.  
*Lingula lingulata* Hall and Clarke.  
*Lingula oblata* Hall.  
*Lumbriconerites armatus* Hinde.  
*Lumbriconerites basalis* Hinde.  
*Lumbriconerites triangularis* Hinde.  
*Mesopalæaster(?) cataractensis* Schuchert.  
*Mesopalæaster granti* (Spencer).  
*Metoplichas breviceps clintonensis* (Foerste).  
*Modiolopsis orthonota* Conrad.  
*Modiolopsis primigenia* Conrad.  
*Nematopora raripora* (Hall).  
*Enonites amplus* Hinde.  
*Enonites fragilis* Hinde.  
*Enonites infrequens* Hinde.  
*Orthis flabellites* Foerste.  
*Pachydietya crassa* (Hall).  
*Phænopora constellata* Hall.  
*Phænopora ensiformis* Hall.  
*Phænopora explanata* Hall.  
*Phænopora punctata* (Nicholson and Hinde).  
*Planolites vulgaris* Nicholson.  
*Plectambonites transversalis* (Wahlenberg).  
*Proetus determinatus* Foerste.  
*Rhinopora verrucosa* Hall.

*Rhipidomella hybrida* (Sowerby).  
*Rhynchonella?* *janca* Billings.  
*Rusophycus clintonense* (Dawson).  
*Sceptropora justiformis* Ulrich.  
*Schuchertella subplana* (Conrad).  
*Scolithus verticalis* Hall.  
*Staurocephalites niagarensis* Hinde.  
*Strophostylus cancellatus* (Hall).  
*Tentaculites neglectus* Nicholson and Hinde.  
*Ucninulus stricklandi* (Sowerby).  
*Zaphrentis bilateralis* (Hall).

LOWER CLINTON OF NEW YORK AND APPALACHIAN  
 VALLEY TO SOUTHWEST VIRGINIA.

(Species marked \* may be of Upper Clinton age.)

*Actinoceras vertebratum* (Hall).  
*Atrypa(?) gibbosa* Hall.  
*Atrypa reticularis* Linnaeus.  
 \**Atrypina clintoni* Hall and Clarke.  
*Atrypina disparilis* (Hall).  
 \**Avicula?? ferruginea* Conrad.  
*Beyrichia lata* (Vanuxem).  
*Bollia lata* Jones.  
*Bucanella trilobata* (Conrad).  
*Bucania bellapuncta* Hall.  
*Bucania stigmosa* Hall.  
*Buthotrephis gracilis* (Hall).  
*Buthotrephis gracilis crassa* Hall.  
*Buthotrephis gracilis intermedia* Hall.  
*Buthotrephis impudica* Hall.  
*Buthotrephis palmata* Hall.  
*Buthotrephis ramosa* Hall.  
*Calymene clintoni* (Vanuxem).  
*Camarotachia equiradiata* (Hall).  
*Camarotachia neglecta* (Hall).  
 \**Calymenella rostrata* (Vogdes).  
*Cannapora junciformis* Hall.  
*Chasmatopora angulata* Hall.  
 \**Climacograptus scalaris annulatus* Ruedemann.  
 \**Clintonella vagabunda* Hall and Clarke.  
 \**Clorinda areyi* (Hall and Clarke).  
*Catospira hemispherica* (Sowerby).  
*Catospira plicatula* (Hall).  
 \**Conchidium georgiæ* Hall and Clarke.  
 \**Ctenodonta clintonensis* (Foerste).  
*Ctenodonta curta* (Hall).  
 \**Ctenodonta diminutus* (Simpson).  
*Ctenodonta? lata* (Hall).  
*Ctenodonta mactriformis* (Hall).  
 \**Ctenodonta sinuosa* (Simpson).  
 \**Ctenodonta subtrigona* (Simpson).  
 \**Ctenopteron ncrepisense* Matthew.  
*Cuneamya alveata* Whitfield and Hovey.  
*Cyrtia meta* (Hall).  
*Cyrtodonta? alata* (Hall).  
*Dalmanella elegantula* (Dalman).  
*Diamesopora? tubulosa* (Hall).  
 \**Diaphorostoma niagarensis clintonense* (Foerste).  
*Discosorus conoides* Hall.  
 \**Encrinurus americanus* Vogdes.  
*Encrinurus ornatus* (Hall and Whitfield).  
 \**Eurypterus (Dolichopterus?) prominens* Hall.  
*Favosites favosides* (Hall).  
*Fenestella tenuis* Hall.  
*Fungispongia irregularis* Ringueberg.

*Glyptocrinus plumosus* Hall.  
*Holopca fragilis* (Hall).  
*Holopca obsolcta* (Hall).  
 \**Holopca obsolcta elevata* Foerste.  
*Hormotoma subulata* (Conrad).  
*Ilyattidina congesta* (Conrad).  
*Ichthyophycus triaetylus* Hall.  
*Ichthyocrinus? clintonensis* Hall.  
*Kionoceras cancellatum* (Hall).  
*Leperditia pennsylvanica* Jones.  
*Leptodesma rhomboidca* (Hall).  
*Lingula acutirostris* Hall.  
*Lingula clintoni* Vanuxem.  
*Lingula oblata* Hall.  
*Lingula (Palaeoglossa) pterovata* (Hall).  
*Lingula subelliptica* D'Orbigny.  
*Lingula tenuiola* Hall and Clarke.  
*Modiolopsis subulatus* Hall.  
*Monograptus clintonensis* (Hall).  
 \**Monograptus pridon chapmanensis* Ruedemann.  
*Nuclospira pisiformis* Hall.  
*Oncoceras subrectum* Hall.  
*Orthis(?) tenuidens* Hall.  
*Orthis(?) trinucleus* Hall.  
*Orthoceras virgulatum* Hall.  
*Orthodesma curtum* (Hall).  
*Pachydietya crassa* (Hall).  
*Palaeophycus striatum* Hall.  
*Pentamerus oblongus* Hall.  
*Pentamerus ovalis* Hall.  
*Peronosporites globosus* Loomis.  
*Peronosporites minutus* Loomis.  
*Peronosporites ramosus* Loomis.  
*Phacopora constellata* Hall.  
*Phacops trisulcatus* Hall.  
*Pisocrinus globosus* (Ringueberg).  
*Pisocrinus pyriformis* (Ringueberg).  
*Plectambonites transversalis* (Wahlenberg).  
 \**Plectambonites transversalis alabamensis* Foerste.  
*Pterinea emacrata* (Conrad).  
 \**Ptilodictya obliqua* (Ringueberg).  
 \**Ptilodictya hartnageli* Ruedemann.  
*Pyrenomcus cuneatus* Hall.  
*Reticolites quinizianus venosus* (Hall).  
*Rhinopora? tubulosa* Hall.  
*Rhipidomella circulus* Hall.  
 \**Rhipidomella subcircula* (Simpson).  
*Rhynchonella(?) bidens* Hall.  
 \**Rhynchonella(?) decemplicata* (Sowerby).  
*Rhynchonella emacrata* (Hall).  
 \**Rhynchonella levis* (Simpson).  
*Rusophycus biloba* (Vanuxem).  
*Rusophycus clavatum* Hall.  
*Rusophycus pudicum* Hall.  
*Rusophycus subangulatum* (Hall).  
 \**Schizophoria senecta* Hall and Clarke.  
*Stricklandinia canadensis* (Billings).  
*Spirifer (Eospirifer) radiatus* (Sowerby).  
*Strophodonta corrugata* (Conrad).  
 \**Strophodonta(?) corrugata pleuristriata* (Foerste).  
*Strophonella(?) patena* Hall.  
*Strophostylus cancellatus* (Hall).  
*Strophostylus ventricosus* (Hall).  
*Tentaculites minutus* Hall.  
*Zaphrentis bilateralis* (Hall).  
*Zaphrentis marcoui* Edwards and Haime.

UPPER CLINTON OF NEW YORK, AND APPALACHIAN  
AND OHIO VALLEYS.

- (Rochester shale=R.; Osgood limestone=O.; Dayton limestone=D. Irondequoit limestone=I.; Upper Clinton of eastern New York, Pennsylvania, and Maryland=Uc.)
- Acanthoclema asperum* Bassler. (R., O.)  
*Acanthograptus walkeri* (Spencer). (R.)  
*Echmina abnormis* Ulrich. (R.)  
*Echmina spinosa* (Hall). (R., Uc.)  
*Alloccystites hammelli* Miller. (O.)  
*Allonema waldroneense* Ulrich and Bassler. (R.)  
*Amphicoelia orbiculoides* (Grabau). (R.)  
*Anastrophia brevisrostris* (Sowerby?) (Hall). (R.)  
*Anastrophia interplicata* (Hall). (R., I.)  
*Apocystites elegans* Hall. (R.)  
*Arctinurus boltoni* (Biggsby). (R.)  
*Arctinurus nereus* (Hall). (R.)  
*Asaphocrinus incisus* (Ringueberg). (R.)  
*Asaphocrinus ornatus* (Hall). (R.)  
*Ascodityon siluriense* Vine. (R.)  
*Atrypa nodostriata* Hall. (R., I.)  
*Atrypa reticularis* Linnæus. (R., O., I., Uc.)  
*Atrypa rugosa* Hall. (R.)  
*Atrypina disparilis* (Hall). (R.)  
*Avicula undosa* Ringueberg. (R.)  
*Batostomella granulifera* (Hall). (R., O., Uc.)  
*Berenice consimilis* (Lonsdale). (R., O.)  
*Bilobites acutilobus* (Ringueberg). (R.)  
*Bilobites bilobus* (Linnæus). (R., I.)  
*Bumastus iozus* Hall. (R.)  
*Buthotrephis gregaria* Ringueberg. (R.)  
*Bythocypris punctulata niagarensis* Ulrich. (R.)  
*Bythopora spinulosa* Hall. (R.)  
*Cactograptus crassus* Ruedemann. (Uc.)  
*Calceocrinus bidentatus* Ringueberg. (R.)  
*Calloccystites canadensis* (Billings). (R.)  
*Calloccystites jewetti* Hall. (R.)  
*Calymene niagarensis* Hall. (R., O., Uc., I.)  
*Calymenella nasuta* (Ulrich). (O.)  
*Camarotoechia indianensis* (Hall). (O.)  
*Camarotoechia neglecta* (Hall). (R., O.)  
*Camarotoechia obliquiplicata* (Hall). (R.)  
*Caryocrinites ellipticus* (Miller and Gurley). (O.)  
*Caryocrinites hammelli* (Miller and Gurley). (O.)  
*Caryocrinites indianensis* (Miller). (O.)  
*Caryocrinites ornatus* Say. (R., O., I.)  
*Ceramopora imbricata* Hall. (R., O.)  
*Ceramopora niagarensis* Bassler. (R., O.)  
*Ceramoporella orbiculata* (Ringueberg). (R.)  
*Ceramoporella reticulata* (Spencer). (R.)  
*Ceratiocaris deweyi* (Hall). (R.)  
*Chasmatopora asperatostrata* (Hall). (R., O.)  
*Cheirus niagarensis* (Hall). (R.)  
*Chilotrypa ostiolata* (Hall). (R., O., Uc., I.)  
*Chonetes cornutus* (Hall). (Uc.)  
*Cladopora scriata* Hall. (R.)  
*Clathropora alciicornis* Hall. (R.)  
*Clathropora frondosa* Hall. (R.)  
*Clathropora frondosa intermedia* (Nicholson and Hinde). (R.)  
*Clorinda fornicata* (Hall). (I.)  
*Clostrocrinus elongatus* Hall. (I.)  
*Caloclema cavernosa* Bassler. (R., O.)  
*Conularia bifurca* Ringueberg. (R.)  
*Conularia laqueata* Conrad. (R.)  
*Conularia longa* Hall. (R.)
- Conularia multipuncta* Ringueberg. (R.)  
*Conularia niagarensis* Hall. (R.)  
*Conularia quadrilucata* Hall.  
*Conularia transversa* Ringueberg. (R.)  
*Cornulites bellistriatus* Hall. (R.)  
*Cornulites clintoni* Hall. (I., Uc.)  
*Cornulites contractus* Ringueberg. (R.)  
*Cornulites nodosus* Ringueberg. (R.)  
*Corynotrypa dissimilis* (Vine). (R., O.)  
*Corynotrypa elongata* (Vine). (R.)  
*Crania dentata* Ringueberg. (R.)  
*Crania gracilis* Ringueberg. (R.)  
*Ctenobolina punctata* Ulrich. (R.)  
*Ctenodonta elliptica* (Hall). (Uc.)  
*Cyclograptus rotandatus* Spencer. (R.)  
*Cyrtia exporrta* (Wahlenberg). (O.)  
*Cyrtia myrtia* (Billings). (O.)  
*Cyrtina pyramidalis* (Hall). (R.)  
*Cyrtoceras cinctum* Foerste. (O.)  
*Cyrtoceras subancellatum* Hall. (R.)  
*Dalmanella elegantula* (Dalman). (R., O., I., Uc.)  
*Dalmanites limulus* (Green). (R., O., I., Uc.)  
*Dawsonoceras annulatum* (Sowerby). (R.)  
*Deiphon forbesi* Barrande. (R.)  
*Deltacrinus halli* (Ringueberg). (R.)  
*Deltacrinus typus* (Ringueberg). (R.)  
*Deudrocrinus celsus* Ringueberg. (R.)  
*Dendrocrinus longidactylus* Hall. (R.)  
*Dendrograptus rectus* Ruedemann. (Uc.)  
*Diamcsopora dichotoma* Hall. (R.)  
*Diaphorostoma cliftonense* Foerste. (O.)  
*Diaphorostoma hemisphericum* (Hall). (R.)  
*Diaphorostoma niagarensis* Hall. (R., O., Uc.)  
*Dictyonella corallifera* Hall. (R.)  
*Dictyonema arcyi* Gurley. (R.)  
*Dictyonema gracile* Hall. (R.)  
*Dictyonema polymorphum* Gurley. (R.)  
*Dictyonema retiforme* (Hall). (R.)  
*Dictyonema subretiforme* (Spencer). (R.)  
*Dimicrocrinus aculeatus* (Hall). (R.)  
*Dimicrocrinus brachiatus* (Hall). (R.)  
*Dimicrocrinus canaliculated* (Hall). (R.)  
*Dimicrocrinus lilliformis* (Hall). (R.)  
*Diploclasma sparsum* (Hall). (R.)  
*Diploclasma sparsum argutum* Bassler. (R.)  
*Diplotrypa walkeri* Bassler. (R.)  
*Duncanella borealis* Nicholson. (O.)  
*Entroclasma calciculum* (Hall). (R., O.)  
*Eridotrypa nodulosa* Bassler. (R.)  
*Eridotrypa similis* Bassler. (R.)  
*Eridotrypa solida* (Hall). (R., Uc.)  
*Eridotrypa spinosa* (Hall). (R.)  
*Eridotrypa striata* (Hall). (R., O.)  
*Eucalyptocrinus calatus* (Hall). (R.)  
*Eucalyptocrinus calatus levis* Grabau and Shimer. (R.)  
*Eucheirocrinus chrysalis* (Hall). (R.)  
*Eucheirocrinus radiculatus* (Ringueberg). (R.)  
*Eugasterella concinna* (Ringueberg). (R.)  
*Favosites strictus* (Hall). (R.)  
*Favosites cristatus* Edwards and Haimo. (O.)  
*Favosites forbesi* Edwards and Haimo. (O.)  
*Favosites hisingeri* Edwards and Haimo. (R.)  
*Favosites pyriformis* (Hall). (R.)  
*Fenestella cribrosa* Hall. (R.)  
*Fenestella elegans* Hall. (R.)  
*Fistulipora crustula* Bassler. (R.)  
*Fistulipora laminata* (Hall). (R.)

- Fistulipora lockportensis* Bassler. (R.)  
*Fistulipora tuberculosa* (Hall). (R.)  
*Gazacrinus immaturus* (Hall). (R.)  
*Goldius niagarensis* (Hall). (I., R.)  
*Gomphocystites indianensis* Miller. (O.)  
*Hallopora clausa* (Bassler). (R., O.)  
*Hallopora elegantula* (Hall). (R., O., Ue., I.)  
*Hallopora magnopora* (Foerste). (R.)  
*Hemicystites parasiticus* Hall. (R.)  
*Holocystites adipatus* Miller. (O.)  
*Holocystites affinis* Miller and Faber. (O.)  
*Holocystites amplus* Miller. (O.)  
*Holocystites asper* Miller and Gurley. (O.)  
*Holocystites baculus* Miller. (O.)  
*Holocystites benedicti* Miller. (O.)  
*Holocystites brauni* Miller. (O.)  
*Holocystites canneus* Miller. (O.)  
*Holocystites collecti* Miller. (O.)  
*Holocystites commodus* Miller. (O.)  
*Holocystites dyeri* Miller. (O.)  
*Holocystites elegans* Miller. (O.)  
*Holocystites fabri* Miller. (O.)  
*Holocystites globosus* Miller. (O.)  
*Holocystites gorbyi* Miller. (O.)  
*Holocystites gyrinus* Miller and Gurley. (O.)  
*Holocystites indianensis* Miller. (O.)  
*Holocystites madisonensis* Miller. (O.)  
*Holocystites ornatus* Miller. (O.)  
*Holocystites ornatus* Miller. (O.)  
*Holocystites papulosus* Miller. (O.)  
*Holocystites parvulus* Miller. (O.)  
*Holocystites perlongus* Miller. (O.)  
*Holocystites plenus* Miller. (O.)  
*Holocystites rotundas* Miller. (O.)  
*Holocystites scitulus* Miller. (O.)  
*Holocystites spangleri* Miller. (O.)  
*Holocystites sphaeroidalis* Miller and Gurley. (O.)  
*Holocystites splendens* Miller and Gurley. (O.)  
*Holocystites subovatus* Miller. (O.)  
*Holocystites subrotundus* Miller. (O.)  
*Holocystites tumidus* Miller. (O.)  
*Holocystites turbinatus* Miller. (O.)  
*Holocystites ventricosus* Miller. (O.)  
*Holocystites wetherbyi* Miller. (O.)  
*Holocystites wykoffi* Miller. (O.)  
*Homalonotus delphinocephalus* (Green). (R., Ue.)  
*Homoerinus cylindricus* Hall. (R.)  
*Homoerinus parvus* Hall. (R.)  
*Homocospira apriniformis* Hall. (R.)  
*Hormotoma subulata* (Conrad). (R., Ue.)  
*Hyalithes elintonensis* Foerste. (O.)  
*Hyalithes subimbricatus* Ringuenberg. (R.)  
*Ichthyocrinus laevis* Conrad. (R.)  
*Idiotrypa punctata* (Hall). (R., O.)  
*Inocaulis plumulosus* Hall. (R.)  
*Kladonella symmetrica* (Hall). (R., Ue.)  
*Labechia delicatula* Parks. (O.)  
*Lecanocrinus macropetalus* Hall. (R.)  
*Lecanocrinus putcolus* Ringuenberg. (R.)  
*Lecanocrinus solidus* Ringuenberg. (R.)  
*Leiopteria subplana* (Hall). (R.)  
*Lepidocoleus sarcli* Clarke. (R.)  
*Leptaena rhomboidalis* (Wilckens). (R., O., Ue.)  
*Lichenalia concentrica* Hall. (R., O.)  
*Lingula bicarinata* Ringuenberg. (R.)  
*Lingula lamellata* Hall. (R.)  
*Lioclema asperum* (Hall). (R., O., Ue.)  
*Lioclema circinctum* Bassler. (R.)  
*Lioclema explanatum* Bassler. (R., O.)  
*Lioclema globularc* Bassler. (R.)  
*Lioclema maceombi* Bassler. (R.)  
*Lioclema multiporum* Bassler. (R., O.)  
*Lioclema ramulosum* Bassler. (R.)  
*Loculipora ambigua precursor* Bassler. (R., O.)  
*Loculipora ulrichi* Bassler. (R.)  
*Lyriocrinus dactylus* (Hall). (R.)  
*Macrostylocrinus fusibrachiatus* Ringuenberg. (R.)  
*Macrostylocrinus ornatus* Hall. (R.)  
*Maricrinus warreni* Ringuenberg. (R.)  
*Meckopora foliacea* (Hall). (R.)  
*Mesopalaeaster bellulus* (Billings). (R.)  
*Mesotrypa nummiformis* (Hall). (R., O.)  
*Mitoclema sarcli* Bassler. (R.)  
*Modiolopsis ovata* Hall. (Ue.)  
*Modiolopsis subcarinata* Hall.  
*Monograptus elintonensis* (Hall). (Ue.)  
*Monotrypa benjamini* Bassler. (R., O.)  
*Monotrypa osgoodensis* Bassler. (R., O.)  
*Monotrypa pediculata* Bassler. (R., O.)  
*Myelodactylus brachiatus* Hall. (R.)  
*Myelodactylus convolutus* Hall. (R.)  
*Mytilarca mytiliformis* (Hall). (Ue.)  
*Nematopora minuta* (Hall). (R.)  
*Nicholsonella florida* (Hall). (R., O., Ue.)  
*Nicholsonella ringuebergi* Bassler. (R.)  
*Nucloospora pisiformis* Hall. (O., Ue.)  
*Oetonaria curta* Ulrich. (R.)  
*Orbignyella expansa* (Ringuenberg). (R.)  
*Orbignyella magnopora* Bassler. (R.)  
*Orthis flabellites* Foerste. (R., O., I.)  
*Orthis interplicata* Foerste. (O.)  
*Orthis(?) punctostriata* Hall. (R.)  
*Orthoceras abruptum* Hall.  
*Orthoceras clavatum* Hall. (Ue.)  
*Orthostrophia (Schizorammina) fasciata* (Hall). (O., R.)  
*Orthostrophia (Schizorammina) fissistriata* (Foerste). (O.)  
*Pachydictya crassa* (Hall). (R., O., Ue.)  
*Palaeaster niagarensis* Hall. (R.)  
*Palaeocyclus rotuloides* Hall. (Ue.)  
*Palaeodictyota anastomotica* (Ringuenberg). (R.)  
*Palaeodictyota bella* (Hall and Whitfield). (R.)  
*Palaeodictyota bella recta* Ruedemann. (Ue.)  
*Palaeodictyota elintonensis* Ruedemann. (Ue.)  
*Pentamerella(?) compressa* Ringuenberg. (R.)  
*Phenopora cnsiformis* Hall. (R., O.)  
*Phenopora fimbriata canadensis* Bassler. (R., Ue.)  
*Pholidops squamiformis* Hall. (R.)  
*Pisocrinus gemmiformis* Miller. (O.)  
*Platycceras angulatum* (Hall). (R.)  
*Platycceras laeiniosum* Ringuenberg. (R.)  
*Platycceras? membranaceum* Ringuenberg. (R.)  
*Platycceras niagarensis* (Hall). (R.)  
*Platycceras proclive* Ringuenberg. (R.)  
*Platycceras pronum* Foerste. (O.)  
*Platycrinus corporiculus* Ringuenberg. (R.)  
*Plectambonites transversalis* (Wahlenberg). (R., O., Ue.)  
*Polypora incepta* Hall. (R.)  
*Proetus corycaeus* (Conrad). (R.)  
*Proetus stokesi* (Murchison?) Hall. (R.)  
*Protaster stellifer* Ringuenberg. (R.)  
*Pseudohornera diffusa* (Hall). (R.)  
*Pseudohornera niagarensis* (Hall). (R.)  
*Pterinea emacrata* (Conrad). (R., Ue.)

- Pterinea undata* (Hall). (R.)  
*Pterinopecten? rhomboides* (Hall). (R.)  
*Ptiloporella nervata* (Nicholson). (R., O.)  
*Pycnosaccus calyculus* (Hall). (R.)  
*Rafinesquina obscura* (Hall). (Uc.)  
*Rhinopora curvata* Ringueberg. (R.)  
*Rhipidomella hybrida* (Sowerby). (R., O., I.)  
*Rhombotrypa spinulifera* Bassler. (O., R.)  
*Rhopalonaria attenuata* Ulrich and Bassler. (R.)  
*Rhynchonella(?) bidentata* (Hisinger). (R.)  
*Rhynchotretra cuneata americana* (Hall). (R., O., I.)  
*Rhynchotretra robusta* (Hall). (I.)  
*Scenidium pyramidale* Hall. (R.)  
*Schuchertella subplana* (Conrad). (R., O., Ue.)  
*Semicoscinium tenuiceps* (Hall). (R., O.)  
*Spatiopora maculata* (Hall). (R.)  
*Spirifer (Eospirifer) asperatus* (Ringueberg). (R.)  
*Spirifer (Delthyris) crispus* (Hisinger).  
*Spirifer (Eospirifer) eudora* (Hall). (O.)  
*Spirifer (Eospirifer) niagarensis* (Conrad). (R., O.)  
*Spirifer (Eospirifer) radiatus* (Sowerby). (O., R.)  
*Spirifer (Delthyris) sulcatus* (Hisinger). (R.)  
*Squamaster echinatus* Ringueberg. (R.)  
*Stephanocrinus angulatus* Conrad. (R.)  
*Stephanocrinus cornetti* Miller. (O.)  
*Stephanocrinus deformis* Rowley. (O.)  
*Stephanocrinus elongatus* Miller. (O.)  
*Stephanocrinus gemmiformis* Hall. (R., O., I.)  
*Stephanocrinus hammelli* Miller. (O.)  
*Stephanocrinus obpyramidalis* Miller. (O.)  
*Stephanocrinus osgoodensis* Miller. (O.)  
*Stephanocrinus quinquepartitus* Rowley. (O.)  
*Stictotrypa punctipora* (Hall). (R.)  
*Stigmatella globata* Bassler. (R.)  
*Striatopora flexuosa* Hall. (R., O.)  
*Strombodes mamillaris wilmingtonensis* Foerste. (D.)  
*Stropheodonta prisca* Hall. (Uc.)  
*Stropheodonta (Brachyprion) profunda* (Hall). (I., R.)  
*Strophomena orthididea* (Hall). (Uc.)  
*Strophonella striata* (Hall). (R.)  
*Tæniodictya shucherti* Bassler. (R.)  
*Tentaculites niagarensis* Hall. (R.)  
*Thamnisus dichotomus* (Hall). (R.)  
*Thecia major* Rominger. (O.)  
*Trematocystis hammelli* (Miller). (O.)  
*Trematocystis subglobosus* (Miller). (O.)  
*Trematopora spiculata* Miller. (R., O.)  
*Trematopora tuberculosa* Hall. (O., R.)  
*Trematopora whitfieldi* Ulrich. (R.)  
*Trematospira camura* Hall. (R.)  
*Triplacia (Cliftonia) tenax* Foerste. (O.)  
*Tuberculopora inflata* Ringueberg. (R.)  
*Turillepas gracillissimus* (Ringueberg). (R.)  
*Vinella(?) multiradiata* Ulrich and Bassler. (R.)  
*Vinella radiceformis* (Vine). (R.)  
*Whitfieldella cylindrica* (Hall). (I.)  
*Whitfieldella intermedia* (Hall). (I.)  
*Whitfieldella naviformis* (Hall). (I.)  
*Whitfieldella nitida* (Hall). (R., I.)  
*Whitfieldella nitida oblata* (Hall). (R., I.)  
*Whitfieldella quadrangularis* Foerste. (O.)  
*Beyrichia lata triplicata* Foerste. (C., F.)  
*Calostylis spongiosa* Foerste. (W.)  
*Calymene clintoni* (Vanuxem). (C.)  
*Calymene niagarensis* Hall. (W.)  
*Camarotochia acinus subrhomboides* Foerste. (Wu.)  
*Camarotochia congruens* Foerste. (C., Wu.)  
*Camarotochia pisa* (Hall and Whitfield). (Wu.)  
*Chonetes vetustus* Foerste.  
*Chonophyllum solitarii* Foerste. (W.)  
*Clathropora frondosa* Hall. (Wu.)  
*Corynotrypa dissimilis* (Vine). (W.)  
*Cyathophyllum densiseptatum* Foerste. (W.)  
*Cyathophyllum sedentarium* Foerste. (W.)  
*Cystiphyllum spinulosum* Foerste. (W.)  
*Dalmanella elegantula* (Dalman). (W.)  
*Dalmanites limululus brevicaudatus* Foerste. (Wu.)  
*Diaphorostoma cliftonense* Foerste. (Wu.)  
*Diaphorostoma niagarensis* (Hall).  
*Encrinurus ornatus* Hall and Whitfield. (W.)  
*Favosites declinatus* Foerste. (W.)  
*Favosites favosus* Goldfuss. (W.)  
*Favosites hisingeri aplata* Foerste. (W.)  
*Halysites catenularia* Linnæus. (W.)  
*Heliolites spongia* Foerste. (W.)  
*Heliolites sububulata distans* Foerste. (W.)  
*Heliolites sububulata naxella* Foerste. (W.)  
*Ilæxus depressus* Foerste. (Wu.)  
*Isochitina panolensis* Foerste. (W.)  
*Lindströmia lingulifera* Foerste. (W.)  
*Lyellia eminula* Foerste. (W.)  
*Meckopora bassleri* Foerste. (W.)  
*Pholidops ovalis* Hall. (W.)  
*Platystrophia reversata* Foerste.  
*Platystrophia unionensis* Bassler. (Wu.)  
*Polygrophe radicata* Foerste. (W.)  
*Orthis flabellites* Foerste. (W.)  
*Rhipidomella magnicardinalis* Foerste. (Wu.)  
*Schuchertella conferta* Foerste. (Wu.)  
*Spirifer (Eospirifer) eudora* (Hall). (Wu.)  
*Spirifer (Eospirifer) harinensis* (Foerste). (Wu.)  
*Spirifer (Delthyris) nanus* (Foerste). (Wu.)  
*Spirifer (Eospirifer) radiatus obsoletus* (Foerste). (Wu.)  
*Spirifer (Eospirifer?) repertus* (Foerste). (Wu.)  
*Stricklandinia norwoodi* Foerste. (O.)  
*Strombodes granulatus* (Foerste). (W.)  
*Strombodes mamillaris distans* (Foerste). (W.)  
*Stropheodonta mundula* Foerste. (C.)  
*Stropheodonta (Brachyprion) planus* Foerste. (Wu.)  
*Syringolites huronensis* (Linde). (W.)  
*Trematospira camura pauciplicata* Foerste. (Wu.)  
*Whitfieldella quadrangularis* Foerste. (I.)  
*Whitfieldella subquadrata* Foerste. (I.)  
*Zaphrentis charazata* Foerste. (W.)  
*Zaphrentis intertexta* Foerste. (W.)  
*Zaphrentis intertexta trivincensis* Foerste. (W.)  
*Zaphrentis intertexta juvenis* Foerste. (W.)  
 "NIAGARAN DOLOMITE" (ROCHESTER) HAMILTON,  
 ONTARIO.

(Regarded as of Lockport age by Schuchert and Parks but the true Lockport dolomite overlies these beds in this section at Hamilton. As the evidence for the Rochester age of the Dictyonema chert beds at Hamilton has not been published, the species have been cited in the bibliography simply as "Niagaran dolomite.")

## CLINTON OF EASTERN KENTUCKY.

(Waco=W.; West Union=Wn; Crab Orchard=C.; Alger=A.; Estill=E.; Indian Fields=I.)

*Atrypa reticularis* Linnæus.  
*Atrypa rugosa* Hall. (Wn.)

*Acanthograptus granti* Spencer.  
*Acanthograptus multispinus* Gurley.

- Acanthograptus pulcher* Spencer.  
*Arctinurus boltoni* (Biggsby).  
*Astroconia granti* Sollas.  
*Astylospongia præmorsa* Goldfuss.  
*Atrypa reticularis* (Linnaeus).  
*Bumastus ioxus* Hall.  
*Callograptus minutus* Spencer.  
*Callograptus minutus altus* Gurley.  
*Callograptus multicaulis* Spencer.  
*Callograptus niagarensis* Spencer.  
*Callograptus strictus* Gurley.  
*Calyptragraptus cyathiformis* Spencer.  
*Calyptragraptus microneumatodes* Spencer.  
*Calyptragraptus? radiatus* Spencer.  
*Camarotoechia neglecta* Hall.  
*Caunopora mirabilis* Spencer.  
*Ceramopora imbricata* Hall.  
*Ceramoporella reticulata* (Spencer).  
*Conularia magnifica* Spencer.  
*Conularia rugosa* Spencer.  
*Conularia wilkinsi* Spencer.  
*Cornulites clintoni* Hall.  
*Crania anna* Spencer.  
*Cyclograptus rotadentatus* Spencer.  
*Dalmanella elegantula* (Dalman).  
*Dalmanites limulurus* Green.  
*Dendrograptus dawsoni* Spencer.  
*Dendrograptus frondosus* Spencer.  
*Dendrograptus onarioensis* Bassler.  
*Dendrograptus phainotheca* Gurley.  
*Dendrograptus prægracilis* Spencer.  
*Dendrograptus? problematicus* (Spencer).  
*Dendrograptus ramosus* Spencer.  
*Dendrograptus spinosus* Spencer.  
*Diamesopora dichotoma* Hall.  
*Dictyonella corallifera* Hall.  
*Dictyonella reticulata* Hall.  
*Dictyonema crassibasale* Gurley.  
*Dictyonema desmoides* Gurley.  
*Dictyonema expansum* Spencer.  
*Dictyonema filiramus* Gurley.  
*Dictyonema parallelum* Gurley.  
*Dictyonema percrassum* Gurley.  
*Dictyonema retiforme* Hall.  
*Dictyonema spenceri* Gurley.  
*Dictyonema stenactinotum* Gurley.  
*Dictyonema tenellum* Spencer.  
*Enterolasma calliculus* (Hall).  
*Fenestella elegans* Hall.  
*Inocaulis cervicornis* Spencer.  
*Inocaulis congregatus* Gurley.  
*Inocaulis diffusus* Spencer.  
*Inocaulis diffusus crassiramus* Gurley.  
*Inocaulis granti* (Dawson).  
*Inocaulis phycoides* Spencer.  
*Inocaulis plumulosus* Hall.  
*Inocaulis ramulosus* Spencer.  
*Inocaulis? strictus* Gurley.  
*Inocaulis? thallosus* Gurley.  
*Leptæna rhomboidalis* (Wilckens).  
*Lichenalia concentrica* Hall.  
*Lingula ingens* Spencer.  
*Lingula lamellata* Hall.  
*Lingulops granti* Hall and Clarke.  
*Lituites niagarensis* Spencer.  
*Mesotrypa nummiformis* (Hall).  
*Nicholsonella florida* (Hall).  
*Odontocaulis obpyriformis* Gurley.  
*Odontocaulis occidentalis* Gurley.  
*Odontocaulis granti* (Spencer).  
*Orthoceras bartonensis* Spencer.  
*Pachydictya crassa* (Hall).  
*Pholidops squamiformis* Hall.  
*Plectambonites transversalis* (Wahlenberg).  
*Pleurotomaria clipeiformis* Spencer.  
*Polypara albionensis* Spencer.  
*Protarea walkeri* (Spencer).  
*Pseudohornera diffusa* (Hall).  
*Pseudohornera niagarensis* (Hall).  
*Pterinea emacerata* (Conrad).  
*Pterygotus canadensis* Dawson.  
*Ptilograptus foliaceus* Spencer.  
*Rhipidomella hybrida* (Sowerby).  
*Rhizograptus bulbosus* Spencer.  
*Schizotreta tenuilamellata* (Hall).  
*Schuchertella subplana* (Conrad).  
*Semicoscium tenuiceps* (Hall).  
*Spirifer (Eospirifer) niagarensis* (Hall).  
*Spirifer (Eospirifer) radiatus* (Sowerby).  
*Spirifer (Delthyris) sulcatus* (Hisinger).  
*Stricklandinia chapmani* Hall and Clarke.  
*Stropheodonta profunda* (Hall).  
*Strophonella patenta* (Hall).  
*Thamnograptus bartonensis* Spencer.  
*Thamnograptus(?) multiformis* Spencer.  
*Whitfieldella nitida oblata* (Hall).

## ANTICOSTIAN, ISLAND OF ANTICOSTI, QUEBEC.

(Beesie River=B.; Gun River=G.; Jupiter River=J.; Chicotte=C.).

- Actinoceras infelix* (Billings). (B., G., J.)  
*Alveolites labechei* Edwards and Haime. (J.)  
*Athyris(?) tumidula* Billings. (G., J.)  
*Atrypa marginalis* Dalman. (B., C.)  
*Atrypa reticularis* Linnaeus. (G., J., C.)  
*Bellerophon dilatatus* (Sowerby?) Billings. (G., J.)  
*Beyrichia diffusa* Jones. (J.)  
*Beyrichia venusta* Billings. (J.)  
*Bilobites bilobus* (Linnaeus). (G., J.)  
*Bumastus orbicaudatus* (Billings). (B., G.)  
*Calymene niagarensis* Hall. (B., G., J.)  
*Camarotoechia argentea* (Billings). (J.)  
*Camarotoechia decemplicata* (Sowerby). (G.)  
*Camarotoechia fringilla* (Billings). (G.)  
*Camarotoechia glacialis* (Billings). (G., J.)  
*Camarotoechia neglecta* (Hall). (B., G.)  
*Camarotoechia nutriz* (Billings). (G., J.)  
*Camarotoechia pyrula* (Billings). (G.)  
*Camarotoechia vicina* (Billings). (C.)  
*Cheirus nuperus* Billings. (G., J., C.)  
*Chilotrypa circe* Billings. (J.)  
*Chonetes primigenius* T'wenhofel. (G., J.)  
*Chonophyllum (Craterophyllum) canadense* (Billings). (J., C.)  
*Clathrodictyon vesiculosum* Nicholson and Murie. (B., G., J., C.)  
*Cælospira hemispherica* (Sowerby). (G., J., C.)  
*Cælospira planoconvexa* (Hall). (B., G.)  
*Cænites lunatus* (Nicholson and Hinde). (J.)  
*Conocardium elegantulum* Billings. (J., C.)  
*Corynotrypa dissimilis* (Vine). (G.)  
*Corynotrypa elongata* (Vine). (G.)  
*Cyathophyllum anticostiense* Billings. (J., C.)

- Cyathophyllum euryone* Billings. (G., C.)  
*Cyathophyllum wahlenbergi* Billings. (B., C.)  
*Cyclonema bellulum* Billings. (G.)  
*Cyclonema commune* Billings. (J., C.)  
*Cyclonema decorum* Billings. (C.)  
*Cyclonema percingulatum* Billings. (J.)  
*Cyclonema varians* Billings. (C.)  
*Cyrtia myrtia* (Billings). (C.)  
*Cystiphyllum niagarensis* (Hall). (G., J.)  
*Dalmanella elegantula media* (Shaler). (J., C.)  
*Diaphorostoma humile* (Billings). (G., J., C.)  
*Diaphorostoma niagarensis* (Hall). (G., J.)  
*Dionide(?) perplexa* Billings. (J.)  
*Diphyphyllum cespitosum* (Hall). (B., G.)  
*Diptoclema sparsum* (Hall). (G., J.)  
*Encrinurus elegantulus* Billings. (J.)  
*Eoharpes consuetus* (Billings). (C.)  
*Eurychilina billingsi* (Jones). (G., J.)  
*Favosites favosus* Goldfuss. (J.)  
*Favosites forbesi* Edwards and Haime. (B., G., J.)  
*Favosites hisingeri* Edwards and Haime. (J.)  
*Glossoceras desideratum* Billings. (J.)  
*Gouldia insularis* (Billings). (C.)  
*Halyrites catenularia* Linnaeus. (B., G., J.)  
*Heliolites interstinctus* (Linnaeus). (J.)  
*Heliolites subtubulatus* (McCoy). (G., J.)  
*Helopora armata* Billings. (J.)  
*Helopora bellula* Billings. (G., J.)  
*Helopora concava* Billings. (B., G., J.)  
*Helopora formosa* Billings. (B., G., J.)  
*Helopora lincopora* Billings. (B., G.)  
*Hindella prinstanta* (Billings). (B.)  
*Hindella umbonata* (Billings). (B., G.)  
*Hormotoma? aculeata* (Billings). (G., J.)  
*Hormotoma funata* (Billings). (G., J.)  
*Huronia persiphonata* (Billings). (G., J.)  
*Huronia vertebralis* Stokes. (J., C.)  
*Hyattidina congesta junia* (Billings). (G.)  
*Illanus grandis* Billings. (B., G., J., C.)  
*Kionoceras bellatulum* (Billings). (G., J.)  
*Leperditia anticostiana* (Jones). (G., J.)  
*Leperditia frontalis* Jones. (J.)  
*Leperditia selwyni* Jones. (J.)  
*Leptæna julia* (Billings). (J.)  
*Leptæna rhomboidalis* (Wilckens). (G., J., C.)  
*Lichas canadensis* Billings. (G.)  
*Lioclema variporum* (Billings). (J.)  
*Lissatrypa atheroidea* Twenhofel. (J.)  
*Lyellia affinis* (Billings). (B., G., J., C.)  
*Lyellia americana* Edwards and Haime. (C.)  
*Lyellia exigua* (Billings). (B., G., J., C.)  
*Monograpthus clintonensis* Hall. (J.)  
*Murchisonia? turricula* Billings. (J.)  
*Mytilarca nitida* (Billings). (J.)  
*Nidulites gregarius* (Billings). (G.)  
*Nidulites intermedius* (Billings). (G.)  
*Oncoceras amator* Billings. (C.)  
*Oncoceras futile* Billings. (J.)  
*Orthis davidsoni* Verneuil. (B., G.)  
*Orthis labellites* Foerste. (B., G., J.)  
*Orthoceras bucklandi* Billings. (C.)  
*Orthoceras medon* Billings. (C.)  
*Orthoceras pileolum* Billings. (C.)  
*Orthoceras raptor* Billings. (J.)  
*Pachydietya crassa* (Hall). (B., G., J., C.)  
*Paleofavosites aspera* (D'Orbigny). (B., G., J., C.)  
*Parastrophia lenticularis* (Billings). (B.)  
*Parastrophia ops* (Billings). (C.)  
*Pascolus halli* Billings. (B.)  
*Pentamerus oblongus* Sowerby. (G., J., C.)  
*Phacopidella orestes* (Billings). (G., J.)  
*Phænopora ensiformis* Hall. (B.)  
*Phænopora excellens* (Billings). (G.)  
*Phænopora superba* (Billings). (B., G.)  
*Plasmapora petaliformis* (Lonsdale). (J., C.)  
*Platystrophia regularis* Shaler. (G.)  
*Plectambonites glaber* Shaler.  
*Plectambonites transversalis* (Wahlenberg). (G., J.)  
*Pleurotomaria cryptata* Billings. (G., J.)  
*Pseudosphærocochus canadensis* (Billings). (C.)  
*Pterinea curiosa* Billings. (J.)  
*Pterinea emacrata* (Conrad). (G.)  
*Pterinea striata* (Billings). (G., J.)  
*Pterinea thibæ* Billings. (G.)  
*Ptilodictya gladiola* Billings. (B., J.)  
*Ptilodictya sulcata* Billings. (J.)  
*Rhipidomella uberis* (Billings). (B., G., J., C.)  
*Rhipidomella uberis rhynchonelliformis* (Shaler). (B., G., J.)  
*Schuchertella alterniradiata* (Shaler). (G.)  
*Schuchertella pecten* (Roemer). (B., G., J.)  
*Spirifer (Eospirifer) radiatus* (Sowerby). (J., C.)  
*Streptelasma? latiusculum* (Billings). (G., J.)  
*Streptelasma (Petraria) pygmaeum* (Billings). (G., J.)  
*Stricklandinia anticostiensis* (Billings?).  
*Stricklandinia brevis* (Billings). (G., J.)  
*Stricklandinia davidsoni* Billings. (G., J., C.)  
*Stricklandinia lirata* (Sowerby). (G., J.)  
*Stricklandinia melissa* Billings. (J.)  
*Stricklandinia salteri* Billings. (G., J.)  
*Strombodes diffusus* Edwards and Haime. (G.)  
*Strophodontia (Brachyprion) anticostiensis* (Shaler). (G., J.)  
*Strophodontia (Brachyprion) leda* (Billings). (B., G., J.)  
*Strophodontia (Brachyprion) philomela* (Billings). (G., J.)  
*Strophomena(?) antiquata* Sowerby. (G., J.)  
*Strophomena(?) semiovalis* Shaler.  
*Strophonella (Strophoprion) geniculata* (Shaler). (G., J.)  
*Syringopora verticillata* Goldfuss. (G., J.)  
*Thamniscus striatopora* (Billings). (J.)  
*Trematopora irregularis* (Billings). (J.)  
*Tripletia insularis anticostiensis* Twenhofel. (G., J.)  
*Vinella? multiradiata* Ulrich and Bassler. (J.)  
*Vinella radiceformis* (Vine). (G., J.)  
*Virgiana barrandici* (Billings). (B.)  
*Whitfieldella(?) julia* (Billings). (J.)  
*Whitfieldella lara* (Billings). (G., J.)  
*Whitfieldella solitaria* (Billings). (G., J.)  
*Zaphrentis patens* Billings. (J.)  
*Zaphrentis stokesi* Edwards and Haime. (B., G., J., C.)  
*Zygospira(?) mica* (Billings). (J.)  
*Zygospira paupera* Billings. (G., J.)

NIAGARAN (LAUREL) OF INDIANA, KENTUCKY, AND TENNESSEE.

*Acacocrinus americana* Wachsmuth and Springer.  
*Aethocystites sculptus* Miller.  
*Allocrinus benedicti* Miller.  
*Amplexus cinctus* Miller.  
*Anastrophia internascens* (Hall).  
*Atrypa nodostriata* Hall.

*Atrypa reticularis* Linnaeus.  
*Barrandoceras caucaliensis* (Miller).  
*Barrandoceras? indianensis* (Miller and Gurley).  
*Callierinus beacheri* Wachsmuth and Springer.  
*Calymene niagarensis* Hall. -  
*Conocardium elrodi* Miller.  
*Corydocephalus byrnesanus* (Miller and Gurley).  
*Corydocephalus phlyctainoides* (Green).  
*Cyphoerinus gorbyi* Miller.  
*Cyrtoceras howardi* Miller.  
*Cyrtoceras indianense* Miller.  
*Cyrtoceras nashvillense* Miller.  
*Dalmanella elegantula* (Dalman).  
*Dawsonoceras annulatum* (Sowerby).  
*Deltacrinus indianensis* (Miller).  
*Empyrocerinus indianensis* Miller and Gurley.  
*Favosites spinigerus* Hall.  
*Gazacrinus inornatus* Miller.  
*Gazacrinus ventricosus* Wachsmuth and Springer.  
*Gyroceras elrodi* White.  
*Habrocerinus howardi* (Miller).  
*Holocystites pustulosus* Miller.  
*Indianocrinus punctatus* Miller and Gurley.  
*Macrostylocrinus indianensis* Miller and Gurley.  
*Mariaerinus aureatus* Miller.  
*Mariaerinus? granulatus* Miller.  
*Melocrinus aequalis* Miller.  
*Melocrinus oblongus* Wachsmuth and Springer.  
*Periechoerinus ornatus* (Hall and Whitfield).  
*Periechoerinus umbrosus* (Miller and Gurley).  
*Petalocrinus longus* Bather.  
*Pisocrinus baccula* Miller and Gurley.  
*Pisocrinus gemmiformis* Miller.  
*Plasmopora foliis* Edwards and Haime.  
*Spirifer (Delthyris) crispus simplex* (Hall).  
*Spirifer (Eospirifer) radiatus* Sowerby.  
*Streptelasma spongiopsis* Rominger.  
*Striatopora gorbyi* Miller.  
*Stribalocystites gorbyi* Miller.  
*Stribalocystites sphaeroidalis* Miller and Gurley.  
*Stribalocystites tumidus* Miller.  
*Subulites benedicti* Miller.  
*Ucinulus stricklandi* (Sowerby).  
*Zophocrinus howardi* Miller.

NIAGARAN (WALDRON) OF INDIANA, KENTUCKY, AND  
 TENNESSEE.

*Acacocrinus elrodi* Wachsmuth and Springer.  
*Allonema waldronense* Ulrich and Bassler.  
*Ampheristocrinus? calyx* (Hall).  
*Ampheristocrinus typus* Hall.  
*Amphicælia leidyi* Hall.  
*Anastrophia internascens* Hall.  
*Arctinurus occidentalis* (Hall).  
*Atrypa reticularis* (Linnaeus).  
*Atrypa reticularis newsonensis* Foerste.  
*Atrypa reticularis niagarensis* Nettelroth.  
*Ascodictyon siluriense* Vine.  
*Astylopongia imbricatio articulata* (Roemer).  
*Astylopongia præmorsa* (Goldfuss).  
*Astylopongia pusilla* Rauff.  
*Atrypina disparilis* (Hall).  
*Aulopora præcius* Hall.  
*Baryphyllum fungus* White.  
*Batostomella granulifera* (Hall).  
*Bellerophon tuber* Hall.  
*Berenicea consimilis* (Lonsdale).

*Beyrichia granulosa* Hall.  
*Beyrichia waldronensis* Ulrich and Bassler.  
*Bilobites bitobus* (Linnaeus).  
*Botryocrinus nucleus* (Hall).  
*Botryocrinus polyx* (Hall).  
*Bumastus armatus* (Hall).  
*Bumastus ioxus* Hall.  
*Buthotrephis gracilis crassa* Hall.  
*Callopora?? cervicornis* Hall.  
*Callopora?? diversa* Hall.  
*Calymene niagarensis* Hall.  
*Camarotoæchia(?) acinus* (Hall).  
*Camarotoæchia(?) indianensis* (Hall).  
*Camarotoæchia neglecta* (Hall).  
*Camarotoæchia (Stegerhynchus) whitei* (Hall).  
*Caryospongia juglans nuxmoschata* (Hall).  
*Ceramopora? constuens* Hall.  
*Ceramopora? explanata* Hall.  
*Ceramopora? notha* Hall.  
*Ceramopora? raripora* Hall.  
*Ceratocephala fimbriata* (Hall).  
*Chaunograpta novellus* (Hall).  
*Cheirurus niagarensis* (Hall).  
*Chilotrypa varia* (Hall).  
*Chilotrypa variolata* (Hall).  
*Chonetes novascoticus waldronensis* Foerste.  
*Chonetes undulatus* Hall.  
*Cladopora sarmentosa* Hall.  
*Clorinda formicata* (Hall).  
*Coleolus spinulus* Hall.  
*Conularia infrequens* Hall.  
*Cornulites proprius* Hall.  
*Corynotrypa dissimilis* (Vine).  
*Corynotrypa elongata* (Vine).  
*Crania setifera* Hall.  
*Crania siluriana* Hall.  
*Crania spinigera* Hall.  
*Cyathocrinus? æmulus* Hall.  
*Cyathocrinus? benedicti* Miller.  
*Cyloceras a mycus* (Hall).  
*Cyphaspis christyi* Hall.  
*Cypricardinia arata* Hall.  
*Cypricardinia subovata* Miller and Dyer.  
*Cyrtia myrtia* (Billings).  
*Cyrtolites sinuosus* Hall.  
*Dalmanella elegantula* (Dalman).  
*Dalmanites bicornis* (Hall).  
*Dalmanites halli* Weller.  
*Dalmanites verrucosus* (Hall).  
*Dawsonoceras annulatum* (Sowerby).  
*Deltacrinus stigmatus* (Hall).  
*Deltacrinus tunicatus* (Hall).  
*Diamesopora infrequens* (Hall).  
*Diamesopora oseutum* (Hall).  
*Diamesopora subimbricata* (Hall).  
*Diaphorostoma niagarensis* (Hall).  
*Diaphorostoma niagarensis multilineatum* Calvin.  
*Diaphorostoma plebium* (Hall).  
*Dictyonella reticulata* Hall.  
*Dimerocrinus halli* (Lyon).  
*Dimerocrinus inornatus* (Hall).  
*Dimerocrinus occidentalis* (Hall).  
*Dimerocrinus waldronensis* (Miller and Dyer).  
*Duncanella borealis* Nicholson.  
*Entomis waldronensis* Ulrich.  
*Eridotrypa echinata* (Hall).  
*Eucalyptocrinus crassus* Hall.



- Eucalyptocrinus ellipticus* Miller.  
*Eucalyptocrinus elrodi* Miller.  
*Eucalyptocrinus magnus* Worthen.  
*Eucalyptocrinus ovalis* Hall.  
*Eucalyptocrinus springeri* Foerste.  
*Eucalyptocrinus tuberculatus* Miller and Dyer.  
*Euomphalopterus alatus obsoletus* Ulrich.  
*Favosites forbesi occidentalis* (Hall).  
*Favosites spinigerus* Hall.  
*Fenestella bellistriata* Hall.  
*Fenestella parvulipora* Hall.  
*Fenestella pertenuis* Hall.  
*Fenestella proluxa* Hall.  
*Fistulipora halli* Rominger.  
*Fistulipora neglecta* Rominger.  
*Fistulipora neglecta maculata* (Hall).  
*Goniophora speciosa* Hall.  
*Gypidula simplex* Foerste.  
*Gyrocceras abruptum* Hall.  
*Hallopora elegantula* (Hall).  
*Homalonotus delphinoccephalus?* Hall.  
*Homocrinus ancilla* (Hall).  
*Homospira exar* Hall.  
*Hyalithes newsomensis* Foerste.  
*Homospira sobrina* (Beecher and Clarke).  
*Ichthyocrinus subangularis* Hall.  
*Inocaulis divaricatus* Hall.  
*Ischadites subtrubrinatus* Hall.  
*Kionoceras cancellatum* (Hall).  
*Lampteroocrinus parvus* Hall.  
*Lecanocrinus pusillus* (Hall).  
*Leperditia faba* Hall.  
*Leptæna rhomboidalis* (Wilckens).  
*Leptotrypa? spharix* (Hall).  
*Lingula gibbosa* Hall.  
*Liolema? exsul* (Hall).  
*Loculipora ambigua* (Hall).  
*Lyriocrinus melissa* (Hall).  
*Macrostylocrinus fasciatus* (Hall).  
*Macrostylocrinus granulatus* (Hall).  
*Macrostylocrinus striatus* Hall.  
*Mariacrinus carleyi* (Hall).  
*Melocrinus obconicus* Hall.  
*Meristina maria* (Hall).  
*Meristina rectirostris* Hall.  
*Metopolichas breviceps* (Hall).  
*Mimulus waldronensis* (Miller and Dyer).  
*Modiolopsis perlatus* Hall.  
*Modiolopsis subalatus* Hall.  
*Monotrypella? consimilis* (Hall).  
*Myelodactylus corbyi* Miller.  
*Mytilarca acutirostra* (Hall).  
*Mytilarca sigilla* Hall.  
*Nautilus? oceanus* Hall.  
*Nematopora macropora* (Hall).  
*Nematopora minuta* (Hall).  
*Nucleospira pisiformis* Hall.  
*Orthis benedicti* Miller.  
*Orthis (?) subnodosa* Hall.  
*Orthoceras simulator* Hall.  
*Orthostrophia newsomensis* Foerste.  
*Palæomanon bursa* (Hall).  
*Paleschara? incrassata* Hall.  
*Paleschara? offula* Hall.  
*Periechoocrinus whitfieldi* (Hall).  
*Pholidops ovalis* Hall.  
*Platycrinus siluricus* Hall.  
*Plectambonites tennesseensis* Foerste.  
*Plectambonites transversalis* (Wahlenberg).  
*Polypora conferta* (Hall).  
*Polypora punctostriata* (Hall).  
*Polypora tantula* (Hall).  
*Protokionoceras modulare* (Hall).  
*Pseudohornera niagarensis* (Hall).  
*Pterinea brisa* Hall.  
*Pterinea nervata* Foerste.  
*Pterinea newsomensis* Foerste.  
*Ptilodictya angusta* (Hall).  
*Receptaculites sacculus* Hall.  
*Reticularia bicostata petita* (Hall).  
*Rhipidomella hybrida* (Sowerby).  
*Rhipidomella newsomensis* Foerste.  
*Rhombopteria (Newsomella) divaricata* Foerste.  
*Rhynchotreta cuneata americana* (Hall).  
*Sagenocrinus americanus* Springer.  
*Scenidium bassleri* Foerste.  
*Schuchertella subplana* (Hall).  
*Schuchertella tenuis* (Hall).  
*Semioscinium amicum* (Hall).  
*Spatiopora maculata* (Hall).  
*Spirifer (Delthyris) crispus* (Hisinger).  
*Spirifer (Delthyris) crispus simplex* (Hall).  
*Spirifer (Eospirifer) eudora* (Hall).  
*Spirifer (Eospirifer) radiatus* (Sowerby).  
*Spirifer (Delthyris) swallowensis* (Foerste).  
*Spirorbis? flexuosus* Hall.  
*Spirorbis inornatus* Hall.  
*Stephanocrinus gemmiformis* Hall.  
*Stephanocrinus pentalobus* (Hall).  
*Stephanocrinus pulchellus* (Miller and Dyer).  
*Stephanocrinus tennesseensis* Foerste.  
*Stictotrypa orbipora* (Hall).  
*Stictotrypa similis* (Hall).  
*Streptosasma radicans* Hall.  
*Strophodonta (Brachyprion) newsomensis* Foerste.  
*Strophodonta profunda* (Hall).  
*Strophodonta semifasciata* Hall.  
*Strophodonta striata* (Hall).  
*Strophostylus amplus* Rowley.  
*Strophostylus cyclostomus* Hall.  
*Strophostylus cyclostomus disjunctus* Hall.  
*Trematopora halli* Ulrich.  
*Trematopora? singularis* (Hall).  
*Trematopora spiculata* Miller.  
*Trematopora whitfieldi* Ulrich.  
*Trochoceras waldronense* Hall.  
*Uncinulus stricklandi* (Sowerby).  
*Vinella radiceformis* (Vine).  
*Vinella radiceformis conferta* Ulrich.  
*Whitfieldella nitia* (Hall).  
*Zaphrentis eclator* Hall.  
*Zygospira(?) minima* Hall.

 NIAGARAN (LOUISVILLE) OF KENTUCKY AND  
 INDIANA.

- Alveolites fibrosus* Davis.  
*Alveolites louisvillensis* Davis.  
*Alveolites thoroldensis* Parks.  
*Alveolites undosus* Miller.  
*Amplexus shumardi* (Edwards and Haime).  
*Anastrophia internascens* Hall.  
*Anastrophia interplicata* Hall.  
*Anisocrinus greeni* (Miller and Gurley).  
*Anisophyllum? bilamellatum* Hall.  
*Anisophyllum trifurcatum* Hall.  
*Anisophyllum unilargum* Hall.

- Astræospongia meniscus* (Roemer).  
*Atrypa calvini* Nettelroth.  
*Atrypa marginalis* Dalman.  
*Atrypa nodostriata* Hall.  
*Atrypa reticularis niagarensis* Nettelroth.  
*Atrypa rugosa* Hall.  
*Aulopora precius* Hall.  
*Aulopora pygmaea* Davis.  
*Aulopora vanclvei* Hall.  
*Blothrophyllum cinctosum* Greene.  
*Blothrophyllum niagarensense* Davis.  
*Bumastus ioxus* Hall.  
*Calceola* (*Rhizophyllum*) *attenuatus* (Lyon).  
*Calceola* (*Rhizophyllum*) *corniculatum* (Lyon).  
*Camarotachia*(?) *acinus* (Hall).  
*Camarotachia*(?) *indianensis* (Hall).  
*Camarotachia pisa* (Hall and Whitfield).  
*Caryocrinites kentuckiensis* (Miller and Gurley).  
*Chonophyllum?* *capax* Hall.  
*Chonophyllum vadum* Hall.  
*Cladopora aculeata* Davis.  
*Cladopora complanata* Davis.  
*Cladopora equisetalis* Davis.  
*Cladopora laqueata* Rominger.  
*Cladopora menis* Davis.  
*Cladopora ordinata* Davis.  
*Cladopora proboscidalis* Davis.  
*Cladopora reticulata* Hall.  
*Cladopora striata* Davis.  
*Clathrodictyon drummondense* Parks.  
*Clathrodictyon rectum* Parks.  
*Clathrodictyon vesiculosum* Nielson and Murie.  
*Clorinda ventricosa* Hall.  
*Calocaulis petila* (Hall and Whitfield).  
*Cænites crassus* (Rominger).  
*Cænites laminatus* Hall.  
*Cænites verticillatus* (Winchell and Marcy).  
*Conchidium crassiplicata* Hall and Clarke.  
*Conchidium exponens* Hall and Clarke.  
*Conchidium knappi* (Hall and Whitfield).  
*Conchidium littoni* (Hall).  
*Conchidium nettelrothi* Hall and Clarke.  
*Conchidium nysius* (Hall and Whitfield).  
*Conchidium tenuicostatum* (Hall and Whitfield).  
*Conchidium unguiforme* (Ulrich).  
*Corynotrypa dissimilis* (Vine).  
*Cyathophyllum flos* Davis.  
*Cyathophyllum intertrium* Hall.  
*Cyathophyllum radiata* Rominger.  
*Cyathospongia exerecens* Hall.  
*Cyclonema cancellata* (Hall).  
*Cyrtia exporrecta* (Wahlenberg).  
*Cyrtia myrtia* (Billings).  
*Cystiphyllum gemmula* Greene.  
*Cystiphyllum granilineatum* Hall.  
*Cystiphyllum incurvum* Davis.  
*Cystiphyllum lineatum* Davis.  
*Cystiphyllum louisvillensis* Greene.  
*Cystiphyllum niagarensense* Hall.  
*Dalmanella elegantula* (Dalman).  
*Desmograptus pergracilis* (Hall and Whitfield).  
*Diaphorostoma niagarensense* (Hall).  
*Dictyostroma undulatum* Nicholson.  
*Dimerocrinus halli* (Lyon).  
*Diorychopora tenuis* Davis.  
*Diphyphyllum billingsi* Greene.  
*Diphyphyllum huronicum* Rominger.  
*Discoceras marshi* (Hall).  
*Eridophyllum cruciforme* Davis.  
*Eridophyllum divinum* Davis.  
*Eridophyllum louisvillensis* Greene.  
*Eridophyllum rugosum* Edwards and Haime.  
*Eridophyllum sentum* Davis.  
*Favosites cristatus* Edwards and Haime.  
*Favosites cristatus major* Davis.  
*Favosites äuscus* Davis.  
*Favosites favosus* Goldfuss.  
*Favosites forbesi* Edwards and Haime.  
*Favosites hisingeri* Edwards and Haime.  
*Favosites louisvillensis* Davis.  
*Favosites niagarensis* Hall.  
*Favosites spinigerus* Hall.  
*Gypidula globulosa* (Nettelroth).  
*Gypidula knotti* (Nettelroth).  
*Gypidula* (*Sicberella*) *nucleus* (Hall and Whitfield).  
*Gypidula* (*Sicberella*) *uniplicata* (Nettelroth).  
*Hallia äivisa* Hall.  
*Hallia scitula* Hall.  
*Hallopora elegantula* (Hall).  
*Halysites catenularia* Linnaeus.  
*Halysites labyrinthicus* Goldfuss.  
*Heliolites elegans* Hall.  
*Heliolites interstinctus* (Linnæus).  
*Heliolites megastoma* McCoy.  
*Heliolites pyriformis* Guettard.  
*Heliolites subtubulatus* McCoy.  
*Heliophyllum dentilineatum* Hall.  
*Heliophyllum flos* Greene.  
*Heliophyllum gemmiferum* Hall.  
*Heliophyllum mitellum* Hall.  
*Heliophyllum parvum* Hall.  
*Heliophyllum puteatum* Hall.  
*Ilæus cornigerus* Hall and Whitfield.  
*Leptæna rhomboidalis* (Wilckens).  
*Lindstromia?* *herzeri* (Hall).  
*Lophiostroma spindicandum* (Parks).  
*Lophospira casii* (Meek and Worthen).  
*Lyellia americana* Edwards and Haime.  
*Lyellia discoidea* Davis.  
*Lyellia glabra* Owen.  
*Lyellia papillata* Rominger.  
*Lyellia parvituba* Rominger.  
*Lyellia puella* Davis.  
*Macrostylocrinus meeki* (Lyon).  
*Melocrinus oblongus* Waehsmuth and Springer.  
*Meristina maria* (Hall).  
*Michelinia louisvillensis* Greene.  
*Michelinia niagarensis* Davis.  
*Michelinia prima* Davis.  
*Nucleospira elegans?* Hall.  
*Nucleospira pistiformis* Hall.  
*Omphyma verrucosa* Rafinesque and Clifford.  
*Orthis flabellites* Foerste.  
*Orthis nettelrothi* Foerste.  
*Orthis(?) rugiplicata* Hall and Whitfield.  
*Orthis submodosa* Hall.  
*Orthostrophia* (*Schizoramma*) *nisis* (Hall and Whitfield).  
*Pachydictya crassa* (Hall).  
*Pentamerus cylindricus* Hall and Whitfield.  
*Pentamerus oblongus* Sowerby.  
*Pentamerus pergibbosus* Hall and Whitfield.  
*Plasmodora follis* Edwards and Haime.  
*Platyceras unguiforme* Hall.

- Pleurotomaria casii* Meek and Worthen.  
*Poleumita rugacincta* (Hall and Whitfield).  
*Ptychophyllum benedicti* Greene.  
*Ptychophyllum fulcratum* Hall.  
*Ptychophyllum invaginatum* Davis.  
*Ptychophyllum ipomaea* Davis.  
*Ptychophyllum stokesi* Edwards and Haime.  
*Reticularia dubia* (Nettelroth).  
*Rhipidomella hybrida* (Sowerby).  
*Rhynchonella* (?) *bellaforma* Nettelroth.  
*Rhynchonella rugicosta* Nettelroth.  
*Rhynchospira* (?) *hclena* (Nettelroth).  
*Rhynchotreta americana* (Hall).  
*Rhynchotreta cuneata americana* Hall.  
*Romingeria uva* Davis.  
*Romingeria vannula* Davis.  
*Schuchertella subplana* (Conrad).  
*Schuchertella tenuis* (Hall).  
*Spirifer* (*Delthyris*) *crispus simplex* (Hall).  
*Spirifer* (*Eospirifer*) *eudora* (Hall).  
*Spirifer* (*Eospirifer*) *foggi* (Hall).  
*Spirifer* (*Eospirifer*) *radiatus* (Sowerby).  
*Spirifer* (*Eospirifer*) *rostellum* (Hall and Whitfield).  
*Streptelasma conulus* Rominger.  
*Streptelasma patula* Rominger.  
*Streptelasma spongazis* Rominger.  
*Striatopora huronensis* Rominger.  
*Stricklandinia* (?) *louisvillensis* Nettelroth.  
*Strombodes incertus* Davis.  
*Strombodes mamillaris* (Owen).  
*Strombodes pentagonus* Goldfuss.  
*Strombodes pygmaeus* Rominger.  
*Strombodes quadrangularis* Davis.  
*Strombodes separatus* Ulrich.  
*Strombodes sinemurus* Davis.  
*Strombodes striatus* (D'Orbigny).  
*Strombodes unicus* Davis.  
*Stropheodonta profunda* (Hall).  
*Strophonella costatula* Hall and Clarke.  
*Strophonella striata* (Hall).  
*Strophostylus cancellatus* (Hall).  
*Syringopora* (*Drymopora*) *fascicularis* (Davis).  
*Syringopora fibrata* Rominger.  
*Thecia major* Rominger.  
*Thecia minor* Rominger.  
*Trochonema fatuum* Hall.  
*Troostocrinus reinwardti* (Troost).  
*Uncinulus stricklandi* (Sowerby).  
*Uncinulus tennesseensis* (Roemer).  
*Whitfieldella nitida* (Hall).  
*Wilsonia saffordi* (Hall).  
*Wilsonia saffordi depressa* (Nettelroth).  
*Wilsonia wilsoni* (Sowerby).  
*Zaphrentis obliqua* Davis.  
*Zaphrentis scutella* Davis.  
*Zaphrentis socialis* Davis.  
*Zaphrentis subvesicularis* Hall.  
*Zaphrentis umbonata* Rominger.
- NIAGARAN (BROWNSPORT) OF WEST TENNESSEE.
- Allocrinus typus* Wachsmuth and Springer.  
*Alveolites inornatus* Foerste.  
*Alveolites louisvillensis* Davis.  
*Alveolites undosus* Müller.  
*Amplexus shumardi* (Edwards and Haime).  
*Anisophyllum ogassizi* Edwards and Haime.  
*Anomoclonella zitteli* Rauff.  
*Asaphocrinus bassleri* Springer.  
*Astræospongia meniscus* (Roemer).  
*Astylospongia imbricato-articulata* (Roemer).  
*Astylospongia præmorsa* Goldfuss.  
*Atrypa arctostriata* (Foerste).  
*Atrypa marginalis* (Dalman).  
*Atrypa reticularis* Linnaeus.  
*Atrypa reticularis niagarensis* Nettelroth.  
*Aulopora roemeri* Foerste.  
*Bilobites bilobus* Linnaeus.  
*Bucanospira expansa* Ulrich.  
*Calceola* (*Rhizophyllum*) *tennesseensis* Roemer.  
*Callicrinus ramifer* (Roemer).  
*Calymene niagarensis* Hall.  
*Camarotoechia lindencensis* Foerste.  
*Carpomanon glandulosum* Rauff.  
*Carpomanon stellatimulcatum* (Roemer).  
*Carpomanon stellatimulcatum distorta* Rauff.  
*Caryocrinites bulbulus* (Miller and Gurley).  
*Caryocrinites globosus* (Troost).  
*Caryocrinites milliganæ* (Miller and Gurley).  
*Caryomanon incisolobatum* Roemer.  
*Caryomanon patci* Foerste.  
*Caryomanon roemeri* Rauff.  
*Chcirurus niagarensis* (Hall).  
*Chiastoclonella headi* Rauff.  
*Chonophyllum* (*Craterophyllum*) *vulcanius* Foerste.  
*Cladopora complanata* Davis.  
*Cladopora reticulata* Hall.  
*Climacospongia radiata* Hinde.  
*Clisophyllum danianum* Edwards and Haime.  
*Cococrinus bacca* Roemer.  
*Cococrinus conicus* Troost.  
*Colospira saffordi* (Foerste).  
*Cœnites verticillatus* (Winchell and Marcy).  
*Conchidium knappi* (Hall and Whitfield).  
*Conchidium legocense* Foerste.  
*Conchidium lindencense* Foerste.  
*Conchidium littoni* (Hall).  
*Conchidium nysius* (Hall and Whitfield).  
*Cyathocrinus brittsi* Miller and Gurley.  
*Cyathocrinus globosus* (Troost).  
*Cyathophyllum bullatum* Hall.  
*Cyathospongia exrescens* Hall.  
*Cyrtia cliftonensis* Foerste.  
*Cystocrinus tennesseensis* Roemer.  
*Dalmanella arcuaria* Hall and Clarke.  
*Dalmanella elegantula* (Dalman).  
*Dendroclonella rugosa* Rauff.  
*Diaphorostoma brownsportense* (Foerste).  
*Diaphorostoma niagarensis* (Hall).  
*Dictyonella concinna* Hall.  
*Dictyonella gibbosa* Hall.  
*Dimerocrinus milliganæ* Miller and Gurley.  
*Dimerocrinus roemeri* (Troost).  
*Diphyphyllum proliferum* Foerste.  
*Ditæcholasma fanninganum* (Safford).  
*Eutelasma waynense* (Safford).  
*Eridophyllum proliferum* Foerste.  
*Erisocrinus?* *bipartitus* (Troost).  
*Eucalyptocrinus extensus* (Troost).  
*Eucalyptocrinus gibbosus* (Troost).  
*Eucalyptocrinus goldfussi* (Troost).  
*Eucalyptocrinus lindahli* Wachsmuth and Springer.  
*Eucalyptocrinus milliganæ* Miller and Gurley.  
*Eucalyptocrinus nashville* (Troost).  
*Eucalyptocrinus ovalis* Hall.  
*Eucalyptocrinus phillipsi* (Troost).

- Eucalyptocrinus ventricosus* Wachsmuth and Springer.  
*Favosites cristatus* Edwards and Haime.  
*Favosites cristatus major* Davis.  
*Favosites discoideus* (Roemer).  
*Favosites discus* Davis.  
*Favosites favosus* (Goldfuss).  
*Favosites louisvillensis* Davis.  
*Favosites niagarcensis* Hall.  
*Favosites obpyriformis* Foerste.  
*Fenestella acuticosta* Roemer.  
*Fistulipora hemispherica* (Roemer).  
*Gazacrinus milliganæ* (Miller and Gurley).  
*Gnoriocrinus cirrifer* Springer.  
*Gnoriocrinus varians* Springer.  
*Gypidula (Sieberella) roemeri* (Hall and Clarke).  
*Hallopora elegans* (Hall).  
*Halysites catenularia* Linnaeus.  
*Halysites labyrinthicus* Goldfuss.  
*Haplocrinus granulatus* (Troost).  
*Haplocrinus maximus* (Troost).  
*Haplocrinus ovalis* (Troost).  
*Heliolites interstinctus* (Linnaeus).  
*Heliolites subtubulatus* McCoy.  
*Heliophyllum pogramensis* Foerste.  
*Hindia spheroidalis* Duncan.  
*Homæospira beecheri* Foerste.  
*Homæospira pisum* Foerste.  
*Homæospira schucherti* Foerste.  
*Homæospira schucherti elongata* Foerste.  
*Laccophyllum acuminatum* Simpson.  
*Lamptrocrinus tennesseensis* Roemer.  
*Lecanocrinus meniscus* Springer.  
*Lecanocrinus pisiformis* (Roemer).  
*Leptæna rhomboidalis* (Wilckens).  
*Lycellia discoidea* Davis.  
*Lycellia glabra* (Owen).  
*Lycellia puella* Davis.  
*Marsipocrinus corrugatus* (Troost).  
*Marsipocrinus magnificus* (Troost).  
*Marsipocrinus pentagonalis* (Troost).  
*Marsipocrinus rosæformis* (Troost).  
*Marsipocrinus stellatus* (Troost).  
*Marsipocrinus striatus* (Troost).  
*Marsipocrinus tennesseensis* (Roemer).  
*Marsipocrinus vcrnaulti* (Troost).  
*Melocrinus oblongus* Wachsmuth and Springer.  
*Melocrinus roemeri* Wachsmuth and Springer.  
*Merista tennesseensis* Hall and Clarke.  
*Meristina maria roemeri* Foerste.  
*Nucleospira concentrica* Hall.  
*Omphyma verrucosa* Rafinesque and Clifford.  
*Ormocrinus tennesseensis* (Worthen).  
*Orthoceras defranci* Troost.  
*Orthostrophia dizoni* Foerste.  
*Orthostrophia (Schizoramia) fissiplica* (Roemer).  
*Pachydictya crassa* (Hall).  
*Palæomanon cratera* (Roemer).  
*Palæomanon pleurixcavatum* (Rauff).  
*Palæomanon verrucosum* (Rauff).  
*Palæomanon verrucosum bullifera* (Rauff).  
*Pentamerus oblongus* Sowerby.  
*Perichocrinus dubius* Wood.  
*Perichocrinus gorbyi* (Miller).  
*Perichocrinus tennesseensis* (Hall).  
*Pisocrinus quinquelobus* Bather.  
*Plasmopora foliis* Edwards and Haime.  
*Platyaxum pogramense* (Foerste).  
*Platyaxum planostiolatum* (Foerste).  
*Platyaxum platys* Foerste.  
*Platyaxum niagarcense* (Hall).  
*Protaxocrinus robustus* Springer.  
*Ptychophyllum vulcanus* Foerste.  
*Pycnopegma callosum* Rauff.  
*Pycnopegma pilcum* Rauff.  
*Pycnopegma stromatoporoides* Rauff.  
*Pycnosuccus dubius* Springer.  
*Pycnosuccus welleri* Springer.  
*Reticularia pogramensis* Foerste.  
*Rhipidomella hybrida* (Sowerby).  
*Rhipidomella lenticularia* Foerste.  
*Rhipidomella saffordi* Foerste.  
*Sagenocrinus clarki* Springer.  
*Schuchertella pecten* (Roemer).  
*Schuchertella roemeri* (Foerste).  
*Schuchertella subplana* (Conrad).  
*Sidrocrinus ornatus* (Troost) Wood.  
*Sphærocichus romingri* Hall.  
*Spirifer (Delthyris) crispus* (Hisinger).  
*Spirifer (Eospirifer) foggi* (Nettelroth).  
*Spirifer (Eospirifer?) geronticus* (Foerste).  
*Spirifer (Eospirifer) niagarcensis oligoptychus* (Roemer).  
*Spirifer (Eospirifer) radiatus* (Sowerby).  
*Spirifer (Delthyris) saffordi* (Hall).  
*Strombodes mamillaris* (Owen).  
*Strombodes pentagonus* Goldfuss.  
*Strombodes striatus* D'Orbigny.  
*Strophonella dizoni* Foerste.  
*Strophonella ganti* Foerste.  
*Strophonella laxiplicata* Foerste.  
*Strophonella prolongata* Foerste.  
*Strophonella roemeri* Foerste.  
*Strophonella semifasciata brownportensis* Foerste.  
*Strophonella tenuistriata* Foerste.  
*Strophostylus tennesseensis* (Roemer).  
*Synbathocrinus granulatus* (Troost).  
*Synbathocrinus tennesseensis* (Roemer).  
*Synbathocrinus troosti* (Wood).  
*Tetracystis fenestrata* Schuchert.  
*Thalamocrinus cylindricus* Miller and Gurley.  
*Thalamocrinus ovatus* Miller and Gurley.  
*Thecia major* Rominger.  
*Thecia minor* Rominger.  
*Trematospira simplex* Hall.  
*Troostocrinus reinwardti* (Troost).  
*Uncinulus stricklandi* (Sowerby).  
*Ucinulus tennesseensis* (Roemer).  
*Wilsonia saffordi* (Hall).

UPPER NIAGARAN OF NEW YORK, ONTARIO, AND WISCONSIN.

(Guelph and Shelby=G; Lockport=L, excluding the Gasport and Shelby members; Gasport member=Gas.)

- Actinoceras abnorme* Hall. (G.)  
*Actinostroma vulcana* Parks. (G.)  
*Actinostroma whitavesi niagarcense* Parks. (L.)  
*Alveolites niagarcensis* Nicholson and Hinde. (L.)  
*Alveolites thordalcensis* Parks. (L.)  
*Amphicalia costata* (Hall and Whitfield). (G.)  
*Amphicalia neglecta* (McChesney). (G.)  
*Amplexus whitfieldi* Miller. (G.)  
*Anodontopsis concinna* Whiteaves. (G.)  
*Archinacella canadensis* (Whiteaves). (G.)

- Ascoceras townsendi* Whiteaves. (G.)  
*Atypha reticularis* Linnaeus. (G.)  
*Avicula triquetra* Hall. (G.)  
*Bellerophon schlbienensis* Clarke and Ruedemann. (G.)  
*Bumastus iorus* Hall. (G.)  
*Callicrinus acanthinus* Ringueberg. (Gas.)  
*Calymene niagarensis* Hall. (G.)  
*Camarotoechia(?) indianensis* (Hall). (G.)  
*Camarotoechia neglecta* (Hall). (G.)  
*Camarotoechia pisa* Hall and Whitfield. (G.)  
*Cheirurus niagarensis* (Hall). (G.)  
*Cladopora caespitosa* Hall. (L.)  
*Cladopora cervicornus* Hall. (L.)  
*Cladopora fibrosa* Hall. (Gas.)  
*Cladopora macrophora* Hall. (L.)  
*Cladopora multipora* Hall. (L.)  
*Cladopora scriata* Hall. (L.)  
*Clathrodictyon fastigiatum* Nicholson. (G.)  
*Clathrodictyon ostiolatum* (Nicholson). (G.)  
*Clathrospira dciopcia* (Billings). (G.)  
*Clorinda ventricosa* (Hall). (G.)  
*Calocaulis bivittatus* (Hall). (G.)  
*Calocaulis estella* (Billings). (G.)  
*Calocaulis longispirus* (Hall). (G.)  
*Calocaulis macrospirus* (Hall). (G.)  
*Calocaulis turritiformis* (Hall). (G.)  
*Calocaulis vitellia* (Billings). (G.)  
*Canites fruticosus* (?Steinger) Hall. (L.)  
*Canites juniperinus* Eichwald. (L.)  
*Canites laminatus* (Hall). (L.)  
*Canites ramulosus* (Hall). (L.)  
*Conchidium multicostratum* (Hall). (G.)  
*Conchidium obsoletum* Hall and Clarke. (G.)  
*Conchidium occidentale* Hall. (G.)  
*Conchidium scoparium* Hall and Clarke. (G.)  
*Condonochilus striatum* Whiteaves. (G.)  
*Cornulites arcuatus* Conrad. (L., G.)  
*Cyathophyllum thoroidense* Lambe. (L.)  
*Cyclostomiceras(?) brevicorne* (Hall). (G.)  
*Cyclostomiceras orodes* (Billings). (G.)  
*Cyrtoceras bovinum* Clarke and Ruedemann. (G.)  
*Cyrtoceras clitus* Billings. (L.)  
*Cyrtoceras corydon* Billings. (L.)  
*Cyrtoceras rectum* Whitfield. (G.)  
*Cyrtorizoeceras curvicameratum* Clarke and Ruedemann. (L., G.)  
*Cyrtospira ventricosa* (Hall). (G.)  
*Cystiphyllum niagarensis* (Hall). (L.)  
*Cystostylus infundibulus* (Whitfield). (G.)  
*Dalmanella elegantula* Dalman. (L., G.)  
*Dawsonoceras annulatum* (Sowerby). (G.)  
*Dcltucinus contractus* (Ringueberg). (Gas.)  
*Dendrocrinus? nodobrachiatus* Ringueberg. (Gas.)  
*Dia-phorostoma niagarensis* (Hall). (G.)  
*Dimeroctinus lockportensis* (Ringueberg). (Gas.)  
*Diphyphyllum caespitosum* (Hall). (L., G.)  
*Diphyphyllum multicaulis* Hall.  
*Discoceras graftonense* Meek and Worthen. (G.)  
*Discoceras ortoni* (Meek). G.  
*Eceytiomphalus circinatus* (Whiteaves). (G.)  
*Encrinurus ornatus* Hall and Whitfield. (G.)  
*Endoceras hudsonicum* Parks. (G.)  
*Entroasma caliculus* (Hall). (G.)  
*Eotomaria areyi* Clarke and Ruedemann. (G.)  
*Eotomaria durhamensis* (Whiteaves). (G.)  
*Eotomaria galtensis* (Billings). (G.)  
*Eotomaria kayscri* Clarke and Ruedemann. (G.)  
*Eucalyptocrinus inconspicuus* Ringueberg. (L.)  
*Eucalyptocrinus muralis* Ringueberg. (Gas.)  
*Eucalyptocrinus proboscidealis* Miller. (G.)  
*Eucalyptocrinus splendidus* Hall and Whitfield. (G.)  
*Euomphalopterus clora* (Billings). (G.)  
*Euomphalopterus halci* (Hall). (G.)  
*Euomphalopterus tyrrelli* Parks. (G.)  
*Euomphalopterus valeria* (Billings). (G.)  
*Euomphalopterus veluris* Whiteaves. (G.)  
*Euomphalus fairchildi* Clarke and Ruedemann. (G.)  
*Euomphalus galtensis* Whiteaves. (G.)  
*Euomphalus inornatus* (Whiteaves). (G.)  
*Eurypterus (Tylopterus) boycei* (Whiteaves). (G.)  
*Favosites forbesi* Edwards and Haime. (L., G.)  
*Favosites hisingeri* Edwards and Haime.  
*Favosites niagarensis* Hall. (L., G.)  
*Favosites occidentis* Whitfield. (G.)  
*Favosites pyriformis* (Hall). (L.)  
*Gomphocystites tenax* Hall. (L.)  
*Goniophora crassa* Whiteaves. (G.)  
*Gyroceras farcimen* Clarke and Ruedemann. (G.)  
*Halysites agglomerata* Hall. (L., G.)  
*Halysites catenularia* Linnaeus. (L., G.)  
*Halysites catenularia micropora* (Whitfield). (G.)  
*Halysites compactus* Rominger. (G.)  
*Heliolites elegans* Hall. (L.)  
*Heliolites interstinclus* Linnaeus.  
*Heliolites pyriformis* Guettard. (L.)  
*Heliolites spiniporus* Hall. (L.)  
*Hermatostroma guelphica* Parks. (G.)  
*Heterocystites armatus* Hall. (L.)  
*Hicameroceras hertzcri* (Hall and Whitfield). (G.)  
*Holopea gracia* Billings. (G.)  
*Holopea guelphensis* Billings. (G.)  
*Holopea harmonia* Billings. (G.)  
*Holopea magnifica* Whitfield. (G.)  
*Holopea? occidentalis* Nicholson. (G.)  
*Hormotoma patriciense* Parks. (G.)  
*Hormotoma whiteavecsi* Clarke and Ruedemann. (G.)  
*Ichthyocrinus conoides* Ringueberg. (Gas.)  
*Illæus aboymensis* Whiteaves. (G.)  
*Illæus springfieldensis* Meek. (G.)  
*Illionia canadensis* Billings. (G.)  
*Illionia? costulata* Whiteaves. (G.)  
*Ischadites canadensis* Billings.  
*Kionoceras darwini* Billings. (G.)  
*Kionoceras striz* (Hall and Whitfield). (G.)  
*Labecchia durhamensis* Parks. (G.)  
*Labecchia minor* Parks. (G.)  
*Lecioptria subplana* (Hall). (G.)  
*Leperditia balthica guelphica* Jones. (G.)  
*Liospira perlata* (Hall). (G.)  
*Lophospira bispiralis* (Hall). (G.)  
*Lophospira? chamberlini* (Whitfield). (G.)  
*Lophospira conradi* (Hall). (G.)  
*Lophospira guelphica* Whiteaves. (G.)  
*Lophospira hesperensis* (Whiteaves). (G.)  
*Lophospira mylitta* (Billings). (G.)  
*Lophospira zanthippe* (Billings). (G.)  
*Lozonema boydi* Hall. (G.)  
*Lozonema(?) magnum* Whitfield. (G.)  
*Lozoplocus solutus* (Whiteaves). (G.)

- Mælonoceras arcticameratum* (Hall). (G.)  
*Marsiporinus præmaturus* (Hall and Whitfield). (G.)  
*Megalomus canadensis* Hall. (G.)  
*Megalomus compressus* Nicholson and Hinde. (G.)  
*Melocrinus sculptus* (Hall). (L.)  
*Modiomorpha acuminata* Parks. (G.)  
*Monomorcella durhamensis* Whiteaves. (G.)  
*Monomorcella egani* Hall and Clarke. (G.)  
*Monomorcella greenii* Hall and Clarke. (G.)  
*Monomorcella newberryi* Hall and Whitfield. (G.)  
*Monomorcella noveboracum* Clarke and Ruedemann. (G.)  
*Monomorcella orbicularis* Billings. (G.)  
*Monomorcella ortoni* Hall and Clarke. (G.)  
*Monomorcella ovata* Whiteaves. (G.)  
*Monomorcella ovata lata* Whiteaves. (G.)  
*Monomorcella prisca* Billings. (G.)  
*Murchisonia?*? *billingsana* Miller. (G.)  
*Mytilarca acutirostris* (Hall). (G.)  
*Oncoceras pettiti* Billings. (L.)  
*Oncoceras teucer* Billings. (L.)  
*Orthoceras brontes* Billings. (L.)  
*Orthoceras cartonensis* Whitfield. (G.)  
*Orthoceras oberon* Billings. (L.)  
*Orthoceras pylades* Billings. (L.)  
*Orthoceras rectum* Worthen. (G.)  
*Orthoceras remsi* Billings. (L.)  
*Orthoceras schuyli* Billings. (G.)  
*Orthoceras subæve* D'Orbigny. (G.)  
*Orthoceras varro* Billings. (L.)  
*Pentamerus oblongus bisinuat* (McChesney). (G.)  
*Pericchoerinus speciosus* (Hall). (L.)  
*Phanerotrema occidens* (Hall). (G.)  
*Phragmoceras hector* Billings. (G.)  
*Phragmoceras nestor canadense* Whiteaves. (G.)  
*Phragmoceras parvum* (Hall and Whitfield). (G.)  
*Phragmoceras whitneyi* Parks. (G.)  
*Pleurotomaria cyclostoma* Whiteaves. (G.)  
*Pleurotomaria townsendii* Whiteaves. (G.)  
*Polemia ercunata* (Whiteaves). (G.)  
*Polemia durhamensis* (Whiteaves). (G.)  
*Polemia hudsonica* Parks. (G.)  
*Polemia macrolincata* (Whitfield). (G.)  
*Polemia parvula* (Whiteaves). (G.)  
*Polemia scannata* Clarke and Ruedemann. (G.)  
*Polemia? sulcata* (Hall). (G.)  
*Polemia viola* (Billings). (G.)  
*Potrioceras sauridens* Clarke and Ruedemann. (G.)  
*Prolocina gattensis* (Whiteaves). (G.)  
*Protokionoceras crebescens* Hall. (G.)  
*Protokionoceras medullare* (Hall). (G.)  
*Protokionoceras trusitum* (Clarke and Ruedemann). (G.)  
*Protophragmoceras patronus* Clarke and Ruedemann. (G.)  
*Pterinea bradti* Grabau. (G.)  
*Pterinea undata* (Hall). (G.)  
*Pycnomphalus solarioides* (Hall). (G.)  
*Pycnostylus elegans* Whiteaves. (G.)  
*Pycnostylus guelpheensis* Whiteaves. (G.)  
*Rhinobolus gattensis* (Billings). (G.)  
*Rhipidomella hybrida* (Sowerby). (L., G.)  
*Rhynchotreta cuneata americana* Hall. (L.)  
*Rosenella glencensis* Parks. (G.)  
*Scenella conica* Whiteaves. (G.)  
*Schizotreta tenuilamellata* (Hall). (L.)  
*Septamroceras septore* (Hall). (G.)  
*Spirifer (Delthyris) crispus* (Hisinger). (G.)  
*Spirifer (Eospirifer) radiatus* (Sowerby). (G.)  
*Stictopora graminifolia* Ringueberg. (Gas.)  
*Straparollina daphne* (Billings). (G.)  
*Straparollus hippolyta* Billings. (G.)  
*Straparollus niagarensis* Hall and Whitfield. (G.)  
*Streptoceras heros* Billings. (L.)  
*Streptoceras janus* Billings. (L.)  
*Streptomylus eduliformis* Clarke and Ruedemann. (G.)  
*Stricklandinia multilirata* Whitfield. (G.)  
*Stromatopora antiqua* (Nicholson and Murie) (L., G.)  
*Stromatopora gattensis* Dawson. (G.)  
*Stromatoporella clora* Parks. (G.)  
*Stromatoporella clora minuta* Parks. (G.)  
*Subulites compactus* Whiteaves. (G.)  
*Subulites tercbriiformis* Hall and Whitfield. (G.)  
*Tremanotus alpheus* (Hall). (G.)  
*Tremanotus angustatus* Hall. (G.)  
*Tremanotus? trigonostoma* Hall and Whitfield. (G.)  
*Trimerella acuminata* Billings. (G.)  
*Trimerella billingsi* Dall. (G.)  
*Trimerella dalli* Davidson and King. (G.)  
*Trimerella grandis* Billings. (G.)  
*Trimerella ohioensis* Meek. (G.)  
*Trochoceras costatum* (Hall). (G.)  
*Trochoceras desplatense* McChesney. (G.)  
*Trochonema fatuum* (Hall). (G.)  
*Trochonema pauper ohioense* Hall and Whitfield. (G.)  
*Troostocrinus subcylindricus* (Hall and Whitfield). (G.)  
*Turritoma boylei* (Nicholson). (G.)  
*Turritoma constricta* (Whiteaves). (G.)  
*Tyrellia severnensis* Parks. (G.)  
*Whitfieldella hyale* (Billings). (G.)  
*Whitfieldella nitida* (Hall). (G., L.)  
*Zaphrentis racinensis* Whitfield. (G.)  
*Zaphrentis turbinata* (Hall). (L.)

NIAGARAN (RACINE) OF ILLINOIS AND WISCONSIN.

- Achrodocrinus patulus* Sloeom.  
*Acidaspis vanhorni* Weller.  
*Actinoceras abnorme* (Hall).  
*Ambonychia undulata* (Whitfield).  
*Amphristocrinus dubius* Weller.  
*Amphicelia leidyi* Hall.  
*Amphicelia neglecta* (McChesney).  
*Amplexus fenestratus* Whitfield.  
*Amplexus shumardi* (Edwards and Halme).  
*Ancistroceras? ayeri* Hyatt.  
*Anistrophia interplicata* Hall.  
*Archæocrinus depressus* Weller.  
*Arctinurus chicagocensis* Weller.  
*Arctinurus occidentalis* (Hall).  
*Atrypa nodostriata* Hall.  
*Atrypa reticularis* Linnaeus.  
*Botryocrinus polyzo* Hall.  
*Bumastus armatus* (Hall).  
*Bumastus chicagocensis* (Weller).  
*Bumastus cuniculatus* (Hall).  
*Bumastus grafftonensis* Meek and Worthen.  
*Bumastus harrisi* (Weller).  
*Bumastus imperator* (Hall).  
*Bumastus insignis* (Hall).

- Bumastus iozus* Hall.  
*Bumastus niagarensis* (Whitfield).  
*Callierinus bifurcatus* Weller.  
*Callierinus bilobus* (Weller).  
*Callierinus cornutus* (Hall)  
*Callierinus corrugatus* (Weller)  
*Callierinus desideratus* Weller.  
*Callierinus digitatus* (Weller).  
*Callierinus hydei* (Weller).  
*Callierinus longispinus* Weller.  
*Callierinus pentangularis* Weller.  
*Calymene niagarensis* Hall.  
*Camarotoechia* (?) *indianensis* (Hall).  
*Camarotoechia neglecta* (Hall).  
*Capellina mira* Hall and Clarke.  
*Caryocrinites ornatus* (?) Say.  
*Ceratoccephala goniatata* Warder.  
*Cheirus hydei* (Weller).  
*Chicirus niagarensis* (Hall).  
*Chicagocrinus inornatus* Weller.  
*Chicagocrinus ornatus* Weller.  
*Cladopora lichenoides* Winchell and Marcy.  
*Cladopora reticulata* Hall.  
*Clidophorus chicagocensis* Miller).  
*Clorinda arcuosa* (McChesney).  
*Clorinda ventricosa* (Hall).  
*Calocystis subglobosus* (Hall).  
*Conites verticillatus* (Winchell and Marcy).  
*Conchidium crassoradii* (McChesney).  
*Conchidium greenei* Hall and Clarke.  
*Conchidium multicostratum* (Hall).  
*Conocardium niagarensis* Winchell and Marcy.  
*Conocardium ornatum* Winchell and Marcy.  
*Corydocephalus phlyctainoides* (Green).  
*Corymaocrinus chicagocensis* Weller.  
*Corymbocrinus niagarensis* Weller  
*Crinocystites chrysalis* Hall.  
*Crinocystites* (?) *rectus* (Hall).  
*Crotalocrinus cora* (Hall).  
*Crotalocrinus* (?) *vanhorni* (Miller).  
*Cyathocrinus turbinatus* Weller.  
*Cyclonema* (?) *elevatum* Hall.  
*Cyclostomiceras* (?) *brevicorne* (Hall).  
*Cyphocrinus chicagocensis* Weller.  
*Cypricardinia arata* Hall.  
*Cypricardites* (?) *quadriatera* Hall.  
*Cyria mcta* (Hall).  
*Cyrtoceras infundibulum* Whitfield.  
*Cyrtoceras laterale* Hall.  
*Cyrtoceras lucillum* Hall.  
*Cyrtoceras pusillum* Hall.  
*Cyrtoceras rigidum* Hall.  
*Cyrtorizoceras dardanum* (Hall).  
*Cyrtorizoceras fosteri* (Hall).  
*Cystiphyllum niagarensis* Hall.  
*Cystostylus infundibulum* (Whitfield).  
*Cystostylus typicus* Whitfield.  
*Dalmanella elegantula* (Dalman).  
*Dalmanites arkansanus* Van Ingen.  
*Dalmanites illinoiensis* Weller.  
*Dalmanites platycaudatus* Weller.  
*Dalmanites vigilans* Hall.  
*Daresonoceras annulatum* (Sowerby).  
*Deiphon americanus* Weller.  
*Diaphorostoma niagarensis* (Hall).  
*Dicranopeltis decipiens* (Winchell and Marcy).  
*Dicranopeltis nasuta* Weller.  
*Dicranopeltis telleri* Weller.  
*Dimicrocrinus campanulatus* Slocum.  
*Dimicrocrinus egani* (Miller).  
*Dimicrocrinus halli* (Lyon).  
*Dimicrocrinus occidentalis* (Hall).  
*Dimerocrinus pentangularis* (Hall).  
*Dinobolus conradi* (Hall).  
*Diphyphyllum caespitosum* (Hall).  
*Edmondia* (?) *nilesi* Winchell and Marcy.  
*Encrinurus egani* Miller.  
*Encrinurus nereus* Hall.  
*Encrinurus ornotus* Hall and Whitfield.  
*Encrinurus tuberculifrons* Weller.  
*Entroclasma calcicum* (Hall).  
*Eotomaria laphami* (Whitfield).  
*Eucalyptocrinus asper* Weller.  
*Eucalyptocrinus crassus* Hall.  
*Eucalyptocrinus depressus* Miller.  
*Eucalyptocrinus egani* (Miller).  
*Eucalyptocrinus inornatus* Weller.  
*Eucalyptocrinus magnus* Worthen.  
*Eucalyptocrinus nodulosus* Weller.  
*Eucalyptocrinus obconicus* Hall.  
*Eucalyptocrinus ornatus* Hall.  
*Eucalyptocrinus rotundus* Miller.  
*Eucalyptocrinus turbinatus* Miller.  
*Euomphalopterus halei* (Hall).  
*Favosites favosus* Goldfuss.  
*Favosites hisingeri* Edwards and Haime.  
*Favosites niagarensis* Hall.  
*Gazacrinus major* Weller.  
*Gazacrinus minor* Weller.  
*Goldius acamas* (Hall).  
*Goldius laphami* (Whitfield).  
*Goldius ocellatus* (Winchell and Marcy).  
*Gomphoceras serinium* Hall.  
*Gomphocystites clausi* Hall.  
*Gomphocystites glans* Hall.  
*Gyrocceras bannisteri* Winchell and Marcy.  
*Habrocrinus benedicti* (Miller).  
*Habrocrinus farringtoni* Slocum.  
*Habrocrinus lemontensis* Slocum.  
*Hallia divergens* Hall.  
*Hallia pluma* Hall.  
*Hallicystis elongatus* (Jaekel).  
*Hallicystis imago* (Hall).  
*Halsytes agglomeratus* Hall.  
*Halsytes catenularia* (Linnaeus).  
*Halsytes catenularia micropora* (Whitfield).  
*Halsytes labyrinthicus* Goldfuss.  
*Harpes telleri* Weller.  
*Heliolites macrostylus* Hall.  
*Heliolites pyriformis* Gueitard.  
*Heliolites spiniferus* Hall.  
*Holocystites abnormis* Hall.  
*Holocystites alternatus* (Hall).  
*Holocystites cylindricus* (Hall).  
*Holocystites jolietensis* Miller.  
*Holocystites oratus* Hall.  
*Holocystites scutellatus* Hall.  
*Holocystites sphaericus* Winchell and Marcy.  
*Holocystites winchelli* Hall.  
*Holopea chicagocensis* Winchell and Marcy.  
*Holopea niagarensis* Winchell and Marcy.  
*Ichthyocrinus corbis* Winchell and Marcy.  
*Ichthyocrinus subangularis* Hall.  
*Ilseuroides triloba* Weller.

- Illanus transversalis* Weller.  
*Kionoceras cancellatum* (Hall).  
*Lamptrocrinus? dubius* Weller.  
*Lamptrocrinus inflatus* (Hall).  
*Lamptrocrinus robustus* Weller.  
*Lamptrocrinus? subglobosus* Weller.  
*Lecanocrinus pisiformis* (Roemer).  
*Lecanocrinus waukoma* (Hall).  
*Leptæna rhomboidalis* (Wilckens).  
*Lindströmia? columellata* (Hall).  
*Lindströmia wisconsinensis* (Whitfield).  
*Lophospira conradi* (Hall).  
*Lozonema leda* Hall.  
*Lyriocrinus melissa* (Hall).  
*Lyriocrinus sculpilis* Hall.  
*Lysocystites nodosus* (Hall).  
*Macrostylocrinus obconicus* Weller.  
*Macrostylocrinus semiradiatus* (Hall).  
*Macrostylocrinus striatus* Hall.  
*Macrostylocrinus subglobosus* Weller.  
*Marsipocrinus chicagocensis* (Weller).  
*Matheria recta* (Hall).  
*Mcloerinus obpyramidalis* (Winchell and Marcy).  
*Meristina maria* (Hall).  
*Meristina trisinuata* (McChesney).  
*Metopolichus pugnax* (Winchell and Marcy).  
*Modiolopsis dictæus* Hall.  
*Monomorella kingi* Hall and Clarke.  
*Mourlonia worthenana* (Miller).  
*Mylodactylus bridgeportensis* Miller.  
*Mytilarca acutirostra* (Hall).  
*Nautilus?? cancellatus* McChesney.  
*Nautilus?? capax* (Hall).  
*Odontopleura illinoisensis* Weller.  
*Oncoceras orcas* (Hall).  
*Orthis flabellites spania* Hall and Clarke.  
*Orthis(?) glypta* Hall and Clarke.  
*Orthoceras alienum* Hall.  
*Orthoceras camolare* McChesney.  
*Orthoceras crebristriatum* Meek and Worthen.  
*Orthoceras jolietense* Meek and Worthen.  
*Orthoceras niagarensis* Hall.  
*Orthoceras rectum* Worthen.  
*Orthoceras strixlineatum* McChesney.  
*Orthoceras subbaculum* Meek and Worthen.  
*Orthoceras wauwatoscense* Whitfield.  
*Orthotropia dolomitica* Hall and Clarke.  
*Palaocardia cordiformis* Hall.  
*Parastrophia grenci* Hall and Clarke.  
*Parastrophia latiplicata* Hall and Clarke.  
*Parastrophia multiplicata* Hall and Clarke.  
*Pentamerus bisiniatus* (McChesney).  
*Pentamerus oblongus* Sowerby.  
*Pentamerus pergibbosus* Hall and Whitfield.  
*Periechocrinus egani* (Miller).  
*Periechocrinus inflex* (Winchell and Marcy).  
*Periechocrinus marcouanus* (Winchell and Marcy).  
*Periechocrinus necis* (Winchell and Marcy).  
*Periechocrinus urniformis* (Miller).  
*Periechocrinus whitfieldi* (Hall).  
*Phacops handwerki* Weller.  
*Phanerotrema occidens* (Hall).  
*Phragmoceras hoyi* Whitfield.  
*Phragmoceras hoyi compressum* Whitfield.  
*Phragmoceras nestor* Hall.  
*Pisocrinus gemmiformis* Miller.  
*Pisocrinus quinquelobus* Bather.  
*Platyoceras senex* (Winchell and Marcy).  
*Platycrinus augusta* Slocum.  
*Platycrinus? dubius* Weller.  
*Plectambonites transversalis* Dalman.  
*Pleurotomaria azion* Hall.  
*Pleurotomaria casc* Meek and Worthen.  
*Pleurotomaria cyclonemoides* Meek and Worthen.  
*Pleurotomaria gonopleura* Winchell and Marcy.  
*Pleurotomaria hoyi* Hall.  
*Pleurotomaria? idia* Hall.  
*Pleurotomaria sigaretoides* Winchell and Marcy.  
*Pratus? handwerki* Weller.  
*Protokionoceras ercbescens* Hall.  
*Protokionoceras medullare* (Hall).  
*Protophragmoceras hercules* Winchell and Marcy.  
*Pterinea brisa* Hall.  
*Pterinea cyrtodontoidea* Winchell and Marcy.  
*Pterinea striacosta* (McChesney).  
*Pterinea rotans* Winchell and Marcy.  
*Ptychophyllum floriforme* Hall.  
*Ptychophyllum stokesi* Edwards and Haima.  
*Pyenosaccus americanus* Weller.  
*Raphistoma?? niagarensis* Whitfield.  
*Receptaculites hemisphericus* (Hall).  
*Receptaculites tessellatus* (Winchell and Marcy).  
*Rhipidomella hybrida* (Sowerby).  
*Rhombopteria (Newsomella) revoluta* (Winchell and Marcy).  
*Rhynchotrema cuneata americana* Hall.  
*Scplameoceras septore* (Hall).  
*Schuchertella subplana* (Conrad).  
*Siphonocrinus armosus* (McChesney).  
*Siphonocrinus pentagonus* Wachsmuth and Springer.  
*Spharerochus romingeri* Hall.  
*Spirifer (Eospirifer) eudora* (Hall).  
*Spirifer (Eospirifer) gibbosus* (Hall).  
*Spirifer (Eospirifer) nobilis* (Barrande).  
*Spirifer (Eospirifer) radiatus* (Sowerby).  
*Spirifer? similis* (Winchell and Marcy).  
*Stephanocrinus gemmiformis* Hall.  
*Stephanocrinus obconicus* Slocum.  
*Stephanocrinus osgoodensis* Miller.  
*Stephanocrinus skiffi* Slocum.  
*Straparollus mopsus* Hall.  
*Staurocephalus obsoletus* Weller.  
*Streptelasma? extans* Hall.  
*Streptelasma? limitare* Hall.  
*Streptomylus aphæa* (Hall).  
*Strombosus pentagonus* Goldfuss.  
*Strophodonta macra* (Winchell and Marcy).  
*Strophodonta profunda* (Conrad).  
*Strophonella semifasciata* (Hall).  
*Strophonella striata* (Hall).  
*Subulites brevis* Winchell and Marcy.  
*Subulites gracilis* Miller.  
*Syringopora compacta* Billings.  
*Syringopora dalmani* Billings.  
*Syringopora rectiformis* Billings.  
*Syringopora verticillata* Goldfuss.  
*Thalcoops pteroccephalus* (Whitfield).  
*Tremanotus alpheus* (Hall).  
*Tremanotus chicagocensis* (McChesney).  
*Tremanotus crassolaris* (McChesney).  
*Tremanotus perovolutus* (McChesney).  
*Tripletia niagarensis* Hall and Clarke.  
*Trochoceras costatum* (Hall).



*Trochoceras desplainense* McChesney.  
*Trochoceras notum* Hall.  
*Trochonema fatuum* (Hall).  
*Trochonema pauper* (Hall).  
*Trochonema (Eunema) trilineatum* (Hall).  
*Turritoma lophami* (Hall).  
*Zaphrentis cristulata* Hall.  
*Zaphrentis racinensis* Whitfield.  
*Zaphrentis subrata* Hall.  
*Zophocrinus globosus* Slocum.  
*Zophocrinus howardi* Miller.  
*Zophocrinus pyriformis* Slocum.

## NIAGARAN (WAUKESHA) OF WISCONSIN.

(Lower Coral bed=L.; Upper Coral bed=U.)

*Amplexus fenestratus* Whitfield. (U.)  
*Atrypa reticularis* (Linnaeus). (U.)  
*Cladopora reticulata* Hall.  
*Clorinda ventricosa* (Hall). (L., U.)  
*Cornites lunatus* Nicholson and Hinde. (U.)  
*Cystiphyllum niagarense* (Hall). (U.)  
*Cystostylus typicus* Whitfield. (L., U.)  
*Dinobolus conradi* (Hall). (L.)  
*Diphyphyllum cæspitosum* (Hall.) (L., U.)  
*Discosorus conoideus* Hall. (L.)  
*Enterolasma calcitulum* (Hall). (U.)  
*Favosites farosus* Goldfuss. (L., U.)  
*Favosites hisingeri* Edwards and Haine. (L., U.)  
*Favosites niagarense* Hall. (L., U.)  
*Goldius acamas* (Hall). (U.)  
*Halysites agglomeratus* Hall. (L., U.)  
*Halysites catenularia* (Linnaeus). (L., U.)  
*Halysites catenularia micropora* Whitfield. (L., U.)  
*Heliolites pyriformis* Guettard. (U.)  
*Marchisonia billingsana* Miller. (L.)  
*Orthis fiabellites* Foerste. (U.)  
*Orthoceras alienum* Hall. (L.)  
*Pentamerus oblongus* Sowerby. (L., U.)  
*Pentamerus oblongus bisinuatus* (McChesney). (L., U.)  
*Phragmoceras labiatum* Whitfield. (L.)  
*Strombodes pentagonus* Goldfuss. (U.)  
*Syringopora compacta* Billings. (U.)  
*Syringopora dolmani* Billings. (L., U.)  
*Trematodus trigonostoma* (Hall and Whitfield). (L.)

## NIAGARAN OF LAKE HURON REGION.

(Mainly of Louisville age.)

*Actinoceras backi* (Stokes).  
*Actinoceras bayfieldi* (Stokes).  
*Actinoceras beaumonti* Castelneau.  
*Actinoceras beudanti* Castelneau.  
*Actinoceras blainvilliei* Castelneau.  
*Actinoceras cordieri* Castelneau.  
*Actinoceras dufrenoyi* Castelneau.  
*Actinoceras sphaeroidale* (Stokes).  
*Actinoceras whitei* (Stokes).  
*Actinostroma tenuifilatum* Parks.  
*Alveolites undosus* Miller.  
*Amplexus shumardi* (Edwards and Haine).  
*Blothrophyllum cæspitosum* Rominger.  
*Cladopora laqueata* Rominger.  
*Clathrodictyon cystosum* Parks.  
*Clathrodictyon drummondense* Parks.  
*Clathrodictyon striatulum* (D'Orbigny).  
*Clathrodictyon variolare* (Von Rosen).

*Clathrodictyon vesiculosum astrodistans* Parks.  
*Cænites crassus* (Rominger).  
*Cyathophyllum radiclea* Rominger.  
*Cyathophyllum solitarii* Billings.  
*Cystiphorolites major* (Rominger).  
*Cystiphorolites variolosus* (Rominger).  
*Dania huronica* Edwards and Haine.  
*Diphyphyllum huronicum* Rominger.  
*Diphyphyllum? multicaule* (Hall).  
*Discosorus conoideus* Hall.  
*Discosorus gracilis* Foord.  
*Discosorus remotus* Foord.  
*Eridophyllum rugosum* Edwards and Haine.  
*Favosites hispidus* Rominger.  
*Favosites niagarensis* Hall.  
*Favosites obliquus* Rominger.  
*Halysites compactus* Rominger.  
*Halysites labyrinthicus* (Goldfuss).  
*Heliolites interstinctus* (Linnaeus).  
*Huronia bigsbyi* Stokes.  
*Huronia distincta* Barrande.  
*Huronia minuens* Barrande.  
*Huronia obliqua* Stokes.  
*Huronia portlocki* Stokes.  
*Huronia turbinata* Stokes.  
*Huronia vertebralis* Stokes.  
*Lophiostroma granulosum* (Parks).  
*Lophiostroma magnum* (Parks).  
*Lophiostroma romingeri* (Parks).  
*Lyellia americana* Edwards and Haine.  
*Lyellia decipiens* Rominger.  
*Lyellia papillata* Rominger.  
*Lyellia parviflora* Rominger.  
*Lyellia superba* (Billings).  
*Oniphyma congregata* Billings.  
*Oniphyma verrucosa* Rafinesque and Clifford.  
*Orthoceras castelnaui* Verneuil.  
*Orthoceras fuliforme* Castelneau.  
*Plasmopora petaliformis* (Lonsdale).  
*Ptychophyllum stokesi* Edwards and Haine.  
*Romingeria niagarensis* (Rominger).  
*Rosnella? manitoulinensis* Parks.  
*Streptelasma conulus* Rominger.  
*Streptelasma patula* Rominger.  
*Streptelasma spongiaris* Rominger.  
*Striatopora huronensis* Rominger.  
*Strombodes eximius* Billings.  
*Strombodes mamillaris* (Owen).  
*Strombodes pentagonus* Goldfuss.  
*Strombodes pygæus* Rominger.  
*Strombodes striatus* (D'Orbigny).  
*Syringopora annulata* Rominger.  
*Syringopora bifurcata* Lonsdale.  
*Syringopora rectiformis* Billings.  
*Syringopora verticillata* Goldfuss.  
*Syringostroma niagarense* Parks.  
*Syringostroma parallelum* Parks.  
*Vermipora niagarensis* Rominger.  
*Zaphrentis lotisnus* Hall.  
*Zaphrentis stokesi* Edwards and Haine.  
*Zaphrentis umbonata* Rominger.

## NIAGARAN (MISCELLANEOUS HORIZONS) OF IOWA, ARKANSAS, WISCONSIN, ILLINOIS, INDIANA, OHIO, AND MISSOURI.

*Acidapsis obsoleta* Van Ingen. Ark. (St. Clair.)  
*Acidapsis quinquepinosa* Lake. Ark. (St. Clair.)  
*Actinoceras deshayesi* Castelneau. Wis.

- Amplexus junctus* Hall. Ill.  
*Amplexus shumardi* (Edwards and Haime). Iowa.  
*Amplexus uniformis* Hall. Ill.  
*Ampyz niagarensis* Van Ingen. Ark. (St. Clair.)  
*Anisocrinus oswegoensis* (Miller and Gurley). Ill.  
*Arctinurus obtus* (Hall). Iowa.  
*Asoceras southwelli* Worthen. Ill.  
*Astylospongia?? christiana* Meek and Worthen. Ill.  
*Aulocrium savagi* Parks. Ill.  
*Bucania cyclostoma* Calvin. Iowa.  
*Bucania perornata* Calvin. Iowa.  
*Bumastus niagarensis* (Whitfield). Ark. (St. Clair.)  
*Calymene altirostris* Van Ingen. Ark. (St. Clair.)  
*Ceratocephala coalescens* Van Ingen. Ark. (St. Clair.)  
*Ceratocephala depauperata* Van Ingen. Ark. (St. Clair.)  
*Ceratocephala goniata* Warder. Ohio.  
*Ceratocephala nodulata* Van Ingen. Ark. (St. Clair.)  
*Cerionites dactyloides* (Owen). Iowa.  
*Clathrodictyon cystosum* Parks. Iowa.  
*Clathrodictyon vesiculosum* Nicholson and Murie. Ill.  
*Conocardium tegulum* Hall.  
*Corylocrinus? dubius* Rowley. Mo. (Bainbridge.)  
*Corydocephalus depauperatus*. Ark. (St. Clair.)  
*Corydocephalus phlyctainoides* (Green). Ohio; Ark. (St. Clair.)  
*Cyathocrinus? ovalis* Rowley. Mo. (Bainbridge.)  
*Cyathophyllum radialis* Rominger. Iowa.  
*Cyphaspis arkansanus* Van Ingen. Ark. (St. Clair.)  
*Cyrtograptus ulrichi* Ruedemann. Mo. (Bainbridge.)  
*Cyrtizoceras dardanum* (Hall). Ill.  
*Cystiphorolites minor* (Rominger). Iowa.  
*Dalmanella elegantula* (Dalman). Ill., Iowa, etc.  
*Dalmanites arkansanus* Van Ingen. Ark. (St. Clair.)  
*Dalmanites vigilans* Hall. Wis., Ark. (St. Clair.)  
*Dawsonoceras annulatum* (Sowerby). Iowa, Ohio, etc.  
*Deiphon forbesi* Barrande. Ark. (St. Clair.)  
*Diaphorostoma trigonostoma* (Meek). Ohio.  
*Dicranopeltis arkansana* (Van Ingen). Ark. (St. Clair.)  
*Dimorphograptus decussatus* Elles and Wood, Ark. (Blaylock.)  
*Disoceras grafftonense* Meek and Worthen. Ill.  
*Disoceras marshi* (Hall). Ill.  
*Enerinurus ornatus* Hall and Whitfield. Ohio, etc.  
*Goniophyllum pyramidale* (Hisinger). Iowa.  
*Halysites catenularia* (Linnaeus). Ill., Wis., etc.  
*Halysites radiatus* Whitfield. Iowa.  
*Helicopora latipiralis* Claypole. Ohio.  
*Heliolites interstinctus* (Linnaeus). Ill., Iowa, etc.  
*Heliolites subtubulatus* (McCoy). Ohio, Ill., etc.  
*Hindia sphaeroidalis* Duncan. Ill., Iowa, etc.  
*Holopea grandis* Calvin. Iowa.  
*Hlavenus danicelsi* Miller and Gurley. Ill.  
*Lecanocrinus hemisphericus* Rowley. Mo. (Bainbridge.)  
*Lycellia glabra* (Owen). Iowa, Ill.  
*Melocrinus wittenbergensis* Rowley. Mo.  
*Monograptus argutus* Lapworth. Ark. (Blaylock.)  
*Monograptus distans* (Portlock). Ark. (Blaylock.)  
*Monograptus gregarius* Lapworth. Ark. (Blaylock.)  
*Odontopleura arkansana* Van Ingen. Ark. (St. Clair.)  
*Odontopleura ortonii* (Foerste). Ark. (St. Clair.)  
*Orthoceras franklinense* Miller. Ind.  
*Orthoceras loxias* Hall. Wis.  
*Orthoceras unionense* Worthen. Ill.  
*Palaeodictyota bella* (Hall and Whitfield). Ohio.  
*Pentamerus oblongus* Sowerby. Iowa, Ohio.  
*Pentamerus oblongus corrugatus* Weller and Davidson. Iowa.  
*Pentamerus oblongus maguokcta* Hall and Clarke. Wis., Iowa.  
*Pentamerus oblongus subrectus* Hall and Clarke. Iowa.  
*Pentamerus pergibbosus* Hall and Whitfield. Ohio.  
*Pericchoerinus ornatus* (Hall and Whitfield). Ohio, Ind.  
*Petalocrinus inferior* Bather. Iowa.  
*Petalocrinus(?) major* Weller and Davidson. Iowa.  
*Petalocrinus mirabilis* Weller and Davidson. Iowa.  
*Phragmoceras byronense* Worthen. Ill.  
*Phragmoceras ellipticum* Hall and Whitfield. Ohio.  
*Pisocrinus glabellus* Rowley. Mo. (Bainbridge.)  
*Pisocrinus globosus* (Ringueberg). Mo. (Bainbridge.)  
*Pisocrinus gorbyi* Miller. Mo. (Bainbridge.)  
*Pisocrinus granulatus* Rowley. Mo. (Bainbridge.)  
*Plectambonites productus* Hall and Clarke. Ohio.  
*Proetus corrugatus* Van Ingen. Ark. (St. Clair.)  
*Proetus subannulatus* Van Ingen. Ark. (St. Clair.)  
*Psychophyllum expansum* (Owen). Iowa, Wis.  
*Receptaculites ohioensis* Hall and Whitfield. Ohio.  
*Retiolites (Gladigraptus) periatius* (Nicholson). Ark. (Blaylock.)  
*Rhinobolus davidsoni* Hall and Clark. Wis.  
*Rhipidomella hybrida* (Sowerby). Ill., Iowa, etc.  
*Romingeria niagarensis* (Rominger). Iowa.  
*Schuchertella subplana* (Conrad). Mo., etc.  
*Skenidium? nodocostatum* Rowley. Mo. (Bainbridge.)  
*Sphaerocoelus romingeri* Hall. Ark. (St. Clair.)  
*Staurocephalus muchisoni* Barrande. Ark. (St. Clair.)  
*Straparollus bicarinatus* Calvin. Iowa.  
*Straparollus tricarinatus* Calvin. Iowa.  
*Streptelasma patula* Rominger. Iowa.  
*Streptelasma spongaxia* Rominger. Iowa.  
*Streptis grayi* (Davidson). Ark. (St. Clair.)  
*Striatopora (Stribalocystites?) elongatus* (Rowley). Mo.  
*Stribalocystites missouriensis* (Rowley). Mo. (Bainbridge.)  
*Stricklandinia castellana* White. Iowa.  
*Stricklandinia deformis* Meek and Worthen. Ill.  
*Strombodes gigas* (Owen). Iowa, Wis.  
*Strombodes mamillaris* (Owen). Iowa, Wis., etc.  
*Trochoceras ancas* Hall. Iowa.  
*Troostocrinus? dubius* Rowley. Mo.  
*Vermipora niagarensis* Rominger. Iowa.  
*Zaphrentis pressula* Hall. Ill.  
*Zaphrentis stokesi* Edwards and Haime. Iowa.

NIAGARAN OF NORTHERN INDIANA.

- Amphicelia neglecta* (McChesney).  
*Anastrophia internascens* Hall.  
*Anodontopsis wabashensis* Kindle and Brøger.  
*Asoceras indianensis* Newell.

*Asoceras newberryi* Billings.  
*Atrypa caleini* Nettelroth.  
*Atrypa reticularis* (Linnaeus).  
*Bumastus armatus* (Hall).  
*Bumastus insignis* (Hall).  
*Bumastus ioxus* Hall.  
*Calymene vogdesi* Foerste.  
*Camarotoechia(?) acinus* (Hall).  
*Ceratoccephala goniata* Warder.  
*Chirurus niagarensis* (Hall).  
*Conchidium laqueatum* (Conrad).  
*Conchidium littoni* (Hall).  
*Conchidium multicostatum* (Hall).  
*Conchidium trilobatum* Kindle and Breger.  
*Conchidium unguiformis* (Ulrich).  
*Conocardium multistriatum* Kindle and Breger.  
*Conocardium oweni* Kindle and Breger.  
*Cyclonema cancellatum* (Hall).  
*Cyrtia exporrecta myrtia* (Billings).  
*Dalmanella elegantula* (Dalman).  
*Dalmanites vigilans* Hall.  
*Dawsonoceras annulatum* (Sowerby).  
*Diaphorostoma niagarensis* (Hall).  
*Dinobolus conradi* (Hall).  
*Discoceras marshii* (Hall).  
*Etonia goodlandensis* Kindle and Breger.  
*Encrinurus indianensis* Kindle and Breger.  
*Eotomaria laphami* (Whitfield).  
*Euomphalopterus alatus americanus* Kindle and Breger.  
*Euomphalopterus alatus limatoideus* Kindle and Breger.  
*Gomphoceras lineare* Newell.  
*Gomphoceras projectum* Newell.  
*Gomphoceras scrinium* Hall.  
*Gomphoceras wabashense* Newell.  
*Gypidula (Sicberella) galeata* (Dalman).  
*Gypidula (Sicberella) nucleus* (Hall and Whitfield).  
*Hexameroceas cacabiforme* Newell.  
*Hexameroceas delphicolum* Newell.  
*Kionoceas cancellatum* (Hall).  
*Kionoceas delphicense* (Kindle and Breger).  
*Kionoceas kentlandense* (Kindle and Breger).  
*Leptæna rhomboidalis* (Wilckens).  
*Meristina maria* (Hall).  
*Meristina rectirostris* Hall.  
*Nucleospira pistiformis* Hall.  
*Odontopleura ortoai* (Foerste).  
*Orthis stabelites* Foerste.  
*Orthis(?) subnodosa* Hall.  
*Orthoceras niagarensis* Hall.  
*Orthoceras obstructum* Newell.  
*Orthoceras rigidum* Hall.  
*Orthoceras unionense* Worthen.  
*Pentameroceras mirum* (Barrande).  
*Pentamerus oblongus compressa* Kindle and Breger.  
*Pentamerus oblongus cylindricus* Hall and Whitfield.  
*Phragmoceras angustum* (Newell).  
*Phragmoceras ellipticum* Hall and Whitfield.  
*Phragmoceras parvum* Hall and Whitfield.  
*Pholidostrophia niagarensis* Kindle and Breger.  
*Physocrinus bmedicti* Miller.  
*Plectoceras biekmoranum* (Whitfield).  
*Plethomytilus cuneatus* Kindle and Breger.  
*Pleurotomaria(?) axion* Hall.  
*Pleurotomaria eloroi/lea* Kindle and Breger.  
*Pleurotomaria hoyi* Hall.  
*Pleurotomaria? idia* Hall.

*Polcumita huntingtonensis* (Kindle and Breger).  
*Poleumita huntingtonensis alternata* (Kindle and Breger).  
*Polcumita plana* (Kindle and Breger).  
*Protokionoceas medullare* (Hall).  
*Protophragmoceras hercules carrollense* (Kindle and Breger).  
*Reticularia proxima* Kindle and Breger.  
*Rhipidomella circulus* Hall.  
*Rhipidomella hybrida* (Sowerby).  
*Rhynchonella colletti* Miller.  
*Rhynchorthoceras dubium* Hyatt.  
*Schizophla(?) prosseri* Kindle and Breger.  
*Schuchertella subplana* (Conrad).  
*Sphaeroceus romingeri* Hall.  
*Spirifer (Delthyris) crispus* Hisinger.  
*Spirifer (Delthyris) crispus simplex* Hall.  
*Spirifer (Eospirifer) foggi* (Nettelroth).  
*Spirifer (Eospirifer) nobilis* (Barrande).  
*Spirifer (Eospirifer) radiatus* (Sowerby).  
*Streptomylus wabashensis* Kindle and Breger.  
*Strophonella striata* (Hall).  
*Strophonella williamsi* Kindle and Breger.  
*Strophostylus cancellata* (Hall).  
*Strophostylus clevatus* Hall.  
*Trimoceras gilberti* Kindle and Breger.  
*Trochoceras desplainense* McChesney.  
*Whitella(?) siluriana* Kindle and Breger.  
*Whitfieldella nitida* (Hall).  
*Wilsonia saffordi* (Hall).

## ARISAIG OF NOVA SCOTIA.

(Ross Brook=R.; McAdam=Me.A.; Moydart=M.; Stonehouse=S.)

*Asaphus erypturus* Green.  
*Atrypa reticularis* Linnaeus (M., R., S.)  
*Atrypana intermedia* (Hall).  
*Avicula lamellosa* Dawson.  
*Beyrichia equilatera* Hall. (S.)  
*Beyrichia pustulosa* Hall. (S.)  
*Beyrichia tuberculata* (Kloeden).  
*Beyrichia tuberculata nallingi* (Reuter).  
*Beyrichia tuberculata strictispinalis* Jones.  
*Bucanella trilobata* (Hall). (Me.A.)  
*Camarotoechia æquidriata* (Hall).  
*Camarotoechia neglecta* (Hall). (Me.A.)  
*Camarotoechia obtusiplicata* (Hall). (Me.A.)  
*Chonetes novascoticus* Hall. (M., S.)  
*Chonetes tenuistriatus* Hall. (R., Me.A.)  
*Clidophorus concentricus* Hall.  
*Clidophorus cuneatus* Hall.  
*Clidophorus elongatus* Hall.  
*Clidophorus erectus* Hall.  
*Clidophorus nuculiformis* Hall.  
*Clidophorus semiradiatus* Hall.  
*Clidophorus suboratus* Hall.  
*Calospira hemisphericæ* (Sowerby). (R.)  
*Cornulites clintoni gracilis* (Hall).  
*Cornulites distans* Hall. (R.)  
*Cornulites proprius* Hall. (M.)  
*Crania acadensis* Hall.  
*Ctenodonta? angustata* (Hall).  
*Ctenodonta? attenuata* (Hall).  
*Cytherodon? placidus* Billings.  
*Cytherodon? socialis* Billings.  
*Dalmanella elegantula* (Dalman). (R., Me.A., M.)  
*Dalmanites logani* (Hall). (S.)  
*Discina stetcheri* Ami.

- Discina norasctica* Ami.  
*Discina orientalis* Ami.  
*Goniophora bellula* Billings.  
*Goniophora consimilis* Billings.  
*Goniophora medioeris* Billings.  
*Goniophora transiens* Billings. (S.)  
*Grammysia acadica* Billings. (M., S.)  
*Grammysia remota* Billings.  
*Grammysia rustica* Billings. (S.)  
*Holopca reversa* Hall.  
*Homalonotus dawsoni* Hall. (M., S.)  
*Leperditia sinuata* Hall.  
*Leptæna rhomboidalis* (Willekens). (R., S.)  
*Leptodesma rhomboidea* (Hall). (R.)  
*Leptadomus (Sanguinolites) aratus* Hall.  
*Megambonia cancellata* Hall.  
*Megambonia striata* Hall.  
*Mesopalæaster parviusculus* (Billings).  
*Modiolopsis exilis* Billings.  
*Modiolopsis rhomboidea* (Conrad).  
*Modiolopsis ruda* Billings.  
*Modiolopsis subnusata* Hall.  
*Monograptus clintonensis* (Hall). (R.)  
*Monograptus priodon chapmanensis* Ruedemann.  
 (R.)  
*Murchisonia aciculata* Hall.  
*Murchisonia arisaigensis* Hall.  
*Nuculites (Orthonota) carinatus* Dawson.  
*Orbiculoidea subplana* (Hall).  
*Orthoceras elegantulum* Dawson.  
*Orthoceras czornatum* Dawson.  
*Orthoceras pictosæ* Dawson.  
*Orthoceras punctostriatum* Hall.  
*Orthonota angulifera* McCoy. (S.)  
*Orthonota incerta* Billings.  
*Orthonota simulans* Billings.  
*Orthonota speciosa* Billings.  
*Orthonota venusta* Billings.  
*Phacopidella downingæ* (Murchison). (R.)  
*Photidops ovalis* Hall. (McA., S.)  
*Pterinea mucronata* (Hall). (A., M.)  
*Pterinea honeymani* (Hall). (A.)  
*Pteronitella curta* Billings. (S.)  
*Pteronitella oblonga* Billings.  
*Pteronitella venusta* Billings. (S.)  
*Retiolites geinitzianus venosus* (Hall). (R.)  
*Rhynchospira(?) acadica* (Hall).  
*Rhynchospira(?) sinuata* Hall.  
*Schizotrocha tenuilamellata* (Hall). (R.)  
*Schuchertella subplana* (Hall). (S.)  
*Scrupulites longissimus* Murchison. (M.)  
*Spirifer (Deltithyris) crispus* (Hisinger). (R.)  
*Spirifer (Deltithyris?) rugicosta* (Hall). (S.)  
*Spirifer (Deltithyris) subulcatus* (Hall). (M., S.)  
*Stricklandinia billingsiana* Dawson.  
*Strophodontia(?) gilperni* (Dawson).  
*Tentaculites canadensis* Ami.
- NIAGARAN OF ARCTIC AMERICA.
- Acercuraria austini* (Salter).  
*Acidaspis perarmata* Whiteaves.  
*Actinoceras backi* (Stokes).  
*Actinoceras keewatinense* Whiteaves.  
*Actinoceras rotulatum* (Billings). (Lake Temiscaming.)  
*Actinodictyon canadense* Parks.  
*Actinodictyon keelei* Parks.
- Actinodictyon lawi* Parks.  
*Actinodictyon neptuni* Parks.  
*Actinostroma franklinense* Parks.  
*Actinostroma tenuifilatum* Parks.  
*Actinostroma tenuifilatum cylindricum* Parks.  
*Actinostroma tenuifilatum infectum* Parks.  
*Alcolites arctica* Woodward.  
*Alcolites undosus* Miller. (Saskatchewan River).  
*Ambonychia septentrionalis* Whiteaves.  
*Ambonychia undulata* (Whitfield).  
*Amplexus fidei* Etheridge.  
*Amplexus phragmoecras* (Salter).  
*Aparchites billingsi* (Jones).  
*Aphylostylus gracilis* Whiteaves.  
*Atrypa mansonii* (Salter).  
*Bellerophon nautarum* Salter.  
*Beyrichia clathrata* Jones.  
*Beyrichia plagosa* Jones.  
*Boraster lowi* Lambe.  
*Calappa borcalis* Whitfield.  
*Camarotoechia(?) coalcescens* Whiteaves.  
*Camarotoechia keewatinensis* Whiteaves.  
*Ceunopora hudsonica* Dawson.  
*Chonetes striatellus* (Dalman).  
*Clathrodictyon cystosum* Parks.  
*Clathrodictyon cystosum cylindricum* Parks.  
*Clathrodictyon cystosum lineatum* Parks.  
*Clathrodictyon drummondense* Parks.  
*Clathrodictyon striatellum* (D'Orbigny).  
*Clathrodictyon vesiculosum minutum* (Rominger).  
*Columnaria sutherlandi* Salter.  
*Conchidium arcticum* Holte Dahl.  
*Conchidium bitoculare* Linnaeus.  
*Conchidium decussatum* (Whiteaves).  
*Cyathophyllum articulatum* (Wahlenberg).  
*Cyathophyllum vesiculosum minutum* (Rominger).  
*Cyathophyllum pickthorni* (Salter).  
*Cyrtoceras cordatum* Parks.  
*Cyrtoceras(?) curvatum* Whiteaves.  
*Diaphorostoma perforatum* Whiteaves.  
*Encrinurus lewis* (Angelin).  
*Endoceras? ommaneyi* Salter.  
*Faristella? franklini* Salter.  
*Favistella reticulata* Salter.  
*Fenestella subarctica* Whiteaves.  
*Glossia variabilis* Whiteaves.  
*Goldius aguilonaris* (Whiteaves).  
*Goldius keewatinensis* (Whiteaves).  
*Goldius labellifer* (Goldfuss).  
*Gypidula coppingeri* (Etheridge).  
*Gyronema brevispira* Whiteaves.  
*Gyronema dowlingii* Whiteaves.  
*Gyronema speciosum* Whiteaves.  
*Halysites agglomeratiformis* Whitfield.  
*Halysites catenularia fidei* Etheridge.  
*Halysites catenularia harti* Etheridge.  
*Halysites parryi* (Konig).  
*Helicoloma narsii* Etheridge.  
*Heliolites megastoma* (McCoy).  
*Heliolites perlegans* Whitfield.  
*Hionia? parvula* Whiteaves.  
*Isoclitha grandis latimarginata* Jones (Saskatchewan River).  
*Leperditia arctica* (Jones).  
*Leperditia cæca* Jones (Saskatchewan River).  
*Leperditia gibbera* Jones.  
*Leperditia hisingeri* Schmidt.  
*Leperditia hisingeri egneri* Jones (Saskatchewan River).

*Leperditia hisingeri fabulina* Jones (Saskatchewan River).  
*Leperditia hisingeri gibbera* Jones (Saskatchewan River).  
*Leperditia marginata* Schmidt.  
*Leperditia whiteavesi* Jones (Saskatchewan River).  
*Lissatrypa phoca* (Salter).  
*Loronema meclintocki* Haughton.  
*Loronema rossi* Haughton.  
*Loronema salteri* Haughton.  
*Lyellia affinis* (Billings).  
*Lyellia superba* (Billings).  
*Megalomphala robusta* Whiteaves.  
*Meristina(?) expansa* Whiteaves.  
*Monograptus convolutus coppingeri* Etheridge.  
*Murchisonia? latifasciata* Etheridge.  
*Mytilarca pernoides* Whiteaves.  
*Phanopora kccuatinnensis* Whiteaves.  
*Phragmoceras lincolntum* Whiteaves.  
*Platyceras compactum* Whiteaves.  
*Platyceras naticoides* Etheridge.  
*Primitia muta* Jones and Holl.  
*Primitia rugulifera* (Jones).  
*Primitia sigillata* (Jones).  
*Pterinea occidentalis* Whiteaves.  
*Orthoceras arcticum* Foord.  
*Orthoceras ekwanense* Whiteaves.  
*Orthoceras griffithi* Haughton.  
*Orthoceras imbricatum* (Wahlenberg).  
*Orthonychia obtusa* Whiteaves.  
*Receptaculites pearyi* Whitfield.  
*Reticularia septentrionalis* Whiteaves.  
*Rhynchonella nucula* (Sowerby).  
*Rhynchospira lowi* Whiteaves (Faun River).  
*Salpingostoma boreale* Whiteaves.  
*Spyroceras meridionale* Whiteaves.  
*Streptelasma pygmaeum occidentale* (Whiteaves) (Saskatchewan River).  
*Stromatopora amii* Parks.  
*Stromatopora carteri* Nicholson.  
*Stromatopora wilsoni* Parks.  
*Strombodes gracile* (Nicholson and Hilde).  
*Strophodonta acanthoptera* (Whiteaves).  
*Strophodonta fiedeni* Etheridge.  
*Strophomena? doncki* Salter.  
*Strophomena(?) siluriana* Davidson.  
*Strophonella cuglypha* (Hisinger).  
*Strophostylus canadensis* Bassler.  
*Strophostylus filicinctus* Whiteaves.  
*Strophostylus inflatus* Whiteaves.  
*Syringophyllum organum* (Linnæus).  
*Syringopora parallela* Etheridge.  
*Syringopora verticillata* Goldfuss.  
*Trimerella borealis* Whiteaves.  
*Trimerella ekwanensis* Whiteaves.  
*Tripluroceras robbi* Whiteaves.  
*Trochoceras boreale* Foord.  
*Trochoceras insigne* Whiteaves.  
*Zaphrentis offleyensis* Etheridge.

SILURIAN (PEMBROKE, EDMUNDS, AND EASTPORT FORMATIONS) OF MAINE.

*Actinopteria bella* Williams.  
*Actinopteria dispar* Williams.  
*Actinopteria fornicata* Williams.  
*Camarotoechia leightoni* Williams.

*Chonetes bastini* Williams.  
*Chonetes cobsecooki* Williams.  
*Chonetes edmundsi* Williams.  
*Cliopecteria bicostata* Williams.  
*Cliopecteria uncosta* Williams.  
*Dalmanella lunata* (Sowerby).  
*Dalmanites lunatus* Lambert (N. II.).  
*Eurymyella anguleria* Williams.  
*Eurymyella conveza* Williams.  
*Eurymyella denbowensis* Williams.  
*Eurymyella plana* Williams.  
*Eurymyella recta* Williams.  
*Eurymyella shaleri* Williams.  
*Eurymyella shaleri breza* Williams.  
*Eurymyella shaleri longa* Williams.  
*Eurymyella shaleri minor* Williams.  
*Eurymyella? simulans* Williams.  
*Grammysia pembrockensis* Williams.  
*Grammysia triangulata* (Salter).  
*Leiopecteria rubra* Williams.  
*Lingula minima americana* Williams.  
*Modiolopsis leightoni* Williams.  
*Modiolopsis leightoni quadrata* Williams.  
*Nuculites corrugatus* Williams.  
*Palaeopecten cobsecooki* Williams.  
*Palaeopecten danbyi* (McCoy).  
*Palaeopecten transversalis* Williams.  
*Platyschisma helcites* (Sowerby).  
*Pterinea larata* Williams.  
*Pterinea (? Toimaia) trescotti* Williams.  
*Streptotrochus carinatus* Williams.  
*Streptotrochus ione* Williams.  
*Streptotrochus regularis* Williams.  
*Streptotrochus sulcatus* Williams.  
*Strophodonta (Brachyprion) shaleri* (Williams).  
*Toimaia campestris* Williams.  
*Whitfieldella edmundsi* Williams.

SILURIAN (NOVA SCOTIA, ETC.).

*Actinostroma matutinum* Nicholson.  
*Ampplexus cingulatus* Billings.  
*Camarotoechia winiskensis* Whiteaves.  
*Ceratoccephala gonata* Warder.  
*Chelurus targuinius* Billings.  
*Chonophyllum nymphae* (Billings).  
*Ctenodonta suborata* Whiteaves.  
*Cynthaspis acadica* (Matthew).  
*Cyathophyllum interruptum* Billings.  
*Cyathophyllum pasithea* Billings.  
*Cyathophyllum penanti* Billings.  
*Cystiphyllum maritimum* Billings.  
*Dictyonema splendens* Billings.  
*Dictyonema websteri* Dawson.  
*Favosites gaspensis* Lambe.  
*Gomphoceras parvulum* Whiteaves.  
*Gomphoceras subgracile* Billings.  
*Gyroceras americanum* Billings.  
*Halyites catenularia amplitubulata* Lambe.  
*Halyites catenularia nitida* Lambe.  
*Isochilina labrosa* Jones.  
*Leperditia phascolum* (Hisinger).  
*Omphymia eriphyle* (Billings).  
*Primitia aequalis* Jones and Holl.  
*Stricklandinia gaspensis* Billings.  
*Syringopora bifurcata* Lonsdale.  
*Syringopora compacta* Billings.

## CAYUGAN (KOKOMO) OF INDIANA.

*Ampicrus septatus* Foerste.  
*Buthotrephis divaricata* David White.  
*Buthotrephis newlini* David White.  
*Chonctes colliculus* Foerste.  
*Ceolospira conyrgata* (Kindle and Breger).  
*Conchidium colletti* Miller.  
*Da'zmanella elegantula* Dalman.  
*Eurypterus (Onychopterus) kokomoensis* Miller and Gurley.  
*Eurypterus vanilarva* Clarke and Ruedemann.  
*Eusarcus newlini* (Claypole).  
*Favosites pyriformis-kokomoensis* Foerste.  
*Isoclinina musculosa* Foerste.  
*Eladocnia kokomoensis* Foerste.  
*Leptena rhomboidalis* Wilkensk.  
*Pentamerus divergens* Foerste.  
*Spirifer corallinensis* Grabau.  
*Spirifer criguus* Foerste.  
*Stylonurus (Drepanopterus) longicaudatus* Clarke and Ruedemann.  
*Whitfieldella erecta* Foerste.  
*Wilsonia kokomoensis* Foerste.

## CAYUGAN OF APPALACHIAN VALLEY, NEW YORK AND ONTARIO.

(Cobleskill=C.; Akron=A.; McKenzie=Ma.; Bertie=B.; Pittsford=P.; Mandus=M.; Rondout=R.; New Bloomfield=N.)

*Actinostroma tenuissimum* Parks. (C.)  
*Atrypa reticularis* Linnaeus. (C.)  
*Bellerophon auriculatus* Hall. (C.)  
*Bryichia moodeyi* Ulrich and Bassler. (Ma.)  
*Buthotrephis clavelloides* (Grabau). (A.)  
*Buthotrephis lesquereuzi* Grote and Pitt. (A.)  
*Calymene camerata* Conrad. (C.)  
*Calymene niagarensis* Hall. (C.)  
*Camarotoechia lamclata* (Hall). (C.)  
*Camarotoechia litchfieldensis* (Schuchert). (C.)  
*Ceratiocaris aculeata* (Hall). (B.)  
*Ceratiocaris acuminata* Hall. (B.)  
*Ceratiocaris maccoyana* Hall. (B.)  
*Ceratiocaris (Limnocoaris) precedens* Clarke. (P.)  
*Chonctes jersycensis* Weller. (C.)  
*Ceolocaulis obtusus* (Hall). (C.)  
*Ceolocaulis tercbrales* (Hall). (C.)  
*Cornulites arcuatus* Conrad. (C.)  
*Corydocephalus ptyonurus* (Hall and Clarke). (C.)  
*Ctenodonta equilatera* (Hall). (C.)  
*Ctenodonta? nucleiformis* (Hall). (M.)  
*Cyathophyllum hydraulicum* Simpson. (A., M.)  
*Cyrtoceras subrectum* Hall. (M.)  
*Diphyphyllum coralliferum* (Hall). (C.)  
*Dolichopterus macrocheirus* Hall. (B.)  
*Dolichopterus siluriceps* Clarke and Ruedemann. (B.)  
*Dolichopterus(?) testudineus* Clarke and Ruedemann. (B.)  
*Ectomaria? extenuata* (Hall). (M.)  
*Ectomaria minuta* (Hall). (M.)  
*Emmelceoe decora* Clarke. (P.)  
*Enterolasma caliculus* (Hall). (C.)  
*Eurypterus dekayi* Hall. (B.)  
*Eurypterus lacustris* Harlan. (B.)  
*Eurypterus lacustris pachycheirus* (Hall). (B.)  
*Eurypterus microphthalmus* Hall. (M.)  
*Eurypterus pitsfordensis* Sarle. (P.)  
*Eurypterus pustulosus* Hall. (B.)  
*Eurypterus remipes* DeKay. (R., B.)  
*Eusarcus scorpionis* Grote and Pitt. (B.)  
*Eusarcus vaningeni* Clarke and Ruedemann. (P.)  
*Goniphora dubia* (Hall). (M.)  
*Halysites calcularia* Linnaeus. (C.)  
*Heterophyllum caliculoideis* Grabau. (M.)  
*Holopea? elongata* Hall. (M.)  
*Hughmilleria socialis* Sarle. (P.)  
*Hughmilleria socialis robusta* Sarle. (P.)  
*Ilionia sinuata* (Hall). (C., M.)  
*Leiopteria subplana* (Hall). (C.)  
*Leperditia alta* (Conrad).  
*Leperditia jonesi* Hall. (C.)  
*Leperditia scalaris* (Jones). (C., A.)  
*Leptæna rhomboidalis* (Wilkens). (C.)  
*Limoptera limseformis* (Hall). (C.)  
*Megammonia ovoidea* Hall. (M.)  
*Mitroceras gebhardi* (Hall). (A., C.)  
*Monotrypa? spinosula* Hall and Simpson. (M.)  
*Nematophycus crassus* (Penhallow). (A.)  
*Onchus clintoni* Claypole. (N.)  
*Onchus pennsylvanica* (Claypole). (N.)  
*Oncoceras expansum* Hall. (C.)  
*Oncoceras ovoideis* Hall. (M.)  
*Orbiculoidea numulus* Hall and Clarke. (M.)  
*Orbiculoidea vanuxemi* (Hall). (M.)  
*Palaespis americana* Claypole. (N.)  
*Pleurotomaria subdepressa* Hall. (C.)  
*Prismetophyllum inaequale* (Hall). (C.)  
*Prolocina gallensis* (Whiteaves). (C.)  
*Proscorpius osborni* (Whitfield). (B.)  
*Protokionoceras trusitum* (Clarke and Ruedemann). (C.)  
*Pseudoniscus roosevelti* Clarke. (P.)  
*Pterinea securiformis* (Hall). (C., R.)  
*Pterinea subrecta* (Hall). (C.)  
*Pterinea subrugosa* (D'Orbigny).  
*Pterinopecten? obscurus* (Hall). (M.)  
*Pterygotus buffalocensis* Pohlman. (B.)  
*Pterygotus cobbi* Hall. (B.)  
*Pterygotus cobbi juvenis* Clarke and Ruedemann. (B.)  
*Pterygotus (Erettopterus) grandis* (Pohlman). (B.)  
*Pterygotus macrophthalmus* Hall. (B.)  
*Pterygotus monroensis* Sarle. (P.)  
*Schuchertella interstriata* (Hall). (C., A., R.)  
*Spirifer (Delthyris) corallinensis* (Grabau). (C., R.)  
*Spirifer (Delthyris) eriensis* (Grabau). (C., A., R.)  
*Spirifer (Delthyris) vanuxemi* Hall. (M.)  
*Spirorbis laxus* Hall. (M.)  
*Straparollus sinuatus* (Hall). (M.)  
*Stromatopora clarkei* Parks. (C.)  
*Stromatopora constellata* Hall. (C.)  
*Stropheodonta bipartita* (Hall). (C.)  
*Stropheodonta varistriata* (Conrad). (M.)  
*Stylonurus (Ctenopterus) multispinosus* Clarke and Ruedemann. (P.)  
*Tentaculites gyraacanthus* (Eaton). (M.)  
*Trochoceras turbinatum* Hall. (C.)  
*Whitfieldella(?) nucleolata* (Hall). (A., C.)  
*Whitfieldella subsulcata* Grabau. (A.)  
*Whitfieldella sulcata* (Vanuxem). (A., M.)

## SILURIAN OF SOUTH AMERICA.

(Brazil=B.; Bolivia=Bo.; Argentina=A.)

- Anabaia parva* Clarke. (B.)  
*Anodontopsis austrina* Clarke. (B.)  
*Anodontopsis pusilla* Clarke. (B.)  
*Ara browni* Salter. (Bo.)  
*Beyrichia forbesi* Jones. (Bo.)  
*Bellia lata brasiliensis* Clarke. (B.)  
*Bucanella trilobata viro-mundo* (Clarke). (B.)  
*Calymene macrophthalma* D'Orbigny. (Bo.)  
*Calymene verneuilli* D'Orbigny. (B.)  
*Clidophorus brasiliensis* Clarke. (B.)  
*Clitambonites adscendens* (?Pander). (A.)  
*Conularia amazonica* Clarke. (B.)  
*Cruziana rugosa* D'Orbigny. (Bo.)  
*Ctenodonta clarkei* Bassler. (B.)  
*Ctenodonta subrecta* (Clarke). (B.)  
*Dalmanella freitana* (Clarke). (B.)  
*Dalmanella smithi* (Clarke). (B.)  
*Homalonotus linares* Salter. (Bo.)  
*Lingula (Palaeoglossa) dubia* (D'Orbigny). (Bo.)  
*Lingula munsteri* D'Orbigny. (Bo.)  
*Lingula submarginata* D'Orbigny. (Bo.)  
*Lingulites derbyi* Clarke. (A.)  
*Maclurites* (?) *stelzneri* (Kayser). (A.)  
*Megalaspis? boliviensis* (D'Orbigny). (Bo.)  
*Orbiculoidea hartii* Clarke. (B.)  
*Orthis callactis amazonica* Clarke. (B.)  
*Orthis humboldti* D'Orbigny. (Bo.)  
*Orthis obtusa* Pander. (A.)  
*Pholidops trombetana* Clarke. (B.)  
*Symphysurus apolonista* Lake. (Bo.)  
*Tentaculites saienzii* Salter. (Bo.)  
*Tentaculites supremus* Salter. (Bo.)  
*Tentaculites trombetensis* Clarke. (B.)

## LOWER MONROAN OF MICHIGAN, OHIO, AND ONTARIO.

(Greenfield=G.; Raisin River=R.; Put-in-Bay=P.)

- Camarotochia hydraulica* (Whitfield). (G.)  
*Cyclostomiceras erodes* (Billings). (R.)  
*Ectomaria minuta* (Hall). (R.)  
*Eurypterus microthalmus* Hall. (P.)  
*Goniophora dubia* (Hall). (R., P.)  
*Hindella? (Greenfieldia) rostralis* Grabau. (G.)  
*Hindella? (Greenfieldia) whitfieldi* Grabau. (G.)  
*Ktodenia monroensis* Grabau. (R.)  
*Leperditia angulifera* Whitfield. (G.)  
*Leperditia ohioensis* Bassler. (G.)  
*Meristina profunda* Grabau. (R.)  
*Meristina profunda sinosus* Grabau. 'R.'  
*Pentamerus pesovis* Whitfield. (?G.)  
*Pholidops ovata* Hall. (R.)  
*Pterinea lamii* Grabau. (R.)  
*Rhynchospira praeformosa* Grabau. (G.)  
*Schuchertella hydraulica* (Whitfield). (R., G.)  
*Sphaerococcytes? glomeratus* Grabau. (G., R.)  
*Spirifer (Delthyris) ohioensis* (Grabau). (P.)  
*Spirorbis lazus* Hall. (R.)  
*Whitfieldella rotundata* (Whitfield). (G.)  
*Whitfieldella subsulcata* Grabau. (G.)

UPPER MONROAN OF MICHIGAN AND ONTARIO  
(?Helderbergian).

(Amherstburg=A.; Lucas=L.; Anderdon=An.)

- Acanthonema holopiforme* Grabau. (A., L.)  
*Acanthonema holopiforme obsoletum* Grabau. (L.)

- Acanthonema lazus* Grabau. (A., L.)  
*Acanthonema neuberryi* Meek. (L.)  
*Atrypa reticularis* Linnaeus. (A.)  
*Camarotochia semiplicata* (Conrad). (L.)  
*Ceratopora regularis* Grabau. (A.)  
*Ceratopora tenella* (Rominger). (An.)  
*Cladopora bifurcata* Grabau. (A., An., L.)  
*Cladopora cervicornis* Hall. (?A.)  
*Clathrodictyon ostiolatum* (Nicholson). (An., A.)  
*Clathrodictyon variolare* (Von Rosen). (An.)  
*Conocardium monroicum* Grabau. (A., An. L.)  
*Cornulites arcuatus* Conrad. (A.)  
*Cyathophyllum thoralense* Lambe. (An.)  
*Cyclostomiceras erodes* (Billings). (A.)  
*Cylindrohelium heliophylloides* Grabau. (L.)  
*Cylindrohelium profundum* Grabau. (L.)  
*Cypricardinia canadensis* Grabau. (A.)  
*Cystiphyllum americanum andersonense* Grabau. (A., An.)  
*Dawsonoceras annulatum* (Sowerby). (A.)  
*Diphyphyllum integumentum* (Barrett). (A., An.)  
*Diphyphyllum? multicaule* (Hall). (A.)  
*Ectomaria? extenuata* (Hall). (L.)  
*Ectomaria minuta* (Hall). (L.)  
*Ectomaria arcyi* Clarke and Ruedemann. (A., L.)  
*Ectomaria gatlensis* (Billings). (L.)  
*Euomphalopterus valeria* (Billings). (L.)  
*Euomphalus fairchildi* Clarke and Ruedemann. (L.)  
*Favosites basalticus nanus* Grabau. (An.)  
*Favosites concavus* Grabau. (An.)  
*Favosites rectangularis* Grabau. (An.)  
*Favosites tuberosus* Grabau. (A.)  
*Heliophrentis alternata* Grabau. (A.)  
*Heliophrentis alternata compressa* Grabau. (A.)  
*Heliophrentis alternata magna* Grabau. (A.)  
*Heliophrentis carinata* Grabau. (A.)  
*Helicentrophyllum caliculoideus* Grabau. (An.)  
*Hercynella canadensis* Grabau. (A.)  
*Holopea antiqua pervetusta* Hall. (A.)  
*Holopea subconica* Hall. (L.)  
*Hormotoma subcarinata* Grabau. (A., L.)  
*Hormotoma tricarinata* Grabau. (L.)  
*Idiostroma nattressi* Grabau. (An.)  
*Lophospira bispiralis* (Hall). (A., L.)  
*Loxonema parva* Grabau. (L.)  
*Meristospira michiganensis* Grabau. (A.)  
*Pancna canadensis* Whiteaves. (A.)  
*Pleuronotus subangulatus* Grabau. (L.)  
*Pleurotrochus tricarinatus* Grabau. (L.)  
*Poleumita crenulata* (Whiteaves). (L.)  
*Poterioceras sauridens* Clarke and Ruedemann. (A.)  
*Proetus crassimarginatus* Hall. (A.)  
*Protokionoceras trusitum* (Clarke and Ruedemann). (L.)  
*Pterinea bradti* Grabau. (L.)  
*Reticularia (Prosserella) lucasi* (Grabau). (L.)  
*Reticularia (Prosserella) modestoides* (Grabau). (A., An.)  
*Reticularia (Prosserella) modestoides depressus* (Grabau). (A.)  
*Reticularia (Prosserella) planisinosus* (Grabau). (L.)  
*Reticularia (Prosserella) subtransversa* (Grabau). (A.)  
*Reticularia (Prosserella) subtransversa alta* (Grabau). (A.)  
*Reticularia (Prosserella) unitamellosa* (Grabau). (L.)  
*Romingeria umbellifera* (Billings). (A.)  
*Schuchertella amherstburgensis* Grabau. (A.)

*Schuchertella interstriata* (Hall). (A.)  
*Spirifer (Delthyris) modestus* (Hall). (L.)  
*Spirifer (Delthyris) sulcatus submersus* (Grabau). (A.)  
*Stromatopora gallensis* Dawson. (A.)  
*Stromatopora (Cenostromei) pustulosum* Grabau. (An.)  
*Strophodontia demissa homolostrata* Grabau. (A.)  
*Strophodontia præplicata* Grabau. (A.)  
*Strophodontia vasculosa* Grabau. (A.)  
*Styliodictyon scherzeri* Grabau. (An.)  
*Syringopora cooperi* Grabau. (F.)  
*Syringopora hisingeri* Billings. (A., F.)  
*Syringopora microfundulus* Grabau. (An.)  
*Trochoceras andersonense* Grabau. (A.)  
*Trochoncma ovoides* Grabau. (A., L.)  
*Whitfieldella prosseri* Grabau. (R.)

HELDERBERGIAN (LOWER BEDS) OF  
 APPALACHIAN VALLEY.

(Keyser=K.; Decker Ferry=D.)

*Actinopteria communis* (Hall). (K.)  
*Actinopteria reticulata* Weller. (D.)  
*Amphicella ulrichi* Maynard. (K.)  
*Anomolocystites cornutus* Hall.  
*Aperchites gordoni* Ulrich and Bassler. (K.)  
*Ascodictyon silurienense* Vine. (K.)  
*Atrypa? biconvexa* Maynard. (K.)  
*Atrypa? reticularis* (Linnaeus).  
*Aulopora schobariae* Hall. (K.)  
*Aulopora schucherti* Swartz. (K.)  
*Aviculopecten tenuilamellatus* (Hall). (K.)  
*Batostomella interporosa* Ulrich and Bassler. (K.)  
*Bellerophon heldergiae* Maynard. (K.)  
*Bythocypris nearpassi* Weller. (D.)  
*Bythocypris punctulata areolata* Ulrich and Bassler. (K.)  
*Calymene camerata* Conrad. (K.)  
*Calymene rugosa* Shumard.  
*Camarocrinus stellatus* Hall. (K.)  
*Camarotæchia gigantea* Maynard. (K.)  
*Camarotæchia hudsonia* Grabau. (D.)  
*Camarotæchia lamellata* (Hall). (D., K.)  
*Camarotæchia litchfieldensis* Schuchert. (D., K.)  
*Camarotæchia litchfieldensis angustata* Hottedahl.  
*Camarotæchia simplicata* Grabau.  
*Centronella? biplicata* Weller. (K.)  
*Ceramopora incondita* Ulrich and Bassler. (K.)  
*Ceratopora? marylandica* Swartz. (K.)  
*Chilotrypa micropora* Ulrich and Bassler. (K.)  
*Chonetes jerseyensis* Weller. (D.)  
*Chonetes jerseyensis spinosus* Maynard. (K.)  
*Cladopora multiseriata* Weller. (K.)  
*Cladopora rectilineata* Simpson. (D.)  
*Clidochirus keyserensis* Springer. (K.)  
*Colospira concava tonolowayensis* (Swartz). (K.)  
*Columnaria? heldergiae* Swartz. (K.)  
*Cordylocrinus plumosus* (Hall).  
*Cornulites cingulatus* Hall. (K.)  
*Ctenobolbina denticula* Ulrich and Bassler. (K.)  
*Ctenobolbina? dubia* Ulrich and Bassler. (K.)  
*Cyathophyllum clarki* Swartz. (K.)  
*Cyathophyllum marylandicum* Swartz. (K.)  
*Cyathophyllum radiale* Rominger. (K.)  
*Cyathophyllum schucherti* Swartz. (K.)  
*Cyphotrypa corrugata* (Weller). (D., K.)

*Cypricardinia lamellosa* Hall. (K.)  
*Dalmanella clarki* Maynard. (K.)  
*Dalmanella concinna* (Hall). (K.)  
*Dalmanella postciegantula* Weller. (D.)  
*Dalmanites aspinosa* Weller. (D., K.)  
*Dalmanites keyserensis* Swartz. (K.)  
*Diaphorostoma niagarensis* (Hall).  
*Dimerocrinus arborescens* (Talbot).  
*Diphyphyllum integumentum* (Barrett). (D.)  
*Diplostomopora siluriana* (Weller). (D.)  
*Edmondia? deckerensis* Weller. (D.)  
*Eridotrypa parvulipora* Ulrich and Bassler. (K.)  
*Favosites corrugatus* Weller. (D.)  
*Favosites foveosus integrilabulatus* Swartz. (K.)  
*Favosites helderbergica præcedens* Schuchert. (K.)  
*Favosites pyriformis* (Hall). (D.)  
*Fenestella (Cycloporina) altidorsata* Ulrich and Bassler. (K.)  
*Fenestella cumberlandica* Ulrich and Bassler. (K.)  
*Fistuliporella cumulata* Ulrich and Bassler. (K.)  
*Fistuliporella marylandica* Ulrich and Bassler. (K.)  
*Fistuliporella maynardi* Ulrich and Bassler. (K.)  
*Fistuliporella minima* Ulrich and Bassler. (K.)  
*Fistuliporella quinquedentata* Ulrich and Bassler. (K.)  
*Frammia dissimilis* Hottedahl.  
*Grammysia arctica* Bassler.  
*Gypidula (Sieberella) coeymanensis corriganensis* Maynard. (K.)  
*Gypidula (Sieberella) coeymanensis prognostica* Maynard. (K.)  
*Gypidula subglobosa* Maynard. (K.)  
*Hallicella? seminulum longa* Ulrich and Bassler. (K.)  
*Hallicella triplicata* Ulrich and Bassler. (K.)  
*Holysites catenularia* Linnaeus.  
*Heliolites inordinata* (Lonsdale).  
*Hindia sphaeroidalis* Duncan.  
*Hyattidina lamellosa* (Weller).  
*Jækløystis avelana* Schuchert. (K.)  
*Jækløystis hartleyi* Schuchert. (K.)  
*Jækløystis papillatus* Schuchert. (K.)  
*Kladocella barretti* (Weller). (K.)  
*Kladocella clarkei* (Jones).  
*Kladocella clarkei paupera* Ulrich and Bassler. (K.)  
*Kladocella halli* (Jones).  
*Kladocella pennsylvanica* (Jones). (K.)  
*Kladocella irisulcata* (Hall).  
*Kladocella turgida* Ulrich and Bassler. (K.)  
*Kladocella barretti* (Weller). (D., K.)  
*Kladocella centricornis* Ulrich and Bassler. (K.)  
*Kladocella fimbriata* Ulrich and Bassler. (K.)  
*Kladocella jerseyensis* (Weller). (D.)  
*Kladocella kummeli* (Weller). (K.)  
*Kladocella manliensis* Weller. (K.)  
*Kladocella manliensis deckerensis* (Weller). (D.)  
*Kladocella montaguensis* (Weller). (M.)  
*Kladocella nearpassi* (Weller). (D., K.)  
*Kladocella notata* (Hall).  
*Kladocella smoeki* (Weller). (M.)  
*Kladocella susscensis* (Weller). (D., K.)  
*Kladocella wallpackensis* (Weller). (M.)  
*Lasiocrinus scoparius* (Hall).  
*Leptoceria subtilana* (Hall). (K.)  
*Leperditia alta* (Conrad).  
*Leperditia altoides* Weller. (K., D.)



- Leperditia elongata* Weller. (K.)  
*Leperditia symmetrica* Høltedahl.  
*Lepocrinites gebhardi* Conrad.  
*Lepocrinites manlius* Schuchert. (K.)  
*Leptæna rhomboidalis* (Wilkins). (D.)  
*Liolema pulchellum* Ulrich and Bassler. (K.)  
*Liolema subramosum* Ulrich and Bassler. (K.)  
*Lisnatrypa scheii* Høltedahl.  
*Loxonema fitchi* Hall.  
*Mariacrinus beecheri* Falbot.  
*Megambonia arivuloides* Hall.  
*Melocrinus nobilissimus* (Hall).  
*Melocrinus pachydaetylus* (Conrad).  
*Merista typa* (Hall). (K.)  
*Meristella prænuntia* Schuchert and Maynard. (K.)  
*Mesomphalus hartleyi* Ulrich and Bassler. (K.)  
*Mesomphalus submarginata* Ulrich and Bassler. (K.)  
*Monotrypa? arbuscula* (Hall).  
*Mytilarca obliqua* Weller. (D.)  
*Nuclospiræ elegans* Hall. (K.)  
*Nuclospiræ swartzii* Maynard. (K.)  
*Nuclospiræ ventricosa* (Hall). (K.)  
*Octonaria? angulata* Ulrich and Bassler. (K.)  
*Octonaria inæqualis* Ulrich and Bassler. (K.)  
*Octonaria simplex* (Krause). (K.)  
*Orbiculoidea schucherti* Swartz. (K.)  
*Orthoceras rigidum* Hall. (K.)  
*Othoceras schucherti* Maynard. (K.)  
*Pachydomella longula* Ulrich and Bassler. (K.)  
*Parallelopora favositiformis* Høltedahl.  
*Pentamerus circularis* Weller. (D.)  
*Pholidops ovata* Hall. (D., K.)  
*Platyceras ellesmerlandi* Høltedahl.  
*Polypora dictyota* Ulrich and Bassler. (K.)  
*Pontocypris arcuata* Ulrich and Bassler. (K.)  
*Pontocypris mauri brevicata* Jones. (K.)  
*Primitia arctica* Høltedahl.  
*Primitia cumberlandica* Ulrich and Bassler. (K.)  
*Prismatophyllum inæquale* (Hall). (K., D.)  
*Protazoerinus virginianensis* Springer. (K.)  
*Proetus depressus* Weller. (D.)  
*Proetus leptorhachis* Høltedahl.  
*Proetus pachydermotus* Barrett. (D., K.)  
*Proetus spinosus* Weller. (D.)  
*Pseudocrinites abnormalis* Schuchert. (K.)  
*Pseudocrinites clarki* Schuchert. (K.)  
*Pseudocrinites clappolei* Schuchert. (K.)  
*Pseudocrinites elongatus* Schuchert. (K.)  
*Pseudocrinites gordoni* Schuchert. (K.)  
*Pseudocrinites perduei* Schuchert. (K.)  
*Pseudocrinites stellatus* Schuchert. (K.)  
*Pseudocrinites subquadratus* Schuchert. (K.)  
*Pterinea emacerrata* (Conrad). (D.)  
*Pterinea textilis* (Hall).  
*Ptilodictya frondosa* Weller. (D.)  
*Ptilodictya tenella* Ulrich and Bassler. (K.)  
*Ptychopleria? subquadrata* Weller. (D.)  
*Pycnosuccens tenuibrachiatus* Springer. (K.)  
*Renssæleria keyserensis* Swartz. (K.)  
*Renssæleria mutabilis* (Hall). (K.)  
*Renssæleria (Beachia) proavita* Schuchert. (K.)  
*Reticulæria bicostata* (Vanuxem). (D., K?)
- Rhipidomella emarginata* (Hall). (K.)  
*Rhipidomella preoblata* Weller. (D.)  
*Rhopalonaria attenuata* Ulrich and Bassler. (K.)  
*Rhynchospira excavata* Grabau. (K.)  
*Rhynchospira formosa* (Hall). (D., K.)  
*Rhynchospira globosa* (Hall). (K.)  
*Rhynchotrema deckerense* (Weller). (D., K.)  
*Rhynchotrema deckerense areticum* (Høltedahl).  
*Rhynchotrema formosum* (Hall). (K.)  
*Schuchertella deckerensis* (Weller). (D., K?)  
*Schuchertella deformis* (Hall). (K.)  
*Schuchertella interstriata* (Hall). (D.)  
*Schuchertella interstriata sinuata* Høltedahl.  
*Schuchertella marylandica* Maynard. (K.)  
*Schuchertella prolifica* Schuchert and Maynard. (K.)  
*Schuchertella sinuata* (Hall and Clarke). (K.)  
*Semicoscinium planum* Ulrich and Bassler. (K.)  
*Sphærocystites bloomfieldensis* Schuchert. (K.)  
*Sphærocystites globularis* Schuchert. (K.)  
*Sphærocystites globularis ovalis* Schuchert. (K.)  
*Sphærocystites multifasciatus* Hall. (K.)  
*Spirifer (Delthyris) corallineus* (Grabau). (D., K.)  
*Spirifer (Delthyris) eriensis* (Grabau). (K.)  
*Spirifer (Delthyris) modestus* (Hall). (K.)  
*Spirifer (Delthyris) modestus plicatus* (Maynard). (K.)  
*Spirifer (Delthyris) modestus striatissimus* Høltedahl.  
*Spirifer (Delthyris) octocostatus* (Hall). (K.)  
*Spirifer (Delthyris) vanuzemi* Hall. (K.)  
*Spirifer (Delthyris) vanuzemi minor* (Weller). (D.)  
*Spirifer (Delthyris) vanuzemi prognosticus* (Schuchert). (K.)  
*Stenopora(?) incrustans* Ulrich and Bassler. (K.)  
*Strepula irregularis* Jones and Høll. (K.)  
*Stromatopora constellata* Hall. (K.)  
*Stromatopora corallifera* Parks.  
*Stromatotrypa globularis* Ulrich and Bassler. (K.)  
*Stropheodonta bipartita* (Hall). (D., K.)  
*Stropheodonta patersoni antiqua* Høltedahl.  
*Stropheodonta varistriata* (Conrad). (D., K.)  
*Strophonella geniculata* (Hall). (K.)  
*Strophonella keyserensis* Swartz. (K.)  
*Syringopora bifurcata* Lonsdale.  
*Syringopora dalmanii* Billings.  
*Syringostroma barretti* Girty. (K.)  
*Syringostroma centrotrou Girty.* (K.)  
*Tentaculites gyrocantus* (Eaton).  
*Tetracystis chrysalis* Schuchert. (K.)  
*Thamnisicus regularis* Ulrich and Bassler. (K.)  
*Trimrocystis peculiaris* Ulrich and Bassler. (K.)  
*Uncinulus convexus* Maynard. (K.)  
*Uncinulus gordoni* Maynard. (K.)  
*Uncinulus keyserensis* Schuchert and Maynard. (K.)  
*Uncinulus nucleolatus* (Hall). (K.)  
*Uncinulus nucleolatus angulatus* Maynard. (K?)  
*Uncinulus septentrionalis* Høltedahl.  
*Whitfieldella laevis* (Vanuxem).  
*Whitfieldella(?) minuta* Maynard. (K.)  
*Whitfieldella(?) nucleolata* (Hall). (K.)  
*Whitfieldella prosseri* Grabau. (K.)  
*Wilsonia globosa* Weller. (D., K.)  
*Zaphrentis keyserensis* Swartz. (K.)



## LIST OF AMERICAN ORDOVICIAN AND SILURIAN FORMATIONS.

- Akron dolomite, Upper Cayugan, New York, etc.
- Albion group or stage, Upper Medinan.
- Albion sandstone, Upper Medinan, New York, etc.
- Alexandrian series, Upper Medinan, Illinois and Missouri.
- Alger formation, Clinton, eastern Kentucky.
- Allentown limestone, Upper Cambrian or Ozarkian, Pennsylvania.
- Ames Knob formation, Silurian, Maine.
- Amherst feldspathic mica schist, Silurian?, New England
- Amherstburg dolomite, Upper Monroan, Michigan and Ontario.
- Amsterdam limestone, Black River, New York, etc.
- Anamosa limestone, Cayugan, Illinois and Iowa.
- Anderdon limestone, Upper Monroan, Michigan and Ontario.
- Anticostian series, Silurian, Quebec.
- Aquashicola formation, Silurian, Pennsylvania.
- Arbuckle limestone, Big Buffalo series, Oklahoma.
- Arisaig series, Silurian, Nova Scotia.
- Arnheim (Warren) formation, Richmond, Ohio Valley, etc.
- Aroostook limestone, Silurian, Maine.
- Arthropycus sandstone, Upper Medinan, New York, etc.
- Ashland shale, Silurian, Maine.
- Athens shale, Blount group, Tennessee and Virginia.
- Atkinson. *See* Fort Atkinson.
- Attalla conglomerate member, Chazyan, Alabama.
- Auburn chert, Black River, Missouri.
- Anroral=Canadian-Black River, Pennsylvania.
- Austin Brook quartz porphyry, Post Ordovician, New Brunswick.
- Avondale limestone, Cambrian-Ordovician(?), Pennsylvania.
- Axeman limestone, Canadian, Pennsylvania.
- Aylmer formation, Chazyan, Quebec.
- Bainbridge limestone, Niagaran, Missouri.
- Bakers limestone (=Brassfield), Upper Medinan, Tennessee.
- Bald Eagle conglomerate, Cincinnati, Pennsylvania.
- Bald Mountain limestone, Canadian, New York.
- Baltimore gneiss, Ordovician, Pennsylvania.
- Barnegat limestone, Cambrian-Ordovician, New York.
- Barree group, Silurian, Pennsylvania.
- Bass Island series, Lower Monroan, (Cayugan), Michigan, etc.
- Baxters Brook formation, Lower Ordovician, Nova Scotia.
- Bays sandstone, Trenton, East Tennessee.
- Beauharnois formation, Canadian (=Division D of Beekmantown), Quebec and Ontario.
- Beaver division, Silurian(?), Texas.
- Beavertown marl (division of Brassfield), Upper Medinan, Ohio.
- Becsie River formation, Anticostian, Anticosti Island, Quebec.
- Beech Hill Cove formation, Niagaran, Nova Scotia.
- Beech River formation, Upper Niagaran, west Tennessee.
- Beekmantown (Calciferous) limestone, Canadian, New York, etc.
- Belfast bed (Elkhorn), Richmond, Ohio Valley.
- Belledune group, Silurian, New Brunswick.
- Bellefonte limestone, Canadian, Pennsylvania.
- Bellevue member, Maysville, Ohio Valley.
- Bellowspipe quartzite, Silurian?, Massachusetts.

- Deloit dolomite, Black River, Wisconsin, etc.  
 Benson limestone, Trenton, Kentucky.  
 Berkshire schist, Ordovician(?), Connecticut.  
 Bertie waterlime, Upper Cayugan, Canada and New York.  
 Bertram beds, Silurian, Iowa.  
 Eib dolomite, Ozarkian, Alabama.  
 Big Buffalo series, Lower Ordovician.  
 Bigby limestone, Trenton, Tennessee, Kentucky, and Virginia.  
 Big Fork chert, Trenton, Arkansas.  
 Big Horn dolomite, Black River and Richmond, Wyoming.  
 Binnewater sandstone, Cayugan, New York.  
 Birch Creek schist, Pre-Ordovician, Alaska.  
 Bird Mountain grit, Ordovician, Vermont.  
 Birdseye limestone (=Lowville) Black River, New York, etc.  
 Black River group, Lower Mohawkian.  
 Blakeley sandstone (=St. Peter), Big Buffalo Series, Arkansas.  
 Blanchester division (of Waynesville) Richmond, Ohio Valley.  
 Blaylock sandstone, Upper Medinan, Arkansas.  
 Bledsoe limestone (=Louisville), Upper Niagaran, Tennessee.  
 Bloomsburg red sandstone, Upper Cayugan, Pennsylvania, Maryland, etc.  
 Blount group, Upper Chazyan.  
 Bluff limestone, Mohawkian, Wisconsin.  
 Bob formation, Upper Niagaran, West Tennessee.  
 Bolin Creek sandstone member of Elizabeth formation (=Roubidoux), Canadian, Missouri.  
 Bossardville limestone, Upper Cayugan, New York and New Jersey.  
 Bowling Green dolomite, Upper Medinan, Missouri, etc.  
 Bradford schist, Ordovician, Vermont.  
 Brainard shales, Upper Medinan, Iowa.  
 Brannon division of Flanagan, Trenton, Kentucky.  
 Brassfield limestone, Upper Medinan, Ohio Valley, etc.  
 Bryanm shales, Cayugan, New York.  
 Bretonian, Canadian, Nova Scotia.  
 Briarfield dolomite, Upper Cambrian or Ozarkian, Alabama.  
 Bridgeport sandstone, Silurian, Pennsylvania.  
 Brimfield schist, Silurian?, Massachusetts.  
 Bromide formation, Black River, Oklahoma.  
 Bromley shale of Cynthiana, Trenton, Kentucky, etc.  
 Brown's Mountain group, Lower Ordovician, Nova Scotia.  
 Brownsport bed, Niagaran, West Tennessee.  
 Bryant limestone, Black River, Missouri.  
 Buff limestone. *See* Upper Buff and Lower Buff.  
 Buffalo shales, Richmond, Iowa.  
 Bullhead dolomite (=Akron), Upper Cayugan, New York, etc.  
 Burden conglomerate, Middle Ordovician, New York.  
 Burgen sandstone, Lower Ordovician, Oklahoma.  
 Byron beds, Niagaran, Wisconsin.  
 Cabot Head beds, Upper Medinan, Ontario.  
 Cacapon sandstone, Lower Niagaran, West Virginia, etc.  
 Caddo shale, Lower Ordovician, Arkansas.  
 Calciferous limestone (=Beekmantown) Canadian, New York, etc.  
 Camillus shale, Lower Cayugan, New York.  
 Camp Nelson limestone, Stones River, Kentucky.  
 Canaan dolomite, Ordovician (?), Massachusetts.  
 Canajoharie shale, Trenton, New York.  
 Cannon limestone, Trenton, Tennessee.  
 Cap-au-Gres sandstone (=St. Peter), Big Buffalo series, Missouri.  
 Cape Canon massive, Ordovician, Quebec.  
 Cape Girardeau limestone. *See* Girardeau.  
 Capitol limestone (=Bigby), Trenton, Tennessee.  
 Cardiff quartzite, Ordovician (?), Maryland.  
 Carters Creek limestone (=Lowville), Black River, Tennessee.  
 Carters limestone. *See* Carters Creek limestone.  
 Cason shale, Richmond, Arkansas.  
 Cassin formation (=division E and upper part of D of Beekmantown), Canadian, Vermont and New York.

- Cat Head limestone, Black River or Richmond, Manitoba.
- Cataract formation, Upper Medinan, Ontario and New York.
- Catheys formation, Trenton, Tennessee, Kentucky, etc.
- Cayugan series or epoch, Silurian.
- Cedarville dolomite. Upper Niagaran, Ohio.
- Central limestone (= Murfreesboro), Stones River, Tennessee.
- Chambersburg formation, Chazyan-Mohawkian, Pennsylvania, Maryland, and Virginia.
- Champlainic (= Ordovician) system.
- Channahon limestone, Upper Medinan, Illinois, etc.
- Charette limestone, Middle Ordovician, Missouri.
- Charleton formation, Richmond, Anticosti Island, Quebec.
- Chazy shales (= Aylmer), Chazyan, Canada.
- Chazyan series or epoch, Lower Ordovician.
- Chepultepec limestone, Ozarkian, Alabama.
- Chester amphibolites, Ordovician (?), Massachusetts.
- Chicago group. *See* Lockport.
- Chickamauga limestone, Stones River to Cincinnati, Tennessee, Alabama, etc.
- Chicotte formation, Anticostian, Anticosti Island, Quebec.
- Chimneyhill limestone, Upper Medinan, Oklahoma.
- Cincinnati series or epoch, Upper Ordovician.
- Citadel series, Quebec group, Canada.
- Clarksville division (of Waynesville), Richmond, Ohio Valley.
- Clermont shale, Richmond, Iowa and Minnesota.
- Cliff limestone, Niagaran, Ohio Valley.
- Clinton limestone, Niagaran, West Tennessee.
- Clinch Mountain sandstone. *See* Clinch.
- Clinch sandstone, Upper Medinan, Tennessee and Virginia.
- Clinton group or stage, Lower Niagaran.
- Cloche Island beds, Black River, Ontario.
- Cobequid series, Silurian, Nova Scotia.
- Cobleskill (Coralline) waterlime, Upper Cayugan, New York.
- Cobscook (Bay) series, Silurian, Maine.
- Cockeysville marble, Cambrian-Ordovician, Maryland.
- Cococonk limestone, Ordovician, Ontario.
- Codus limestone, Ordovician, Pennsylvania.
- Ceggan beds, Silurian, Iowa.
- Colesburg terrane, Silurian, Iowa.
- College Hill limestone, Maysville, Central Tennessee.
- Collingwood black shales, Trenton, Ontario.
- Conococheague limestone, Upper Cambrian or Ozarkian, Pennsylvania, Maryland, etc.
- Conway schist, Ordovician (?), Massachusetts.
- Coos series, Silurian (?), New Hampshire.
- Coplay limestone, Canadian, Pennsylvania.
- Copper Ridge chert, Ozarkian, Virginia and Tennessee.
- Coral beds (Upper and Lower) Niagaran, Wisconsin.
- Coralline limestone (= Cobleskill) Silurian, New York.
- Cornishville member of Perryville, Trenton, Kentucky.
- Cornwall limestone, Silurian, New York.
- Corryville beds, Maysville, Ohio Valley.
- Cotter limestone, Canadian, Arkansas.
- Covington group, = Cincinnati.
- Crab Orchard formation, Clinton, Eastern Kentucky.
- Croasdale quartzite, Silurian, New Jersey.
- Crown Point limestone, Chazyan, New York.
- Crystal City sandstone (= St. Peter) Big Buffalo series, Missouri.
- Cumberland Head shale, Trenton, New York.
- Cumberland sandstone, Richmond, Kentucky.
- Curdsville limestone, Trenton, Kentucky, Tennessee and Ontario.
- Cynthiana formation, Trenton, Ohio Valley.
- Cyrene member of Edgewood, Upper Medinan, Illinois and Missouri.
- Dadina schist, Pre Silurian, Alaska.

- Damourite slate, Silurian, Pennsylvania.  
 Day Point limestone, Chazyan, New York.  
 Dayton limestone, Clinton, Ohio.  
 Decatur limestone, Lower Cayugan, Tennessee and Oklahoma.  
 Decew member of Lockport, Upper Niagaran, New York, etc.  
 Decker Ferry limestone, Helderbergian, New York, etc.  
 Decker limestone. *See* Decker Ferry.  
 Decorah shale, Black River, Iowa, Minnesota, etc.  
 Deep Creek division of San Saba series, Silurian (?), Texas.  
 Deepkill shale, Canadian, New York.  
 Delaware stage, Niagaran (preoccupied). *See* Hopkinton.  
 Dennys formation, Silurian, Maine.  
 Depauville waterlime (=Pamelia) Stones River, New York.  
 Detroit River series, Upper Monroan, Michigan and Ontario.  
 Dixon formation, Upper Niagaran, west Tennessee.  
 Dolgeville shale, Trenton, New York.  
 Dorset limestone, Silurian (?), Vermont.  
 Dubuque dolomite, Richmond, Missouri and Iowa.  
 Eastport formation, Silurian, Maine.  
 Economy member of Eden, Ohio Valley.  
 Eden shale, Lower Cincinnati, Ohio Valley, New York, etc.  
 Edgewood limestone, Upper Medinan, Illinois and Missouri.  
 Edmunds formation, Silurian, Maine.  
 Egremont limestone, Ordovician, Massachusetts.  
 Elevator sandstone included in Shakopee, Canadian, Minnesota.  
 Elgin shaly limestone, (=Fort Atkinson) Richmond, Iowa.  
 Elizabeth formation (=Roubidoux) Canadian, Missouri.  
 Elkhorn division, Richmond, Indiana and Ohio.  
 Ellenberger limestone, Cambrian-Ordovician, Texas.  
 Ellis Bay formation, Richmond, Anticosti Island, Quebec.  
 Elmtree slates, Silurian, New Brunswick.  
 El Paso limestone, Canadian, Texas and New Mexico.  
 Eminence chert, Ozarkian, Missouri.  
 English Head formation, Richmond, Anticosti Island, Quebec.  
 Eolian limestone, Cambro-Ordovician, Vermont.  
 Escanaba, Ordovician, Michigan.  
 Essex limestone, Upper Medinan, Illinois and Missouri.  
 Estil (?) clay, Clinton, eastern Kentucky.  
 Eureka quartzite, Middle Ordovician, Nevada and California.  
 Everett schist, Ordovician, Massachusetts.  
 Everton limestone, Big Buffalo series, Arkansas and Missouri.  
 Fairmount beds, Maysville, Ohio Valley, etc.  
 Fairview formation, Maysville, Ohio Valley, etc.  
 Farnham formation, Mohawkian, Quebec.  
 Faulconer division of Perryville, Trenton, Kentucky.  
 Fernvale limestone, Richmond, Illinois, Missouri, Tennessee, and Colorado.  
 Fish Haven dolomite (=Fernvale), Richmond, Utah.  
 Fishkill limestone, Cambrian-Ordovician, New York.  
 Flades clay, Clinton, eastern Kentucky.  
 Flanagan chert, Trenton, Kentucky, Tennessee, and Virginia.  
 Flat Rock dolomite, Upper Monroan, Michigan.  
 Folley limestone, Black River, Missouri.  
 Fort Ancient division (of Waynesville), Richmond, Ohio Valley.  
 Fort Atkinson limestone, Richmond, Iowa, and Minnesota.  
 Fournier group, Ordovician-Devonian, New Brunswick.  
 Fowler limestone (=Saluda), Richmond, Kentucky.  
 Frankfort shale, Cincinnati, New York.  
 Fremont limestone, Black River (Kimmswick) and Richmond, Colorado.  
 Fulton shale, Eden, Ohio and Kentucky.  
 Furnaceville iron-ore formation, Clinton, New York.  
 Fusselman limestone, Upper Niagaran, Texas.  
 Galena dolomite, Trenton, Upper Mississippi Valley.  
 Gamachian (Richmond), Anticosti Island, Quebec.  
 Gant bed, Niagaran, west Tennessee.

- Garden City limestone, Canadian, Utah.  
 Garrard sandstone, Eden, Kentucky.  
 Gasconade limestone, Ozarkian, Missouri.  
 Gasport limestone member, Upper Niagaran, New York.  
 Gilbert member, Maysville, Kentucky.  
 Girardeau limestone, Upper Medinan, Illinois and Missouri.  
 Glade limestone (=Lebanon), Stones River, Tennessee.  
 Glen Falls limestone, Trenton, New York.  
 Glencoe marble (Galena), Mohawkian, Illinois.  
 Glens Falls black marble, Silurian, Arkansas.  
 Glenkirk limestone, Niagaran, west Tennessee.  
 Glenwood shales, base of Platteville, Iowa and Minnesota.  
 Goodsir formation, Canadian, British Columbia.  
 Goshen schist, Ordovician (?), Massachusetts.  
 Gower formation, Cayugan, Illinois and Iowa.  
 Grand Rapids sandstone (=Sylvania), Monroan, Ohio, etc.  
 Granville serpentines, Ordovician (?), Massachusetts.  
 Gratz shale (of Cynthiana), Trenton, Kentucky.  
 Gray sandstone (of Oswego), Silurian, New York.  
 Greendale bed (of Cynthiana), Trenton, Kentucky.  
 Greenfield dolomite, Upper Cayugan, Ohio and Michigan.  
 Green Pond conglomerate, Upper Medinan, New Jersey and New York.  
 Greylock schist, Ordovician (?), Massachusetts.  
 Grimby sandstone, Upper Medinan, Ontario.  
 Grizzly formation, Silurian, California.  
 Guelph dolomite, Niagaran, Ontario, New York, Michigan, etc.  
 Gun River formation, Anticostian, Anticosti Island, Quebec.  
 Gunter sandstone (member of Gasconade) Ozarkian, Missouri.  
 Hancock limestone, Cayugan, east Tennessee.  
 Harding sandstone, Black River (just below Kimmiswick limestone), Colorado.  
 Hardwick gneiss, Ordovician(?), Massachusetts.  
 Hartwick terrane, Silurian, Iowa.  
 Hawley schist, Ordovician(?), Massachusetts.  
 Heiskell shale, Upper Chazyan, Virginia and Tennessee.  
 Henryhouse shale, Niagaran, Oklahoma.  
 Hermansville limestone, Cambrian-Ordovician, Michigan.  
 Hermitage limestone, Trenton, Tennessee and Kentucky.  
 Highbridge limestone, Stones River-Black River, Kentucky.  
 High Falls shale, Lower Cayugan, New York and New Jersey.  
 Hillsboro sandstone, Upper Cayugan, Ohio.  
 Hinton division of San Saba series, Silurian(?), Texas.  
 Hitz layer of Saluda, Richmond, Indiana.  
 Holland sandstone (=Sylvania), Monroan, Ohio.  
 Holston marble, Blount group, Tennessee and Virginia.  
 Hoosac schists, Ordovician, Massachusetts.  
 Hoover division, Silurian(?), Texas.  
 Hopkinton dolomite, Niagaran, Iowa and Minnesota.  
 Hoyt limestone, Upper Cambrian or Ozarkian, New York.  
 Hudson River beds or group, Ordovician, New York, etc.  
 Hudson shale and schist, Ordovician, New York, etc.  
 Hull limestone, Trenton, Central Ontario.  
 Huntington limestone, Niagaran, northern Indiana.  
 Hunton formation, Silurian and Lower Devonian, Arkansas.  
 Hurrah slate, Post Ordovician, Alaska.  
 Hydraulic limestone, Silurian, New York, etc.  
 Indian Fields formation, Clinton, eastern Kentucky.  
 Indian Ladder beds, Eden, New York.  
 Inwood limestone, Ordovician(?), New York.  
 Irondequoit limestone, Upper Clinton, New York and Ontario.  
 Irasburg conglomerate, Ordovician, Vermont.  
 Iron Ridge ore bed, Upper Medinan, Wisconsin.

- Isle La Motte sandstone, Ordovician, Vermont.
- Izard limestone, Ordovician, Arkansas and Missouri.
- Jacksonburg limestone, Mohawkian, New Jersey.
- James River formation, Lower Ordovician, Nova Scotia.
- Jasper limestone, Big Buffalo series, Arkansas.
- Jefferson City limestone, Canadian, Missouri.
- Jessamine series, Trenton, Kentucky.
- Joachim limestone, member of St. Peter sandstone, Missouri.
- Jonesboro limestone, Canadian, Tennessee and Virginia.
- Juniata sandstone and shales, Lower Medinan, Pennsylvania and Maryland.
- Jupiter River formation, Anticostian, Anticosti Island, Quebec.
- Kagawong beds, Richmond, Ontario.
- Keefer sandstone, Clinton, West Virginia, Pennsylvania and Maryland.
- Kentucky marble (=Oregon dolomite), Black River, Kentucky.
- Keppel dolomites, Silurian, Ontario.
- Ketona dolomite, Upper Cambrian or Ozarkian, Alabama.
- Key sandstone (=St. Peter), Big Buffalo series, Arkansas.
- Keyser formation, Lowest Helderbergian, Maryland, Pennsylvania, etc.
- Kigluaik series, Pre-Silurian, Alaska.
- Kimmswick limestone, Black River, Missouri and Illinois.
- Kirkfield limestone, Trenton, Ontario.
- Kittatinny limestone, Ozarkian and Canadian, New Jersey, etc.
- Klutena series (schists) Pre-Silurian, Alaska.
- Knox dolomite, Cambrian and Ozarkian, east Tennessee, etc.
- Kokomo limestone, Upper Cayugan, Indiana.
- Kugruk group, Silurian or Devonian, Alaska.
- Kuzitrina formation, Pre-Silurian, Alaska.
- Laketown dolomite (=Fusselman), Niagaran, Utah.
- Lancaster limestone, Canadian and Ordovician, Pennsylvania.
- Laughery formation, Richmond, Indiana, etc.
- Laurel limestone, Upper Niagaran, Indiana, Kentucky, and Tennessee.
- Lauzon formation, Quebec group, Eastern Canada.
- Lebanon beds (=Richmond), early Medinan, Ohio Valley.
- Lebanon (=Glade) limestone, Stones River, Tennessee, etc.
- Leclaire limestone, Cayugan, Iowa and Illinois.
- Lego limestone, Upper Niagaran, west Tennessee.
- Lehigh limestone, Mohawkian, eastern Pennsylvania.
- Leipers Creek limestone, Richmond, Tennessee.
- Leipers formation, Cincinnati, Tennessee.
- Leonor limestone, Chazyan, east Tennessee and Virginia.
- Leon series, Silurian (?), Texas.
- Leray limestone, member of Lowville formation, Black River, New York and Ontario.
- Levant, Silurian, Pennsylvania.
- Levis formation, Canadian, Quebec and Ontario.
- Lewiston (=Queenston shale), Richmond, New York, etc.
- Lewiston limestone, Silurian-Early Devonian, Pennsylvania and West Virginia.
- Lexington limestone, Trenton, Kentucky.
- Leyden phyllite, Ordovician (?), Massachusetts.
- Liberty beds, Richmond, Ohio Valley.
- Liberty Hall limestone, Black River, Virginia.
- Little Falls dolomite, Ozarkian, New York.
- Lobelville formation, Upper Niagaran, West Tennessee.
- Lockport dolomite, Niagaran, New York and Ontario.
- Lockport group or stage, Upper Niagaran.
- Logana limestone (=Hermitage), Trenton, Kentucky.
- Lone Mountain limestone, Early Silurian, Nevada.
- Lone Mountain quartzite, Lower Ordovician, Nevada.



- Longfellow formation, Canadian, Arizona.
- Longwood shale limestone, Lower Cayugan, New Jersey and New York.
- Lorraine formation, Cincinnatian, New York and Ontario.
- Louisville limestone, Niagaran, Kentucky, Tennessee, and Indiana.
- Lower Blue, Black River, Wisconsin, etc.
- Lower Buff (=Minneapolis limestone), Black River, Minnesota, Wisconsin, etc.
- Lower Magnesian dolomite, includes Cambrian, Ozarkian and Canadian, Mississippi Valley.
- Lowville limestone, Black River, New York, Canada, Appalachian and Mississippi Valleys.
- Lucas dolomite, Upper Monroan, Michigan, etc.
- Lulbegrud clay, Clinton, Eastern Kentucky.
- Macastey black shale, Trenton, Anticosti Island, Quebec.
- Maddox limestone, Upper Medinan and Clinton, West Tennessee.
- Madison bed (=Saluda), Richmond, Indiana.
- Madison sandstone, Upper Cambrian or Ozarkian, Wisconsin.
- Magnesian limestone, has included Cambrian to Silurian, Mississippi Valley.
- Malignant Cove formation, Ordovician, Nova Scotia.
- Manhattan schist, Ordovician (?), New York.
- Manitou limestone, Canadian, Colorado.
- Manitoulin member of Cataract, Upper Medinan, Ontario.
- Manlius limestone, Upper Cayugan, New York and New Jersey.
- Mannie shale, Richmond, Tennessee.
- Maquoketa shale, Richmond, Iowa, Illinois, Missouri, and Minnesota.
- Marble Hill marble, Richmond, Indiana.
- Marsouin series, Mohawkian, Quebec.
- Martinsburg shale, Trenton-Cincinnatian, West Virginia, Pennsylvania, Maryland, and Virginia.
- Mascarene series, Silurian, New Brunswick.
- Massanutten sandstone, Cincinnatian and Medinan, Virginia.
- Matinal, Ordovician, Pennsylvania.
- Maxford formation, Cambrian (not Ordovician), Utah.
- Maysville group, Upper Cincinnatian.
- Mayville dolomite, Niagaran, Wisconsin.
- Maywood formation, Upper Cambrian (not Silurian), Montana.
- McAdam formation, Niagaran, Nova Scotia.
- McCoytown sandstone, Silurian, Pennsylvania.
- McCune dolomite, Trenton, Missouri.
- McKenzie formation, Lower Cayugan, West Virginia, Pennsylvania and Maryland.
- McMicken member, Eden, Ohio Valley.
- McMillan formation, Cincinnatian, Ohio Valley.
- Medina sandstone, Silurian, New York, Ontario, etc.
- Medinan series or epoch, Silurian.
- Memphremagog slates, Ordovician, Vermont.
- Mendota dolomite, Upper Cambrian or Ozarkian, Wisconsin.
- Meniscus beds, Niagaran, west Tennessee.
- Mifflintown limestone, Silurian, Pennsylvania.
- Millersburg division of Cynthiana, Trenton, Kentucky.
- Million beds, Eden, Kentucky.
- Millstream series, Ordovician, New Brunswick.
- Mimbres limestone, Canadian, New Mexico.
- Minneapolis limestone (=Lower Buff), Black River, Minnesota.
- Mistassini limestone, Ordovician (?), Quebec.
- Moccasin limestone, Black River, Virginia and Tennessee.
- Moduria limestone, Ordovician, Georgia.
- Mohawk limestone. *See* Mohawkian.
- Mohawkian series or epoch, Middle Ordovician.
- Monarek formation, Devonian (not Silurian), Montana.
- Monclova sandstone (=Sylvania), Monroan, Ohio.
- Monroan =Upper Cayugan and Helderbergian.
- Montecello terrane, Silurian, Iowa.

- Montgomery limestone (=Brassfield), Upper Medinan, Ohio.
- Montgomery limestone, Niagaran, California.
- Montoya limestone (Richmond), Texas and New Mexico.
- Moreau sandstone, Ozarkian, Missouri.
- Morehouse quartzite, Ordovician and Silurian (?), Utah.
- Mosheim limestone, Stones River, Tennessee and Virginia.
- Mottled limestone, Black River or Richmond, Canada.
- Mount Auburn beds, Maysville, Ohio Valley.
- Mount Hope beds, Maysville, Ohio Valley.
- Mount Joli massive, Ordovician, Quebec.
- Mount Pleasant phosphate (=Bigby), Trenton, central Tennessee.
- Mount Washington series, Ordovician, Massachusetts.
- Moydart formation, Niagaran, Nova Scotia.
- Murat limestone, Chazyan, Virginia.
- Murfreesboro (Central) limestone, Stones River, Tennessee and Virginia.
- Nashville group, Trenton and Maysville, Tennessee.
- Natural Bridge limestone, Canadian, Virginia.
- Nazareth cement rock, Trenton, north-east Pennsylvania.
- Neeleytown limestone, Ozarkian, New York.
- Newburgh limestone, Cambrian-Ordovician, New York.
- Newsom shale (=Waldron), Upper Niagaran, Tennessee.
- Niagaran series or epoch, Silurian.
- Nicholas bed of Cynthiana, Trenton, Kentucky.
- Nisky limestone, Ordovician, Pennsylvania.
- Nittany limestone, Canadian, Pennsylvania.
- Noblesville dolomite, Niagaran, northern Indiana.
- Noix oolite, Upper Medinan, Illinois and Missouri.
- Normandy limestone, Middle Ordovician, Tennessee.
- Normanskill shale, Chazyan, New York, New Jersey, etc.
- North Peak formation, Ozarkian and Utah.
- Octoraro schist, Ordovician, Pennsylvania.
- Oldham limestone, Clinton, eastern Kentucky.
- Oneida conglomerate, Upper Medinan, New York.
- Oneota dolomite, Ozarkian, Iowa.
- Onondaga salt group (=Salina).
- Orchard Creek shale (lower member of Girardeau), Upper Medinan, Illinois and Missouri.
- Oregon dolomite, Black River, Kentucky.
- Oregonia division of Arnheim, Richmond, Ohio Valley.
- Osgood limestone, Niagaran, Ohio Valley.
- Oswego sandstone, Cincinnati, New York and Pennsylvania.
- Ottosee shale, Blount group, Tennessee and Virginia.
- Ouachita shale, Canadian, Arkansas.
- Pacific sandstone, Big Buffalo series, Arkansas.
- Paint Lick member, Eden, Kentucky.
- Pamelia limestone, Stones River, Quebec, Ontario, and New York.
- Panola formation, Upper Medinan to Devonian, eastern Kentucky.
- Paradise limestone, Silurian, Utah.
- Paris bed, Trenton, Kentucky.
- Peachbottom slates, Ordovician (?), Maryland.
- Pearisburg limestone, Upper Chazyan, Virginia and Tennessee.
- Peekskill granite, Ordovician (?), New York.
- Pelham (Trenton) limestone, Ordovician, Alabama.
- Pembroke formation, Silurian, Maine.
- Perryville limestone, Trenton, Kentucky.
- Phillipsburg limestone, Canadian, Quebec, etc.
- Picton limestone, Trenton, Quebec, etc.
- Pierce limestone, Stones River, Tennessee and Virginia.
- Pittsford shale, Lower Cayugan, New York.
- Platteville limestone, Black River, Illinois, Iowa, and Minnesota.
- Plattin limestone, Black River, Missouri and Illinois.

- Plum Creek clay, Clinton, eastern Kentucky.
- Pogonip limestone, Canadian-Black River, Nevada.
- Pohenagamuk formation, Ordovician, Quebec.
- Point Pleasant limestone, Upper Trenton, Ohio and Kentucky.
- Polk Bayou limestone (lower), Black River, Arkansas.
- Polk Bayou limestone (upper), Richmond, Arkansas.
- Polk Creek shale, Cincinnati, Arkansas.
- Porcupine group, Silurian-Devonian, Alaska.
- Port Clarence limestone, Silurian and Ordovician, Alaska.
- Potosi limestone, Ozarkian, Missouri.
- Potsdam sandstone, Upper Cambrian or Ozarkian, New York and Quebec.
- Poughquag quartzite, Cambrian-Ordovician, Connecticut.
- Powell limestone, Canadian, Arkansas.
- Poxino Island shale, Cayugan, New York, etc.
- Poxino shale. *See* Poxino Island Shale.
- Prairie du Chien limestone, Ozarkian and Canadian, Iowa and Wisconsin.
- Proctor dolomite, Ozarkian, Missouri.
- Prosser limestone, Trenton, Upper Mississippi Valley.
- Puckmummis schist, Post Ordovician, Alaska.
- Pulaski shale, Cincinnati, New York and Ontario.
- Put-in-Bay dolomite, Lower Monroan, Ohio and Michigan.
- Quantico slate, Ordovician (?), Virginia.
- Quebec City formation, Trenton, Quebec.
- Quebec group, Cambrian and Ordovician, of eastern Canada.
- Queenston shale, Richmond, New York and Ontario.
- Quoddy shale, Silurian, Maine.
- Racine dolomite, Niagaran, Wisconsin.
- Rainy Mountain limestone, Ordovician, Oklahoma.
- Raisin River dolomites, Lower Monroan, Michigan.
- Razor Mountain group, PreOrdovician, Alaska.
- Receptaculites limestone (=Kimmswick), Black River, Missouri.
- Red Mountain limestone, Upper Medinan and Clinton, Alabama.
- Red Warren limestone, Silurian (?), Utah.
- Reedsville shale, Trenton and Eden, Pennsylvania.
- Rensselaer grit, Silurian or Devonian, eastern New York.
- Richmond group of stage, Lower Medinan. Richmondian. *See* Richmond.
- Ridley limestone, Stones River, Tennessee.
- Riga schist, Ordovician, Massachusetts.
- Robson limestone, Lowest Ordovician, British Columbia and Alberta.
- Richdale limestone, Cambrian-Ordovician, New York.
- Rochester shale, Upper Clinton, New York, etc.
- Rockland formation, Cambrian-Ordovician, Maine.
- Rockland limestone, Mohawkian, central Ontario.
- Rockmart slates (=Athens), Chazyan, Georgia.
- Rockport limestone member, Cambrian-Ordovician, Maine.
- Rockwood formation, Medinan, Tennessee and Alabama.
- Rogers Gap division of Cynthiana, Trenton, Kentucky.
- Romaine formation, Canadian, Mingan Island, Quebec.
- Rosendale water lime, Cayugan, New York.
- Ross Brook formation, Niagaran, Nova Scotia.
- Roubidoux sandstone, Canadian, Missouri.
- Rysedorph conglomerate, Trenton, New York.
- Sabula terrane, Silurian, Iowa.
- Saccharoidal sandstone = St. Peter sandstone.
- St. Clair limestone, Upper Medinan, and Clinton, Arkansas, Oklahoma.
- St. Elizabeth formation. *See* Elizabeth.
- St. François limestone, Cambrian-Ordovician, Missouri.
- St. Joseph limestone, Cambro-Ordovician, Missouri.
- St. Lawrence (Mendota) limestone, Ordovician, Minnesota, etc.
- St. Peter sandstone, Big Buffalo series, Mississippi Valley.

- St. Thomas sandstone, Cambro-Ordovician, Missouri.
- Salina group=Lower Cayugan.
- Salmon River sandstone (=Oswego), Cincinnati, New York.
- Saltillo limestone (=Hermitage) Trenton, Tennessee.
- Saluda bed (=Whitewater) Richmond, Ohio Valley.
- Salvia division of Perryville, Trenton, Kentucky.
- San Saba series, Silurian (?), Texas.
- Santa Rita limestone, Silurian, New Mexico.
- Saratogan =Lower Ozarkian or Upper Cambrian.
- Savoy schist, Ordovician, Massachusetts.
- Sealent, Silurian, Pennsylvania.
- Schaghticoke shale, Canadian, New York.
- Schenectady beds, Trenton, New York.
- Sequatchie formation, Richmond, east Tennessee.
- Sevier shale, Ordovician, Tennessee and Virginia.
- Sexton Creek limestone (=Brassfield), Upper Medinan, Illinois and Missouri.
- Shakopee dolomite, Canadian, Minnesota.
- Shawangunk conglomerate and grit, Upper Medinan, New York, New Jersey, and Pennsylvania.
- Sheguindah beds, Eden, Ontario.
- Shelby dolomite, Upper Niagaran, New York.
- Shenandoah group, Canadian and Ordovician, Virginia.
- Sheridan formation, Ordovician, Michigan.
- Sheridan sandstone, Silurian, Maine.
- Sillery formation, Canadian, Quebec.
- Simpson formation, Stones River, Oklahoma.
- Skajit formation, Upper Silurian, Alaska.
- Slatington shale, Silurian, Arkansas.
- Snake Hill shale, Trenton, New York.
- Sneed's limestone, Big Buffalo series, Arkansas.
- Sneedville limestone, Upper Cayugan, Tennessee.
- Sodus shale, Lower Clinton, New York.
- Solomon schist, Pre-Ordovician, Alaska.
- South Tunnel limestone (=Osgood), Lower Niagaran, Tennessee.
- Southgate member, Eden, Ohio Valley.
- Sowik limestone, Ordovician, Alaska.
- Sparry limestone, Ordovician (?), Vermont.
- Springfield dolomite, Upper Niagaran, Ohio.
- Stewartville dolomite, Trenton, Upper Mississippi Valley.
- Stissing limestone, Cambrian or Lowest Ordovician, New York.
- Stockbridge limestone, Cambro-Ordovician, New York.
- Stone House formation, Cayugan, Nova Scotia.
- Stonehenge limestone, Canadian, Pennsylvania and Maryland.
- Stones River group, Lower Chazyan.
- Stony Mountain formation, Richmond, Manitoba.
- Stringtown shale, Chazyan, Arkansas.
- Sunset division of Arnheim, Richmond, Kentucky and Ohio.
- Surgent, Silurian, Pennsylvania.
- Swan Creek limestone, Maysville, Tennessee.
- Swan Peak quartzite, Ordovician, Utah.
- Swift Current limestone, Black River, Ontario.
- Swift Water series, Silurian, New Hampshire.
- Sylvan shale, Richmond, Oklahoma.
- Sylvania sandstone, Monroan, Ohio, etc.
- Syracuse shale, Lower Cayugan, New York.
- Talihina chert, Ordovician, Oklahoma.
- Tatalina group, Ordovician (?), Alaska.
- Tate member, Maysville, Kentucky.
- Tatina group, Ordovician, Alaska.
- Taylor's Ridge, Silurian, Georgia.
- Taylorville slate, Silurian (?), California.
- Tellico sandstone, Blount group, Tennessee and Virginia.
- Tentaculite limestone=Manlius.
- Tetagonche series, Ordovician, New Brunswick.
- Thebes formation, Richmond, Illinois and Missouri.
- Theresa dolomite, Upper Cambrian or Ozarkian, New York.
- Thorofare andesite, Silurian, Maine.
- Thorold sandstone, Upper Medinan, New York and Ontario.
- Toll Pit beds, Silurian, Michigan.
- Tomichi limestone, Ordovician, Colorado.

- Tonoloway limestone, Upper Cayugan, West Virginia, Pennsylvania, and Maryland.  
 Totsen series, Silurian, Alaska.  
 Trenton group, Upper Mohawkian.  
 Trenton limestone, Mohawkian, New York, etc.  
 Tribes Hill limestone, Canadian, New York.  
 Tuscarora sandstone, Upper Medinan, Pennsylvania, West Virginia, and Maryland.  
 Tymochtee beds, Lower Monroan, Ohio, and Michigan.  
 Tyner formation, Middle Ordovician, Oklahoma.  
 Tyrone beds (=Bald Eagle), Cincinnati, Pennsylvania.  
 Tyrone limestone, Black River, Kentucky.  
 Upper Blue limestone, Black River, Wisconsin, etc.  
 Upper Buff dolomite, Black River, Wisconsin.  
 Ute limestone, Cambrian-Silurian, Utah, Nevada.  
 Utica shale, Cincinnati, New York, Ohio, and Pennsylvania, etc.  
 Valcour limestone, Chazyan, Champlain Valley.  
 Valdez formation, Silurian, Alaska.  
 Variegated beds, Niagaran, West Tennessee.  
 Vernon shales, Lower Cayugan, New York.  
 Versailles beds, Richmond, Ohio Valley.  
 Vinalhaven rhyolite, Silurian?, Maine.  
 Viola limestone, Trenton, Oklahoma.  
 Waco limestone, Clinton, eastern Kentucky.  
 Waits River limestone, Ordovician, Vermont.  
 Waldron shale, Upper Niagaran, Indiana, Kentucky, and Tennessee.  
 Wales series, Silurian, Alaska.  
 Wappinger Valley limestone, Cambrian-Ordovician, New York.  
 Warren beds. *See* Arnheim.  
 Washington phase of Waits River limestone, Ordovician, Vermont.  
 Waterlime. *See* Cayugan.  
 Watertown limestone, Black River, New York and Canada.  
 Waterville slates, Ordovician, Maine.  
 Waubakee limestone, Cayugan, Wisconsin.  
 Waukesha dolomite, Niagaran, Wisconsin.  
 Waynesville formation, Richmond, Ohio Valley.  
 Wekwemikongsing, Maysville, Ontario.  
 Wells chert, Canadian, Tennessee.  
 Weskeas quartzite member, Cambrian-Ordovician, Maine.  
 West Union limestone, Clinton, Ohio.  
 Westfield serpentine, Ordovician (?), Massachusetts.  
 Whatley bed, Ordovician (?), Massachusetts.  
 Whitewood limestone, Early Silurian (?), Wyoming and South Dakota.  
 Whirlpool sandstone, Upper Medinan, New York and Ontario.  
 White limestone, Silurian, Colorado.  
 White Oak Mountain, Upper Medinan, Tennessee.  
 Whites Bend limestone (=Laurel), Upper Niagaran, Tennessee.  
 Whitewater formation, Richmond, Ohio Valley.  
 Whitmores Ferry bed, Ordovician (?), Massachusetts.  
 Wilbur limestone, Cayugan, New York.  
 Williamson shale, Clinton, New York.  
 Willow River limestone, Canadian, Iowa.  
 Wills Creek shale, Upper Cayugan, West Virginia, Pennsylvania, and Maryland.  
 Wilmore limestone, Trenton, Kentucky.  
 Winchester limestone, Ordovician, Kentucky.  
 Winfield limestone, Canadian, Missouri.  
 Winnipeg sandstone, Ordovician, Manitoba.  
 Wolcott limestone, Clinton, New York.  
 Woodburn division of Flanagan, Trenton, Kentucky.  
 Wykoff limestone, Richmond, Minnesota, Iowa.  
 Wyoming division, Silurian (?), Texas.  
 Yellville limestone, Canadian, Arkansas.  
 Yule limestone, Early Silurian, Colorado.





# OSARKIAN-ORDOVICIAN

GENERAL TIME SCALE		<i>Newfoundland</i>	<i>Cape Breton and New Brunswick</i>	<i>Levis and Quebec, Canada</i>	<i>Slate belt of Eastern New York</i>	<i>Champlain Valley</i>		
<b>SILURIAN</b>								
<b>ORDOVICIAN</b>	CINCINNATIAN	EDEN	Mrs Millan (Ohio)					
		WARSVILLE	Fairview (Ohio)					
			Frankfort (N.Y.)					
			Utica (N.Y.)			Shale (? Utica)		
	MOHAWKIAN	TRENTON		Cynthiana (Ky)				
				Ferryville (Ky.)			?	
				Flanagan (Ky)				
		BLACK RIVER		Bigby (Ky)				
				Wilmore (Ky)				Cumberland Head shale
				Hermitage (Ky)		Quebec City formation with conglomerates (Rysedorph) near base	Snake Hill shale	
				Curdsville (Ky)			Rysedorph conglomerate	Glen Falls ls
	CHAZYAN	BLOUNT		Kimmswick (Mo.)				
				Decorah (Iowa)				Amsterdam
				Watertown (N.Y.)				
				Lowville (N.Y.)				Lowville ls
		STONES RIVER		Otlosee (Tenn)				
				Tellico (Tenn.)	Quebec I-M (N-P in part)			
				Athens (Tenn.)			Normanskill shale (Lower <i>Dicellograptus</i> zone)	
				Holston (Tenn.)				Valcour ls
				Lebanon (Tenn.)				
			Ridley (Tenn.)	?			Crown Point	
BIG BUFFALO SERIES		Pierce (Tenn.)						
		Murfreesboro (Tenn.)				Day Point ls		
		Mosheim (Tenn.)						
		Jasper (Ark)						
CANADIAN	UPPER	Bellefonte (Pa.)						
	MIDDLE	Axeman (Pa.)						
	LOWER	Nittany (Pa.)						
OSARKIAN	UPPER		Stonehenge (Pa.)					
			Dictionema flabelliforme bed	Quebec D-H (N-P in part)				
			Gasconade (Mo.)					
	LOWER		Copper Ridge (Tenn.)					
			Eminence (Mo.)					
			Little Falls (N.Y.)				Little Falls dol.	
			Hoyt (N.Y.)				Hoyt ls.	
	Potsdam (N.Y.)				Potsdam s			
CAMBRIAN	UPPER	St. Croixan						
	MIDDLE	Acadian			Cambrian slates and sandstones			
	LOWER	Waucoban	Quebec A-C					

Hudson R. slate

Hudson River slate

Deep Kill

Schaghticoke shale

Levis

Bretonian

Quebec D-H (N-P in part)

Cambrian

Beekmantown limestone

Little Falls dol. (to Div. D Div. C Div. B)

Hudson River slate









# OSARKIAN-ORDOVICIAN

GENERAL TIME SCALE		<i>Central Pennsylvania</i>	Alabama	<i>Cincinnati dome</i>	<i>Nashville dome</i>	<i>East Missouri</i>	<i>Arbuckle (Oklahoma)</i>		
SILURIAN		Juniata		Richmond (Arnhem)		Maquoketa (Buffalo F.) Fernvale	Fernvale		
O R D O V I C I A N	CINCINNATIAN EDEN MASSILLÉ	ME Millan (Ohio)	Oswego (Bald Eagle)		ME Auburn Gorville (Gilbert) Bellevue (Lick)				
		Fairview (Ohio)			Fairmount Mt. Hope (Up Garard)	Leipers (Swan G.)			
		Frankfort (N.Y.)	Shale	Eden shale	ME Mcken (Point Lick) Southside Million				
		Utica (N.Y.)			Eden Fulton				
	MOHAWKIAN TRENTON	Cynthiana (Ky)	Trenton ls.	Reedsville shale	Cynthiana	Leipers cap Cortley			
		Perryville (Ky)			Perryville Cronquist	Catheys f.			
		Flanagan (Ky)			Flanagan Woodburn				
		Bigby (Ky)			Bigby ? ls.	Bigby (Paris in part)	Bigby Capital ls. Mt. Pleasant		Viola ls.
		Wilmore (Ky)				Wilmore ls.			
		Hermitage (Ky)				Hermitage (Logans)		Hermitage ls. (Saltville)	ME Cune dol.
	BLACK RIVER	Curdsville (Ky)		Lower Trenton limestone	Curdsville ls.	Curdsville	Upper Prosser		
		Kimmswick (Mo)			Christiania fauna		Kimmswick (Bryant)		
		Decorah (Iowa)	Amsterdam ls.			Decorah sh. (Upper)	Decorah (Auburn)		
		Watertown (N.Y.)							
	CHAZYAN BLOUNT STONES RIVER	Lowville (N.Y.)	Lowville ls.			Lowville (Troy ls. Oregon dol.)	Lowville (Carters)	Bryant ls. (Lower) Folley ls.	
		Otosee (Tenn.)							
		Tellico (Tenn.)							
		Athens (Tenn.)		Athens (Rockmart)					
		Holston (Tenn.)							
		Lebanon (Tenn.)	Pamelia ls.			Camp Nelson ls.	Lebanon ls.		
Ridley (Tenn.)			Stones River ls.			Ridley ls.			
Pierce (Tenn.)						Pierce ls.			
Murfreesboro (Tenn.)						Murfreesboro ls.			
Mosheim (Tenn.)									
BIG BUFFALO SERIES	Jasper (Ark)								
	St. Peter (Minn)				St. Peter (in wells)	St. Peter ss. (Crawfords) (Joachim ls. member)	Arbuckle (Main m.)		
	Everton (Ark)								
CANADIAN UPPER MIDDLE LOWER	Sneeds (Ark)								
	Bellefonte (Pa.)	Bellefonte dol.				Powell ls.			
	Axeman (Pa.)	Axeman ls.				Cotter ls.	Wierfield ls.		
	Nittany (Pa.)	Nittany dol.	Ceratopea fauna		Wells chert	Jefferson City ls.			
OSARKIAN UPPER LOWER	Stonehenge (Pa.)	Stonehenge ls.	Pelham ls.			Roubidoux ss.			
	Dictyonema flabelliforme bed	Represented ?							
	Gasconade (Mo)		Chepultepec ls. (Upper Knox)			Gasconade ls. (Carter ss. member)			
	Copper Ridge (Tenn.)		Copper Ridge ch.			Proctor dol.			
	Eminence (Mo)		"Lower Knox"			Eminence chert			
	Little Falls (N.Y.)	Represented	Bib dol.			Potosi ls.			
CAMBRIAN UPPER MIDDLE LOWER	Hoyt		Ketona dol.						
	Potsdam		Briarfield dol.						
	St. Croixan		Nolichucky sh. Marysville ls. Rogersville sh.						

# CORRELATION TABLE

BULLETIN 92 PLATE 2

Arkansas Northern West Central (Ouachitas)		Wisconsin Illinois	Minnesota and Northern Iowa	Manitowlin Ids. Lake Huron	Central Ontario	Esthonia, Russia	Great Britain Wales Scotland	
Fernvale	Fernvale	Fernvale	Dubuque dol.	Richmond.	Richmond.	Borholm ls.(F <sup>2</sup> )	Llandovery Birkhill	
Polk Bayou limestone					Wekwemikong sh.			
		Polk Creek shale			Sheguindah	Eden sh.		
		Big Fork chert	Galena dol.			? Utica sh.		
					Collingwood	Collingwood sh.	Lyckholm ls. (F <sup>1</sup> )	Hartfell (Upper)
					Stewartville dol. (Maclurea bed)		Picton ls.	Wesenberg ls. (E) Wassalem ls. (D <sup>3</sup> ) Kegel ls. (D <sup>2</sup> ) Jewe ls. (D <sup>1</sup> )
				Prosser limestone	Prosser Curdsville	Hull (Curdsville) Rockland ls. Glen Falls ls.	Itfer ls. (C <sup>3</sup> )	Hartfell (Lower)
		Kimmswick ls.		Decorah shale (Upper Blue Upper Buff)	Cloche Island.		Kuckers shale (C <sup>2</sup> )	
		Plattin ls.		Platteville	Swift Current (Leray) Lowville	Leray ls. Lowville ls.	Echinospherites ls. (C <sup>1</sup> )	
							? Orthoceras ls. (B <sup>3</sup> ) ? Glauconite ls. (B <sup>2</sup> )	
	Izard limestone		Stringtown sh.					
					Pamelia ls.		Landeilo Glenkiln	
	Jasper ls. St. Peter with Joachim ls. member Everton ls. Sneeds ls.	Blakeley ss.	St. Peter sandstone				Llandovery (Upper)	
Yellville	Powell ls. Cotter ls. Jefferson City ls. Roubidoux ss.	Ouachita shale	Shakopee dolomite			Glauconite ss. (B <sup>1</sup> )	Arenig Skiddaw.	
				Oneota dolomite			Dichyonema flabelliformis bryol. (Inequite ss. at base) (B <sup>0</sup> )	Tremadoc Durness
	Gasconade ls. (Clinton ss. member)							?
	Proctor dol.							
	Eminence ch.							
	Potosi ls.							
		Madison ss.						
		Mendota ls.						
Union Some Terre Ouachita	Central Mt. ss. Cotter shale	St. Croix ss.	Jordan ss. St. Lawrence f. Francis ss. Friedrich ss. Sauclair ss. St. Simon ss.					
						Esthonia fm. (A <sup>1</sup> )	Cambrian	





GENERAL TIME SCALE		Western New York and Ontario		Central and Eastern New York		APPALACHIAN VALLEY		
						Penn. Md. and Va.	Tennessee	
DEVONIAN (HELDERBERGIAN)		Becraft (N.Y.)		Becraft form.				
		New Scotland (N.Y.)		New Scotland formation				
		Coeymans (N.Y.)		Coeymans ls.				
		Keyser (W.Va.)		Keyser ls. - Decker Ferry ls. (N.J.)				
CAYUGAN	UPPER	Manlius (N.Y.)		Manlius ls. (Tentaculite ls.)		Bossardville ls.	Sneedville ls.	
		Tonoloway (Md.)		Cobleskill ls.		Tonoloway ls.		
		Wills Creek (Md.)	Akron dol. (Bullhead)				Wills Creek ls.	
	LOWER	Bloomsburg (Pa.)	Bertie wl.			Bloomsburg ss.		
		Salina - M <sup>o</sup> Kenzie (N.Y.)	Salina (Ontario salt group)	Camillus sh. Syracuse sh. Vernon sh. Pittsford sh.	High Falls sh. - Longwood sh.	M <sup>o</sup> Kenzie form.		
NIAGARAN	LOCKPORT	Louisville (Ky)					? Louisville coral zone	
		Guelph (Canada)	Shelby dol.	Lockport ls.				
		Bob (Tenn.)						
		Beech River (Tenn.)						
		Racine (Wis.)	Gasport ls.					
		Waukesha (Wis.)						
	Waldron (Ind.)							
			Laurel (Ind.)	Decew ls.				
	CLINTON		Rochester (N.Y.)	Rochester shale	Typical			
			Irondequoit (N.Y.)	Irondequoit ls.	Clinton formation		Clinton group (Keefe ss. near top)	
		Williamson (N.Y.)	Williamson shale			(Cacapon member at base)		
		Wolcott (N.Y.)	Wolcott ls.					
		Sodus (N.Y.)	Sodus shale					
MEDINAN	ALBION	Thorold (Arthropycus ss)	Albion sandstone (New York) (Ontario) Thorold sandstone					
		Brassfield (Ky)						
		Noix (Mo)	Grimsby ss	Catawact			Medina or Tuscarora sandstone	Clinch ss. Brassfield ls.
		Edgewood (Mo)	Cabot Head sh. Manitoulin beds					
		Whiteoak (Tenn.)	Whirlpool ss.					White Oak ss.
		Girardeau (Mo)						
	RICHMONDIAN		Elkhorn (Ind.)					
			Whitewater (Ind.)					
		Maquoketa (Iowa)	Queenston shale			Juniata sandstone and shale	Sequatchie formation	
		Liberty (Ind.)						
		Waynesville (Ohio)						
		Fernvale (W. Tenn.)						
		Annheim (Ohio)	?					
		Dubuque (Iowa)						
ORDOVICIAN (CINCIANNIAN)		Maysville	Oswego sandstone Pulaski formation	Oswego sandstone		Oswego sandstone (Bald Eagle)	Fairview	



# RELATION TABLE

BULLETIN 92 PLATE 3.

West Tennessee	OHIO VALLEY		Northern and Central Ohio, Michigan, and Ontario	Iowa and Minnesota	Eastern Wisconsin
	West of Cincinnati	Southern Ohio & Eastern Ky.			
London form.			Detroit River	Lucas dol. Amherstburg dol. Anderson Is. Flat Rock dol.	
			Sylvania ss. Bass Island	Flat River dol. Put-in Bay dol. Tymochtee sh.	
		Greenfield dol.	Greenfield dol.		
	Kokomo ls.	Hillsboro ss.		Anamosa Leclair } Gower	Waubakee ls.
			Salina.		
Decatur ls.					
Lobelville f.	Louisville ls. (Bledsoe in Tenn)				
		Cedarville dol. Springfield dol.			Guelph dol.
Bob ls. Beech River f.					
Dixon form. Lego ls.				Hopkinton dol.	Racine dol. Waukesha dol. Mayville dol.
Waldron sh. (Newsom)	Waldron sh.				
Laurel ls. (Whites Bend)	Laurel ls.				
Osgood ls. (South Tunnel)	Osgood ls.	West Union ls.			
		(Ohio) "Niagara" sh. Dayton ls.	(Eastern Ky.) Fossil clay Wagon ls. Lubegrud sh. Indian Fields Oldham ls. Plum Cr. clay		
			Cliff limestone		
			Undetermined		
Brassfield ls. (Bakers)		Brassfield ls. (Montgomery and Beavertown)			Iron Ridge ore bed
				Unnamed dolomite	
				Brainard shale	
		Elkhorn (Belfast)			
		Whitewater-Saluda (Madison and Fowler) (Kagawong in Manitoulin Islands)		Ft. Atkinson ls.	?
				Maquoketa shale	"Cincinnati shales" (Richmond age)
		Liberty		Clermont shale	
		Waynesville	Blanchester member Clarksville Ft. Ancient		?
Mannie sh. Leipers Cr. ls.				Wykoff ls.	
Arnheim	Arnheim	Oregonia member Surfet member			
				Dubuque dol.	
Leipers formation	Maysville formation				





GENERAL TIME SCALE			Northern Arkansas	East Missouri and Illinois	Central C	
DEVONIAN (HELDERBERGIAN)						
				Bailey Is.	Haragan	
CAYUGAN	UPPER	Becraft (N.Y.)				
		New Scotland (N.Y.)				
		Coeymans (N.Y.)				
		Keyser (W.Va.)				
	LOWER	Manlius (N.Y.)				
		Tonoloway (Md.)				
		Wills Creek (Md.)				
		Bloomsburg (Pa.)				
		Salina-M <sup>2</sup> Kenzie (N.Y.) (Md.)				
NIAGARAN	LOCKPORT	Louisville (Ky.)				
		Guelph (Canada)				
		Bcb (Tenn.)				
		Beech River (Tenn.)				
		Racine (Wis.)				
		Waukesha (Wis.)				
		Waldron (Ind.)				
			Laurel (Ind.)			
	CLINTON	Rochester (N.Y.)		St. Clair Is. (Upper)		
		Irondequoit (N.Y.)				
		Williamson (N.Y.)				
		Wolcott (N.Y.)		St. Clair Is. (Middle)		St. Clair
		Sodus (N.Y.)				
MEDINAN	ALBION	Thorold (Arthropycus ss.)				
		Brassfield (Ky.)	St. Clair Is. (Lower)	Brassfield (Sexton Creek)	Chimney H	
		Noix (Mo.)		Esser ls. Bowling Green dol. Noix oolite		
		Edgewood (Mo.)		Edgewood Is. (Channahon Synon. member)		
		Whiteoak (Tenn.)				
			Girardeau (Mo.)		Girardeau Is. (Orchard Cr. shale at base)	
	RICHMONDIAN	Elkhorn (Ind.)				
		Whitewater (Ind.)				
		Maquoketa (Iowa)		Cason shale	Thebes form. ss. member shale Maquoketa	Sylvan s
		Liberty (Ind.)				
		Waynesville (Ohio)				
		Fernvale (West Tenn.)		Fernvale shale (Upper Polk Bayou)	Fernvale shale	Fernvale
		Arnhem (Ohio)				
		Dubuque (Iowa)				
ORDOVICIAN (CINCINNATIAN)	Maysville					

Bainbridge Is.  
(East of  
St. Louis)

Blaylock ss. (west central Ark.)

Alexandrian

RELATION TABLE BULLETIN 92 PLATE 4

	<i>Island of Anticosti</i>	<i>Arisaig, Nova Scotia</i>	<i>Wales and Shropshire</i>	<i>Scotland</i>
			Ludlow group	Ludlow
		Stonehouse form.		
Hunton formation		Moydart form.	Wenlock limestone and shale	Wenlock
		M $\Sigma$ Adam form.	Woolhope ls.	
	Chicotte	Ross Brook form.	Tarannon	Tarannon
	Jupiter River	Beechhill Cove form.	Upper Llandovery	Upper Birkhill
Anticostian	Gun River		Lower Llandovery	Lower Birkhill
	Becsie River			
	Gamachian (Ellis Bay)			
	Charleton		?	(Probable hiatus)
	English Head			

Date		Time		Place	
1880	10	10	10	10	10
1880	11	11	11	11	11
1880	12	12	12	12	12
1880	13	13	13	13	13
1880	14	14	14	14	14
1880	15	15	15	15	15
1880	16	16	16	16	16
1880	17	17	17	17	17
1880	18	18	18	18	18
1880	19	19	19	19	19
1880	20	20	20	20	20
1880	21	21	21	21	21
1880	22	22	22	22	22
1880	23	23	23	23	23
1880	24	24	24	24	24
1880	25	25	25	25	25
1880	26	26	26	26	26
1880	27	27	27	27	27
1880	28	28	28	28	28
1880	29	29	29	29	29
1880	30	30	30	30	30
1880	31	31	31	31	31













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