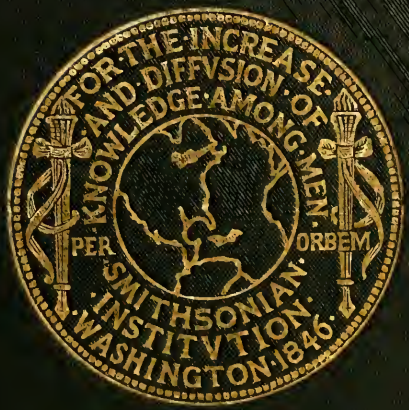
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WASHINGTON 1846

SMITHSONIAN INSTITUTION
UNITED STATES NATIONAL MUSEUM
Bulletin 92

BIBLIOGRAPHIC INDEX OF AMERICAN ORDOVICIAN AND SILURIAN FOSSILS

VOLUME 1

BY

RAY S. BASSLER
Curator of Paleontology, United States National Museum

WASHINGTON
GOVERNMENT PRINTING OFFICE
1915

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BULLETIN OF THE UNITED STATES NATIONAL MUSEUM.

Issued November 1, 1915

II

ADVERTISEMENT.

The scientific publications of the United States National Museum consist of two series—the *Proceedings* and the *Bulletins*.

The scientific publications of the United States National Museum are intended primarily as a medium for the publication of original, and usually brief, papers based on the collections of the National Museum, presenting newly acquired facts in zoology, geology, and anthropology, including descriptions of new forms of animals, and revisions of limited groups. One or two volumes are issued annually and distributed to libraries and scientific organizations. A limited number of copies of each paper, in pamphlet form, is distributed to specialists and others interested in the different subjects as soon as printed. The date of publication is printed on each paper, and these dates are also recorded in the tables of contents of the volumes.

The *Bulletins*, the first of which was issued in 1875, consist of a series of separate publications comprising chiefly monographs of large zoological groups and other general systematic treatises (occasionally in several volumes), faunal work, reports of expeditions, and catalogues of type-specimens, special collections, etc. The majority of the volumes are octavos, but a quarto size has been adopted in a few instances in which large plates were regarded as indispensable.

Since 1902 a series of octavo volumes containing papers relating to the botanical collections of the Museum, and known as the *Contributions from the National Herbarium*, has been published as bulletins.

The present work forms No. 92 of the *Bulletin* series.

RICHARD RATHBUN,
Assistant Secretary, Smithsonian Institution,
In charge of the United States National Museum.

WASHINGTON, D. C., *July 21, 1915.*

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PREFACE.

The literature of systematic natural history has become so voluminous that it is almost impossible for the student to attain good results without the aid of some kind of a compilation. In Paleozoic paleontology the need of such an index is perhaps greatest for the fossils of the Ordovician, Silurian, and Devonian periods for the reason that the Carboniferous has been covered up to 1898 by Weller's Bibliographic Index of North American Invertebrates (Bulletin 153, United States Geological Survey), and the numerous monographs of the Secretary of the Smithsonian Institution upon Cambrian geology and paleontology have assembled the fossils of that period. Dr. E. M. Kindle, while a member of the United States Geological Survey, prepared an index of Devonian fossils which will probably be published in the future. In the course of work upon the paleontologic collections of the United States National Museum the present author has specialized upon the Ordovician and Silurian, and it therefore became appropriate for him to prepare the bibliographic index which is herewith placed at the service of his fellow workers.

The great amount of labor required to complete an index of this size and character in a few years is very evident, and the work could not have been brought to a speedy conclusion had the author not had the help of two indefatigable and intelligent assistants, Miss Florence George and Miss Adelaide C. Quisenberry, to both of whom he is under great obligations. The refinement of stratigraphic designation consequent on the great advance in knowledge of Ordovician and Silurian stratigraphy in the last decade has necessitated a careful examination of all described fossils in order to locate them accurately in the time scale. In this work and also in the task of clearing up the synonyms the author is indebted to many friends for generous help, particularly to Dr. Rudolph Ruedemann, Mr. Frank Springer, Dr. P. E. Raymond, and Prof. W. H. Twenhofel. To Dr. E. O. Ulrich, whose knowledge of American Paleozoic paleontology and stratigraphy, whether in manuscript form or otherwise, has ever been at the command of the writer, he is under special indebtedness. The writer has also had access to a set of references to American Paleozoic fossils covering part of the literature up to 1906, prepared under the direction of Prof. Charles Schuchert by Miss M. W. Moodey and Mr. J. M. Nickles. This set was of greatest use for its foreign generic references, but in order to insure as few errors as possible these references were again checked up with the literature covered by them.

The terms Ordovician and Silurian in the title of this work are employed in a broad sense, so as to include formations which, although considered of Cambrian or Devonian age by some, are still placed in the Ordovician or Silurian by others. The particular cases in the Silurian are those of the upper Monroan and the Keyser formations, both of which the author would place in the Devonian. With the Ordovician the author has catalogued the Ozarkian and Canadian faunas, both of which divisions are regarded by Ulrich, Schuchert, Walcott, and others, the writer included, as of systemic value. In fact, then, the present index is intended to cover all American fossils which are known to occur in formations regarded as probably younger than those which are definitely decided to be of Cambrian age, and older than those now generally considered to belong to the Devonian period.

Every effort has been made to eliminate errors, but it is inevitable that many will be found. As the author intends to keep this index up to date for use in the United States National Museum, all corrections will be greatly appreciated. A chapter devoted to the literature of American Ordovician and Silurian paleontology was prepared for this work, but was omitted when it was found that this subject will be included in a forthcoming bibliographic publication by the United States Geological Survey.

The citations have been brought up to the close of 1914 with the exception that two important monographs (Schuchert, Revision of Paleozoic Stelleroidea, Bulletin 88, United States National Museum, and Springer, Monograph Crinoidea Flexibilia, Smithsonian Institution), then in press or ready for publication, were included.

Following the bibliographic list proper which makes up the greater part of the work (pages 1 to 1342), the author has added an index of specific names (pages 1343 to 1406), showing under what generic or other combination any particular name has been employed. Then, in order that the biological classification of any doubtful genus may be readily ascertained, a biological classification (pages 1407 to 1428) and an alphabetical list of genera (pages 1429 to 1440) are given. Finally, as an aid in recalling the position of the many geological formations cited, an alphabetical list of American Ordovician and Silurian formations, indicating their approximate place in the time scale (pages 1511 to 1521), and correlation tables covering the most important areas of fossiliferous rocks, are given. With the help of these several features, in addition to the bibliographic references, it is believed that all the needs of the student with one exception are covered. This exception is the failure to indicate the characteristic species of each formation in the faunal lists. As knowledge of the early Paleozoic faunas increases it is becoming more evident that a species is characteristic of a formation only in a certain area of deposition and when considered in connection with the associated organisms. As the origin of the fauna, the lithology of its inclosing sediments, and still other factors must also be considered in determining such species, it has not seemed advisable to attempt to indicate them at present.

The bibliographic citations are abbreviated as far as possible without sacrificing clearness, and the horizon and locality of each species are condensed into as few words as needed. The type locality is cited first, and in cases where a species occurs in several formations the name of the particular formation follows in parenthesis each locality listed. It will be noted that this index is also a register of the types of Ordovician and Silurian fossils contained in the United States National Museum. The type terms holotype, paratype, and cotypes, for primary types, and plesiotypes, for all supplemental types, employed throughout this work are those adopted in the division of paleontology in the United States National Museum. All valid species are printed in heavy-faced type. The cross references are condensed as much as possible, and in cases where the generic cross reference will suffice for the species under it, those for the latter are not given.

BIBLIOGRAPHIC INDEX OF AMERICAN ORDOVICIAN AND SILURIAN FOSSILS.

By Ray S. Bassler

Curator of Paleontology, United States National Museum.

BIBLIOGRAPHIC LIST OF GENERA AND SPECIES.

ACACOCRINUS Wachsmuth and Springer.

Genotype: A. elrodi Wachsmuth and Springer.

Acacocrinus (subgenus of Habrocrinus) Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 21, 1897, p. 515.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 730.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 194.

Acacocrinus americanus Wachsmuth and Springer.

Acacocrinus americanus Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 21, 1897, p. 516, pl. 34, fig. 15a, b.

Niagaran (Laurel): St. Paul, Indiana.

Acacocrinus elrodi Wachsmuth and Springer.

Acacocrinus elrodi Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 21, 1897, p. 515, pl. 34, fig. 16.

Niagaran (Waldron): Hartsville, Indiana.

Acanthaloma Conrad. See Ceratocephala Warder.

ACANTHOCLEMA Hall. Genotype: Trematopora alternata Hall.

Acanthoclema Hall, 5th Ann. Rep. State Geol. New York for 1885, 1886, expl. pl. 25.—Hall and Simpson, Pal. New York, 6, 1887, p. 15.—Miller, N. A. Geol. Pal., 1889, p. 291.—Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 402, 661.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 552.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 44.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 58; Zittel-Eastman Textb. Pal., 1913, p. 344.

Acanthoclema asperum (Hall).

Trematopora aspera Hall, Pal. New York, 2, 1852, p. 154, pl. 40 A, figs. 10a–c.

Batostomella? aspera Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 189.

Acanthoclema asperum Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 58, pl. 21, figs. 3–5; pl. 24, figs. 7–9; pl. 25, figs. 17–20.

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

Plesiotypes.—Cat. No. 35756, U.S.N.M.

ACANTHODICTYA Hinde. Genotype: A. hispida Hinde.

Acanthodictya Hinde, Trans. Roy. Soc. Canada, 7, sec. 4, 1890, p. 47.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 666.—Dawson, Trans. Roy. Soc. Canada, 2d ser., 2, sec. 4, 1896, p. 110.

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Acanthodictya hispida Hinde, Trans. Roy. Soc. Canada, 7, sec. 4, 1890, p. 48, figs. 18, 19, pl. 3, fig. 8.—Rauff, Palæontographia, 40, 1894, p. 255.—Dawson, Trans. Roy. Soc. Canada, 2d ser., 2, sec. 4, 1896, p. 110, figs. 20, 21, pl. 3, fig. 11.

Canadian? (Levis?): Metis, Quebec.

ACANTHOGRAPTUS Spencer. Genotype: A. granti Spencer.

Acanthograptus Spencer, Canadian Nat., n. s. 8, 1878, p. 461.—Lapworth Quart. Jour. Geol. Soc. London, 37, 1881, p. 174.—Spencer, Trans. Acad. Sci. St. Louis, 4, 1884, pp. 562, 581; Bull. Mus. Univ. State Missouri, 1, 1884, p. 31.—Miller, N. A. Geol. Pal., 1889, p. 170.—Ruedemann, Mem. New York State Mus., 9, 1908, p. 191.

Acanthograptus bartonensis Grant. See Acanthograptus walkeri.

Acanthograptus chætophorus Gurley.

Acanthograptus chætophorus (Gurley MS.) Bassler, Bull. U. S. Nat. Mus., 65, 1911, p. 61, fig. 84, pl. 3, fig. 5.

Niagaran dolomite: Hamilton, Ontario.

Acanthograptus granti Spencer.

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Niagaran dolomite: Hamilton, Ontario.

Acanthograptus multispinus Gurley.

Acanthograptus multispinus (Gurley MS.), Bassler, Bull. U. S. Nat. Mus., 65, 1911, p. 61, figs. 85, 86.

Niagaran dolomite: Hamilton, Ontario.

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Acanthograptus pulcher Spencer, Canadian Nat., 10, 1882, p. 165 (nom. nud.); Bull. Mus. Univ. State Missouri, 1, 1884, p. 32, pl. 4, fig. 6; Trans. Acad. Sci. St. Louis, 4, 1884, pp. 564, 582, pl. 4, fig. 6.—Miller, N. A. Geol. Pal., 1889, p. 170, fig. 128.—Gurley, Jour. Geol. 4, 1896, pp. 92, 308.—Bassler, Bull. U. S. Nat. Mus., 65, 1909, pp. 59, 60, figs. 81–83, pl. 4, fig. 5.

Niagaran dolomite: Hamilton, Ontario.

Acanthograptus walkeri (Spencer).

Inocaulis walkeri Spencer, Canadian Nat., 10, 1882, p. 165 (nom. nud.); Bull. Mus. Univ. State Missouri, 1, 1884, p. 35, pl. 5, fig. 2; Trans. Acad. Sci. St. Louis, 4, 1884, p. 585, pl. 5, fig. 2.—Gurley, Jour. Geol., 4, 1896, pp. 99, 309.

Acanthograptus walkeri Ruedemann, Mem. New York State Mus., 11, 1908, p. 194, figs. 97, 98, pl. 6, figs. 1, 2; pl. 7, fig. 4.—Bassler, Bull. U. S. Nat. Mus., 65, 1909, pp. 57–59, figs. 75–80.

Acanthograptus bartonensis Grant, Jour. and Proc. Hamilton Assoc., 16, 1900, p. 101 (fig. only).

Acanthograptus walkeri—Continued.
Niagaran dolomite: Hamilton, Ontario.
Clinton (Rochester): Middleport, New York.
Plesiotype.—Cat. No. 54277, U.S.N.M.

ACANTHOLENUS Matthew. Genotype: Leptoplastus spiniger Matthew.
Acantholenus Matthew, Trans. Royal Soc. Canada, 2d ser., 4, sec. 4, 1898, p. 142.

Acantholenus spiniger (Matthew).
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Canadian (Bretonian, Div. C 3b): Long Island, Kennebecasis River, New Brunswick.

ACANTHONEMA Grabau. Genotype: A. holopiforme Grabau.
Acanthonema Grabau, Michigan Geol. Surv., Geol. Ser. 1, 1909, p. 181.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 691.

Acanthonema holopiforme Grabau.
Acanthonema holopiformis Grabau, Michigan Geol. Surv., Geol. Ser. 1, 1909, p. 182, pl. 16, fig. 4, pl. 26, figs. 1–3; pl. 23, figs. 6, 8.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 691.
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Acanthonema holopiforme obsoletum Grabau.
Acanthonema holopiformis var. obsoleta Grabau, Michigan Geol. Surv., Geol. Ser. 1, 1909, p. 183, pl. 26, fig. 1, right half.
Upper Monroan (Lucas): Gibraltar quarry, Wayne County, Michigan.

Acanthonema laxum Grabau.
Acanthonema laxa Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 183, pl. 26, fig. 4; pl. 27, figs. 3, 4.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 691.
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Orthonema newberryi Meek, Proc. Acad. Nat. Sci. Philadelphia, 1871, p. 81; Geol. Surv. Ohio, Pal. 1, 1873, p. 217, pl. 20, figs. 3a–b.—Miller, N. A. Geol. Pal., 1889, p. 414, fig. 690.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 566, fig.
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Upper Monroan (Lucas): Otsego, Wood County, Ohio.

Acaste Goldfuss. See Phacopidella Reed.

ACERVULARIA Schweigger.
Genotype: A. baltica Schweigger=A. ananas (Linnæus).
Acervularia Schweigger, Handb. der Naturg., 1820, p. 418.—Eichwald, Zool. Specialis, pt. 1, Vilnae, 1829, p. 187.—Dana, Wilkes' U. S. Expl. Exped., 1838–42, 7, Zoophytes, 1846, p. 358; Amer. Jour. Sci. and Arts, 2d ser., 1, 1846, p. 184.—Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal., 1851

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Strephodes? Austini Salter, Sutherland's Jour. Voyage in Baffins Bay, etc., 2, 1852, p. ccxxx, pl. 6, figs. 6, 6a.—Etheridge, Quart. Jour. Geol. Soc. London, 1878, p. 587.—Woodward, Geol. Mag., dec. 2, 5, 1878, p. 386, pl. 10, figs. 1, 2.

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Niagaran: Cornwallis, Beechey and Griffith's Islands, and Cape Hilgard, Arctic America.

Acervularia clintonensis Nicholson.

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Upper Medinan (Brassfield?): Yellow Springs, Ohio.

ACERVULARIA COMMUNIS Simpson. See Prismatophyllum inequalis.

Acervularia gracilis (Billings).

Strombodes gracilis Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 306, fig. 309; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 113 (Adv. sheets, 1862).—Chamberlin, Geol. Wisconsin, 1, 1883, p. 190, fig.—Lesley, Geol. Surv. Pennsylvania, Rep. P. 4, 1890, p. 1109, fig.

Acervularia gracilis Lambe, Ottawa Nat., 12, 1899, p. 221; Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 163, pl. 14, figs. 2, 2a.

Upper Medinan (Cataract): Manitouaning, Grand Manitoulin Island, Lake Huron.

ACERVULARIA INEQUALIS Schuchert. See Prismatophyllum inequale.

ACHRADOCRINUS Schultze. Genotype: A. ventrosus Schultze.

Achradocrinus Schultze, Denk. d. Kais. Akad. der Wiss., Math.-Naturw. Cl. 24, Abth. 2, p. 213, fig. 19.—Zittel, Handb. Pal., 1, 1879, p. 364.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, pp. 115, 151. (Rev. Pal., pt. 3, sec. 2, pp. 191, 272.)—Bather, Ann. Mag. Nat. Hist., 6 ser., 5, 1890, p. 324, pl. 14, fig. 22; Treatise on Zool., pt. 3, Echinoderma, 1900, p. 178, fig. 95.—Slocom, Field Columbian Mus., 2, 1908, p. 287.—Zittel, Handb. Pal., 1, 1910, p. 152.

Achradocrinus patulus Slocom.

Achradocrinus patulus Slocom, Field Columbian Mus., 2, 1908, p. 288, pl. 85, figs. 1–4.

Niagaran (Racine): Romeo, Illinois.

ACIDASPIS Murchison. Genotype: A. brightii Murchison.

Acidaspis Murchison, Sil. Syst., 1839, p. 658.—Hall, Pal., 1 New York, 1847, p. 240.—Barrande, Neues Jahrb. f. Min., etc., 1850, p. 777; Syst. Sil. du Centre Boheme, 1, 1852, p. 692.—Salter, Mem. Geol. Surv. United Kingd., dec. 7, 1853, pl. 6.—McCoy, British Pal. Rocks and Fossils, 1854, p. 152.—Pictet, Traite de Pal., 2d ed., 2, 1854, p. 517.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 217.—Gebhard, Ninth Rep. New York State Cab. Nat. Hist., 1856, p. 46.—Chapman, Canadian Jour., n. s., 1, 1856, p. 282.—Salter, Cat. Camb. Sil. Foss., 1873, p. 134.—Steinhardt, Beit. z. Naturk. Preus. Phys.-Oekon. Gesell., Konigsberg, 1874, p. 62.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, pp. 128, 129.—Angelin, Pal. Scandinavica, 3d ed., Holmiae, 1878, p. 33.—Walcott, Science, 3, 1884, p. 281.—Zittel, Handb. d. Pal., 2, 1885, p. 622.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 7, ser., 33, 1885, p. 1.—Hall and Clarke, Pal. New York, 7, 1888, p. xxxv, fig.; p. xxxvi.—Whidborne, Mon. Devonian Fauna South England, 1, Pal. Soc., 1889, p. 11.—Clarke, 10th Rep. State Geol. New York for 1890, 1891, pp. 63, 67; 44th Rep. New York State Mus., 1892, pp. 93, 97.—Vogdes, Cal. Acad. Sci., Occ. Pap., 4, 1893, p. 259.—Beecher, Amer. Geol., 16, 1895, p. 178.—Koken, Die Leitfossilien, Liepzig, 1896, p. 31, fig. 20.—Oehlert, Bull. Soc. geol. France, 3d ser., 24, 1896, p. 112, text fig. 33.—Beecher, Amer. Jour. Sci., 4th ser., 3, 1897, p. 104, pl. 3, fig. 23.—Lindström, Kongl. Sven. Vet.-Akad. Handl., 34, No. 8, 1901, pp. 26, 35.—Miller, N. A. Geol. Pal., 1889, p. 526.—Cumings, Thirty-second Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1051.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 311.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 722.

Observation.—Most of the above references are to Acidaspis in a broad sense, including Ceratocephala and Odontopeura.

ACIDASPIS ANCHORALIS Miller. See Ceratocephala anchoralis.

Acidaspis brevispinosa Foerste.

Acidaspis brevispinosa Foerste, Geol. Surv., Ohio, 7, 1895, p. 522, pl. 37A, fig. 13.

Upper Medinan (Brassfield): Huffman Quarry, Dayton, Ohio.

ACIDASPIS CERALEPTA Meek. See Ceratocephala ceralepta.

ACIDASPIS CINCINNATIENSIS Meek. See Ceratocephala cincinnatiensis.

ACIDASPIS CROSOTUS Cumings. See Odontopleura crosota.

ACIDASPIS DANAI Hall. See Ceratocephala goniata.

ACIDASPIS FIMBRIATA Hall. See Ceratocephala fimbriata.

ACIDASPIS HALLI Shumard. See Odontopleura halli.

ACIDASPIS HORANI Billings. See Ceratocephala horani.

ACIDASPIS IDA Winchell and Marcy. See Ceratocephala goniata.

Acidaspis obsoleta Van Ingen.

Acidaspis obsoleta Van Ingen, School of Mines Quart., 23, 1901, p. 51, figs. 13, 14, pl., figs. 9, 10.

Niagaran (St. Clair): St. Clair Spring, Independence County, Arkansas.

ACIDASPIS O'NEALLI Miller. See Odontopleura o'nealli.

ACIDASPIS ORTONI Foerste. See Odontopleura ortoni.

ACIDASPIS PARVULA. See Odontopleura parvula.

Acidaspis perarmata Whiteaves.

Acidaspis perarmata Whiteaves, Canadian Rec. Sci., 4, 1891, p. 300, pl. 3, fig. 6; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 289, pl. 42, fig. 3.

Niagaran: Long Point, Lake Winnipegosis, Saskatchewan, Canada.

Acidaspis quinquespinosa Lake.

Acidaspis quinquespinosa Lake, Quart. Jour. Geol. Soc. London, 52, 1896, p. 240, pl. 7, figs. 3, 4.—Van Ingen, School of Mines Quart., 23, 1901, p. 50, fig. 12, pl., figs. 7, 8.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 311, fig. 1621h.

Silurian: Dudley, England (Wenlock); St. Clair Spring, Independence County, Arkansas (Niagaran-St. Clair).

Acidaspis rhyncocephalus Meek. See Ceratocephala cincinnatiensis.

Acidaspis spiniger Hall. See Bathyurus spiniger.

Acidaspis trentonensis Hall. See Odontopleura trentonensis.

Acidaspis vanhornei Weller.

Acidaspis vanhornei Weller, Bull. Chicago Acad. Sci., 4, pt. 2, 1907, p. 251, pl. 23, figs. 3, 4.

Niagaran (Racine): Bridgeport, Illinois.

Acleistoceras Hyatt. See Poterioceras McCoy.

Acroculia Phillips. See Platyceras Conrad.

ACROTHELE Linnarsson. Genotype: A. coriacea Linnarsson.

Acrothele Linnarsson, Bihang till K. svensk. Vet.-Akad. Handl., 3, No. 12, 1876, pp. 20–21.—Zittel, Handbuch d. Pal., 1, Abth. 1, 1880, p. 665.—Davidson, British Foss. Brach., 5, pt. 2, 1883, pp. 213–214.—Walcott, Bull. U. S. Geol. Surv., 30, 1886, pp. 107–108.—Œhlert, Man. Conch., 1887, p. 1269.—Hall and Clarke, 11th Ann. Rep. State Geol. New York, 1892, pp. 249, 250; 45th Ann. Rep. New York State Mus., 1892, pp. 565, 566; Pal. New York, 8, pt. 1, 1892, pp. 98–101.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 308.—Matthew, Geol. Surv. Canada, Rep. Cam. Rocks Cape Breton, 1903, pp. 103–105.—Grabau and Shimer, N. A. Index Foss., 1, 1907, p. 200.—Walcott, Smiths. Misc. Coll., 53, 1908, pp. 142 and 146; Mon. U. S. Geol. Surv., 51, 1912, p. 630.

Acrothele levisensis Walcott.

Acrothele levisensis Walcott, Smithsonian Misc. Coll., 53, No. 3, 1908, p. 85, pl. 8, fig. 13; Mon. U. S. Geol. Surv., 51, 1912, p. 646, pl. 81, figs. 12, 12a, b.

Canadian (Levis, Didymograptus zone): Point Levis, Quebec.

Acrothele pretiosa (Billings).

Obolella pretiosa Billings, Pal. Foss., 1, 1862, p. 68, fig. 61; Geol. Canada, 1863, p. 230, fig. 239.—Chapman, Canadian Jour., n. s., 8, 1864, p. 191, fig. 160c.; Expos. Min. Geol. Canada, 1864, p. 163, fig. 160b.—Walcott, Bull. U. S. Geol. Surv., 30, 1886, p. 111.

Billingsia pretiosa Ford, Amer. Jour. Sci., 3d ser., 31, 1886, p. 467 (gen. ref.).

Elkania pretiosa Ford, Amer. Jour. Sci., 3d ser., 32, 1886, p. 325 (gen. ref.).

Linnarssonia pretiosa Schuchert (part) Bull. U. S. Geol. Surv., 87, 1897, p. 262.—Walcott, Proc. U. S. Nat. Mus., 23, 1901, p. 673.—Grabau and Shimer, Index Fossils, 1, 1907, p. 200.

Acrothele pretiosa Walcott, Proc. U. S. Nat. Mus., 21, 1898, p. 402; Mon. U. S. Geol. Surv., 51, 1912, p. 652, pl. 58, figs. 1, 1a–g.

Acrothele pretiosa—Continued.

Canadian: Chaudiere River at Grand Trunk Rail Road Bridge, Cape Rouge above Quebec, Canada (Sillery); near Grenville, Washington County, New York; Point Levis, Quebec (Levis, Didymograptus zone).

Plesiotype.—Cat. No. 52004 U.S.N.M.

Acrothele rotunda (Nicholson).

Dawsonia rotunda Nicholson, Ann. Mag. Nat. Hist., 4th ser., 11, 1873, p. 141, fig. 3a, b.

Canadian (Levis, Diplograptus dentatus zone): Point Levis, Quebec.

ACROTRETA Kutorga. Genotype: A. subconica Kutorga.

Acrotreta Kutorga, Verhandl. Russ.-kais Min. Gesell. St. Petersburg for 1847, No. 12, 1848, pp. 259, 260.—Morris, Ann. Mag. Nat. Hist., 2d ser., 4, 1849, pp. 316, 318.—Davidson, Brit. Fossil Brach., 1, Introduction, No. 3, 1853, p. 133.—Von Seebach, Zeits. d. d., geol. Gesell., 17, Hft. 2, 1865, p. 341.—Davidson, British Foss Brach., 3, pt. 7, No. 4, 1871, p. 343.—Dall, Bull. U. S. Nat. Mus., 8, 1877, p. 12.—Zittel, Handb. Pal., 1, Abth. 1, 1880, p. 666.—Walcott, Mon. U. S. Geol. Surv., 8, 1884, pp. 16–17.—Œhlert, Man. Conch., 1887, p. 1266.—Hall and Clarke, 11th Ann. Rep. State Geol. New York, 1892, p. 250.—45th Ann. Rep. New York State Mus., 1892, p. 566; Pal. New York, 8, pt. 1, 1892, pp. 101–104.—Schuchert, Zittel-Eastman, Textb. Pal., 1, 1900, p. 308.—Matthew, Bull. Nat. Hist. Soc. New Brunswick, 4, pt. 5, 1902, p. 399; Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, p. 94–97.—Grabau and Shimer, N. A. Index Foss., 1, 1907, p. 199.—Walcott, Smithsonian Misc. Coll., 53, 1908, pp. 142, 146; Mon. U. S. Geol. Surv., 51, 1912, p. 671.

Linnarssonia Walcott, Amer. Jour. Sci., 3d ser., 29, 1885, p. 115.—Matthew, Trans. Royal Soc. Canada, 1st ser., 3, sec. 4, 1886, p. 35.—Dawson, Trans. Royal Soc. Canada, 1st ser., 7, sec. 4, 1890, pp. 53–54.—Hall and Clarke, 11th Ann. Rep. State Geol. New York, 1892, p. 251; 45th Ann. Rep. New York State Mus., 1892, p. 567; Pal. New York, 8, pt. 1, 1892, pp. 107–109.—Matthew, Trans. Royal Soc. Canada, 1st ser., 9, sec. 4, 1892, p. 42.

Acrotreta attenuata Meek (part). See Acrotreta idahoensis.

Acrotreta baileyi Matthew. See Acrotreta bisecta.

Acrotreta belti (Davidson?) (Matthew).

?Obolella belti Davidson, Geol. Mag., 5, 1868, p. 310, pl. 15, figs. 25–27.

Linnarssonia belti? Matthew, Trans. Royal Soc. Canada, 1st ser, 9, sec. 4, 1892, pp. 42, 43, pl. 12, figs. 7a–c; Geol. Surv. Canada, Rep. Cambrian rocks Cape Breton, 1903, p. 209, pl. 16, fig. 3a–c.

Lower Tremadoc shales: North Wales.

Canadian (Bretonian—Div. C. 3 c): St. John, New Brunswick.

Acrotreta bisecta Matthew.

Acrotreta baileyi Matthew, Trans. Royal Soc. Canada, 1st ser., 9, sec. 4, 1892, p. 43, pl. 12, fig. 7d.

Acrotreta bisecta Matthew, Bull. Nat. Hist. Soc. New Brunswick, 4, pt. 4, 1901, pp. 275–276, pl. 5, figs. 5a–g; ibid., pt. 5, 1902, p. 394, pl. 16, figs. 2a–g.—Walcott, Proc. U. S. Nat. Mus., 25, 1902, p. 582.—Matthew, Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, pp. 186–187, pl. 11, figs. 5a–g.—Walcott, Proc. U. S. Nat. Mus., 28, 1905, pp. 298–299; Mon. U. S. Geol. Surv., 51, 1912, p. 678, pl. 66, figs. 7, 7a–e.

Acrotreta bisecta—Continued.

Acrotreta sipo Matthew, Bull. Nat. Hist. Soc. New Brunswick, 4, pt. 5, 1902, pp. 406–407, pl. 18, figs. 1, 2; Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, pp. 185–186, pl. 18, figs. 1, 2.

Canadian (Bretonian—Div. C. 3 c): McLeod Brook, Cape Breton, Nova Scotia, and Navy Island, St. John Harbor, New Brunswick.

Acrotreta?? cancellata Walcott.

Acrotreta?? cancellata Walcott, Proc. U. S. Nat. Mus., 28, 1905, p. 299; Mon. U. S. Geol. Surv., 51, 1912, p. 679, pl. 79, figs. 5, 5a.

Canadian (Lower Pogonip): Roundtop Mountain, Eureka County, Nevada.

Acrotreta convexa Walcott.

Acrotreta convexa Walcott, Proc. U. S. Nat. Mus., 25, 1902, p. 584; Mon. U. S. Geol. Surv., 51, p. 682, pl. 66, figs. 6, 6a–c.

Canadian (Bretonian—Div. C. 3 c): Salmon River, thirteen miles south of Marion Bridge, etc., Cape Breton, Nova Scotia.

Acrotreta curvata Walcott.

Acrotreta gemma Walcott (not Billings) (part), Mon. U. S. Geol. Surv., 8, 1884, pp. 17, 18, pl. 1, figs. 1d, 1e (not figs. 1a–c, f); 10th Ann. Rep. U. S. Geol. Surv., 1891, p. 608, pl. 67, fig. 5b (not figs. 5a–e).—Hall and Clarke (part), Pal. New York, 8, pt. 1, 1892, p. 102, fig. 55 (not figs. 56, 57).—Walcott (part), Mon. U. S. Geol. Surv., 32, pt. 2, 1899, p. 499, pl. 62, fig. 2e (not figs. 2, 2a–d).

Acrotreta curvata Walcott, Proc. U. S. Nat. Mus., 25, 1902, p. 584; Mon. U. S. Geol. Surv., 51, 1912, p. 682, pl. 68, figs. 1a–n.

Canadian (Lower Pogonip): Hamburg Ridge, Eureka District, Eureka County, Nevada. Also in Upper Cambrian of Oklahoma.

Holotype and *paratypes*.—Cat. No. 35269, U.S.N.M.

Acrotreta gemma Billings.

Acrotreta gemma Billings, Geol. Surv. Canada, Pal. Fossils, 1, 1865, pp. 216, 217, figs. 201a–f.—Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 685, pl. 66, figs. 1a–b.

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

ACROTRETA GEMMA Walcott. See Acrotreta curvata and A. idahoensis alta.

Acrotreta idahoensis Walcott.

Acrotreta attenuata Meek (part), 6th Ann. Rep. U. S. Geol. and Geog. Surv. Terr. for 1872, 1873, p. 463, footnote.

Acrotreta idahoensis Walcott, Proc. U. S. Nat. Mus., 25, 1902, p. 587; Mon. U. S. Geol. Surv., 51, 1912, p. 687, pl. 65, figs. 1a–i; pl. 68, figs. 2a–g.

Canadian (Lower Pogonip): East of Hamburg Ridge, etc., Eureka County, Nevada. Also Upper and Middle Cambrian of Utah, Montana, etc.

Holotype and *paratypes*.—Cat. Nos. 52089, 52091, U.S.N.M.

Acrotreta idahoensis alta Walcott.

Acrotreta gemma Walcott (not Billings) (part), Mon. U. S. Geol. Surv., 8, 1884, pp. 17, 18, pl. 1, figs. 1a, 1b (not figs. 1c–f); pl. 9, figs. 9, 9a; 10th Ann. Rept. U. S. Geol. Surv., 1891, p. 608, pl. 67, figs. 5, 5a (not figs. 5b–e).—Hall and Clarke (part) Pal., New York, 8, pt. 1, 1892, p. 102, figs. 56, 57 (not fig. 55).—Walcott, (part), Mon. U. S. Geol. Surv., 32, pt. 2, 1899, p. 499, pl. 62, figs. 2a, 2c (not figs. 2, 2b, 2d, 2e).

Acrotreta idahoensis alta Walcott, Proc. U. S. Nat. Mus., 25, 1902, p. 588; Mon. U. S. Geol. Surv., 51, 1912, p. 689, pl. 65, figs. 4–4b.

Acrotreta idahoensis alta—Continued.

Canadian (Base of Pogonip): Adams Hill, Eureka County, Nevada. Also Middle and Upper Cambrian of Montana, Utah, and Nevada.

Holotype and *paratype*.—Cat. Nos. 35273, 52099 U.S.N.M.

ACROTRETA MINUTA Walcott. See Linnarssonella minuta.

Acrotreta ovalis Walcott.

Acrotreta ovalis Walcott, Proc. U. S. Nat. Mus., 25, 1902, p. 592; Mon. U. S. Geol. Surv., 51, 1912, p. 699, pl. 66, figs. 2, 2a-b.

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

ACROTRETA SIPO Matthew. See Acrotreta bisecta.

ACTINOCERAS Bronn. Genotype: A. bigsbyi Bronn.

Actinoceras Bronn, Leth. geog., 1837, p. 97.—Stokes, Proc. Geol. Soc. London, 2, 1838, p. 689; Trans. Geol. Soc. London, 2d ser., 5, 1840, p. 707.—McCoy, Syn. Char. Carb. Foss. Ireland, 1844, p. 11.—D'Orbigny, Prodr. de Pal., 1, 1849, p. 3.—Woodward, Man. Mollusca, pt. 1, 1851, p. 88, fig. 47.—Saemann, Palæontographica, 3, 1852, pp. 137, 145, 156.—Pictet, Traite de Pal., 2d ed., 2, 1854, p. 638.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 148.—Barrande, Bull. Soc. Geol. France, 2d ser., 12, pt. 1, 1855, p. 458; Neues Jahrb. f. Min., etc., 1855, p. 395.—Woodward, Geol. Mag., 5, 1868, p. 133.—Barrande, Syst. Sil. du Centre Boheme, 2, pt. 3, 1879, p. 760.—Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1883, p. 272.—Zittel, Handb. Pal., 2, 1884, p. 368.—Foord, Geol. Mag., dec. 3, 5, 1888, p. 487; Cat. Foss. Ceph. Brit. Mus., 1, 1888, p. 164.—Miller, N. A. Geol. Pal., 1889, p. 431.—Whidborne, Mon. Dev. Fauna South England, 1, Pal. Soc., 1890, p. 119.—Bather, Nat. Sci., 5, 1894, pp. 431, 434, fig. 6.—Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 781.—Hyatt, Zittel-Eastman Textb. Pal., 1, 1900, p. 528.—Foord, Mon. Carb. Ceph. Ireland, pt. 5, Pal., Soc., App., 1903, p. 211.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 114.—Hyatt, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 609.

Ormoceras. Stokes, Proc. Geol. Soc. London, 2, 1838, p. 689; Trans. Geol. Soc. London, 2d ser., 5, 1840, p. 709.—Woodward, Man. Mollusca, pt. 1, 1851, p. 88, fig. 48.—Saemann, Palaeontographica, 3, 1852, pp. 146, 156.—Billings, Geol. Surv. Canada, Rep. Progr. for 1853-56, 1857, pp. 326, 328.—Barrande, Neues Jahrb. f. Min., etc., 1855, p. 400.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 150.—Barrande, Bull. Soc. Geol. France, 2d ser., 12, pt. 1, 1855, p. 470.—Chapman, Canadian Jour., n. s., 8, 1863, p. 20; Expos. Min. Geol. Canada, 1864, p. 128.—Barrande, Syst. Sil. du Centre Boheme, 2, pt. 3, 1874, p. 765.—Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 271.—Zittel, Handb. Pal., 2, 1884, p. 368.—Miller, N. A. Geol. & Pal., 1889, p. 445.—(Genotype: O. bayfieldi Stokes).

Paractinoceras (subgenus of Actinoceras) Hyatt, Zittel-Eastman Textb. Pal., 1900, p. 528 (Genotype: Sactoceras canadense Whiteaves).

Deiroceras (subgenus of Actinoceras) Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 273 (Genotype: Orthoceras python Billings).

Conotubularia Troost, Mem. Soc. Geol. France, 3, 1838, p. 87; 5th Geol. Rep. Tennessee, 1840, p. 5.—Saemann, Palæontographica, 3, 1852, p. 146.—Barrande, Syst. Sil. Boheme, 2, pt. 3, 1874, p. 767. (Genotype: C. cuvierii Troost.)

Actinoceras abnorme (Hall).

Orthoceras abnorme Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 355, pl. 18 (9), fig. 10; rev. ed. 1868 (1870), p. 415, pl. 18, fig. 10; pl. 25, fig. 18.—Barrande, Syst. Sil. du Centre Boheme, 2, pt. 3, 1874, p. 756, pl. 456.—Day, Trans. Wisconsin Acad. Sci., Arts Letters, 4, 1879, p. 120.

Actinoceras abnorme—Continued.

Orthoceras (Actinoceras) abnorme Zittel, Handb. Pal., 2, 1884, p. 367, fig. 506.

Actinoceras abnorme Ruedemann, Bull. New York State Mus., 80, 1905, p. 332, fig. 22.

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

Actinoceras Allumettense Whiteaves. See Loxoceras allumettense.

Actinoceras anticostiense (Billings).

Orthoceras Anticostiense, Billings, Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, p. 316; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 22 (loc. ref.).—Barrande, Syst. Sil. du Centre Boheme, 2, pt. 3, 1874, p. 731, pl. 434.

Richmond and Gamachian: Charleton Point, etc., Anticosti.

Actinoceras backi (Stokes).

Orthocerae —— Bigsby, Trans. Geol. Soc. London, 1, pt. 2, 1824, p. 204, pl. 30, fig. 1.

Orthoceras Backii Stokes, Proc. Geol. Soc. London, 2, 1838, p. 689.

Orthoceras nummularium Etheridge (not Sowerby), Quart. Jour. Geol. Soc. London, 34, 1878, p. 608.

Actinoceras Backi Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 182.

Niagaran: Drummond Island, Lake Huron; Cape Louis Napoleon, Smith Sound, and Bessels Bay, Kennedy Channel, Arctic America.

Observation.—See Actinoceras rotulatum (Billings) for a possible synonym.

Actinoceras bayfieldi (Stokes).

Ormoceras Bayfieldii Stokes, Proc. Geol. Soc. London, 2, 1838, p. 689 (nom. nud.); Trans. Geol. Soc. London, 2d ser., 5, 1840, p. 709, pl. 40, fig. 1.—Woodward, Man. Mollusca, pt. 1, 1851, p. 88, footnote, fig. 48.—Barrande, Bull. Soc. Geol. France, 2d ser., 12, 1855, p. 470, pl. A, fig. 5; Neues Jahrb. f. Min., etc., 1855, p. 408, pl. 6, fig. 5.—Miller, N. A. Geol. Pal., 1889, p. 445, fig. 749.

Orthoceras Bayfieldi Barrande, Syst. Sil. du Centre Boheme, 2, pt. 3, 1874, p. 738, pl. 231.

Orthoceras (Ormoceras) Bayfieldi, Zittel, Handb. Pal., 2, 1884, p. 368, fig. 507.

Niagaran: Drummond Island, Lake Huron.

Actinoceras beaumonti Castelnau.

Actinoceras Beaumonti Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 32, pl. 6, fig. 1.

Niagaran: Drummond Island, Lake Huron.

Actinoceras beloitense (Whitfield).

Orthoceras (Actinoceras) Beloitense Whitfield, Ann. Rep. Geol. Surv. Wisconsin, for 1877, 1878, p. 77; Geol. Wisconsin, 4, 1882, p. 226, pl. 8, fig. 1; pl. 10, figs. 9, 10.

Orthoceras Beloitense Chamberlin, Geol. Wisconsin, 1883, p. 159, figs.

Actinoceras beloitense Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 782, pl. 47, fig. 18.—Holtedahl. Vidensk, Skrifter, 1, No. 9, 1912, p. 8, pl. 4, fig. 2.

Orthocerae —— Bigsby, Trans. Geol. Soc. London, 1, pt. 2, 1824, p. 198, pl. 25, fig. 3 (not 1, 2).

Actinoceras Bigsbyi, Stokes (part) Trans. Geol. Soc. London, 2d ser., 5, pt. 3, 1840, p. 707.

Orthoceras (Ormoceras) Backii? Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 298, pl. 1, fig. 4.—Barrande, Syst. Sil. Centre Boheme, 2, text 4, 1877, p. 264, pl. 474, fig. 11.

Black River (Platteville): Beloit and Janesville, Wisconsin; Thessalon Island, Lake Huron; Arctic America.

Actinoceras beudanti Castelnau.

Actinoceras Beudanti Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 34, pl. 6, fig. 2.

Niagaran: Drummond Island, Lake Huron.

Actinoceras bigsbyi Bronn.

Orthocerae —— Bigsby, Trans. Geol. Soc. London, 1, 1824, p. 198, pl. 25, figs. 1, 2 (not 3).

Actinoceras Bigsbyi Bronn, Leth. Geog., 1, 1837, p. 98, pl. 1, fig. 8.—Stokes, Trans. Geol. Soc. London, 2d ser., 5, 1840, p. 707.—Seamann, Palæontographica, 3, 1852, p. 142.—Foord, Cat. Ceph. British Mus., 1, 1888, p. 168.—Whiteaves, Trans. Royal Soc. Canada, 9, sec. 4, 1892, p. 84, pl. 10, fig. 2; Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 208.—Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 781, pl. 47, figs. 15–17.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 115, fig. 1350.

Orthoceras bigsbyi Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 149, fig. 109a, b, and App., p. 949. — Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 543, figs.

Orthoceras (Actinoceras) Bigsbyi Barrande, Neues Jahrb. f. Min., etc., 1855, p. 400, Syst. Sil. du Centre Boheme, 1, pt. 3, 1874, p. 734, pl. 231, figs. 4, 5; pl. 437, figs. 10–16.—Roemer, Leth, geog., 1, Leth. Pal., 1876, pl. 16, fig. 7.

Actinoceras Lyonii Stokes, Trans. Geol. Soc. London, 2d ser., 5, pt. 3, 1840, p. 707, pl. 59, fig. 1.—Castelnau, Syst. Sil. de l'Amerique Septent., 1843, p. 32, pl. 17, figs. 1a–b.

Ormoceras Lyonii Hector, Quart. Jour. Geol. Soc. London, 17, 1861, p. 439.

Conoceras angulosum Saemann, Palæontographica, 3, 1852, p. 144.

Black River: Thessalon Island, Lake Huron; New York; Ontario; Manitoba; Kentucky; Tennessee; Minnesota; Arctic America, etc.

Actinoceras bigsbyi Stokes (part). See Actinoceras beloitense.

Actinoceras blainvillei Castelnau.

Actinoceras Blainvillei Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 31, pl. 5, fig. 1; pl. 8, fig. 1.

Niagaran: Little Manitoulin Island, Lake Huron.

Actinoceras (Paractinoceras) canadense (Whiteaves).

Sactoceras Canadense Whiteaves, Trans. Royal Soc. Canada, 9, sec. 4, 1892, p. 85, pl. 10, figs. 1a–c.

Orthoceras Canadense Miller, N. A. Geol. Pal., 1st App., 1892, p. 697.

Actinoceras (Sactoceras?) Canadense Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 210.

Paractinoceras Canadense Hyatt, Zittel-Eastman Textbook Pal., 1900, p. 528.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 344.

Black River or Richmond: Lake Winnipeg, Manitoba.

Actinoceras capitolinum Foord. See Actinoceras cuvieri.

Actinoceras clouei (Barrande).

Orthoceras clouei Barrande, Syst. Sil. du Centre Boheme, ser. 2, 1870, pl. 432, figs. 1–6; pl. 433, figs. 1, 2; pl. 434, figs. 1–5.

Ordovician: Newfoundland.

Actinoceras cordieri Castelnau.

Actinoceras Cordieri Castelnau, Essai Syst. Sil. l'Amerique Septent., 1883, p. 31, pl. 5, fig. 2.

Niagaran: Great Manitoulin Island, Lake Huron.

Actinoceras crebriseptum (Hall).

Ormoceras crebriseptum Hall, Pal. New York, 1, 1847, p. 313, pl. 86, fig. 2a; pl. 87, figs. 2a-e.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 151.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 821, fig. 621.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 504, fig.

Actinoceras crebriseptum D'Orbigny, Prodr. Pal., 1, 1849, p. 3 (gen. ref.).—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 173.

Orthoceras crebriseptum Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 218, fig. 228.—Chapman, Canadian Jour. n. s., 8, 1863, p. 206, fig. 208; Expos. Min. Geol. Canada, 1864, p. 178, fig. 208.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 546, figs.

Orthoceras (Ormoceras) crebriseptum Barrande, Syst. Sil. du Centre Boheme, 2, pt. 3, 1874, p. 739, pl. 434, figs. 6–8.

Cincinnatian (Pulaski): Turin, Pulaski, etc., New York.

Actinoceras(?) cuvieri (Troost).

Conotubularia Cuvierii Troost, Mem. Soc. Geol. France, 3, 1838, p. 88, pl. 9, fig. 1; 5th Geol. Rep. Tennessee, 1840, p. 48; 6th Geol. Rep. Tennessee, 1841, p. 176.

Actinoceras Cuvieri D'Orbigny, Prodr. Pal., 1, 1849, p. 3 (gen. ref.).

Orthoceras cuvieri Miller, N. A. Geol. Pal., 1889, p. 447 (gen. ref.).

Orthoceras Capitolinum Safford, Geol. Tennessee, 1869, p. 290, pl. 4 (G. 3), figs. 1a, b.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 544, figs.

Actinoceras capitolinum Foord. Cat. Foss. Ceph. British Mus., 1, 1888, p. 174.

Jovellania capitolinum Foord. Cat. Foss. Ceph. British Mus., 1, 1888, p. 327 (gen. ref.).

Trenton (Bigby): Nashville, Tennessee.

Actinoceras daytonense (Foerste).

Orthoceras (Actinoceras) Daytonensis Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 286, pl. 8, fig. 6; Geol. Surv. Ohio, 7, 1893, p. 539, pl. 33, fig. 6.

Upper Medinan (Brassfield): Soldiers' Home, near Dayton, Ohio.

Actinoceras deshayesi Castelnau.

Actinoceras Deshayesii Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 32, pl. 8, fig. 4.

Silurian: Green Bay, Lake Michigan.

Actinoceras distans (Hall).

Endoceras distans Hall, Pal. New York, 1, 1847, p. 220, pl. 58, figs. 1a, b.

Actinoceras distans Whitfield and Hovey, Bull. Amer. Mus. Nat. Hist., 11, pt. 1, 1898, p. 58 (gen. ref.).

Trenton: Turin, Lewis County, New York.

Actinoceras dufresnoyi Castelnau.

Actinoceras Dufresnoyi Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 32, pl. 8, fig. 3.

Niagaran: Drummond Island, Lake Huron.

Actinoceras fulgur (Billings).

Orthoceras propinquum Billings (not Eichwald), Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, p. 320.

Orthoceras fulgur Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 22.

Richmond (Charleton): Charleton Point, Anticosti.

Actinoceras gracile (Hall).

Ormoceras? gracile Hall, Pal. New York, 1, 1847, p. 58, pl. 17, fig. 3.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 151.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 504, fig.

Actinoceras gracile D'Orbigny, Prodr. Pal., 1, 1849, p. 3 (gen. ref.).

Hormoceras? gracile Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 601 (gen. ref.).

Black River (Watertown): Watertown, New York.

Actinoceras hearsti Parks.

Actinoceras hearsti Parks, in Tyrrell, 22d Rep. Ontario Bur. Mines, 1913, p. 37.

Niagaran (Guelph): Severn River, Ontario.

Actinoceras infelix (Billings).

Orthoceras infelix Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 57.

Actinoceras (Orthoceras) infelix Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1883, p. 272.

Anticostian (Becsie River–Jupiter River): Southwest Point, Anticosti.

Actinoceras keewatinense Whiteaves.

Actinoceras Keewatinense Whiteaves, Ann. Rep. Geol. Surv. Canada (n. s.), 14, App. F, 1904, p. 54; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, pp. 246, 263, pl. 30, figs. 7, 8.

Niagaran: Rainy Island, Attawapiskat River and Ekwan River, Canada.

Actinoceras latonummulatum (Foerste).

Orthoceras (Actinoceras) lata-nummulatus Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 285, pl. 8, fig. 4; Geol. Surv. Ohio, Pal. 7, 1893, p. 538, pl. 33, fig. 4.

Upper Medinan (Brassfield): Soldiers' Home, near Dayton, Ohio.

Actinoceras Lyoni Stokes. See Actinoceras bigsbyi.

Actinoceras lyoni Whiteaves. See Actinoceras richardsoni.

Actinoceras (Deiroceras) python (Billings).

Orthoceras python Billings, Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, p. 335.

Deiroceras python Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1883, p. 273 (gen. ref.).

Actinoceras (Deiroceras) python Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 210.

Trenton: Ottawa, Montreal and Lake Winnipeg, Canada.

Actinoceras remotiseptum (Hall).

Ormoceras remotiseptum Hall, 3d Rep. New York State Cab. Nat. Hist., rev. ed., 1850, p. 181, pl. 4, fig. 3. (Doc. ed., p. 173).

Actinoceras remotiseptum Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 782, pl. 54, figs. 1–3.—Foord, Cat. Foss. Ceph. Brit. Mus., 1, 1888, p. 172.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 115.

Hormoceras remotiseptum Clarke and Ruedemann, New York State Mus., Bull. 65, p. 602 (gen. ref.).

Black River: Watertown, New York (Watertown); Cannon Falls, Minnesota (Platteville).

Actinoceras richardsoni Stokes.

Actinoceras Richardsonii Stokes, Proc. Geol. Soc. London, 2, p. 689 (nom. nud.); Trans. Geol. Soc. London, 2d ser., 5, 1840, p. 708, pl. 59, figs. 2, 3.—Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 30, pl. 7, figs. 1, 2; pl. 8, figs.

Actinoceras richardsoni—Continued.

2a, b.—Woodward, Man. Mollusca, pt. 2, 1851, p. 88, footnote, fig. 47.—Barrande, Neues Jahrb. f. Min., etc., 1855, p. 396, pl. 6, figs. 6, 7; Bull. Soc. Geol. France, 2d ser., 12, 1855, p. 461, pl. B, figs. 6, 7.—Foord, Cat. Foss. Ceph. Brit. Mus., pt. 1, 1888, p. 172.—Miller, N. A. Geol. Pal., 1889, p. 431, text fig. 725.—Whiteaves, Trans. Royal Soc. Canada, 9, sec. 4, p. 83, pl. 9, figs. 1, 2, 2a, 3; 4a; Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 207.

Orthoceras richardsoni Barrande, Syst. Sil. du Centre Boheme, 2, pt. 3, 1874, p. 737, pl. 234.

?Ormoceras Brongniarti Owen, Geol. Rep. Wisconsin, Iowa, Minnesota, 1852, p. 181.

Actinoceras Lyoni Whiteaves (not Stokes), Geol. Surv. Canada, Rep. Progr. 1878–79, 1880, pp. 460, and 48c of Appendix 1.

Black River or Richmond: Lake Winnipeg, Canada.

Actinoceras richardsoni magnum Parks.

Actinoceras richardsoni var. magnum Parks in Tyrrell, 22nd Rep. Ontario Bur. Mines, 1913, p. 33.

Mohawkian or Richmond: Shamattawa River, Manitoba.

Actinoceras rotulatum (Billings).

Orthoceras rotulatum Billings, Geol. Surv. Canada, Rep. Progr. for 1853–1856, 1857, p. 334.—Barrande, Syst. Sil. du Centre Boheme, 2, pt. 3, 1874, p. 732, pl. 437, figs. 1–5.

Niagaran: Head of Lake Temiscaming, Canada.

Observation.—Considered synonymous with *A. backi* (Stokes) by Foord (Cat. Foss. Ceph. British Mus., 1, 1888, p. 182).

Actinoceras sedgwicki (Billings).

Orthoceras Sedgwicki Billings, Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, p. 320; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, pp. 22, 58 (loc. ref.).

Richmond and Gamachian: West End, Gamachi Bay, etc., Anticosti.

Actinoceras sphæroidale (Stokes).

Huronia sphæroidalis Stokes, Trans. Geol. Soc. London, 2d ser., 1, pt. 2, 1824, p. 203, pl. 28, fig. 5.

Orthoceras (Huronia) sphæroidale Barrande, Syst. Sil. du Centre Boheme, 2, pt. 3, 1874, p. 742, pl. 232, fig. 3.

Actinoceras sphæroidale Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 186.

Niagaran: Drummond Island, Lake Huron.

Actinoceras tenuifilum (Hall).

Ormoceras tenuifilum Hall, Pal. New York, 1, 1847, p. 222, pl. 58, figs. 2a–c; p. 55, pl. 15, figs. 1a–c; pl. 16, figs. 1a–e; pl. 17, figs. 1a, b.—Saemann, Paleontographica, 3, 1852, p. 142.—Barrande, Neues Jahrb. f. Min., etc., 1855, p. 398, 405.—Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 72.—Chapman, Canadian Jour., n. s., 8, 1863, p. 20, fig. 129, p. 198, fig. 171; Expos. Min. Geol. Canada, 1864, p. 128, fig. 129, p. 170, fig. 171.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 158, fig.—Lesley, Geol. Surv. Pennsylvania Rep. P. 4, 1889, p. 504, fig.

Hormoceras tenuifilum Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 602 (gen. ref.)

Actinoceras tenuifilum D'Orbigny, Prod. Pal., 1, 1849, p. 3 (gen. ref.).—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 151.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 115, fig. 1351.

Actinoceras tenuifilum—Continued.

Orthoceras (Ormoceras) tenuifilum Barrande, Syst. Sil. du Centre Boheme, 2, pt. 3, 1874, p. 754, pl. 237.

Orthoceras tenuifilum James, Jour. Cincinnati Soc. Nat. Hist., 8, 1886, p. 241.

Black River: Watertown, Lowville, etc., New York (Watertown); Kentucky; Tennessee.

Actinoceras tenuifilum distans (Hall).

Ormoceras tenuifilum? var. distans Hall, Pal. New York, 1, 1847, p. 58, pl. 17, fig. 2.

Black River (Watertown): Watertown, etc., New York.

Actinoceras turgidonummulatum (Foerste).

Orthoceras (Actinoceras) turgido-nummulatus Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 285, pl. 8, fig. 7; Geol. Surv. Ohio, Pal. 7, 1893, p. 538, pl. 33, fig. 7; pl. 35, figs. 1, 2.

Upper Medinan (Brassfield): Soldiers Home, near Dayton, Ohio

Actinoceras vertebratum (Hall).

Ormoceras vertebratum Hall, Pal. New York, 2, 1852, p. 94, pl. 29, fig. 1a-g.—Lesley, Geol. Surv. Pennsylvania Rep., P 4, 1889, p. 504, figs.

Orthoceras (Ormoceras) vertebratum Barrande, Syst. Sil. du Centre Boheme, 2, pt. 3, 1874, p. 755, pl. 232, 237.

Actinoceras vertebratum Foord, Cat. Foss. Ceph. Brit. Mus., 1, 1888, p. 185.—Hyatt, Zittel-Eastman Textb. Pal., 1, 1900, p. 528, fig. 1078.

Lower Clinton: Reynale's Basin, New York.

Actinoceras whitei (Stokes).

Orthoceræ ——— Bigsby, Trans. Geol. Soc. London, 1, pt. 2, 1824, p. 204, pl. 30, fig. 2.

Ormoceras whitei Stokes, Proc. Geol. Soc. London, 2, 1838, p. 689; Trans. Geol. Soc. London, 2d ser., 5, 1840, p. 709.

Actinoceras whitei Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 184.

Orthoceras Backi Barrande, Syst. Sil. du Centre Boheme, 2, pt. 3, 1874, p. 731, pl. 437, figs. 17, 18.

Niagaran: Drummond Island, Lake Huron.

Actinoceras youngi (Foerste).

Orthoceras (Actinoceras) youngi Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 284, pl. 8, fig. 3; Geol. Surv. Ohio, Pal., 7, 1893, p. 537, pl. 33, fig. 3; pl. 36, fig. 1.

Upper Medinan (Brassfield): Hanover, Indiana; Dayton, Ohio.

Actinocrinites tennesseeæ Troost. See Periechocrinus tennesseensis and P. dubius.

Actinocrinites verneuili Troost. See Melocrinus roemeri.

Actinocrinus christyi Hall. See Periechocrinus whitfieldi.

Actinocrinus Meeki Lyon. See Macrostylocrinus meeki.

Actinocrinus obpyramidalis Winchell and Marcy. See Melocrinus obpyramidalis.

Actinocrinus? plumosus Hall. See Glyptocrinus plumosus.

Actinocrinus polydactylus Bonny. See Melocrinus pachydactylus.

Actinocrinus (Saccocrinus) semiradiatus Hall. See Macrostylocrinus semiradiatus.

ACTINOCRINUS SPECIOSUS Meek and Worthen. See Periechocrinus speciosus.

ACTINOCRINUS SUBCRASSUS Meek and Worthen. See Iocrinus subcrassus.

ACTINOCRINUS TENUIRADIATUS Hall. See Palæocystites tenuiradiatus.

ACTINOCRINUS WALDRONENSIS Shumard. See Periechocrinus whitfieldi.

ACTINOCRINUS WHITFIELDI Shumard. See Periechocrinus whitfieldi.

ACTINODICTYON Parks. Genotype: A. canadense Parks.

Actinodictyon Parks, Univ. Toronto Studies, Geol. Ser., No. 6, 1909, p. 30.

Actinodictyon canadense Parks.

Actinodictyon canadense Parks, Univ. Toronto Studies, Geol. Ser. No. 6, 1909, p. 32, pl. 20, figs. 1, 2.

Niagaran: Southampton Island, Hudson Bay, Canada.

Actinodictyon keelei Parks.

Actinodictyon keelei Parks, Univ. Toronto Studies, Geol. Ser. No. 5, 1909, p. 35, pl. 19, figs. 5, 6.

Niagaran: Gravel River, Mackenzie District, Canada.

Actinodictyon lowi Parks.

Actinodictyon lowi Parks, Univ. Toronto Studies, Geol. Ser. No. 6, 1909, p. 33, pl. 20, figs. 3, 4.

Niagaran: Southampton Island, Hudson Bay, Canada.

Actinodictyon neptuni Parks.

Actinodictyon neptuni Parks, Univ. Toronto Studies, Geol. Ser. No. 6, 1909, p. 34, pl. 20, figs. 5, 6.

Niagaran: Southampton Island, Hudson Bay, Canada.

ACTINODONTA Phillips. See Lyrodesma Conrad.

ACTINOMYA Ulrich. See Whiteavesia Ulrich.

ACTINOPTERIA Hall. Genotype: A. decussata Hall.

Actinopteria Hall, Pal. New York, 5, pt. 1, Lam. (adv. copy), 1883, p. 3; ibid., 1884, p. xii; 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. 459.—Nettelroth, Kentucky, Foss. Shells, Geol. Surv. Kentucky, 1889, p. 229.—Jackson, Mem. Boston Soc. Nat. Hist., 4, 1890, p. 386.—Whidborne, Mon. Dev. Fauna South England, 2, Pal. Soc., 1892, p. 59.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 245.—Clarke, Archiv. Mus. Nac. de Janeiro, 10, author's Eng. ed., 1900, p. 45.—Hind, Mon. British Carb. Lamell., 2, Pal. Soc., 1901, p. 22.

Actinopteria bella Williams.

Actinopteria bella Williams, Proc. U. S. Nat. Mus., 45, 1913, p. 342, pl. 30, figs. 17, 19.

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

Cotypes.—Cat. No. 58964, U.S.N.M.

Actinopteria communis (Hall).

Avicula communis Hall, Pal. New York, 3, 1859, p. 286, pl. 3, figs. 1–7; pl. 53, figs. 1, 4, 6.

Actinopteria communis Clarke, Mem. New York State Mus., 3, No. 3, 1900, p. 34, pl. 4, figs. 1, 2.—Weller, Pal. New Jersey, 3, 1903, p. 292, pl. 31, fig. 21.—Ohern, Maryland Geol. Surv., Low. Dev., 1913, p. 455, pl. 76, figs. 2–4.

Helderbergian: Helderberg Mountains, etc., New York; New Jersey; Cumberland, Maryland (Keyser, etc.).

Actinopteria dispar Williams.

Actinopteria dispar Williams, Proc. U. S. Nat. Mus., 45, 1913, p. 343, pl. 30, figs. 20, 21.

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

Cotypes.—Cat. No. 58966, U.S.N.M.

ACTINOPTERIA EMACERATA Whitfield and Hovey. See Pterinea emacerata.

Actinopteria fornicata Williams.

Actinopteria fornicata Williams, Proc. U. S. Nat. Mus., 45, 1913, p. 343, pl. 30, figs. 14–16.

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

Holotype.—Cat. No. 58965, U.S.N.M.

Actinopteria reticulata Weller.

Actinopteria reticulata Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 245, pl. 22, fig. 3.—Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 459, pl. 76, fig. 6.

Helderbergian: Near Tri States, New York (Decker Ferry); Keyser, West Virginia (Keyser).

ACTINOSTOMA Young and Young. See Fenestella Lonsdale.

ACTINOSTROMA Nicholson. Genotype: A. clathratum Nicholson.

Actinostroma Nicholson, Mon. British Strom., Pal. Soc., 1886, p. 75.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 221.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 142.—Zittel-Eastman Textb. Pal., 1, 1900, p. 112; 2d ed., 1913, p. 122.

Actinostroma franklinense Parks.

Clathrodictyon franklinense Ami., Cruise of the "Neptune," 1906, p. 329 (nom. nud.). Actinostroma franklinense Parks, Univ. Toronto Studies, Geol. Ser. No. 6, 1909, p. 27, pl. 19, figs. 3, 4.

Niagaran: Beechy Island, Lancaster Sound, Canada.

ACTINOSTROMA INFLECTUM Parks. See Actinostroma tenuifilatum inflectum.

Actinostroma matutinum Nicholson.

Actinostroma matutinum Nicholson, Ann. Mag. Nat. Hist., 6th ser., 7, 1891, p. 322, pl. 9, figs. 1, 2.—Whiteaves, Canadian Rec. Sci., 7, 1895, p. 134.—Parks, Univ. Toronto Studies, Geol. Ser., No. 5, 1908, p. 14.

Silurian: L'Anse au Gascon, Baie de Chaleur, Quebec.

Actinostroma tenuifilatum Parks.

Actinostroma tenuifilatum Parks, Univ. Toronto Studies, Geol. Ser., No. 5, 1908, p. 10, pl. 9, figs. 1–3; Ibid., No. 6, 1909, p. 25.

Niagaran: Ann Arbor, Michigan (drift); Drummonds Island, Lake Huron, Pagwachuan River, and Southampton Island, Hudson Bay, Canada.

Cotypes.—Cat. Nos. 36828, 36829, U.S.N.M.

Actinostroma tenuifilatum cylindricum Parks.

Actinostroma tenuifilatum var. cylindricum Parks, Univ. Toronto Studies, Geol. Ser., No. 6, 1909, p. 26.

Niagaran: Southampton Island, Hudson Bay, Canada.

Actinostroma tenuifilatum inflectum Parks.

Actinostroma inflectum Parks, Ottawa Nat., 22, 1898, p. 27; Univ. Toronto Studies, Geol. Ser., No. 5, 1908, p. 11.

Actinostroma tenuifilatum inflectum—Continued.

Actinostroma tenuifilatum var. inflectum, Parks, Univ. Toronto Studies, Geol. Ser. No. 6, 1909, p. 25, pl. 19, figs. 1 and 2.

Niagaran: Pagwachuan River and Little Current River, Canada.

Actinostroma tenuissimum Parks.

Actinostroma tenuissimum Parks, Univ. Toronto Studies, Geol. Ser., No. 6, 1909, p. 42, pl. 18, figs. 2, 3, 9, and 12.

Cayugan (Cobleskill): Schoharie County, New York.

Actinostroma? trentonense Ulrich and Everett.

Actinostroma? trentonense Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 282, pl. 7, figs. 3a, b.

Black River (Platteville): Near Dixon, Illinois.

Sections of *holotype*.—Cat. No. 46545 U.S.N.M.

ACTINOSTROMA TRENTONENSIS Weller. See Solenopora compacta.

Actinostroma vulcana Parks.

Actinostroma vulcana Parks, Univ. Toronto Studies, Geol. Ser., No. 4, 1907, p. 10, pl. 1, figs. 1, 2, 5.

Niagaran (Guelph): Durham, Ontario.

Actinostroma whiteavesi niagarense Parks.

Actinostroma whiteavesii var. niagarense Parks, Univ. Toronto Studies, Geol. Ser., No. 5, 1908, p. 11, pl. 12, figs. 4–5.

Niagaran (Lockport): Thorold, Ontario.

ÆCHMINA Jones and Holl. Genotype: A. cuspidata Jones and Holl.

Æchmina Jones and Holl, Ann. Mag. Nat. Hist., 4th ser., 3, 1869, p. 217.—Zittel, Handb. Pal., 2, 1885, p. 557.—Vogdes, Ann. New York Acad. Sci., 5, 1889, p. 4, pl. 2, fig. 6.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 704.—Koken, Die Leitfossilien, Leipzig, 1896, p. 40.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 308.—Ulrich, Zittel-Eastman Textb., Pal., 1, 1900, p. 644.—Grabau, Bull. New York State Mus., 45, 9, 1901, p. 220; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 220.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 345.—Bassler, Zittel-Eastman Textb., Pal., 2d ed., 1913, p. 738.

Æchmina abnormis Ulrich.

Æchmina abnormis Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 183, pl. 12, figs. 7a, 7b.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 346, fig. 1660, h–j.

Clinton (Rochester): Lockport, etc. New York, Maryland, etc.

Holotype.—Cat. No. 41372, U.S.N.M.

ÆCHMINA BYRNESI Jones. See Dicranella? byrnesi.

Æchmina spinosa (Hall).

Cytherina spinosa Hall, Pal. New York, 2, 1852, p. 317, pl. 67, figs. 17–21.

Beyrichia spinosa Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 80 (gen. ref.).

Æchmina spinosa Jones and Holl, Ann. Mag. Nat. Hist., 4th ser., 3, 1869, p. 218 (gen. ref.).—Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 11, pl. 13, figs. 4–8.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 220, fig. 152; Bull. New York State Mus., 45, No. 9, 1901, p. 220, fig. 152.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 345, fig. 1659.

Clinton (Rochester): Lockport, Rochester, etc., New York; Ontario; Pennsylvania; Maryland.

Ægilops Hall. Genotype: Æ. subcarinata Hall.

Ægilops Hall, 3d Rep. New York State Cab. Nat. Hist., rev. ed., 1850, p. 179 (doc. ed., p. 171).

Ægilops subcarinata Hall.

Ægilops subcarinata Hall, 3d Rep. New York State Cab. Nat. Hist., rev. ed., 1850, p. 179, pl. 4., figs. 1a, b (doc. ed., p. 171).

Trenton: Near Lowville, Lewis County, New York.

Observation.—Not recognized. Founded on cast of undetermined pelecypod.

Æonia Burmeister. See Proetus Steininger.

Æsiocystis Bather. See Æsiocystites Miller and Gurley.

ÆSIOCYSTITES Miller and Gurley. Genotype: A. priscus Miller and Gurley.

Æsiocystites Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 5, 1894, p. 13.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 732.

Æsiocystis Bather, Treatise on Zoology (Lankester), pt. 3, 1900, p. 208.

Æsiocystites priscus Miller and Gurley.

Æsiocystites priscus Miller and Gurley, Bull. Illinois State Mus., 5, 1894, p. 14, pl. 2, figs. 10–12.—Miller, N. A. Geol and Pal., 2d App., 1897, p. 732, text fig. 1281.

Trenton (Curdsville): Mercer County, Kentucky.

ÆTHOCYSTITES Miller. Genotype: Æ. sculptus Miller.

Æthocystites Miller, N. A. Geol. Pal., 1st App., 1892, p. 673; 18th Ann. Rep. Indiana Dep. Geol. Nat Res., 1894, p. 263. (Adv. sheets, 1892, p. 9.)—Bather, Treatise on Zoology (Lankester), pt. 3, 1900, p. 57.

Æthocystites sculptus Miller.

Æthocystites sculptus Miller, N. A. Geol. Pal., 1st App., 1892, p. 673, fig. 1207; 18th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1894, p. 264, pl. 2, fig. 2. (Advance sheets, 1892, p. 10, pl. 2, fig. 2.)

Niagaran (Laurel): St. Paul, Indiana.

Agaricia Swindernana Goldfuss. See Thecia swindernana.

AGELACRINITES Vanuxem. Genotype: A. hamiltonensis Vanuxem.

Agelacrinites Vanuxem, Geol. Surv. New York, 3d dist., 1842, p. 158.—Beyrich, Neues Jahrb. f, Min., etc., 1846, p. 192.—Forbes, Mem. Geol. Surv. Great Britain, 2, pt. 2, 1848, p. 519.—Hall, Pal. New York, 2, 1852, p. 236 footnote.—Billings, Canadian Jour., 2, 1854, p. 271.—Chapman, Canadian Jour., n. s., 5, 1860, p. 358, 361; Ann. Mag. Nat. Hist., 3d ser., 6, 1860, p. 159; Expos. Min. Geol. Canada, 1864, p. 110.—Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 53 (footnote).—Salter, Mem. Geol. Surv. Great Britain, 3, 1866, p. 290; 2d ed. 1881, p. 481.—Barrande and Waagen, Syst. Sil. du Centre Boheme, 7, pt. 1, 1887, p. 83, pl. 37.—Jaekel, Stammesges. Pelmat., 1, 1899, p. 49.—Zittel, Grundzuge Pal., 1, 1910, p. 182.

Agelacrinus Pictet, Traite de Pal. 2d ed., 4, 1857, p. 305.—Hall, Pal. New York, 3, 1859 (1861), p. 152.—Zittel, Handb. Pal., 1, 1879, p. 414.—Stürtz, Neues Jahrb. f. Min., 2, 1886, p. 144.—Miller, N. A. Geol. Pal., 1889, p. 221.—Bather, Treatise on Zoology (Lankester), pt. 3, 1900, p. 207, fig. 3.—Clarke, Bull. New York State Mus., 49, 1901 (1902), p. 184.—Haeckel, Amphorideen u. Cystoideen, 1896, p. 112.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 472.—Springer, Zittel-Eastman Textb. Pal. 1, 1913, p. 169.—Foerste, Bull. Sci. Lab. Denison Univ. 17, 1914, p. 399.

Agelacrinus (Agelacrinites) Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 353.

Agelacystis Haeckel, Amphorideen u. Cystoideen, 1890, p. 114.

Agelacrinites austini (Foerste).

Agelacrinus austini Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 444, pl. 6, fig. 1.

Richmond (Whitewater): Four and one-half miles northwest Wilmington, Ohio.

Agelacrinites (Edrioaster) Bigsbyi Chapman. See Edrioaster bigsbyi.

Agelacrinites Billingsi Chapman. See Hemicystites billingsi.

Agelacrinites cincinnatiensis (Roemer).

Agelacrinus Cincinnatiensis Roemer, Verhdl. Nat. Hist. Ver. preuss. Rheinland, 8, 1851, p. 372, pl. 8, fig. 3.—Bronn, Leth. geog., 3d ed., 2, 1855, p. 277, pl. 4, fig. 6.—Hall, Desc. n. sp. Crin., etc., 1886, p. 6.—Roemer, Leth. geog., 1, Leth. Pal., Atlas, 1876, pl. 3, fig. 16.—Zittel, Handb. Pal., 1, 1879, p. 414, fig. 291.—Miller, N. A., Geol. Pal., 1889, p. 222, fig. 241.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 476, pl. 1, fig. 6.

Agelacrinus (Lepidodiscus) Cincinnatiensis Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 214, pl. 6, fig. 7; Desc. n. sp. fossils, Cincinnati, Ohio, 1871, photographic pl. 2, fig. 7.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 472, fig. 1784b.

Lepidodiscus cincinnatiensis Sharman and Newton, Quart. Jour. Geol. Soc. London, 48, 1892, p. 151.—Haeckel, Amphorideen u. Cystoideen, 1896, p. 113, fig. 16.—Bather, Treatise on Zool., pt. 3, Echinoderma, 1900, p. 207, fig. 4.

Agelacrinites (Lepidodiscus) Cincinnatiensis Meek, Geol. Surv. Ohio, Pal. 1, pt. 2, 1873, p. 55, pl. 3, fig. 6a, b.

Agelacrinites cincinnatiensis Jaekel, Stamm. Pelmat., 1, Thecoidea, u. Cystoidea, Berlin, 1899, p. 50, pl. 2, fig. 1.—Clarke, Bull. New York State Mus., 49, 1901, p. 185.

Maysville (Fairmount-Corryville): Cincinnati, Ohio, and vicinity; Indiana; Kentucky; Tennessee.

Agelacrinites dicksoni Billings.

Agelacrinites dicksoni Billings, Rep. Progress 1853–56, Geol. Surv. Canada, 1857, p. 294; Canadian Org. Rem., dec. 3, Geol. Surv. Canada, 1858, p. 84, pl. 8, fig. 3, 3a, 4, 4a.—Chapman, Expos. Min. Geol. Canada, 1864, p. 110.—Grant, Trans. Ottawa Field Nat. Club, 1, No. 2, 1881, fig. 9.—Jaekel, Stamm. Pelmat. 1, Thecoidea u. Cystoidea, 1899, p. 50, pl. 2, fig. 2.—Clarke, Bull. New York State Mus. 49, 1901, p. 191, fig. 3.

Agelacrinus Dicksoni Haeckel, Amphorideen u. Cystoideen, 1896, pl. 3, fig. 29.—Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 44 (loc. occ.).

Trenton (Curdsville): Ottawa and Kirkfield, Ontario.

Agelacrinites faberi (Miller).

Agelacrinus faberi Miller, Jour. Cincinnati Soc. Nat. Hist., 17, 1894, p. 156, pl. 8, figs. 24, 25.—Foerste, Bull. Sci. Lab. Denison Univ. 17, 1914, p. 441, pl. 1, fig. 3, pl. 3, fig. 4.

Lepidodiscus faberi Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 728, pl. 4, fig. 11.

Richmond (Whitewater): Between Osgood and Versailles, Indiana.

Agelacrinites holbrooki (James).

Agelacrinus Holbrooki James, Paleontologist, No. 1, 1878, p. 2; Jour. Cincinnati Soc. Nat. Hist., 10, 1897, p. 25, figs. A, B.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 446, pl. 1, fig. 1, pl. 4, fig. 1.

Agelacrinites holbrooki—Continued.

Agelacrinites Holbrooki Jaekel, Stammes. Pelmat., 1, Thecoidea u. Cystoidea, Berlin, 1889, p. 50.—Clarke, Bull. New York State Mus., 49, 1901, p. 189, fig. 2.

Maysville(?Corryvile): Near Lebanon (Morrow), Ohio.

Plesiotype.—Cat. No. 40744, U.S.N.M.

Agelacrinites pileus (Hall).

Agelacrinus (Lepidodiscus) pileus Hall., 24th Rep. New York State Cab. Nat. Hist., 1872, p. 214, pl. 6, figs. 8–10 (Adv. publication, 1866).

Lepidodiscus pileus Sladen, Quart. Jour. Geol. Soc. London, 1879, p. 750.

Agelacrinus pileus Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 15, 1892, p. 85, pl. 1, fig. 10.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 482, pl. 2, figs. 1–4.

Agelacrinites pileus Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 56, pl. 3, fig. 5.—Jaekel, Stammes, Pelmatozoen, 1, Thecoidea u. Cystoidea, Berlin, 1899, p. 50, fig. 10, pl. 1, fig. 6.

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

AGELACRINITES SEPTEMBRACHIATUS Jaekel. See Streptaster septembrachiatus.

Agelacrinites vetustus (Foerste).

Agelacrinus vetustus Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 439.

Trenton (Cynthiana): Clays Ferry, Kentucky.

AGELACRINITES VORTICELLATA Meek. See Streptaster vorticellatus.

Agelacrinites warrenensis (James).

Agelacrinus warrenensis James, Paleontologist, No. 7, 1883, p. 58, pl. 2, figs. 3, 3a.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 448, pl. 1, fig. 4.

Maysville (Fairmount): Morrow, Ohio.

Observation.—Poorly defined and figured. Probably young specimens of A. cincinnatiensis.

AGELACRINUS of authors. See Agelacrinites Vanuxem.

AGELACRINUS BIGSBYI Schmidt. See Edrioaster bigsbyi.

AGELACRINUS BILLINGSI Chapman. See Hemicystites billingsi.

AGELACRINUS CINCINNATIENSIS of authors. See Agelacrinites cincinnatiensis.

AGELACRINUS DICKSONI Hæckel. See Agelacrinites dicksoni

AGELACRINUS FABERI Miller. See Agelacrinites faberi.

AGELACRINUS HOLBROOKI James. See Agelacrinites holbrooki.

AGELACRINUS PARASITICA Hall. See Hemicystites parasiticus.

AGELACRINUS PILEUS of authors. See Agelacrinites pileus.

AGELACRINUS SEPTEMBRACHIATUS Miller and Dyer. See Streptaster septembrachiatus.

AGELACRINUS (HEMICYSTITES) STELLATUS Hall. See Hemicystites stellatus.

AGELACRINUS VORTICELLATA Hall. See Streptaster vorticellatus.

AGELACRINUS WARRENENSIS James. See Agelacrinites warrenensis.

AGELACYSTIS Hæckel. See Agelacrinites Vanuxem.

AGNOSTUS Brongniart. Genotype: Entomolitus paradoxus pisiformis Linnæus.

Agnostus Brongniart, Hist. Crust. Foss., 1822, p. 38.—DeKay, Ann. Lyceum Nat. Hist. New York, 1, 1824, p. 176, footnote.—Green, Mon. Tril. N. A., 1832, p. 17.—Murchison, Sil. Syst., 1839, p. 664.—Edwards, Hist. Nat. d. Crustaces, 3, 1840, p. 347.—Goldfuss, Neues Jahrb. f. Min., etc., 1843, p. 541.—Pictet, Traite de Pal., 2d ed., 2, 1854, p. 526.—Salter, Mem. Geol. Surv. United Kingdom, dec. 11, 1864, pl. 1.—Salter, Mem. Geol. Surv. Great Britain, 3, 1866, p. 296 (ibid., 2d ed., 1881, p. 488).—Brögger, Nyt Mag. for Naturvid., 24, 1877, p. 61.—Angelin, Pal. Scandinavica, 3d ed., Holmiæ, 1878, p. 5.—Tullberg, Sveriges, Geol. Unders., Ser. C, No. 42, 1880, p. 11.—Zittel, Handb. Pal., 2, 1885, p. 592.—Matthew, Trans. Royal Soc. Canada, 3, sec. 4, 1886, p. 67.—Miller, N. A. Geol. Pal., 1889, p. 526.—Vogdes, Amer. Geol., 9, 1892, pp. 377–383; Cal. Acad. Sci., Occ. Papers, 4, 1893, p. 262.—Beecher, Amer. Jour. Sci., 3d ser., 46, 1893, p. 143; Amer. Geol., 16, 1895, p. 175.—Matthew, Trans. New York Acad. Sci., 15, 1896, p. 207.—Koken, Die Leitfossilien, Leipzig, 1896, p. 14, fig. 6.—Beecher, Amer. Jour. Sci., 4th ser., 3, 1897, pp. 104, 183, pl. 3, fig. 9.—Matthew, Trans. Royal Soc. Canada, 2d ser. 3, sec. 4, 1897, p. 170.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 34, No. 8, 1901, pp. 10, 37, pl. 1, fig. 7.—Matthew, Amer. Geol., 27, 1901, p. 56.—Gronwall, Danmarks Geol. Unders., 2, Række, No. 13, 1902, p. 46.—Jaekel, Zeit. d, Deutsch. Geol. Gesell., 61, 1909, p. 380.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 710.

Agnostus acadicus declivus Matthew.

Agnostus Acadicus var. declivis Matthew, Trans. Royal Soc. Canada, 3, sec. 4, 1886, p. 70, pl. 7, figs. 6a, b.—Vogdes, Amer. Geol., 9, 1892, p. 387, pl. 9, fig. 8.—Matthew, Trans. New York Acad. Sci., 15, 1896, p. 219, pl. 15, figs. 11a–d.

Agnostus cf. declivis Matthew, Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, p. 223.

Canadian (Bretonian—Div. C. 3b): McNeil Brook, Cape Breton, Nova Scotia.

Agnostus americanus Billings.

Agnostus Americanus Billings, Canadian Nat. Geol., 5, 1860, p. 302, fig. 1 a, b; Geol. Canada, Geol. Surv. Canada, 1863, p. 233, figs. 250 a, b; Pal. Foss. 1, Geol. Surv. Canada, 1865, p. 395, fig. 372 a, b.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1880, p. 298.

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

Agnostus bisectus Matthew.

Agnostus bisectus Matthew, Trans. Royal Soc. Canada, 9, sec. 4, 1892, p. 50, pl. 13, figs. 2 a, b.

Canadian (Bretonian—Div. C. 3b): Navy Island, St. John, New Brunswick.

Agnostus bolivianus Hoek.

Agnostus bolivianus Hoek, Neues Jahrb. Min., Geol., Pal., 34, 1912, p. 212, pl. 7, fig. 6.

Lowest Ordovician: Salitre, Bolivia-Argentina boundary.

Agnostus canadensis Billings.

Agnostus Canadensis Billings, Canadian Nat. Geol., 5, 1860, p. 304, fig. 3 a, b; Geol. Canada, Geol. Surv. Canada, 1863, p. 233, fig. 252 a, b; Pal. Fos., 1, Geol. Surv. Canada, 1865, p. 397, fig. 374 a, b.—Brögger, Geol. Foren. Stockholm Forhandl., 8, 1886, p. 207.—Vogdes, Amer. Geol., 9, 1892, p. 390, pl. 9, fig. 9.

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

Agnostus communis Hall and Whitfield.

Agnostus communis Hall and Whitfield, U. S. Geol. Expl. 40th Parl., 4, 1877, p. 228, pl. 1, figs. 28, 29.—Walcott, Mono. U. S. Geol. Surv., 8, 1884, p. 27.—Brögger, Geol. Foren. Stockholm Forhandl., 8, 1886, p. 207.—Vogdes, Amer. Geol., 9, 1892, p. 390, pl. 9, fig. 15.

Cambrian and ?Ordovician (Pogonip): White Pine and Eureka Districts, Nevada.

Agnostus cyclopyge Tullberg. See Lejopyge cyclopyge.

Agnostus fabius Billings.

Agnostus Fabius Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 298, text fig. 289.—Vogdes, Amer. Geol., 9, 1892, p. 396, pl. 9, fig. 10.

Chazyan (Quebec—N, P): Table Head, Pistolet Bay and four miles northeast Port. land Creek, Newfoundland.

Agnostus galba Billings. See Arthrorrachis galba.

Agnostus latus Vanuxem. See Beyrichia lata.

Agnostus orion Billings.

Agnostus Orion Billings, Canadian Nat. Geol., 5, 1860, p. 304, fig. 2; Geol. Canada, Geol. Surv. Canada, 1863, p. 233, fig. 251.—Shumard, Trans. Acad. Sci. St. Louis, 2, 1863, p. 105.—Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 397, fig. 373.—Vogdes, Amer. Geol., 9, 1893, p. 391, pl. 9, fig. 12.

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

Agnostus pisiformis (Linnæus).

Entomolithus paradoxus pisiformis Linnæus, Inter Scan., 1757, p. 122.

Agnostus pisiformis Brongniart, Crust. foss., 1822, p. 38.—Roemer, Leth. geog., 1. Leth. Pal., Atlas, 1876, pl. 1, fig. 2a.—Tullberg, Sveriges Geol. Unders., Ser. C, No. 42, 1880, p. 25, pl. 2, fig. 14.—Salter, Mem. Geol. Surv. Great Britain, 2d ed., 1881, p. 489.—Brögger, Die sil. Etagen 2–3, Kristiania, 1882, p. 55 (cites bibliography).—Wallerius, Unders, Zonen med Agnostus lævigatus i Vestergotland, Lund, 1895, p. 43.—Koken, Die Leitfossilien, Leipzig, 1896, p. 11, fig. 6; p. 347, fig. 242, 1.

Agnostus pisiformis var. Matthew, Trans. Roy. Soc. Canada, 9, sec. 4, 1892, p. 59, pl. 13, fig. 1a, b; ibid., 1898, p. 138, pl. 2, figs. 1a–c.

Lower Ordovician: Europe.

Canadian (Bretonian—Div. C3a): Long Island, Kennebecasis River, New Brunswick.

Agnostus pisiformis affinis Matthew.

Agnostus pisiformis mut. affinis Matthew, Trans. Royal Soc. Canada, 2d ser., 4, sec. 4, 1898, p. 137, pl. 2, fig. 3.

Canadian (Bretonian—Div. C 3a): Kennebecasis Valley, New Brunswick.

Agnostus pisiformis rugulosus Matthew.

Agnostus pisiformis mut. rugulosus Matthew, Trans. Royal Soc. Canada, 2d ser. 4, sec. 4, 1898, p. 137, pl. 2, fig. 2.

Canadian (Bretonian—Div. C 3a): Kennebecasis Valley, New Brunswick.

Agnostus pisiformis validus Matthew.

Agnostus pisiformis mut. valida Matthew, Trans. Royal Soc. Canada, 2d ser., 4, sec. 4, 1898, p. 137.

Canadian (Bretonian—Div. C 3a): Kennebecasis Valley, New Brunswick.

Agnostus sidenbladhi Linnarsson.

Agnostus Sidenbladhi Linnarsson, Vesterg. Cambr., etc., 1869, p. 82, pl. 2, figs. 60, 61 (K. Sv. Vet. Akad. Handl.); Ofvers. K. Vet.-Akad. Forhandl., 26, 1869, p. 195.—Brögger, Die Sil. Etagen 2–3, Kristiania, 1882, p. 56 (cites bibliography).

Canadian: Europe; Point Levis, Quebec (Levis-Diplograptus dentatus zone) [Raymond].

Agnostus trisectus Salter.

Agnostus trisectus Salter, Mem. Geol. Surv., dec. 11, 1864, p. 10, pl. 1, fig.11.—Belt, Geol. Mag., 5, 1868, p. 11.—Salter, Cat. Camb. Sil. Foss., 1873, p. 10.—Linnarsson, Geol. For. Stockholm Forhandl., 5, 1880, p. 157, p. 6, fig. 16.—Tullberg, Sveriges Geol. Unders., Ser. C, No. 42, 1880, p. 24, pl. 1, fig. 13.—Linnarsson, ibid., No. 43, 1880, p. 27, pl. 2, fig. 16.—Matthew, Trans. Royal Soc., Canada, 11, sec. 4, 1894, p. 110.—Groom, Quart. Jour. Geol. Soc., London, 58, 1902, p. 119.

Lower Ordovician: Europe.

Canadian (Bretonian—Div. C 3b): McNeil Brook, Cape Breton, Nova Scotia.

Agnostus trisectus germanus Matthew.

Agnostus trisectus mut. germanus Matthew, Bull. Nat. Hist. Soc. New Brunswick, No. 19, 1901, p. 279; Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, p. 221.

Canadian (Bretonian—Div. C 3b): East Bay, east of Bras d'Or Lake, Cape Breton, Nova Scotia.

Agnostus trisectus ponepunctus Matthew.

Agnostus trisectus mut. ponepunctus Matthew, Bull. Nat. Hist. Soc. New Brunswick, No. 19, 1901, p. 278, pl. 5, fig. 8a–c; Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, p. 220, pl. 17, figs. 8a–c.

Canadian (Bretonian—Div. C 3b): McAdam shore, East Bay, Bras d'Or Lake, Cape Breton, Nova Scotia.

Agnostus tuberculatus Quenstedt. See Beyrichia tuberculata.

Agnostus tumidosus Hall and Whitfield.

Agnostus tumidosus Hall and Whitfield, U. S. Geol. Expl. 40th Parl., 4, 1877, p. 231, pl. 1, fig. 32.—Brogger, Geol. Foren Stockholm Forhandl., 8, 1886, p. 204.—Vogdes, Amer. Geol., 9, 1892, p. 393, pl. 10, fig. 8.—Walcott, Mono. U. S. Geol. Surv., 32, pt. 2, 1899, p. 455, pl. 63, figs. 5, 5a.

Cambrian and ?Ordovician (Pogonip): Eureka District, Nevada.

Agraulos cylindricus Miller. See Arionellus cylindricus.

Agraulos oweni Meek and Hayden. See Ptychoparia oweni.

Agraulos (Arionellus) pustulatus Vogdes. See Glaphurus pustulatus.

Agraulos saratogensis Walcott. See Plethopeltis saratogensis.

Alecto Lamouroux. See Stomatopora Bronn.

Alecto auloporoides Nicholson. See Proboscina auloporoides.

Alecto confusa Nicholson. See Proboscina confusa.

Alecto frondosa Nicholson. See Proboscina frondosa.

Alecta inflata Hall. See Corynotrypa inflata.

ALECTO NEXILIS James. See Batostoma implicatum.

ALEPIDASTER Meek. Genotype: Protaster? granuliferus Meek.

Alepidaster Meek, Amer. Jour. Sci., 3d ser., 4, 1872, p. 275; Geol. Surv. Ohio, Pal., 1, 1873, p. 68.—Schuchert, Bull. U. S. Nat. Mus., 88, 1915, p. 228.

Protasterina Ulrich, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 95—James, ibid., 18, 1895, p. 139. (Genotype: P. fimbriata Ulrich).

Alepidaster fimbriatus (Ulrich).

Protasterina (Protaster) fimbriata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 95, pl. 4, figs. 9, 9a, 9b, 9c.

Protasterina fimbriata James, ibid., 18, 1895, p. 139.

Eden (Economy): Covington, Kentucky.

Alepidaster flexuosus (Miller and Dyer).

Protaster flexuosus Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 31, pl. 2, figs. 1, 1a.—Miller, N. A. Geol. Pal., 1889, p. 276, fig. 409.—Parks, Trans. Canadian Inst., 8, 1908, p. 368.

Protasterina flexuosa James, Jour. Cincinnati Soc. Nat. Hist., 18, 1896, p. 140.

Alepidaster flexuosus Schuchert, in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 11; Bull. U. S. Nat. Mus., 88, 1915, p. 231, pl. 36, fig. 4.

Maysville: Cincinnati, Ohio.

Alepidaster granuliferus (Meek).

Protaster? granuliferus Meek, Amer. Jour. Sci., 3d ser., 4, 1872, p. 274; Geol. Surv. Ohio, Pal., 1, 1873, p. 68, pl. 3 bis., figs. 8a, b.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 775, figs.—James, Jour. Cincinnati Soc. Nat. Hist., 23, 1896, p. 138.—Parks, Trans. Canadian Inst., 8, 1908, p. 368.

Tæniaster granuliferus Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res., Indiana, 1908, p. 733, pl. 3, fig. 7.

Alepidaster granuliferus Schuchert, in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 11; Bull. U. S. Nat. Mus., 88, 1915, p. 230, fig. 26.

Richmond: Moore's Hill, Indiana.

Alepidaster miamiensis (Miller).

Protaster miamiensis Miller, Jour. Cincinnati Soc. Nat. Hist., 5, 1872, p. 116, pl. 5, figs. 6, 6a, 6b.—James, ibid., 18, 1895, p. 138.—Parks, Trans. Canadian Inst., 8, 1908, p. 368.

Alepidaster miamiensis Schuchert, in Frech, Foss. Cat., 1, pt. 3, 1914, p. 11; Bull. U. S. Nat. Mus., 88, 1915, p. 233.

Richmond (Waynesville or Liberty): Near Waynesville, Ohio.

Cotypes.—Cat. No. 40886, U.S.N.M.

ALLOCRINUS Wachsmuth and Springer.

Genotype: A. typus Wachsmuth and Springer.

Allocrinus Wachsmuth and Springer in Miller, N. A. Geol. Pal., 1889, p. 222; Geol. Surv. Illinois, 8, 1890, p. 206; Proc. Acad. Nat. Sci. Philadelphia, 1890, p. 376; Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 306.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 162.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 148.—Zittel, Grundzuge Pal., 1, 1910, p. 162.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 191.

Allocrinus benedicti Miller.

Allocrinus benedicti Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 647, pl. 7, fig. 1 (Adv. sheets, 1891, p. 37); N. A. Geol. Pal., 1st App., 1892, p. 674, fig. 1210.—Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 308, pl. 24, fig. 8a, b.

Niagaran (Laurel): St. Paul, Indiana.

Allocrinus typus Wachsmuth and Springer.

Allocrinus typus Wachsmuth and Springer, Geol. Surv. Illinois, 8, 1890, p. 207, pl. 14, figs. 7, 7a, b; Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 307, pl. 24, fig. 7a, b.

Niagaran (Brownsport): Wayne and Decatur Counties, Tennessee.

ALLOCYSTITES Miller. Genotype: A. hammelli Miller.

Allocystites Miller, N. A. Geol. Pal., 1889, p. 222.—Jaekel, Stammes. Pelmat., 1, Thecoidea u. Cystoidea, Berlin, 1899, p. 398.—Zittel, Grundzuge Pal., 1, 1910, p. 72.

Allocystites hammelli Miller.

Allocystites hammelli Miller, N. A. Geol. Pal., 1889, p. 222, fig. 242.—Jaekel, Stammes. Pelmat., 1, Thecoidea u. Cystoidea, Berlin, 1899, p. 398.

Clinton (Osgood): Jefferson County, Indiana.

ALLODESMA Ulrich. Genotype: Modiolopsis subelliptica Ulrich.

Modiolopsis (part) Ulrich, 19th Ann. Rep. Geol. and Nat. Hist Surv. Minnesota, 1892, p. 226.

Allodesma Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 617.—Dall, Zittel-Eastman Textb. Pal., 1, 1900, p. 393; ibid., 2d ed., 1913, p. 470.

Allodesma subelliptlcum (Ulrich).

Modiolopsis subelliptica Ulrich, 19th Ann. Rep. Geol. Nat. Hist. Surv., Minnesota, 1892, p. 226, fig. 12.

Allodesma subellipticum Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 617, pl. 42, figs. 9–14.—Ruedemann, Bull. New York State Mus., 162, 1912, p. 103, pl. 6, fig. 11.

Trenton: Near Cannon Falls, Minnesota (Prosser); Canajoharie, New York (Canajoharie).

Holotype and *plesiotype*.—Cat. No. 46078, U.S.N.M.

ALLONEMA Ulrich aud Bassler. Genotype: A. botelloides Ulrich and Bassler.

Allonema Ulrich and Bassler, Smith. Misc. Coll. (Quart. Issue), 45, 1904, p. 276–279.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 12.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 118.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 318.

Allonema waldronense Ulrich and Bassler.

Allonema waldronense Ulrich and Bassler, Smith. Misc. Coll. (Quart. Issue), 45, 1904, p. 283, pl. 67, fig. 5.—Bassler, Bull. U. S. Geol. Survey, 292, 1906, p. 13, pl. 4, fig. 9.

Niagaran: Waldron, Indiana (Waldron); Middleport, New York (Rochester).

Holotype.—Cat. No. 43128, U.S.N.M.

ALLONYCHIA Ulrich. Genotype: Ambonychia (Megambonia) jamesi Meek.

Megambonia Meek (not Hall, 1859), Proc. Acad. Nat. Sci., Philadelphia, 1872, p. 321.

Allonychia Ulrich, Geol. Surv. Ohio, 7, 1893, p. 640.—Cumings, 32d Ann. Rep., Dep. Geol. Nat. Res. Indiana, 1908, p. 978.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 432.

Allonychia flanaganensis Foerste.

Allonychia flanaganensis Foerste Bull. Sci. Lab. Denison Univ. 17, 1912, p. 30; Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 134, pl. 2, fig. 1.

Trenton (Cynthiana): Flanagan, etc., Kentucky.

Allonychia jamesi (Meek).

Megambonia jamesi Meek, Proc. Acad. Nat. Sci. Philadelphia, 1872, p. 321; Geol. Surv. Ohio, Pal. 1, 1873, p. 136, pl. 12, figs. 9a, b.—Miller, Cincinnati Quart. Jour. Sci., 1, 1873, p. 13; ibid. 1874, p. 225.

Ambonychia jamesi Miller, N. A. Geol. Pal., 1889, p. 460 (gen. ref.)

Allonychia jamesi Ulrich, Geol. Surv. Ohio, 7, 1893, p. 641, pl. 48, fig. 7.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 986, pl. 43, fig. 2.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 432.

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

Plesiotype.—Cat. No. 46079, U.S.N.M.

Allonychia ovata Ulrich.

Allonychia ovata Ulrich, Geol. Surv. Ohio, 7, 1893, p. 641, pl. 48, figs. 4–6.

Maysville (Fairmount): Covington, Kentucky.

Holotype.—Cat. No. 46080 U.S.N.M.

Allonychia subrotunda Ulrich.

Allonychia subrotunda Ulrich, Geol. Surv. Ohio, 7, 1893, p. 642, pl. 48, figs. 8, 9.

Maysville (Corryville): Cincinnati, Ohio.

Holotype.—Cat. No. 46081, U.S.N.M.

ALVEOLITES Lamarck. Genotype: A. suborbicularis Lamarck.

Alveolites Lamarck, Syst. des Anim. sans. Vert., 1801, p. 375.—Steininger, Mem. Soc. Geol. France, 1, 1834, p. 333.—Koninck, Desc. Animaux Fossiles, Leige, 1842, p. 11.—Dana, Wilkes' U. S. Expl. Exped. 1838–42, 7, Zoophytes, 1846, p. 537.—Edwards and Haime, Compt. Rend. l'Acad. Sci., 29, 1849. p. 260.—King, Mon. Permian Foss. England, Pal. Soc., 1850, p. 29.—Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal. (Arch. du Mus. d'Hist., 5), 1851, p. 153; McCoy, British Pal. Rocks Foss., 1854, p. 68.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 442.—Billings, Canadian Jour., n. s., 4, 1858, p. 114.—Milne-Edwards, Hist. Nat. d. Corall., 3, 1860, p. 263.—Rominger, Amer. Jour. Sci. and Arts, 2d ser., 34, 1862, p. 390.—Duncan, Rep. 41st Meeting British Assoc. Adv. Sci., 1872, p. 132.—Salter, Cat. Camb. Sil. Foss., 1873, p. 106.—Nicholson, Rep. Pal. Prov. Ontario, pt. 1, 1874, p. 53; Geol. Mag., dec. 2, 1, 1874, p. 14.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 40.—Nicholson, Trans. Royal Soc. Edinburgh, 27, 1876, p. 247.—Nicholson and Etheridge, Jour. Linnean Soc. London, Zool., 13, 1877, p. 353, 354.—Nicholson, Tab. Corals, 1879, p. 117.—Zittel, Handb. Pal., 1, 1880, p. 618.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 441.—Hall and Simpson, Pal. New York 6, 1887, p. xiii.—Nicholson, Geol. Mag., dec. 3, 5, 1888, p. 107.—Miller, N. A. Geol. Pal., 1889, p. 170.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 20.—James, Jour. Cincinnati Soc. Nat. Hist., 15, pt. 4, 1893, pp. 147, 148.—Sardeson, Neues Jahrb. Min., Geol., Pal., Beilage-Band, 10, 1896, p. 315.—Zittel-Eastman Textb. Pal., 1, 1900, p. 100.—Pocta, Syst. Sil. du Centre Boheme, 8, pt. 2, 1902, p. 266.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 91.—Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 114.

Alveolites? arcticus Woodward.

Alveolites? arctica Woodward, Geol. Mag., dec. 2, 5, 1878, p. 289, pl. 10, fig. 7.

Niagaran: Beechy Island, Arctic America.

ALVEOLITES EXPANSA James. See Ceramopora? expansa.

ALVEOLITES EXSUL Hall. See Lioclema? exsul.

Alveolites fibrosus Davis.

Alveolites fibrosus Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 46, fig. 8.

Niagaran (Louisville): Near Louisville, Kentucky.

ALVEOLITES GRANULOSUS James. See Stromatocerium huronensis.

ALVEOLITES HEMISPHERICUS D'Orbigny.

Alveolites hemispherica D'Orbigny, Prodr. Pal., 1, 1849, p. 49.—Boule and Thevenin, Ann. Pal., 1, 1906, p. 8, pl. 4, figs. 1–4.

Silurian(?): Falls of the Ohio.

Observation.—The figures given by Boule and Thevenin refer to a Devonian species.

Alveolites inornatus Foerste.

Alveolites inornatus Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 103, pl. 3, fig. 56.

Niagaran (Brownsport): East of Linden, Tennessee.

ALVEOLITES IRREGULARIS Whitfield. See Ceramoporella? irregularis.

Alveolites labechei Edwards and Haime.

Alveolites labechei Edwards and Haime, Polyp. Foss. d. Terr. Pal., 1851, p. 257.—Milne-Edwards and Haime, Brit. Foss. Corals, 1855, p. 262, pl. 61, figs. 6a–b.—Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 33 (loc. ref.).—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 21.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 285.

Silurian: Great Britain and Russia; Anticosti (Jupiter River) and Manitoulin Islands, Canada (Niagaran).

Alveolites louisvillensis Davis.

Alveolites louisvillensis Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 46, figs. 5, 6.

Niagaran: Louisville, Kentucky (Louisville); West Tennessee (Brownsport).

Cotype.—Cat. No. 52754 U.S.N.M.

Alveolites? niagarensis Nicholson and Hinde.

Alveolites Niagarensis Nicholson and Hinde (not Rominger), Canadian Journal, n. s., 14, 1874, p. 152, fig. 3.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 56, fig. 27.

Niagaran (Lockport): Rockford, Ontario.

Observation.—Probably a species of Cladopora.

ALVEOLITES NIAGARENSIS Rominger. See Alveolites undosus.

ALVEOLITES PEGRAMENSIS Foerste. See Pachypora (Platyaxum) pegramensis.

Alveolites repens (Fought).

Millepora repens Fought, Amœn Acad., 1, 1749, p. 99.

Alveolites repens Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal., 1851 (Arch. du Mus. d'Hist. Nat., 5), p. 258.—Mon. British Foss. Corals, Pal. Soc., 1854, p. 263, pl. 62, figs. 1, 1a.—Roemer, Sil. Fauna West Tennessee, 1860, p. 22, pl. 2, fig. 13, 13a.—Milne-Edwards, Hist. Nat. d. Corall., 3, 1860, p. 268.

Silurian: Gotland and England;? West Tennessee.

Observation.—Roemer's reference is to some Cladopora probably distinct from Alveolites repens (Fought).

ALVEOLITES REPENS Billings. See Cœnites juniperina.

Alveolites? seriatopora Edwards and Haime.

Alveolites? seriatopora Edwards and Haime, Mon. Polyp. Foss. Terr. Pal., 1851 (Arch. Mus. Hist. Nat., 5), p. 260.

Silurian: Dudley, England; Bear Grass Creek near Louisville, Kentucky.

Observation.—Not recognized as an American species.

ALVEOLITES STROMATOPOROIDES Rominger. See Dictyostroma undulatum.

Alveolites thoroldensis Parks.

Alveolites thoroldensis Parks, Univ. Toronto Studies, Geol. Ser. No. 5, 1908, p. 59, pl. 15, figs. 5 and 6.

Niagaran: Louisville, Kentucky (Louisville); Thorold, Ontario (Lockport).

Alveolites undosus Miller.

Alveolites niagarensis Rominger (not Nicholson and Hinde), Geol. Surv. Michigan, 3, pt. 2, 1876, p. 40, 41, fig., pl. 16, figs. 1, 2.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 46, fig. 7.—Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 336.—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 22.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 91.

Alveolites undosus Miller, N. A. Pal. Foss. (2d ed.), 1883, p. 262.

Niagaran: Drummond Island, Lake Huron; Point Detour, Michigan; Lake Temiscaming, Saskatchewan River, etc., Quebec; Falls of the Ohio (Louisville); Dayton, Ohio; West Tennessee (Brownsport).

AMBONYCHIA of authors. See Byssonychia and Clionychia Ulrich.

AMBONYCHIA Hall. Genotype: A. bellistriata Hall.

Ambonychia (part) Hall, Pal. New York, 1, 1847, p. 163.—McCoy, British Pal. Rocks and Foss., 1854, p. 264.—Woodward, Man. Mollusca, 2, 1854, p. 261.—Hall, Pal. New York, 3, 1859, pp. 14, 272, 523; 12th Rep. New York State Cab. Nat. Hist., 1859, pp. 8, 110.—Zittel, Handb. Pal., 2, 1881, p. 35.—Miller, N. A. Geol. Pal., 1889, p. 460.—Koken, Die Leitfossilien, Leipzig, 1896, p. 185.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 489.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 429.

AMBONYCHIA ACUTIROSTRA Hall. See Mytilarca acutirostra.

Ambonychia affinis Ulrich.

Ambonychia affinis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 492, pl. 35, figs. 5–7.

Trenton (Prosser): Near Spring Valley, Minnesota; Carroll County, Illinois.

Cotype.—Cat. No. 46083, U.S.N.M.

AMBONYCHIA (MEGAPTERA) ALATA Meek. See Anomalodonta alata.

Ambonychia amygdalina Hall.

Ambonychia amygdalina Hall, Pal. New York, 1, 1847, p. 165, pl. 36, figs. 6a–c.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 493, pl. 35, figs. 8, 9.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 430, fig. 561c–d.

Palæarca? amygdalina Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 65 (gen. ref.).

Cypricardites amygdalina Miller, N. A. Geol. Pal., 1889, p. 476 (gen. ref.).—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 22, fig.

Posidonomya amygdalina Emmons, Amer. Geology, 1, pt. 2, 1855, p. 177, pl. 13, figs. 20, 21.

Cleionychia amygdalina Ulrich, Amer. Geol., 10, 1892, p. 97 (gen. ref.).

Trenton: Adams, Jefferson County, New York; Goodhue County, Minnesota (Prosser).

Plesiotype.—Cat. No. 46085, U.S.N.M.

AMBONYCHIA APILÆA Hall. See Streptomytilus aphæa.

AMBONYCHIA ATTENUATA of authors. See Clionychia lamellosa.

Ambonychia bellistriata Hall.

Ambonychia bellistriata Hall, Pal. New York, 1, 1847, p. 163, pl. 36, figs. 4a–d.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 819, fig. 605.—Zittel, Handb. Pal., 2, Munich, 1881, p. 35, fig. 42a.—Lesley, Geol. Surv. Pennsylvania, Rep., P. 4, 1889, p. 22, fig.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 492, pl. 35, figs. 1 and 2.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 430, fig. 561a, b.

Posidonomya bellistriata Emmons, Amer. Geology, 1, pt. 2, 1855, p. 176, pl. 13, figs. 5, 6.

Trenton: Middleville and Trenton Falls, New York; near Wykoff, Minnesota (Prosser).

Plesiotype.—Cat. No. 46084, U.S.N.M.

Ambonychia bellistriata Miller. See Byssonychia vera.

Ambonychia carinata Hall. See Byssonychia carinata.

Ambonychia (Megaptera) casei Meek and Worthen. See Opisthoptera casei.

Ambonychia (Megaptera) casei? Meek. See Opisthoptera fissicosta.

Ambonychia cincinnatiensis Miller and Faber. See Byssonychia vera.

Ambonychia costata James. See Anomalodonta costata.

Ambonychia? curvata Raymond.

Ambonychia? curvata Raymond, Amer. Jour. Sci., 20, 1905, p. 373.

Chazyan (Day Point, Crown Point): Chazy, Valcour and Sloop Islands, New York.

Ambonychia erecta Hall. See Clionychia erecta.

Ambonychia excavata Miller. See Clionychia excavata.

Ambonychia illinoisensis Worthen.

Ambonychia Illinoisensis Worthen, Geol. Surv. Illinois, 6, 1875, p. 495, pl. 23, figs. 4a–b.

Richmond (Maquoketa): Savannah County, Illinois.

Ambonychia intermedia Meek and Worthen. See Byssonychia intermedia.

Ambonychia jamesi Miller. See Allonychia jamesi.

Ambonychia lamellosa of authors. See Clionychia lamellosa.

Ambonychia maxima Safford.

Ambonychia maxima Safford, Geol. Tennessee, 1869, p. 287 (not defined).

Middle Nashville: Central Tennessee.

Ambonychia mytiloides Hall. See Clionychia mytiloides.

Ambonychia neglecta McChesney. See Amphicœlia neglecta.

Ambonychia nitida Billings. See Mytilarca nitida.

Ambonychia obesa Miller. See Byssonychia obesa.

Ambonychia obtusa Hall. See Cyrtodonta obtusa.

Ambonychia orbicularis (Emmons).

Pterinea orbicularis Emmons, Nat. Hist. New York, Geol., 2, 1842, pp. 395, 397, fig. 3.—Owen, Amer. Jour. Sci. and Arts, 47, 1844, pp. 368, 369, fig. 3.

Ambonychia orbicularis—Continued.

Posidonomya orbicularis Emmons, Amer. Geol., 1, pt. 2, 1855, p. 176, pl. 13, figs. 18, 19.

Ambonychia orbicularis Hall, Pal. New York, 1, 1847, p. 164, pl. 36, figs. 5a–d.—Emmons, Man. Geol., 1860, p. 99, fig. 88.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 22, fig.

Trenton: Watertown and Middleville, New York.

AMBONYCHIA PERANGULATA Miller. See Psilonychia perangulata.

Ambonychia planistriata Hall.

Ambonychia planistriata Hall, Rep. Geol. Surv. Wisconsin, 1861, p. 32.—Ulrich Geol. Minnesota, 3, pt. 2, 1894, p. 491, pl. 35, figs. 3 and 4.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 58, pl. 7, figs. 3, 4.

Black River (Platteville): Mineral Point and Beloit, Wisconsin; Cannon Falls, Minnesota; Lee County, Illinois.

Plesiotype.—Cat. No. 46086, U.S.N.M.

AMBONYCHIA RADIATA of authors. See Byssonychia radiata.

AMBONYCHIA RAUCHI McChesney.

Ambonychia Rauchi McChesney, Desc. New Fossils, 1860, p. 89.

Maysville or Richmond: Madison, Indiana.

Observation.—Probably refers to some species of Byssonchia, but description is too poor for identification.

AMBONYCHIA RETRORSA Miller. See Byssonychia retrorsa.

AMBONYCHIA ROBUSTA Miller. See Byssonychia robusta and B. richmondensis.

Ambonychia septentrionalis Whiteaves.

Ambonychia septentrionalis Whiteaves, Geol. Surv. Canada, Ann. Rep. (n. s.), 14, App. F, 1904, p. 46; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 255, pl. 28, fig. 5.

Niagaran: Ekwan River, Canada.

AMBONYCHIA STRIÆCOSTA McChesney. See Pterinea striæcosta.

AMBONYCHIA SUBUNDATA Miller. See Clionychia subundata.

AMBONYCHIA SUPERBA Billings. See Clionychia superba.

AMBONYCHIA SWANANA Safford.

Ambonychia Swanana Safford, Geol. Tennessee, 1869, p. 287 (nom. nud.).

Upper Nashville: Central Tennessee.

AMBONYCHIA TENUISTRIATA Miller. See Byssonychia tenuistriata.

AMBONYCHIA UNDATA Hall. See Clionychia undata.

Ambonychia undulata (Whitfield).

Leptodomus undulatus Whitfield, Ann. Rep. Wisconsin Geol. Surv. for 1877, 1878, p. 81; Geol. Wisconsin, 4, 1882, p. 293, pl. 18, figs. 1, 2.

Ambonychia undulata Whiteaves, Ann. Rep. Geol. Surv. Canada (n. s.), 14, App. F, 1904, p. 46; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 254, pl. 28, fig. 4.

Niagaran: Wauwatosa, Wisconsin (Racine); Ekwan River, Canada.

AMPHERISTOCRINUS Hall. Genotype: A. typus Hall

Ampheristocrinus Hall, 11th Ann. Rep. Indiana Dept. Geol. Nat. Hist., 1882, p. 278, fig.—Trans. Albany Inst., 10, 1883, p. 67, fig. (Preliminary notice, 1879). —Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, pp. 115, 143.—Miller, N. A. Geol. Pal., 1889, p. 223.—Bather, Ann. Mag. Nat. Hist., 6th ser., 5, 1890, p. 332, pl. 14, fig. 18; Treatise on Zoology, pt. 3, Echinoderma, London, 1900, p. 173.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 67.

Ampheristocrinus? calyx (Hall).

Poteriocrinus? calyx Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 266, pl. 15, fig. 14; Trans. Albany Inst., 10, 1883, p. 66 (Preliminary notice, 1879).—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 740, fig.

Niagaran (Waldron): Waldron, Indiana.

Ampheristocrinus dubius Weller.

Ampheristocrinus dubius Weller, Bull. Chicago Acad. Sci., 4, 1900, p. 67, pl. 14, fig. 11.

Niagaran (Racine): Romeo, Illinois.

Ampheristocrinus typus Hall.

Ampheristocrinus typus Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 278, pl. 15, figs. 17, 18; Trans. Albany Inst., 10, 1883, p. 67 (Preliminary notice, 1879).—Miller, N. A. Geol. Pal., 1889, p. 223, text fig. 243.—Weller, Bull. Chicago Acad. Sci., 4, 1900, p. 68.

Niagaran (Waldron): Waldron, Indiana.

AMPHICŒLIA Hall. Genotype: A. leidyi Hall.

Amphicœlia Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, (extras, 1865) p. 339; Rev. ed., p. 386.—Meek and Worthen, Geol. Surv. Illinois, 2, 1866, p. 339, footnote; 3, 1868, p. 357.—Meek, Amer. Jour. Sci. Arts, 2d ser., 44, 1867, p. 173, footnote.—Miller, N. A. Geol. Pal., 1889, p. 461.

Amphicœlia costata (Hall and Whitfield).

Amphicœlia (Leptodomus?) costata Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 140, pl. 7, fig. 23.

Amphicœlia costata Miller, N. A. Geol. Pal., 1889, p. 461, fig. 773.

Niagaran (Cedarville): Cedarville, Greene County, Ohio.

Amphicœlia leidyi Hall.

Amphicœlia leidyi Hall, 20th Rep. New York State Cab. Nat. Hist., 1868 (extras, 1865), p. 339, pl. 14 (5), figs. 13–15, p. 387; Rev. ed., 1870, p. 387, pl. 14, figs. 13–15; p. 431, fig.; 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875, pl. 27, figs. 1, 2; mus. ed. 1879, p. 171, pl. 27, figs. 1, 2; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 313, pl. 28, figs. 1, 2.

Leptodomus (Amphicœlia) leidyi Whitfield, Geol. Wisconsin, 4, 1882, p. 357 (gen. ref.)

Niagaran: Racine and Wauwatosa, Wisconsin; Bridgeport, Illinois (Racine); Waldron, Indiana; and Newsom, Tennessee (Waldron).

Amphicœlia neglecta (McChesney).

Ambonychia neglecta McChesney, Desc. New Fossils, 1861, p. 88.

Pterinea neglecta Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, pp. 96, 108.

Pterinea (Ambonychia) neglecta McChesney, Plates Illust. New Sp. Fossils, 1865, pl. 9, figs. 2–2b.

Leptodomus neglectus Whitfield, Geol. Wisconsin, 4, 1882, p. 292, pl. 18, figs. 3, 4.

Amphicœlia neglecta—Continued.

Amphicœlia neglecta McChesney, Trans. Chicago Acad. Sci., 1, 1868, p. 41, pl. 9, fig. 2.—Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 358, pl. 5, fig. 9a, b.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 66 (loc. occ.).—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 449, pl. 10, fig. 10.

Niagaran: Bridgeport, Illinois; Milwaukee, Wisconsin (Racine); Wabash, Indiana; Ontario (Guelph).

Amphicœlia orbiculoides (Grabau).

Avicula? orbiculata Hall (not Hall, 1843) Pal. New York, 2, 1852, p. 284, pl. 59, fig. 4.

Lyriopecten orbiculoides Grabau, Bull. New York State Mus., 45, 1901, p. 208; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 208.

Amphicœlia orbiculata Whitfield and Hovey, Bull. Amer. Mus. Nat. Hist., 11, pt. 2, 1899, p. 156 (gen. ref.).

Clinton (Rochester): Rochester, Niagara, etc., New York.

Amphicœlia ulrichi Maynard.

Amphicœlia ulrichi Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 453, pl. 75, figs. 8–10.

Helderbergian (Keyser): Keyser, West Virginia.

Amphidesma delafieldi Castelnau. Not recognized.

Amphidesma delafieldi Castelnau, Sil. Syst., 1843, p. 44, pl. 14, fig. 10.

Ordovician or Silurian: New York.

AMPHIGRAPTUS Lapworth. Genotype: Graptolithus divergens Hall.

Amphigraptus Lapworth, Geol. Mag., 10, 1873, p. 559.—Zittel, Handb. Pal., 1, 1879, p. 298.—Tullberg, Sveriges Geol. Unders., Ser. C, No. 55, 1883, p. 12.—Wiman, Bull. Geol. Inst. Univ. Upsala, 2, pt. 2, No. 4, 1896, p. 266.—Koken, Die Leitfossilien, Leipzig, 1896, p. 328.—Roemer and Frech, Leth. geog., 1 Theil. Leth. Pal., 1, 3 Lief., 1897, p. 587.—Elles and Wood, Mon. British Grapt., Pal. Soc., 1903, p. 121.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 270.

Amphigraptus divergens (Hall).

Graptolithus divergens Hall, Pal. New York, 3, 1859, p. 509, fig. 9; 12th Ann. Rep. New York State Cab. Nat. Hist., 1859, p. 57, fig. 9.—Canadian Org. Rem., Geol. Surv. Canada, dec. 2, 1865, p. 13, fig. 11.—Walcott, Trans. Albany Inst., 10, 1883, p. 35 (Adv. sheets 1879).—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 264, fig.

Graptolithus (Cœnograptus) divergens Hall, 20th Ann. Rep., New York State Cab. Nat. Hist., 1868, p. 179, fig. 12; p. 226; rev. ed., 1868, p. 210, fig. 12; p. 223.

Cœnograptus (?Pleurograptus,? Pterograptus) divergens, Roemer and Frech, Leth. geog., Leth. Pal., 1, 1897, p. 587.

Amphigraptus divergens Lapworth, Geol. Mag., 10, 1873, p. 559; Cat. West Scot, Foss., 1876, p. 5, pl. 1, fig. 70; Quart. Jour. Geol. Soc. London, 34, 1878, p. 331; Ann. Mag. Nat. Hist., 6, 1880, p. 18; Trans. Royal Soc. Canada, 5, sec. 4, 1886, p. 184.—Walcott, Bull. Geol. Soc. Amer., 1, 1890, p. 338.—Elles and Wood, Mon. British Grapt., pt. 3, 1903, p. 122, fig. 73, pl. 18, fig. 1.—Ruedemann Mem. New York State Mus., 11, pt. 2, 1908, pp. 271–272, figs. 187–190, pl. 15, figs. 2, 3.

Chazyan: Kenwood and Glenmont, New York (Normanskill); England and Scotland (Hartfell).

Amphigraptus multifasciatus (Hall).

Graptolithus multifasciatus Hall, Pal. New York, 3, 1859, suppl., pp. 508, 509, fig. 8; 12th Ann. Rep. New York State Cab. Nat. Hist., 1859, pp. 56, 57, fig. 8; Can. Org. Rem., Geol. Surv. Canada, dec. 2, 1865, p. 10, fig. 7.—Walcott, Trans. Albany Inst., 10, 1883, p. 35 (Adv. sheets, 1879).—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 266, fig.

Graptolithus (Monoprion) multifasciatus Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 176, fig. 8, p. 226; rev. ed., 1870, p. 208, fig. 8; p. 223.

Clematograptus multibrachiatus Lapworth, Ann. Mag. Nat. Hist., 6, 1880, p. 20.

Clematograptus multifasciatus Hopkinson, Quart. Jour. Geol. Soc. London, 31, 1875, p. 652 (gen. ref.).—Lapworth, Proc. and Trans. Royal Soc. Canada, 4, 1887, p. 178.—Walcott, Bull. Geol. Soc. Amer. 1, 1890, p. 338.

Amphigraptus multifasciatus Elles and Wood, Mon. Brit. Graptolites, Pal. Soc., 1903, p. xlii (gen. ref.).—Ruedemann Mem. New York State Mus., 11, pt. 2, 1908, pp. 272–274, pl. 15, fig. 4.

Chazyan (Normanskill): Kenwood, near Albany, New York; Canada.

AMPHILICHAS Raymond. Genotype: Platymetopus lineatus Angelin.

Platymetopus Angelin, Pal. Scand., 1854, p. 68; 3d ed., 1878, p. 68.—Nieszkowski, Archiv. f. Naturk. Liv-, Ehst-u. Kurl., (1), 1, 1857, p. 621.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 7th ser., 33, 1885, pp. 5, 29, 39, 49.—Zittel, Handb. Pal., 2, 1885, p. 623.—Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 753.—Koken, Die Leitfossilien, Leipzig, 1896, p. 30.—Lindström, Kongl. Sven. Vet.-Akad. Handl., 34, No. 8, 1901, p. 67.—Gurich, Neues Jahrb. f. Min., Geol. Pal. Beilage-Band, 14, 1901, p. 524, pl. 20, fig. 19.—Reed, Quart. Jour. Geol. Soc. London, 58, 1902, pp. 62, 63, 81.—Raymond, Amer. Jour. Sci., 4th ser., 19, 1905, p. 377.

Paralichas Reed (new name for Platymetopus, preoccupied), Quart. Jour. Geol. Soc. London, 58, sec. F, 1902, pp. 80–82.

Amphilichas Raymond, Amer. Jour. Sci., 4th ser., 19, 1905, p. 378 (to replace the preoccupied names Platymetopus and Paralichas).—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 308.—Slocom, Field Mus. Nat. Hist., Geol. Ser. 4, No. 3, 1913, p. 58.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 721

Amphilichas bicornis (Ulrich).

Lichas (Hoplolichas) bicornis Ulrich, Amer. Geol., 10, 1892, p. 272, fig. 2a, b.

Lichas (Platymetopus) bicornis Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 748, figs. 70, 71.

Richmond (Maquoketa): Spring Valley, Minnesota.

Holotype.—Cat. No. 41949. U.S.N.M.

Amphilichas clermontensis Slocom.

Amphilichas clermontensis Slocom, Field Mus. Nat. Hist., Geol. Ser., 4, No. 3, 1913, p. 59, pl. 15, fig. 7.

Richmond (Maquoketa): Clermont, Iowa

Amphilichas cucullus (Meek and Worthen).

Lichas cucullus Meek and Worthen, Proc. Acad. Nat. Sci., Philadelphia, 1865, p. 266; Geol. Surv. Illinois, 3, 1868, p. 299.

Lichas (Platymetopus) cucullus Clarke, Geol. Minnesota, 3, 1894, p. 746, figs. 66, 67.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 236.

Black River: Alexander County, Illinois (Kimmswick); Janesville, Wisconsin; Lake Winnipeg, Canada.

Trenton (Prosser): Wykoff, Minnesota.

Amphilichas halli (Foerste).

Platynotus trentonensis (part) Hall, Pal. New York, 1, 1847, p. 235, pl. 64, fig. 1e (not 1a-d).

Lichas trentonensis Miller, N. A. Geol. Pal., 1889, p. 555, fig. 1026.

Lichas halli Foerste, Bull. Ser. Lab. Denison Univ., 3, 1888, p. 118, pl. 13, fig. 4.—Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 754.

Lichas faberi Miller, N. A. Geol. Pal., 1889, p. 554, fig. 1024.

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

Cotype.—Cat. No. 43038, U.S.N.M

Amphilichas jukesi (Billings).

Lichas Jukesii Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, pp. 282, fig. 269a, b; 335, figs. 323a, b.

Lichas (Platymetopus) jukesi Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 7th ser., 33, 1885, p. 29.—Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 753.

Chazyan (Quebec P.): Cow Head, Newfoundland; Stanbridge, Quebec.

Amphilichas minganensis (Billings).

Lichas Minganensis Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 181, fig.163a, b.

Lichas (Platymetopus) minganensis Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 753.

Platymetopus minganensis Raymond, Ann. Carnegie Mus., 3, 1905, p. 355, pl. 14, figs. 1–3; p. 366, figs. 7, 8.

Amphilichas minganensis Raymond, 7th Rep. State Geol. Vermont, 1910, p. 232, pl. 36, figs. 1–3, pl. 38, fig. 6, pl. 39, fig. 14; Ann. Carnegie Mus., 7, No. 1, 1910, p. 72, pl. 18, fig. 6, pl. 19, figs. 13, 14.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 308, fig. 1619.—Bassler, Bull. Virginia Geol. Surv., 2, A, 1909, p. 111, figs. 7, 8, 10.—Perkins, Rep. State Geol. Vermont, 8, 1912, pl. 18, fig. 6.

Lichas Champlainensis Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1881, p. 342, pl. 33, figs. 6–8.—Brainerd and Seely, Bull. Amer. Mus. Nat. Hist., 3, 1890, p. 22.

Chazyan: Large Island, Mingan Islands, and Montreal, Canada; Chazy, Valcour Island, etc., New York, Isle la Motte, Vermont (Day Point, Valcour); Lexington, Virginia (Liberty Hall).

Amphilichas rhinoceros Slocom.

Amphilichas rhinoceros Slocom, Field Mus. Nat. Hist., Geol. Ser., 4, No. 3, 1913, p. 58, pl. 15, figs. 5–6.

Richmond (Maquoketa): Elgin, Iowa.

Amphilichas robbinsi (Ulrich).

Lichas (Hoplolichas) robbinsi Ulrich, Amer. Geol., 10, 1892, p. 271, fig. 1a, b.

Lichas (Platymetopus) robbinsi Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 747, figs. 68, 69.

Trenton (Prosser): Near Wykoff, Minnesota.

Holotype.—Cat. No. 41950, U.S.N.M.

Amphilichas trentonensis (Conrad).

Asaphus? Trentonensis Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1842, p. 277, pl. 16, fig. 16.

Platynotus trentonensis Hall, Pal. New York, 1, 1847, p. 235, pl. 64, figs. 1a–d.

Lichas trentonensis Emmons, Amer. Geol., 1, pt. 2, 1855, pl. 15, figs. 2, 5, 18.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 127.—Rowley, Missouri Bur. Geol. Mines, 2d ser., 8, 1908, p. 58, pl. 15, figs. 4, 5.

Amphilichas trentonensis—Continued.

Lichas (Platymetopus) trentonensis Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 753, (gen. ref.).

Platymetopus trentonensis Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 200, pl. 15, figs. 17–19.

Amphilichas trentonensis Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 308.

Trenton: Near Carlisle, Pennsylvania; Middleville. etc., New York; Jacksonburg, New Jersey; Frankfort, Missouri.

Amphion cayleyi Billings. See Anacheirurus? apollo.

Amphion multisegmentatus Portlock. See Encrinurus multisegmentatus.

Amphistrophia Hall and Clarke. See Strophonella Hall.

Amphoton Lorenz. See Dolichometopus Angelin.

AMPLEXOPORA Ulrich. Genotype: A. cingulata Ulrich.

Amplexopora Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 154.—Foord, Contr. Micro-Pal. Cambro.-Sil., 1883, p. 15.—Miller, N. A. Geol. Pal., 1889, p. 291.—Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 377, 450.—Ulrich, Zittel-Eastman Textb. Pal., 1896, p. 278.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 577.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 30.—Ulrich and Bassler, Smiths. Misc. Coll., 47, 1904, p. 41.—Grabau and Shimer, N. A. Index Fossils, 1, 1904, p. 130.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 739.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 336.

Amplexopora affinis Ulrich. See Heterotrypa affinis.

Amplexopora ampla Ulrich and Bassler.

Amplexopora ampla Ulrich and Bassler, Smiths. Misc. Coll., 47, 1904, p. 42, pl. 13, figs. 7, 8; pl. 14, fig. 3.

Maysville: Nashville and Columbia, Tennessee (Leipers); Cincinnati, Ohio (Fairmount).

Cotypes.—Cat. No. 42313, U.S.N.M.

Amplexopora Canadensis Foord. See Batostoma canadense.

Amplexopora cingulata Ulrich.

Amplexopora cingulata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 254, pl. 11, figs. 5–5c.—Miller, N. A. Geol. Pal., 1889, fig. 449 (p. 292).—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 308, fig. 3c; p. 309, fig. 4c.—J. F. James, Jour. Cincinnati Soc. Nat. Hist., 16, 1894, p. 193.—Nickles, Bull. Kentucky Geol. Surv., 5, 1905, p. 55, pl. 3, fig. 6.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 131, fig. 186g.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 758, pl. 6, figs. 1, 1a; pl. 26, fig. 3.

Maysville (Fairmount): McKinneys Station and Boyle County, Kentucky; Cincinnati, Ohio.

Cotypes.—Cat. No. 43641, U.S.N.M.

Amplexopora columbiana Ulrich and Bassler.

Amplexopora columbiana Ulrich and Bassler, Smiths. Misc. Coll., 47, 1904, p. 41, pl. 13, figs. 1–4.—Hayes and Ulrich, Folio U. S. Geol. Surv., 95, 1903, illustration sheet, figs. 11, 12.

Maysville (Leipers): Columbia, etc., Tennessee.

Cotypes.—Cat. No. 43211, U.S.N.M.

Amplexopora cylindracea Ulrich and Bassler.

Amplexopora cylindracea Ulrich and Bassler, Smiths. Misc. Coll., 47, 1904, p. 43, pl. 13, figs. 5, 6; pl. 14, figs. 4, 5.

Trenton (Catheys): Nashville, Tennessee.

Cotypes.—Cat. No. 43216, U.S.N.M.

Amplexopora? discoidea (Nicholson).

Chætetes discoideus James, Cat. Foss. Cincinnati group, 1871 (not defined).—Nicholson, Quart. Jour. Geol. Soc. London, 30, 1874, p. 511, pl. 30, figs. 4–4d; Pal. Ohio, 2, 1875, p. 206, pl. 21, figs. 15–15c; Pal. Prov. Ontario, 1875, pp. 10, 32,; Ann. Mag. Nat. Hist., 4th ser., 18, 1876, p. 88, pl. 5, figs. 7, 7a.

Chætetes (Monticulipora) discoideus Chamberlin, Geol. Wisconsin, 1, 1883, p. 153, fig.

Monticulipora (Monotrypa) discoidea Nicholson, Genus Monticulipora, 1881, p. 193, pl. 4, figs. 3, 3f.

Amplexopora discoidea Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 255.—Foord, Contr. Micro-Pal. Cambro.-Sil., 1883, p. 17.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 11.

Leptotrypa discoidea Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 158.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Hist. Res. Indiana, 1908, p. 855, pl. 20, figs. 2–2f.

Monticulipora discoidea Hall, 12th Ann. Rep. Indiana Geol. Nat. Hist., 1883, p. 247, pl. 10, figs. 4, 5.—James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 163.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 420, figs.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 16, 1894, p. 178.

Maysville: Cincinnati, Ohio, and vicinity (Fairmount); Ontario (Pulaski).

Amplexopora filiasa (D'Orbigny).

Monticulipora filiasa D'Orbigny, Prodr. de Pal., 1, 1850, p. 25.—Milne-Edwards, Hist. nat. des Corall, 3, 1860, p. 274.—James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 162.—J. F. James, ibid., 15, 1893, p. 158.

Chætetes filiasa Milne-Edwards and Haime, Pol. Foss. Ter. Pal., 1851, p. 261.—Nicholson, Pal. Ohio, 2, 1875, p. 206.

Leptotrypa filiosa Ulrich, Geol. Surv. Illinois, 8, 1890, p. 456, pl. 36, figs. 7, 7a.

Monotrypa? filiasa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 10, 1883, p. 162.

Amplexopora filiasa Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 164.—Ulrich and Bassler, Smiths. Misc. Coll., 47, 1904, p. 41, pl. 12, figs. 10, 11.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 12, pl. 3, figs. 1–3.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 765, pl. 5, fig. 2; pl. 7, figs. 1, 1b.

Monticulipora subcylindrica James, Jour. Cincinnati Soc. Nat. Hist., 18, 1896, p. 123, fig. 13a–c.

Maysville (Fairmount-Corryville): Cincinnati, Ohio, and various localities in Ohio, Indiana, Kentucky, Tennessee, etc.

Plesiotypes.—Cat. No. 44070, U.S.N.M.

Amplexopora granulosa Cumings and Galloway.

Amplexopora granulosa Cumings and Galloway, 37th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1913, p. 69, pl. 1, figs. 1–1c.

Richmond (Liberty): Near Weisburg, Indiana.

AMPLEXOPORA MULTISPINOSA Cumings. See Amplexopora septosa.

Amplexopora persimilis Nickles.

Amplexopora persimilis Nickles, Bull. Kentucky Geol. Surv., 5, 1905, p. 47, pl. 2, figs. 2, 3.

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

Amplexopora petasiformis (Nicholson).

Chætetes petropolitanus James, Paleontologist, No. 2, 1878, p. 11.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 31.

Monticulipora (Monotrypa) petasiformis Nicholson, Genus Monticulipora, 1881, p. 190, fig. 40.

Monotrypa petasiformis Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 256; 6, 1883, p. 163.

Monticulipora petasiformis James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 168.—J. F. James, ibid., 16, 1894, p. 186.

Amplexopora petasiformis Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 165.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 760, pl. 6, figs. 3, 3a; pl. 26, fig. 2.

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

Amplexopora petasiformis welchi (James).

Monticulipora (Monotrypa) welchi James, Paleontologist, No. 6, 1882, p. 50; No. 7, 1883, pl. 1, figs. 4–4c.

Monticulipora petasiformis var. welchi James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 169.—J. F. James, ibid., 16, 1894, p. 187.

Amplexopora petasiformis-welchi Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 165.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 13.

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

Amplexopora pumila Cumings and Galloway.

Amplexopora pumila Cumings and Galloway, 37th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1913, p. 70, pl. 2, figs. 1–1e.

Richmond (Waynesville and Liberty): Near Weisburg, Indiana.

Amplexopora pustulosa Ulrich.

Amplexopora pustulosa Ulrich, Geol. Surv. Illinois, 8, 1890, p. 451, pl. 36, figs. 3–3c.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 761, pl. 6, figs. 4–4b; pl. 26, fig. 1.

Monticulipora pustulosa J. F. James, Jour. Cincinnati Soc. Nat. Hist., 18, 1895, p. 72.

Richmond (Waynesville): Hanover, Clarksville, etc., Ohio; Indiana.

Cotype.—Cat. No. 44069 U.S.N.M.

Amplexopora robusta Ulrich.

Amplexopora robusta Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 82, pl. 1, figs. 1–1*b*.—Miller, N. A. Geol. Pal., 1889, p. 292, fig. 450.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 318, fig. 7*d*.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 762, pl. 6, figs. 5, 5b.

Maysville (Bellevue): Cincinnati, Ohio, and vicinity; Indiana; Kentucky.

Holotype.—Cat. No. 43640 U.S.N.M.

Amplexopora septosa (Ulrich).

Atactopora septosa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 125, pl. 12, figs. 7–7c.

Monticulipora septosa James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 180.—James, J. F., ibid., 16, 1894, p. 203.

Amplexopora septosa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 255.—Nickles, Bull. Kentucky Geol. Surv., 5, 1905, p. 52, pl. 3, fig. 1.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 763, pl. 6, figs. 6, 6b; pl. 26, fig. 4.

Amplexopora multispinosa Cumings, Amer. Geol., 28, 1901, p. 376, pl. 34, figs. 7–10.

Amplexopora septosa—Continued.

Amplexopora septosa var. multispinosa Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 765, pl. 6, figs. 2, 2b; pl. 26, fig. 5.

Amplexopora septosa maculosa Cumings and Galloway, 37th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1913, p. 71, pl. 3, figs. 1–1c.

Amplexopora septosa minima Cumings and Galloway, 37th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1913, p. 72, pl. 4, figs. 1–1d.

Eden (McMicken) and Maysville (Mt. Hope and Fairmount): Cincinnati, Ohio, and vicinity; Indiana and Kentucky.

Cotypes.—Cat. No. 43621 U.S.N.M.

AMPLEXOPORA SEPTOSA MACULOSA Cumings and Galloway. See Amplexopora septosa.

AMPLEXOPORA SEPTOSA MINIMA Cumings and Galloway. See Amplexopora septosa.

AMPLEXOPORA SEPTOSA MULTISPINOSA Cumings. See Amplexopora septosa.

AMPLEXOPORA SUPERBA Foord. See Batostoma superbum and B. minnesotense.

AMPLEXOPORA WINCHELLI Ulrich. See Batostoma winchelli.

AMPLEXUS Sowerby. Genotype: A. coralloides Sowerby.

Amplexus Sowerby, Min. Conch., 1, 1814, p. 165.—Phillips, Pal. Foss. Cornwall, Devon and W. Somerset, 1841, p. 7.—McCoy, Syn. Char. Carb. Foss. Ireland, 1844, p. 185.—Koninck, Desc. Animaux Fossiles, Leige, 1842, p. 26.—Dana, Wilkes' U. S. Expl. Exped. 1838–42, 7, Zoophytes, 1846, p. 357; Amer. Jour. Sci. Arts, 2d ser., 1, 1846, p. 184.—Edwards and Haime, Mon. d. Polyp. Foss. d. Terr., Pal., 1851 (Arch. du Mus. d'Hist. Nat., 5), pp. 164, 342.—McCoy, British Pal. Rocks Foss., 1854, p. 70.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 452.—Billings, Canadian Jour. n. s., 4, 1859, p. 123.—Milne-Edwards Hist. Nat. d. Corall., 3, 1860, p. 347.—Koninck, Animaux Foss. Terr. Carb. Belgique (Mem. l'Acad. Royal Sci. de Belgique, 39), 1872, p. 63.—Dybowski, Archiv. f. Natur. Liv-Ehst-und Kurl., 5, 1873, p. 334.—Nicholson, Rep. Pal. Prov. Ontario, pt. 1, 1874, p. 31.—Thomson and Nicholson, Ann. Mag. Nat. Hist., 4th ser., 16, 1875, p. 424.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 153.—Zittel, Handb. Pal., 1, 1879, p. 227.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 364.—Frech, Zeits. d. geol. Gesell., 37, 1885, p. 83.—Frech, in Dames & Kayser, Pal. Abhandl., 3, Heft 3, 1886, p. 97.—Miller, N. A. Geol. Pal., 1889, p. 171; 2d App., 1897, p. 726.—Sherzer, Amer. Geol., 7, 1891, pp. 278–283.—Koken, Die Leitfossilien, Leipzig, 1896, p. 313.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 123.—Zittel-Eastman Textb. Pal., 1, 1900, p. 76.—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 128.—Pocta, Syst. Sil. du Centre Boheme, 8, pt. 2, 1902, p. 76.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 58.—Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 83.

AMPLEXUS ANNULATUS Whitfield. See Amplexus whitfieldi.

Amplexus cinctutus Miller.

Amplexus cinctutus Miller, 18th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1893, p. 259, pl. 1, figs. 5, 6. (Adv. sheets, 1892, p. 5.)

Niagaran (Laurel): St. Paul, Indiana.

Amplexus cingulatus Billings.

Amplexus cingulatus Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 106. (Adv. sheets, 1862.)—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 129, pl. 10, figs. 2, 3, 3a.

Silurian: L'Anse a la Barbe, Bay of Chaleurs, Quebec.

Amplexus feildeni Etheridge.

Amplexus Feildeni Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 589, pl. 26, fig. 3.

Niagaran: Offley Island, Arctic America.

Amplexus fenestratus Whitfield.

Amplexus fenestratus Whitfield, Ann. Rep. for 1877, Wisconsin Geol. Surv., 1878, p. 80; Geol. Wisconsin, 4, 1882, p. 278, pl. 15, figs. 1–3.

Niagaran (Waukesha-Racine): Cato, Cato Falls, and near Clarks Mills, Wisconsin.

Amplexus junctus Hall.

Amplexus junctum Hall, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 415 (ext. 1882, p. 11).

Niagaran: Port Byron, Illinois.

Amplexus laxatus Billings. See Pycnostylus guelphensis.

Amplexus phragmoceras (Salter).

Calophyllum Phragmoceras Salter, Sutherland's Jour. Voyage in Baffin's Bay, etc., 2, 1852, p. ccxxx, pl. 6, figs. 4, 4a.—Houghton, Jour. Geol. Soc. Dublin, 1, 1857, p. 245, pl. 8, fig. 1.—Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 585.

Amplexus phragmoceras Miller, N. A. Geol. Pal., 1889, p. 171 (gen. ref.).

Niagaran: Seal Island, Baring Bay, and Cape Hilgard, Arctic America.

Amplexus septatus Foerste.

Amplexus septatus Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, No. 1, 1909, p. 8, pl. 1, figs. 12a, b; pl. 2, figs. 16 a–c.

Cayugan (Kokomo): Near Kokomo, Indiana.

Amplexus shumardi (Edwards and Haime).

Cyathophyllum Shumardi Milne-Edwards and Haime, Hist. Nat. Corall., 3, 1860, p. 372; Mon. Polyp. Foss. Terr. Pal. (Arch. du Mus. d'Hist. Nat., 5), 1851, p. 370, pl. 7, fig. 3.—Roemer, Sil. Fauna West Tennessee, 1860, p. 27, pl. 2, figs. 14, 14a.

Amplexus shumardi Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 153, pl. 54.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 132, fig. 14; pl. 138, fig. 3.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 24, fig.—Foerste, Jour. Geol., 11, 1903, p. 712.—Grabau and Shimer, N. A. Index Fossils 1, 1906, p. 59.

Zaphrentis cinctosa Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 92.

Zaphrentis shumardi Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 121, pl. 8, figs. 3, 4.

Niagaran: Perry County, etc. Tennessee (Brownsport): Masonville, Iowa; Drummond Island, Point Detour, Cockburn Island, etc., Lake Huron; Louisville, Kentucky; Wisconsin, etc.

Amplexus uniformis Hall.

Amplexus uniforme Hall, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 415 (ext. 1882, p. 11).

Niagaran: Port Byron, Illinois.

Amplexus whitfieldi Miller.

Amplexus annulatus Whitfield (not Verneuil and Haime, 1850), Ann. Rept. for 1877, Wis. Geol. Surv., 1878, p. 80; Geol. Wisconsin, 4, 1882, p. 314, pl. 23, figs. 8–11.

Amplexus whitfieldi Miller, N. A. Geol. Pal., 2d App., 1897, p. 726.

Niagaran (Guelph): Sheboygan and Carlton, Wisconsin.

AMPYX Dalman. Genotype: Ampyx nasutus Dalman.

Ampyx Dalman, Svenska Vet.-Akad. Handl. for 1826, 1827, pp. 252, 279.—Dalman-Engelhart, Die Palæaden, Nurenberg, 1828, pp. 53, 72.—Eichwald, Zool. Specialis, Pt. 2, Vilnæ, 1830, p. 116.—Green, Mon. Tril. N. A., 1832, p. 19.—Edwards, Hist. Nat. d. Crustaces, 3, 1840, p. 296.—Portlock, Rep. Geol. Londonderry, 1843, p. 258.—Burmeister, Org. der Tril., Berlin, 1843, p. 128.—Goldfuss, Neues Jahrb. f. Min., etc., 1843, p. 540, 542.—Emmrich, Neues Jahrb. f. Min., etc., 1845, p. 45.—Burmeister, Org. Tril., London, 1846, p. 110.—Hawle and Corda, Abh. d. k. Bohmischen Gesell. d. Wiss., 5 (extract), 1847, p. 38, pl. 3, fig. 19.—Forbes, Mem. Geol. Surv. United Kingdom, Dec. 2, 1849, pl. 10.—Barrande, Neues Jahrb. f. Min., etc., 1850, p. 780; Syst. Sil. du Centre Boheme, 1, 1852, p. 632.—McCoy, British Pal. Rocks Fossils, 1854, p. 147.—Pictet, Traite Pal., 2d ed., 2, 1854, p. 509.—Malaise, Desc. Terr. Sil. du Centre de la Belgique, 1873, p. 84.—Steinhardt, Beit. z. Naturk. Preus. Phys.-Oekon. Gesell., Konigsberg, 1874, p. 38.—Angelin, Pal. Scandinavica, 3d ed., Holmiæ, 1878, p. 19.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1880, p. 176.—Zittel, Handb. Pal., 2, 1885, p. 594.—Miller, N. A. Geol. Pal., 1889, p. 528.—Pompeckj, Beit. Phys.-Oekon. Gesell. Konigsberg, 1890, p. 16.—Vogdes, Amer. Geol. 11, 1893, pp. 99–105.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 7, ser., 42, 1894, p. 74.—Beecher, Amer. Jour. Sci., 3d ser., 49, 1895, p. 307.—Koken, Die Leitfossilien, Leipzig, 1896, p. 15, fig. 8.—Beecher, Amer. Jour. Sci., 4th ser., 3, 1897, pp. 105, 184, 186, pl. 3, fig. 13.—Frech, Leth. geog., 1, Th., Leth. Pal., 2, 1897, p. 32, footnote.—Ruedemann, Bull. New York State Mus., 49, 1901, p. 51.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 34, No. 8, 1901, p. 32.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 259.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 712.

Lonchodomas Angelin, Pal. Scandinavica, 3d ed., Holmiæ, 1878, p. 80, pl. 40, fig. 11.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1880, p. 177.—Zittel, Handb. Pal., 2, 1885, p. 594.—Pompeckj, Beit. Phys.-Oekon. Gesell. Konigsberg, 1890, p. 16.—Vogdes, Amer. Geol., 11, 1893, p. 103.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 7th ser., 62, 1894, p. 75.—Koken, Die Leitfossilien, Leipzig, 1896, p. 15.—Ruedemann, Bull. New York State Mus., 49, 1902, p. 51.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 712 (Genotype: Ampyx rostratus Sars).

Ampyx americanus Safford and Vodges.

Ampyx Americanus Safford and Vogdes, Proc. Acad. Nat. Sci. Philadelphia, 1889, p. 166, fig.—Vogdes, Amer. Geol., 11, 1893, p. 106, fig. 4.

Ampyx jillsoni Safford, Geol. Tennessee, 1869, p. 235 (nom. nud.).

Chazyan (Athens): Bulls Gap, near Russellville, Tennessee.

Ampyx (Lonchodomas) halli (Billings).

Ampyx halli Billings, Rep. Econ. Geol., etc., Vermont, 1862, p. 231, fig. 365; Geol. Vt., 2, 1862, p. 959, fig. 365; Geol. Canada, Geol. Surv. Canada, 1863, p. 274, fig. 279a–c; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 24, text figs. 25a–c (Adv. sheets, 1861).—Vogdes, Amer. Geol., 11, 1893, p. 106, fig. 5.

Ampyx (Lonchodomus) halli Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 259, figs. 1548, 1549.

Lonchodomas halli Raymond, Ann. Carnegie Mus., 3, No. 2, 1905, p. 332, pl. 10, figs. 3–7; 7th Rep. State Geol. Vermont, 1910, p. 216, pl. 32, figs. 3–6.

Chazyan: St. Dominique, Canada; Highgate, Vermont; Valcour, etc., New York (Crown Point).

Ampyx (Lonchodomas) hastatus Ruedemann.

Ampyx (Lonchodomas) hastatus Ruedemann, Bull. New York State Mus., 49, 1902, p. 48, pl. 3, figs. 1–10, 30.

Mohawkian (Rysedorph): Rysedorph Hill, Rensselaer County, New York.

AMPYX JILLSONI Safford. See Ampyx americanus.

Ampyx (Lonchodomas) læviusculus (Billings).

Ampyx læviusculus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 295, fig. 285.

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

Ampyx niagarensis Van Ingen.

Ampyx niagarensis Van Ingen, School of Mines Quart., 23, 1901, p. 53, fig. 15, pl. figs. 11, 11a.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 259, fig. 1550.

Niagaran (St. Clair): St. Clair Spring, Independence County, Arkansas.

Ampyx (Lonchodomas) normalis (Billings).

Ampyx normalis Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 295, fig. 286.—Miller, N. A. Geol. Pal., 1889, p. 528, fig. 958.—Vogdes, Amer. Geol., 11, 1893, p. 107, fig. 6.

Ampyx (Lonchodomus) normalis Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 259.

Chazyan (Quebec–N, P.): Table Head and Pistolet Bay and four miles northeast of Portland Creek, Newfoundland.

Ampyx quadricostatus (Emmons).

Microdiscus quadricostatus Emmons, Amer. Geology, 1, pt. 2, 1855, p. 116, pl. 1, fig. 8; Man. Geol., 1860, p. 88, fig. 73.—Barrande, Bull. Soc. Geol. France, 2d ser., 18, 1861, p. 280, pl. 5, fig. 13.—Marcou, Mem. Boston Soc. Nat. Hist., 4, 1888, p. 128.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 405, fig.—Miller, N. A. Geol. Pal., 1889, p. 557, fig. 1033.

Chazyan (Athens): Augusta County, Virginia.

Ampyx (Lonchodomas) rutilius (Billings).

Ampyx rutilius Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 296.—Vogdes, Amer. Geol., 11, 1893, p. 108.

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

Ampyx (Lonchodomas) semicostatus (Billings).

Ampyx semicostatus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 297, fig. 287.—Vogdes, Amer. Geol., 11, 1893, p. 108, fig. 6.

Chazyan (Quebec–N, P.): Table Head, Pistolet Bay, and four miles northeast Portland Creek, Newfoundland.

AMYGDALOCYSTIS Haeckel. See Amygdalocystites Billings.

AMYGDALOCYSTITES Billings. Genotype: A. florealis Billings.

Amygdalocystites Billings, Canadian Jour., 2, 1854, p. 270; Geol. Surv. Canada, Rep. for 1853–1857, 1857, p. 288; Geol. Surv. Canada, dec. 3, 1858, p. 63.—Chapman, Expos. Min. and Geol. Canada, 1864, p. 109.—Zittel. Handb. Pal., 1, 1879, p. 413.—Billings, Trans. Ottawa Field Nat. Club, 1, No. 4, 1883, p. 51.—Miller, N. A. Geol. Pal., 1889, p. 223.—Jaekel, Zeits. d. d. geol. Gesell., 52, 1900, p. 675.—Zittel, Grundzuge Pal., 1, 1910, p. 184.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 462.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 151.

Amygdalocystis Haeckel, Amphor. und Cystoid., 1896, p. 106.—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 58, fig. 29.

Amygdalocystites florealis Billings.

Amygdalocystites florealis Billings, Canadian Jour., 2, 1854, p. 270, figs. 4–6; Rep. Geol. Surv. Canada, 1857, p. 289; Canadian Org. Remains, dec. 3, Geol. Surv. Canada, 1858, p. 888, 63, pl. 6, fig. 1a–e; pl. 10 bis., fig. 12.—Chamberlin Geol. Wisconsin, 1, 1883, p. 154, fig.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 463, fig. 1769.

Amygdalocystis florealis Haeckel, Amphorideen u. Cystoideen, 1896, p. 106, fig. 15.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 57, fig. 19.—Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 45 (loc. occ.).

Trenton (Curdsville): Ottawa and Kirkfield, Ontario.

Amygdalocystites florealis lævis Billings.

Amygdalocystites florealis var. lævis Billings, Trans. Ottawa Field Nat. Club, 4, 1883, p. 52.

Trenton (Curdsville): Hull, Quebec.

Amygdalocystites huntingtoni Wetherby.

Amygdalocystites huntingtoni Wetherby, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 177, pl. 5, fig. 3.—Miller, N. A. Geol. Pal., 1889, p. 223, fig. 245.

Trenton (Curdsville): Mercer County, near High Bridge, Kentucky.

Amygdalocystites radiatus Billings.

Amygdalocystites radiatus Billings, Canadian Jour., 2, 1854, p. 271, figs. 7, 8; Rep. Geol. Surv. Canada, 1857, p. 289; Canadian Org. Rem., dec. 3, Geol. Surv. Canada, 1858, p. 65, pl. 6, figs. 3a, 3b; Trans. Ottawa Field Nat. Club, 1, No. 4, 1883, p. 51.

Amygdalocystis radiatus Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 45 (loc. occ.).

Trenton (Curdsville): Ottawa and Kirkfield, Ontario.

Amygdalocystites tenuistriatus Billings.

Amygdalocystites tenuistriatus Billings, Canadian Journal, 2, 1854, p. 271, text fig. 9; Rep. Geol. Surv. Canada, 1857, p. 289; Canadian Org. Rem., dec. 3, Geol. Surv. Canada, 1858, p. 64, pl. 6, figs. 2a–f.

Trenton (Curdsville): Ottawa, Ontario.

ANABAIA Clarke. Genotype: A. paraia Clarke.

Anabaia Clarke, Archivos Mus. Nac. Rio de Janeiro, 10, author's Eng. ed., 1900, p. 12.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 417.

ANABAIA ANTICOSTIANA Clarke. See Camarotœchia decemplicata.

Anabaia paraia Clarke.

Anabaia paraia Clarke, Archivos Mus. Nac. Rio de Janerio, 10, author's Eng. ed., 1900, p. 12, pl. 2, figs. 1–9.

Silurian: Rio Trombetas, Brazil.

ANACHEIRURUS Reed. Genotype: Ecccptocheile frederici Salter,

Anacheirurus Reed, Geol. Mag., dec. 4, 3, 1896, p. 119.

Anacheirurus? apollo (Billings).

Cheirurus Apollo Billings, Canadian Nat. Geol., 5, 1860, p. 322, fig. 28; Geol. Canada, Geol. Surv. Canada, 1863, p. 239, fig. 275; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 413, fig. 397.

Ceraurus (Cyrtometopus) apollo Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 738.

Pseudosphærexochus apollo Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 36, pl. 4, figs. 1, 2.

Anacheirurus? apollo—Continued.

Anacheirurus? apollo Raymond and Barton, Bull. Mus. Comp. Zool., 54, No. 20, 1913, p. 543 (gen. ref.).

Amphion Cayleyi Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 239, fig. 277; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 413, footnote, fig. 398.

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

ANAPHRAGMA Ulrich and Bassler. Genotype: A. mirabile Ulrich and Bassler.

Anaphragma Ulrich and Bassler, Smiths. Misc. Coll., 47, 1904, p. 49.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 297.

Anaphragma mirabile Ulrich and Bassler.

Anaphragma mirabile Ulrich and Bassler, Smiths. Misc. Coll., 47, 1904, p. 49, pl. 13, figs. 9–11.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 298, 299. fig. 183.

Richmond: Wilmington, Illinois (Fernvale); Delafield and Iron Ridge, Wisconsin (Maquoketa); Island of Dago, Baltic Sea (Lyckholm).

Cotypes and *plesiotype:* Cat. Nos. 43218, 57385, U.S.N.M.

ANASTROPHIA Hall. Genotype: Pentamerus verneuili Hall.

Brachymerus Shaler (not Dejean, 1834), Bull. Mus. Comp. Zool., 4, 1865, p. 69.—Zittel, Handb. Pal., 1, Munich, 1880, p. 694.—Koken, Die Leitfossilien, Leipzig, 1896, p. 244.

Anastrophia Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, p. 163; Pal. New York, 4, 1867, p. 374.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv. 1889, p. 47.—Miller, N. A. Geol. Pal., 1889, p. 333.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 224; 13th Ann. Rep. New York State Geol., 1895, p. 839.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 321.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 189; Bull. New York State Mus., 9, 1901, p. 189.

Anastrophia brevirostris (Hall).

?Terebratula brevirostris Sowerby, Murchison's Sil. Syst., 1839, p. 631, pl. 13, fig. 15.

Atrypa brevirostris? Hall, Pal. New York, 2, 1852, p. 278, pl. 58, fig. 1.

Pentamerus brevirostris Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 77.

Rhynchonella brevirostris Billings, Geol. Canada, 1863, p. 315, fig. 324.—Lesley, Geol. Surv. Pennsylvania Rep. P 4, 1889, p. 884, fig.

Anastrophia brevirostris Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 142.—Grabau, Bull. New York State Mus., 45, 1901, p. 190, fig. 102; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 190, fig. 102.

Clinton (Rochester): Lockport, etc., New York.

ANASTROPHIA? HEMIPLICATA Winchell and Schuchert. See Parastrophia hemiplicata.

ANASTROPHIA? HEMIPLICATA var. ROTUNDA Winchell and Schuchert. See Parastrophia hemiplicata rotunda.

Anastrophia internascens Hall.

Anastrophia verneuili Hall (not Hall, 1859), 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1876, pl. 26, figs. 41–49.

Anastrophia internascens Hall, ibid., 1879, p. 168, pl. 26, figs. 41–49; 11th Rep. State Geol. Indiana, 1882, p. 311, pl. 26, figs. 41–49.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 47, pl. 32, figs. 17–20.—Beecher and Clarke, Mem. New York State Mus., 1, 1889, p. 32, pl. 3, figs. 14–16.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 224, pl. 63, fig.

Anastrophia internascens—Continued.

30.—Miller, N. A. Geol. Pal., 1889, p. 333, text fig. 538.—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 434, pl. 2, fig. 10.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 272, fig. 329.

Niagaran: Waldron, Indiana, and Newsom, Tennessee (Waldron and Laurel); Louisville, Kentucky (Louisville); Wabash, Indiana; Milwaukee, Wisconsin.

Plesiotype.—Cat. No. 51336, U.S.N.M.

Anastrophia interplicata (Hall).

Atrypa interplicata Hall, Pal. New York, 2, 1852, p. 275, pl. 57, fig. 2.

Pentamerus interplicatus Hall, 12th Rep. New York State Cab. Nat. Hist. 1859, p. 77.—Safford, Geol. Tennessee, 1869, p. 315, fig. 7.

Anastrophia interplicata Miller, Amer. Pal. Fossils, 1877, p. 104.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 224.—Grabau, Bull. New York State Mus., 45, 9, 1901, p. 190, fig. 101; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 190, fig. 101.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 272, fig. 238.

Niagaran: Lockport, etc., New York (Rochester); Louisville, Kentucky; Tennessee; Wisconsin.

ANASTROPHIA REVERSA Miller. See Parastrophia reversa.

ANASTROPHIA? SCOFIELDI Winchell and Schuchert. See Parastrophia scofieldi.

ANASTROPHIA VERNEUILI Hall. See Anastrophia internascens.

ANATINA? SINUATA Hall. See Ilionia sinuata.

ANAZYGA Davidson. See Zygospira Hall.

ANCISTROCERAS Boll. Genotype: A. undulatum Boll.

Ancistroceras Boll, Archiv. des Vereins der Freunde der Naturgisch. in Mecklenburg, 11, 1857, p. 87.—Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 509.—Remele, Zeits. d. d. geol. Gesell., 33, 1881, p. 184; ibid., 34, 1882, p. 123.—Noetling, Jahrb. d. k. Preuss. Geol. Landesans. u. Bergak. fur 1883, 1884, p. 122, 130.—Koken, Die Leitfossilien, Leipzig, 1896, p. 50.

Ancistroceras? dyeri Hyatt.

Ancistroceras? dyeri Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 511.

Niagaran (Racine): Chicago, Illinois.

ANGELLUM Miller. See Cyrtodonta Billings.

ANISOCRINUS Angelin. Genotype: A. interradiatus Angelin.

Anisocrinus Angelin, Icon. Crin. Suec., 1878, p. 13.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, Rev. Pal., 1, 1879, p. 37.—Zittel, Handb. d. Pal., 1, 4, 1879, p. 356.—Bather, Treatise on Zool., 3, 1900, p. 189.—Springer, Jour. Geol., 14, 1906, p. 479.

Anisocrinus greenei (Miller and Gurley).

Lecanocrinus greenei Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 8, 1896, p. 52, pl. 3, fig. 28.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 748 fig., 1363.

Anisocrinus greenei Springer, Jour. Geol., 14, 1906, p. 480, pl. 6, fig. 11; Mon. Crin. Flex., Smiths. Inst. (in press).

Niagaran: Near Louisville, Kentucky (Louisville); Decatur County, Tennessee (Brownsport).

Anisocrinus oswegoensis (Miller and Gurley).

Lecanocrinus oswegoensis Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 4, 1894, p. 33, pl. 3, figs. 15–17.

Anisocrinus oswegoensis Springer, Jour. Geol., 14, 1906, p. 480, pl. 6, fig. 12; Mon. Crin. Flex., Smiths. Inst. (in press).

Niagaran: Oswego, Illinois.

ANISOPHYLLUM Edwards and Haime.

Genotype: A. agassizi Edwards and Haime.

Anisophyllum Edwards and Haime, Mon. Polyp. Foss. Ter. Pal., 1851 (Arch. du Mus. d'Hist. Nat., 5), pp. 165, 354.—Pictet, Traite Pal., 2d ed., 4, 1857, p. 453.—Milne-Edwards, Hist. Corall., 3, 1860, p. 354.—Dybowski, Archiv. Natur. Liv.-Ehst. und Kurl., 5, 1873, pp. 335, 396.—Zittel, Handb. Pal., 1, 1879, p. 229.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 370.—Miller, N. A. Geol. Pal., 1889, p. 172.—Sherzer, Amer. Geol., 7, 1891, pp. 278–285.

Anisophyllum agassizi Edwards and Haime.

Anisophyllum agassizi Edwards and Haime, Mon. Polyp. Foss. Ter. Pal., 1851 (Arch. du Mus. d'Hist. Nat., 5), p. 351, pl. 1, figs. 2, 2a.—Pictet, Traite Pal., 2d ed., 4, 1857, p. 453, pl. 107, fig. 19.—Milne-Edwards, Hist. Nat. Corall., 3, 1860, p. 355.

Niagaran (Brownsport): Perry County, Tennessee.

Anisophyllum? bilamellatum Hall.

Anisophyllum? bilamellatum Hall, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 413 (ext. 1882, p. 9).

Niagaran (Louisville): Louisville, Kentucky.

Anisophyllum trifurcatum Hall.

Anisophyllum trifurcatum Hall, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 413 (ext. 1882, p. 9); 12th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1883, p. 273, pl. 15, figs. 7, 8.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 26, text figs.

Niagaran (Louisville): Louisville, Kentucky.

Anisophyllum unilargum Hall.

Anisophyllum unilargum Hall, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 412 (ext. 1882, p. 8); 12th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1883, p. 272, pl. 15, figs. 5, 6.—Miller, N. A. Geol. Pal., 1889, p. 172, text fig. 134.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 26, text figs.

Niagaran (Louisville): Louisville, Kentucky.

ANODONTOPSIS (part) Meek. See Cycloconcha Miller and Ischyrodonta Ulrich.

ANODONTOPSIS McCoy. Genotype: A. angustifrons McCoy.

Anodontopsis, McCoy, Ann. Mag. Nat. Hist., 2d ser., 7, 1851, p. 53; Cont. British Pal., 1854, p. 188; Brit. Rocks and Foss., 1854, p. 270.—Pictet, Traite Pal., 2d ed., 3, 1855, p. 533.—Zittel, Handb. Pal., 2, 1881, p. 64.—Miller, N. A. Geol. Pal., 1889, p. 462.

Anodontopsis austrina Clarke.

Anodontopsis austrina Clarke, Archiv. Mus. Nac. Rio de Janeiro, 10, author's Eng. ed., 1900, p. 16, pl. 2, fig. 12.

Silurian: Rio Trombetas, Brazil.

Anodontopsis concinna Whiteaves.

Anodontopsis concinna Whiteaves, Pal. Foss. Geol. Surv. Canada, 3, pt. 1, 1884, p. 12, pl. 2, fig. 4; pl. 7, figs. 4, 4a; ibid., 3, pt. 2, 1895, p. 67 (loc. occ.).

Niagaran (Guelph): Galt and Durham, Ontario.

ANODONTOPSIS MILLERI Meek. See Cycloconcha milleri.

Anodontopsis putilla Clarke.

Anodontopsis putilla Clarke, Archiv. Mus. Nac. Rio de Janeiro, 10, author's Eng. ed., 1900, p. 16, pl. 2, figs. 10, 11.

Silurian: Rio Trombetas, Brazil.

ANODONTOPSIS? UNIONOIDES Meek. See Ischyrodonta unionoides.

Anodontopsis wabashensis Kindle and Breger.

Anodontopsis wabashensis Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 453, pl. 10, figs. 5–7.

Niagaran: Wabash, Indiana.

ANOLOTICHIA Ulrich. Genotype: Anolotichia ponderosa Ulrich.

Anoloticha Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 381, 473; Geol. Minnesota, 3, 1893, p. 326; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 268.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 24.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 123.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 91; Zittel-Eastman Textb. Pal., 1913, p. 328.

Anolotichia impolita (Ulrich).

Crepipora impolita Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 77.

Anolotichia impolita Ulrich, Geol. Minnesota, 3, 1893, p. 327, pl. 28, figs. 15–20; Zittel's Textb. Pal. (Eng. ed.), 1896, p. 268, fig. 437a–c.—Sardeson, Jour. Geol., 9, 1901, p. 13, pl. A, fig. 12.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 123, fig. 182a.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 97, figs. 32, 33, pl. 7, fig. 11.—Zittel-Eastman Textb. Pal., 1913, p. 328, figs. 465a–c.

Black River (Decorah): Minneapolis, etc., Minnesota; Iowa.

Ordovician (Kuckers): Near Jewe, Esthonia, Russia.

Cotypes and *plesiotype*.—Cat. Nos. 43276, 57204, U.S.N.M.

Anolotichia ponderosa Ulrich.

Anolotichia ponderosa Ulrich, Geol. Surv. Illinois, 8, 1890, p. 320, fig. 8c; p. 473, pl. 41, figs. 3–3d; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 268, fig. 437d.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 328, fig. 465d.

Richmond (Fernvale): Wilmington, Illinois; Tennessee.

Cotype.—Cat. No. 43275, U.S.N.M.

ANOMALOCRINUS Meek and Worthen.

Genotype: Heterocrinus? incurvus Meek and Worthen.

Heterocrinus(?) subgenus Anomalocrinus Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 2d ser., 9, 1865, p. 148.

Hybocrinus (Anomalocrinus) Meek and Worthen, Geol. Rep. Illinois, 3, 1868, p. 327.

Anomalocrinus Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 17.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 295 (Rev. Pal., pt. 1, p. 72); ibid., 1886, pp. 110, 111, 116, 135; ibid., 1890, pp. 378, 380.—Zittel, Handb. Pal., 1, 1879, p. 350.—Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 111; ibid., 5, 1882, p. 38, pl. 5, figs. 3, 3a, 3e.—Miller, N. A. Geol. Pal., 1889, p. 223.—Bather, Ann. Mag. Nat. Hist., 6th ser, 5, 1890, p. 15, fig. 11; p. 332, pl. 14, fig. 8; pl. 15, fig. 10; Kongl. Sv. Vet. Akad. Handl., 25, No. 2, 1893, p. 20; Treatise on Zool. (Lankester), pt. 3, 1900, p. 146, fig. 58, 4.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 152.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res., Indiana, 1908, p. 710.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 501.—Zittel, Grundzuge Pal., 1, 1910, p. 151.—Springer, Zittel-Eastman Textb. Pal., 1913, p. 213.

ANOMALOCRINUS—Continued.

Ataxiacrinus Lyon, Trans. Amer. Phil. Soc., n. s., 13, 1869, p. 463.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 247 (Rev. Pal., pt. 2, p. 73).

Ataxocrinus Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 146.—Zittel, Grundzuge Pal., 1, 1910, p. 151.

Anomalocrinus caponiformis (Lyon).

Ataxiacrinus caponiformis Lyon, Trans. Amer. Phil. Soc., n. s., 13, 1869, p. 464, pl. 27, figs. 1–3.

Anomalocrinus caponiformis Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1879 p. 109, pl. 9, figs. 4–4a.

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

Anomalocrinus incurvus (Meek and Worthen).

Heterocrinus (Anomalocrinus) incurvus, Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1865, p. 148.

Hybocrinus? (Anomalocrinus) incurvus Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 327, text fig., pl. 4, figs. 3a, b.

Anomalocrinus incurvus Meek and Worthen, Geol. Surv. Ohio, 1, pt. 2, 1873, p. 17, pl. 2, figs. 6a–f.—Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 112; N. A. Geol. Pal., 1889, p. 224, fig. 246.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 716, pl. 3, figs. 1–1c.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 501, fig. 1813.

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

ANOMALOCYSTIS Haeckel. See Anomalocystites Hall.

ANOMALOCYSTITES Hall. Genotype: A. cornutus Hall.

Anomalocystites Hall, Amer. Jour. Sci. Arts, 2d ser., 25, 1858, p. 279; Pal. New York, 3, 1859, p. 132.—Meek (part), Geol. Surv. Ohio, Pal., 1, 1873, p. 43.—Woodward, Geol. Mag., dec. 2, 7, 1880, pp. 193, 199.—Barrande, Syst. Sil. Center Boheme, 7, pt. 1, 1887, p. 89.—Miller, N. A. Geol. Pal., 1889, p. 224.—Jaekel, Zeits. d. d. geol. Ges., 52, 1900, p. 668.—Zittel-Eastman Textb. Pal., 1, 1900, p. 186.—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 51.—Schuchert, Smiths. Misc. Coll., 47, pt. 2, 1904, p. 204.—Zittel, Grundzuge Pal., 1, 1910, p. 182.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 150.

Ateleocystites Woodward (part), Geol. Mag., dec. 2, 7, 1880, p. 193.

Anomalocystis Haeckel, Amphoroideen und Cystoideen, 1896, p. 40.

ANOMALOCYSTITES (ATELEOCYSTITES) BALANOIDES Meek. See Ateleocystites balanoides.

Anomalocystites cornutus Hall.

Anomalocystites cornutus Hall, Pal. New York, 3, 1859, p. 133, pl. 7A, figs. 5–7.—Woodward, Geol. Mag., dec. 2, 7, 1880, p. 193, pl. 6, figs. 4, 5.—Schuchert, Smiths. Misc. Coll., 47, pt. 2, 1904, p. 206, pl. 40, figs, 4, 5.

Anomalocystis cornuta Haeckel, Amphoroideen und Cystoideen, 1896, p. 41, pl. 2, figs. 8, 9.

Helderbergian (Manlius transition beds or Coeymans): Litchfield, Herkimer County, New York.

Plesiotypes.—Cat. Nos. 35078, 35079, U.S.N.M.

ANOMALOCYSTITES HUXLEYI Miller. See Ateleocystites huxleyi.

ANOMALODONTA Miller. Genotype: A. gigantea Miller.

Anomalodonta, Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 16; 2, 1875, p. 280.—White, Amer. Jour. Sci. Arts, 3d ser., 8, 1874, pp. 218, 219.—Zittel, Handb. Pal., 2, 1881, p. 36.—Miller, N. A. Geol. Pal., 1889, p. 462.—Ulrich, Geol. Surv. Ohio, 7, 1893, p. 636.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 978.—Grabau and Shimer, N. A. Index Fossils, 1 1909, p. 430.

Anomalodonta alata (Meek).

Ambonychia (Megaptera) alata Meek, Proc. Acad. Nat. Sci. Philadelphia, 1872, p. 319; Geol. Surv. Ohio, Pal., 1, 1873, p. 131, pl. 11, fig. 9; pl. 12, fig. 10.

Megaptera alata White, Cincinnati Quart. Jour. Sci., 1, 1874, p. 327.

Anomalodonta alata Miller, Cincinnati Quart. Jour. Sci., 1874, p. 16, pp. 223, 328.—Ulrich, Geol. Surv. Ohio, 7, 1893, p. 638, pl. 46, fig. 1.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 431.

Richmond (Arnheim and Waynesville): Morrow, Clarksville, etc., Ohio; Versailles, etc., Indiana.

Plesiotype.—Cat. No. 46087, U.S.N.M.

Anomalodonta casei (Meek and Worthen).

Ambonychia (Megaptera) Casei Meek and Worthen, Proc. Chicago Acad. Sci., 1, 1866, p. 22.—Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 133, pl. 11, fig. 8.—White, 2d Ann. Rep. Indiana Dep. Stat. Geol., 1880, p. 491, pl. 1, figs. 1, 2.

Megaptera Casei Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 337, pl. 4, fig. 9a, b.

Anomalodonta casei Miller, Cincinnati Quart. Jour. Sci., 1, 1874, pp. 15, 16, p. 224.

Richmond (Whitewater): Richmond, Indiana.

Anomalodonta costata (Meek).

Ambonychia costata James, Cat. Low. Sil. Fossils Cincinnati Group, 1871, p. 13 (not described).—Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 130, pl. 12, figs. 5a, b, c—Miller, Cincinnati Quart. Jour. Sci., 1, p. 15.

Anomalodonta costata Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 987, pl. 62, figs. 6–6a.

Richmond (Arnheim and Waynesville): Clarksville, etc., Ohio.

Anomalodonta gigantea Miller.

Anomalodonta gigantea Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 17, figs. 7, 8, 9; also p. 327; N. A. Geol. Pal., 1889, p. 462, figs. 776, 777; p. 463, fig. 778.—Ulrich, Geol. Surv. Ohio, 7, 1895, p. 637, pl. 50, figs. 1 to 4.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 968, pl. 43, figs. 1–1b.

Richmond (Arnheim-Whitewater): Versailles, etc., southeastern Indiana; Ohio.

Plesiotype.—Cat. No. 46088, U.S.N.M.

Anomalodonta plicata Ulrich.

Anomalodonta plicata Ulrich, Geol. Surv. Ohio, 7, 1893, p. 638, pl. 46, figs. 2, 3.

Maysville (Corryville): Cincinnati, Ohio.

Holotype.—Cat. No. 46089, U.S.N.M.

ANOMALOIDES Ulrich. Genotype: A. reticulatus Ulrich.

Anomaloides Ulrich, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 92.—James, J. F., ibid., 8, 1885, pp. 165, 166.—Ulrich, Amer. Geol., 1, 1888, p. 324.

Anomalospongia Ulrich, Geol. Minnesota, 3, pt. 1, 1895, pp. 68–69 (ext. 1893).

Anomaloides reticulatus Ulrich

Anomaloides reticulatus Ulrich, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 92, pl. 4, figs. 6, 6a–b.

Anomalospongia reticulata Ulrich, Geol. Minnesota, 3, pt. 1, 1895, p. 71, fig. 1, pl. F, figs. 13–15 (ext. 1893).

Receptaculites reticulatus James, J. F., Jour. Cincinnati Soc. Nat. Hist., 8, 1885, p. 166; 9, 1886, p. 249; 14, 1891, p. 62.

Maysville (Mt. Hope): Covington, Kentucky.

Cotypes.—Cat. No. 46546, U.S.N.M.

ANOMALOSPONGIA Ulrich. See Anomaloides Ulrich.

ANOMIA BILOBA Linnæus. See Bilobites bilobus.

ANOMIA RETICULARIS Linnæus. See Atrypa reticularis.

ANOMITES EXPORRECTUS Wahlenberg. See Cyrtia exporrecta.

ANOMITES LENTICULARIS Wahlenberg. See Eoorthis (Orusia) lenticularis.

ANOMITES TRANSVERSALIS Wahlenberg. See Plectambonites transversalis.

ANOMOCARE Angelin. Genotype: A. læve Angelin.

Anomocare Angelin, Pal. Scandinavica, 3d ed., 1878, p. 24.—Zittel, Handb. Pal., 2, 1885, p. 601.—Matthew, Trans. Royal Soc. Canada, 9, sec. 4, 1892, p. 60.—Koken, Die Leitfossilien, Leipzig, 1896, p. 22.—Walcott, Smiths. Misc. Coll., 57, No. 4, 1911, p. 87; Research in China, 3, Carnegie Institution, 1913, p. 187 (figures genotype).

Anomocare parvula Weller.

Anomocare parvula Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 120, pl. 3, fig. 12.

Upper Cambrian or Ozarkian (Kittatinny): Newton, New Jersey.

ANOMOCARE SPINIGER Matthew. See Acantholenus spiniger.

Anomocare stenotoides (Matthew).

Leptoplastus stenotoides Matthew, Canadian Rec. Sci., 3, 1889, p. 486, fig. 2.

Anomocare stenotoides Matthew, Trans. Royal Soc. Canada, 9, sec. 4, 1892, p. 61, pl. 13, fig. 3 a–d; Bull. Nat. Hist. Soc. New Brunswick, 16, 1898, p. 42; Trans. Royal Soc. Canada, 2d ser., 4, sec. 4, 1898, p. 139, pl. 2, figs. 5 a–i.

Canadian (Bretonian—Div. C 3b): Long Island, Kennebecasis River, New Brunswick.

ANOMOCARELLA Walcott. Genotype: A. chinensis Walcott.

Anomocarella Walcott, Proc. U. S. Nat. Mus., 29, 1905, p. 54; Smiths. Misc. Coll., 57, 1911, p. 91; Research in China, 3, Carnegie Inst., 1913, p. 195.

Anomocarella belli (Billings).

Dikelocephalus Belli Billings, Canadian Nat. Geol., 5, 1860, p. 311, fig. 7; Geol. Canada, Geol. Surv. Canada, 1863, p. 236, fig. 260; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 403, fig. 378.

Dicellocephalus Belli Matthew, Trans. Royal Soc. Canada, 10, sec. 4, 1893, p. 11, footnote.

Anomocarella belli Walcott, Smiths. Misc. Coll., 57, 1914, p. 349 (gen. ref.).

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

Anomocarella? oweni (Billings).

Dikelocephalus Oweni Billings, Canadian Nat. Geol. 5, 1860, p. 310, fig. 8; Geol. Canada, Geol. Surv. Canada, 1863, p. 236, fig. 259; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 402, fig. 379.

Dicellocephalus Oweni Matthew, Trans. Royal Soc. Canada, 10, sec. 4, 1893, p. 11, footnote.

Anomocarella? oweni Walcott, Smiths. Misc. Coll., 57, 1914, p. 251 (gen. ref.).

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

Anomocarella? planifrons (Billings).

Dikelocephalus planifrons Billings, Canadian Nat. Geol., 5, 1860, p. 309, fig. 6; Geol. Canada, Geol. Surv. Canada, 1863, p. 236, fig. 256; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 401, fig. 377.

Dicellocephalus planifrons Matthew, Trans. Royal Soc. Canada, 10, sec. 4, 1893, p. 11, footnote.

Anomocarella? planifrons Walcott, Smiths. Misc. Coll., 57, 1914, p. 352 (gen. ref.).

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

ANOMOCLONELLA Rauff. Genotype: A. zitteli Rauff.

Anomoclonella Rauff, Palæontographica, 41, 1895, p. 226.

Anomoclonella zitteli (Rauff).

Anomoclonella Zitteli Rauff, Palæontographica, 40, 1894, pl. 8, figs. 1–4; 41, 1895, pp. 226–242, figs. 78–83.

Niagaran (Brownsport): Decatur County, Tennessee.

ANOPLOTHECA (part) of authors. See Cœlospira Hall.

ANOPTERA Ulrich. Genotype: A. miseneri Ulrich.

Anoptera Ulrich, Geol. Surv. Ohio, 7, 1893, p. 649.

Anoptera miseneri Ulrich.

Anoptera miseneri Ulrich, Geol. Surv. Ohio, 7, 1893, p. 650, pl. 50, figs. 5–9.

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

Cotypes.—Cat. Nos. 46090, 46091, U.S.N.M.

ANORTHASTER Schuchert. Genotype: Palæaster miamiensis Miller

Anorthaster Schuchert in Frech, Cat. Foss., 1, Anim., pt. 3, 1914, p. 11 (nom. nud.); Bull. U. S. Nat. Mus., 88, 1915, p. 125.

Anorthaster miamiensis (Miller).

Palæaster miamiensis Miller, Jour. Cincinnati Soc. Nat. Hist., 3, 1880, p. 143, pl. 4, fig. 3.—James, Ibid. 18, 1895, p. 129.

Anorthaster miamiensis Schuchert, in Frech, Cat. Foss., 1, Anim., pt. 3, 1914, p. 11; Bull. U. S. Nat. Mus., 88, 1915, p. 127, pl. 13, fig. 4; pl. 20, fig. 1.

Richmond (Waynesville or Liberty): Waynesville, Ohio.

Holotype.—Cat. No. 40880, U.S.N.M.

ANTHASPIDELLA Ulrich and Everett.

Genotype: A. mammulata Ulrich and Everett.

Anthaspidella Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 256.—Miller, N. A. Geol. Pal., 1889, p. 153.

Anthaspidella fenestrata Ulrich and Everett.

Anthaspidella fenestrata, Ulrich and Everett, Geol. Surv. Illinois, 1890, p. 264, pl. 2, fig. 1.

Black River (Platteville): Near Dixon, Illinois.

Anthaspidella firma Ulrich and Everett.
Anthaspidella firma Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 263, pl. 2, figs. 3, 3a.
Black River (Platteville): Near Dixon, Illinois.

Anthaspidella florifera Ulrich and Everett.
Anthaspidella florifera Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 259, pl. 1, fig. 2; pl. 4, fig. 2.
Black River (Platteville): Near Dixon, Illinois.

Anthaspidella grandis Ulrich and Everett.
Anthaspidella grandis Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 262, pl. 2, figs. 2, 2a.
Black River (Platteville): Near Dixon, Illinois.

Anthaspidella? magnifica Ulrich and Everett.
Anthaspidella? magnifica Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 265, pl. 8, figs. 2, 2a–c.
Black River (Platteville): Near Dixon, Illinois.

Anthaspidella mammulata Ulrich and Everett.
Anthaspidella mammulata Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 258, pl. 1, figs. 1, 1a–d.
Black River (Platteville): Near Dixon, Illinois.

Anthaspidella obliqua Ulrich and Everett.
Anthaspidella obliqua Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 265, pl. 4, figs. 1, 1a.
Black River (Platteville): Near Dixon, Illinois.

Anthaspidella parvistellata Ulrich and Everett.
Anthaspidella parvistellata Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 260, pl. 1, fig. 3.
Black River (Platteville): Near Dixon, Illinois.

Anthaspidella scutula Ulrich and Everett.
Anthaspidella scutula Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 261, pl. 3, fig. 1, 1a.
Black River (Platteville): Near Dixon, Illinois.

ANTHES Goldfuss. See Peltura Milne-Edwards.

ANTHOCRINUS Müller. See Cyathocrinus Miller.

ANTHOCYSTIS Haeckel. See Callocystites Hall.

ANTHOCYSTIS HALLIANA Haeckel. See Callocystites jewetti.

ANTHOPHYLLUM DENTICULATUS Goldfuss. See Zaphrentis denticulatus.

ANTHOPHYLLUM EXPANSUM Owen. See Ptychophyllum expansum.

ANTIRHYNCHONELLA Quenstedt. See Conchidium Linnæus.

APARCHITES Jones. Genotype: A. whiteavesi Jones.
Aparchites Jones, Ann. Mag. Nat. Hist., 6th ser., 3, 1889, p. 384.—Miller, N. A. Geol. Pal., 1889, p. 529.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 643; Zittel-Eastman Textb. Pal., 1, 1900, p. 644.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 343.—Bassler, Zittel-Eastman Textb. Pal., 2d. ed., 1913, p. 737.

Aparchites arrectus Ulrich.
Aparchites arrectus Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 646, pl. 43, figs. 35, 36.
Black River (Decorah): St. Paul, Minnesota.
Holotype.—Cat. No. 41836, U.S.N.M.

Aparchites billingsi (Jones).
Leperditia Billingsi Jones, Ann. Mag. Nat. Hist., 5th ser., 8, 1881, p. 345, pl. 20, fig. 9.
Aparchites billingsii Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 3, 1897, p. 231.
Silurian or Devonian: Lake Winnepegosis, Canada.

Aparchites chatfieldensis Ulrich.
Aparchites chatfieldensis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 646, pl. 43, figs. 37, 38.
Black River (Decorah): Chatfield, Minnesota.
Holotype.—Cat. No. 41829 U.S.N.M.

Aparchites concinnus (Jones).
Cytheropsis concinna Jones, Ann. Mag. Nat. Hist., 3d ser., 1, 1858, p. 249, pl. 10, figs. 3, 4; Geol. Surv. Canada, dec. 3, 1858, p. 99.
Primitia concinna Jones and Holl, Ann. Mag. Nat. Hist., 3d ser., 16, 1865, p. 424.
Aparchites concinnus Jones, Cont. Micro-Pal., Geol. Surv. Canada, pt. 3, 1891, p. 99.
Black River (Leray): Pauquettes Rapids, Allumette Island, Ottawa River, Canada.

Aparchites ellipticus Ulrich.
Aparchites ellipticus Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 644, pl. 43, figs. 15–17.
Black River (Decorah): Minneapolis, Minnesota.
Cotypes.—Cat. No. 41832 U.S.N.M.

Aparchites fimbriatus (Ulrich).
Leperditia fimbriata Ulrich, Amer. Geol., 10, 1892, p. 268, pl. 9, figs. 34–36.
Aparchites fimbriatus Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 645, pl. 45, figs. 10–12.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 343, fig. 1657b.
Richmond (Maquoketa): Spring Valley, Minnesota.
Holotype.—Cat. No. 41834, U.S.N.M.

Aparchites gordoni Ulrich and Bassler.
Aparchites gordoni Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 515, pl. 95, figs. 1–3.
Helderbergian (Keyser): Cumberland, Maryland.
Holotype.—Cat. No. 53283, U.S.N.M.

Aparchites granilabiatus (Ulrich).
Leperditia granilabiata Ulrich, Amer. Geol., 10, 1892, p. 267, pl. 9, figs. 31–33.
Aparchites granilabiatus Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 644, pl. 45, figs. 21–23.
Black River (Decorah): St. Paul, Minnesota.
Holotype.—Cat. No. 41828, U.S.N.M.

Aparchites granilabiatus neglectus Ulrich.
Aparchites granilabiatus neglectus Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 645.
Black River (Decorah): Minneapolis, Minnesota.
Cotypes.—Cat. No. 41835, U.S.N.M.

Aparchites millepunctatus (Ulrich).

Leperditia millepunctata Ulrich, Amer. Geol., 10, 1892, p. 268, pl. 9, figs. 37–39.

Aparchites millepunctatus Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 645, pl. 45, figs. 16–18.

Black River (Decorah): Fountain, Minnesota.

Holotype.—Cat. No. 41837, U.S.N.M.

Aparchites minutissimus (Hall).

Leperditia (Isochilina) minutissima Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 231, pl. 8, fig. 13 (adv. sheet 1871, p. 7).—Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 102, pl. 4, fig. 4.

Leperditia minutissima Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 122.

Aparchites minutissimus Ulrich, Geol. Surv. Canada, Cont. Micro-Pal., pt. 2, 1889, p. 49, pl. 9, fig. 5.—Whiteaves, ibid., Pal. Foss., 3, pt. 2, 1895, p. 126 (loc. occ.).

Eden-Richmond: Cincinnati, Ohio, and vicinity; Stony Mountain, Manitoba, Anticosti, etc.

Aparchites minutissimus robustus Ruedemann.

Aparchites minutissimus var. robustus Ruedemann, Bull. New York State Mus., 49, 1901, p. 74, pl. 7, figs. 6–11.

Mohawkian (Rysedorph): Rysedorph Hill, Rensselaer County, New York.

Aparchites minutissimus trentonensis Ulrich.

Aparchites minutissimus var. trentonensis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 646, pl. 43, figs. 18–20.

Black River (Decorah) and Trenton (Prosser): Fountain, Cannon Falls, etc., Minnesota.

Cotypes.—Cat. Nos. 41302, 41303, U.S.N.M.

Aparchites mundulus Jones.

Aparchites mundulus Jones, Geol. Surv. Canada, Cont. Micro-Pal., pt. 3, 1891, p. 62, pl. 10, figs. 12a, b.

Trenton: Falls of Lorette, Quebec.

Aparchites oblongus Ulrich.

Aparchites oblongus Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 137, pl. 10, figs. 10a–10c.

Richmond (Arnheim): Middletown, Ohio.

Holotype.—Cat. No. 41811, U.S.N.M.

Aparchites parvulus Jones.

Aparchites parvulus Jones, Geol. Surv. Canada, Pal. Foss., 3, pt. 3, 1897, p. 230, pl. 22, figs. 4a–4c.

Black River or Richmond: Little Black Island, Lake Winnipeg, Canada.

Aparchites tyrrelli Jones.

Aparchites Tyrrellii Jones, Geol. Surv. Canada, Cont. Micro-Pal., pt. 3, 1891, p. 62, pl. 13, figs. 14a–c.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 3, 1897, p. 242 (loc. occ.).

Black River or Richmond: Great Black Island, Like Winnipeg, Canada.

APARCHITES UNICORNIS Ulrich. See Primitiella unicornis.

Aparchites whiteavesi Jones.

Aparchites Whiteavesi Jones, Ann. Mag. Nat. Hist., 6th ser., 3, 1889, p. 384, figs. 5, 6, pl. 17, fig. 10.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 3, 1897, p. 230.

Black River or Richmond: Lower Fort Garry, St. Andrew, Manitoba.

APATOKEPHALUS Brögger. Genotype: Trilobites serratus Boeck.

Apatokephalus Brögger, Nyt. Mag. f. Naturvid, 36, 1897, p. 184.

Tramoria Reed, Quart. Jour. Geol. Soc. London, 55, 1899, p. 758, pl. 49, figs. 14–16; Geol. Mag., dec. 4, 7, 1900, p. 46.

Apatokephalus corax (Billings).

Dikelocephalus? corax Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 334, fig. 322a, b.—Matthew, Trans. Royal Soc. Canada, 10, sec. 4, 1893, p. 11, footnote.

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

Apatokephalus finalis (Walcott).

Dicellocephalus finalis Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 89, pl. 12, figs. 12, 12a, 22.—Matthew, Trans. Royal Soc. Canada, 10, sec. 4, 1893, p. 11, footnote.

Apatokephalus finalis Brögger, Nyt. Mag. f. Naturvid., 1897, p. 175, fig. 6a, p. 184.

Upper Pogonip: Ridge east of Hamburg Ridge, Eureka District, Nevada.

Cotypes.—Cat. No. 24563, U.S.N.M.

APATOKEPHALUS MAGNIFICUS Brögger. See Hungaia magnifica.

APATOKEPHALUS SCHLOTHEIMI Billings. See Remopleurides? schlotheimi.

APHETOCERAS Hyatt. Genotype: A. americanum Hyatt.

Aphetoceras Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 447.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 771.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 65.

Aphetoceras americanum Hyatt.

Aphetoceras americanum Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 447, pl. 6, figs. 5–8.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 65.

Canadian: Port au Choix, Newfoundland.

Aphetoceras attenuatum Hyatt.

Lituites farnsworthi Billings (part), Geol. Surv. Canada, Pal. Foss., 1, 1861, p. 21.

Aphetoceras attenuatum Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 449.—Ruedemann, Bull. New York State Mus., 90, Pal., 14, 1906, p. 475.

Canadian (Beekmantown): Phillipsburg, Missisquoi County, Quebec.

Aphetoceras boreale Hyatt.

Aphetoceras boreale Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 448, pl. 5, figs. 15–17.

Canadian: Schooner Island, Newfoundland.

Aphetoceras complanatum (Shumard).

Lituites complanata Shumard, Trans. Acad. Sci. St. Louis, 2, 1863, p. 107.—Keyes, Missouri Geol. Surv., 5, 1895, p. 225.

Aphetoceras complanatum Miller, N. A. Geol. Pal., 2d App., 1897, p. 771 (gen. ref.).

Canadian (Yellville): Ozark County, Missouri.

Aphetoceras farnsworthi (Billings).

Lituites Farnsworthi Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 21, fig. 24 (adv. sheets, 1861); Geol. Vermont, 2, 1862, p. 958, fig. 364; Rep. Econ. Geol., etc., Vermont, 1862, p. 230, fig. 364; Geol. Canada, Geol. Surv. Canada, 1863, p. 277, fig. 283.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 354, fig.

Aphetoceras farnsworthi—Continued.

Aphetoceras farnsworthi Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 448.—Ruedemann, Bull. New York State Mus., 90, Pal., 14, 1906, p. 473, fig. 24.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 65, fig. 1273.

Canadian (Beekmantown): Phillipsburg, Missisquoi County, Quebec.

APHYLLOSTYLUS Whiteaves. Genotype: A. gracilis Whiteaves.

Aphyllostylus Whiteaves, Ottowa Naturalist, 18, 1904, p. 113.

Aphyllostylus gracilis Whiteaves.

Aphyllostylus gracilis Whiteaves, Ottawa Nat., 18, 1904, p. 114; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 278, pl. 24, figs. 1, 1a.

Niagaran: Stonewall, Manitoba.

APIOCERAS Saemann. See Poterioceras McCoy.

APIOCRINITE(?) Anthony. See Glyptocrinus decadactylus.

APIOCYSTIS Haeckel. See Apiocystites Forbes.

APIOCYSTITES Hall. See Hallicystis Jaekel.

APIOCYSTITES Jaekel. See Lepocrinites Conrad.

APIOCYSTITES Forbes. Genotype: A. pentrematoides Forbes.

Apiocystites Forbes, Mem. Geol. Surv. Great Britain, 2, pt. 2, 1848, pp. 501, 503.—Hall, Pal. New York, 2, 1852, p. 242.—Muller, Ann. Mag. Nat. Hist., 2d ser., 13, 1854, p. 248.—Pictet, Traité de Pal., 2d ed., 4, 1857, p. 298.—Chapman, Canadian Jour., n. s., 2, 1857, p. 303.—Hall, Pal. New York, 3, 1861, pp. 126, 151.—Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 354.—Miller, N. A. Geol. Pal., 1889, p. 224.—Jaekel, Stammesg. Pelmat., 1, Thecoidea u. Cystoidea, Berlin, 1899, p. 279 (part).—Schuchert, Smiths. Misc. Coll., 47, pt. 2, 1904, p. 210.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 154.

Apiocystis Haeckel, Amphorideen u. Cystoideen, Leipzig, 1896, p. 132.—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 61.—Zittel, Grundzuge Pal., 1, 1910, p. 187.

Lepadocrinus Bather (part), Treatise on Zool. (Lankester), pt. 3, 1900, p. 61.

APIOCYSTITES CANADENSIS Billings. See Callocystites canadensis.

Apiocystites elegans (Hall).

Apiocystites elegans Hall, Pal. New York, 2, 1852, p. 243, pl. 51, figs. 1–17.—Jaekel, Stammesg. Pelmat., 1, Thecoidea u. Cystoidea, Berlin, 1899, p. 282.—Schuchert, Smiths. Misc. Coll., 47, pt. 2, 1904, p. 212, pl. 34, figs. 4, 5.

Apiocystis elegans Haeckel, Amphorideen u. Cystoideen, 1896, pl. 3, figs. 4–9.

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

APIOCYSTITES GEBHARDII Jaekel. See Lepocrinites gebhardi.

APIOCYSTITES HURONENSIS Billings. See Brockocystis huronensis.

APIOCYSTITES IMAGO Hall. See Hallicystis imago.

APIOCYSTITES TECUMSETH Billings. See Brockocystis tecumseth.

APLOCRINUS D'Orbigny. See Haplocrinus Steininger.

APSIDOCERAS Hyatt. Genotype: Gyroceras (Lituites) magnificum Billings.

Apsidoceras Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 289.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 695.

APSIDOCERAS INSIGNE Whiteaves. See Litoceras insigne.

Apsidoceras magnificum (Billings).
Gyroceras (Lituites) magnificum Billings, Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, p. 307.
Lituites? magnificum Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 23 (loc. ref.).
Apsidoceras magnificum Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 289.
Richmond (English Head and Charleton): Southwest End Lighthouse, Anticosti.

ARABELLITES Hinde. Genotype: A. hamatus Hinde.
Arabellites Hinde, Quart. Jour. Geol. Soc. London, 25, 1879, p. 377.—Miller, N. A. Geol. Pal., 1889, p. 517.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 240.

Arabellites aciculatus James.
Arabellites aciculatus James, Jour. Cincinnati Soc. Nat. Hist., 7, 1884, p. 148, pl. 7, fig. E.
Maysville (Fairmount): Near Loveland, Ohio.

Arabellites ascialis Hinde.
Arabellites ascialis Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 378, pl. 18, fig. 21,
Cincinnatian (Pulaski): Toronto, Ontario.

Arabellites cervicornis Hinde.
Arabellites cervicornis Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 379, pl. 19, figs. 8, 12.
Cincinnatian (Pulaski): Toronto, Ontario.

Arabellites cornutus Hinde.
Arabellites cornutus Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 377, pl. 18, figs. 13–15.
Cincinnatian (Pulaski): Toronto, Ontario.

Arabellites crenulatus Hinde.
Arabellites crenulatus Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 379, pl. 19, fig. 9.
Cincinnatian (Pulaski): Toronto, Ontario.

Arabellites cristatus Hinde.
Arabellites cristatus Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 378, pl. 19, fig. 7.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 241, fig. 1528g.
Eunicites cristatus Miller, N. A. Geol. Pal., 1889, p. 518 (gen. ref.).
Cincinnatian (Pulaski): Toronto, Ontario.

Arabellites cuspidatus Hinde.
Arabellites cuspidatus Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 378, pl. 18, fig. 19.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 241, fig. 1527a.
Cincinnatian (Pulaski): Toronto, Ontario.

Arabellites elegans Hinde.
Arabellites elegans Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 382, pl. 20, figs. 5, 7.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 241, fig. 1529b.
Upper Medinan (Cataract): Toronto, Ontario.

Arabellites gibbosus Hinde.

Arabellites gibbosus Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 378, pl. 18, fig. 21.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 241, fig. 1527c.

Cincinnatian (Pulaski): Toronto, Ontario.

Arabellites hamatus Hinde.

Arabellites hamatus Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 377, pl. 18, fig. 12.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 240, fig. 1526d.

Cincinnatian (Pulaski): Toronto, Ontario.

Arabellites hindei James.

Arabellites hindei James, Jour. Cincinnati Soc. Nat. Hist., 7, 1884, p. 149, pl. 7, fig. D.

Maysville (Fairmount): Near Loveland, Ohio.

Arabellites lunatus Hinde.

Arabellites lunatus Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 378, pl. 19, fig. 4–6.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 241, fig. 1528d.

Cincinnatian (Pulaski): Toronto, Ontario.

Arabellites? obliquus Hinde.

Arabellites? obliquus Hinde, Quart. Jour. Geol. Soc. London, 1879, p. 379, pl. 19, fig. 15.

Cincinnatian (Pulaski): Toronto, Ontario.

Arabellites ovalis Hinde.

Arabellites ovalis Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 378, pl. 18, fig. 16.

Cincinnatian (Pulaski): Toronto, Ontario.

Arabellites pectinatus Hinde.

Arabellites pectinatus Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 379, pl. 19, fig. 11.

Cincinnatian (Pulaski): Toronto, Ontario.

Arabellites procursus Foerste.

Arabellites procursus Foerste, Amer. Geologist. 2, 1888, p. 417, fig. 3; Geol. Surv. Ohio, Pal., 7, 1893, p. 517, fig. 3.

Richmond (Elkhorn): Todds Fork, near Wilmington, Ohio.

Arabellites quadratus Hinde.

Arabellites quadratus Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 379, pl. 19, fig. 14.

Cincinnatian (Pulaski): Toronto, Ontario.

Arabellites rectus Hinde.

Arabellites rectus Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 378, pl. 18, fig. 18.

Cincinnatian (Pulaski): Toronto, Ontario.

Arabellites scutellatus Hinde.

Arabellites scutellatus Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 379, pl. 19, fig. 16.

Cincinnatian (Pulaski): Toronto, Ontario.

Arabellites similis Hinde.

Arabellites similis Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 382, pl. 20, fig. 8.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 241, fig. 1529d.

Upper Medinan (Cataract): Toronto, Ontario.

ARACHNOCRINUS PISIFORMIS Meek and Worthen. See Lecanocrinus pisiformis.

ARACHNOPHYLLUM Dana. See Strombodes Schweigger.

ARCA Linnæus. Not a Paleozoic genus.

Arca?? browni Salter.

Arca? Brownii Salter, Quart. Jour. Geol. Soc. London, 17, 1861, p. 69, pl. 4, figs. 19, 20.

Silurian: West slope of Mt. Illampu, Bolivia.

Arca?? gracilis Hoek.

Arca gracilis Hoek, Neues Jahrb., Min., Geol., Pal., 34, 1912, pl. 8, fig. 17.

Ordovician: Totoropampa, Bolivia.

ARCA POSTSTRIATA D'Orbigny. See Lyrodesma poststriatum.

ARCHÆOCRINUS Wachsmuth and Springer.

Genotype: Glyptocrinus lacunosus Billings.

Archæocrinus Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 363 (Rev. Pal., pt. 2, p. 189); ibid., 1885, p. 318; ibid., 1890, p. 366.—Miller, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 217.—Carpenter, Phil. Trans. Roy. Soc. London, 174, 1884, pp. 929, 930.—Miller, N. A. Geol. Pal., 1889, p. 225.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 253.—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 200, fig. 125.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 145.—Weller, Bull. Chicago Acad. Nat. Hist. Surv., 4, pt. 1, 1900, p. 88, fig. 41.—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. 188.

ARCHÆOCRINUS ASPERATUS Wachsmuth and Springer. See Deocrinus asperatus.

ARCHÆOCRINUS ASPERATUS Miller and Gurley. See Diabolocrinus asperatus.

Archæocrinus? deliculatus Hudson.

Archæocrinus ? deliculatus Hudson, Bull. New York State Mus., 107, 1907, p. 129, fig. 8.

Chazyan (Valcour): Valcour Island, Lake Champlain, New York.

Archæocrinus depressus Weller.

Archæocrinus depressus Weller, Bull. Chicago Acad. Sci. Nat. Hist. Surv., 4, pt. 1, 1900, p. 89, pl. 3, figs. 9–10.

Niagaran (Racine): Bridgeport, Cicero, and Hawthorne, Illinois.

Archæocrinus desideratus W. R. Billings.

Archæocrinus desideratus W. R. Billings, Trans. Ottawa Field Nat. Club, 2, 1885, p. 249, pl. fig.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 257, pl. 10, figs. 4a, b.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 200, fig. 125.

Trenton (Curdsville): Ottawa, Ontario.

Archæocrinus knoxensis Miller and Gurley.

Archæocrinus knoxensis Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 6, 1895, p. 34, pl. 3, fig. 12–15.

Chazyan (Ottosee): Knox County, Tennessee.

Archæocrinus lacunosus (Billings).

Glyptocrinus lacunosus Billings, Geol. Surv. Canada, Rep. Progress for 1853–1856, 1857, p. 261; Geol. Surv. Canada, dec. 4, 1859, p. 61, pl. 8, figs. 3a–3e.

Archæocrinus lacunosus Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 364 (Rev. Pal., pt. 2, p. 190); Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 255, pl. 10, fig. 1.—Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 11 (loc. occ.).

Trenton (Curdsville): Ottawa and Kirkfield, Ontario.

Archæocrinus marginatus (Billings).

Glyptocrinus marginatus Billings, Geol. Surv. Canada, Rep. Progr. for 1853–1856, 1857, p. 260; Geol. Surv. Canada, dec. 4, 1859, p. 59, pl. 9, fig. 1a.

Archæocrinus marginatus Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 364 (Rev. Pal., pt. 2, p. 190); Mem. Mus. Comp. Zool., Harvard, 20, 1897, pp. 254, 275, pl. 20, fig. 2

Trenton (Curdsville): Ottawa, Ontario.

Archæocrinus microbasilis (Billings).

Thysanocrinus (Rhodocrinus) microbasilis Billings, Geol. Surv. Canada, Rep. Progr. for 1853–1856, 1857, p. 264.

Rhodocrinus microbasilis Billings, Geol. Surv. Canada, dec. 4, 1859, p. 63, pl. 6, fig. 2.

Archæocrinus microbasilis Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 364 (Rev. Pal., pt. 2, p. 190); Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 256, pl. 10, fig. 2a–c.—Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 11 (loc. occ.).

Trenton (Curdsville): Ottawa and Kirkfield, Ontario.

Archæocrinus parvus Miller and Gurley.

Archæocrinus parvus Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 5, 1894, p. 21, pl. 2, figs. 26–28.—Miller, N. A. Geol. Pal., 1897, 2d App., p. 734, fig. 1298.

Chazyan (Ottosee): Knox County, Tennessee.

Archæocrinus peculiaris Miller and Gurley.

Archæocrinus peculiaris Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 5, 1894, p. 17, pl. 2, figs. 1–3.—Miller, N. A. Geol. Pal., 1897, 2d App., p. 734, figs. 1299–1300.

Chazyan (Ottosee): Knox County, Tennessee.

Archæocrinus pyriformis (Billings).

Thysanocrinus (Rhodocrinus) pyriformis Billings, Geol. Surv. Canada, Rep. Progr. for 1853–1856, 1857, p. 262.

Rhodocrinus pyriformis Billings, Geol. Surv. Canada, dec. 4, 1859, p. 61, pl. 6, figs. 1a–d.

Archæocrinus pyriformis Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 364 (Rev. Pal., pt. 2, p. 190) (gen. ref.); Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 255, pl. 10, fig. 3a, b.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 550.—Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 11.

Trenton (Curdsville): Ottawa, Montreal, and Kirkfield, Canada.

Archæocrinus? ramulosus Wachsmuth and Springer. See Glyptocrinus ramulosus.

Archæocrinus sculptus Wachsmuth and Springer. See Diabolocrinus vesperalis.

Archæocyathus Minganensis Billings. See Archæoscyphia minganensis.

ARCHÆOSCYPHIA Hinde. Genotype: Archæocyathus minganensis Billings.

Archæocyathus (part) Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 354.

Archæoscyphia Hinde, Quart. Jour. Geol. Soc. London, 45, 1894, p. 142.—Rauff, Palæontographica, 40, 1894, p. 238.

Archæoscyphia minganensis (Billings).

Petraia minganensis Billings, Canadian Nat. Geol., 4, 1859, p. 346.

Archæocyathus Minganensis Billings, New sp. L. Sil. Foss., 1861, p. 5; Pal. Foss. 1, Geol. Surv. Canada, 1865, p. 354, figs. 342a, b, 343a, 344; Geol. Vermont, 2, 1861, p. 945; Rep. Econ. Geol., etc., Vermont, 1862, p. 217.—Nicholson, Man. Pal., 1872, p. 68, fig. 15.—Dawson, Life's Dawn on Earth, 1875, p. 152, fig. 38.—Roemer, Leth. geog., 1, Leth. Pal., Atlas, 1876, pl. 2, fig. 2a; Ibid., 1880, p. 299, pl. 2, figs. 2a, b.—Zittel, Handb. Pal., 1, 1880, pp. 173, 728.—Hinde, Quart. Jour. Geol. Soc., London, 40, 1884, p. 835; Geol. Mag., dec. 3, 5, 1888, p. 226, 227, fig. 1.

Archæoscyphia minganensis Hinde, Quart. Jour. Geol. Soc. London, 45, 1889, p. 143, pl. 5, figs. 12–14; Canadian Rec. Sci., 3, 1889, p. 373.—Rauff, Palæontographica, 40, 1894, p. 240, pl. 1, figs. 1–10.

Ethmophyllum minganense Walcott, Bull. U. S. Geol. Surv., 30, 1886, p. 77, fig. 6–8.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, pp. xxii, 225, figs.

Canadian (Romaine): Mingan Islands, Canada.

ARCHINACELLA Ulrich and Scofield. Genotype: A. powersi Ulrich and Scofield.

Metoptoma Billings (part), Geol. Surv. Canada, Pal. Fossils, 1, 1865, p. 39.

Tryblidium Whiteaves (part), Geol. Surv. Canada, Pal. Fossils, 3, 1884, p. 31.—Whitfield, Bull. Amer. Mus. Nat. Hist., 1 and 2, 1886–9.

Archinacella Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, pp. 821–828.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 605.—Berkey, Amer. Geol., 21, 1898, p. 278.

Archinacella? billingsi (Walcott).

Metoptoma Billingsi Walcott, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 212, pl. 17, figs. 12, 12a.

Black River (Lowville): Russia, Herkimer County, New York.

Archinacella canadensis (Whiteaves).

Tryblidium Canadense Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 31, pl. 5, figs. 1, 1a.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1234, text figs.

Capulus Canadensis Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 69, pl. 11, fig. 1.

Archinacella canadensis Ulrich and Scofield Geol. Minnesota, 3, pt. 2, 1897, p. 825 (gen. ref.).

Niagaran (Guelph): Hespeler, Ontario.

Archinacella cingulata Ulrich.

Archinacella cingulata Ulrich Geol. Minnesota, 3, pt, 2, 1897, p. 829, pl. 61, figs. 1, 2.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 606, fig. 805 g, h.

Triblidium cingulatum Miller, N. A. Geol. Pal., 2d App., 1897, p. 771 (gen. ref.).

Trenton (Curdsville): Mercer County, Kentucky.

Holotype.—Cat. No. 45686, U.S.N.M.

Archinacella clochensis Foerste.

Archinacella clochensis Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 308, pl. 2, figs. 5a–b.

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

Archinacella deformata (Hall).

Orbicula? deformata Hall, Pal. New York, 1, 1847, p. 23, pl. 4, figs. 10a, 10b. (Orbicula deformis in explanation of plate.)

Crania? deformata Miller, N. A. Geol. Pal., 1889, p. 341.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 150.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 189.

Archinacella? deformata Raymond, Amer. Jour. Sci., 4th ser., 20, 1905, p. 375; Ann. Carnegie Mus., 4, 1908, p. 171, pl. 46, figs. 1–6.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 605, fig. 806.

Metoptoma deformis Billings, Geology Canada, 1863, p. 937.

Discina deformis Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 1, fig. 10.

Stenotheca dubia Whitfield and Hovey, Bull. Amer. Mus. Nat. Hist., 11, 1898, p. 58.

Metoptoma dubia Hall, Pal. New York, 1, 1847, p. 23, pl. 4, figs. 11a, 11b.

Chazyan (Day Point-Valcour): Crown Point, Valcour Island and Chazy, New York; Aylmer, Canada.

Archinacella deleta (Sardeson).

Carinaropsis deleta Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, 1892, p. 335, pl. 6, figs. 5, 6.

Archinacella deleta Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 831, pl. 61, figs. 16–20.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 606, fig. 805c–e.

Black River (Decorah): Minneapolis, St. Paul, Cannon Falls, etc., Minnesota.

Plesiotype.—Cat. No. 45687, U.S.N.M.

Archinacella depressa Ulrich and Scofield.

Archinacella depressa Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 830, pl. 61, figs. 8 and 9.

Black River (Platteville): Minneapolis, Minnesota.

Plastotype.—Cat. No. 45688, U.S.N.M.

Archinacella estella (Billings).

Metoptoma estella Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 153, fig. 134a, b (advance sheets, 1862); Cat. Sil. Fossils Anticosti, Geol. Surv. Canada, 1866, p. 18 (loc. ref.).

Tryblidium? estella, Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1894, p. 31 (gen. ref.).

Archinacella estella Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 829 (gen. ref.).

Richmond (English Head): English Head, Anticosti.

Archinacella indianensis (Miller).

Tryblidium indianense Miller, 17th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1892, p. 695, pl. 14, fig. 14 (adv. sheets, 1891, p. 85).—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 977, pl. 39, fig. 11.

Richmond: Fayette County, Indiana.

Observation.—Compare Archinacella richmondensis Ulrich.

Archinacella instabilis (Billings).

Metoptoma instabilis Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 251, fig. 236a, b.

Tryblidium? instabilis Whiteaves, Pal. Fossils, Geol. Surv. Canada, 3, pt. 1, 1884, p. 31 (gen. ref.).

Archinacella instabilis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 829 (gen. ref.).

Chazyan (Quebec L): Table Head, Newfoundland.

Archinacella instabilis incurva Ulrich and Scofield.

Archinacella instabilis var. incurva Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 835, pl. 61, figs. 21–23.

Black River (Decorah): Goodhue County, Minnesota.

Holotype.—Cat. No. 45689, U.S.N.M.

Archinacella orbiculata (Hall).

Carinaropsis orbiculatus Hall, Pal. New York, 1, 1847, p. 306, pl. 83, figs. 8a–c.

Helcion orbiculatus D'Orbigny, Prodr. Pal., 1, 1849, p. 9 (gen. ref.).—Emmons, Amer. Geol., 1, pt. 2, 1855, p. 164.

Archinacella orbiculata Ruedemann, Bull. New York State Mus., 162, 1912, p. 108, pl. 7, figs. 1–6.

Trenton (Snake Hill): Snake Hill, Waterford, etc., New York.

Archinacella patelliformis (Hall).

Carinaropsis patelliformis Hall, Pal. New York, 1, 1847, p. 183, pl. 40, figs. 2a, b.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 314; N. A. Geol. Pal., 1889, p. 400, fig. 659.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 117, figs.

Helcion patelliformis Emmons, Amer. Geology, 1, pt. 2, 1855, p. 164, pl. 6, fig. 1.—D'Orbigny, Prodr. Pal., 1, 1849, p. 9 (gen. ref.).

Archinacella patelliformis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 832 (gen. ref.).—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 174, pl. 12, figs. 1, 2.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 606.

Black River-Maysville: Middleville, etc., New York (Trenton); New Jersey; Ohio; Missouri, etc.

Archinacella perovalis (Whitfield).

Metoptoma perovalis Whitfield, Ann. Rep. Geol. Surv. Wisconsin, 1878, p. 74; Geol. Wisconsin, 4, 1882, p. 211, pl. 5, figs. 13 and 14.

Archinacella perovalis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 830, pl. 82, figs. 3 and 4.

Metoptoma explanata Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, 1892, p. 337, pl. 6, figs. 7, 8.

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

Archinacella phillipsi (Walcott).

Metoptoma phillipsi Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 83, pl. 1, figs. 4, 4a.

Archinacella phillipsi Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 829 (gen. ref.)

Upper Pogonip: Pogonip Ridge, Eureka District, Nevada.

Cotypes.—Cat. No. 17359, U.S.N.M.

Archinacella pileolum (Whitfield).

Triblidium pileolum Whitfield, Bull. Amer. Mus. Nat. Hist., 2, 1889, p. 46, pl. 7, figs. 15–17.

Tryblidium pileolum Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p.1236, figs.

Archinacella pileolum Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 826 (gen. ref.).

Canadian (Beekmantown): Beekmantown, New York.

Archinacella powersi Ulrich and Scofield.

Archinacella powersi Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 829, pl. 61, figs. 3–5, p. 820, fig. 1a.

Archinacella powersi—Continued.

Triblidium powersi Miller, N. A. Geol. Pal., 2d App., 1897, p. 771 (gen. ref.)

Black River (Platteville): Beloit, Wisconsin.

Plastotype.—Cat. No. 45690, U.S.N.M.

Archinacella? propria Raymond.

Metoptoma montrealensis Raymond (not Billings), Bull. Amer. Pal., 14, 1902, p. 34.

Archinacella? propria Raymond, Ann. Carnegie Mus., 3, 1906, p. 575; 4, 1908, p. 172, pl. 46, figs. 7, 8.

Chazyan (Day Point, Crown Point): Crown Point, Valcour Island, and Chazy, New York.

Archinacella pulaskiensis Foerste.

Carinaropsis patelliformis Hull (part), Pal. New York, 1, 1847, p. 306, pl. 83, figs. 7a, b.

Archinacella pulaskiensis Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 309, pl. 3, fig. 3a–d.

Cincinnatian (Pulaski): Pulaski, Lorraine, etc., New York.

Archinacella richmondensis Ulrich.

Archinacella richmondensis Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 834, pl. 61, figs. 6, 7.

Richmond (Whitewater): Richmond, Indiana.

Holotype.—Cat. No. 45691, U.S.N.M.

Observation.—Compare Archinacella indianensis (Miller).

Archinacella rotunda Ulrich and Scofield.

Archinacella rotunda Ulrich and Schofield, Geol. Minnesota, 3, pt. 2, 1897, p. 835, pl. 61, figs. 24, 25.

Triblidium rotundum Miller, N. A. Geol. Pal., 2d App., 1897, p. 771 (gen. ref.).

Richmond (Maquoketa): Near Graf, Iowa.

Holotype.—Cat. No. 45692, U.S.N.M.

Archinacella rugatina Ulrich.

Archinacella rugatina Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 835, pl. 82, figs. 5, 6.

Richmond (Arnheim): Middletown, Ohio.

Holotype.—Cat. No. 43693, U.S.N.M.

Archinacella semicarinata Ulrich and Scofield.

Archinacella semicarinata Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 833, pl. 61, figs. 12, 13.

Trenton (Prosser): Cannon Falls, Goodhue County, Minnesota.

Holotype.—Cat. No. 43694, U.S.N.M.

Archinacella similis (Whitfield).

Metoptoma similis Whitfield, Ann. Rep. Wisconsin Geol. Surv. for 1877, 1878, p. 61; Geol. Wisconsin, 4, 1882, p. 196, pl. 3, figs. 12, 13.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 142, fig.

Tryblidium simile Sardeson, Jour. Geol., 11, 1903, p. 479, fig. 3.

Archinacella similis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 829 (gen. ref.).

Ozarkian (Mendota): East of Baraboo, Wisconsin.

Archinacella simplex (Billings).

Metoptoma simplex Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 346, fig. 334.

Archinacella simplex—Continued.

Tryblidium simplex Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 31 (gen. ref.).—Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 306, pl. 24, figs. 30, 31.—Seely, Rep. Vermont State Geol., 7, 1910, pl. 62, figs. 30, 31.

Archinacella simplex Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 826 (gen. ref.).

Canadian (Beekmantown): Near Merrickville, Ontario.

Archinacella simulatrix Ulrich and Scofield.

Archinacella simulatrix Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 833, pl. 61, figs. 10, 11.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 606, fig. 805f, i.

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

Trenton (Hermitage): Frankfort, Kentucky.

Holotype.—Cat. No. 45695, U.S.N.M.

Archinacella subrotunda Ulrich and Scofield.

Archinacella subrotunda Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 834, pl. 61, figs. 26, 27.

Black River (Decorah): Near Cannon Falls, Minnesota.

Holotype.—Cat. No. 45696, U.S.N.M

Archinacella trentonensis (Billings).

Metoptoma trentonensis Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 40, fig. 41a, b (adv. sheets, 1862).

Tryblidium? trentonensis Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 31 (gen. ref.).

Archinacella trentonensis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 829 (gen. ref.).

Trenton: Chevrotiere and Island of Montreal, Canada.

Archinacella valida (Sardeson).

Tryblidium validum Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, 1892, p. 337, pl. 6, figs. 1, 2.

Archinacella valida Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 832, pl. 61, figs. 14, 15.

Trenton (Prosser): Near Cannon Falls and Kenyon, Minnesota.

ARCTINURUS Castelnau. Genotype: Paradoxides boltoni Bigsby.

Arctinurus Castelnau, Essai Syst. Sil. l'Amer. Sept., 1843, p. 21.—Reed, Quart. Jour. Geol. Soc. London, 58, 1902, pp. 60, 63, 73.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 307.

Oncholichas Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 7th ser., 33, 1885, pp. 31, 39.—Koken, Die Leitfossilien, Leipzig, 1896, p. 30.

Platynotus Reed, Quart. Jour. Geol. Soc. London, 58, 1902, pp. 60, 62.

Pterolichas Gurich, Neues Jahrb. f. Minn., Geol. Pal., Beilage-Band, 14, 1901, p. 528, pl. 20, fig. 2.—Reed, Quart. Jour. Geol. Soc. London, 58, 1902, pp. 62, 73.

Arctinurus boltoni (Bigsby).

Paradoxides boltoni Bigsby, Jour. Acad. Nat. Sci. Philadelphia, 1st ser., 4, pt. 2, 1825, p. 365, pl. 23.—Green, Mon. Tril. N. A., 1832, p. 60, pl. 1, fig. 5.—Harlan, Trans. Geol. Soc. Pennsylvania, pt. 1, 1834, p. 103.

Arctinurus boltoni Castelnau, Essai Syst. Sil. l'Amer. Sept., 1843, p. 21, pl. 3, fig. 2.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 307, fig. 1618.

Arctinurus boltoni—Continued.

Platynotus boltoni Conrad, Rep. New York State Geol Surv., 1838, p. 118.—Hall, Geol. New York, pt. 4, Tab. Org. Rem., 1843, p. 19, fig. 1.

Lichas boltoni Hall, Pal. New York, 2, 1852, p. 311, pl. 69; pl. 70, figs. 1a–g, j–l (not figs. 1h–i).—Gebhard, 8th Rep. New York State Cab. Nat. Hist., 1855, p. 29, pl. 69, fig. 1.—Meek and Worthen, Geol. Surv. Illinois, 6, 1875, p. 508, pl. 25, fig. 5.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 336, fig.—Clarke, 10th Rep. State Geol. New York, 1891, p. 88; 44th Rep. New York State Mus., 1892, p. 112.—Keyes, Missouri Geol. Surv., 4, 1894, p. 226.—Grabau, Bull. New York State Mus., 45, 1901, p. 225, pl. 17.

Lichas (Oncholichas) Boltoni Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 7th ser., 33, 1885, p. 31.

Pterolichas boltoni Gurich, Neues Jahrb. f. Min., Geol. Pal., Beilage-Band, 14, 1901, p. 528, pl. 20, fig. 2.

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

Plastotype.—Cat. No. 4888, U.S.N.M.

Arctinurus chicagoensis Weller.

Arctinurus chicagoensis Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 248, pl. 23, figs. 7, 8; pl. 22, fig. 14.

Niagaran (Racine): Hawthorne, Illinois.

Arctinurus harrisi (Miller).

Lichas harrisi Miller, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 106, pl. 3, fig. 9.

Lichas (Platynotus) harrisi Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 753.

Richmond (Liberty): Near Waynesville, Ohio.

Holotype.—Cat. No. 40690, U.S.N.M.

Arctinurus nereus (Hall).

Lichas boltoni Hall, Pal. New York, 2, 1852, p. 311, pl. 70, figs. 1h–i (not figs. 1a–g, j–l).

Lichas nereus Hall, 16th Rep. New York State Cab. Nat. Hist., 1863, p. 226.—Van Ingen, School of Mines Quart., 23, 1901, p. 64, pl. figs. 14–26.

Arctinurus nereus Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 308.

Niagaran: Lockport, New York (Rochester); St. Clair Springs, Independence County, Arkansas (St. Clair).

Arctinurus obvius (Hall).

Lichas obvius Hall, 20th Rep. New York State Cab. Nat. Hist., 1870 (rev. ed.), p. 424, pl. 25, fig. 10.

Lichas (Oncholichas) obvia Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 7th ser., 33, 1885, p. 31.

Niagaran: Lyons, Iowa.

Arctinurus occidentalis (Hall).

Lichas boltoni Worthen and Meek, Geol. Surv. Illinois, 6, 1875, p. 508, pl. 25, fig. 5.

Lichas boltoni var. occidentalis Hall, Trans. Albany Inst., 4, 1864, p. 223; 28th Rep. New York State Mus. Nat. Hist. (doc. ed.), 1877, pl. 34, figs. 8–11; (mus. ed.), 1879, p. 198, pl. 34, figs. 8–11; 11th Rep. Dep. Geol. Nat. Hist. Indiana, 1882, p. 344, pl. 36, figs. 8–11, 12.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 335, fig.—Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 272.

Arctinurus occidentalis Weller, Bull. Chicago Acad. Sci., Nat. Hist., Surv., 4, pt. 2, 1907, p. 247, pl. 20, figs. 10–12.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 308, fig. 1621a.

Arctinurus occidentalis—Continued.

Niagaran: Waldron, Indiana, and Newsom, Tennessee (Waldron); Grafton, Joliet, and Bonfield, Illinois; Cumberland Gap, Tennessee (Clinton).

ARENICOLA SALTER. See Arenicolites Salter.

ARENICOLITES Salter. Genotype: Arenicola didyma Salter.

Arenicola Salter (not Leach), Quart. Jour. Geol. Soc. London, 12, 1856, p. 248.

Arenicolites Salter, Quart. Jour. Geol. Soc. London, 13, 1857, p. 204.—Nathorst. Kongl. Sven. Vet.-Akad. Handl., 18, No. 7, 1881, p. 49.—Whitfield, Geol. Wisconsin, 4, 1882, p. 177.—Miller, N. A. Geol. Pal., 1889, p. 517.

ARENICOLITES (SCOLITHUS) LINEARIS. See Scolithus linearis.

Arenicolites sparsus Salter.

Arenicolites sparsus Salter, Quart. Jour. Geol. Soc. London, 13, 1857, p. 203.—Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 138.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 41, fig.17.

Silurian: Europe; Dundas, Ontario (Cataract).

ARETHUSINA Barrande. Genotype: Arethusa koninckii Barrande.

Arethusa Barrande, Notice Prel., Syst. Sil. Boheme, 1846, p. 48.

Arethusina Barrande, Neues Jahrb. f. Min., etc., 1850, p. 780; Syst. Sil. du Centre Boheme, 1, 1852, p. 493.—Pictet, Traite de Pal., 2d ed., 2, 1854, p. 498.—Barrande, Neues Jahrb. f. Min., Geol. Pal., 1868, p. 257.—Œhlert, Bull. Soc. d'Etudes Sci. d'Angers, 1885, p. 4.—Zittel, Handb. Pal., 2, 1885, p. 624.—Beecher, Amer. Jour. Sci., 3d ser., 46, 1893, p. 143; Amer. Geol., 16, 1895, pp. 167, 176.—Koken, Die Leitfossilien, Leipzig, 1896, p. 24.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 34, No. 8, 1901, p. 32.

Arethusina americana Walcott.

Arethusina Americana Walcott, Mono. U. S. Geol. Surv., 8, 1884, p. 62, pl. 9, fig. 27.—Brogger, Geol. Foren. Stockholm Forhandl., 8, 1886, p. 206.

Harpides? americanus Frech, Leth. geog., Th. 1, Leth. Pal., 2, 1897, p. 44, footnote.

Cambrian and ?Ordovician (Pogonip): Eureka District, Nevada.

Arethusina argentina Kayser.

Arethusina argentina Kayser, Beitr. Geol. Pal. Argentinischen Republik, Palæontographica Supp., 3, 1876, p. 12, pl. 2, fig. 2.

Ordovician: Quebrada de la Laja, Argentina.

ARGASTER Hall. See Mesopalæaster Schuchert.

ARGES ARKANSANA Van Ingen. See Dicranopeltis arkansana.

ARGES PHLYCTAINODES Hall. See Corydocephalus phlyctainodes.

ARGES PHLYCTAINODES DEPAUPERATUS Van Ingen. See Corydocephalus depauperatus.

ARGES TUBERCULATUS Weller. See Corydocephalus tuberculatus.

ARIONELLUS Barrande. Genotype: A. ceticephalus Barrande.

Arionellus Barrande, Neues Jahrb. f. Min., etc., 1850, p. 779; Syst. Sil. du Centre Boheme, 1, 1852, p. 404, pl. 10.—Pictet, Traite de Pal., 2d ed., 1854, 2, p. 491.—Billings, Canadian Nat. Geol., 5, 1860, p. 313; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 405.—Kayser, Beit. Geol. Pal., Argentinischen Republik, Palæontographica Suppl., 3, 1876, p. 7.—Walcott, Science, 3, 1884, p. 281.—

ARIONELLUS—Continued.

Zittel, Handb. Pal., 2, 1885, p. 601.—Koken, Die Leitfossilien, Leipzig, 1896, p. 21, fig. 13, figs. 5, 6.—Lindström, Kongl. Sven. Vet.-Akad. Handl., 34, No. 8, 1901, pp. 22, 25.

Arionellus? cylindricus Billings.

Arionellus cylindricus Billings, Canadian Nat. Geol., 5, 1860, p. 314, fig. 14; Geol. Canada, Geol. Surv. Canada, 1863, p. 237, fig. 264; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 406, fig. 385.

Ptychaspis cylindricus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 198.

Agraulos cylindricus Miller, N. A. Geol. Pal., 1889, p. 527, fig. 955.

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

ARIONELLUS OWENI Meek and Hayden. See Ptychoparia oweni.

ARIONELLUS PUSTULATUS Walcott. See Glaphurus pustulatus.

Arionellus? subclavatus Billings.

Arionellus subclavatus Billings, Canadian Nat. Geol., 5, p. 315, fig. 15; Geol. Canada, Geol. Surv. Canada, 1863, p. 237, fig. 265a, b; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 406, fig. 386a.

Ptychaspis subclavatus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 198.

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

ARISTERELLA Ulrich. Genotype: A. nitidula Ulrich.

Aristerella, Ulrich Geol. Minnesota, 3, pt. 2, 1894, p. 524.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 779.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 518.

Aristerella nitidula Ulrich.

Aristerella nitidula Ulrich Geol. Minnesota, 3, pt. 2, 1894, p. 524, pl. 35, figs. 30–39.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 518, fig. 696c, d, e.

Black River: Chatfield, Minnesota (Decorah); Lincoln County, Missouri (Auburn).

Cotypes.—Cat. No. 46092, 46093, U.S.N.M.

Aristophycus Miller and Dyer. Genotype: A. ramosum Miller and Dyer.

Aristophycus Miller and Dyer, Contr. to Pal. No. 2, 1878, p. 3.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 7, 1884, p. 130.—Miller, N. A. Geol. Pal., 1889, p. 107.

Observation.—Genus and species abandoned by author in 1889, as probably inorganic and, if fucoidal, too irregular and too little known to be retained.

Aristophycus ramosum Miller and Dyer.

Aristophycus ramosum Miller and Dyer, Contr. to Pal., No. 2, 1878, p. 4, pl. 4, fig. 2.—James, Jour. Cincinnati Soc. Nat. Hist., 7, 1884, p. 130, pl. 6, fig. 2; 14, 1891, p. 46.—Miller, N. A. Geol. Pal., 1, 1889, p. 107.

Maysville: Cincinnati, Ohio.

Aristophycus ramosum germanum Miller and Dyer.

Aristophycus ramosum var. germanum Miller and Dyer, Contr. to Pal., No. 2, 1878, p. 4, pl. 4, fig. 3.—Miller, N. A. Geol. Pal., 1889, p. 130.—James, Jour. Cincinnati Soc. Nat. Hist., 1891, 14, p. 46.

Maysville: Cincinnati, Ohio.

ARISTOZOE Barrande. Genotype: A. bisulcata Barrande.

Aristozoe Barrande, Syst. Sil. Boheme, Sup. 1, 1872, p. 474.—Canu, Ann. Soc. geol. du Nord, 12, 1885, p. 145.—Jones Rep. 53d Meeting Brit. Assoc. Adv. Sci., 1884, p. 217; 55th Meeting, 1886, p. 358.—Zittel, Handb. d. Pal., 2,

ARISTOZOE—Continued.

Munich, 1885, p. 552.—Novak, Sitz. d. k. bohm. Gesell. d. Wiss. Math.-Naturw. Cl., 1886, p. 239.—Jones and Woodward, Mon. Brit. Pal. Phyllopoda, Pal. Soc., 1888, p. 3.—Whidborne, Mon. Dev. Fauna South England, 1, Pal. Soc., 1889, p. 42.—Miller, N. A. Geol. Pal., 1889, p. 530.—Koken, Die Leitfossilien, Leipzig, 1896, p. 40.

Aristozoe canadensis Whitfield.

Aristozoe canadensis Whitfield, Ann. New York Acad. Sci., 1890, p. 505; 5, 1891, p. 572, pl. 12, figs. 17, 18; Geol. Surv. Ohio, Pal., 7, 1893, p. 462, pl. 8, figs. 17, 18.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 379, fig. 1680e, f.

Trenton: Ottawa Basin, Ontario.

ARTHRARIA Billings. Genotype: A. antiquata Billings.

Arthraria Billings, Canadian Nat., n. s., 6, 1872, p. 467; Pal. Foss., Geol. Surv. Canada, 2, pt. 1, 1874, p. 66; Geol. Surv. Newfoundland, Rep. Progr. for 1881, 1882, App. p. 14.—Miller, N. A. Geol. Pal., 1889, p. 107.

Arthraria biclavata Miller.

Arthraria biclavata Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 354, fig. 26.

Maysville: Cincinnati, Ohio, and vicinity.

ARTHROCLEMA Billings. Genotype: A. pulchellum Billings.

Arthroclema Billings, Pal. Foss., 1, 1865, p. 54 (adv. sheets, 1862).—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 151; 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 60; Amer. Geol., 1, 1888, p. 232.—Miller, N. A. Geol. Pal., 1889, p. 293.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 12, 1890, p. 192; Geol. Surv. Illinois, 8, 1890, p. 400; Geol. Minnesota, 3, 1893, p. 197; Zittel's Textb. Pal., 1896, p. 281.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 546.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 5.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 42.—Cumings, Amer. Jour. Sci., 4th ser., 17, 1904, p. 75, fig. 83; 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 739.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 152.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 150; Zittel-Eastman Textb. Pal., 1913, p. 343.

Arthroclema angulare Ulrich.

Arthroclema angulare Ulrich, Contr. Micro-Pal. Cambro-Sil., pt. 2, 1889, p. 45; Geol. Surv. Illinois, 8, 1890, p. 641, pl. 29, figs. 6–6b.—Whiteaves, Pal. Foss., 3, 1895, p. 117.

Richmond: Wilmington, Illinois (Fernvale); Stony Mountain, Manitoba (Stony Mountain); English Head, etc., Anticosti (English Head and Charleton).

Arthroclema armatum Ulrich.

Arthroclema armatum Ulrich, Jour. Cincinnati Soc. Nat. Hist., 12, 1890, p. 194, fig. 19a–d (not e–h); Geol. Minnesota, 3, 1893, p. 201, pl. 2, figs. 8–11, 25, 28–33, pl. 3, fig. 7.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 547, fig. 111.—Sardeson, Jour. Geol., 9, 1901, p. 161.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 153, fig. 205l.—Bassler, Bull. U. S. Nat. Mus. No. 77, 1911, pp. 151, 152, fig. 73.

Trenton (Prosser): Cannon Falls and St. Paul, Minnesota.

Ordovician (Glauconite limestone): Reval, Esthonia, Russia.

Cotypes.—Cat. No. 43633, U.S.N.M.

ARTHROCLEMA ARMATUM Ulrich (part). See Arthroclema pulchellum.

Arthroclema billingsi Ulrich.

Arthroclema billingsi Ulrich, Geol. Surv. Illinois, 8, 1890, p. 642; Geol. Minnesota, 3, 1893, p. 197, pl. 2, fig. 7.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 547, fig. 105.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 153, fig. 205k.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 343, fig. 501a.

Trenton: Ottawa, Ontario.

Holotype.—Cat. No. 43415, U.S.N.M.

Arthroclema cornutum Ulrich.

Arthroclema cornutum Ulrich, Jour. Cincinnati Soc. Nat. Hist., 12, 1890, p. 193, fig. 18; Geol. Minnesota, 3, 1893, p. 200, pl. 2, figs. 16–21, 23, pl. 3, fig. 34.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 547, figs. 106–108, 112.

Black River (Decorah): Minneapolis, Minnesota.

Cotypes.—Cat. No. 43634, U.S.N.M.

Arthroclema pulchellum Billings.

Arthroclema pulchellum Billings, Pal. Foss., 1, 1865, p. 54, fig. 60 (adv. sheets, 1862); Geol. Canada, Geol. Surv. Canada, 1863, p. 157, fig. 119.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 642, pl. 29, fig. 6c; Geol. Minnesota, 3, 1893, pl. 2, figs. 12–15.

Arthroclema armatum (part) Ulrich, Jour. Cincinnati Soc. Nat. Hist., 12, 1890, p. 194, fig. 19e–h (not 19a–d).

Trenton: Ottawa, Ontario.

Arthroclema spiniforme Ulrich. See Helopora spiniformis.

Arthroclema striatum Ulrich.

Arthroclema striatum Ulrich, Geol. Minnesota, 3, 1893, p. 198, pl. 2, figs. 22, 24, pl. 3, figs. 28–33.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 547, figs. 109, 110.

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

Cotypes.—Cat. No. 43498, U.S.N.M.

Arthronema Ulrich. See Arthrostylus Ulrich.

ARTHROPHYCUS Hall. Genotype: Fucoides harlani Conrad.

Arthrophycus Hall, Pal., New York, 2, 1852, p. 4.—Dawson, Canadian Nat. and Geol., n. s., 1, 1864, p. 366.—Nathorst, Kongl. Sven. Vet.-Akad. Handl., 18, No. 7, 1881, pp. 32, 86.—James, Jour. Cincinnati Soc. Nat. Hist., 16, 1893, p. 82; Proc. Amer. Assoc. Adv. Sci., 42, 1894, p. 172.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 132; Bull. New York State Mus., 9, 1901, p. 132.—Sarle, Proc. Rochester Acad. Sci., 4, 1906, p. 203.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 247.

Harlania Goeppert, Zeits. d. d. Geol. Gesell., 3, 1851, p. 189.—Roemer, Leth. geog., 1 Theil, Leth. Pal., Erste Lief, 1880, p. 135.—Nathorst, Kongl. Sven. Vet.-Akad. Handl., 21, No. 14, 1886, p. 32.

Arthrophycus alleghaniensis (Harlan).

Fucoides alleghaniensis Harlan, Jour. Acad. Nat. Sci., 6, 1831, p. 289, pl. 15.—Taylor Trans. Geol. Soc. Pennsylvania, 1, 1834, p. 5.—Harlan, Medical and Physical Researches, 1835, p. 393, fig. 1 on plate.—Unger, Gen. et Sp. Foss. Plants, 1850, p. 30.

Arthrophycus alleghaniensis James, Jour. Cincinnati Soc. Nat. Hist., 16, 1893, p. 86.—Proc. Amer. Assoc. Adv. Sci., 42, 1894, p. 172.—Sarle, Proc. Rochester Acad. Sci., 4, 1906, p. 203.—Bassler, Bull. Geol. Surv. Virginia, 2a, 1909, pl. 8, fig. 4.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 247.

Arthrophycus alleghaniensis—Continued.

Fucoides harlani Conrad, 2d Ann. Rep. New York Geol. Surv., 1838, p. 113.—Vanuxem, Nat. Hist. New York, Geol, 3, 1842, p. 71, fig. 10.—Hall, Nat. Hist. New York, Geol., 4, 1843, p. 46, figs. 1, 2; tab. ill. 1, figs. 1, 2.—Owen, Amer. Jour. Sci. Arts, 48, 1845, p. 299, figs. 1, 2.—Hall, Pal. New York, 2, 1852, p. 5, pl. 1, fig. 1; pl. 2, figs. 1a–c.

Arthrophycus harlani Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 821, fig. 623.—Emmons, Manual Geol., 1860, p. 105, fig. 95.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, p. 52, pl. 5, figs. 10,11.—Chapman, Canadian Jour., n. s., 8, 1863, p. 209, fig. 211; Expos. Min. Geol. Canada, 1864, p. 181, fig. 211.—Whiteaves, Trans. Royal Soc. Canada, 1, sec. 4, 1883, p. 110.—Lesley, Geol. Surv. Pennsylvania Rep. P 4, 1889, p. 37–39, figs.—James, Jour. Cincinnati Soc. Nat. Hist., 16, 1893, pp. 82–86; Proc. Amer. Assoc. Adv. Sci., 42, 1894, p. 172.—Clarke, Archivos Mus. Nac. Rio de Janeiro, 10, author's Eng. ed., 1900, p. 3.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 132, pl. 16; Bull. New York State Mus., 45, 1901, p. 132, pl. 16.

Crinosoma antiqua Castelnau, Syst. Sil., 1843, p. 50, pl. 25, fig. 1.

Encrinus giganteus Eaton, Geol. Textbook, 2d ed., 1832, p. 37, pl. 1, fig. 8.

Harlania Hallii Goeppert, Nov. Act. Acad. Caes. Leop., 22, 1852, Suppl. (Uebergangsgeb, p. 98, pl. 41, fig. 4); Zeits. d. d. geol. Gesell., 3, 1852, pp. 189, 205; Saporta Le Monde des Plantes Appar. Homme, Paris, 1879, p. 164, figs. 1, 2.—Schimper, Pal. Veg., 1, 1869, p. 196, pl. 2, fig. 6.—Roemer, Leth. Geog., 1, Pal., 1880, p. 135, fig. 4.—Lesquereux, 13th Ann. Rep. Indiana Geol. Surv., 1883, p. 29, pl. 2, fig. 3.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 272, fig.—James, Proc. Amer. Assoc. Adv. Sci., 42, 1894, p. 172.—Dana, Man. Geol., New York, 4th ed., 1895, p. 545, fig. 744.—Nathorst, Forh. Geol. Foren. Stockholm, 19, pt. 5, 1897, p. 364, pl. 5.

Fucoides Brongniartii Harlan, Featherstonhaugh's Monthly Amer. Jour. Geol., 1, 1832, p. 307.—Taylor, Trans. Geol. Soc. Pennsylvania, 1, 1834, p. 14, pl. 3, fig. 6.—Harlan, Medical, Physical Res., 1835, p. 398, pl. —, fig. 2.—Conrad 1st Ann. Rep. New York Geol. Surv., 1837, p. 168.

Top of White Medina (Tuscarora, Clinch, etc.): Mifflin County, etc., Pennsylvania; New York; Ontario; Maryland; Virginia.

ARTHROPHYCUS HARLANI Rogers. See Arthrophycus alleghaniensis.

ARTHROPORA Ulrich. Genotype: Ptilodictya (Stictopora) shafferi Meek.

Arthropora Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, pp. 152, 167.—Miller, N. A. Geol. Pal., 1889, p. 293.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 393; Geol. Minnesota, 3, 1893, p. 176; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 279.—Pocta, Syst. Sil. Centre Boheme, 8, 1894, pt. 2, p. 14.—Simpson, 14th Ann. Rep. State. Geologist New York for the year 1894, 1897, p. 605.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 46.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 156.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 739.—Bassler, Bull. U. S. Nat. Mus., No. 77, 1911, p. 119; Zittel-Eastman Textb. Pal., 1913, p. 345.

Arthropora bifurcata Ulrich.

Arthropora bifurcata Ulrich, Geol. Minnesota, 3, 1893, p. 178, pl. 14, figs. 22–25.

Black River (Decorah): St. Paul and Cannon Falls, Minnesota.

Trenton: Minnesota, Kentucky, Tennessee, and Canada.

Cotypes.—Cat. No. 43504, U.S.N.M.

Arthropora cincinnatiensis (James).

Ptilodictya? cincinnatiensis James, Paleontologist, No. 5, 1881, p. 39.

Arthropora cincinnatiensis Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 14, pl. 4, fig. 7.

Maysville (Mount Hope): Cincinnati, Ohio, and vicinity.

Arthropora cleavelandi (James).

Ptilodictya cleavelandi James, Paleontologist, No. 5, 1881, p. 38.

Ptilodictya grahami James, Paleontologist, No. 5, 1881, p. 39.

Ptilodictya dubia James, Paleontologist, No. 5, 1881, p. 40.

Arthropora shafferi-cleavelandi Nickles and Bassler, Bull. U. S. Geol. Surv., 173 1900, p. 171.

Arthropora cleavelandi Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 14, pl. 3, figs. 13–16; pl. 4, fig. 6.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 766, pl. 26, fig. 10.

Eden: Cincinnati, Ohio, and vicinity.

Arthropora kentuckiensis (James).

Ptilodictya kentuckyensis James, Paleontologist, No. 5, 1881, p. 38.

Arthropora kentuckiensis Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 15, pl. 4, fig. 5.

Trenton (Upper): Ohio River bank opposite Cincinnati, Ohio.

Arthropora reversa Ulrich.

Arthropora reversa Ulrich, Geol. Minnesota, 3, 1893, p. 178, pl. 14, fig. 26.

Trenton (Prosser): St. Paul, Minnesota.

Holotype.—Cat. No. 43502 U.S.N.M.

Arthropora shafferi (Meek).

Ptilodictya (Stictopora) Shafferi Meek, Proc. Acad. Nat. Sci. Philadelphia, 1872, p. 317; Pal. Ohio, 1, 1873, p. 69, pl. 5, figs. 1a–c.

Ptilodictya shafferi Nicholson, Pal. Prov. Ontario, 1875, p. 33, fig. 4.

Stictopora shafferi Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1069, figs.

Arthropora shafferi Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 167, pl. 7, figs. 10, 10a.—Miller, N. A. Geol. Pal., 1889, p. 293, figs. 453–455.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 308, fig. 3e.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 157.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 171.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 767, pl. 26, fig. 9.

Crateripora erecta Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 29, pl. 7, figs. 29, 29a; 5, 1882, p. 151.

Stromatopora(?) lichenoides James, Paleontologist, No. 3, 1879, p. 18; Jour. Cincinnati Soc. Nat. Hist., 9, 1886, p. 251; 15, 1892, pt. 3, p. 90.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 56.

Maysville (Bellevue, Corryville): Cincinnati, Ohio, and many localities in Ohio, Indiana, Kentucky, and Tennessee.

Plesiotypes.—Cat. Nos. 43630, 43646 U.S.N.M.

Arthropora shafferi-cleavelandi Nickles and Bassler. See Arthropora cleavelandi.

Arthropora simplex Ulrich.

Arthropora simplex Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 65; Geol. Minnesota, 3, 1893, p. 177, pl. 14, figs. 12–21.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 157, fig. 208g.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 120, 121, fig. 16.

Black River (Decorah): Minneapolis, St. Paul, etc., Minnesota; Decorah, Iowa,

Ordovician (Wassalem): Uxnorm, Esthonia, Russia.

Cotypes.—Cat. No. 43503, U.S.N.M.

ARTHRORHACHIS Hawle and Corda. Genotype: Battus tardus Barrande.

Arthrorhachis Hawle and Corda, Abh. d. k. bohmischen Gesell. d. Wiss., 5 (extract), 1847, p. 114, pl. 6, fig. 60.—Raymond, Ottawa Naturalist, 26, 1913, p. 3.

Arthrorhachis galba (Billings).

Agnostus Galba Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 297, fig. 288.—Vogdes, Amer. Geol., 9, 1892, p. 395, pl. 9, fig. 6.—Bassler, Bull. Geol. Surv. Virginia, 2a, 1909, p. 111, figs. 10, 2–5.

Chazyan: Table Head, Pistolet Bay, and four miles northeast of Portland Creek, Newfoundland (Quebec—M, N, P); Lexington, Virginia (Liberty Hall).

ARTHROSTYLUS Ulrich. Genotype: Helopora tenuis James.

Arthronema (preoccupied) Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, pp. 151, 160; Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 14.

Arthrostylus Ulrich, American Geologist, 1, 1888, p. 230.—Miller, N. A. Geol. Pal., 1889, p. 293.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 12, 1890, p. 188; Geol. Surv. Illinois, 8, 1890, p. 400; Geol. Minnesota, 3, 1893, p. 187; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 280.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 527.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 42.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 152.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 740.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 147; Zittel-Eastman Textb. Pal., 1913, p. 342.

Arthrostylus conjunctus Ulrich.

Arthrostylus conjunctus Ulrich, Jour. Cincinnati Soc. Nat. Hist., 12, 1890, p. 189, fig. 14; Geol. Minnesota, 3, 1893, p. 188, pl. 3, figs. 13, 14.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 526, figs. 78, 79, 79a.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 147, 148, fig. 70; Zittel-Eastman Textb. Pal., 1913, p. 343, fig. 501d, e.

Black River (Decorah): Near Fountain, Minnesota.

Ordovician (Wassalem): Uxnorm, Esthonia, Russia.

Holotype.—Cat. No. 43636, U.S.N.M.

Arthrostylus curtus (Ulrich).

Arthronema curtum Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 161, pl. 6, fig. 9.

Arthrostylus curtus Miller, N. A. Geol. Pal., 1889, p. 293.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 171.

Maysville (Mount Hope): Covington, Kentucky.

Holotype.—Cat. No. 43639, U.S.N.M.

Observation.—Probably the basal segment of some species of Arthropora.

Arthrostylus obliquus Ulrich.

Arthrostylus obliquus Ulrich, Jour. Cincinnati Soc. Nat. Hist., 12, 1890, p. 190, figs. 14c, d; Geol. Minnesota, 3, 1893, p. 188, pl. 3, figs. 15, 16.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 152, fig. 205i.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 148, fig. 71.

Black River (Decorah): Minneapolis, Minnesota.

Ordovician (Echinospherites limestone): Wolchow River, St. Petersburg, Russia.

Holotype.—Cat. No. 43639, U.S.N.M.

Arthrostylus tenuis (James).

Helopora tenuis James, Paleontologist, No. 1, 1878, p. 3.

Arthronema tenuis Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 160, pl. 6, figs. 8–8c.

Arthrostylus tenuis Ulrich, Geol. Minnesota, 3, 1893, pl. 3, fig. 16e; Jour. Cincinnati Soc. Nat. Hist., 12, 1890, pp. 189, 190, figs. 14e, f.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 15.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 768, pl. 26, figs. 8–8c.

Arthrostylus tenuis—Continued.

Trenton (Upper) and Eden: Cincinnati, Ohio, and vicinity; Indiana and Kentucky; New York (Indian Ladder).

Plesiotypes.—Cat. No. 43637, U.S.N.M.

ASAPHELLUS Callaway. Genotype: Asaphus homfrayi Salter.

Asaphellus Callaway, Quart. Jour. Geol. Soc. London, 33, 1877, p. 663.—Zittel, Handb. Pal., 2, 1885, p. 609.—Raymond, Ann. Carnegie Mus., 7, No. 1, 1910, p. 37; Zittel-Eastman Textb. Pal., 1913, p. 719.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 290.

Asaphellus gyracanthus Raymond.

Asaphus canalis? Cleland, Bull. Amer. Pal., 3, 1900, p. 128, pl. 16, figs. 7, 8; 4, 1903, p. 38.

Isotelus canalis Weller, Pal. New Jersey, 3, 1902, p. 132, pl. 5, figs. 5, 6.

Asaphellus gyracanthus Raymond, Ann. Carnegie Mus., 7, No. 1, 1910, p. 39, pl. 14, figs. 5–7.

Canadian (Beekmantown): Fort Hunter, New York (Tribes Hill), and Columbia, New Jersey.

Asaphellus homfrayi (Salter).

Asaphus Homfrayi Salter, App. Ramsay Geol. N. Wales; Mem. Geol. Surv., 3, 1866, p. 311, pl. 8, figs. 11–14; Mem. Geol. Surv. Great Britain, 3, 1881, 2d ed., p. 506, pl. 8, figs. 11–14.

Asaphus (Isotelus) Homfrayi Salter, Mon. British Tril., Pal. Soc., 1866, p. 165, pl. 24, figs. 6–12; Cat. Camb. and Sil. Foss., 1873, p. 17.

Asaphus (Asaphellus) Homfrayi Callaway, Quart. Jour. Geol. Soc. London, 33, 1877, p. 663, pl. 24, fig. 1.

Asaphellus Homfrayi var. Matthew, Bull. Nat. Hist. Soc. New Brunswick, 20, 1902, p. 413, pl. 18, figs. 10a–e; Rep. Cambrian Rocks Cape Breton, Geol. Surv. Canada, 1903, p. 232, pl. 18, figs. 10a–e.

Asaphellus Homfrayi, var. macropyga Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 290, fig. 1598.

Lower Ordovician: Europe; McLeod Brook, near Boisdale, Cape Breton, Nova Scotia (Bretonian—Div. C 3c2).

Asaphellus planus Matthews. See Hemigyraspis plana.

ASAPHOCRINUS Springer. Genotype: A. bassleri Springer.

Asaphocrinus Springer, Mon. Crin. Flex., Smiths. Inst. (in press).

Asaphocrinus bassleri Springer.

Asaphocrinus bassleri Springer, Mon. Crin. Flex., Smiths. Inst. (in press).

Niagaran (Brownsport): Decatur County, Tennessee.

Asaphocrinus incisus (Ringueberg).

Lecanocrinus incisus Ringueberg, Bull. Buffalo Soc. Nat. Hist., 5, No. 1, 1886, p. 10, pl. 1, fig. 6.

Asaphocrinus incisus Springer, Mon. Crin. Flex., Smiths. Inst. (in press).

Clinton (Rochester): Lockport, New York.

Asaphocrinus ornatus (Hall).

Cyathocrinus? Hall, Nat. Hist. New York, Geol. 4th Dist., 2, 1843, p. 201, pl. 44, figs. 2a–m.

Lecanocrinus ornatus Hall, Pal. New York, 2, 1852, p. 201, pl. 44, figs. 2a–m.

Asaphocrinus ornatus Springer, Mon. Crin. Flex., Smiths. Inst. (in press).

Lecanocrinus nitidus Ringueberg, Bull. Buffalo Soc. Nat. Hist., 5, No. 1, 1886, p. 9, pl. 1, fig. 5.

Lecanocrinus excavatus Ringueberg, Bull. Buffalo Soc. Nat. Hist., 5, No. 1, 1886, p. 11, pl. 1, fig. 7.

Clinton (Rochester): Lockport, New York.

ASAPHOIDICHNUS Miller. Genotype: A. trifidus Miller.

Asaphoidichnus Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1880, pp. 217, 218; N. A. Geol. Pal., 1889, p. 530.

Asaphoidichnus dyeri Miller.

Asaphoidichnus dyeri Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1880, p. 219, pl. 13, fig. 1.—Nathorst, Kongl. Sven. Vet.-Akad. Handl., 18, No. 7, 1881, p. 48.

Eden (Economy): Cincinnati, Ohio.

Asaphoidichnus trifidus Miller.

Asaphoidichnus trifidus Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1880, p. 218; N. A. Geol. Pal., 1889, p. 530, fig. 966.

Eden (Economy): Cincinnati, Ohio.

ASAPHUS Brongniart. Genotype: Entomolithus paradoxus expansus Linnæus.

Asaphus Brongniart, Hist. Nat. Crust. Foss., 1822, p. 17.—DeKay, Annals Lyceum Nat. Hist., New York, 1, 1824, p. 175 footnote.—Dalman, Kongl. Vet.-Akad. Handl. for 1826, 1827, pp. 149, 235, 268.—Dalman-Engelhart, Die Palaeaden, Nurnberg, 1828, pp. 32, 41.—Eichwald, Zool. Specialis, pt. 2, Vilnae, 1830, p. 114.—Fischer de Waldheim, Oryctographie de Moscou, 1830-1837, p. 121.—Eaton, Geol. Textb., 2d ed., 1832, p. 31.—Green, Mon. Tril. N. A., 1832, pp. 16, 43.—Murchison, Sil. Syst., 1839, p. 654.—Edwards, Hist. Nat. d. Crustaces, 3, 1840, p. 305.—Burmeister, Org. der Tril., Berlin, 1843, p. 122.—Portlock, Rep. Geol. Londonderry, 1843, pp. 274, 292.—Goldfuss, Neues Jahrb. f. Min., etc., 1843, pp. 541, 560.—Emmrich, ibid., 1845, p. 41.—Loven, Ofvers. Kongl. Vet.-Akad. Forhandl., 2, 1845, p. 50.—Burmeister, Org. Tril., London, 1846, pp. 105, 108.—Hawle and Corda, Abh. d. k. bohmischen Gesell. d. Wiss., 5 (extract), 1847, p. 68, pl. 4, fig. 38.—Salter, Mem. Geol. Surv. United Kingdom, dec. 2, 1849, pl. 5.—McCoy, Ann. Mag. Nat. Hist., ser. 2, 4, 1849, p. 399.—Barrande, Neues Jahrb. f. Min., etc., 1850, p. 778; Syst. Sil. du. Centre Boheme, 1, 1852, p. 643.—Pictet, Traite de Pal., 2d ed., 2, 1854, p. 511.—McCoy, British Pal. Rocks and Foss., 1854, p. 169.—Nieszkowski, Archiv. für die Naturk. Liv.-Ehstund Kurl., 1st ser., 1, 1857, p. 545.—Chapman, Canadian Jour., n. s., 8, 1863, p. 28; Expos. Min. and Geol. Canada, 1864, p. 136.—Salter, Mem. Geol. Surv. United Kingdom, dec. 11, 1864, pl. 3; Mon. Brit. Tril., Pal. Soc. 1866, p. 145.—Woodward, Canadian Nat., n. s., 6, 1871, p. 228.—Miller, Cincinnati Quart. Jour. Sci., 1874, pp. 135, 136.—Angelin, Pal. Scandinavica, 3d ed., Holmiae, 1878, p. 51.—Novak, Sitz. d. k. bohm. Gesell. d. Wiss. Math. Naturw. Cl. for 1884, 1885, p. 217.—Zittel, Handb. Pal., 2, Munich, 1885, p. 608.—Brogger, Bihang till K. Sven. Vet.-Akad. Handl., 11, No. 3, 1886, pp. 25, 26, 70; Afh. Sveriges Geol. Unders., ser. C, 1886, p. 70.—Woodward, Quart. Jour. Geol. Soc. London, 44, 1888, p. 77.—Clarke, Jour. Morph., 2, 1888, pp. 254, 265.—Miller, N. A. Geol. Pal., 1889, p. 530; 1st App. 1892, p. 704.—Walcott, Geol. Mag., dec. 4, 1, 1894, p. 247.—Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 701.—Koken, Die Leitfossilien, Leipzig, 1896, p. 26, fig. 16, 1, 2.—Beecher, Amer. Jour. Sci., 4th ser., 3, 1897, p. 104, pl. 3, fig. 18.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 8th ser., 6, 1898, pp. 11, 12; 12, 1901, p. 4,—Jackel, Zeits. d. d. geol. Gesell., 53, 1901, p. 147.—Lindström, Kongl. Sven. Vet.-Akad. Handl., 34, No. 8, 1901, pp. 26, 37.—Cumings, 32d Ann. Rep. Dep. Geol. and Nat. Res. Indiana, 1908, p. 1051.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 290.—Raymond, Trans. and Proc. Roy. Soc. Canada, 5, 3d ser., sec. 4, 1912, p. 114.

ASAPHUS—Continued.

Cryptonymus Eichwald, Obs. geog.-zool., etc., de Tril. (not 1840), 1825, p. 44; Zool. Specialis, pt. 2, Vilnae, 1830, p. 114.—Goldfuss, Neues Jahrb. f. Min., etc., 1843, pp. 541, 554.—Salter, Mon. Brit. Tril., Pal. Soc., 1866, p. 147, 160.—Vogdes, Mon. Genera Zethus, Cybele and Cryptonymus, 1878, p. 15.—Zittel, Handb. Pal., 2, Munich, 1885, p. 609.

Hemicrypturus Green, Mon. Tril. N. A. 1832, p. 20.—Burmeister, Org. der Tril., Berlin, 1843, p. 124; Org. Tril., 1846, p. 107.—Hawle and Corda, Abh. d. k. bohmischen Gesell. d. Wiss., 5, 1847, p. 69, pl. 4, fig. 37.

Observation.—Few of the above references apply to Asaphus s. s., but all are included here for future research upon this and allied genera.

ASAPHUS ALACER Billings. See Brachyaspis alacer.

ASAPHUS ALPHA Raymond. See Basilicus marginalis.

Asaphus? astragolotes Green.

Asaphus astragolotes Green Supp. 1, Mon. Trilobites N. A., 1835, p. 11.
Ordovician: Grenville Canal, Canada.
Plastotype.—Cat. No. 25698, U.S.N.M.

ASAPHUS BARRANDI Hall. See Ptychopyge barrandi.

ASAPHUS BETA Raymond. See Isotelus beta.

ASAPHUS BOLIVIENSIS D'Orbigny. See Megalaspis? boliviensis.

ASAPHUS CANADENSIS Chapman. See Ogygites canadensis.

ASAPHUS CANALIS Whitfield. See Isoteloides whitfieldi.

ASAPHUS CANALIS Hall. See Isotelus canalis.

ASAPHUS CANALIS Cleland. See Asaphellus gyracanthus.

Asaphus(?) caribouensis Walcott.

Asaphus Caribouensis Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 98, pl. 12, figs. 7, 7a, b.
Upper Pogonip: Ridge east of Hamburg Ridge, Eureka District, Nevada.
Cotype.—Cat. No. 24652, U.S.N.M.

ASAPHUS CAUDATUS Green. See Dalmanites limulurus.

ASAPHUS CONVEXUS Cleland. See Symphysurus convexus.

ASAPHUS CORDIERI Castelnau. See Dalmanites, limulurus.

ASAPHUS CORYCŒUS Conrad. See Proetus corycœus.

Asaphus? crypturus Green.

Asaphus crypturus Green, Suppl. Mon. Trilobites North Amer., 1835, p. 18.
Silurian: Moose River, Nova Scotia.
Plastotype.—Cat. No. 4835, U.S.N.M.

Asaphus(?) curiosus Billings.

Asaphus? Curiosus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 318, fig. 305.
Asaphus? curiosa Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 98, pl. 12, fig. 15.
Canadian: Stanbridge, Quebec (Beekmantown); Eureka District, Nevada (Pogonip).
Plesiotype.—Cat. No. 24651, U.S.N.M.

ASAPHUS EDWARDSII Castelnau. See Dalmanites limulurus.

ASAPHUS EMORYI Hall. See Onchometopus emoryi.

ASAPHUS EXTANS Winchell. See Proetus stonemani.

ASAPHUS? EXTANS Hall. See Bathyurus extans.

ASAPHUS GAMMA Raymond. See Basilicus marginalis.

ASAPHUS GIGAS Dalman. See Isotelus gigas.

ASAPHUS(?) GONIURUS Billings. See Megalaspis goniurus.

ASAPHUS HALLI Chapman. See Ogygites canadensis.

ASAPHUS HINCKSII Chapman. See Ogygites canadensis.

ASAPHUS HOMALONOTOIDES Walcott. See Isoteloides homalonotoides.

ASAPHUS HUTTONI Billings. See Basilicus huttoni.

ASAPHUS ILLÆNOIDES Billings. See Symphysurus illænoides.

ASAPHUS (ISOTELUS) IOWENSIS Owen. See Isotelus iowensis.

Asaphus(?) latimarginata Hall.

Asaphus? latimarginata Hall, Pal. New York, 1, 1847, p. 253, pl. 66, figs. 4a, b.
Asaphus latimarginatus Chapman, Canadian Jour., n. s., 2, 1857, p. 47.
Utica: Near Watertown, Jefferson County, New York.
Observation.—Possibly the same as *Ogygites canadensis* (Chapman).

ASAPHUS LIMULURUS Green. See Dalmanites limulurus.

ASAPHUS MARGINALIS Collie. See Hemigyraspis collieana.

ASAPHUS MARGINALIS Hall. See Basilicus marginalis.

ASAPHUS MAXIMUS Clarke. See Isotelus maximus.

Asaphus megalopthalmus Troost.

Asaphus megalopthalmus Troost, Mem. Soc. Geol. France, 3, 1838, p. 94, pl. 11, figs. 1–5; 5th Geol. Rep. Tennessee, 1840, p. 57; 6th Geol. Rep. Tennessee, 1841, p. 175 (nom. nud.).
Silurian or Devonian: Perry County, Tennessee.
Observation.—Not recognized. Probably refers to some Devonian species of Phacops.

ASAPHUS MEGISTOS of authors. See Isotelus maximus.

Asaphus micropleurus Green. Not recognized.

Asaphus micropleurus Green, Suppl. Mon. Tril. N. A., 1835, p. 21, cast No. 41.
Trenton: Glens Falls, New York.

ASAPHUS MORRISII Billings. See Basilicus huttoni.

ASAPHUS MURCHISONI Castelnau. See Isotelus gigas.

ASAPHUS NODOSTRIATUS Hall. See Bathyurus extans.

ASAPHUS? NOTANS Billings. See Brachyaspis notans.

ASAPHUS OBTUSUS Hall. See Onchometopus obtusus.

Asaphus(?) pelops Billings.

Asaphus pelops Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 317, fig. 304a, b.

Canadian (Beekmantown): Bedford, Missisquoi County, Quebec.

Asaphus planus Dalman. See Isotelus gigas.

Asaphus platycephalus Stokes. See Isotelus gigas.

Asaphus platycephalus Billings. See Isotelus latus and Brachyaspis altilis.

Asaphus(?) quadraticaudatus Billings.

Asaphus quadraticaudatus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 272, fig. 258.

Chazyan (Quebec-N. P.): Table Head and four miles northeast Portland Creek, Newfoundland.

Asaphus Romingeri Walcott. See Basilicus romingeri.

Asaphus susæ Whitfield. See Onchometopus susæ.

Asaphus stokesii Murchison. See Proetus stokesii.

Asaphus tetragonocephalus Green.

Asaphus tetragonocephalus Green, Amer. Jour. Sci., 25, 1834, p. 335; Suppl. Mon. Tril. N. A., 1835, p. 12, cast 38.

Ordovician(?): ?Newport, New York.

Plastotype.—Cat. No. 4948, U.S.N.M.

Observation.—The type is a specimen made up of two fragments of unidentified Cambrian trilobites, probably Olenus.

Asaphus? trentonensis Conrad. See Amphilichas trentonensis.

Asaphus triangulatus Whitfield. See Isoteloides homalonotoides.

Asaphus ulrichi Miller. See Basilicus romingeri.

Asaphus vetustus Hall. See Basilicus vetustus.

Asaphus (Isotelus) vigilans Meek and Worthen. See Nileus vigilans.

Asaphus wetherilli Green. See Dalmanites limulurus.

Asaphus wisconsinensis Walcott. See Basilicus romingeri.

ASCOCERAS Barrande. Genotype: A. bohemicum Barrande.

Ascoceras Barrande in Haidinger's Mittheil. d. Fr. d. Naturw., 3, 1847, p. 264–269; Neues Jahrb. f. Min., etc., 1854, p. 11, pl. 1, fig. 13a, b.—Pictet, Traite de Pal., 2d ed., 2, 1854, p. 639.—Barrande, Neues Jahrb. f. Min., etc., 1855, pp. 257, 260, pl. 3, figs. 1–10, p. 320; Bull. Soc. Geol. France, 2d ser., 12, 1855, p. 160, pl. 5, figs. 16–28.—Woodward, Mem. Mollusca, pt. 3, 1856, p. 450.—Billings, Canadian Nat. Geol., 2, 1857, p. 137, fig. 9.—Barrande, Neues Jahrb. f. Min., etc., 1860, p. 653; Syst Sil. du Centre Boheme, 2, pt. 1, 1867, p. 334.—Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1881, p. 26, fig. 3.—Blake, Mon. British Foss. Cephalopoda, 1882, p. 60.—Zittel, Handb. Pal., 2, Munich, 1884, p. 372.—Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 279; 23, 1888, p. 483.—Lindström, Geol. Mag., dec. 3, 5, 1888, p. 532.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 246; 2, 1891, p. 387.—Miller, N. A. Geol. Pal. 1889, p. 432.—Lindström, Kongl. Sven. Vet.-Akad. Handl., 23, No. 12, 1890, p. 14.—Koken, Die Leitfossilien, Leipzig, 1896, p. 49, text fig. 32, fig. 3.—Hyatt, Zittel-Eastman Textb. Pal., 1, 1900, p. 516; 2d ed., 1913, p. 596.

Ascoceras anticostiense Billings.

Ascoceras newberryi Billings (part), Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 163, fig. 148b (adv. sheets, 1862).

Ascoceras Anticostiense Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1865, p. 60 (loc. ref.).

Gamachian (Ellis Bay): Gamache Bay, Anticosti.

Ascoceras boreale Parks.

Ascoceras boreale Parks in Tyrrell, 22d Rep. Ontario Bur. Mines, 1913, p. 34.

Mohawkian or Richmond: Shamattawa River, Manitoba.

ASCOCERAS CANADENSE Billings. See Billingsites canadensis.

Ascoceras costulatum Whiteaves.

Ascoceras costulatum Whiteaves, Canadian Rec. Sci., 6, 1895, p. 394; Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 215, pl. 22, fig. 1.

Black River or Richmond: Lake Winnipeg, Canada.

Ascoceras gibberosum Sardeson.

Ascoceras gibberosum Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 102, pl. 6, figs. 8–10.

Ozarkian (Oncota): Dresbach, Minnesota.

Ascoceras indianense Newell.

Ascoceras Indianensis Newell, Proc. Boston Soc. Nat. Hist., 23, 1888, p. 484, figs.

Niagaran: Delphi, Indiana.

Ascoceras newberryi Billings.

Ascoceras Newberryi Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 163, fig. 148a (adv. sheets, 1862); Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, pp. 23, 59 (loc. ref.).—Newell, Proc. Boston Soc. Nat. Hist., 23, 1888, p. 484.

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

Niagaran: Delphi, Indiana (Newell).

ASCOCERAS NEWBERRYI Billings (part). See Ascoceras anticostiense.

Ascoceras southwelli Worthen.

Ascoceras southwelli Worthen, Geol. Surv. Illinois, 8, 1890, p. 151, pl. 27, figs. 2, 2a.

Niagaran: Port Byron, Illinois.

Ascoceras townsendi Whiteaves.

Ascoceras Townsendii Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 41, pl. 6, figs. 4, 4a; pt. 2, 1895, p. 103.

Niagaran (Guelph): Durham, Ontario.

ASCODICTYON Nicholson and Etheridge, Jun.

Genotype: A. stellatum Nicholson and Etheridge, Jun.

Ascodictyon Nicholson and Etheridge, Jun., Ann. Mag. Nat. Hist. 4th ser., 19, 1877, p. 463.—Vine, Quart. Jour. Geol. Soc. London, 37, 1881, p. 618; 38, 1882, p. 52; Rep. 53d Meeting Brit. Assoc. Adv. Sci., 1884, p. 185; Proc. Yorkshire Geol. Polyt. Soc., 9, 1887, p. 183; 12, 1892, p. 86.—Miller, N. A. Geol. Pal., 1889, p. 293.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 367.—Simpson, 14th Rep. State Geol. New York for 1894, 1897, p. 603.—Nickles

ASCODICTYON—Continued.

and Bassler, Bull. U. S. Geol. Surv., 173, 1900, pp. 19, 172.—Ulrich and Bassler, Smiths. Misc. Coll., 45, 1904, p. 285.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 14.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 117.

ASCODICTYON RADIANS Vine. See Vinella radiciformis.

ASCODICTYON RADICIFORME Vine. See Vinella radiciformis.

Ascodictyon siluriense Vine.

Ascodictyon stellatum Vine (not Nicholson and Etheridge), Quart. Jour. Geol. Soc. London, 37, 1881, p. 618.

Ascodictyon stellatum var. siluriense Vine, Quart. Jour. Geol. Soc. London, 38, 1882, p. 52, figs. 1, 2; Ann. Mag. Nat. Hist., 5th ser., 14, 1884, p. 81, fig. 7; Proc. Yorkshire Geol. and Polytech. Soc., 9, 1887, p. 184, pl. 12, fig. 6.

Ascodictyon siluriense Vine, Proc. Yorkshire Geol. Polytech. Soc., 12, 1892, p. 88, pl. 2, fig. 1.—Ulrich and Bassler, Smiths. Misc. Coll., 45, 1904, p. 286, pl. 68, figs. 11, 12.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 14, pl. 4, figs. 6–8.—Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 260, pl. 46, fig. 2.

Silurian: Shropshire, England (Wenlock); Lockport, etc., New York; Ontario, Canada (Rochester); Waldron, Indiana; Newsom, Tennessee (Waldron); Island of Anticosti (Jupiter River).

Helderbergian (Keyser): Cash Valley, Maryland.

Plesiotypes.—Cat. Nos. 43135, 43138, U.S.N.M.

ASCODICTYON STELLATUM Vine. See Ascodictyon siluriense.

ASCODICTYON STELLATUM SILURIENSE Vine. See Ascodictyon siluriense.

ASPIDOPORA Ulrich. Genotype: Aspidopora areolata Ulrich.

Aspidopora Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 155.—Miller, N. A. Geol. Pal., 1889, p. 293.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 373; Geol. Minnesota, 3, 1893, p. 254.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 584.—Nickels and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 29.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 130.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 740.

Aspidopora areolata Ulrich.

Aspidopora areolata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 164, pl. 7, figs. 2–2c.

Monticulipora areolata J. F. James, ibid., 16, 1894, p. 183.

Eden (Fulton): Cincinnati, Ohio, and vicinity.

Cotypes.—Cat. No. 43632, U.S.N.M.

Aspidopora calycula (James).

Lichenalia? calycula James, Cat. Foss. Cincinnati Group, 1871 (not defined).

Chætetes? calyculus James, Introd. Cat. Foss. Cincinnati Group, 1875, p. 1.

Monticulipora (Diplotrypa) calycula Nicholson, Genus Monticulipora, 1881, p. 165, pl. 4, figs. 4–4b.

Prasopora calycula Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 165.

Monticulipora calycula James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 167.—J. F. James, ibid., 16, 1904, p. 184.

Aspidopora calycula Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 173.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 16, pl. 1, figs. 8–10.

Trenton (Upper): Covington, Kentucky, and vicinity.

Aspidopora eccentrica (James).

Monticulipora (Heterotrypa?) eccentrica James, Paleontologist, No. 6, 1882, p. 48; No. 7, pl. 1, figs. 6, 6a.

Monticulipora eccentrica James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 167, pl. 2, figs. 2a–c.—J. F. James, ibid., 16, 1894, p. 185.

Aspidopora eccentrica Ulrich, Geol. Minnesota, 3, 1893, p. 255.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 17, pl. 2, figs. 8–12; pl. 5, figs. 7, 8.

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

Aspidopora elegantula (Ulrich).

Aspidopora elegantula Ulrich, Geol. Minnesota, 3, 1893, p. 256, pl. 17, figs. 13–21.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, figs. 162–164 (p. 584).—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 130, fig. 186e.

Trenton (Prosser): Kenyon and St. Paul, Minnesota.

Cotypes.—Cat. No. 45499, U.S.N.M.

Aspidopora newberryi (Nicholson).

Chætetes Newberryi Nicholson, Pal. Ohio, 2, 1875, p. 212, pl. 22, figs. 4, 4*a*.

Monticulipora (Prasopora) Newberryi Nicholson, Genus Monticulipora, 1881, p. 212, pl. 4, figs. 1–1*e*.

Prasopora? newberryi Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 165.

Aspidopora newberryi Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 91.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 130.

Monticulipora newberryi James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 164.—J. F. James, ibid., 16, 1894, p. 179.

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

Aspidopora parasitica (Ulrich).

Aspidopora parasitica Ulrich (part), 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 90; Geol. Minnesota, 3, 1893, p. 255, pl. 17, figs. 26–32.—J. F. James, Jour. Cincinnati Soc. Nat. Hist., 16, 1894, p. 180.

Black River (Decorah): Minneapolis, St. Paul, and Fountain, Minnesota.

Cotypes.—Cat. No. 44051, U.S.N.M.

Aspidopora parmula (Foerste).

Prasopora parmula Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 170; 3, 1888, pl. 15, fig. 14.

Aspidopora parmula Foerste, Geol. Surv. Ohio, 7, 1895, p. 600, pl. 28, fig. 14.

Upper Medinan (Brassfield): Dayton, and Clinton County, Ohio.

Aspidopora parmula fenestelliformis Foerste.

Aspidopora parmula var. fenestelliformis Foerste, Geol. Surv. Ohio, 7, 1895, p. 600.

Upper Medinan (Brassfield): Dayton, Ohio.

ASTERIAS ANTHONII Dana. See Petraster jamesi.

ASTERIAS ANTIQUA Troost. See Mesopalæaster antiqua.

ASTERIAS ANTIQUATA Locke. See Promopalæaster speciosa.

ASTERIAS (FOSSIL) Graham, Anthony, and James. See Petraster americana.

ASTERIAS MATUTINA Hall. See Hudsonaster matutina.

ASTRÆOPHYLLUM Nicholson and Hinde. See Strombodes Schweigger.

ASTRÆOPORA VETUSTA D'Orbigny. See Protarea vetusta.

ASTRÆOSPONGIA Roemer. Genotype: Blumenbachium meniscus Roemer.

Blumenbachium Roemer (not Konig, 1820), Neues Jahrb. f. Min., etc., 1848, pp. 680, 682.

Astræospongia Roemer, Sil. Fauna West. Tennessee, Breslau, 1860, p. 13; Cincinnati Quart. Jour. Sci., 1, 1874, p. 248.—Zittel, Handb. Pal., 1, Munich, 1879, p. 185.—Roemer, Leth. geog., 1, Theil, Leth. Pal., Erste Lief., 1880, p. 313.—Hinde, Mon. Brit. Foss. Sponges, Pal. Soc., 1888, p. 133.—Miller, N. A. Geol. Pal., 1889, p. 154.—Koken, Die Leitfossilien, Leipzig, 1896, p. 342.—Zittel-Eastman Textb. Pal., 1, 1900, p. 56—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 17.—Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 62.

Astræospongia meniscus (Roemer).

Blumenbachium meniscus Roemer, Neues Jahrb. Min., 1848, p. 683, pl. 9, fig. 1.—Oswald, Zeits. d. d. geol. Gesell., 2, 1850, p. 83.

Astræospongia meniscus Roemer, Sil. Fauna West. Tennessee, 1860, p. 14, pl. 1, figs. 6, 6a–d.—Safford, Geol. Tennessee, 1869, pp. 311, 320, pl. 5 (H), figs. 1a–e.—Roemer, Cincinnati Quart. Jour. Sci., 1, 1874, p. 248; Leth. geog., Leth. Pal., 1, Atlas, 1876, pl. 9, fig. 2.—J. W. Hall and Gaertner, 30th Rep. New York State Mus. Nat. Hist., 1878, pp. 111–116, pl. 3, pp. 1–6.—Roemer, Leth. geog, 1, Theil., Leth. Pal., Erste Lief., 1880, p. 314, pl. 9, figs. 2a–2e.—Hinde, Cat. Foss. Sponges Brit. Mus., 1883, p. 148.—Miller, N. A. Geol. Pal., 1889, p. 154, text fig. 90.—Foerste, Jour. Geol., 11, 1903, p. 713, (loc. occ.).—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 18, fig. 27.

Niagaran: Brownsport, Perryville, etc., Tennessee (Brownsport); Louisville, Kentucky (Louisville).

ASTRASPIS Walcott. Genotype: A. desiderata Walcott.

Astraspis Walcott, Bull. Geol. Soc. Amer., 3, 1892. p. 166.

Astraspis desiderata Walcott.

Astraspis desiderata Walcott, Bull. Geol. Soc. Amer., 3, 1892, p. 166, pl 3, figs. 6–14, pl. 4, figs. 1–4.

Black River (Harding): Canyon City, Colorado.

Astrea fungiformis Owen. Not recognized.

Astrea fungiformis Owen, Geol. Expl. Iowa, Wisconsin, and Illinois, 2d ed., 1844, p. 78, pl. 14, fig. 11.

Niagaran: Iowa and Wisconsin.

ASTREA? GIGAS Owen. See Strombodes gigas.

ASTREA MAMILLARIS Owen. See Strombodes mamillaris.

ASTREOPORA ORGANUM D'Orbigny. See Syringophyllum organum.

ASTROCERIUM Hall. See Favosites Lamarck.

ASTROCERIUM CONSTRICTUM Hall. See Favosites constrictum.

ASTROCERIUM PARASITICUM Hall. See Favosites hisingeri.

ASTROCERIUM PYRIFORME Hall. See Favosites pyriformis.

ASTROCERIUM VENUSTUM Whitfield. See Favosites hisingeri.

ASTROCONIA Sollas. Genotype: A. granti Sollas.

Astroconia Sollas, Quart. Jour. Geol. Soc. London, 36, 1881, p. 254.—Miller, N. A. Geol. Pal., 1889, p. 154.

Astroconia granti Sollas.

Astroconia Granti Sollas, Quart. Jour. Geol. Soc. London, 37, 1881, pp. 254, 255, figs. 1–11.—Rauff, Palæontographica, 40, 1894, p. 278, fig. 58.

Niagaran dolomite: Hamilton, Ontario.

ASTROCRINITES Conrad. See Mariacrinus Hall.

ASTROCRINITES PACHYDACTYLUS Conrad. See Melocrinus pachydactylus.

ASTROCYSTITES Whiteaves. Genotype: A. ottawaensis Whiteaves.

Astrocystites Whiteaves, Canadian Rec. Sci., 7, 1897, p. 287.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 734.

Steganoblastus Whiteaves, Canadian Rec. Sci., 7, 1897, p. 305 (proposed to replace Astrocystites which was believed to be too much like Asterocystis Haeckel).—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 209, fig. 7.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 320.—Springer, Zittel-Eastman Textb. Pal., 1, 1913, p. 160.

Astrocystites ottawaensis Whiteaves.

Astrocystites Ottawaensis Whiteaves, Canadian Rec. Sci., 7, 1897, p. 287, figs. 1–3.

Steganoblastus canadensis (in error for ottawaensis) Whiteaves, Canadian Rec. Sci., 7, 1898, p. 396.

Steganoblastus ottawaensis Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 210, fig. 7.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 316, figs. 21, 21a, 22; p. 321, figs. 23, 24.

Trenton (Curdsville): Ottawa, Ontario.

Astroporites Lambe. Genotype: A. ottawaensis Lambe.

Astroporites Lambe, Canadian Rec. Sci., 7, 1896, p. 1.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 174.

Astroporites ottawaensis Lambe.

Astroporites Ottawaensis Lambe, Canadian Rec. Sci., 7, 1896, p. 1, pl. 1.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, pp. 173, 174.—Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 46.

Trenton (Curdsville): Hull near Ottawa, and Kirkfield, Ontario; Mercer County, Kentucky.

Observation.—This genus and species, originally described as a bryozoan, is founded upon the attached basal disk of some crinoid.

ASTYLOMANON Rauff. See Palæomanon Roemer.

ASTYLOMANON CRATERA Rauff. See Palæomanon cratera.

ASTYLOMANON CRATERA ARYBALLIUM Rauff. See Palæomanon cratera.

ASTYLOMANON CRATERA BALANTIUM Rauff. See Palæomanon cratera.

ASTYLOMANON CRATERA CANTHARIUM Rauff. See Palæomanon cratera.

ASTYLOMANON CRATERA CYLIX Rauff. See Palæomanon cratera.

ASTYLOMANON CRATERA LECYTHIUM Rauff. See Palæomanon cratera.

ASTYLOMANON CRATERA PATERA Rauff. See Palæomanon cratera.

ASTYLOMANON CRATERA POTERIUM Rauff. See Palæomanon cratera.

ASTYLOMANON CRATERA PROMISCUUM Rauff. See Palæomanon cratera.

ASTYLOMANON CRATERA PROTOTYPUM Rauff. See Palæomanon cratera.

ASTYLOMANON PLEURIEXCAVATUM Rauff. See Palæomanon pleuriexcavatum.

ASTYLOMANON VERRUCOSUM Rauff. See Palæomanon verrucosum.

ASTYLOMANON VERRUCOSUM BULLIFERA Rauff. See Palæomanon verrucosum bullifera.

ASTYLOSPONGIA Roemer. Genotype: Siphonia præmorsa Goldfuss.

Astylospongia Roemer, Sil. Fauna West Tennessee, 1860, p. 7; Cincinnati Quart. Jour. Sci., 1, 1874, p. 31.—Zittel, Ann. Mag. Nat. Hist., 4th ser., 20, 1877, p. 501; Neues Jahrb. Min., Geol. Pal., 1877, p. 353; Abh. math.-phys. Classe Akad. Wiss., 13, 1 Abth., 1878, p. 44.—Martin, Arch. Ver. Freun. Naturg. Mechlenburg, Jahrg., 31, 1878, pp. 2, 18.—Zittel, Handb. Pal., 1, 1879, p. 172.—Roemer, Leth. geog., 1, Theil. Leth. Pal., Erste Lief., 1880, p. 307.—Hinde, Cat. Foss. Sponges Brit. Mus., 1883, p. 91.—Zittel, Ann. Mag. Nat. Hist., 5th ser. 14, 1884, p. 271; Neues Jahrb. f. Min., Geol. Pal., 2, 1884, p. 75.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 9, 1887, pp. 246, 247.—Hinde, Mon. Brit. Foss. Sponges, Palæont. Soc., 1888, p. 112.—Miller, N. A. Geol. Pal., 1889, p. 154.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 14, 1891, p. 55.—Rauff, Palæontographica, 40, 1894, p. 289.—James, Amer. Nat., 29, 1895, p. 543.—Koken, Die Leitfossilien, 1896, p. 337.—Zittel-Eastman Textb. Pal., 1, 1900, p. 50; 2d ed., 1913, p. 55.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 14.

ASTYLOSPONGIA (PALÆOMANON) BURSA Hall. See Palæomanon bursa.

Astylospongia?? christiana Meek and Worthen.

Astylospongia?? Christiana Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 344, pl. 5, figs. 3a–c.

Niagaran: Carroll County, Illinois.

ASTYLOSPONGIA GREGARIA James. See Hindia gregaria.

Astylospongia imbricato-articulata (Roemer).

Siphonia imbricato-articulata Roemer, Neues Jahr. Min. Geol., Pal., 1848, p. 685.

Astylospongia imbricato-articulata Roemer, Sil. Fauna West Tennessee, 1860, p. 12, pl. 1, figs. 5, 5a; Cincinnati Quar. Jour. Sci., 1, 1874, p. 191.—Hall, 28th Rep. New York State Mus. Nat. Hist., Mus. ed., 1879, p. 104; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 224.—Foerste, Jour. Geol., 11, 1903, p. 714 (loc. occ.).

Niagaran: Various localities in Decatur and Perry Counties, Tennessee (Brownsport); Louisville, Kentucky (Louisville).

ASTYLOSPONGIA INCISO-LOBATA Roemer. See Caryomanon incisolobatum.

ASTYLOSPONGIA INORNATA Hall. See Hindia sphæroidalis.

Astylospongia parvula Billings.

Astylospongia parvula Billings, Geol. Vermont, 2, 1861, p. 956; Rep. Econ. Geol. Vermont, 1862, p. 956; Pal. Foss., 1, Geol. Surv. Canada, 1863, p. 20. (Advance sheets, 1861.)

Trenton: Ottawa, Ontario.

Astylospongia præmorsa (Goldfuss).

Siphonia præmorsa Goldfuss, Petref. Germ., 1826, p. 17, pl. 6, fig. 9a.

Astylospongia præmorsa Roemer, Sil. Fauna West Tennessee, 1860, p. 8, pl. 1, figs. 1, 1a–c.—Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 377, fig. 352—

Astylospongia præmorsa—Continued.

Roemer, Cincinnati Quart. Jour. Sci., 1, 1874, p. 32.—Meek and Worthen, Geol. Surv. Illinois, 6, 1875, p. 499, pl. 25, figs. 2, 2a.—Roemer, Leth. geog., 1, Theil, Leth. Pal., Erste Lief, 1880, p. 307, pl. 9, figs. 1a–c.—Miller, N. A. Geol. Pal., 1889, p. 154, fig. 91.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 224, fig. 3.—Rauff, Palæontographica, 40, 1894, p. 309, pl. 11, fig. 3.—Walker, Jour. and Proc. Hamilton Assoc., 11, 1895, p. 87, fig. 5.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 14, fig. 22.

Niagaran: West Tennessee, and many other localities.

Plesiotype.—Cat. No. 49719, U.S.N.M.

Observation.—A very complete bibliography of this species is given by Rauff, 1894.

ASTYLOSPONGIA PRÆMORSA Hall. See Astylospongia præmorsa pusilla.

ASTYLOSPONGIA PRÆMORSA Roemer. See Palæomanon verrucosum.

ASTYLOSPONGIA PRÆMORSA var. NUXMOSCHATA Hall. See Caryospongia juglans nuxmoschata.

Astylospongia præmorsa pusilla Rauff.

Astylospongia præmorsa Hall, Trans. Albany Inst., 4, 1863, p. 228; 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875, pl. 3, figs. 4–14 (Museum ed., 1879); 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 222, pl. 2, figs. 4–11, 14.

Astylospongia præmorsa var. pusilla Rauff, Palæontographica, 40, 1894, p. 309.

Niagaran (Waldron): Waldron, Indiana; Newsom, Tennessee.

Plesiotypes.—Cat. No. 46547, U.S.N.M.

ASTYLOSPONGIA ROEMERI Hinde. See Caryomanon roemeri.

ASTYLOSPONGIA STELLATIM-SULCATA Roemer. See Carpomanon stellatim-sulcatum.

ASTYLOSPONGIA SUBROTUNDUS James. See Hindia subrotunda.

ASTYLOSPONGIA TUMIDUS James. See Pasceolus darwini.

ATACTOPORA Ulrich (part). See Atactoporella Ulrich.

ATACTOPORA Ulrich. Genotype: Atactopora hirsuta Ulrich.

Atactopora Ulrich (part), Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 119; Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 154; 6, 1883, p. 245.—Miller, N. A. Geol. Pal., 1889, p. 293.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 377; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 278.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 563.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 31.—Ulrich and Bassler, Smiths. Misc. Coll., 47, 1904, pp. 24, 31.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 334.

Atactopora angularis Ulrich and Bassler.

Atactopora angularis Ulrich and Bassler, Smiths. Misc. Coll., 47, 1904, p. 32, pl. 8, figs. 10–12.

Richmond (Waynesville): Waynesville, Ohio.

Holotype.—Cat. No. 43193, U.S.N.M.

Atactopora hirsuta Ulrich.

Atactopora hirsuta Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 120, pl. 12, figs. 3–3b; 6, 1883, p. 245, pl. 12, figs. 1, 1a.—Ulrich and Bassler, Smiths. Misc. Coll., 47, 1904, p. 31, pl. 8, fig. 14.

Eden and Maysville (Fairview): Covington and Newport, Kentucky; Cincinnati, Ohio.

Holotype.—Cat. No. 43619. U.S.N.M.

Atactopora intermedia Cumings and Galloway.

Atactopora intermedia Cumings and Galloway, 37th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1913, p. 73, pl. 4, figs. 2, 2a; pl. 5, figs. 1–1d.

Eden (McMicken): Big Four Railroad, near Guilford, Indiana.

Atactopora maculata Ulrich.

Atactopora maculata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 121, pl. 12, figs. 2–22; 6, 1883, p. 245, pl. 12, figs. 2, 2a; Zittel's Textb. Pal. (Engl. ed.), 1896, fig. 466 (p. 278).—Ulrich and Bassler, Smiths. Misc. Coll., 47, 1904, p. 31, pl. 8, fig. 13.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 333, fig. 483.

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

Holotype.—Cat. No. 43619, U.S.N.M.

ATACTOPORA MULTIGRANOSA Ulrich. See Atactoporella multigranosa.

ATACTOPORA MUNDULA Ulrich. See Atactoporella mundula.

ATACTOPORA ORTONI Ulrich. See Atactoporella ortoni.

ATACTOPORA SEPTOSA Ulrich. See Amplexopora septosa.

ATACTOPORA SUBRAMOSA Ulrich. See Heterotrypa subramosa.

ATACTOPORA TENELLA Ulrich. See Atactoporella tenella.

ATACTOPORELLA Ulrich. Genotype: Atactoporella typicalis Ulrich

Atactopora Ulrich (part), Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 119.

Peronopora Nicholson (part), Genus Monticulipora, 1881, p. 215.

Atactoporella Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 247.—Miller, N. A. Geol. Pal., 1899, p. 293.—Ulrich, Geol Surv. Illinois, 8, 1890, p. 370; Geol. Minnesota, 3, 1893, p. 222; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 272.—Simpson, 14th Ann. Rep. State. Geol. New York for 1894, 1897, p. 585.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 28.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 127.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 740.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 331.

ATACTOPORELLA CRASSA Ulrich. See Homotrypella hospitalis crassa.

Atactoporella insueta Ulrich.

Atactoporella insueta Ulrich, Geol. Minnesota, 3, 1893, p. 224, pl. 15, figs. 13–15; pl. 18, figs. 5–8.

Black River (Decorah): Minneapolis, St. Paul, and Fountain, Minnesota.

Cotypes.—Cat. No. 43805, U.S.N.M.

Atactoporella multigranosa (Ulrich).

Atactopora multigranosa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 122, pl. 12, figs. 1, 1a.

Atactoporella multigranosa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 254, pl. 12, figs. 8, 8a.—J. F. James, ibid., 18, 1895, p. 80.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 769, pl. 7, figs. 2, 2a.

Maysville (Fairmount-Corryville): Hamilton, Morrow, and Cincinnati, Ohio; southeastern Indiana.

Holotype.—Cat. No. 43626, U.S.N.M.

Atactoporella mundula (Ulrich).

Atactopora mundula Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 123, pl. 12, figs. 4, 4a..

Atactoporella mundula—Continued.

Atactoporella mundula Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 252, pl. 12, figs. 6, 6a.—J. F. James, ibid., 18, 1895, p. 80.—Cumings, 32d Ann. Rep. Dep. Geol. Nat Res. Indiana, 1908, p. 770, pl. 7, figs. 3, 3a; pl. 26, fig. 6.

Maysville (Fairmount): Covington, Kentucky, and Cincinnati, Ohio.

Holotype.—Cat. No. 43623, U.S.N.M.

Atactoporella newportensis Ulrich.

Atactoporella newportensis Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 250, pl. 12, figs. 4–4b.—Miller, N. A. Geol. Pal., 1889, fig. 456, p. 29.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 770, pl. 7, fig. 4; pl. 26, fig. 7.

Monticulipora newportensis James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 183.—James, ibid., 16, 1894, p. 206.

Eden (Economy): Newport, Kentucky.

Cotypes.—Cat. No. 43627, U.S.N.M.

Atactoporella ortoni (Nicholson).

Chætetes Ortoni Nicholson, Quart. Jour. Geol. Soc. London, 30, 1874, p. 513, pl. 29, figs. 15–15b; Pal. Ohio, 2, 1875, p. 211, pl. 22, figs. 3–3b.

Atactopora ortoni Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 120 (gen. ref.).

Monticulipora (Peronopora?) Ortoni Nicholson, Genus Monticulipora, 1881, p. 228, pl. 3, figs. 4–4d.

Atactoporella ortoni Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 256, pl. 12, figs. 7, 7a.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 771, pl. 7, figs. 5, 5a; pl. 26, fig. 11.

Monticulipora ortoni James and James, Jour. Cincinnati Soc. Nat. Hist., 1888, 11, p. 22.—James, ibid., 18, 1895, p. 79.

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

Plesiotype.—Cat. No. 43629, U.S.N.M.

Atactoporella ramosa Ulrich.

Atactoporella ramosa Ulrich, Geol. Minnesota, 3, 1893, p. 226, pl. 20, figs. 22–27.

Black River (Decorah): Cannon Falls, Minnesota.

Cotypes.—Cat. No. 43500, U.S.N.M.

Atactoporella schucherti Ulrich.

Atactoporella schucherti Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 251, pl. 12, figs. 5–5b.—J. F. James, ibid., 18, 1895, p. 80.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 772, pl. 7, figs. 6, 6a.

Richmond (Waynesville-Whitewater): Oxford, Waynesville, etc., Ohio; Richmond and Versailles, Indiana.

Holotype.—Cat. No. 43628, U.S.N.M.

Atactoporella tenella (Ulrich).

Atactopora tenella Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 123, pl. 12, figs. 5, 5a.

Atactoporella tenella Ulrich, ibid., 6, 1883, p. 246.—J. F. James, ibid., 18, 1895, p. 80.

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

Holotype.—Cat. No. 43624, U.S.N.M.

Atactoporella typicalis (Ulrich).

Atactoporella typicalis Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 248, pl. 12, figs. 3–3d.—J. F. James, ibid., 18, 1895, p. 80.—Ulrich, Zittel's Textb. Pal. (Engl. ed.), 1896, p. 272, fig. 450.—Simpson, 14th Ann. Rep. State

Atactoporella typicalis—Continued.

Geol. New York for 1894, 1897, p. 585, figs. 165–167.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 128, fig. 186b.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 332.

Eden (Economy): Covington, Kentucky, and vicinity.

Cotypes.—Cat. No. 43625, U.S.N.M.

Atactoporella typicalis præcipta Ulrich.

Atactoporella typicalis var. præcipta Ulrich, Geol. Minnesota, 3, 1893, p. 223, pl. 15, figs. 16, 17, pl. 18, figs. 1–4.

Black River (Decorah): Minneapolis, St. Paul, and Fountain, Minnesota.

Cotypes.—Cat. Nos. 43806, 43872, U.S.N.M.

Ataxiacrinus Lyon. See Anomalocrinus Meek.

Ataxocrinus Bather. See Anomalocrinus Meek.

Atelocystis Haeckel. See Ateleocystites Billings.

ATELEOCYSTITES Billings. Genotype: A. huxleyi Billings.

Ateleocystites Billings, Geol. Surv. Canada, Can. Org. Rem., dec. 3, 1858, pp. 72, 73.—Chapman, Expos. Min. Geol. Canada, 1864, p. 110.—Salter, Cat. Camb. Sil. Foss., 1873, p. 128.—Zittel, Handb. Pal., 1, Munich, 1879, p. 413.—Woodward, Geol. Mag., dec. 2, 7, 1880, p. 194.—Walther, Palæontographica, 32, 1886, p. 193.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 674.

Ateleocystis Haeckel, Amphorideen u. Cystoideen, 1896, p. 41, pl. 2, figs. 10–12.

Enoploura Wetherby, Jour. Cincinnati Soc. Nat. Hist., 1, 1879, p. 163.—Jaekel, Zeits. d. d. Geol. Gesell., 52, 1900, p. 668.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 51 (Genotype Anomalocystites balanoides Meek).

Anomalocystites in part of authors.

Ateleocystites balanoides (Meek).

Anomalocystites (Ateleocystites?) balanoides Meek, Amer. Jour. Sci. Arts, 3d ser., 3, 1872, p. 423; Geol. Surv. Ohio, 1, pt. 2, 1873, p. 41, pl. 3, bis. fig. 6a–c.

Enoploura balanoides Wetherby, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 162, pl. 7, figs. 1a–g; p. 164, pl. 1, figs. 1–5.

Ateleocystites balanoides Woodward, Geol. Mag., dec. 2, 7, 1880, p. 198, pl. 6, figs. 5–15.

Anomalocystites balanoides Miller, N. A. Geol. Pal., 1889, p. 224, fig. 247.

Placocystis balanoides Haeckel, Amphorideen u. Cystoideen, 1896, pl. 2, figs. 5–7.

Placocystis crustacea Haeckel, Amphorideen u. Cystoideen, Leipzig, 1896, p. 39, figs. 1, 2.

Enoploura crustacea Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 51.

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

Ateleocystites huxleyi Billings.

Ateleocystites Huxleyi Billings, Geol. Surv. Canada, Can. Org. Rem., dec. 3, 1858, pp. 72, 73, fig. 4.—Woodward, Geol. Mag., 7, 1870, p. 261, footnote; 8, 1871, p. 72, text figs. 1–7; dec. 2, 7, 1880, pl. 6, fig. 1.

Anomalocystites Huxleyi Miller, N. A. Geol. Pal., 1889, p. 224.

Ateleocystis Huxleyi Haeckel, Amphor. und Cystoid., 1896, p. 41.

Trenton (Curdsville): Hull and Ottawa, Canada.

ATHYRIS McCoy. Genotype: Terebratula concentrica Von Buch.

Athyris McCoy, Carb. Fossils Ireland, 1844, pp. 128, 146.—Hall, 13th Rep. New York State Cab. Nat. Hist., 1860, p. 73.—Billings, Canadian Jour., 5, 1860, p. 273; 6, 1861, p. 138; Pal. Fossils, 1, 1862, p. 144.—Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, pp. 152, 258; Pal. New York, 4, 1867, p. 282.—Billings, Amer. Jour. Sci., 44, 1867, p. 48.—Herrick, Bull. Denison Univ., 4, 1888, p. 14.—Nettelroth, Kentucky Fossil Shells, Mem. Geol. Surv. Kentucky, 1889, p. 87.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 83, fig. 57 on p. 86; 13th Ann. Rep. New York State Geol., 1895, p. 777.

Spirigera D'Orbigny, Paris Acad. Sci., Comptes Rendus, 25, 1847, p. 268.

Euthyris Quenstedt, Petrefactenkunde Deutschlands, 1871, p. 442.

ATHYRIS Billings (1863). See Meristella Hall.

ATHYRIS ANTICOSTIENSIS Billings. See Catazyga anticostiensis.

ATHYRIS BOREALIS Billings. See Catazyga headi borealis.

ATHYRIS CYLINDRICA Billings. See Whitfieldella cylindrica.

ATHYRIS HEADI Billings. See Catazyga headi.

ATHYRIS HEADI ANTICOSTIENSIS Billings. See Catazyga anticostiensis.

ATHYRIS HEADI BOREALIS Billings. See Catazyga headi borealis.

ATHYRIS INTERMEDIA Nicholson and Hinde. See Whitfieldella intermedia.

ATHYRIS JULIA Billings. See Whitfieldella(?) julia.

ATHYRSIS JUNIA Billings. See Hyattidina congesta junia.

ATHYRIS LARA Billings. See Whitfieldella lara.

ATHYRIS NAVIFORMIS Billings. See Whitfieldella(?) naviformis.

ATHYRIS NITIDA Hall. See Whitfieldella nitida.

ATHYRIS PRINSTANA Billings. See Hindella prinstana.

ATHYRIS SOLITARIA Billings. See Whitfieldella? solitaria.

ATHYRIS? TRISINUATUS McChesney. See Meristina trisinuata.

ATHYRIS TUMIDA Roemer. See Meristina maria roemeri.

Athyris(?) tumidula Billings.

Athyris tumidula Billings, Cat. Sil. Foss. Anticosti, 1866, p. 47.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 150.

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

ATHYRIS TURGIDA Shaler. See Hindella prinstana.

ATHYRIS UMBONATA Billings. See Hindella umbonata.

ATOPS FISCHERI Miller. See Triarthrus fischeri.

ATRYPA Dalman. Genotype: Anomia reticularis Linnæus.

Atrypa Dalman, Kongl. Svenska Vet.-Akad. Handl., 1828, p. 102.—Billings, Canadian Nat. Geol., 1, 1856, p. 134; Canadian Jour., 6, 1861, p. 264.—Chapman, Canadian Jour., n. s., 7, 1862, p. 114; Expos. Min. Geol. Canada, 1864, p. 117.—Whitfield, 20th Rep. New York State Cab. Nat. Hist., 1867, p. 141, pl. 1.—Hall, Pal. New York, 4, 1867, p. 312.—Zittel, Handb. Pal., 1, Munich, 1880, p. 688.—Davidson, Mon. Brit. Foss. Brachiopoda, 5, Sil. Suppl., Pal. Soc., 1882, p. 84.—Miller, N. A. Geol. Pal., 1889, p. 335.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 88.—Beecher, Amer. Jour. Sci., 3d ser., 44, 1892, p. 147.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 163; 13th Ann. Rep. New York State Geol., 1895, p. 818.—Koken, Die Leitfossilien, Leipzig, 1896, p. 241, fig. 202, 203.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 226; Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 334.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 195.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 309.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 409.

ATRYPA ACUTIROSTRA Hall. See Zygospira(?) acutirostris.

ATRYPA AFFINIS Vanuxem. See Atrypa reticularis.

ATRYPA ALTILIS Hall. See Camarotœchia plena.

ATRYPA AMBIGUA Hall. See Camarella ambigua.

ATRYPA APRINIS Hall. See Homœospira apriniformis.

Atrypa arctostriata (Foerste).

Atrypa reticularis arctostriatus Foerste, Jour. Geol., 11, 1903, p. 710.

Atrypa arctostriata Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 93, pl. 2, figs. 34A, B.

Niagaran (Brownsport): Near Brownsport Furnace, three miles west Vice Landing, Tennessee.

Atrypa? biconvexa Maynard.

Atrypa? biconvexa Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 393, pl. 68, figs. 1–3.

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

ATRYPA BIDENS Hall. See Rhynchonella(?) bidens.

ATRYPA BIDENTATA Hall. See Rhynchonella(?) bidentata.

ATRYPA BISULCATA Hall. See Cyclospira bisulcata.

ATRYPA BREVIROSTRIS Hall. See Anastrophia brevirostris.

Atrypa calvini Nettelroth.

Atrypa calvini Nettelroth, Kentucky Foss. Shells, Mem. Kentucky Geol. Surv., 1889, p. 89, pl. 32, figs. 64–66.—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 440, pl. 8, figs. 13–15.

Niagaran: Louisville, Kentucky (Louisville); Delphi, Pendleton, etc., Indiana (Noblesville).

Holotype.—Cat. No. 51331, U.S.N.M.

ATRYPA CAMURA Hall. See Trematospira camura.

ATRYPA CAPAX Conrad. See Rhynchotrema capax.

ATRYPA CHEMUNGENSIS Conrad. See Atrypa reticularis.

ATRYPA CIRCULARIS Hall. See Parastrophia hemiplicata.

ATRYPA CONGESTA Conrad. See Hyattidina congesta.

ATRYPA CORALLIFERA Hall. See Dictyonella corallifera.

ATRYPA CRASSIROSTRA Hall. See Whitfieldella cylindrica.

ATRYPA CUNEATA Hall. See Rhynchotreta cuneata americana.

ATRYPA CUSPIDATA Hall. See Triplecia cuspidata.

ATRYPA CYLINDRICA Hall. See Whitfieldella cylindrica.

ATRYPA DEFLECTA Hall. See Zygospira deflecta.

ATRYPA DENTATA Hall. See Rhynchotrema dentatum.

ATRYPA DISPARILIS Hall. See Atrypina disparilis.

ATRYPA DUBIA Hall. See Protorhyncha dubia.

ATRYPA EMACERATA Hall. See Rhynchonella emacerata.

ATRYPA EQUIRADIATA Hall. See Camarotœchia æquiradiata.

ATRYPA EXIGUA Hall. See Zygospira exigua.

ATRYPA EXTANS Emmons. See Triplecia extans.

ATRYPA FLABELLA Shaler. See Cœlospira hemispherica.

ATRYPA GALEATA Dalman. See Gypidula (Sieberella) galeata.

ATRYPA GRAYI Davidson. See Streptis grayi.

Atrypa(?) gibbosa Hall.
Atrypa gibbosa Hall, Pal. New York, 2, 1852, p. 79, pl. 20, fig. 10.
Clinton: Clinton, New York.

ATRYPA HEMIPLICATA Hall. See Parastrophia hemiplicata.

ATRYPA HEMISPHERICA Sowerby. See Cœlospira hemispherica.

ATRYPA IMBRICATA Hall. See Atrypa nodostriata.

ATRYPA IMPRESSA Shaler. See Atrypa reticularis.

ATRYPA INCREBESCENS Hall. See Rhynchotrema capax and R. inæquivalve.

ATRYPA INTERMEDIA Hall. See Whitfieldella intermedia.

ATRYPA INTERPLICATA Hall. See Anastrophia interplicata.

ATRYPA LÆVIS Vanuxem. See Whitfieldella lævis.

ATRYPA LAMELLATA Hall. See Camarotœchia lamellata.

ATRYPA? LARA Schuchert. See Whitfieldella? lara.

Atrypa laticorrugata Foerste.
Atrypa lati-corrugata Foerste, Geol. Ohio, 7, 1895, p. 591, pl. 57A, fig. 16.
Upper Medinan (Brassfield): Dayton, Ohio.

ATRYPA LENS Sowerby. See Stricklandinia lens.

ATRYPA LENTIFORMIS Vanuxem. See Atrypa reticularis.

Atrypa mansonii (Salter).

Rhynchonella mansonii Salter, Sutherland's Jour. Voyage Baffins Bay, etc., 2, 1852, p. ccxxi, pl. 5, fig. 5.—Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 596.

Atrypa masonii Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 153.

Niagaran: Near Wellington Channel, Bessels Bay, Arctic America.

Atrypa marginalis (Dalman).

Terebratula marginalis Dalman, Kongl. Svenska Vet.-Akad. Handl. for 1827, 1828, p. 59, pl. 6, fig. 6.

Atrypa marginalis Roemer, Sil. Fauna west. Tennessee, 1860, p. 69, pl. 5, fig. 10.—Billings, Cat. Sil. Foss. Anticosti, 1866, p. 46.—Hall and Whitfield, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 197.—Davidson, Geol. Mag., dec. 2, 8, 1881, p. 10, fig. 9; Mon. Brit. Foss. Brachiopoda, 5, Sil. Suppl., Pal. Soc., 1882, p. 122.—Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 314, pl. 6, figs. 8, 9; Geol. Ohio, 7, 1895, p. 591, pl. 25, figs. 6, 9; pl. 31, figs. 8, 9.—Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pl. 55, figs. 24, 25.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 309.

Trematospira matthewsoni McChesney, Descriptions New Pal. Fos., 1860, p. 71; Trans. Chicago Acad. Sci., 1, 1868, p. 32, pl. 7, fig. 3.

Atrypa nodostriata Foerste (not Hall), Bull. Denison Univ., 1, 1885, p. 90, pl. 13, fig. 9.

Atrypa marginalis var. multistriata Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 316, pl. 6, fig. 8.

Silurian: Europe; Anticosti, etc., Canada; New York, Pennsylvania, Ohio, etc. (Brassfield-Niagaran).

Atrypa marginalis var. multistriata Foerste. See Atrypa marginalis.

Atrypa modesta Hall. See Zygospira modesta.

Atrypa naviformis Hall. See Whitfieldella(?) naviformis.

Atrypa neglecta Hall. See Camarotœchia (Stegerhynchus) neglecta.

Atrypa nitida Hall. See Whitfieldella nitida.

Atrypa nitida var. oblata Hall. See Whitfieldella oblata.

Atrypa nodostriata Foerste. See Atrypa marginalis.

Atrypa nodostriata Hall.

Atrypa imbricata Hall (not Sowerby), Geol. New York, Rep. 4th Dist., 1843, Tab. Org. Rem., 13, fig. 1.

Atrypa nodostriata Hall, Pal. New York, 2, 1852, p. 272, pl. 56, fig. 2.—Hall and Whitfield, Pal. Ohio, 2, 1875, p. 133, pl. 7, figs. 12–14.—Safford, Geol. Tennessee, 1869, p. 315, text fig. 5.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 196, fig. 114; Bull. New York State Mus., 45, 1901, p. 196, fig. 113.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 309, fig. 387.

Niagaran: Lockport, etc., New York (Rochester); Ontario; Ohio; Kentucky; Wisconsin; Tennessee.

Atrypa nucleolata Hall. See Whitfieldella(?) nucleolata.

Atrypa nucleus Hall. See Triplecia nucleus.

Atrypa obtusiplicata Hall. See Camarotœchia obtusiplicata.

Atrypa orbicularis Owen.

Atrypa orbicularis Owen, Geol. Expl. Iowa, Wisconsin, Illinois, 2d ed., 1844, p. 80, pl. 15, fig. 9.

Atrypa orbicularis—Continued.
Ordovician: Iowa.
Observation.—Not recognized. Figure represents internal cast of some undetermined brachiopod.

ATRYPA PHOCA of authors. See Lissatrypa phoca.

ATRYPA PLANOCONVEXA Hall. See Cœlospira planoconvexa.

ATRYPA PLENA Hall. See Camarotœchia plena.

ATRYPA PLICATA Hall. See Rhynchonella plicata.

ATRYPA PLICATELLA Hall. See Rhynchonella plicatella.

ATRYPA PLICATULA Hall. See Cœlospira plicatula.

ATRYPA PLICIFERA Hall. See Camarotœchia plena.

Atrypa præmarginalis Savage.
Atrypa præmarginalis Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 84, pl. 4, figs. 14–16.
Upper Medinan (Edgewood): Near Edgewood and Watson Station, Pike County, Missouri; near Thebes, Illinois.

ATRYPA PRISCA Vanuxem. See Atrypa reticularis.

Atrypa putilla (Hall and Clarke).
Zygospira putilla Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 157, fig. 150; p. 365, pl. 54, figs. 35–37; pl. 83, figs. 29, 30.—Hall, 48th Rep. New York State Mus., 2, 1897, p. 362, pl. 9, figs. 31, 32.—Hall and Clarke, 14th Rep. State Geol. New York for 1894, 1897, p. 362, pl. 9, figs. 31, 32.
Atrypa putilla Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 85, pl. 4, fig. 25.
Upper Medinan (Edgewood): Thebes, Illinois; Edgewood and Louisiana, Missouri.

ATRYPA QUADRICOSTATA Hall. See Hyattidina congesta.

ATRYPA RECURVIROSTRIS Hall. See Zygospira recurvirostris.

Atrypa reticularis (Linnæus).
Anomia reticularis Linnæus, Syst. Nat., 12th ed., 1, 1767, p. 1132.
Atrypa chemungensis Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1842, p. 265.—Vanuxem, Geol. New York, Rep. 3d Dist., 1842, p. 182, fig. 4.
Hipparionyx consimilaris Vanuxem, Geol. New York, Rep. 3d Dist., 1842, p. 132, fig. 2.
Atrypa affinis Vanuxem, Geol. New York, Rep. 3d Dist., 1842, p. 88, fig, 12.—Hall, ibid., Rep. 4th Dist., 1843, p. 88, fig. 12.
Atrypa prisca Vanuxem, Geol. New York, Rep. 3d Dist., 1842, p. 139, fig. 5.—Hall, ibid., Rep. 4th Dist., 1843, p. 175, fig. 5; p. 198, fig. 4.—Owen, Geol. Expl. Iowa, Wisconsin, Illinois, 1844, pl. 12, figs. 2, 10.—Billings, Canadian Nat. Geol., 1, 1856, p. 474, pl. 7, fig. 11.
Atrypa lentiformis Vanuxem, Geol. New York, Rep. 3d Dist., 1842, p. 163, fig. 3, p. 164.—Hall, ibid., Rep. 4th Dist., 1843, p. 215, fig. 3.
Strophomena ithacensis Vanuxem Geol. New York, Rep. 3d Dist., 1842, p. 174, fig. 2.
Atrypa tribulis Hall, Geol. New York, Rep. 4th Dist., 1843, p. 271, fig. 3.
Terebratula prisca Castelnau, Essai Syst., Sil. l'Amérique Septent., 1843, p. 40, pl. 13, fig. 8.

Atrypa reticularis—Continued.

Terebratula reticularis Hall, Amer. Jour. Sci., 2d ser., 20, 1849, p. 227.—Yandell and Shumard, Cont. Geol. Kentucky, 1847, p. 10.

Atrypa impressa Shaler (not Hall), Bull. Mus. Comp. Zool., 4, 1865, p. 68.

Atrypa reticularis Hall, Pal. New York, 2, 1852, p. 72, pl. 23, fig. 8; p. 270, pl. 55, fig. 5.—Billings, Canadian Nat. Geol., 1, 1856, p. 137, pl. 2, fig. 10.—Hall, Geol. Surv. Iowa, 2, 1858, p. 515; Pal. New York, 3, 1859, p. 253, pl. 42, fig. 1.—Roemer, Sil. Fauna west. Tennessee, 1860, p. 69, pl. 5, fig. 9.—Billings, Canadian Jour., 6, 1861, p. 264, figs. 84–87; Geol. Canada, 1863, p. 318, fig. 335; p. 384, fig. 416.—Hall, Pal. New York, 4, 1867, p. 316, pl. 52, figs. 1–3, 7–12; pl. 53, figs. 3–19; pl. 53A, figs. 22, 23.—Meek, Trans. Chicago Acad. Sci., 1, 1868, p. 97, pl. 13, fig. 13.—Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 432, pl. 13, fig. 11.—Meek, Simpson's Rep. Expl. Great Basin Terr. Utah, 1876, p. 347, pl. 1, fig. 6.—King's U. S. Geol. Surv. Expl. 40th Parl., 4, 1877, p. 38, pl. 1, fig. 7; pl. 3, fig. 6.—Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 596.—Hall, 28th Rep. New York. State Mus. Nat. Hist., 1879, p. 162, pl. 25, figs. 44–47.—White, 2d Ann. Rep. Indiana Bureau Statistics and Geol., 1880, p. 502, pl. 5, figs. 7–9; 10th Rep. State Geol. Indiana, 1881, p. 134, pl. 5, figs. 7–9; 11th Rep., 1882, p. 304, pl. 25, figs. 44–47.—Whitfield, Geol. Wisconsin, 4, 1882, p. 333, pl. 26, fig. 6.—Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 150, pl. 14, fig. 6.—Beecher and Clarke, Mem. New York State Mus. Nat. Hist., 1, 1889, p. 51, pl. 4, figs. 12–20.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Surv., 1889, p. 91, pl. 14, figs. 12–23; pl. 15, fig. 1.—Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 314.—Whiteaves, Cont. Canadian Pal., 1, 1892, p. 289, pl. 37, fig. 8.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 165, fig. 153; pl. 55, figs. 1–17.—Herrick, Geol. Ohio, 7, 1895, pl. 20, fig. 7.—Davidson, Mon. British Devonian Brach. Pal. Soc., 1864, p. 53, pl. 10, figs. 3, 4.; 1867, p. 129, pl. 14, figs. 1–22; 1882, pp. 109, 110, figs.; pl. 6, figs. 14, 15; pl. 7, figs. 1–6.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, pp. 57–60, figs.—Miller, N. A. Geol. Pal., 1889, pp. 336, 337, figs. 541–543.—Grabau, Bull. Buffalo Soc. Nat. Sci., 8, 1901, p. 195, fig. 112; Bull. New York State Mus., 45, 1901, p. 195, fig. 112.—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 440, pl. 8, figs. 16–18.—Grabau, Michigan Geol. Surv., geol. ser. 1, 1909, p. 162, pl. 20, fig. 1.—Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 392, pl. 67, figs. 26–28.—Holtedahl, 2d Arct. Exp. *Fram*, 1898–1902, No. 32, 1914, p. 23, pl. 8, fig. 5.

Silurian and Devonian: World-wide distribution.

ATRYPA RETICULARIS ARCTOSTRIATUS Foerste. See Atrypa arctostriata.

Atrypa reticularis newsomensis Foerste.

Atrypa reticularis newsomensis Foerste, Jour. Geol., 11, 1903, p. 710.—Foreste, Bull. Sci. Lab. Denison Univ. 14, 1909, p. 93, pl. 1, fig. 11A, B.

Niagaran (Waldron): Newsom, etc., Tennessee.

Atrypa reticularis niagarensis Nettelroth.

Atrypa reticularis var. niagarensis Nettelroth, Kentucky Fossils Shells, Mem. Kentucky Geol. Surv., 1889, p. 92, pl. 32, figs. 5–8, 44–47.—Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1909, p. 13.

Niagaran (Waldron-Louisville): Louisville, etc., Kentucky; Clarke County, Waldron, etc., Indiana; Newsom, etc., Tennessee.

Cotypes.—Cat. No. 51314, U.S.N.M.

ATRYPA ROBUSTA Hall. See Rhynchotreta robusta.

Atrypa rugosa Hall.

Atrypa rugosa Hall, Pal. New York, 2, 1852, p. 271, pl. 56, fig. 1.—Hall and Clarke, ibid., 8, pt. 2, 1893, p. 171.—Grabau, Bull. New York State Mus., 45, 1901, p. 196, fig. 114; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 196, fig. 114.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 310, fig. 388.—Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1909, p. 13, pl. 2, fig. 6.

Rhynchonella rugosa Billings, Geol. Canada, 1863, p. 315, fig. 321.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 899, fig.

Niagaran: Lockport, etc., New York, and Ontario (Rochester); Indiana; Ohio (West Union); Kentucky; Anticosti.

ATRYPA SEMIPLICATA Conrad. See Camarotœchia semiplicata.

ATRYPA SORDIDA Hall. See Plectorthis (Encuclodema) sordida.

ATRYPA SUBTRIGONALIS Hall. See Rhynchotrema subtrigonale.

ATRYPA SULCATA Vanuxem. See Whitfieldella sulcata.

ATRYPA TRIBULIS Hall. See Atrypa reticularis.

Atrypa tubulistriata Savage.

Atrypa tubulistriata Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 86, pl. 5, figs. 23 and 24.

Upper Medinan (Edgewood): Louisiana and mouth of Buffalo Creek, Pike County, Missouri; south of Hamburg, Illinois.

ATRYPINA Hall and Clarke. Genotype: Leptocœlia imbricata Hall.

Atrypina Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 161, fig. 152; 13th Ann. Rep. New York State Geol. 1895, p. 815.—Schuchert, Zittel-Eastman Textb. Pal., 1900, p. 334; 2d ed., 1913, p. 408.

Atrypina clintoni Hall and Clarke.

Atrypina clintoni Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 162, pl. 53, figs. 7, 17–19; pl. 83, fig. 6; 48th Rep. New York State Mus., 2, 1897, p. 362, pl. 9, figs. 27–30; 14th Rep. State Geol. New York for 1894, 1897, p. 362, pl. 9, figs. 27–30.

Clinton: Orleans County, New York.

Atrypina disparilis (Hall).

Atrypa disparilis Hall, Pal. New York, 2, 1852, p. 277, pl. 57, fig. 6.—Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pl. 53, figs. 1–4.

Leptocœlia disparilis Hall, 12th, Rep. New York State Cab. Nat. Hist., 1859, p. 77.

Trematospira? disparilis Hall, 16th Rep., ibid., 1863, p. 60; Trans. Albany Institute, 4, 1863, p. 146.

Cœlospira disparilis Hall, 28th Rep. New York State Mus. Nat. Hist., 1879, p. 162, pl. 25, figs. 39–43; 11th Rep. State Geol. Indiana, 1882, p. 363, pl. 25, figs. 39–43.—Beecher and Clarke, Mem. New York State Mus. Nat. Hist., 1, 1889, p. 64, pl. 5, figs. 17–23.

Atrypina disparilis Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 156.

Niagaran: Wolcott, etc., New York (Wolcott-Rochester); Waldron, Indiana; Tennessee (Waldron).

Atrypina intermedia (Hall).

Leptocœlia intermedia Hall, Canadian Nat. Geol., 1860, 5, p. 147, fig. 5.—Dawson, Acadian Geology, 3d ed., 1878, p. 598, fig. 202.

Atrypina intermedia Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 157 (gen. ref.).

Silurian: Arisaig, Nova Scotia.

AULOCERIUM Parks. Genotype: A. savagei Parks.
Aulocerium Parks, Univ. Toronto Studies, Geol. Ser., 6, 1909, p. 44.

Aulocerium savagei Parks.
Aulocerium savagei Parks, Univ. Toronto Studies, Geol. Ser., 6, 1909, p. 44, pl. 18, figs. 13 and 15.
Niagaran: Wilmington, Illinois.

AULOCOPELLA Rauff. Genotype: A. winnipegensis Rauff.
Aulocopella Rauff, Palæontographica, 41, 1895, p. 268.

Aulocopella winnipegensis Rauff.
Aulocopella winnipegensis Rauff, Palæontographica, 41, 1895, p. 269, fig. 124, pl. 24, figs. 4–6.—Whiteaves, Pal. Foss. Geol. Surv. Canada, 3, pt. 3, 1897, pp. 145, 146, fig. 9, pl. 16, figs. 1–3.
Black River or Richmond: Cat Head, Lake Winnipeg, Canada.

AULOCOPINA Billings. Genotype: A. granti Billings.
Aulocopina Billings, Canadian Nat., n. s., 7, 1874, p. 230.—Miller, N. A. Geol. Pal., 1889, p. 154.—Zittel-Eastman Textb. Pal., 1, 1900, p. 47; 2d ed., 1913, p. 53.

Aulocopina granti Billings.
Aulocopina Granti Billings, Canadian Nat., n. s., 7, 1874, p. 231, figs. 1, 2.—Walker, Jour. and Proc. Hamilton Assoc., 11, 1895, p. 86, fig. 2.
Niagaran dolomite: Hamilton, Ontario.

Aulopora Goldfuss (part). See Stomatopora Bronn.

AULOPORA Goldfuss. Genotype: A. serpens Goldfuss.
Aulopora Goldfuss, Petrefacta Germ., 1826, pp. 82, 245.—Fischer de Waldheim, Oryctographie Gouv. Moscou, 1837, p. 162.—Dana, Wilkes' U. S. Expl. Exped., 7, Zoophytes, 1842, p. 630.—McCoy, Syn. Foss. Carb. Ireland, 1844, p. 190.—King, Mon. Permian Foss. England, Pal. Soc., 1850, p. 31.—Edwards and Haime, Mono. d. Polyp. Foss. d. Terr. Pal. (Arch. du Mus. d'Hist. Nat., 5), 1851, pp. 159, 311.—Pictet, Traite de Pal., 2d ed., 4, 1859, p. 463.—Billings, Canadian Jour., n. s., 4, 1859, p. 118.—Milne-Edwards, Hist. Nat. d. Corall., 3, 1860, p. 319.—Koninck, Animaux Foss. Terr. Carb. Belgique (Mem. l'Acad. Royale Sci. de Belgique, 39), 1872, p. 148.—Nicholson, Rep. Pal. Prov. Ontario, pt. 1, 1874, p. 42.—Nicholson, Trans. Royal Soc. Edinburgh, 27, 1876, p. 241.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 87.—Nicholson, Tab. Corals Pal. Period, 1879, p. 219.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 518.—Hall and Simpson, Pal. New York, 6, 1887, p. xi.—Miller, N. A. Geol. Pal., 1889, p. 173.—Beecher, Trans. Connecticut Acad. Arts and Sci., 8, 1891, p. 210.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 217.—Sardeson, Neues Jahrb. f. Min., Geol. Pal., Beilage-Band, 10, 1896, p. 339.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 131.—Zittel-Eastman Textb. Pal., 1, 1900, p. 101.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 78.—Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 116.

Aulopora arachnoidea Hall. See Stomatopora arachnoidea.

Aulopora consimilis Lonsdale. See Berenicea consimilis.

Aulopora frondosa James. See Proboscina frondosa.

Aulopora precius Hall.

Aulopora precius Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875 (1877), pl. 9, figs. 5, 6; Mus. ed., 1879; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 227, pl. 8, figs. 5, 6.—Roemer, Lethæa geog., pt. 1, Leth. Pal., 1883, p. 521.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 97, fig. 20.

Niagaran: Waldron, Indiana, etc. (Waldron); Louisville, Kentucky (Louisville).

Aulopora precius compressus Foerste.

Aulopora precius compressus Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 339.

Upper Medinan (Brassfield): Ludlow Falls, Ohio.

Aulopora pygmœa Davis.

Aulopora pygmœa Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 73, figs. 5, 6.

Niagaran (Louisville): Near Louisville, Kentucky.

AULOPORA REPENS Roemer. See Aulopora roemeri.

Aulopora roemeri Foerste.

Aulopora repens Roemer (not Knorr and Walsh, 1775), Sil. Fauna West Tennessee, 1860, p. 28, pl. 2, fig. 1, 1a.

Aulopora roemeri Foerste, Jour. Geol., 11, 1903, p. 712.

Niagaran (Brownsport): Perry and Decatur Counties, Tennessee.

Aulopora schohariæ Hall.

Aulopora schohariæ Hall, 26th Rep. New York State Mus., 1874, p. 110; 32d Rep. 1879, p. 142; Rep. New York State Geol. for 1882, 1883, pl. 2, figs. 1–6; Pal. New York, 6, 1887, p. 3, pl. 2, figs. 1–6.—Swartz, Maryland Geol. Surv., Low. Dev., 1913, p. 219, pl. 26, figs. 2, 3.

Helderbergian: Schoharie and Clarksville, New York (New Scotland); Hyndman, Pennsylvania (Keyser).

Aulopora schucherti Swartz.

Aulopora schucherti Swartz, Maryland Geol. Surv., Low. Dev., 1913, p. 219, pl. 26, figs. 4, 5.

Helderbergian (Keyser): Keyser, West Virginia; Cash Valley, Hancock, etc., Maryland; Hyndman, Pennsylvania.

Aulopora serpens Owen.

Aulopora serpens Owen (not Goldfuss, 1829), Geol. Expl. Iowa, Wisconsin, and Illinois, 2d ed., 1844, p. 78, pl. 14, fig. 2.

Niagaran: Iowa and Wisconsin.

Aulopora(?) trentonensis Winchell and Schuchert.

Aulopora(?) trentonensis Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 95, pl. G, figs. 26–28.

Black River (Decorah): Minneapolis, near Cannon Falls, etc., Minnesota.

AULOPORA UMBELLIFERA Billings. See Romingeria umbellifera.

Aulopora vanclevii Hall.

Aulopora Vanclevii Hall, 12th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1883, p. 255, pl. 4, figs. 1, 2.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 67, figs.

Niagaran (Louisville): Falls of the Ohio.

AUSTINELLA Foerste. See Plectorthis subgenus Austinella.

AVICULA Klein. Genotype: A. hirundo Klein.

Avicula Klein, Ostrac., 1873.—McCoy, Syn. Char. Foss., 1844, p. 82.—Woodward, Man. Mollusca, pt. 2, 1854, p. 260, pl. 16, fig. 18.—McCoy, Brit. Pal. Rocks and Foss., 1854, p. 257.—Pictet, Traite de Pal., 2d ed., 3, 1855, p. 597.—Zittel, Handb. Pal., 2, Munich, 1881, p. 32.—Waagen, Mem. Geol. Surv. India, Pal. Indica, 13th ser., 1, 1881, p. 289.—Barrande, Syst. Sil. Centre Boheme, 6, 1881, p. 23.—Miller, N. A. Geol. Pal., 1889, p. 463.—Jackson, Amer. Nat., 24, 1890, p. 1141.—Koken, Die Leitfossilien, Leipzig, 1896, p. 187.

Avicula alata Nicholson. See Modiolopsis primigenia.

Avicula aviformis Conrad. See Prolobella trentonensis.

Avicula carinata Emmons. See Byssonychia carinata.

Avicula communis Hall. See Actinopteria communis.

Avicula corrugata James. See Pterinea corrugata.

Avicula danbyi McCoy. See Palæopecten danbyi.

Avicula demissa Conrad. See Pterinea demissa.

Avicula elliptica Hall. See Prolobella subelliptica.

Avicula emacerata Conrad. See Pterinea emacerata.

Avicula?? ferruginea Conrad.

Avicula ferruginea Conrad, Proc. Acad. Nat. Sci. Philadelphia, 3, 1846, p. 23, pl. 1, fig. 28.

Silurian (iron ore): Jersey Shore, Lycoming County, Pennsylvania.

Avicula Hermione Billings. See Prolobella? hermione.

Avicula honeymani Miller. See Pterinea honeymani.

Avicula insueta Emmons. See Pterinea insueta.

Avicula lamellosa Dawson.

Avicula lamellosa Dawson, Canadian Nat., n. s., 9, 1880, p. 342.

Silurian: Pictou, Nova Scotia.

Avicula leptonota Hall. See Pterinea emacerata.

Avicula limæformis Hall. See Limoptera limæformis.

Avicula obscura Hall. See Pterinopecten? obscura.

Avicula? orbiculata Hall. See Amphicœlia orbiculoides.

Avicula rhomboidea Hall. See Leptodesma rhomboidea.

Avicula rugosa Vanuxem. See Pterinea subrugosa.

Avicula securiformis Hall. See Pterinea securiformis.

Avicula subarcuata Emmons. See Modiolopsis arcuata.

Avicula subelliptica Emmons. See Prolobella subelliptica.

Avicula subplana Hall. See Leiopteria subplana.

Avicula subrecta Hall. See Pterinea subrecta.

AVICULA SUBRETROFLEXA D'Orbigny. See Pterinea demissa.

AVICULA SUBRUGOSA D'Orbigny. See Pterinea subrugosa.

AVICULA TENUILAMELLATA Hall. See Aviculopecten tenuilamellatus.

AVICULA TRENTONENSIS Conrad. See Prolobella trentonensis.

Avicula triquetra Hall.
Avicula triquetra Hall, Nat. Hist. New York, Geol., 4, 1843, p. 137, fig. 7.
Niagaran (Guelph): Newark, Wayne County, New York.

AVICULA UNDATA Hall. See Pterinea undata.

Avicula? undosa Ringueberg.
Avicula undosa Ringueberg, Bull. Buffalo Soc. Nat. Hist., 5, 1886, p. 18, pl. 2, fig. 9.
Clinton (Rochester): Lockport, New York.

Avicula welchi James. Not recognized.
Avicula welchi James, Cincinnati Quart. Jour. Sci., 1, 1874, p. 239.
Richmond: Clinton County, Ohio.

AVICULA WHITFIELDI Foerste. See Cyrtodonta? ferruginea.

AVICULOPECTEN McCoy. Genotype: A. planoradiatus McCoy.
Aviculopecten McCoy, Ann. Mag. Nat. Hist., 2d ser., 7, 1851, p. 171, fig; Contr. British Pal., 1854, p. 203, fig.; British Pal. Rocks and Foss., 1854, p. 392.—Meek, Amer. Jour. Sci. and Arts, 2d ser., 37, 1864, p. 217.—Meek and Hayden, Pal. Up. Missouri, Smiths. Cont. Knowl., 172, 14, 1865, p. 49.—Meek, Amer. Jour. Sci. and Arts, 2d ser., 44, 1867, p. 175; 44, 1868, p. 64.—Zittel, Handb. Pal., 2, Munich, 1881, p. 30.—Waagen, Mem. Geol. Surv. India, Pal. Indica, 13th ser., 1, 1881, p. 300.—Barrande, Syst. Sil. du Centre Boheme, 6, 1881, p. 22; Acephales Ext. Syst. Sil. du Centre Boheme, 1881, p. 34.—Hall, Pal. New York, 5, pt. 1, Lam. (adv. copy), 1883, p. 3; 4th Rep. State Geol. New York, 1885, p. 47, figs. 1, 2; 1st Rep. State Geol. New York, 1884, p. 12; Pal. New York, 5, pt. 1, Lam. 1, 1884, p. xii; 35th Rep. New York State Mus., 1884, p. 406b.—Miller. N. A. Geol. Pal., 1889, p. 465.—Koken, Die Leitfossilien, Leipzig, 1896, p. 185.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 240.—Girty, Amer. Geol., 33, 1904, pp. 291, 292, fig.; 34, 1904, p. 332.—Hind, ibid., 34, p. 200.—Dall, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 457.

AVICULOPECTEN SUBRECTUS Miller. See Pterinea subrecta.

Aviculopecten tenuilamellatus (Hall).
Avicula tenuilamellata Hall, Pal. New York, 3, 1859, p. 281, pl. 51, figs. 1 and 2.
Aviculopecten tenuilamellatus Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 461, pl. 78, fig. 4.
Helderbergian: Albany and Schoharie Counties, New York (New Scotland); Keyser, West Virginia (Keyser).

AZYGOGRAPTUS Nicholson. Genotype: A. lapworthi Nicholson.
Azygograptus Nicholson, Ann. Mag. Nat. Hist., 4th ser, 16, 1875, p. 269.—Wiman, Bull. Geol. Inst. Univ. Upsala, 2, pt. 2, No. 4, 1896, p. 266; Nat. Sci., 9, 1896, p. 188.—Elles, Quart. Jour. Geol. Soc. London, 54, 1898, p. 513.—Elles and Wood, Mon. British Grapt. Pal. Soc., 1902, p. 92.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 256–257.

Azygograptus? simplex Ruedemann.

Dawsonia campanulata Ruedemann (not Nicholson, 1873), Bull. New York State Mus., 42, 1901, p. 520.

Azygograptus? simplex Ruedemann, Mem. New York State Mus., 11, pt. 2, pp. 258–260, pl. 14, fig. 10, figs. 163–171.

Chazyan (Normanskill): Kenwood, Glenmont, Mount Moreno, and Lansingburg, New York.

Azygograptus? walcotti Lapworth.

Azygograptus? walcotti (Lapworth) Gurley, Jour. Geol., 4, 1896, pp. 69, 92.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 257, 258, fig. 162.

Chazyan (Normanskill): Stockport, New York.

Bairdia anticostiensis Jones. See Krausella anticostiensis.

Balanocrinites Troost. See Lampterocrinus Roemer.

Balanocrinus Hall. See Lampterocrinus Roemer.

BALTOCERAS Holm. Genotype: Endoceras burchardii Dexitz.

Baltoceras Holm, Geol. Mag., dec. 4, 4, 1897, p. 251.—Ruedemann, Bull. New York State Mus., 90, Pal., 14, 1906, p. 432.—Hyatt, Zittel-Eastman Textb. Pal., 1, 1900, p. 517.

Baltoceras(?) pusillum Ruedemann.

Baltoceras(?) pusillum Ruedemann, Bull. New York State Mus., 90, Pal. 14, 1906, p. 431, pl. 9, fig. 4, 5.

Canadian (Beckmantown): Valcour, New York.

Barrandella Hall and Clarke. See Clorinda Barrande.

BARRANDEOCERAS Hyatt. Genotype: Nautilus natator Billings.

Barrandeoceras Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 299.—Zittel. Handb. Pal., 2, Munich, 1884, p. 382.—Foord, Cat. Foss. Ceph. British Mus., 11, 1891, p. 77.—Hyatt, Proc. Amer. Philos. Soc., 32, 1894, p. 450.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 771.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 307.—Ruedemann, Bull. New York State Mus., 90, Pal. 14, 1906, p. 454.—Grabau and Shimer N. A. Index Fossils, 2, 1910, p. 65.

Barrandeoceras americanum (D'Orbigny).

Lituites convolvans (Hisinger?) Hall, Pal. New York, 1, 1847, p. 53, pl. 13, figs. 2, 2a.

Hortholus Americanus D'Orbigny, Prodr. de Pal., 1, 1849, p. 1 (new name for Lituites convolvans Hall).—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 146.

Lituites Americanus Miller, N. A. Geol. Pal., 1889, p. 442.

Barrandeoceras convolvans Hyatt, Proc. Amer. Philos. Soc., 32, 1894, p. 451.—Miller, N. A. Geol. Pal., sec. app., 1897, p. 771.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 66.

Barrandeoceras subcostulatum Whiteaves, Ottawa Naturalist, 12, 1898, p. 121; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 310, pl. 38.

Black River: Watertown, New York (Watertown); Wolfe Island, near Kingston, Canada.

Barrandeoceras convolvans Hyatt. See Barrandeoceras americanum.

Barrandeoceras elrodi Milleri. See Gyroceras elrodi.

Barrandeoceras minganense Hyatt.

Barrandeoceras minganense Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 451.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 309.

Chazyan (Mingan): Mingan Islands, Canada.

Barrandeoceras natator (Billings).

Nautilus natator Billings, Canadian Nat., 4, No. 6, 1859, p. 406.

Phragmoceras natator Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 638, 7 figs.

Barrandeoceras natator Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 299 (gen. ref.); Proc. Amer. Phil. Soc., 32, 1894, p. 452.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 308, pl. 39, figs. 1, 1a, 1b.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 66, fig. 1274.

Chazyan: Mingan Islands, Canada (Mingan); east shore of Valcour Islands, New York (Valcour).

Barrandeoceras subcostulatum Whiteaves. See Barrandeoceras americanum.

Barrandeoceras vagrans (Billings).

Gyroceras (Lituites) vagrans Billings, Geol. Surv. Canada Rep. Progr. for 1853–56, 1857, p. 308.

Barrandeoceras vagrans Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 311, pl. 40, figs. 1–2a.

Black River (Leray): La Petite Chaudiere Rapids, Ottawa River, and Montreal, Canada.

BARRANDEOCRINUS Angelin. Genotype: B. septrum Angelin.

Barrandeocrinus Angelin, Icon. Crin., 7, 1878, pl. 4, fig. 5, 5a; pl. 5, figs. 6, 6a; pl. 22, figs. 2–4.—Zittel, Handb. Pal., 1, 1879, p. 368.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1885, p. 347 (Rev. Pal., pt. 3, p. 125); Mem. Mus. Comp. Zool., Harvard, 21, 1897, p. 484.—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 166, fig. 80.—Wachsmuth, Zittel-Eastman Pal., 1, 1900, p. 144.—Zittel, Grundzuge Pal., 1, 1910, p. 159.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 195.

Cylicocrinus Miller, N. A. Geol. Pal., 1st App., 1892, p. 676; 18th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1894, p. 285 (adv. sheets 1892).—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 156. (Genotype: C. canaliculatus Miller.)

Barrandeocrinus canaliculatus (Miller).

Cylicocrinus canaliculatus Miller, 18th Ann. Rep. Dep. Geol. Nat. Res. Indiana (adv. sheets, 1892, p. 31, pl. 5, figs. 13, 14), 1894, p. 285, pl. 5, figs. 13, 14; N. A. Geol. Pal., 1st App., 1892, p. 676, fig. 1220.

Barrandeocrinus canaliculatus Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 21, 1897, p. 485.

Niagaran (Laurel): St. Paul, Indiana.

Barrandeocrinus? indianensis (Miller and Gurley).

Cylicocrinus(?) indianensis Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 6, 1895, p. 31, pl. 4, figs. 20–22.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 741, fig. 1331.

Niagaran (Laurel): St. Paul, Indiana.

Barrandia? mccoyi Walcott. See Dolichometopus mccoyi.

BARYPHYLLUM Edwards and Haime.

Genotype: B.verneuileanum Edwards and Haime.

Baryphyllum Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal. (Arch. du Mus. d'Hist. Nat., 5), 1851, pp. 165, 352.—Pictet, Traité de Pal., 4, 1857, p. 453.—Milne-Edwards, Hist. Nat. d. Corall., 3, 1860, p. 355.—Ludwig, Palæontographica, 14, 1865, p. 143, pl. 31, figs. 11, 11a.—Dybowski, Archiv f. Natur. Liv-, Ehst- und Kurl., 5, 1873, p. 334.—Zittel, Handb. Pal., 1, Munich, 1879, p. 227.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 372.—Miller, N. A. Geol. Pal., 1889, p. 174.—Sherzer, Amer. Geol., 7, 1891, pp. 278–283.

Baryphyllum fungulus White.

Baryphyllum fungulus White, Proc. Acad. Nat. Sci. Philadelphia, 1878, p. 29. Niagaran (Waldron) Waldron, Indiana.

BASILICUS Salter. Genotype: Asaphus tyrannus Murchison.

Basilicus Salter, Mem. Geol. Surv. United Kingdom, dec. 2, 1849, pl. 5.—McCoy, Ann. Mag. Nat. Hist. (2), 4, 1849, p. 399; Brit. Pal. Rocks and Fossils, 1854, p. 169.—Salter, Mon. Brit. Tril., Pal. Soc., 1866, p. 146.—Zittel, Handb. Pal., 2, 1885, p. 608.—Koken, Die Leitfossilien, Leipzig, 1896, p. 26.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 8th ser., 6, 1898, p. 29; 12, No. 8, 1901, p. 1; 14, No. 10, 1904, pp. 3–20.—Raymond, Ann. Carnegie Mus., 7, No. 1, 1910, p. 62; Trans. and Proc. Roy. Soc. Canada, 5, 3d ser., sec. 4, 1912, p. 115; Zittel-Eastman Textb. Pal., 1913, p. 719.

Basilicus barrandi (Hall).

Asaphus Barrandi Hall, Geol. Lake Superior Land Dist., Foster and Whitney's Rep., 1851, p. 210, pl. 27, figs. 1a–d; pl. 28; Rep. Geol. Surv. Wisconsin, 1862, p. 41, fig. 4.

Ogygia barrandii Whitfield, Amer. Mus. Nat. Hist., 2, pt. 1, 1898, p. 70.

Asaphus Romingeri Walcott, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1877, p. 96; mus. ed., 1879, p. 96.

Ptychopyge romingeri Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 709.

Basilicus romingeri Raymond, Ann. Carnegie Mus., 7, No. 1, 1910, p. 49, pl. 15, figs. 9, 10; pl. 16, figs. 1–4.

Asaphus Wisconsensis Walcott, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1877, p. 97; mus. ed., 1879, p. 97.

Ptychopyge ulrichi Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 709, figs. 12, 13.

Asaphus ulrichi Miller, N. A. Geol. Pal., 2d App., 1897, p. 786 (gen. ref.).

Basilicus barrandi Raymond, Bull. Victoria Mem. Mus., 1, 1913, p. 42; Bull. Mus. Comp. Zool., 58, 1914, p. 261, pl. 1, figs. 4, 5; pl. 2, figs. 1, 7.

Black River: Platteville, etc., Wisconsin; Russia, Herkimer County, New York; Cannon Falls and Faribault, Minnesota; Ottawa, Ontario· St. Joseph's Island, Lake Huron.

BASILICUS CANADENSIS Chapman. See Ogygites canadensis.

Basilicus huttoni (Billings).

Asaphus Huttoni Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 271, fig. 256.

Ptychopyge huttoni Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 710.

Asaphus morrisii Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 272, fig. 257.—Vogdes, Bull. U. S. Geol. Surv., 63, 1890, pp. 93, 94.

Chazyan (Quebec—N, P): Tablehead and four miles northeast Portland Creek, Newfoundland.

Basilicus marginalis (Hall).

Asaphus marginalis Hall, Pal. New York, 1, 1847, p. 24, pl. 4 (bis.), fig. 15.—Emmons, Amer. Geol., 1, pt. 2, 1855, p. 235, pl. 3, fig. 16.—Raymond, Ann. Carnegie Mus., 3, 1905, p. 339, pl. 10, figs. 17–20; pl. 11.—Grabau and Shimer, N. A. Index Foss., 2, 1910, p. 291, fig. 1599.

Basilicus marginalis—Continued.

Basilicus marginalis Raymond, 7th Rep. State Geol. Vermont, 1910, p. 220, pl. 32, figs. 17–20; pl. 34, figs. 8–10; pl. 37, fig. 6; pl. 39, figs. 1–2; Ann. Carnegie Mus., 7, No. 1, 1910, p. 62, fig. 1; pl. 17, fig. 6; pl. 19, figs. 1, 2.

Asaphus alpha Raymond, Ann. Carnegie Mus., 3, 1905, p. 342, pl. 12, fig. 9.

Asaphus gamma Raymond, Ann. Carnegie Mus., 3, 1905, p. 342, pl. 12, fig. 10.

Chazyan (Day Point, Crown Point): Chazy, Valcour Island, etc., New York.

Observation.—See also Gerasaphes ulrichana Ruedemann (not Clarke) for a possible synonym.

Basilicus? vetustus (Hall).

Ogygia? vetusta Hall, Pal. New York, 1, 1847, p. 227, pl. 60, fig. 1.—Emmons, Amer. Geol., 1, pt. 2, 1855, p. 216, fig. 72.

Asaphus vetustus Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 72 (gen. ref.).

Black River (Lowville): Mohawk Valley, New York.

Bathycœlia Foerste. See Pianodema Foerste.

BATHYURELLUS Billings. Genotype: Bathyurellus abruptus Billings.

Bathyurellus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, pp. 262, 263.—Walcott, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1877, p. 94, footnote; mus. ed., 1879.—Dames, Richthofen's China, Berlin, 4, 1883, p. 5.—Zittel, Handb. Pal., 2, 1885, p. 602.—Miller, N. A. Geol. Pal., 1889, p. 533.—Raymond, Ann. Carnegie Mus., 3, No. 2, 1905, p. 337; Zittel-Eastman Textb. Pal., 1913, p. 718.

Bathyurellus abruptus Billings.

Bathyurellus abruptus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 263, fig. 247 (?250).

Canadian (Quebec—F, G, H): Port aux Choix and Keppel Island, Newfoundland.

Bathyurellus brevispinus Raymond.

Bathyurellus brevispinus Raymond, Ann. Carnegie Mus., 3, 1905, p. 337, pl. 10, figs. 13–15; 7th Rep. State Geol. Vermont, 1910, p. 218, pl. 32, figs. 13–15.

Chazyan: Three miles east of Chazy, New York (Day Point); Mingan Islands, Canada (Mingan).

Bathyurellus expansus Billings.

Bathyurellus expansus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 318, fig. 306a, b.

Canadian (Beekmantown): Stanbridge, Quebec.

Bathyurellus formosus Billings.

Bathyurellus formosus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 206, fig. 250.

Chazyan (Quebec—P): Cow Head, Newfoundland.

Observation.—Compare Bathyurellus brevispinus Raymond.

Bathyurellus fraternus Billings.

Bathyurellus fraternus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 267, fig. 251, a, b.

Chazyan: Cow Head, Newfoundland (Quebec—P); Mingan Islands, Canada (Mingan).

Bathyurellus litoreus Billings.

Bathyurellus litoreus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 320.

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

Bathyurellus marginatus Billings.

Bathyurellus marginatus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 264, fig. 248 (?249).

Canadian (Quebec—F, G, H): Keppel Island, Port aux Choix, and Table Head, Newfoundland.

Bathyurellus minor Raymond.

Bathyurellus minor Raymond, Annals Carnegie Mus., 3, 1905, p. 338, pl. 10, fig. 16; 7th Rep. State Geol. Vermont, 1910, p. 219, pl. 32, fig. 16.

Bathyurellus validus Raymond, Bull. Amer. Pal., 3, No. 14, 1902, p. 301.

Chazyan (Crown Point): Crown Point, Valcour Island, New York.

Bathyurellus nitidus Billings.

Bathyurellus nitidus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 265, fig. 249.—Miller, N. A. Geol. Pal., 1889, p. 533, fig. 971.

Chazyan (Quebec—P): Cow Head, Newfoundland.

Bathyurellus rarus Billings.

Bathyurellus rarus Billings, Pal. Foss., 1, Geol. Surv., Canada, 1865, p. 320.

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

Bathyurellus validus Billings.

Bathyurellus validus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 268, fig. 252. Chazyan (Quebec—L): Point Rich, Newfoundland.

BATHYURUS Billings. Genotype: Asaphus extans Hall.

Bathyurus Billings, Canadian Nat. Geol., 4, 1859, p. 364; 5, 1860, p. 317; Pal. Foss., 1, Geol. Surv. Canada, 1865, pp. 408, 409.—Walcott, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1877, p. 94; mus. ed., 1879.—Kayser, Beitr. Geol. and Pal. Argentinischen Republik, Palæontographica Suppl., 3, 1876, p. 10.—Dames, Richthofen's China, 4, 1883, p. 4.—Zittel, Handb. Pal., 2, 1885, p. 602.—Miller, N. A. Geol. Pal., 1889, p. 533.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 288.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 718; Bull. Victoria Mem. Mus., 1, 1913, p. 51.

Bathyurus acutus Raymond.

Bathyurus acutus Raymond, Bull. Victoria Mem. Mus., 1, 1913, p. 56, pl. 7, fig. 4.

Stones River (Pamelia): Westboro, near Ottawa, Ontario.

Bathyurus amplimarginatus Billings.

Bathyurus amplimarginatus Billings, Canadian Nat. Geol., 4, 1859, p. 365, fig. 12a, b; Geol. Canada, Geol. Surv. Canada, 1863, p. 122, fig. 41; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 353, fig. 341a.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 288.—Raymond, Bull. Victoria Mem. Mus., 1, 1913, p. 54.

Bathyurus minganensis Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 353.

Canadian: Mingan Islands, Canada (Romaine); Rockland, Ontario, (Beekmantown).

Bathyurus angelini Billings.

Bathyrus Angelini Billings, Canadian Nat. Geol., 4, 1859, p. 467, fig. 37; Geol. Canada, Geol. Surv. Canada, 1863, p. 133, fig. 68.—Chapman, Canadian Jour., n. s., 8, 1863, p. 29, fig. 142; p. 195, fig. 166; Expos. Min. Geol. Canada, 1864, p. 137, fig. 142; p. 167, fig. 166.—Raymond, Ann. Carnegie Mus., 3, 1905, No. 2, p. 335, fig. 1, pl. 10, figs. 11, 12; 7th Rep. State Geol. Vermont, 1910, pl. 32, figs. 11, 12; Bull. Victoria Mem. Mus., 1, 1913, p. 55, pl. 7, fig. 5.

Canadian: Grenville (Beekmantown), Mingan Islands (Romaine), etc., Canada.

Bathyurus arcuatus Billings.

Bathyurus arcuatus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 205, figs. 189, 190.—Raymond, Bull. Victoria Mem. Mus., 1, 1913, p. 57.

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

BATHYURUS ARMATUS Billings. See Plethopeltis armatus.

BATHYURUS ARMATUS Walcott. See Plethopeltis saratogensis.

BATHYURUS BITUBERCULATUS Billings. See Lloydia bituberculatus.

BATHYURUS BREVICEPS Billings. See Leiostegium breviceps.

BATHYURUS CAPAX Billings. See Platycolpus capax.

BATHYURUS CAUDATUS Billings. See Goniurus caudatus.

BATHYURUS CONGENERIS Walcott. See Holasaphus congeneris.

BATHYURUS CONICUS Billings. See Hystricurus conicus.

BATHYURUS CORDAI Billings. See Hystricurus cordai.

BATHYURUS CROTALIFRONS Dwight. See Hystricurus crotalifrons.

BATHYURUS CYBELE Billings. See Petigurus cybele.

Bathyurus?? darwini Kayser.

Bathyurus? Darwinii Kayser, Beitr. Geol. Pal. Argentinischen Republik, Palæontographica Suppl., 3, 1876, p. 12, pl. 2, fig. 6.

Ordovician: Quebrada de Juan Pobre, Argentina.

BATHYURUS DUBIUS Billings. See Platycolpus dubius.

BATHYURUS ELLIPTICUS Cleland. See Petigurus ellipticus.

Bathyurus extans (Hall).

Asaphus? extans Hall, Pal. New York, 1, 1847, p. 228, pl. 60, figs. 2, 2a–c; 3d Rep. New York State Cab. Nat. Hist., rev. ed., 1850, p. 182, pl. 3, fig. 1 (doc. ed., p. 174).—Emmons, Amer. Geology 1, pt. 2, 1855, pl. 15, figs. 8, 11.

Asaphus? nodostriatus Hall, Pal. New York, 1, 1847, p. 248, pl. 61, figs. 1a, b.

Bathyurus extans Billings, Canadian Nat. Geol., 4, 1859, p. 364; Geol. Canada, Geol. Surv. Canada, 1863, p. 153, fig. 114.—Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 722, fig. 37.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 288, fig. 1594.—Raymond, Ann. Carnegie Mus., 7, No. 1, 1910, p. 46, pl. 15, figs. 7, 8; pl. 16, fig. 5; Bull. Victoria Mem. Mus., 1, 1913, p. 52.

Black River: Mohawk Valley, near Watertown, etc., New York; Ottawa and Mingan Islands, Canada; Minnesota, Wisconsin, Kentucky.

Bathyurus glandicephalus Whitfield.

Bathyurus (Bathyurellus) glandicephalus Whitfield, Bull. Amer. Mus. Nat. Hist., 3, 1890, p. 38, pl. 2, figs. 9–12.

Bathyurus glandicephalus Raymond, Bull. Victoria Mem. Mus., 1, 1913, p. 55.

Canadian (Beekmantown): Shoreham, Vermont; Champlain Valley.

Bathyurus ingalli Raymond.

Bathyurus ingalli Raymond, Bull. Victoria Mem. Mus., 1, 1913, p. 57, pl. 7, fig. 7.

Trenton (Curdsville): Two miles north Kirkfield, Belleville, and near Ottawa, Ontario.

Bathyurus johnstoni Raymond.

Bathyurus johnstoni Raymond, Bull. Victoria Mem. Mus., 1, 1913, p. 53, pl. 7, figs. 2, 3.

Black River (Lowville): Carden, Ottawa, and west of Mechanicsville, Ontario.

Bathyurus? lajensis Kayser.

Bathyurus? Lajensis Kayser, Beitr. Geol. and Pal. Argentinischen Republik, Palæontographical Suppl. 3, 1876, p. 12, pl. 2, fig. 5.

Ordovician: Quebrada de la Laja, Argentina.

Bathyurus levis Cleland. See Symphysurus convexus.

Bathyurus longispinus Walcott.

Bathyurus longispinus Walcott, 28th Ann. Rep. New York State Mus., 1879, p. 94.—Raymond, Ann. Carnegie Mus., 7, No. 1, 1910, p. 47, pl. 16, figs. 12–14; Zittel-Eastman Textb. Pal., 1913, p. 718, fig. 1381; Bull. Victoria Mem. Mus., 1, 1913, p. 54.

Ptychopyge jerseyensis Weller, Pal. New Jersey, 3, 1903, p. 193, pl. 14, fig. 16.

Black River: Newport, New York; Jacksonburg, New Jersey.

Bathyurus minganensis Billings. See Bathyurus amplimarginatus.

Bathyurus nero Billings. See Petigurus nero.

Bathyurus oblongus Billings. See Lloydia oblongus.

Bathyurus? orbignyanus Kayser.

Bathyurus? Orbignyanus Kayser, Beitr. Geol. and Pal. Argentinischen Republik, Palæontographical Suppl. 3, 1876, p. 12, pl. 2, figs. 7, 8.

Ordovician: Quebrada de Juan Pobre, Argentina.

Bathyurus perkinsi Whitfield.

Bathyurus perkinsi Whitfield, Bull. Amer. Mus. Nat. Hist., 9, 1897, p. 183, pl. 5, figs. 7, 8.—Seely, 7th Rep. State Geol. Vermont, 1910, pl. 55, figs. 7, 8.

Canadian (Beekmantown): Mouth of Otter Creek, Vermont.

Bathyurus perplexus Billings.

Bathyurus perplexus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 364, fig. 350.—Raymond, Bull. Victoria Mem. Mus., 1, 1913, p. 52.

Middle Ordovician? Boune Bay, Newfoundland.

Observation.—Probably the same as B. extans.

Bathyurus perspicator Billings. See Goniurus perspicator.

Bathyurus pogonipensis Hall and Whitfield.

Bathyurus Pogonipensis Hall and Whitfield, U. S. Geol. Expl. 40th Parl., 4, 1877, p. 243, pl. 1, figs. 33, 34.

Lower Pogonip: West side Pogonip Mountain, White Pine District, Nevada.

Holotype.—Cat. No. 24655, U.S.N.M.

Bathyurus quadratus Billings. See Leiostegium quadratus.

Bathyurus saffordi Billings. See Lloydia saffordi.

Bathyurus schucherti Clarke.

Bathyurus schucherti Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 724, figs. 41, 42.—Raymond, Bull. Victoria Mem. Mus., 1, 1913, p. 58.

Black River (Platteville): Minneapolis, Minnesota.

Cotype.—Cat. No. 43052, U.S.N.M.

BATHYURUS SEELYI Whitfield. See Bolbocephalus seelyi and Hystricurus cordai.

Bathyurus(?) simillimus Walcott.

Bathyurus? simillimus Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 93, pl. 12, fig. 11.

Upper Pogonip: White Mountain, Eureka District, Nevada.

Holotype: Cat. No. 24653, U.S.N.M.

BATHYURUS SMITHI Billings. See Haploconus smithi.

BATHYURUS SOLITARIUS Billings. See Lloydia solitarius.

Bathyurus spiniger (Hall).

Acidaspis spiniger Hall, Pal. New York, 1, 1847, p. 241, pl. 64, fig. 5.

Bathyurus spiniger Clarke, Geol. Minnesota, 3, pt. 2, 1884, p. 723, figs. 38–40.—Raymond, Bull. Amer. Pal., 3, 1902, pl. 19, figs. 1–3; Ann. Carnegie Mus., 7, 1910, p. 48, pl. 15, figs. 4–6.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 288.—Raymond, Bull. Victoria Mem. Mus., 1, 1913, p. 57.

Black River: Mohawk Valley, New York; Montreal, Quebec; Illinois, Kentucky, Missouri, Iowa.

Plesiotype.—Cat. Nos. 41932, 41933, U. S.N.M.

BATHYURUS STONEMANII Vogdes. See Prœtus stonemani.

BATHYURUS STRENUUS Billings. See Lloydia strenuus.

Bathyurus superbus Raymond.

Bathyurus superbus Raymond, Ottawa Nat., 24, 1910, p. 129, pl. 2, figs. 1–3; Bull. Victoria Mem. Mus., 1, 1913, p. 54.

Black River: Near Ottawa, Ontario.

Bathyurus? taurifrons Dwight.

Bathyurus taurifrons Dwight, Amer. Jour. Sci., 3d ser., 27, 1884, p. 252, pl. 7, figs. 1, 1a–3.

Canadian (Beekmantown): Rochdale County, New York.

Bathyurus? timon Billings.

Bathyurus Timon Billings, Pal. Foss., 1, Geol. Surv. Canada, p. 261, fig. 244.

Canadian (Quebec–G, H): Port aux Choix, Newfoundland.

BATHYURUS TUBERCULATUS Walcott. See Hystricurus tuberculatus.

Bathyurus? vetulus Billings.

Bathyurus vetulus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 365.

Middle Ordovician: East arm of Bonne Bay, Newfoundland.

BATOSTOMA? Ulrich.

Genotype: Monticulipora (Heterotrypa) implicata Nicholson.

Batostoma Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 154.—Foord, Contr. Micro-Pal. Cambro-Sil., 1883, p. 17.—Miller, N. A. Geol. Pal., 1889, p. 294.—Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 379, 459; Geol. Minnesota, 3, 1893, p. 288; Zittel's Textb. Pal. (Engl. ed.), 1897, p. 275.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 588.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 35.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 136.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 740.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 272; Zittel-Eastman Textb. Pal., 1913, p. 338.

Batostoma canadense (Foord).

Amplexopora Canadensis Foord, Contr. Micro-Pal. Cambro-Sil., 1883, p. 17, pl. 4, figs. 2-2d.

Batostoma Canadensis Ulrich, Geol. Minnesota, 3, 1893, p. 317.

Mohawkian: St. Joseph Island, Lake Huron (Black River); Joliette, Quebec (?Trenton).

Batostoma? decipiens Ulrich.

Batostoma? decipiens Ulrich, Geol. Minnesota, 3, 1893, p. 298, pl. 27, figs. 16-19.

Black River (Decorah): Minneapolis, Minnesota.

Holotype.—Cat. No. 43511, U.S.N.M.

Batostoma fertile Ulrich.

Batostoma fertilis Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 92; Geol. Minnesota, 3, 1893, p. 290, pl. 25, figs. 1–11; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 275, fig. 459A.—Sardeson, Jour. Geol., 9, 1901, p. 12.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 136, fig. 188k, 1901.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 274, 275, fig. 163.

Black River (Decorah): Minneapolis, Minnesota, and vicinity.

Ordovician (Echinospherites limestone): Near Reval, Esthonia, Russia.

Cotypes.—Cat. No. 43505, U.S.N.M.

Batostoma fertile circulare Ulrich.

Batostoma fertile var. circulare Ulrich, Geol. Minnesota, 3, 1893, p. 291, pl. 25, figs. 8, 9—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 275, 276, fig. 164; Zittel-Eastman Textb. Pal., 1913, p. 338, fig. 492b.

Batostoma fertile Ulrich, Zittel's Textb. Pal. (Eng. ed.), 1896, p. 275, fig. 459B.

Black River (Decorah): Minneapolis, Minnesota, and vicinity.

Ordovician (Echinosphærites limestone): Near Reval, Esthonia, Russia.

Holotype.—Cat. No. 43506, U.S.N.M.

Batostoma humile Ulrich.

Batostoma humile Ulrich, Geol. Minnesota, 3, 1893, p. 294, pl. 25, figs. 29–36.

Trenton (Prosser): St. Paul and Cannon Falls, Minnesota; Decorah, Iowa.

Cotypes.—Cat. No. 43509, U.S.N.M.

Batostoma imperfectum Ulrich. See Hemiphragma imperfectum.

Batostoma implicatum (Nicholson).

Chætetes implicata Ulrich, Cat. Foss. Cincinnati Group, 1880, p. 12 (not defined).

Monticulipora (Heterotrypa) implicata Nicholson, Genus Monticulipora, 1881, p. 147, pl. 2, figs. 7, 7e.

Monticulipora implicatum J. F. James, Jour. Cincinnati Soc. Hist., 16, 1894, p. 198

Batostoma implicatum Ulrich, ibid., 5, 1882, p. 256; 7, 1883, p. 83.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 178.—Nickles, Bull. Kentucky Geol. Surv., 5, 1905, p. 48, pl. 2, fig. 6.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 774, pl. 7, fig. 7; pl. 8, fig. 2.

Alecto nexilis James, Intr. Cat. Foss. Cincinnati Group, 1875, p. 3.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 10.

Ceramopora? irregularis James, Paleontologist, No. 1, 1878, p. 5 (part).—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 26.

Eden: Cincinnati, Ohio, and vicinity.

Batostoma irrasa Ulrich. See Hemiphragma irrasum.

Batostoma jamesi (Nicholson).

Chætetes Jamesi Nicholson, Quart. Jour. Geol. Soc. London, 30, 1874, p. 506, pl. 29, figs. 10, 10b; Pal. Ohio, 2, 1875, p. 200, pl. 21, figs. 11, 11a; Ann Mag. Nat. Hist., 4th. ser., 18, 1876, p. 89.

Batostoma jamesi—Continued.

Monticulipora Jamesi Nicholson, Ann. Mag. Nat. Hist., 5th ser., 6, 1880, p. 415, fig. 3A, B, fig. 4.—(Van Cleve) Hall, 12th Rep. Indiana Geol. Nat. Hist., 1883, p. 248, pl. 11, fig. 8.—James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 176.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 421, figs.—J. F. James, Jour. Cincinnati Soc. Nat. Hist., 16, 1894, p. 197.

Monticulipora (Heterotrypa) Jamesi Nicholson, Genus Monticulipora, 1881, p. 143, figs. 25, 26.

Batostoma jamesi Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 256; 6, 1883, p. 83.—Miller, N. A. Geol. Pal., 1889, p. 294, fig. 457.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 775, pl. 7, figs. 8, 8a; pl. 8, fig. 1, pl. 27, figs. 6, 6a.

Ceramopora? irregularis James, Paleontologist, No. 1, 1878, p. 5 (part).—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 26.

Eridotrypa vevayensis Cumings, Amer. Geol., 28, 1901, p. 376, pl. 35, figs. 7, 8.

Eden: Cincinnati, Ohio, and vicinity.

Observation.—The type specimen of Eridotrypa vevayensis was found to be an example of Batostoma jamesi in which the mesopores were fewer than usual, thus making the zoœcia more angular. Ceramopora irregularis James was based on incrusting forms of both Batostoma jamesi and B. implicatum.

Batostoma libana (Safford).

Stenopora libana Safford, Geol. Tennessee, 1869, p. 285.

Stones River (Lebanon): Lebanon, Tennessee.

Observation.—Although not sufficiently described for recognition, this species is known to be a characteristic fossil of the Lebanon limestone.

Batostoma magnopora Ulrich.

Batostoma magnopora Ulrich, Geol. Minnesota, 3, 1893, p. 291, pl. 25, figs. 12–15.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 272–274, figs. 161, 162.

Black River (Decorah): Minneapolis, Minnesota, and vicinity.

Ordovician (Wassalem): Uxnorm, Esthonia, Russia.

Cotypes and *plesiotype*.—Cat. Nos. 43508, 57377, U.S.N.M.

Batostoma manitobense Ulrich.

Batostoma Manitobense Ulrich, Contr. Micro-Pal. Cambro-Sil., pt. 2, 1889, p. 33; pl. 9, figs. 3–3c.—Whiteaves, Pal. Foss., 3, 1895, p. 117.

Richmond (Stony Mountain): Stony Mountain, Manitoba; Wyoming.

Sections of *cotypes*.—Cat. No. 43250, U.S.N.M.

Batostoma maysvillense Nickles.

Batostoma maysvillensis Nickles, Bull. Kentueky Geol. Surv., 5, 1905, p. 51, pl. 2, figs. 13, 14.

Maysville (Mount Hope): Near Maysville, Kentucky.

Batostoma minnesotense Ulrich.

Amplexopora superba Ulrich (not Foord), 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1881, p. 92.

Batostoma minnesotense Ulrich, Geol. Minnesota, 3, 1893, p. 297, pl. 26, figs. 38–40, pl. 27, figs. 9–15.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 588, fig. 173.

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

Cotypes.—Cat. No. 43507, U.S.N.M.

Batostoma montuosum Ulrich.

Batostoma montuosum Ulrich, Geol. Minnesota, 3, 1893, p. 293, pl. 25, figs. 26–28.

Black River (Decorah): Cannon Falls, Minnesota.

Holotype.—Cat. No. 45312, U.S.N.M.

Batostoma ottawaense Foord. See Hemiphragma ottawaense.

Batostoma prosseri Cumings and Galloway.

Batostoma prosseri Cumings and Galloway, Proc. Indiana Acad. Sci., 1912, p. 151, pl. 5, figs. 1–1c; pl. 6, figs. 1–1d; pl. 7, figs. 2–2c.

Richmond (Upper Waynesville and Lower Liberty): Weisburg, Indiana.

Batostoma? rugosum (Whitfield).

Fistulipora rugosa Whitfield, Ann. Rep. Wisconsin Geol. Surv. for 1879, 1880, p. 60; Geol. Surv. Wisconsin, 4, 1882, p. 255, pl. 11, figs. 20, 21.

Batostoma rugosum Miller, N. A. Geol. Pal., 1889, p. 294.

Richmond (Maquoketa): Delafield, Wisconsin.

Batostoma sevieri Bassler.

Batostoma sevieri Bassler, Bull. Geol. Surv. Virginia, 2a, 1909, pl. 21, figs. 1–3.

Chazyan (Ottosee): Speer Ferry, Virginia; Knoxville, Tennessee, etc.

Cotypes.—Cat. No. 56630, U.S.N.M.

Batostoma superbum (Foord).

Amplexopora superba Foord, Contr. Micro-Pal. Cambro-Sil., 1883, p. 16, pl. 4, figs. 1–1c.

Batostoma superbum Ulrich, Geol. Minnesota, 3, 1893, p. 297.

Trenton: Montreal, Quebec.

Batostoma (Hemiphragma) tenuimurale Grabau and Shimer. See Hemiphragma tenuimurale.

Batostoma variable (part) Ulrich. See Batostoma varians.

Batostoma variable Ulrich.

Batostoma variable Ulrich (part), Geol. Surv. Illinois, 8, 1890, p. 460, pl. 35, fig. 5; pl. 36, fig. 1 (not pl. 35, figs. 4b, c=B. varians).—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 18, pl. 7, figs. 9, 10.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 777, pl. 8, fig. 4; pl. 26, fig. 13.—Cumings and Galloway, Proc. Indiana Acad. Sci., 1912, p. 150, pl. 2, figs. 1–1c; pl. 3, figs. 1–1c; pl. 4, figs. 1, 1a, pl. 7, figs. 1–1c.

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

Cotypes and *plesiotype.*—Cat. Nos. 43820, 44777, U.S.N.M.

Batostoma varians (James).

Chætetes varians James, Paleontologist, No. 1, 1878, p. 2.

Monticulipora (Chætetes) varians James, Paleontologist, No. 5, 1881, p. 36.

Monticulipora varians James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 177, pl. 2, figs. 4a, b.—J. F. James, ibid., 16, 1894, p. 199.

Batostoma variabile (part) Ulrich, Geol. Surv. Illinois, 8, 1890, p. 460, pl. 35, figs. 4b–c, (Not 4, 4a, 5, or pl. xxxvi, pt. 1=B. variabile).—J. F. James, Jour. Cincinnati Soc. Nat. Hist., 16, 1894, p. 200.

Batostoma varians Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 179.—Nickles, Bull. Kentucky Geol. Surv., 5, 1905, p. 57, pl. 3, figs. 8, 9.—Bassler Proc. U. S. Nat. Mus., 30, 1906, p. 18.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 778, pl. 7, fig. 9; pl. 8, figs. 3, 3b; pl. 26, fig. 14.—Cumings and Galloway, Proc. Indiana Acad. Sci., 1912, p. 148, pl. 1, figs. 1–1e; pl. 7, figs. 3, 3a.

Richmond: Blanchester, Clarksville, etc., Ohio; Richmond, Versailles, etc., Indiana (Arnheim-Liberty); Savannah, Illinois, and Delafield, Wisconsin (Maquoketa).

Batostoma varium Ulrich.

Batostoma varium Ulrich, Geol. Minnesota, 3, 1893, p. 292, pl. 25, figs. 16–25.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 588, fig. 175 (not fig. 176=Eridotrypa mutabilis).

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

Chazyan (Mingan): Mingan Islands, Canada.

Cotypes.—Cat. No. 43510, U.S.N.M.

Batostoma (Hemiphragma) whitfieldi Grabau and Shimer. See Hemiphragma whitfieldi.

Batostoma winchelli (Ulrich).

Amplexopora winchelli Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 91.

Batostoma winchelli Ulrich, Geol. Minnesota, 3, 1893, 295, pl. 26, figs. 33–37, pl. 27, figs. 1–6.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 588, fig. 174.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 136, fig. 188j, 190j.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 278, 279, fig. 166.

Black River (Decorah): Minneapolis, Minnesota, and vicinity; Lake Nipissing, Ontario.

Ordovician (Wesenberg): Wesenberg, Esthonia, Russia.

Cotypes.—Cat. No. 43815, U.S.N.M.

Batostoma winchelli nodosum Ulrich.

Batostoma winchelli var. nodosa Ulrich, Geol. Minnesota, 3, 1893, p. 295, pl. 26, fig. 35.

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

Batostoma winchelli spinulosum Ulrich.

Batostoma winchelli var. spinulosum Ulrich, Geol. Minnesota, 3, 1893, p. 296, pl. 27, figs. 7, 8; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 275, fig. 459C.—Bassler, Bull. U. S. Nat. Mus. 77, 1911, pp. 279–280, figs. 167, 168.

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

Ordovician (Wassalem): Uxnorm, Esthonia, Russia.

Plesiotype.—Cat. No. 57383 U.S.N.M.

BATOSTOMELLA Ulrich. Genotype: B. spinulosa Ulrich.

Batostomella Ulrich (in part), Jour. Cincinnati Soc. Nat. Hist., 5, 1882, pp. 141, 154.—Miller, N. A. Geol. Pal., 1889, p. 294.—Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 375, 432.—Rominger, Amer. Geol., 6, 1890, p. 119.—Whidborne, Devon. Fauna England, Pal. Soc., 2, 1895, pt. 4, p. 187.—Ulrich, Zittel's Textb. Pal. (Engl. ed.), 1896, p. 277.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, pp. 32, 180.—Grabau, Bull. New York State Mus., 45, 1901, p. 164; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 164.—Condra, Nebraska Geol. Surv., 2, pt. 1, 1903, p. 38.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 28.—Grabau and Shimer, N. A. Index Foss., 1, 1907, p. 133.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 335.

Geinitzella Waagen and Wentzel, Pal. Indica, ser., 13, 1886, pp. 875, 880.—Zittel, Textb. Pal. (Engl. ed.), 1896, p. 105.

Batostomella (part) Ulrich. See Eridotrypa Ulrich.

Batostomella annulifera Ulrich. See Lioclemella annulifera.

Batostomella? aspera Nickles and Bassler. See Acanthoclema asperum.

Batostomella gracilis Ulrich. See Bythopora gracilis.

Batostomella granulifera (Hall).

Trematopora granulifera Hall, Pal. New York, 2, 1852, p. 154, pl. 40 A, figs. 9a–c; *28th Ann. Rep. New York State Mus. (doc. ed.), 1876, pl. 11, figs. 6, 7; (mus. ed.), 1879, p. 112, pl. 11, figs. 6, 7; *11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 233, pl. 10, figs. 6, 7.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1200, figs.

Rhombopora granulifera Ulrich, Geol. Surv. Illinois, 8, 1890, p. 647.

Batostomella granulifera Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 180 (gen. ref.).—Grabau, Bull. New York State Mus., 45, 1901, p. 164, fig. 61.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, pp. 28, 29, pl. 13, figs. 1–5; pl. 24, figs. 10, 11; pl. 25, figs. 11, 12.—*Grabau and Shimer, N. A. Index Foss., 1, 1907, p. 133.

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

Niagaran (Waldron): Waldron, Indiana.

Plesiotypes.—Cat. No. 35517, U.S.N.M.

Observation.—The citations preceded by the (*) refer to the Waldron form, which may be specifically distinct.

Batostomella granulifera Ulrich. See Homotrypella granulifera.

Batostomella interporosa Ulrich and Bassler.

Batostomella interporosa Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 270, pl. 45, figs. 1, 2; pl. 48, fig. 5.

Helderbergian (Keyser): Devils Backbone, near Cumberland, Maryland.

Cotypes.—Cat. No. 53761, U.S.N.M.

Batostomella simulatrix Ulrich. See Eridotrypa simulatrix.

Battus pisiformis Dalman. See Agnostus pisiformis.

Battus pusillus Sars. See Shumardia pusilla.

Battus tuberculatus Kloeden. See Beyrichia tuberculata.

BEATRICEA Billings. Genotype: B. nodulosa Billings.

Beatricea Billings, Geol. Surv. Canada, Rep. Progr. for 1853–6, 1857, p. 343; Canadian Jour., n. s., 3, 1858, p. 331; Canadian Nat. Geol., n. s., 2, 1865, p. 405.—Hyatt, Amer. Jour. Sci. Arts, 2d. ser., 39, 1865, p. 261–266.—Linney, Geol. Surv. Kentucky, Notes on Rocks Central Kentucky, 1883, p. 14.—Nicholson, Mon. British Strom., Pal. Soc., 1886, pp. 9, 86.—James, Jour. Cincinnati Soc. Nat. Hist., 9, 1886, p. 245.—Miller, N. A. Geol. Pal., 1889, p. 155.—Grant, Jour. and Proc. Hamilton Assoc., 6, 1890, p. 122.—James, Jour. Cincinnati Soc. Nat. Hist., 15, pt. 3, 1892, p. 94.—Grabau and Shimer, N. A. Index Foss., 1, 1906, p. 46.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 699.—Parks, Univ. Toronto Studies, Geol. Ser., No. 7, 1910, p. 37.

Beatricea nodulifera Foerste.

Beatricea nodulifera Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 299, pl. 7, fig. 13; pl. 8, fig. 5.—Parks, Univ. Toronto Studies, Geol. Ser., No. 7, 1910, p. 47, pl. 25, fig. 10.

Richmond (Liberty): Near Sulphur Spring, three miles southeast of Lebanon, and Bardstown, Kentucky.

Beatricea nodulifera intermedia Foerste.

Beatricea nodulifera intermedia Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 300, pl. 8, figs. 4a–c.—Parks, Univ. Toronto Studies, Geol. Ser., No. 7, 1910, p. 47, pl. 25, fig. 9.

Richmond (Liberty): Marion County, Kentucky.

Beatricea nodulosa Billings.

Beatricea nodulosa Billings, Geol. Surv. Canada, Rep. Progr. for 1853–6, 1857, p. 344; Canadian Jour., n. s., 3, 1858, p. 332.—Hyatt, Proc. Boston Soc. Nat. Hist., 10, 1865, p. 19; Amer. Jour. Sci. and Arts, 2d ser., 39, 1865, pp. 262, 266.—Billings, Cat. Sil. Foss., Anticosti, Geol. Surv. Canada, 1866, p. 8 (loc. ref.)—Shaler, Amer. Nat., 11, 1877, p. 628.—Nicholson, Mon. British Strom., pt. 1, Pal. Soc., 1886, p. 87–89; pl. 8, figs. 1–8.—James, Jour. Cincinnati Soc. Nat. Hist., 9, 1886, p. 245; 15, pt. 3, 1892, p. 95.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 114 (loc. occ.); Canadian Rec. Sci., 7, 1897, p. 132.—Grabau and Shimer, N. A. Index Foss., 1, 1906, p. 47, fig. 74.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 700, pl. 1, figs. 1a–b.—Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 300.—Parks, Univ. Toronto Studies, Geol. Ser., No. 7, 1910, p. 45, pl. 25, figs. 2–5, 7–8.

Richmond: Wreck Point, Salmon River, etc., Anticosti; Stony Mountain, Manitoba; Ohio; Indiana; Kentucky.

Beatricea sulcata Hyatt. See Beatricea undulata.

Beatricea undulata Billings.

Beatricea undulata Billings, Geol. Surv. Canada, Rep. Progr. for 1853–1856, 1857, p. 344; Canadian Jour., n. s., 3, 1858, p. 332; Canadian Nat. Geol., n. s., 2, 1865, p. 405, figs. 1, 2.—Hyatt, Amer. Jour. Sci. and Arts, 2d ser., 39, 1865, pp. 261, 266.—Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 8, 34 (loc. ref.).—Shaler, Amer. Nat., 11, 1877, p. 628.—Nicholson, Mon. Brit. Strom., Pal. Soc., 1886, p. 89.—James, Jour. Cincinnati Soc. Nat. Hist., 9, 1886, p. 245; 15, pt. 3, 1892, p. 95.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 114 (loc. occ.); Canadian Rec. Sci., 7, 1897, p. 133.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 47.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res., Indiana, 1908, p. 701, pl. 1, fig. 1.—Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 298, pl. 8, fig. 3.—Parks, Univ. Toronto Studies, Geol. Ser., No. 7, 1910, p. 43, pl. 25, figs. 1, 6, 7.

Beatricea sulcata Hyatt, Proc. Boston Soc. Nat. Hist., 10, 1865, p. 19 (error for undulata).

Richmond: Cape James, Table Head, etc., Anticosti; Snake Island, Lake St. John, Quebec; Rabbit and Club Islands, Lake Huron; Stony Mountain, Manitoba; Marion, Nelson, Madison, and Bullitt Counties, Kentucky; Ohio and Indiana.

Beatricea undulata cylindrica Foerste.

Beatricea undulata-cylindrica Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 298, pl. 9, fig. 7.—Parks, Univ. Toronto Studies, Geol. Ser., No. 7, 1910, p. 44.

Richmond: Four miles north Richmond, and Marion and Nelson counties, Kentucky (Liberty); Elkhorn Creek, south of Richmond, Indiana (Elkhorn).

Belemnocystis Bather. See Belemnocystites Miller and Gurley.

BELEMNOCYSTITES Miller and Gurley.

Genotype: B. wetherbyi Miller and Gurley.

Belemnocystites Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 5, 1894, p. 8.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 739.

Belemnocystis Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 51.

Belemnocystites wetherbyi Miller and Gurley.

Belemnocystites wetherbyi Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 5, 1894, p. 9, pl. 1, figs. 4–6.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 740, fig. 1321.

Trenton (Curdsville): Mercer County, Kentucky.

BELLEROPHON (part) of authors. See Sinuites Koken, Salpingostoma Roemer, Bucanopsis Ulrich, Tetranota Ulrich and Scofield, and Oxydiscus Koken.

BELLEROPHON Montfort. Genotype: B. vasulites Montfort.

Bellerophon Montfort, Conchiliologie Systematique, 1, 1808, p. 51.—Pictet, Traité de Pal., 2d ed., 3, 1855, p. 286.—Emmons, Amer. Geology, pt. 2, 1855, pp. 163, 164.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 306.—Waagen, Mem. Geol. Surv. India, Pal. Indica, 13th ser., 1, 1880, pp. 130, 133.—Zittel, Handb. Pal., 2, 1882, p. 183.—Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 192.—Nettelroth, Kentucky Foss. Shells, Geol. Surv. Kentucky, 1889, p. 158.—Koken, Neues Jahrb. f. Min., Geol., Pal., Beilage-Band, 6, 1889, p. 385.—Miller, N. A. Geol. Pal., 1889, p. 396.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 280.—Girty, 19th Ann. Rep. U. S. Geol. Surv., 1899, p. 592.—Koken, Die Leitfossilien, 1896, pp. 100, 101, fig. 78, 2.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, pp. 853–914.—Pilsbry, Zittel-Eastman Textb. Pal., 1, 1900, p. 445.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 948.—Grabau and Shimer, N. A. Index Fossils, 3, 1909, p. 618.—Dall, Zittel-Eastman Textb. Pal., 2ed ed., 1913, p. 522.

BELLEROPHON ACUTUS Sowerby. See Oxydiscus acutus.

Bellerophon allegoricus White.

Bellerophon allegoricus White, Geogr. Geol. Expl. West. 100th Merid., Prel. Rep., 1874, p. 10; Rep. U. S. Geogr. Surv. West 100th Merid., 4, 1877, p. 55, pl. 3, fig. 6a–c.

Middle Ordovician: Fish Spring, House Range, Utah.

Cotypes.—Cat. No. 8564, U.S.N.M.

BELLEROPHON ANGUSTATA Billings. See Tremanotus angustata.

BELLEROPHON ANTIQUATUS Whitfield. See Owenella antiquata.

BELLEROPHON ARGO Billings. See Oxydiscus argo.

Bellerophon auriculatus Hall.

Bellerophon auriculatus Hall, Pal. New York, 2, 1852, p. 334, pl. 76, fig. 7a, b.—Emmons, Man. Geol., 1860, p. 108, fig. 98.

Cayugan (Cobleskill): Schoharie, New York.

BELLEROPHON BIDORSATUS of authors. See Tetranota bidorsata.

Bellerophon bilineatus Ulrich.

Bellerophon bilineatus Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 917, pl. 64, figs. 19–21.

Trenton (Flanagan): Near Danville, Kentucky.

Holotype.—Cat. No. 45697, U.S.N.M.

BELLEROPHON BILOBATUS Emmons. See Sinuites cancellatus.

BELLEROPHON BILOBATUS var. ACUTUS Hall. See Sinuites cancellatus acutus.

BELLEROPHON BILOBATUS var. CORRUGATUS Hall. See Sinuites cancellatus corrugatus.

Bellerophon bretonensis Matthew.

Bellerophon Bretonensis Matthew, Bull. Nat. Hist. Soc. New Brunswick, 20, 1902, p. 409, pl. 18, figs. 4a–d; Geol. Surv. Canada Rep. Cambrian Rocks, Cape Breton, 1903, p. 218, pl. 18, figs. 4a–d.

Canadian (Bretonian-Div. C 3c.): McLeod Brook, near Boisdale, Cape Breton, Nova Scotia.

Bellerophon calcifer Cleland.

Bellerophon calcifer Cleland, Bull. Amer. Pal., 3, 1900, p. 126 (254), pl. 15, figs. 15–18; 4, 1903, p. 18.

Canadian (Tribes Hill): Fort Hunter and Canajoharie, New York.

Bellerophon Canadensis Billings. See Salpingostoma canadensis.

Bellerophon cancellatus Hall. See Sinuites cancellatus.

Bellerophon capax Ulrich.

Bellerophon capax Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 921, pl. 63, figs. 50, 51; pl. 64, figs. 40–43.

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

Cotypes.—Cat. Nos. 45698, 45699, U.S.N.M.

Bellerophon Cassinensis Whitfield. See Sinuites cassinensis.

Bellerophon charon Billings.

Bellerophon Charon Billings, Canadian Nat. Geol., 5, 1860, p. 169, figs. 14, 15; Geol. Canada, Geol. Surv. Canada, 1863, p. 146, fig. 97a, b.

Black River (Leray): Pauquettes Rapids, Ottawa River, Canada.

Bellerophon cincinnatiensis Miller and Faber.

Bellerophon cincinnatiensis Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 17, 1894, p. 29, pl. 1, figs. 23, 24.

Maysville: Cincinnati, Ohio.

Bellerophon clausus Ulrich.

Bellerophon clausus Ulrich Geol. Minnesota, 3, pt. 2, 1897, p. 916, pl. 64, figs. 7–10.—Hayes and Ulrich, U. S. Geol. Surv., Folio 95, 1903, illust. sheet, fig. 32–34.

Trenton: Frankfort, Kentucky (Perryville), and near Nashville, Tennessee (Catheys).

Cotypes.—Cat. Nos. 45700, 45701, U.S.N.M.

Bellerophon consimilis Savage.

Bellerophon consimilis Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 98, pl. 6, fig. 2.

Upper Medinan (Edgewood): Alexander County, Illinois; Missouri.

Bellerophon convolutus Eaton. Not recognized.

Bellerophon convolutus Eaton, Geol. Textb., 2d ed., 1832, p. 28.

Silurian(?): Helderberg, New York.

Bellerophon declivis Conrad.

Bellerophon declivis Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1842, p. 269, pl. 17, fig. 3.

Trenton: Near Carlisle, Pennsylvania.

Bellerophon dilatatus (Sowerby?) Billings.

Bellerophon dilatatus (Sowerby?) Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 56 (loc. ref.).

Anticostian (Gun River and Jupiter River): The Jumpers, Anticosti.

Bellerophon disculus Billings. See Oxydiscus disculus.

Bellerophon (Bucania) exigua Foerste. See Bucania exigua.

Bellerophon expansus Emmons. See Salpingostoma expansa.

Bellerophon fiscello-striatus Foerste. See Bucania fiscello-striata.

Bellerophon fraternus Billings. See Salpingostoma fraternum.

Bellerophon globularis Miller and Faber. See Sinuites globularis.

Bellerophon gorbyi Miller.

Bellerophon gorbyi Miller, 17th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1892, p. 694, pl. 14, figs. 7–9.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 953, pl. 39, figs. 1–1b.

Maysville: Dearborn County, Indiana.

Bellerophon helderbergiæ Maynard.

Bellerophon helderbergiæ Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 466, pl. 79, figs. 3, 4.

Helderbergian (Keyser): Cash Valley, Maryland.

Bellerophon insulæ Matthew.

Bellerophon insulæ Matthew, Bull. Nat. Hist. Soc. New Brunswick, 20, 1902, p. 408, pl. 18, fig. 3; Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, p. 217, pl. 18, fig. 3.

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

Bellerophon intextus Emmons. See Bucania intexta.

Bellerophon lindsleyi Safford. See Bucania lindsleyi.

Bellerophon lirata Hall.

Bellerophon (Bucania) lirata Hall, Geol. Rep. Wisconsin, 1862, p. 55, figs. 7, 8.

Richmond (Maquoketa): Southwestern Wisconsin.

Bellerophon macer Billings. See Oxydiscus macer.

Bellerophon miser Billings.

Bellerophon miser Billings, Cat. Sil. Fossils Anticosti, Geol. Surv. Canada, 1866, p. 20.

Richmond (English Head): Macasty Bay, Anticosti.

Bellerophon mohri Miller.

Bellerophon Mohri Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 306, fig. 30; N. A. Geol. Pal., 1889, p. 397, fig. 653.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 920, pl. 64, figs. 44–45.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 954, pl. 39, figs. 2–2a.

Richmond (Whitewater): Richmond, Indiana; Lincoln County, Kentucky.

Plesiotypes.—Cat. No. 45702, U.S.N.M.

Bellerophon morrowensis Miller and Dyer. See Sinuites morrowensis.

Bellerophon nashvillensis Troost.

Bellerophon Nashvillensis Troost, 5th Geol. Rep. Tennessee, 1840, p. 54; 6th Rep., 1841, p. 175 (nom. nud.); 7th Rep., 1844, p. 17.

Ordovician: Davidson County, Tennessee.

Observation.—Not defined. Probably refers to the abundant Bellerophon troosti D'Orbigny.

Bellerophon nautarum Salter.

Bellerophon Nautarum Salter, Sutherland's Jour. Voyage in Baffins Bay, etc., 2, App., 1852, p. ccxxiii, pl. 5, fig. 20.

Niagaran: Dundas Island, Victoria Channel, Arctic America.

BELLEROPHON (BUCANIA) OPERTUS Foerste. See Bucania operta.

BELLEROPHON PALINURUS Billings. See Oxydiscus palinurus.

Bellerophon patersoni Hall.

Bellerophon patersoni Hall, Geol. Rep. Wisconsin, 1862, p. 55, fig. 9.

Richmond (Maquoketa): Southwestern Wisconsin.

BELLEROPHON (BUCANIA) PERFORATUS Winchell and Marcy. See Tremanotus alpheus.

Bellerophon platystoma (Meek and Worthen).

Bellerophon (Bucania?) platystoma Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 312, pl. 3, figs. 8a, b.

Bellerophon platystoma Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 918, pl. 64, figs. 22–30.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 619, figs. 829d–g.

Trenton: Galena and Dixon, Illinois (Galena); Kenyon, Wykoff, etc., Minnesota (Prosser).

Plesiotypes.—Cat. Nos. 45703, 45704, U.S.N.M.

Bellerophon profundus Emmons.

Bellerophon profundus Emmons, Nat. Hist. New York Geol., 2, 1842, p. 393, fig. 103; Amer. Geology, 1, pt. 2, 1855, p. 233, pl. 17, fig. 7.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 86, figs.

Trenton: Watertown, New York.

BELLEROPHON PUNCTIFRONS Emmons. See Bucania punctifrons.

Bellerophon recurvus Ulrich.

Bellerophon recurvus Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 920, pl. 64, figs. 11–13.

Maysville (Corryville): Cincinnati, Ohio.

Cotypes.—Cat. No. 45705, U.S.N.M.

Bellerophon rogersensis Foerste.

Bellerophon rogersensis Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 141, pl. 2, figs. 4a–c.

Trenton (Upper): Near Rogers Gap, Kentucky.

BELLEROPHON ROTUNDATUS Emmons. See Bucania sulcatina.

Bellerophon rugosus Emmons.

Bellerophon rugosus Emmons, Amer. Geology, 1, pt. 2, 1855, p. 166, fig. 37; Man. Geol., 1860, p. 103, fig. 93.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 853 (gen. ref.).

Bucania rugosa Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 97, fig.

Cincinnatian (Pulaski): Lorraine, Jefferson County, New York.

Bellerophon semisculptus Matthew.

Bellerophon semisculptus Matthew, Bull. Nat. Hist. Soc. New Brunswick, 20, 1902, p. 410, pl. 18, fig. 5; Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, p. 219, pl. 18, fig. 5.

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

Bellerophon shelbiensis Clarke and Ruedemann.

Bucania stigmosa Whiteaves (not Hall), Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 34, pl. 5, fig. 3; pl. 8, fig. 4.

Bellerophon shelbiensis Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 51, pl. 5, figs. 13–19.

Niagaran (Guelph-Shelby): Shelby, New York.

Bellerophon similis Ulrich and Scofield.

Bellerophon similis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 919, pl. 64, figs. 31–39.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 165.

Trenton: Wykoff, Kenyon, etc., Minnesota (Prosser); Head of Frobisher Bay, Baffin Land.

Cotypes.—Cat. Nos. 45706, 45707, U.S.N.M.

Bellerophon solitarius Billings.

Bellerophon solitarius Billings, Cat. Sil. Fossils, Anticosti, Geol. Surv. Canada, 1866, p. 20.

Richmond (English Head): McCasty Bay, Anticosti.

Bellerophon subangularis Ulrich.

Bellerophon subangularis Ulrich, Geol. Minnesota, 3, 1897, p. 920, pl. 64, figs. 14–16.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 954, pl. 39, figs. 3–3b.

Richmond (Whitewater): Richmond, Indiana.

Holotype.—Cat. No. 45708, U.S.N.M.

Bellerophon subglobulus Ulrich.

Bellerophon subglobulus Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 917, pl. 64, figs. 17 and 18.

Black River (Lowville): Mercer County, Kentucky.

Holotype.—Cat. No. 45709, U.S.N.M.

Bellerophon subovatus Cleland.

Bellerophon subovatus Cleland, Bull. Amer. Pal., 3, 1909, p. 217 (255), pl. 15, figs. 19–21.

Canadian (Tribes Hill): Near Fort Hunter, New York.

BELLEROPHON SULCATINUS of authors. See Bucania sulcatina..

BELLEROPHON TRILOBATUS Hall. See Bucanella trilobata.

Bellerophon troosti D'Orbigny.

Bellerophon troosti D'Orbigny, Cephalopoda, 1840, p. 206.—Safford, Geol. Tennessee, 1869, p. 289, pl. 3G, figs. 4a–4d.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 915, pl. 64, figs. 1–5.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 618, fig. 829a–c.—Bassler, Bull. Geol. Surv. Virginia, 2a, 1909, p. 183, fig. 20, 9, 10.

Trenton: Nashville, Hartsville, etc., Tennessee (Catheys) Danville; Frankfort, etc., Kentucky (Flanagan); Virginia.

Plesiotypes.—Cat. Nos. 45710, 45711, U.S.N.M.

Bellerophon troosti burginensis Ulrich.

Bellerophon troosti var. burginensis Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 916, pl. 64, fig. 6.

Trenton (Flanagan): Near Burgin and Danville, Kentucky.

Holotype.—Cat. No. 45712, U.S.N.M.

Bellerophon tuber Hall.

Bellerophon tuber, Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875, pl. 30, figs. 19, 20; mus. ed., 1879, p. 177, pl. 30, figs. 19, 20; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 320, pl. 31, figs. 19, 20; pl. 33, fig. 6.

Niagaran (Waldron): Waldron, Indiana.

Bellerophon volutus Eaton. Not recognized.

Bellerophon volutus Eaton, Geol. Textb., 1832, p. 28.

Silurian: Helderberg region of New York.

BELLEROPHON WISCONSINENSIS Whitfield. See Tetranota wisconsinensis.

BERENICEA Lamouroux. Genotype: Berenicea diluviana Lamouroux.

Berenicea Lamouroux (part), Expos. Meth. des Genres d. Pol., 1821, p. 80.—McCoy, Brit. Pal. Foss., 52, p. 44.—D'Orbigny, Pal. Franc. Terr. Cret., 5, 1854, p. 858.—Haime, Bry. de la Form. Juras., 1854, p. 175.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 149.—Miller, N. A. Geol. Pal., 1889, p. 294.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 368; Geol. Minnesota, 3, 1893, p. 120.—Zittel's Textb. Pal. (Engl. ed.), 1896, p. 261.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 594.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 20.—Bassler, Bull. U. S. Geol. Surv. 292, 1906, p. 16.—Hennig, Archiv. fur Zool., K. Sven. Vet.-Akad. Stockholm, 3, No. 10, 1906, p. 25.—Grabau and Shimer, N. A. Index Fossils, I, 1907, p. 119.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res., Indiana, 1908, p. 741.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 319.

Rosacilla Roemer, Verst. des Norddeutsh. Kreidegeb., 1840, p. 19.

Diastopora (not Lamouroux) D'Orbigny, Busk and other English authors.

Diastoporella Vine, Rep. Brit. Assoc. Adv. Sci., 52, 1883, p. 275; Rep. 53d Meeting Brit. Assoc. Adv. Sci., 1884, p. 187; Proc. Yorkshire Geol. Polyt. Soc., 9, 1887, p. 190.

Sagenella Hall, Amer. Jour. Sci. and Arts, 2d ser., 11, 1851, p. 401; Pal. New York, 2, 1852, p. 172.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 171.—Miller, N. A. Geol. Pal., 1889, p. 321.—Poeta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 8.—Simpson, 14th Ann. Rep. State Geol. New York, 1897, p. 597.

Berenicea consimilis (Lonsdale).

Aulopora consimilis Lonsdale, in Murchison's Sil. Syst., pt. 2, 1839, p. 675, pl. 15.

——— ——— Hall, Pal. New York, 2, 1852, p. 173, pl. 40E, figs. 8a, b.

Diastopora consimilis Vine, Quart. Jour. Geol. Soc. London, 38, 1882, p. 58.

Diastoporella consimilis Vine, Rep. 53d meeting British Assoc. Adv. Sci., 4, 1883; Proc. Yorkshire Geol. and Polytech. Soc., 9, 1887, p. 190, pl. 12, figs. 18–20.

Berenicea consimilis Bassler, Bull. U. S. Geol. Surv., 292, 1906, pp. 16, 17, pl. 5, figs. 1–5.

Sagenella membranacea Hall, Pal. New York, 2, 1852, p. 172, pl. 40E, figs. 6a, b.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 181.

Sagenella elegans Hall, 28th Rep. New York State Mus., doc. ed., 1876, pl. 7, figs. 12, 13; Mus. ed., 1879, p. 118, pl. 7, figs. 12, 13; 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 242, pl. 6, figs. 12, 13.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 917, figs.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, pl. 20, fig. 4.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 181.

Silurian: Dudley and Shropshire, England (Wenlock); Island of Gotland; western New York and Ontario (Rochester); Osgood, Indiana (Osgood); Waldron, Indiana; and Newsom, Tennessee (Waldron).

Plesiotypes.—Cat. Nos. 35565, 44115, U.S.N.M.

BERENICEA ELEGANS Nickles and Bassler. See Berenicea consimilis.

BERENICEA MEMBRANACEA Nickles and Bassler. See Berenicea consimilis.

Berenicea minnesotensis Ulrich.

Berenicea minnesotensis Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 58; Geol. Minnesota, 3, 1893, p. 120, pl. 1, figs, 25, 27, 29, pl. 2, fig. 1.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 595, figs. 197, 198.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 119, fig. 178e.

Proboscina minnesotensis Sardeson, Jour. Geol., 9, 1901, p. 169, fig. 2B.

Black River (Decorah): Minneapolis, Minnesota, and vicinity.

Cotypes.—Cat. No. 43269, U.S.N.M.

Berenicea primitiva Ulrich.

Berenicea primitiva Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 157, pl. 6, fig. 4,—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 779, pl. 26, fig. 12.

Maysville and Richmond: Cincinnati, Waynesville, Lebanon, Clarksville, etc., Ohio; Richmond and Versailles, Indiana.

Holotype.—Cat. No. 43268, U.S.N.M.

Berenicea vesiculosa Ulrich.

Berenicea vesiculosa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 158, pl. 6, fig. 5.

Eden: Cincinnati, Ohio, and vicinity.

Holotype.—Cat. No. 43267, U.S.N.M.

BEYRICHIA McCoy. Genotype: B. klœdeni McCoy.

Beyrichia McCoy (part), Synop. Sil. Foss. Ireland, 1846, p. 57.—Bell and Forbes, in Burmeister's Org. Tril., London, Suppl. App., 1846, p. 124.—McCoy, Brit. Pal. Rocks and Foss., 1854, p. 135.—Jones, Ann. Mag. Nat. Hist., 2d ser., 16, 1855, p. 85.—Hall, Pal. New York, 3, 1859, p. 377.—Barrande, Syst. Sil. du Centre Bohme, 1, Suppl., 1872, p. 490.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 118.—Zittel, Handb. Pal., 2, 1885, p. 553.—Reuter, Zeits. d. d. Geol. Gesell., 37, 1885, p. 628.—Jones and Holl, Ann. Mag. Nat. Hist., 5th ser., 17, pp. 338, 345.—Jones and Kirkby, Proc. Geol. Assoc. (London), 9, 1886, p. 505.—Verworn, Zeits. d. d. Geol. Gesell., 39, 1887, p. 27.—Krauss, ibid., 41, 1889, p. 17.—Miller, N. A. Geol. Pal., 1889, p. 534.—Vogdes, Annals New York Acad. Sci., 5, 1889, p. 8, pl. 2, figs. 19–21.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 657.—Koken, Die Leitfossilien, Leipzig, 1896, p. 40, text fig. 26B, p. 431.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 306.—Ulrich, Zittel-Eastman Textb. Pal., 1, 1900, p. 644.—Ulrich and Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 151; 35, 1908, pp. 283, 284.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 355.—Bassler, Zittel-Eastman Textb., Pal., 2d ed., 1913, p. 738.

Observation.—Most of the earlier references in the above bibliography are not to Beyrichia as now restricted.

Beyrichia atlantica Billings.

Beyrichia Atlantica Billings, Geol. Surv. Canada, Pal. Foss., 1, 1865, p. 300.

Chazyan (Quebec—L, M): Point Rich and Table Head, Newfoundland.

BEYRICHIA BARRETTI Weller. See Klœdenia barretti.

Beyrichia bella Walcott.

Beyrichia bella Walcott, Desc. new Spec. Trenton Group, 1883, p. 7, pl. 17, fig. 11; 35th Rep. New York State Mus. Nat. Hist., 1884, p. 213, pl. 17, figs. 11, 11a.

Trenton: Trenton Falls, New York.

BEYRICHIA BICORNIS Miller. See Dicranella bicornis.

BEYRICHIA BUCHIANA Jones. See Bollia persulcata.

BEYRICHIA CHAMBERSI Miller. See Ceratopsis chambersi.

BEYRICHIA CHAMBERSI VAR. ROBUSTA Ulrich. See Ceratopsis robusta.

BEYRICHIA CILIATA Emmons. See Ctenobolbina ciliata.

BEYRICHIA CINCINNATIENSIS Miller. See Primitia cincinnatiensis.

BEYRICHIA CLARKEI Jones. See Klœdenella clarkei.

Beyrichia clathrata Jones.

Beyrichia clathrata Jones, Ann. Mag. Nat. Hist., 3d ser., 1, 1858, p. 242, pl. 9, fig. 1.

Niagaran: Beechey Island, Arctic America.

BEYRICHIA CLAVIGERA Jones. See Isochilina? clavigera.

BEYRICHIA CLAVIGERA CLAVIFRACTA Jones. See Isochilina? clavigera clavifracta.

BEYRICHIA DECKERENSIS Weller. See Klœdenia manliensis deckerensis.

BEYRICHIA DECORA Billings. See Beyrichia venusta.

Beyrichia diffisa Jones.

Beyrichia diffisa Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 546, pl. 21, fig. 7.

Anticostian (Jupiter River): Jupiter River, Anticosti.

BEYRICHIA DURYI Miller. See Ctenobolbina duryi.

Beyrichia equilatera Hall.

Beyrichia equilatera Hall, Canadian Nat. Geol., 5, 1860, p. 158, fig. 20.—Dawson, Acadian Geol., 2d ed., 1868, p. 609, fig. 217.—Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 18, pl. 2, fig. 6; p. 552; Geol. Surv. Canada, Contr. Micro-Pal., pt. 3, 1891, p. 72, pl. 11, fig. 6.

Silurian: Arisaig, Nova Scotia.

Beyrichia forbesi Jones.

Beyrichia Forbesii Jones, Quart. Jour. Geol. Soc. London, 17, 1861, p. 67, pl. 4, figs. 13a–c.

Silurian: Mount Illampu, Bolivia.

Beyrichia granulosa Hall.

Beyrichia granulosa Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1877, pl. 32, fig. 4; mus. ed., 1879, p. 186, pl. 32, fig. 4; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 331, pl. 34, fig. 4.—Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, pl. 37, fig. 15.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 355, fig. 1663a.

Niagaran (Waldron): Waldron, Indiana.

BEYRICHIA HALLI Jones. See Klœdenella halli.

BEYRICHIA HAMMELLI Miller and Faber. See Ctenobolbina hammelli

BEYRICHIA INITIALIS Ulrich. See Klœdenia initialis.

BEYRICHIA JERSEYENSIS Weller. See Klœdenia jerseyensis

BEYRICHIA KÜMMELI Weller. See Klœdenia kümmeli.

Beyrichia lata (Vanuxem).

Agnostus latus Vanuxem, Geol. New York, 3d Geol. Dist., 1842, p. 80.

Beyrichia lata Hall (part), Pal. New York, 2, 1852, p. 301, pl. A 66, figs. 10c–e. (Not b=Bollia lata.)—Jones, Ann. Mag. Nat. Hist., 2d ser., 16, 1855, p. 168, pl. 6, fig. 13.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 90, figs.—Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908. p. 292, fig. 25.

Clinton: New York, Pennsylvania, Maryland, etc.

Plesiotype.—Cat. No. 41557, U.S.N.M.

Beyrichia lata triplicata Foerste.

Beyrichia lata-triplicata Foerste, Bull. Geol. Surv. Kentucky, 7, 1906, p. 329; Jour. Cincinnati Soc. Nat. Hist., 21, 1909, pl. 1, fig. 4.

Clinton (Alger): Lewis County, Kentucky.

Beyrichia Logani Jones. See Primitia logani.

Beyrichia Logani var. leperditioides Jones. See Primitia logani leperditioides.

Beyrichia Logani var. reniformis Jones. See Primitia logani reniformis.

Beyrichia manliensis Miller. See Klœdenia manliensis.

Beyrichia marginata Miller. See Dicranella marginata.

Beyrichia montaguensis Weller. See Klœdenia montaguensis.

Beyrichia moodeyi Ulrich and Bassler.

Beyrichia moodeyi Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 285, pl. 37, fig. 8.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 355, fig. 1663d.

Cayugan (Mackenzie): Near Cacapon, West Virginia.

Cotypes.—Cat. No. 53936, U.S.N.M.

Beyrichia nearpassi Weller. See Klœdenia nearpassi.

Beyrichia Noetlingi Reuter. See Beyrichia tuberculata noetlingi.

Beyrichia notata Hall. See Klœdenia notata.

Beyrichia notata var. ventricosa Hall. See Klœdenia notata ventricosa.

Beyrichia oculifera Miller. See Ceratopsis oculifera.

Beyrichia parallela (Ulrich).

Primitia? (?Beyrichia) parallela Ulrich, Geol. Surv. Canada, Contr. Micro-Pal., pt. 2, 1889, p. 51, pl. 9, figs. 7, 7a.

Beyrichia (?Primitia) parallela Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 125, pl. 10, fig. 15a–c.

Beyrichia parallela Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 319, fig. 64.

Richmond: Stony Mountain, Manitoba (Stony Mountain); Richmond, Indiana; Oxford, Ohio (Whitewater); Anticosti (Charleton).

Plesiotype.—Cat. No. 41434, U.S.N.M.

Beyrichia perinflata Weller. See Klœdenia sussexensis.

Beyrichia persulcata Ulrich. See Bollia persulcata.

Beyrichia plagosa Jones.

Beyrichia plagosa Jones, Ann. Mag. Nat. Hist., 3d ser., 1, 1858, p. 243, pl. 9, fig. 2.

Niagaran: Beechey Island, Arctic America.

Beyrichia pustulosa Hall.

Beyrichia pustulosa Hall, Canadian Nat. Geol., 5, 1860, p. 157, fig. 19.—Dawson, Acadian Geol., 2d ed., 1868, p. 608, fig. 216.

Beyrichia tuberculata var. pustulosa Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 18, pl. 2, fig. 1a-c; Geol. Surv. Canada, Contr. Micro-Pal., pt. 3, 1891, p. 76, pl. 11, fig. 2.

Silurian: Arisaig, Nova Scotia.

BEYRICHIA QUADRIFIDA Jones. See Ceratopsis? quadrifida.

BEYRICHIA QUADRILIRATA Hall and Whitfield. See Tetradella quadrilirata.

BEYRICHIA REGULARIS Emmons. See Bollia regularis.

BEYRICHIA REGULARIS Miller. See Tetradella quadrilirata.

BEYRICHIA RICHARDSONI Miller. See Drepanella richardsoni.

BEYRICHIA RUGULIFERA Jones. See Primitia rugulifera.

BEYRICHIA SIGILLATA Jones. See Primitia sigillata.

BEYRICHIA SIMPLEX Miller. See Dicranella? simplex.

Beyrichia simplex Emmons. Not recognized.

Beyrichia simplex Emmons (not Jones, 1853), Amer. Geology, 1, pt. 2, 1855, p. 218, fig. 74a.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 91, fig.

Blue limestone: Ohio.

BEYRICHIA SMOCKI Weller. See Klœdenia smocki.

BEYRICHIA SPINOSA Hall. See Æchmina spinosa.

BEYRICHIA SPINOSA Miller. See Dicranella spinosa.

BEYRICHIA STRIATO-MARGINATUS Miller. See Eurychilina? striatomarginata.

BEYRICHIA SUSSEXENSIS Weller. See Klœdenia sussexensis.

BEYRICHIA SYMMETRICA Hall. See Klœdenella symmetrica.

BEYRICHIA SYMMETRICA Emerson. See Drepanella symmetrica.

BEYRICHIA TRISULCATA Hall. See Klœdenella trisulcata.

Beyrichia tuberculata (Kloeden).

Battus tuberculatus Kloeden (part), Verstein. der Mark Brandenburg, 1834, p. 115–117, pl. 1, figs. 21–23.

Agnostus tuberculatus Quenstedt, Petrefactenkunde, 1852, p. 302, pl. 23, figs. 25–28.

Beyrichia tuberculata Boll, Palæontographica, 1, 1847, p. 127; Archiv des Vereins der Freunde der Naturgeschichte in Meklenburg, 16 Jahr., 1862, p. 119, pl. 1, figs. 1a, b.—Bronn and Roemer, Lethæa geog., 1, 1854, p. 536, pl. 10, figs. 9a–d.—Jones, Ann. Mag. Nat. Hist., 2d ser., 16, 1855, p. 86, pl. 5, figs. 4–9b; Proc. Geol. Soc., Pal. Div. Entom., 1869, p. 12, figs. 12a–c; Geol. Mag., dec. 2, 3, 1881, p. 344, pl. 10, figs. 8–10; Ann. Mag. Nat. Hist., 6th ser., 1, 1888, p. 402, pl. 21, fig. 12.—Roemer, Lethæa palæozoica, 1876, pl. 19, figs. 9a–d.—Krause, Zeitschr. d. d. geol. Gesell., 29, 1877, p. 30, pl. 1, figs. 12a, b.—Hoernes, Palæontologie, 1884, p. 379, figs. 525c, d.—Reuter, Zeits. d. d. geol. Ges., 37, 1885, p. 632, pl. 25, figs. 1a, b.—Zittel, Handb. Pal., 2, 1885, p. 553, figs. 739, 740.—Verworn, Zeitschr. d. d. geol. Gesell., 1887, p. 31, pl. 3, fig. 12.—Jones, Contr. Micro-Pal., Geol. Surv. Canada, 3, 1891, p. 74, pl. 2, fig. 3.

Silurian: Europe; Stonehouse Brook, Arisaig, Nova Scotia.

Beyrichia tuberculata noetlingi (Reuter).

Beyrichia Noetlingi Reuter, Zeits. d. d. geol. Gesell., 37, 1885, p. 637, pl. 25, figs. 5a, 5b.

Beyrichia tuberculata var. noetlingi Jones, Contr. Micro. Pal. Geol. Surv. Canada, 3, 1891, p. 78, pl. 11, figs. 4a, b, 5.

Silurian: Europe; Stonehouse Brook, Arisaig, Nova Scotia.

BEYRICHIA TUBERCULATA var. PUSTULOSA Jones. See Beyrichia pustulosa.

Beyrichia tuberculata strictispiralis Jones.

Beyrichia tuberculata var. strictispiralis Jones, Cont. Micro-Pal., Geol. Surv. Canada, pt. 3, 1891, p. 77, pl. 11, fig. 1.

Silurian: Arisaig, Nova Scotia.

Beyrichia tumida (Ulrich).

Ctenobolbina tumida Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 11, pl. 7, figs. 5a–5b.

Beyrichia tumida Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 285; p. 292, fig. 24; p. 294, fig. 33.

Richmond (lower): McKinneys and Moreland, Kentucky.

Holotype and *plesiotype*.—Cat. Nos. 41326, 41327, U.S.N.M.

BEYRICHIA TUMIFRONS Hall. See Ctenobolbina ciliata.

Beyrichia venusta Billings.

Beyrichia venusta Billings, Geol. Surv. Canada, Cat. Sil. Foss. Anticosti, 1866, p. 68.

Beyrichia decora Billings, ibid., p. 67.

Anticostian (Jupiter River): East Point, Chaloupe River, Jumpers, etc., Anticosti.

Observation.—B. decora was based on the female form of B. venusta.

Beyrichia waldronensis Ulrich and Bassler.

Beyrichia waldronensis Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 286, pl. 27, figs. 9, 10.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 355, fig. 1663b, c.

Niagaran (Waldron): Waldron, Indiana.

Cotypes.—Cat. No. 41660, U.S.N.M.

BEYRICHIA WALLPACKENSIS Weller. See Klœdenia wallpackensis.

BILLINGSELLA Hall and Clarke. Genotype: Orthis coloradoensis Shumard.

Kutorgina Hall and Clarke (not Walcott), Pal. New York, 8, pt. 1, 1892, pp. 90–94.

Billingsella Hall and Clarke, 11th Ann. Rep. State Geol. New York, 1892, p. 273; 45th Ann. Rep. New York State Mus., 1892, p. 589; Pal. New York, 8, pt. 1, 1892, pp. 230–231.—Schuchert (part), Bull. U. S. Geol. Surv., 87, 1892, p. 158.—Walcott (part), Proc. U. S. Nat. Mus., 28, 1905, pp. 227–229.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 210.—Walcott, Smiths. Misc. Coll., 53, 1908, pp. 142 and 148, pl. 11; Mon. U. S. Geol. Surv., 51, 1912, p. 749.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 380.

Billingsella coloradoensis (Shumard).

Orthis coloradoensis Shumard, Trans. Acad. Sci. St. Louis, 1, 1860, p. 627.

Orthis pepina Hall, 16th Ann. Rep. New York State Cab. Nat. Hist., 1863, pp. 134–135, pl. 6, figs. 23–27.—Whitfield, Geol. Wisconsin, 4, pt. 3, 1882, pp. 170–171, pl. 1, figs. 4, 5.

Orthis? (Orthisina?) pepina Hall, 2d Ann. Rep. State Geol. New York, 1883, pl. 8, figs. 1, 2.

Billingsella coloradoensis—Continued.

Orthis (Billingsella) pepina Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 96.

Billingsella pepina Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 230, pl. 7, figs. 16–19; pl. 7a, figs. 7–9.

Billingsella coloradoensis Walcott, Mon. U. S. Geol. Surv., 32, pt. 2, 1899, pp. 450–451, pl. 61, figs. 1, 1a–d; Proc. U. S. Nat. Mus., 28, 1905, pp. 231–234.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 210.—Walcott, Mon. U. S. Geol. Surv., 51, 1912, pp. 299, 751, fig. 6, pl. 85, figs. 1, 1a–z.

Ozarkian (Oneota): Stillwater, Washington County, Minnesota. Middle and Upper Cambrian of Montana, Texas, Wisconsin, etc.

Plesiotypes.—Cat. Nos. 34774, 34776, U.S.N.M.

Billingsella dice Walcott.

Billingsella dice Walcott, Proc. U. S. Nat. Mus., 28, 1905, p. 234; Mon. U. S. Geol. Surv., 51, 1912, p. 754.

Lower Ordovician (drift bowlder of sandstone): St. Albans, Franklin County, Vermont.

Holotype and *paratypes.*—Cat. No. 52248, U.S.N.M.

Billingsella(?) grandæva (Billings).

Orthisina grandæva Billings, Canadian Nat. Geol., 4, 1859, p. 349, fig. 1; Geol. Canada, 1863, p. 113, fig. 21.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, p. 540, fig.

Canadian (Romaine): Mingan Islands, Canada.

Observation.—See Orthis piger for a possible synonym.

Billingsella laurentina Hall and Clarke. See Orthis(?) laurentina.

Billingsella pepina Hall and Clarke. See Billingsella coloradoensis.

Billingsella(?) primordialis (Whitfield).

Streptorhynchus? primordiale Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886. p. 301, pl. 24, fig. 7.—Lesley, Geol. Surv. Pennsylvania, Rep., P 4, 1890, p. 1096, fig.—Seely, Rep. State Geol. Vermont, 7, 1910, pl. 52, fig. 7.

Canadian (Beekmantown): Fort Cassin, Vermont.

Billingsia Ford. See Elkania Ford.

Billingsia Walcott. See Matherella Walcott.

Billingsia pretiosa Ford. See Acrothele pretiosa.

Billingsia saratogensis Walcott. See Matherella saratogensis.

BILLINGSITES Hyatt. Genotype: Ascoceras canadense Billings.

Billingsites Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 278.—Zittel, Handb. Pal., 2, 1884, p. 373.—Hyatt, Zittel-Eastman, Textb. Pal., 1, 1900, p. 516; 2d ed., 1913, p. 597.

Billingsites canadensis (Billings).

Ascoceras Canadense Billings, Geol. Surv. Canada, Rep. Progr. for 1853–1856, 1857, p. 310; Geol. Canada, Geol. Surv. Canada, 1863, p. 218, fig. 227; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 23 (loc. ref.).—Miller, N. A. Geol. Pal., 1889, p. 432, fig. 726.

Billingsites canadense Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 278 (gen. ref.).

Richmond (English Head and Charleton): English Head, etc., Anticosti.

BILOBITES Linnæus. Genotype: Anomia biloba Linnæus.

Bilobites Linnæus, Syst. Naturae, ed. Muller, 6, 1775, p. 325.—Zittel, Handb. Pal., 1, Munich, 1880, p. 674.—Nathorst, Kongl. Sven. Vet.-Akad. Handl., 18, No. 7, 1881, pp. 38, 87.—Waagen, Mem. Geol. Surv. India, Pal. Indica, 13th ser., 1, 1884, p. 549.—Hall, Bull. Geol. Soc. Amer., 1, 1889, p. 21.—Dawson, Quart. Jour. Geol. Soc. London, 46, 1890, p. 595.—Beecher, Amer. Jour. Sci., 3d ser., 42, 1891, p. 51; 44, 1892, p. 152.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 204, 223; 11th Ann. Rep. New York State Geol., 1894, p. 269.—Koken, Die Leitfossilien, Leipzig, 1896, p. 234.—Cumings, Amer. Jour. Sci., 4th ser., 1903, p. 40.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 259.

Dicœlosia King, Mon. Permian Fossils England, Pal. Soc., 1850, p. 106.

Bilobites acutilobus (Ringueberg).

Orthis acutiloba Ringueberg, Proc. Acad. Nat. Sci. Philadelphia, 1888, p. 134, pl. 7, fig. 5.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 507, figs.

Bilobites acutilobus Beecher, Amer. Jour. Sci., 3d ser. 42, 1891, p. 52, pl. 1, fig. 1.

Clinton (Rochester): Lockport, New York.

Bilobites bilobus (Linnæus).

Anomia biloba Linnæus, Systema Naturæ, ed. 12, 1767, p. 1154.

Delthyris sinuatus Hall, Geol. New York, Rep. 4th Dist., 1843, p. 105, fig. 8.—Owen (Hall), Amer. Jour. Sci. Arts, 48, 1845, p. 313, fig. 8.

Spirifer bilobus Hall, Amer. Jour. Sci., 2d ser., 20, 1849, p. 228; Pal. New York, 4, 1852, p. 260, pl. 54, fig. 1.

Orthis biloba Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 85.—Davidson, Mon. British Sil. Brach., Pal. Soc., 1869, p. 206, pl. 26, figs. 10–15.—Safford, Geol. Tennessee, 1869, p. 315, fig. 10.—Hall, 11th Rep. State Geol. Indiana, 1882, p. 286, pl. 27, fig. 16.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 510, fig.

Bilobites bilobus Beecher, Amer. Jour. Sci., 3d ser., 42, 1891, p. 52, pl. 1, fig. 28.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 190, 204, 205, 223, pl. 5B, figs. 11–14.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 259.

Niagaran: Lockport, etc., New York; Ontario (Rochester); Waldron, Indiana, and Newsom, Tennessee (Waldron).

Anticostian (Gun River and Jupiter River): Anticosti.

BISTRAMIA Hoek. Genotype: B. elegans Hoek.

Bistramia Hoek, Neues Jahrb. Min., Geol., Pal., 34, 1912, p. 247.

Bistramia elegans Hoek.

Bistramia elegans Hoek, Neues Jahrb. Min., Geol., Pal., 34, 1912, p. 247, pl. 8, figs. 12, 13.

Ordovician: Totorapampa, Bolivia.

BLASTOIDOCRINUS Billings. Genotype: B. carchariædens Billings.

Blastoidocrinus Billings, Geol. Surv. Canada, dec. 4, 1859, p. 18.—Chapman, Canadian Jour., n. s., 6, 1861, p. 514, footnote; Expos. Min. Geol. Canada, 1864, p. 108.—Zittel, Handb. Pal., 1, 1879, p. 423.—Etheridge and Carpenter, Ann. Mag. Nat. Hist., 5th ser., 9, 1882, p. 214, footnote.—Miller, N. A. Geol. Pal., 1889, p. 229.—Jaekel, Stammesgeschichte d. Pelmatozoen, 1, Thecoidea u. Cystoidea, Berlin, 1899, p. 389.—Bather, Rep. Mus. Assoc., 1900, p. 103; Treatise on Zool., pt. 3, Echinoderma 1900, p. 80, fig. 3.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 477.—Hudson, Bull. New York State Mus., 149, 1911, p. 203.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 167.

Blastoidocrinus carchariædens Billings.

Blastoidocrinus carchariædens Billings, Can. Org. Rem., dec. 4, Geol. Surv. Canada, 1859, p. 18, pl. 1, figs. 1a–n; fig. 6, p. 20.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 81, fig. 3, 1, 2.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 478, fig. 1787.

Blastoidocrinus carcharidens Miller, N. A. Geol. Pal., 1889, p. 229, text fig. 257.—Hudson, Bull. New York State Mus., 107, 1907, p. 97, figs. 1, 2; pls. 1–7; p. 149, 1911, pls. 1–4.

Chazyan: Caughnawaga, Islands of Montreal, Jesus, and Bizard, Canada; Valcour Island, New York (Valcour).

BLASTOPHYCUS Miller and Dyer. Genotype: B. diadematum Miller and Dyer.

Blastophycus Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 24.—Miller, N. A. Geol. Pal., 1889, p. 109.

Blastophycus diadematum Miller and Dyer.

Blastophycus diadematum Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 24, pl. 1, figs. 1, 2.—Miller, N. A. Geol. Pal., 1889, p. 109, fig. 17.

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

BLOTHROPHYLLUM Billings. Genotype: B. decorticatum Billings.

Blothrophyllum Billings, Canadian Jour., n. s., 4, 1859, p. 129.—Nicholson, Canadian Nat., n. s., 7, 1874, p. 139; Rep. Pal. Prov. Ontario, pt. 1, 1874, p. 18.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 112.—Miller, N. A. Geol. Pal., 1889, p. 174.—Sherzer, Amer. Geol., 7, 1891, pp. 284–289.—Lambe, Contr. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 171.

Blothrophyllum cæspitosum Rominger.

Blothrophyllum cæspitosum Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 114, pl. 42.

Niagaran: Point Detour, Michigan.

Blothrophyllum cinctosum Greene.

Blothrophyllum cinctosum Greene, Contr. Indiana Pal., 2, pt. 2, 1906, p. 34, pl. 7, figs. 7, 8.

Niagaran (Louisville): Near Louisville, Kentucky.

Blothrophyllum niagarense Davis.

Blothrophyllum niagarense Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 99, fig. 10.

Niagaran (Louisville): Near Louisville, Kentucky.

Blumenbachium Roemer. See Astræospongia Roemer.

Blumenbachium meniscus Roemer. See Astræospongia meniscus.

BODMANIA Miller and Faber. Genotype: B. insuetum Miller and Faber.

Bodmania Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 17, 1894, p. 22.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 780.

Observation.—Probably the same as Cyrtodonta.

Bodmania insuetum Miller and Faber.

Bodmania insuetum Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 17, 1894, p. 23, pl. 1, figs. 5–7.

Richmond (Whitewater): Richmond, Indiana.

Bodmania ventricosa Miller and Faber. See Whitella ventricosa.

BOLBOCEPHALUS Whitfield. Genotype: Bathyurus seelyi Whitfield.

Bolbocephalus Whitfield, Bull. Amer. Mus. Nat. Hist., 2, 1890, p. 36.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 705.

Bolbocephalus seelyi (Whitfield).

Bathyurus? Seelyi Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 339, pl. 33, fig. 12–18.

Bolbocephalus Seelyi Whitfield, Bull. Amer. Mus. Nat. Hist., 3, 1890, pl. 3, figs. 1–8.—Seely, Rep. State Geol. Vermont, 7, 1910, pl. 57, figs. 1–3.

Canadian (Beekmantown): Fort Cassin, Vermont, and Beekmantown, New York.

Bolbocephalus? truncatus Whitfield.

Bolbocephalus? truncatus Whitfield, Bull. Amer. Mus. Nat. Hist., 3, 1890, p. 37, pl. 2, figs. 6–8.

Canadian (Beekmantown): Fort Cassin, Vermont.

BOLBOPORITES Pander. Genotype: B. mitralis Pander.

Bolboporites Pander, Beitrag zur Geognosie Russlands, 1830, p. 106.—Edwards and Haime, Mon. d. Polyp. Foss. Terr. Pal., 1851 (Arch. du. Mus. d'Hist. Nat., 5), p. 246.—Eichwald, Leth. Rossica, 1, sect. 1, 1860, p. 495.—Miller, N. A. Geol. Pal., 1889, p. 174.

Bolboporites americanus Billings.

Bolboporites americanus Billings, Canadian Nat. Geol., 4, 1859, p. 429, figs. 3–6; Geol. Surv. Canada, 1863, p. 124, fig. 124a–d.—Chapman, Canadian Jour., n. s., 8, 1863, p. 195, fig. 165b; Expos. Min. Geol. Canada, 1864, p. 167, fig. 165b.—Miller, N. A. Geol. Pal., 1889, p. 174, fig. 140.—Ruedemann, Bull. New York State Mus., 49, 1901, p. 11, pl. 1, fig. 1.

Chazyan: Montreal and Mingan Islands, Canada; New York; Rysedorph Hill, Rensselaer County, New York (Rysedorph).

BOLIVIANA Salter. Genotype: B. melocactus Salter.

Boliviana Salter, Quart. Jour. Geol. Soc. London, 17, 1861, p. 71.

Boliviana bipennis Salter.

Boliviana bipennis Salter, Quart. Jour. Geol. Soc. London, 17, 1861, p. 72, pl. 5, fig. 11.

Ordovician(?): Valley of Unduavi, Bolivia.

Boliviana melocactus Salter.

Boliviana melocactus Salter, Quart. Jour. Geol. Soc. London, 17, 1861, p. 71, pl. 5, fig. 9.

Ordovician(?): Valley of Aceromarka, Bolivia.

Boliviana proboscidea Salter.

Boliviana proboscidea Salter, Quart. Jour. Geol. Soc. London, 17, 1861, p. 71, pl. 5, fig. 10.

Ordovician(?): Valley of Aceromarka, Bolivia.

BOLLIA Jones and Holl. Genotype: B. bicollina Jones and Holl.

Bollia Jones and Holl, Ann. Mag. Nat. Hist., 5th ser., 17, 1886, p. 360.—Krause, Zeits. d. d. geol. Gesell., 41, 1889, p. 13.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 705.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 668.—Koken, Die Leitfossilien, Leipzig, 1896, p. 40, fig. 26D.—Ulrich, Zittel-Eastman Textb. Pal., 1, 1900, p. 644.—Grabau, Bull. New York State Mus., 45, 9, 1901, p. 219.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 219.—Bonnema, Mitt. Min. Geol. Inst. Groningen, 2, 1909, p. 57.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 351.—Bassler. Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 738.

BOLLIA CLARKEI Ulrich. See Klœdenella clarkei.

Bollia cornucopiæ Ruedemann.

Bollia cornucopiæ Ruedemann, Bull. New York State Mus., 49, 1901, p. 82, pl. 6, figs. 1, 2.

Mohawkian (Rysedorph): Rysedorph Hill, Rensselaer County, New York.

BOLLIA HALLI Ulrich. See Klœdenella halli.

Bollia lata Jones.

Beyrichia lata Hall (part), Pal. New York, 2, 1852, p. 301, pl. A 66, fig. 10b (not figs. 10c–e=Beyrichia lata).

Bollia lata Jones, Amer. Geol., 4, 1889, p. 339.—Grabau and Shimer N. A. Index Fossils 2, 1910, p. 352.

Clinton: New York, Pennsylvania, Maryland, etc.

Bollia lata brasiliensis Clarke.

Bollia lata var. brasiliensis Clarke, Archivos. Mus. Nac. Rio de Janeiro, 10, author's Eng. ed., 1900, p. 22, pl. 2, figs. 30, 31—Katzer, Grundz. d. Geol. d. unt. Amazonas, Leipzig, 1903, pl. 16, fig. 18a, b.

Silurian: Rio Trombetas, Brazil.

Bollia persulcata (Ulrich).

Beyrichia persulcata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 12, pl. 7, fig. 6.

Bollia persulcata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 116, figs. 3a–d.

Beyrichia buchiana Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 16, pl. 3, fig. 25.

Eden, Maysville, and Richmond: Cincinnati, Ohio, and vicinity.

Holotype.—Cat. No. 41524, U.S.N.M.

Bollia pumila Ulrich.

Bollia pumila Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 117, pl. 12, figs. 1a, 1b.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res., Indiana, 1908, p. 1042, pl. 53, figs. 12, 12a.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 351, figs. 1660z, z′.

Richmond (Waynesville): Weisberg, etc., Indiana; Waynesville, etc., Ohio.

Holotype.—Cat. No. 41691, U.S.N.M.

Bollia regularis (Emmons).

Beyrichia regularis Emmons, Amer. Geology, 1, pt. 2, 1855, p. 219, fig. 74b.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 91, fig.

Bollia regularis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 669 (gen. ref.).—Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 288, figs. 12–14.

Richmond (Arnheim): Waynesville, etc., Ohio; Indiana; Kentucky.

Plesiotypes.—Cat. No. 41516, U.S.N.M.

Bollia semilunata Jones.

Bollia semilunata Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 548, pl. 21, figs. 9, a, b.

Richmond (Charleton and English Head): South of Junction Cliff, etc. Anticosti.

Bollia subæquata Ulrich.

Bollia subæquata Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 669, pl. 46, figs. 26–29.

Trenton (Prosser): Cannon Falls, St. Paul, etc., Minnesota.

Cotypes.—Cat. Nos. 41519, 41520, U.S.N.M.

Bollia symmetrica of authors. See Klœdenella symmetrica.

Bollia typa Miller. See Dilobella typa.

Bollia unguloidea Ulrich.

Bollia unguloidea Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 669, pl. 46, figs. 23–25.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 351, fig. 1658, 10, 10′.

Trenton (Prosser): Goodhue County, Minnesota.

BOREASTER Lambe. Genotype: B. lowi Lambe.

Boreaster Lambe, Cruise of the Neptune in 1903–4, App. 4, 1906, p. 323.

Boreaster lowi Lambe.

Boreaster lowi Lambe, Cruise of the "Neptune" in 1903–4, App. 4, 1906, p. 323.

Niagaran: Beechy Island, Lancaster Sound, Arctic America.

Botryocrinites of authors. See Botryocrinus Angelin.

BOTRYOCRINUS Angelin. Genotype: B. ramossissimus Angelin.

Botryocrinus Angelin, Icon. Crin. Suec., 1878, 24, pl. 20, fig. 8; pl. 23, fig. 14.—Zittel, Handb. Pal., 1, 1879, p. 352.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 320 (Rev. Pal., pt. 1, p. 97); ibid., 1886, pp. 112, 115, 148 (Rev. Pal., pt. 3, sec. 2, pp. 188, 191, 224); ibid., 1890, p. 380.—Bather, Ann. Mag. Nat. Hist., 6th ser., 5, 1890, p. 324, pl. 14, fig. 30; pl. 15, figs. 9, 13; 7, 1891, p. 392; Kongl. Sv. Vet.-Akad. Handl., 25, No. 2, 1893, p. 116, pl. 5, fig. 160; pl. 6, fig. 193; Nat. Science, 12, 1898, p. 342.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 65, fig. 34.—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 179, fig. 97.—Springer, Amer. Geol., 26, 1900, p. 133.—Bather, ibid., p. 308.—Wachsmuth, Zittel-Eastman Textb., Pal., 1, 1900, p. 157.—Zittel, Grundzuge Pal., 1, 1910, p. 154.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 506.

Botryocrinites Bather, Kongl. Sv. Vet.-Akad. Handl., 25, No. 2, 1893, pp. 114, 119, fig. 17.

Sicyocrinus Angelin, Icon. Crin. Suec., 1879, p. 23, pl. 4, fig. 9; pl. 16, fig. 5.—Wachsmuth and Springer, Rev. Pal., 1, 1879, pp. 62, 99.—Zittel, Handb. Pal., 1, 1879, p. 352.

Botryocrinus nucleus (Hall).

Dendrocrinus nucleus Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1877, pl. 15, figs. 7–9.

Cyathocrinus nucleus Hall, ibid., mus. ed., 1879, p. 136, pl. 15, figs. 7–9; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 265, pl. 14, figs. 7–9.

Homocrinus nucleus Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 144 (Rev. Pal., 3, sec. 2, p. 220).

Botryocrinus nucleus Bather, Crinoidea Gotland, 1893, p. 104.

Niagaran (Waldron): Waldron, Indiana.

Botryocrinus polyxo (Hall).

Cyathocrinus polyxo Hall, Trans. Albany Institute, 4, 1863, p. 199; 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875, pl. 15, figs. 10–17; mus. ed., p. 135, pl. 15, figs. 10–17.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 310 (Rev. Pal., 1, p. 87).—Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 264, pl. 14, figs. 10–17.

Homocrinus polyxo Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 144 (Rev. Pal., pt. 1, p. 87).

Botryocrinus polyxo—Continued.

Botryocrinus polyxo Bather, Crin. Gotland, 1893, p. 105.—Weller, Bull. Chicago Acad Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 66, pl. 14, fig. 12.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 506.

Niagaran: Waldron, Indiana (Waldron); Bridgeport, Illinois (Racine).

BRACHIOSPONGIA Marsh. Genotype: Scyphia digitata Owen.

Brachiospongia Marsh, Amer. Jour. Sci. and Arts, 2d ser., 44, 1867, p. 88.—Hovey, Trans. Kansas Acad. Sci., 3, 1875, p. 10; reprint, 1896, p. 111.—Roemer, Leth. geog., 1, Theil, Leth. Pal., Erste Lief, 1880, p. 319.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 9, 1886, pp. 246, 247.—Beecher, Mem. Peabody Mus., Yale Univ., 2, 1889, pp. 1, 13.—Miller, N. A. Geol. Pal., 1889, p. 155.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 14, pt. 1, 1891, p. 66.—Rauff, Palæontographica, 40, 1894, p. 272.—James, Amer. Nat., 29, 1895, p. 542, fig. 5.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 17.

Brachiospongia digitata (Owen).

——— ——— Troost, Mem. Geol. Soc. France, 3, 1838, p. 95, pl. 11, figs. 8–10.

Scyphia digitata Owen, 2d Rep. Geol. Surv. Kentucky, 1857, p. 111.—Hovey, Trans. Kansas Acad. Sci., 3, 1875, p. 10; reprint, 1896, p. 111.

Brachiospongia Lyonii Marsh, Amer. Jour. Sci. and Arts, 2d ser., 44, 1867, p. 88.

Brachiospongia Roemerana Marsh, Amer. Jour. Sci. and Arts, 2d ser., 44, 1867, p. 88.—Hovey, Trans. Kansas Acad. Sci., 3, 1875, p. 10, fig. 1; reprint, 1896, p. 112, fig. 1.—Roemer, Leth. geog., 1, Theil, Leth. Pal., Erste Lief, 1880, p. 319, fig. 61.

Brachiospongia hoveyi Marsh, Trans. Kansas Acad. Sci., 1874, p. 344.

Brachiospongia digitata James, J. F., Jour. Cincinnati Soc. Nat. Hist., 9, 1886, p. 248.—Beecher, Mem. Peabody Mus., Yale University, 2, 1889, p. 19, figs. 1–4; pl. 1, figs. 1, 2; pl. 2, figs. 1–7; pl. 3, figs. 1, 2; pl. 4, figs. 1–8.—Nettleroth, Kentucky Foss. Shells, Geol. Surv. Kentucky, 1889, p. 29, pl. 25, fig. 3; pl. 36, figs. 1, 2.—Miller, N. A. Geol. Pal., 1889, p. 155, fig. 92.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 14, pt. 1, 1891, p. 66, fig. 6.—Rauff, Palæontographica, 40, 1894, p. 272, figs. 52–55.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 17, fig. 26.

Trenton (Bigby): Near Bright's Mill, Franklin County, Kentucky; Davidson County, Tennessee.

BRACHIOSPONGIA HOVEYI Marsh. See Brachiospongia digitata.

Brachiospongia laevis Foerste.

Brachiospongia sp. Beecher, Mem. Peabody Mus., 2, pt. 1, 1889, p. 19.

Brachiospongia laevis Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 300, pl. 8, fig. 2.

Maysville (Mount Hope): Near Paint Lick, Madison County, Kentucky.

BRACHIOSPONGIA LYONII Marsh. See Brachiospongia digitata.

BRACHIOSPONGIA ROEMERANA Marsh. See Brachiospongia digitata.

Brachiospongia tuberculata James.

Brachiospongia tuberculata James, Palæontologist, No. 4, 1879, p. 25.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 9, 1886, p. 248; 14, pt. 1, 1891, p. 67.—Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, pl. 10, fig. 5.

Richmond (Liberty): Seven miles west of Wilmington, Ohio.

BRACHYASPIS Salter. Genotype: Isotelus rectifrons Portlock.

Brachyaspis Salter, Mon. Brit. Tril., Pal. Soc., 1866, p. 148.—Zittel, Handb. Pal., 2, 1885, p. 609.—Koken, Die Leitfossilien, Leipzig, 1896, p. 28.—Raymond, Trans. and Proc. Roy. Soc. Canada, 5, 3d ser., sec. 4, 1912, p. 115.

Brachyaspis alacer (Billings).

Asaphus alacer Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 26, fig. 9a.

Brachyaspis alacer Raymond, Trans. and Proc. Roy. Soc. Canada, 3d ser., 5, sec. 4, 1912, p. 119, pl. 2, fig. 3.

Richmond (Charleton) and Gamachian: Charleton Point, etc., Anticosti.

Brachyaspis altilis Raymond.

Asaphus platycephalus Billings (not Stokes), Cat. Sil. Foss. Anticosti, 1866, pp. 24, 26, fig. 9b.

Brachyaspis altilis Raymond, Trans. and Proc. Roy. Soc. Canada, 3d ser., 5, sec. 4, 1912, p. 119, pl. 2, figs. 4, 5; Bull. Victoria Mem. Mus., 1, 1913, p. 47, pl. 4, figs. 3, 7.

Richmond (Charleton): English Head, Anticosti.

Brachyaspis notans (Billings).

Asaphus notans Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 24, fig. 8; p. 60.

Brachyaspis notans Raymond, Trans. and Proc. Roy. Soc. Canada, 3d ser., 5, sec. 4, 1912, p. 118, pl. 1, fig. 1.

Richmond (English Head): English Head, Anticosti.

Gamachian (Ellis Bay): Gamache Bay, Anticosti.

BRACHYMERUS Shaler. See Anastrophia Hall.

BRACHYMERUS REVERSUS Shaler. See Parastrophia reversa.

BRACHYPRION Shaler. See Stropheodonta subgenus Brachyprion.

BRACHYPRION VENTRICOSA Shaler. See Stropheodonta (Brachyprion) philomena.

BROCKOCYSTIS Foerste. Genotype: Apiocystites tecumseth Billings.

Brockocystis Foerste, Bull. Sci. Lab. Denison Univ. 17, 1914, p. 468.

Brockocystis clintonensis (Parks).

Lepadocystis clintonensis Parks, Amer. Jour. Sci., 29, 1910, p. 404, figs. 1, 2.

Brockocystis clintonensis Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 473.

Upper Medinan (Cataract): Forks of Credit River, Ontario.

Brockocystis huronensis (Billings).

Apiocystites Huronensis Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 91, fig. 28.—Schuchert, Smiths. Misc. Coll., 47, 1904, p. 212.

Brockocystis huronensis Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 473.

Upper Medinan (Cataract): Cabots Head, shore of Lake Huron, Canada.

Brockocystis tecumseth (Billings).

Apiocystites? Tecumseth Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 91.—Schuchert, Smiths. Misc. Coll., 47. pt. 2, 1904, p. 211.

Brockocystis tecumsethi Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 469, pl. 5, fig. 2.

Upper Medinan (Cataract): Near South Bay, Manitoulin Island, Lake Huron.

BRÖGGERIA Walcott. See Obolus subgenus Bröggeria.

BRONGNIARTIA Eaton. See Homalonotus Koenig.

BRONGNIARTIA CARCINODEA Eaton. See Triarthrus becki.

BRONGNIARTIA ISOTELEA Eaton. See Isotelus gigas.

BRONGNIARTIA PLATYCEPHALA Harlan. See Homalonotus delphinocephalus.

BRONGNIARTIA TRENTONENSIS Collie. See Homalonotus trentonensis.

BRONTES Goldfuss. See Goldius Dekoninck.

BRONTEUS Goldfuss. See Goldius Dekoninck.

BRYOGRAPTUS Lapworth. Genotype: B. kjerulfi Lapworth.

Bryograptus Lapworth, Ann. Mag. Nat. Hist., 5th ser., 5, 1880, p. 164.—Tullberg, Sveriges Geol. Unders., Ser. C, No. 55, 1883, p. 12.—Hermann, Geol. Mag., dec. 3, 1886, p. 17.—Lapworth, Trans. Royal Soc. Canada, 4th ser., 1887, p. 168.—Nicholson and Marr, Geol. Mag., dec. 4, 2, 1895, pp. 530, 531, fig.—Koken, Die Leitfossilien, Leipzig, 1896, p. 328.—Wiman, Bull. Geol. Inst. Univ. Upsala, 2, pt. 2, No. 4, 1896, p. 265.—Roemer and Frech, Leth. geog., 1 Theil, Leth. Pal., 1, 3 Lief., 1897, p. 583.—Elles, Quart. Jour. Geol. Soc., London, 54, 1898, p. 472.—Elles and Wood, Mon. Brit. Graptolites, Pal. Soc., 1902, p. 87.—Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 638, 639.

BRYOGRAPTUS KJERULFI Matthew. See Staurograptus dichotomus.

BRYOGRAPTUS KJERULFI Ruedemann. See Bryograptus pusillus.

Bryograptus lapworthi Ruedemann.

Bryograptus n. sp., Ruedemann, Ann. Rep., New York State Pal., 1902, p. 556.

Bryograptus lapworthi Ruedemann, Mem., New York State Mus., 7, pt. 1, 1904, pp. 639–641, pl. 5, figs. 1–12, fig. 47.

Canadian (Deepkill, Tetragraptus zone): Deepkill, Rensselaer County, New York.

BRYOGRAPTUS LENTUS Matthew. See Staurograptus dichotomus.

BRYOGRAPTUS? MULTIRAMOSUS Gurley. See Dictyonema flabelliforme.

BRYOGRAPTUS PATENS Matthew. See Staurograptus dichotomus.

Bryograptus pusillus Ruedemann.

Brygraptus Kjerulfi Ruedemann (not Lapworth), Ann. Rep. New York State Pal., 1902, p. 556.

Bryograptus pusillus Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 641, 642, pl. 4, figs. 21, 22.

Canadian (Deepkill, Tetragraptus zone): Deepkill, Rensselaer County, New York.

Bryograptus spinosus Matthew.

Bryograptus spinosus Matthew, Trans. New York Acad. Sci., 14, 1895, p. 269, pl. 48, figs. 3a, b.—Gurley, Jour. Geol., 4, 1896, p. 93.—Ruedemann, Bull. New York State Mus., 69, 1903, p. 938 (loc. occ.).

Canadian (Bretonian-Div. C 3c): St. John, New Brunswick.

Observation.—Possibly the same as Staurograptus dichotomus Emmons.

BUCANELLA Meek. Genotype: B. nana Meek.

Bucanella Meek, Proc. Amer. Phil. Soc., 11, 1870, p. 426.—Miller, N. A. Geol. Pal., 1889, p. 298.—Koken, Neues Jahrb. f. Min., Geol. Pal., Beilage-Band 6, 1889, p. 390.

Bucaniella Koken, Die Leitfossilien, Leipzig, 1896, pp. 100, 392, 558; Neues Jahrb. f. Min., Geol. Pal., 1, 1896, pp. 6, 10.—Clarke, Archives Mus. Nac. Rio de Janeiro, 10, author's Eng. ed., 1900, p. 36.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 612.

BUCANELLA Koken (part). See Kokenospira Bassler, and Tetranota Ulrich and Scofield.

Bucanella nana Meek.

Bucanella nana Meek, Proc. Amer. Phil. Soc., 11, 1870, p. 426.

Lower Ordovician: Crater's Falls, Colorado.

Bucanella trilobata (Conrad).

Planorbis trilobatus Conrad, Ann. Rep. New York State Geol. Surv., 1838, p. 113.

Bellerophon trilobatus Hall, Geol. Rep. 4th Dist. New York, 1843, p. 48, figs. 6, 7; pl. 2, figs. 6, 7.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 88, figs.

Bucania trilobatus Hall, Pal. New York, 2, 1852, p. 13, pl. 4 (bis), figs. 5a, b, and part of 3d; p. 93, pl. 28, figs. 10a, b.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 822, fig. 624.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 5, figs. 6, 7.—Foerste, Bull. Sci. Lab. Denison Univ., 2, pt. 1, 1887, p. 103, pl. 8, figs. 33a, b.—Grabau, Bull. New York State Mus., 45, 1901, p. 213, fig. 144.

Bellerophon (Bucania) trilobatus Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 549, pl. 27, figs. 33a, b.

Bucaniella trilobata Clarke, Archivos Mus. Nac. Rio de Janeiro, 10, author's Eng. ed., 1900, p. 36 (gen. ref.).

Upper Medinan and Clinton: Lockport, Medina, etc., New York; Ontario; Arisaig, Nova Scotia.

Bucanella trilobata viromundo (Clarke).

Bucaniella trilobata var. viro-mundo Clarke, Archivos Mus. Nac. Rio de Janeiro, author's Eng. ed., 1900, p. 18, pl. 2, figs. 20–22.

Silurian: Rio Trombetas, Brazil.

BUCANIA (part) of authors. See Tetranota Ulrich and Scofield, Salpingostoma Roemer, and Bucanopsis Ulrich.

BUCANIA Hall. Genotype: Bellerophon sulcatinus Emmons.

Bucania Hall, Pal. New York, 1, 1847, p. 32.—Verneuil, Bull. Soc. Geol. France, 2d ser., 5, 1848, p. 376, footnote.—Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 66; 14th Rep., 1861, p. 93.—Meek, Proc. Chicago Soc. Nat. Hist., 1, 1866, p. 11.—Miller, Cincinnati Quart. Jour. Sci., 1874, p. 307.—Hall, Pal. New York, 5, pt. 2, 1879, p. 121.—Waagen, Mem. Geol. Surv. India, Pal. Indica, 13th ser., 1880, 1, p. 130, 150.—Zittel, Handb. Pal., 2, 1882, p. 184.—Koninck, Ann. d. Mus. Royal d'Hist. Nat. de Belgique, 8, 1883, p. 148.—Nettelroth, Kentucky Foss. Shells, Geol. Surv. Kentucky, 1889, p. 159.—Koken, Neues Jahrb. f. Min., Geol. Pal., Beilage-Band, 6, 1889, pp. 379, 385.—Miller, N. A. Geol. Pal., 1889, p. 398.—Barrois, Ann. Soc. Geol. du Nord, 19, Lille, 1891, p. 216.—Koken, Die Leitfossilien, Leipzig, 1896, p. 100, text fig. 78, fig. 1; Bull. l'Acad. Imp. Sci. St. Petersburg, 7, 1897, p. 120.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 850.—Koken, Neues Jahrb. f. Min., Geol. Pal., 1, 1898, p. 6.—Clarke, Archivos Mus. Nac. Rio de Janeiro, 10, author's Eng. ed., 1900, p. 35.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 213; Bull. New York State Mus., 45, 1901, p. 213.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 52.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 948.—Grabau and Shimer, N. A. Index Fossils, 3, 1909, p. 613.—Dall, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 521.

BUCANIA ANGUSTATA Hall. See Tremanotus angustata.

Bucania bellapuncta Hall.

Bucania bellapuncta Hall, Pal. New York, 2, 1852, p. 93, pl. 28, fig. 9.

Lower Clinton: Walcott, New York.

BUCANIA (BELLEROPHON) BIDORSATA Hall. See Tetranota bidorsata.

BUCANIA BUELLI Whitfield. See Salpingostoma buelli.

BUCANIA (TREMANOTUS) BUELLI Whitfield. See Salpingostoma buelli.

BUCANIA CATILLOIDES Raymond. See Oxydiscus catilloides.

BUCANIA CHAMPLAINENSIS Whitfield. See Bucania sulcatina.

BUCANIA CHICAGOENSIS McChesney. See Tremanotus chicagoensis.

BUCANIA COSTATUS Miller. See Dyeria costata.

Bucania crassa Ulrich.

Bucania crassa Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 893, pl. 67, figs. 46–48.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 955, pl. 39, figs. 4–4b.

Richmond (Elkhorn): Near Richmond, Indiana.

Holotype.—Cat. No. 45714, U.S.N.M.

BUCANIA CRASSOLARE McChesney. See Tremanotus crassolaris.

Bucania cyclostoma Calvin.

Bucania cyclostoma Calvin, Bull. Lab. Nat. Hist. State Univ. Iowa, 1, 1890, p. 181, pl. 1, figs. 2a, b.

Niagaran: Maquoketa, Iowa.

Bucania elliptica Ulrich and Scofield.

Bucania elliptica Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 888, pl. 66, figs. 11 and 12.

Trenton (Prosser): Near Cannon Falls, Minnesota.

Holotype.—Cat. No. 45715, U.S.N.M.

Bucania emmonsi Ulrich and Scofield.

Bucania emmonsi Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 887, pl. 66, figs. 1–3.

Black River (Platteville): Cannon Falls and Fountain, Minnesota.

Stones River (Murfreesboro): Murfreesboro, Tennessee.

Cotypes.—Cat. Nos. 46049, 46050, U.S.N.M.

Bucania euomphaloides Owen. Not recognized.

Bucania euomphaloides Owen, Geol. Surv. Indiana, 1862, p. 362, fig. 3.

Silurian: Locality not given.

Bucania exigua Foerste.

Bucania exigua Foerste, Bull. Sci. Lab. Denison Univ., 1, 1884, p. 99, pl. 13, figs. 18a–d.

Bellerophon (Bucania) exigua Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 288, pl. 6, fig. 3; Geol. Surv. Ohio, Pal., 7, 1893, p. 548, pl. 25, figs. 18a–b; pl. 31, fig. 3; pl. 37A, figs. 2a–c.

Bellerophon exiguus Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 619.—Savage, Bull. Illinois Geol. Surv., 23, 1913, p. 99, pl. 6, fig. 6.

Upper Medinan: Dayton and Todds Fork, Ohio; Hanover, Indiana (Brassfield); Pike County, Missouri (Edgewood).

BUCANIA EXPANSA Hall. See Salpingostoma expansa.

Bucania fiscellostriata (Foerste).

Bellerophon fiscello-striatus Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 99, pl. 13, figs. 19a–d; Proc. Boston Soc. Nat. Hist., 24, 1889, p. 287; Geol. Surv. Ohio, Pal., 7, 1893, p. 548, pl. 25, figs. 19a–e.

Upper Medinan (Brassfield): Near Dayton, Ohio.

Bucania frankfortensis Ulrich.

Bucania frankfortensis Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 891, pl. 66, figs. 30–33.

Trenton (Cynthiana): Frankfort, Kentucky.

Holotype.—Cat. No. 45716, U.S.N.M.

Bucania halli Ulrich and Scofield.

Bucania halli Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 886, pl. 66, figs. 4–8.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 614, fig. 822.

Black River: Cannon Falls, Minnesota (Platteville); Lincoln County, Missouri (Auburn); Mercer County, Kentucky (Lowville).

Cotypes.—Cat. Nos. 45717, 45718, U.S.N.M.

Bucania imbricata Miller. See Salpingostoma imbricata.

Bucania intexta Hall.

Bucania intexta Hall, Pal. New York, 1, 1847, p. 217, pl. 33, figs. 4a–d.

Bellerophon intextus Emmons, Amer. Geology, 1, pt. 2, 1855, p. 166.

Trenton: Near Watertown, New York.

Bucania lindsleyi (Safford).

Bellerophon lindsleyi Safford, Geol. Tennessee, 1869, pl. 3 (G), figs. 3a, b, d, e.

Bucania lindsleyi Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 889, pl. 66, figs. 24 and 25.

Trenton: Dekalb County, Tennessee (Catheys): Near Cannon Falls, Minnesota (Prosser).

Holotype.—Cat. No. 45719, U.S.N.M.

Bucania micronema Ulrich.

Bucania micronema Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 892, pl. 66, figs. 26–29.

Trenton (Flanagan): Danville, Kentucky.

Holotype.—Cat. No. 45720, U.S.N.M.

Bucania minnesotensis Ulrich and Scofield.

Bucania minnesotensis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, pl. 66, figs. 9 and 10.

Black River (Platteville): Goodhue County, Minnesota.

Holotype.—Cat. No. 45721, U.S.N.M.

Bucania nana Ulrich.

Bucania nana Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 895, pl. 66, figs. 41–44.

Trenton: Near Burgin (Flanagan) and Covington, Kentucky.

Cotypes.—Cat. No. 45722, U.S.N.M.

Bucania nana subpatula Ulrich.

Bucania nana var. subpatula Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 896, pl. 66, figs. 45, 46.

Trenton: Near Burgin (Flanagan) and Covington, Kentucky.

Holotype.—Cat. No. 45723, U.S.N.M.

Bucania nashvillensis Ulrich.

Bucania nashvillensis Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 890, pl. 66, figs. 36–40.

Trenton (Catheys): Dekalb County and Nashville, Tennessee.

Cotypes.—Cat. Nos. 45724, 45725, U.S.N.M.

BUCANIA OBSOLETA Miller. See Tetranota obsoleta.

Bucania operta (Foerste).

Bellerophon (Bucania) opertus Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 548, pl. 25, figs. 18c–d; pl. 37A, figs. 3a, b.

Upper Medinan (Brassfield): Near Dayton, Ohio, and Hanover, Indiana.

Bucania peracuta Ulrich.

Bucania peracuta Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 896, pl. 66, figs. 34, 35.

Trenton (Catheys): Dekalb County, Tennessee.

Holotype.—Cat. No. 45726, U.S.N.M.

Bucania pernornata Calvin.

Bucania pernornata Calvin, Bull. Lab. Nat. Hist., State Univ. Iowa, 1, 1890, p. 180, pl. 3, figs. 3a, b.

Niagaran: Maquoketa, Iowa.

BUCANIA PERVOLUTA McChesney. See Tremanotus pervolutus.

BUCANIA PUNCTATA Lincklaen. See Bucania punctifrons.

Bucania punctifrons (Emmons).

Bellerophon punctifrons Emmons, Geol. Rep. 2d Dist. New York, 1842, p. 392, fig. 5.—Owen, Amer. Jour. Sci. and Arts, 47, 1844, p. 369, fig. 5.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 165, pl. 12, figs. 11a, 12; Manual Geol., 1860, p. 98, fig. 87.—Lesley, Geol. Surv. Pennsylvania, Rep. P. 4, 1889, p. 87, figs.

Bucania punctifrons Hall, Pal. New York, 1, 1847, p. 187.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 894, pl. 67, figs. 41–44.—Raymond, Bull. Amer. Pal., 3, 1902, pl. 19, figs. 9, 10.—Weller, Geol. Surv. New Jersey, Pal. 3, 1903, p. 177, pl. 12, figs. 10–12.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 614.

Bucania punctata Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 2, fig. 5.

Retepora foliacea Hall, Pal. New York, 1, 1847, p. 78, pl. 26, figs. 9a, b.

Trenton: Middleville, Watertown, etc., New York; Canada; Central Tennessee; New Jersey.

Plesiotypes.—Cat. No. 45727, U.S.N.M. (Ulrich and Scofield).

BUCANIA RICHMONDENSIS Miller. See Salpingostoma richmondensis.

BUCANIA ROTUNDATA Hall. See Bucania sulcatina.

Bucania rugatina Ulrich.

Bucania rugatina Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 890, pl. 66, figs. 13–15.

Trenton (Flanagan): Near Burgin, Kentucky.

Holotype.—Cat. No. 45728, U.S.N.M.

BUCANIA RUGOSA Lesley. See Bellerophon rugosa.

BUCANIA SCULPTILIS Miller. See Salpingostoma sculptilis.

Bucania simulatrix Ulrich.

Bucania simulatrix Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 892, pl. 63, figs. 48, 49; pl. 67, fig. 45.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 955, pl. 42, figs. 9, 9a.

Richmond (Whitewater): Richmond, Indiana.

Bucania singularis Ulrich.

Bucania singularis Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 894, pl. 66, fig. 47.

Trenton (Catheys): Nashville, Tennessee.

Holotype: Cat. No. 45730, U.S.N.M.

Bucania stigmosa Whiteaves. See Bellerophon shelbiensis.

Bucania stigmosa Hall.

Bucania stigmosa Hall, Pal. New York, 2, 1852, p. 92, pl. 28, figs. 8a–e.

Lower Clinton: Lockport, New York.

Bucania subangulata Ulrich.

Bucania subangulata Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 891, pl. 66, figs. 20–23.

Trenton (Flanagan): Mercer and Boyle Counties, Kentucky.

Cotypes.—Cat. No. 45731, U.S.N.M.

Bucania sublata Ulrich and Scofield.

Bucania sublata Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 888, pl. 66, figs. 16–19.

Trenton: Near Burgin, Kentucky (Flanagan); Wykoff, Minnesota (Prosser).

Black River (Decorah): Near Fountain and Minneapolis, Minnesota.

Cotypes.—Cat. Nos. 45732, 45733, U.S.N.M.

Bucania sulcatina (Emmons).

Bellerophon sulcatinus Emmons, Geol. Nat. Hist. New York, 2, 1842, p. 312, fig. 4.—Owen, Amer. Jour. Sci., 47, 1844, p. 358, fig. 4, p. 359.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 165, pl. 4, fig. 4; Manual Geol., 1860, p. 93, fig. 78 only.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 146, fig. 96a, b.

Bellerophon (Bucania) sulcatinus Salter, Quart. Jour. Geol. Soc. London, 1854, 10, p. 74.

Bucania sulcatina Hall, Pal. New York, 1, 1847, p. 32, pl. 6, figs. 10, 10a; pl. 33, fig. 4d.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 1, figs. 4, 5.—Waagen, Pal. Indica, 13th ser., pt. 2, 1880, p. 131.—Miller, N. A. Geol. Pal. 1889, p. 398, fig. 656.—Koken, Neues Jahrb. f. Min., Geol. Pal., Beilage-Band 6, 1889, p. 379.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 97, figs.—Whiteaves, Canadian Rec. Sci., 5, 1893, p. 322 (loc. occ.).—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, pp. 850, 883.—Koken, Neues Jahrb. f. Min., Geol. Pal., 1, 1898, p. 9.—Raymond, Ann. Carnegie Mus., 4, 1908, p. 194, pl. 49, figs, 15–17; pl. 50, figs. 3, 4; pl. 55, figs. 13, 14.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 613, figs. 820, 821.

Bucania rotundata Hall, Pal. New York, 1, 1847, p. 33, pl. 6, figs. 11a–c.

Bellerophon rotundatus Emmons, Amer. Geology, 1, pt. 2, 1855, p. 165.

Megalomphala? rotundata Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 850 (gen. ref.).

Bucania champlainensis Whitfield, Bull. Amer. Mus. Nat. Hist., 9, 1897, p. 181, pl. 4, figs. 14–16.—Raymond, Bull. Amer. Pal., 3, 1902, p. 305, pl. 18, figs. 7, 8.

Chazyan (Day Point-Valcour): Chazy, Plattsburgh, etc., New York; Vermont· East Tennessee; Isle La Motte, Vermont.

Middle Stones River: Chambersburg, Pennsylvania, etc.

Plesiotypes.—Cat. No. 53635, U.S.N.M.

BUCANIA TRIGONOSTOMA Whitfield. See Tremanotus? trigonostoma.

BUCANIA TRILOBATA Clarke. See Bucanella trilobata.

Bucania tripla Whitfield.

Bucania tripla Whitfield, Bull. Amer. Mus. Nat. Hist., 2, 1889, p. 55, pl. 9, figs. 12, 13.—Seely, Rep. State Geol. Vermont, 7, 1910, pl. 60, fig. 7.

Canadian (Beekmantown): Providence Island, Lake Champlain.

BUCANIELLA Koken. See Bucanella Meek.

BUCANOPSIS Ulrich. Genotype: B. carinifera Ulrich.

Bellerophon (part)of authors prior to 1884.

Bucania (part) Waagen, Pal. Indica, 13th ser., pt. 2, 1880, pp. 130 and 150.—Koken, N. Jahrb. f. Min., etc., Beilage Band, 6, 1889, p. 379.

Bucanopsis Ulrich, Geol. Minnesota, 3, pt. 2, 1897, pp. 853–922.—Grabau and Shimer, N. A. Index Fossils, 3, 1909, p. 622.

Bucanopsis carinifera Ulrich.

Bucanopsis carinifera Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 925, pl. 62, figs. 56–61.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 622, fig. 836.

Trenton (Flanagan): Near Danville, Kentucky; Maysville (Fairmount); Cincinnati, Ohio, and vicinity.

Cotypes.—Cat. No. 45734, U.S.N.M.

BUCANOSPIRA Ulrich. Genotype: B. expansa Ulrich.

Bucanospira Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1044.

Bucanospira expansa Ulrich.

Bucanospira expansa Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1044, figs. 9a–c.

Niagaran (Brownsport): Wayne County, Tennessee.

Cotypes.—Cat. No. 45735, U.S.N.M.

BUMASTUS Murchison. Genotype: B. barriensis Murchison.

Bumastus Murchison, Sil. Syst., 1839, p. 656.—Goldfuss, Neues Jahrb. f. Min., etc., 1843, pp. 540, 552.—Salter, Mem. Geol. Surv. United Kingdom, dec. 2, 1849, pls. 3, 4.—McCoy, Ann. Mag. Nat. Hist., 2d ser., 4, 1849, p. 399.—Salter, Mon. British Tril., Pal. Soc., 1867, p. 183.—Steinhardt, Beit. z. Naturk. Preus. Phys.-Oekon. Gesell., Konigsberg, 1874, p. 52.—Angelin, Pal. Scandinavica, 3d ed., Holmiæ, 1878, p. 40.—Holm, Bihang K. Svenska Vet.-Hand., 7, 1882, pp. 12, 16.—Zittel, Handb. Pal., 2, Munich, 1885, p. 612.—Holm, Mem. l'Acad. Imp. Sci. St. Petersburg, 7th ser., 33, 1886, pp. 18, 21, 42.—Koken, Die Leitfossilien, Leipzig, 1896, p. 28.—Lindström, Kongl. Sven. Vet.-Akad. Handl., 34, No. 8, 1901, pp. 26, 45.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 297.—Slocom, Field Mus. Nat. Hist., Geol. Ser. 4, 1913, p. 54.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 720.

Bumastus armatus (Hall).

Illænus armatus Hall, adv. sheets, 18th Rep. New York State Cab. Nat. Hist., 1865, p. 26, figs. 3, 4; 20th Rep. 1867, p. 330, pl. 22, figs. 1–3, figs. 3–4; (rev. ed.), 1870, p. 418, figs. 8, 9, pl. 22, figs. 1–3, pl. 25, fig. 22; also p. 433; 28th Rep. New York State Mus. Nat. Hist. (doc. ed.), 1877, pl. 32, figs. 19–20; 1879, Mus. ed., p. 189, pl. 32, figs. 19, 20; 11th Rep. Dep. Geol. and Nat. Hist. Indiana, 1882, p. 335, pl. 34, figs. 19–20, pl. 33, fig. 12.—Kindle and Breger 28th Rep., ibid., 1904, p. 479, pl. 22, fig. 6.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 222, pl. 18, figs. 4–6.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 297, fig. 1609.

Bumastus armatus—Continued.

Illænus (Bumastus) armatus Salter, Mon. Brit. Tril., Pal. Soc., 1867, p. 209, fig. 54.

Illænus (Bumastus) worthenanus Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 105, 109.

Niagaran: Bridgeport, Illinois; Racine, etc., Wisconsin (Racine); Waldron, Indiana (Waldron); Georgetown and Wabash, Indiana.

Bumastus barriensis Hall. See Bumastus ioxus.

Bumastus beckeri Slocom.

Bumastus beckeri Slocom, Field Mus. Nat. Hist., Geol. Ser., 4, 1913, p. 54, pl. 14, figs. 1–4.

Richmond (Maquoketa): Clermont, Iowa.

Bumastus bellevillensis Raymond and Narraway.

Bumastus bellevillensis Raymond and Narraway, Ann. Carnegie Mus., 4, 1908, p. 253, pl. 61, figs. 6, 7.

Trenton: Belleville, Canada.

Bumastus billingsi Raymond and Narraway.

Cf. Bumastus trentonensis Emmons, Geol. New York, Rep. 2d Dist., 1842, p. 290, fig. 1.

Cf. Illænus trentonensis Hall, Pal. New York, 1, 1847, p. 230, pl. 60, fig. 5.

Cf. Bumastus orbicaudatus Clarke, Geol. Minnesota, 3, 1897, p. 722, fig. 36.

Bumastus billingsi Raymond and Narraway, Ann. Carnegie Mus., 4, 1908, p. 250, pl. 61, figs. 1, 2.—Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 34, pl. 3, fig. 12.

Trenton: Hull, Quebec, and vicinity.

Observation.—See Raymond and Narraway (1908) for a discussion of the synonyms of this species.

Bumastus chicagoensis (Weller).

Illænus chicagoensis Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 220, pl. 16, figs. 10–12.

Niagaran (Racine): Bridgeport, Illinois.

Bumastus cuniculus (Hall).

Illænus cuniculus Hall, 20th Rep. New York State Cab. Nat. Hist, 1868, p. 377, pl. 22, fig. 12; rev. ed., 1870, p. 421, pl. 22, fig. 12.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 219, pl. 19, figs. 1–6.

Niagaran (Racine): Hawthorne, Illinois; Wauwatosa, Wisconsin.

Bumastus elongatus Weller.

Bumastus elongatus Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 195, pl. 14, fig. 15.

Trenton: Near Springdale, New Jersey.

Bumastus erastusi (Raymond).

Illænus erastusi Raymond, Ann. Carnegie Mus., 3, 1905, p. 351, pl. 13, figs. 8, 9.

Bumastus erastusi Raymond, Ann. Carnegie Mus., 7, 1910, p. 71; 7th Rep. State Geol. Vermont, 1910, p. 229, pl. 35, figs. 8, 9.

Illænus crassicauda? Hall, Pal. New York, 1, 1847, p. 24, pl. 4 bis, fig. 13.

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

Bumastus globosus (Billings).

Illænus globosus Billings, Canadian Nat. Geol., 4, 1859, p. 367, figs. 1–3; Geol. Canada, Geol. Surv. Canada, 1863, p. 133, figs. 64, a–c.—Miller, N. A. Geol. Pal., 1889, p. 551, text figs. 1015–16.—Raymond, Annals Carnegie Mus., 1905, p. 350, pl. 13, figs. 6, 7.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 294, figs. 1605, a. c.

Bumastus globosus—Continued.

Bumastus globosus Raymond, Ann. Carnegie Mus., 7, 1910, p. 71, pl. 19, fig. 9; 7th Rep. State Geol. Vermont, 1910, p. 228, pl. 35, figs. 6, 7; pl. 39, fig. 9; Trans. and Proc. Roy. Soc. Canada, 3d ser., 5, sec. 4, 1912, p. 120, pl. 3, fig. 3.

Chazyan: Mingan Islands (Mingan); Island of Montreal; Chazy, Valcour Island, Plattsburg, and Crown Point, New York; Isle La Motte, Vermont (Day Point, Valcour); East Tennessee (Lenoir).

Bumastus graftonensis (Meek and Worthen).

Illænus (Bumastus) graftonensis Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1870, p. 54; Geol. Surv. Illinois, 7, 1875, p. 508, pl. 25, fig. 4.

Illænus graftonensis Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 223, pl. 16, figs. 4–6.—Keyes, Missouri Geol. Surv., 4, 1894, p. 226.

Niagaran: Grafton, Joliet, and near Lemont, Illinois (Racine).

Bumastus harrisi (Weller).

Illænus harrisi Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 218, pl. 16, figs. 1–3.

Niagaran (Racine): Bridgeport, Illinois.

Bumastus imperator (Hall).

Illænus imperator Hall, Rep. Prog. Geol. Surv. Wisconsin, 1861, p. 49; Geol. Surv. Wisconsin, 1, 1862, p. 433; adv. sheets 18th Rep. New York State Cab. Nat. Hist., 1865, p. 28; 20th Rep., 1867, p. 332, pl. 22, figs. 15–17; pl. 23, figs. 2–3; rev. ed., 1870, p. 420, pl. 22, figs. 15–17; pl. 23, figs. 2–3.—Whitfield, Geol. Wisconsin, 4, 1882, p. 306, pl. 21, figs. 4–5.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 225, pl. 16, figs. 13–16.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 297.

Niagaran (Racine): Racine, Waukesha and Burlington, Wisconsin; Joliet, Illinois.

Bumastus indeterminatus (Walcott).

Illænus indeterminatus Walcott, 31st Rep. New York State Mus. Nat. Hist., 1879 (1880); adv. sheets 1877, pp. 19, 70.

Illænus cf. indeterminatus Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 716, fig. 24.

Bumastus indeterminatus Raymond and Narraway, Ann. Carnegie Mus., 4, 1908, p. 253, pl. 62, figs. 8, 9.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 297.

Black River: Russia, New York; Mechanicsville, Ontario; Tetreauville, Quebec (Lowville); Platteville and Janesville, Wisconsin (Platteville).

Bumastus insignis (Hall).

Illænus insignis Hall, adv. sheets 18th Rep. New York State Cab. Nat. Hist., 1865, p. 27, figs. 5, 6; 20th Rep., 1867, p. 331, figs. 5, 6; pl. 22, figs. 13, 14; rev. ed., 1870, p. 419, figs. 10, 11; pl. 22, figs. 13, 14.—Whitfield, Geol. Wisconsin, 4, 1882, p. 305, pl. 21, figs. 6–10.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 195, fig.—Foerste, 15th Ann. Rep. Geol. and Nat. Hist. Surv. Minnesota, 1887, p. 481.—Keyes, Missouri Geol. Surv., 4, 1894, p. 227, pl. 32, figs. 1 a–b.—Geol. Surv. Ohio, 7, 1895, p. 525, pl. 26, fig. 11.—Kindle, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 479, pl. 22, figs. 1–5.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 215, pl. 17, figs. 1–5.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 296, fig. 1608.

Illænus (Bumastus) insignis Salter, Mon. Brit. Tril., Pal. Soc., 1867, p. 207, pl. 27, figs. 6, 7.

Bumastus insignis Salter, Mon. Brit. Tril., Pal. Soc., 1867, p. 183 (gen. ref.).

Niagaran: Waukesha, Milwaukee, Racine, etc., Wisconsin; Bridgeport, Illinois (Racine): Ohio and Indiana.

Bumastus ioxus (Hall).

Bumastus barriensis Hall (not Murchison), Geol. New York, pt. 4, 1843, p. 102, fig. 4; p. 101; tab. org. rem., 10, fig. 4, and 19, fig. 2.—Owen, Amer. Jour. Sci. and Arts, 48, 1845, p. 309, fig. 4.—Verneuil, Amer. Jour. Sci. and Arts, 2d ser., 7, 1849, p. 225.—Hall, Pal. New York, 2, 1852, p. 302, pl. 66, figs. 1–15.—Roemer, Sil. Fauna West Tennessee, Breslau, 1860, p. 83, pl. 5, fig. 23.—Emmons, Man. Geol., 1860, p. 108, fig. 98.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 319, fig. 338.—Miller, N. A. Geol. Pal., 1889, p. 536, fig. 981.

Illænus (Bumastus) barriensis? Hall, Geol. Surv. Wisconsin, 1, 1862, p. 433; adv. sheets, 18th Rep. New York State Cab. Nat. Hist., 1865, p. 28; 20th Rep. 1867, p. 332.

Illænus barriensis Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 8, fig. 5.—Hall, Trans. Albany Inst., 4, 1863, p. 227.

Illænus ioxus Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, p. 387, fig.; pl. 22, figs. 4–11; pl. 23, fig. 1; rev. ed., 1870, p. 420, fig. 12, pl. 22, figs. 4–10.—Whitfield, Geol. Wisconsin, 4, 1882, p. 304, pl. 21, figs. 11, 12.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 195, fig.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 299, figs.—Foerste, Proc. Bost. Soc. Nat. Hist., 24, 1889, p. 268, pl. 5, fig. 20.—Van Ingen, School of Mines Quart., 23, 1901, p. 35.—Grabau, Bull. New York State Mus., 45, 1901, p. 223, fig. 154; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 223, fig. 154.—Kindle, 28th Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 480, pl. 22, fig. 7; pl. 23, fig. 3.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 222, pl. 18, figs. 1–3.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 295, figs. 1606, 1607.

Illænus (Bumastus) ioxus Hall, Trans. Albany Inst., 10, 1883, p. 76; 11th Rep. Dep. Geol. Nat. Hist. Indiana, 1882, p. 335, pl. 38, figs. 13, 14.

Niagaran: Rochester, Lockport, etc., New York; Hamilton, etc., Ontario (Rochester); Waldron, Indiana (Waldron); Racine, etc., Wisconsin; Illinois (Racine); Cedarville, etc., Wisconsin (Guelph); Indiana; Arkansas; Ohio; etc.

Bumastus limbatus Raymond.

Bumastus limbatus Raymond, Ann. Carnegie Mus., 7, 1910, p. 71; 7th Rep. Vermont State Geol., 1910, p. 230, pl. 35, figs. 1, 2.

Illænus indeterminatus Raymond (not Walcott) Ann. Carnegie Mus., 3, 1905, p. 347, pl. 13, figs. 1, 2.

Chazyan (Valcour): Valcour Island, New York, and Isle La Motte, Vermont.

Bumastus milleri (Billings).

Cf. Illænus trentonensis Emmons, Geol. New York, Rep. 2d Dist., 1842, p. 390, fig. 3.

Cf. Bumastus trentonensis Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 718, figs. 30–35.—Weller, Pal. New Jersey, 3, 1902, p. 194, pl. 14, figs. 8–13.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 298, figs. 1610a, b.

Illænus milleri Billings, Canadian Nat. Geol., 4, 1859, p. 375, fig. 10; Geol. Canada, Geol. Surv. Canada, 1863, p. 151, fig. 112.—Walcott, 31st Ann. Rep. New York State Mus. Nat. Hist., 1879, p. 71 (adv. sheets, 1877, p. 20).—Raymond and Narraway, Ann. Carnegie Mus., 4, 1908, p. 249, pl. 61, figs. 9, 10; pl. 62, figs. 3–5.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 297.

Black River: Ottawa, etc., Ontario; New York; New Jersey; etc.

Observation.—See Raymond and Narraway (1908) for a discussion of this and related species.

Bumastus niagarensis (Whitfield).

Illænus niagarensis Whitfield, Ann. Rep. Wisconsin Geol. Surv., 1880, p. 68.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 219, pl. 19, figs. 7–11.

Bumastus niagarensis—Continued.

Bumastus niagarensis Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 298.

Illænus madisonianus Whitfield, Geol. Wisconsin, 4, 1882, p. 307, pl. 20, figs. 8, 9.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 195, fig.—Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 106, pl. 14, figs. 1a, 1b, 2a–2b; 2, 1887, p. 93, pl. 8, figs. 8–10; Geol. Surv. Ohio, Pal., 7, 1893, p. 526, pl. 27, figs. 7–10.—Van Ingen, School of Mines Quart., 23, 1901, p. 35.

Illænus madisonianus vars. elongatus and depressus Foerste, Geol. Surv. Ohio, 7, 1893, p. 526, pl. 26, figs. 1, 2; pl. 27, figs. 7–10.

Niagaran: Wisconsin and Illinois (Racine); St. Clair Springs, Arkansas (St. Clair); Dayton, Ohio (Brassfield).

Bumastus orbicaudatus (Billings).

Illænus orbicauda Billings, Canadian Nat., 4, 1859, p. 379.

Illænus orbicaudatus Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 27, fig. 10; p. 60.—Salter, Mon. Brit. Tril., Pal. Soc., 1867, p. 209.

Richmond-Anticostian (English Head, Gun River): English Head, Gamache Bay, etc., Anticosti.

Bumastus orbicaudatus Clarke. See Bumastus billingsi.

Bumastus transversalis Weller.

Bumastus transversalis Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 195, pl. 14, fig. 14.

Trenton: Hainesburg, New Jersey.

Bumastus trentonensis Emmons.

Bumastus trentonensis Emmons, Nat. Hist. New York, Geol., 2, 1842, p. 390, fig. 1.

Illænus trentonensis Hall, Pal. New York, 1, 1847, p. 230, pl. 69, fig. 5.

Trenton (drift): Hogansburg, New York.

Observation.—Type lost and figures not sufficient for accurate identification. See Raymond and Narraway (Annals Carnegie Mus., 4, 1908, p. 251) for a discussian of this and related forms.

BUTHOGRAPTUS Hall. Genotype: B. laxus Hall.

Buthograptus Hall, Rep. Sup. Geol. Surv. Wisconsin, 1861, p. 18; 20th Rep. New York State Cab. Hist., 1868, p. 218; rev. ed., 1870, p. 252.—Nicholson, Mon. Brit. Grapt., 1872, p. 131.—Spencer, Trans. Acad. Sci. St. Louis, 4, 1884, p. 563.—Whitfield, Bull. Amer. Mus. Nat. Hist., 6, 1894, p. 351 (Bythocladus, new name, suggested).

Bythograptus Miller, N. A. Geol. Pal., 1889, p. 174.

Buthograptus laxus Hall.

Buthograptus laxus Hall, Rep. Sup. Geol. Surv. Wisconsin, 1861, p. 19; Geol. Surv. Canada, dec. 2, 1865, p. 18, fig. 25; 20th Rep. New York State Cab. Nat. Hist., 1868, p. 185, fig. 27; rev. ed., 1870, p. 214, fig. 27.—Nicholson, Mon. Brit. Graptol., 1872, p. 132, fig. 72.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 153, fig.—Whitfield, Bull. Amer. Mus. Nat. Hist., 6, 1894, p. 351, pl. 11, figs. 1–3; Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 40, pl. 4, figs. 1–3.

Black River (Platteville): Platteville, etc., Wisconsin.

BUTHOTREPHIS Hall. Genotype: B. antiquata Hall.

Buthotrephis Hall, Pal. New York, 1, 1847, p. 8.—Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 99.—Nathorst, Ofvers K. Vet.-Akad. Forhandl., 30, No. 9, 1873, p. 46.—James, Jour. Cincinnati Soc. Nat. Hist., 7, 1885, p. 159.

Bythotrephis Roemer, Leth. geog., 1, Theil, Leth. Pal., Erste Leif, 1880, p. 123.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 139.—Grabau, Bull. New York State Mus., 45, 1901, p. 130; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 130.—Miller, N. A. Geol. Pal., 1889, p. 109.

Buthotrephis antiquata Hall.

Buthotrephis antiquata Hall, Pal. New York, 1, 1847, p. 8, pl. 2, fig. 6.—Goeppert, Nov. Act. Acad. Caes. Leop. Car., 22, Suppl. (Uebergangsgeb.), 1852, p. 85.—Quenstedt, Handb. Petrefaktenk. Tubingen, 3d ed., 1885, p. 1081, fig. 402.—Lesley, Rep. Geol. Surv. Pennsylvania, P 4, 1889, p. 98, fig.

Chazyan: Chazy, New York.

Buthotrephis? cæspitosa Hall.

Buthotrephis? cæspitosa Hall, 3d Rep. New York State Cab. Nat. Hist., rev. ed., 1850, p. 178, pl. 1, fig. 1a–c (doc. ed., p. 170).

Trenton: Near Watertown, New York.

Buthotrephis clavelloides (Grabau).

Bythotrephis clavelloides Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 210, pl. 12, fig. 1.

Cayugan (Akron): North Buffalo, New York.

Buthotrephis divaricata White.

Buthotrephis divaricata David White, Proc. U. S. Nat. Mus., 24, 1902, p. 265, pl. 16.

Cayugan (Kokomo): Kokomo, Indiana.

Buthotrephis filiciformis James. See Chlœphycus filiciformis.

Buthotrephis gracilis Hall (1847). See Buthotrephis tenuis.

Buthotrephis gracilis (Hall).

Fucoides gracilis Hall, Nat. Hist. New York, Geol., 4, 1843, p. 69, fig.

Buthotrephis gracilis Hall (not Hall, 1847), Pal. New York, 2, 1852, p. 18, pl. 5, figs. 1a–d.—Rogers, Geol. Pennsylvania, 2, 1858, p. 822, fig. 625.—Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 137.—Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 574.—Lesquereux, 13th Ann. Rep. Indiana Geol. Surv., 1883, p. 30, pl. 1, figs. 1, 6, 7.—James, Jour. Cincinnati Soc. Nat. Hist., 7, 1885, p. 160, pl. 9, fig. 6.—Lesley, Rep. Geol. Surv. Pennsylvania, P. 4, 1889, pp. 99, 100, figs.

Bythotrephis gracilis Schimper, Pal. Veg., 1, 1869, p. 198.—Grabau, Bull. New York State Mus., 45, 1901, pp. 130, 131, fig. 25; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 130, 131, fig. 25.

Buthotrephis Hallii Humphreys, Bull. Torrey Botanical Club, 37, 1910, p. 309.

Lithodendron dichotomum Eaton, Geol. Textb., 2d ed., 1882, p. 39, pl. 4, fig. 43.—Clarke, 11th Rep. State Geol. New York, 1894, p. 34.—45th Rep. New York State Mus., 1894, p. 350.

Clinton: New Hartford, New York. This species has been identified in the Silurian at numerous American localities.

Buthotrephis gracilis crassa Hall.

Buthotrephis gracilis var. crassa Hall, Pal. New York, 2, 1852, p. 19, pl. 5, fig. 3a–d; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 221, pl. 1, fig. 6.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 101, fig.

Dendrograptus gracilis var. crassa James, Jour. Cincinnati Soc. Nat. Hist, 7, 1885, p. 159.

Silurian: Oneida County, etc., New York (Clinton); Waldron, Indiana (Waldron); Ontario (Cataract), etc.

Buthotrephis gracilis intermedia Hall.

Buthotrephis gracilis var. intermedia Hall, Pal. New York, 2, 1852, p. 19, pl. 5, fig. 2a, b.

Buthotrephis gracilis intermedia—Continued.

Dendrograptus gracillimum var. intermedia James, Jour. Cincinnati Soc. Nat. Hist., 7, 1885, p. 161.

Early Silurian: New Hartford, New York (Clinton); Ontario (Cataract), etc.

Buthotrephis Granti Dawson. See Inocaulis grantii.

Buthotrephis gregaria Ringueberg.

Buthotrephis gregaria Ringueberg, Proc. Acad. Nat. Sci. Philadelphia, 1888, p. 131, pl. 7, fig. 1.

Clinton (Rochester): Lockport, New York.

Buthotrephis Hallii Humphreys. See Buthotrephis gracilis.

Buthotrephis impudica Hall.

Buthotrephis impudica Hall, Pal. New York, 2, 1852, p. 20, pl. 6, fig. 2.

Clinton: New Hartford, New York.

Buthotrephis lesquereuxi Grote and Pitt.

Buthotrephis Lesquereuxi Grote and Pitt, Bull. Buffalo Soc. Nat. Sci., 3, 1876, p. 88.—Pohlman, ibid., 4, 1881, p. 19, fig. 6.

Bythotrephis lesquereuxi Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 131, fig. 26; Bull. New York State Mus., 45, 1901, p. 131, fig. 26.

Cayugan (Akron): Buffalo, New York.

Buthotrephis newlini White.

Buthotrephis newlini David White, Proc. U. S. Nat. Mus., 24, 1902, p. 266, pls. 17, 18.

Cayugan (Kokomo): Kokomo, Indiana.

Buthotrephis palmata Hall.

Buthotrephis palmata Hall, Pal. New York, 2, 1852, p. 20, pl. 6, fig. 1; pl. 7, fig. 1a, b.

Clinton: New Hartford, New York.

Buthotrephis pergracilis Dawson.

Buthotrephis pergracilis Dawson, Canadian Rec. Sci., 3, 1888, p. 55.—Dawson. Trans. Royal Soc. Canada, 7, sec. 4, 1890, p. 54, fig. 27; 2d ser., 2, sec. 4, 1896, p. 120, fig. 32.

Canadian? (Levis?): Little Metis, Quebec.

Buthotrephis ramosa Hall.

Buthotrephis ramosa Hall, Pal. New York, 2, 1852, p. 21, pl. 6, fig. 3.

Clinton: New Hartford, New York.

Buthotrephis ramulosa Miller.

Buthotrephis ramulosus Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 235, fig. 29.—James, Jour. Cincinnati Soc. Nat. Hist., 7, 1885, p. 159.

Bythotrephis ramulosus Miller, N. A. Geol. Pal., 1889, p. 109, fig. 19.

Trenton (upper) or Eden (Fulton): Cincinnati, Ohio, and vicinity.

Buthotrephis subnodosa Hall.

Buthotrephis subnodosa Hall, Pal. New York, 1, 1847, p. 262, pl. 68, figs. 3a, b.—Gœppert, Nov. Act. Acad. Caes. Leop. Car., 22, Suppl. (Uebergangsgeb.), 1852, p. 86.

Utica-Pulaski: Turin, Loraine, and Pulaski, New York.

Buthotrephis succulens Hall.

Buthotrephis succulens Hall, Pal. New York, 1, 1847, p. 62, pl. 22, figs. 2a, b.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 152, fig. 25.

Buthotrephis succulosa James, Jour. Cincinnati Soc. Nat. Hist., 7, 1885, p. 159.

Bythotrephis succulens Miller, N. A. Geol. Pal., 1889, p. 110.

Licrophycus succulens Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 937 (gen. ref.).

Trenton: Glens Falls, New York.

BUTHOTREPHIS SUCCULOSA James. See Buthotrephis succulens.

Buthotrephis tenuis (Hall).

Buthotrephis gracilis Hall, Pal. New York, 1, 1847, p. 62, pl. 21, fig. 1.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 7, fig. 1.—Etheridge, Quart. Jour. Geol. Soc. London, 39, 1878, p. 574.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 152, fig. 26b.

Buthotrephis conf. gracilis Emerson, Narrative Hall's Second Arctic Exped., U. S. Navy Dep., 1879, p. 575, fig. 1.

Buthotrephis tenuis Hall, Pal. New York, 2, 1852, p. 18.

Bythotrephis tenuis Chapman, Proc. Royal Soc. Victoria, 15, new ser., 1903, p. 104, pl. 16, fig. 1.

Trenton: Jacksonburgh and Middleville, Herkimer County, New York.

Buthotrephis yukonensis Ami.

Bythotrephis yukonensis Ami., Canadian Geol. Surv., Summ. Rep. for 1904, 1905, p. 388.

Lower Paleozoic?: Seven miles north Dalton's Post, Unihana River, Yukon district, Canada.

BYSSONYCHIA Ulrich. Genotype: Ambonychia radiata Hall.

Ambonychia (part) Hall, Pal. New York, 1, 1847, p. 163; 3, 1859, pp. 269 and 523; also of many American and European authors.

Byssonychia, Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 498; Geol. Surv. Ohio, 7, 1893, p. 629.—Cumings, 32d Ann. Rep. Dep. Geol. and Nat. Res. Indiana, 1908, p. 979.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 431.—Dall. Zittel-Eastman Textb. Pal., 1900, p. 368; 2d. ed., 1913, p. 445.

Byssonychia acutirostris Ulrich.

Byssonychia acutirostris Ulrich, Geol. Surv. Ohio, 7, 1893, p. 634, pl. 45, figs. 8, 9; pl. 46, fig. 10.

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

Holotype.—Cat. No. 46095 U.S.N.M.

Byssonychia alveolata Ulrich.

Byssonychia alveolata, Ulrich, Geol. Surv. Ohio, 7, 1893, p. 631, pl. 48, figs. 1–3.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 989, pl. 42, figs. 7, 7a.

Maysville (Corryville): Cincinnati, Ohio; southeastern Indiana.

Holotype.—Cat. No. 46096, U.S.N.M.

Byssonychia(?) byrnesi Ulrich.

Byssonychia(?) byrnesi Ulrich, Geol. Surv. Ohio, 7, 1893, p. 635, pl. 47, figs. 4 and 5.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 431, fig. 563.—Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 134, pl. 3, fig. 6.

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

Cotypes.—Cat. No. 46097, U.S.N.M.

Byssonychia carinata (Goldfuss).

Pterinea carinata Goldfuss, Petref. Germ., 1826, p. 136, pl. 119, fig. 8.—Vanuxem, Nat. Hist. New York, Geol., 3, 1842, p. 64, p. 65, fig. 1.—Emmons, ibid., Geol., 2, 1842, p. 402, fig. 1.—Owen, Amer. Jour. Sci. and Arts, 47, 1844, p. 376, fig. 1.

Avicula carinata Emmons, Amer. Geology, 1, pt. 2, 1855, p. 175, pl. 17, fig. 23.

Ambonychia carinata Hall, Pal. New York, 1, 1847, p. 294, pl. 80, figs. 5a, b; Geol. Lake Sup. Land Dist., Foster and Whitney's Rep., 1851, p. 215, pl. 31, fig. 3; Pal. New York, 3, 1861, p. 269.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 22, fig.

Byssonychia carinata Foerste, Bull. Sci. Lab. Denison Univ. 17, 1914, p. 324.

Cincinnatian (Pulaski): Lewistown, Oneida County, New York.

Byssonychia cultrata Ulrich.

Byssonychia cultrata, Ulrich, Geol. Surv. Ohio, 7, 1893, p. 632, pl. 45, figs. 5–7.

Richmond (Waynesville): Waynesville, Ohio; Versailles, Indiana.

Cotypes.—Cat. Nos. 46098, 46596, U.S.N.M.

Byssonychia grandis Ulrich.

Byssonychia grandis Ulrich, Geol. Surv. Ohio, 7, 1893, p. 631, pl. 46, figs. 6–9.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 990, pl. 44, figs. 1, 1a.

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

Cotypes.—Cat. Nos. 46099, 46100, U.S.N.M.

Byssonychia imbricata Ulrich.

Byssonychia imbricata Ulrich, Geol. Surv. Ohio, 7, 1893, p. 635, pl. 46, figs. 4 and 5.

Maysville (Corryville): Cincinnati, Ohio.

Holotype.—Cat. No. 46101, U.S.N.M.

Byssonychia intermedia (Meek and Worthen).

Ambonychia intermedia Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 306, pl. 2, fig. 5a, b.

Byssonchia intermedia Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 499, pl. 35, figs. 23–26.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 182.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 431, fig. 562a, b.

Trenton: Mount Carroll, Illinois; Oshkosh, Wisconsin; Wykoff, Minnesota; Lake Winnepeg, Canada; Kentucky.

Plesiotype.—Cat. No. 46102, U.S.N.M.

Byssonychia obesa Ulrich.

Byssonychia obesa Ulrich, Geol. Surv. Ohio, 7, 1893, p. 630, pl. 45, figs. 10–12.—Whiteaves, Pal. Foss., 2, Geol. Surv. Canada, 3, 1895, pt. 2, p. 122 (loc. occ.).—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 991, pl. 42, figs. 8, 8b.

Ambonychia obesa Miller, N. A. Geol. Pal., 1897, 2d App., p. 779 (gen. ref.).

Richmond: Richmond, Indiana (Whitewater); Stony Mountain, Manitoba.

Holotype.—Cat. No. 46103, U.S.N.M.

Byssonychia præcursa Ulrich.

Byssonychia præcursa Ulrich, Geol. Surv. Ohio, 7, 1893, p. 633, pl. 45, figs. 1, 2.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 992, pl. 43, figs. 3, 3a.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 432, fig. 565.

Maysville: Lorraine, New York (Pulaski); Covington, Kentucky, and vicinity (Fairmount).

Cotype.—Cat. No. 46104, U.S.N.M.

Byssonychia radiata (Hall).

Ambonychia radiata Hall, Pat. New York, 1, 1847, p. 292, pl. 80, figs. 4a–l.—Billings, Canadian Nar. Geol., 1, 1856, p. 44, fig. 7.—Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 8, fig.; p. 110, figs. 1, 2.—Lincklaen. 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 4, fig. 7.—Hall, Pal. New York, 3, 1861, p. 269, fig.; p. 523, figs. 1, 2.—Chapman, Canadian Jour., n. s., 7, 1862, p. 166, fig. 110; ibid., 8, 1863, p. 206, fig. 205.—Hall, Rep. Geol. Surv. Wisconsin, 1862, p. 54, figs. 1, 2.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 215, fig. 219.—Chapman, Expos. Min. Geol. Canada, 1864, p. 120, fig. 110; p. 178, fig. 205.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, pp. 14, 15.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 35, fig. 11.—Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 79, pl. 2, fig. 2.—Roemer, Leth. geog., 1, Leth. Pal., Atlas, 1876, pl. 4, fig. 17.—Zittel, Handb. Pal., 2, 1881, p. 35, fig. 42b.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 174, fig.—Miller, N. A. Geol. Pal., 1889, p. 461, fig. 771.—Lesley, Geol. Pennsylvania, Rep. P 4, 1889, p. 23, figs.

Byssonychia radiata Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 477, fig. 35VI.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 993, pl. 43, fig. 4.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 432, fig. 562c, 566.—Bassler, Bull. Geol. Surv. Virginia, 2a, 1909, pl. 14, fig. 7.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 273, pl. 3, figs. 12a–c.

Maysville-Richmond: Turin, Lorraine, Pulaski, etc., New York, and Quebec (Pulaski); Ohio; Indiana; Kentucky; Virginia; Tennessee (Maysville and Richmond); Anticosti, etc., Canada.

Plesiotype.—Cat. No. 46105, U.S.N.M. (Ulrich).

Byssonychia retrorsa (Miller).

Ambonychia retrorsa Miller, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 104, pl. 3, fig. 6.

Byssonychia retrorsa Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 499 (gen. ref.).

Maysville (Fairmount): Cincinnati, Ohio.

Byssonychia richmondensis Ulrich.

Ambonychia robusta Miller (part), Jour. Cincinnati Soc. Nat. Hist., 3, 1880, p. 315.

Byssonychia richmondensis Ulrich, Geol. Surv. Ohio, 7, 1893, p. 632, pl. 45, figs. 3, 4.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 994, pl. 44, figs. 2–2a.

Richmond (Whitewater): Richmond, etc., Indiana.

Holotype.—Cat. No. 46106, U.S.N.M.

Byssonychia robusta (Miller).

Ambonychia robusta Miller, Jour. Cincinnati Soc. Nat. Hist., 3, 1881, p. 315, pl. 8, figs. 3, 3a.

Byssonychia robusta Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 499 (gen. ref.).

Richmond (Whitewater): Osgood, Indiana.

Byssonychia subrecta Ulrich.

Byssonychia subrecta Ulrich, Geol. Surv. Ohio, 7, 1893, p. 634, pl. 45, figs. 13–15.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 995, pl. 44, figs. 3–3b.

Richmond (Waynesville): Waynesville, Ohio; Versailles, Indiana.

Cotypes.—Cat. No. 46107, U.S.N.M.

Byssonychia tenuistriata Ulrich.

Byssonychia tenuistriata Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 500, fig. 39.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 996, pl. 43, figs. 5, 5a.

Byssonychia tenuistriata—Continued.

Ambonychia tenuistriata Miller, N. A. Geol. Pal., 2d App., 1897, p. 779 (gen. ref.).

Richmond: Granger and Spring Valley, Minnesota (Maquoketa); Richmond, Indiana (Whitewater).

Byssonychia vera Ulrich.

Byssonychia vera Ulrich, Geol. Surv. Ohio, 7, 1893, p. 629, figs. a–c.—Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 134, pl. 1, fig. 15.

Ambonychia bellistriata, Miller (not Hall, 1847), Cincinnati Quart. Jour. Sci., 1, 1874, p. 14.

Byssonychia radiata (Hall) new var., Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 479, fig. 36V.

Ambonychia cincinnatiensis Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 17, 1894, p. 24, pl. 1, figs. 8–10.

Eden: Cincinnati, Ohio, and vicinity.

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

Cotypes.—Cat. No. 46108, U.S.N.M.

Byssonychia walkerensis Grabau.

Byssonychia walkerensis Grabau, Bull. Geol. Soc. Amer., 24, 1913, p. 454.

Maysville (Bays): Big Walker Mountain, Virginia.

Bythocladus Whitfield. See Buthograptus Hall.

BYTHOCYPRIS Brady. Genotype: B. reniformis Brady.

Bythocypris Brady, "Challenger" Exped. Rept. Ostracoda, 1880, p. 45.—Jones and Kirkby, Ann. Mag. Nat. Hist., 5th ser., 18, 1886, p. 250; Proc. Geol. Assoc., 9, 1897, p. 510.—Jones, Ann. Mag. Nat. Hist., 5th. ser., 19, 1887, p. 184.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 196.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 706.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 686; Zittel-Eastman Textb. Pal., 1, 1900, p. 646.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 365.—Bassler, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 740.

Bythocypris(?) curta Ulrich.

Bythocypris (?) curta Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 689, pl. 44, figs. 36–38.

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

Holotype.—Cat. No. 41794, U.S.N.M.

Bythocypris cylindrica (Hall).

Leperditia (Isochilina) cylindrica Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 231, pl. 8, fig. 12 (Extract, 1871, p. 7, pl. 4, fig. 12).—Hall and Whitfield, Geol. Surv. Ohio, Pal. 2, 1875, p. 101, pl. 4, fig. 5.

Leperditia cylindrica Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 122; 2, 1875, p. 351.

Bythocypris cylindrica Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 687, pl. 44, figs. 29–35, p. 688.—Ulrich, Geol. Surv. Canada, Cont. Micro-Pal., pt. 2, 1889, p. 48, pl. 9, fig. 6.—Ruedemann, Bull. New York State Mus., 49, 1901, p. 86, pl. 7, figs. 26, 28.

Bythocypris (Cytherellina?) cylindrica Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 365, fig. 1666.

Primitia minuta Jones (part), Quart. Jour. Geol. Soc. London, 46, 1890, p. 7, pl. 3, figs. 18, 19 (not figs. 21–23).

Trenton to Richmond: Cincinnati, Ohio, and vicinity; Indiana; Kentucky; Tennessee; Minnesota; New York; Ontario, Manitoba; etc.

Plesiotypes.—Cat. Nos. 41795, 41796, U.S.N.M.

Bythocypris granti Ulrich.

Bythocypris granti Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 689, pl. 44, figs. 39–42.

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

Cotypes.—Cat. No. 41793, U.S.N.M.

Bythocypris? lindstrœmi Jones.

Bythocypris? Lindstrœmii Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 548, pl. 21, figs. 11a–c.

Richmond (English Head and Charleton): South of Junction Cliff, Anticosti.

Bythocypris nearpassi Weller.

Bythocypris nearpassi Weller, Geol. Surv. New Jersey, Pal. 3, 1903, p. 257, pl. 23, fig. 12.

Helderbergian (Decker Ferry): Two miles south Tri-States, New York.

Bythocypris? obtusa Jones.

Bythocypris? obtusa Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 549, pl. 21, figs. 4a, b.

Richmond (English Head and Charleton): English Head, etc., Anticosti.

Bythocypris punctulata arctata Ulrich and Bassler.

Bythocypris punctulata var. arctata Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 540, pl. 98, fig. 22.

Helderbergian (Keyser): Cumberland, Maryland; Keyser, West Virginia.

Holotype.—Cat. No. 53290 U.S.N.M.

Bythocypris punctulata niagarensis Ulrich.

Bythocypris punctulata niagarensis Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1891, p. 196.

Clinton (Rochester): Lockport, New York.

Holotype.—Cat. No. 41797, U.S.N.M.

Bythocypris(?) robusta Ulrich.

Bythocypris (?) robusta Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 690, figs. 52a–d.

Bythocypris (?) (Cytherellina?) robusta Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 365, fig. 1667, 1, 1′, m, n.

Black River (Platteville): Dixon, Illinois.

Holotype.—Cat. No. 41728, U.S.N.M.

BYTHOPORA Miller and Dyer.

Genotype: B. fruticosa Miller and Dyer=Helopora dendrina James.

Bythopora Miller and Dyer, Contr. Pal., No. 2, 1878, p. 6.—Miller, N. A. Geol. Pal., 1889, p. 295.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 376; Geol. Minnesota, 3, 1893, p. 263; Zittel's Textb. Pal. (Eng. ed.), 1896, p. 277.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 551.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 32.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 166; Bull. New York State Mus., 45, 1901, p. 166.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 29.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 133.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 741.—Hennig, Archiv fur Zool., 4, No. 10, 1908, p. 44.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 240; Zittel-Eastman Textb. Pal., 1913, p. 335.

Bythopora alcicornis Ulrich.

Bythopora alcicornis Ulrich, Geol. Minnesota, 3, 1893, p. 264, pl. 26, figs. 7–9.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 551, fig. 121.

Black River (Decorah): Near Cannon Falls, Minnesota.

Cotypes.—Cat. No. 43514, U.S.N.M.

Bythopora arctipora (Nicholson).

Ptilodictya? arctipora Nicholson, Ann. Mag. Nat. Hist., 4th ser., 15, 1875, p. 180, pl. 14, figs. 4–4b; Pal. Ohio, 2, 1875, p. 262, pl. 25, figs. 9–9b.—Lesley, Geol. Surv. Pennsylvania, Rep. P. 4, 1889, p. 825, figs.

Bythopora arctipora Miller and Dyer, Contr. to Pal., No. 2, 1878, p. 6.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 19, pl. 2, figs. 1, 2.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 780, pl. 8, fig. 8; pl. 26, fig. 15, 15a.

Chætetes minutus James, Paleontologist, 3, 1879, p. 20 (see James and James, Jour. Cincinnati Soc. Nat. Hist., 10, p. 173).

Eden: Cincinnati, Ohio, and vicinity.

Bythopora delicatula (Nicholson).

Chætetes delicatulus Nicholson, Quart. Jour. Geol. Soc. London, 30, 1874, p. 505, pl. 29, figs. 8–8b; Pal. Ohio, 2, 1875, p. 199, pl. 21, figs. 9, 9a; Pal. Province Ontario, 1875, p. 30.

Monticulipora delicatula James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 173.—Miller, N. A. Geol. Pal., 1889, p. 197, fig. 196.

Bythopora? delicatula Ulrich, Contr. Micro-Pal., Cambro-Sil., pt. 2, 1889, p. 36.—Whiteaves, Pal. Foss., 3, 1895, p. 116.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 184.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 781, pl. 8, fig. 7; pl. 27, fig. 1.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 133.

Richmond: Oxford, Waynesville, etc., Ohio; Richmond and other localities in Indiana; Weston and Toronto, Ontario; Stony Mountain, Manitoba.

Bythopora dendrina (James).

Helopora dendrina James, Paleontologist, No. 1, 1878, p. 3; No. 2, p. 14.

Bythopora dendrina Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 185.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 20.

Bythopora fruticosa Miller and Dyer, Contr. Pal., No. 2, 1878, p. 6, pl. 4, figs. 6, 6a.—Miller, N. A. Geol. Pal., 1889, p. 295, fig. 461.

Maysville (Fairmount) Cincinnati, Ohio, and vicinity.

Bythopora fruticosa Miller and Dyer. See Bythopora dendrina.

Bythopora gracilis (Nicholson).

Chætetes gracilis James, Cat. Low. Sil. Foss. Cincinnati Group, 1871, p. 3.—Nicholson, Quart. Jour. Geol. Soc. London, 30, 1874, p. 504, pl. 29, figs. 7, 7a; Pal. Ohio, 2, 1875, p. 198, pl. 21, figs. 8, 8b; Pal. Province Ontario, 1875, p. 11; Ann. Mag. Nat. Hist., 4th ser., 28, 1876, p. 90, pl. 5, fig. 13.

Monticulipora (Heterotrypa) gracilis Nicholson, Genus Monticulipora, 1881, p. 125, pl. 2, figs. 1–1b, 20.

Monticulipora gracilis Hall, 12th Ann. Rep. Indiana Geol. Nat. Hist., 1883, p. 248, pl. 10, figs. 1–3; pl. 11, fig. 11.—James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 173.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 420, figs.—James, Jour. Cincinnati Soc. Nat. Hist., 1894, 16, p. 191.

Batostomella gracilis Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 141; 6, 1883, p. 83; 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 103; Contr. Micro-Pal., Cambro-Sil., pt. 2, 1889, p. 35.—Miller, N. A. Geol. Pal., 1889, p. 294, fig. 458.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 432, pl. 35, fig. 2.

Homotrypella gracilis Ulrich, Geol. Minnesota, 3, 1893, p. 228.—Whiteaves, Pal. Foss., 3, 1895, p. 115.

Bythopora gracilis Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 185.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 20.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 782, pl. 8, figs. 6, 6b; pl. 27, figs. 2, 2a.

Bythopora gracilis—Continued.

Chætetes læviramus Quenstedt, Rœhren- und Sternkorallen, 1881, p. 81, pl. 146, fig. 2b.

Maysville: Cincinnati, Ohio, and vicinity; Kentucky; Indiana; Tennessee.

Plesiotypes.—Cat. No. 43408, U.S.N.M. (Ulrich).

Bythopora herricki (Ulrich).

Bythopora herricki Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 99; Geol. Minnesota, 3, 1893, p. 263, pl. 26, figs. 1–6.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 551, fig. 120.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 133, fig. 188e, 190e.

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

Cotypes.—Cat. No. 43513, U. S.N.M.

Bythopora meeki (James).

Chætetes meeki James, Paleontologist, No. 1, 1878, p. 1.

Monticulipora (Chætetes) meeki James, Paleontologist, No. 5, 1881, p. 35.

Monticulipora gracilis var. meeki Nicholson, Genus Monticulipora, 1881, p. 127.

Monticulipora meeki James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 174.—J. F. James, ibid., 16, 1894, p. 192.

Homotrypella meeki Ulrich, Geol. Minnesota, 3, 1893, p. 228.

Bythopora meeki Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 185.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 21.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 783, pl. 8, figs, 5, 5a; pl. 27, fig. 5.

Richmond: Waynesville and other localities in Ohio, Richmond, etc., Indiana; Kentucky.

Bythopora nashvillensis Miller. See Rhinidictya nashvillensis.

Bythopora parvula (James).

Helopora parvula James, Paleontologist, No. 1, 1878, p. 3.

Bythopora parvula Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 186.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 22, pl. 3, figs. 11, 12; pl. 5, fig. 4.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 783, pl. 27, fig. 3.

Eden (McMicken): Obanon Creek, Clermont County, Cincinnati, etc., Ohio; Indiana; Kentucky.

Bythopora spinulosa (Hall).

Trematopora spinulosa Hall, Pal. New York, 2, 1852, p. 155, pl. 40A, figs. 11a–c.

Bythopora spinulosa Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 180.—Grabau, Bull. New York State Mus., 45, 1901, p. 166, fig. 64; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 166, fig. 64.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 29, pl. 13, figs. 6, 7; pl. 24, figs. 12, 13.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 134, fig. 189.

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

Plesiotypes.—Cat. No. 35516, U.S.N.M.

Bythopora striata Ulrich.

Bythopora striata Ulrich, Contr. Micro-Pal. Cambro-Sil., pt. 2, 1889, p. 36.—Whiteaves, Pal. Foss., 3, 1895, p. 116.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 784, pl. 27, fig. 4.

Richmond: Stony Mountain, Manitoba (Stony Mountain); Anticosti (English Head); Ohio; Indiana; Kentucky (Arnheim and Waynesville).

Cotypes.—Cat. No. 44064, U.S.N.M.

Bythopora subgracilis (Ulrich).
Homotrypella? subgracilis Ulrich, Geol. Minnesota, 3, 1893, p. 230, pl. 26, figs. 10-16.
Bythopora subgracilis Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 241, 242, figs. 135, 136.
Black River (Decorah): Minneapolis, Minnesota, and vicinity.
Ordovician (Wassalem): Uxnorm, Esthonia, Russia.
Cotypes and *plesiotypes*.—Cat. Nos. 43558, 57314, U.S.N.M.

BYTHOTREPHIS Roemer. See Buthotrephis Hall.

BYTHOTRYPA Ulrich. See Favositella Etheridge and Foord.

CACTOGRAPTUS Ruedemann. Genotype: C. crassus Ruedemann.
Cactograptus Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 196.

Cactograptus crassus Ruedemann.
Cactograptus crassus Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 197, pl. 8, fig. 1, figs. 99-101.
Upper Clinton: Clinton, Oneida County, New York.

CALAMENA Eaton. See Calymene Brongniart.

CALAMOPORA Goldfuss. See Favosites Lamarck.

Calamopora cellulata Castelnau. Not recognized.
Calamopora cellulata Castelnau, Syst. Sil. l'Amer. Nord., 1843, p. 46.
Silurian: Point Latour, Lake Huron.

CALAMOPORA FAVOSA Goldfuss. See Favosites favosus.

CALAMOPORA FIBROSA Eichwald. See Dianulites petropolitana.

CALAMOPORA FIBROSA Roemer. See Hindia sphæroidalis.

CALAMOPORA FORBESI var. DISCOIDEA Roemer. See Favosites discoidea.

CALAMOPORA GOLDFUSSI Castelnau. See Favosites goldfussi.

CALAMOPORA GOTHLANDICA Goldfuss. See Favosites gothlandica.

CALAMOPORA MAXIMUS Troost. See Favosites maxima.

Calamopora minuta Castelnau. Not recognized.
Calamopora minuta Castelnau, Terr. Sil. de l'Amer. du Nord, 1846, p. 46.
Silurian: Drummond Island, Lake Huron, etc.

Calamopora minutissima Castelnau. Not recognized.
Calamopora minutissima Castelnau, Terr.-Sil. de l'Amer. du Nord, 1843, p. 46, pl. 18, fig.
Silurian: Drummond Island, Lake Huron.

Calamopora radians Castelnau.
Calamopora radians Castelnau, Terr.-Sil. de l'Amer. Nord, 1843, p. 46, pl. 18, fig. 1.
Silurian: Buffalo, New York.
Observation.—Not recognized. Figure represents basal side of some Favosites, probably a Devonian species.

CALAMOPORA VENUSTA Rominger. See Favosites hisingeri.

Calamopora verneuili Castelnau.
Calamopora Verneuili Castelnau, Sil. Syst., 1843, p. 47.
Ordovician: Near Quebec, Canada.
Observation.—Not recognized. Refers to some ramose trepostomatous bryozoan with monticules.

CALAPŒCIA Billings. Genotype: C. canadensis Billings.

Calapœcia Billings, Canadian Nat. Geol., n. s., 2, 1865, p. 425.—Nicholson, Tab. Corals Pal. Period, 1879, p. 162.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 433.—Miller, N. A. Geol. Pal., 1889, p. 174.—James, Jour. Cincinnati Soc. Nat. Hist., 15, pt. 4, 1893, p. 150.—Sardeson, Neues Jahrb. f. Min., Geol. Pal., Beilage-Band, 10, 1896, p. 295.—Lindström, Kongl. Sven. Vet.-Akad. Handl., 32, No. 1, 1899, p. 24.—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 42.—Etheridge, Rec. Australian Mus., 5, 1903, p. 18.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 699.

Columnopora Nicholson, Geol. Mag., dec. 2, 1, 1874, p. 253; Geol. Surv. Ohio, Pal., 2, 1875, p. 186; Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 25; Tab. Corals Pal. Period, 1879, p. 159.—Zittel, Handb. Pal., 1, Munich, 1879, p. 237.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 433.—Beecher, Trans. Connecticut Acad. Arts and Sci., 8, 1891, p. 212.—Lindström, Kongl. Sven. Vet.-Acad. Handl., 32, No. 1, 1899, p. 25. (Genotype: C. cribriformis Nicholson.)

Houghtonia Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 18.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 433.—Sardeson, Neues Jahrb. f. Min., Geol. Pal., Beilage-Band, 10, 1896, p. 276.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 32, No. 1, 1899, p. 25. (Genotype: H. huronica Rominger.)

Calapœcia anticostiensis Billings.

Calapœcia Anticostiensis Billings, Canadian Nat. Geol., n. s., 2, 1865, p. 426; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 32, figs. 15a, b.—Nicholson, Tab. Corals Pal. Period, 1879, p. 163.

Calapœcia Canadensis Billings, Canadian Nat. Geol., n. s., 2, 1865, p. 426.—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 1, 1889, p. 43, pl. 1, figs. 6, 6a, 7.—Nicholson, Tab. Corals Pal. Period, 1879, p. 163.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 2, pt. 3, 1897, p. 157.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 154.

Richmond and Gamachian (English Head—Ellis Bay): Gamache Bay, etc., Anticosti (C. anticostiensis).

Black River: Near Ottawa, Canada; Baffin Land, etc. (A. canadensis).

Observation.—Although considered the same species at present, C. canadensis may be an early variety of C. anticostiensis. It is also possible that the types of C. canadensis were derived from the Richmond and not from the Black River.

Calapœcia borealis Whitfield.

Calapœcia borealis Whitfield, Bull. Amer. Mus. Nat. Hist., 13, 1900, p. 20, pl. 2, figs. 3–7.

Niagaran: Cape Harrison, Princess Marie Bay, Greenland.

CALAPŒCIA CANADENSIS Billings (part). See Calapœcia anticostiensis.

Calapœcia cribriformis (Nicholson).

Columnopora cribriformis Nicholson, Geol. Mag., dec. 2, 1, 1874, p. 253; Geol. Surv. Ohio, Pal., 2, 1875, p. 187, pl. 22, figs. 8, 8b; Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 25; Tab. Corals Pal. Period, 1879, p. 164, pl. 7, figs. 2–2d.—Whiteaves, Rep. Progr., Geol. Surv. Canada, 1880, p. 48C; 1881, p. 570.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 434, fig. 103.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 5, figs. 2, 4, 5; pl. 6, fig. 2.

Calapœcia cribriformis Miller, N. A. Geol. Pal., 1889, p. 175, fig. 141.—James, Jour. Cincinnati Soc. Nat. Hist., 15, pt. 4, 1893, p. 150.—Sardeson, Neues Jahrb. f. Min., Geol. Pal., Beilage-Band, 10, 1896, p. 295, text figs. 23, 24.—Foerste, Amer. Geology, 31, 1903, pp. 343, 345.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 701, pl. 1, figs. 3–3b; pl. 5, fig. 1.—Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 310, pl. 11, fig. 4.

Calapœcia cribriformis—Continued.

Houghtonia huronica Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 18, pl. 3, figs. 3, 4.—Sardeson, Neues Jahrb. f. Min., Geol. Pal., Beilage-Band, 10, 1896, p. 276, 277, text fig. 13, 14.

Calapœcia Huronensis Billings, Canadian Nat. Geol., n. s., 2, 1865, p. 426.—Nicholson, Tab. Corals Pal. Period, 1879, p. 163.

Columnopora rayi Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 5, figs. 1, 3; pl. 6, fig. 1.

Richmond: Waynesville, Clarksville, Oxford, Ohio; Richmond, Indiana; Marion and other counties in Kentucky (Waynesville-Elkhorn); Anticosti (Charleton); Ontario, Drummond Isle, etc.

Calapœcia favositoidea Savage.

Calapœcia favositoidea Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 64, pl. 3, figs. 1–3.

Upper Medinan (Edgewood): Near Edgewood and Louisiana, and south of Clarksville, Pike County, Missouri.

Calapœcia huronensis Billings. See Calapœcia cribriformis.

CALATHIUM Billings. Genotype: C. formosum Billings.

Calathium Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, pp. 208, 209.—Hinde, Quart. Jour. Geol. Soc. London, 45, 1889, p. 144.—Miller, N. A. Geol. Pal., 1889, p. 155.

Calathium affine Billings.

Calathium affine Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 209, fig. 193.

Canadian (Quebec—G): Cape Norman, Newfoundland.

Calathium anstedi Billings.

Calathium Anstedi Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 210, fig. 194; p. 337, figs. 325a, b.—Hinde, Quart. Jour. Geol. Soc. London, 45, 1889, p. 144.

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

Calathium canadense Billings.

Calathium Canadense Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 377, text fig. 351.—Miller, N. A. Geol. Pal., 1889, p. 155, text fig. 93.

Chazyan (Mingan): Mingan Islands, Canada.

Calathium fittoni Billings.

Calathium Fittoni Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 211, fig. 195.

Chazyan (Quebec): Point Rich, Newfoundland.

Calathium formosum Billings.

Calathium formosum Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 209, fig. 192.—Miller, N. A. Geol. Pal., 1889, p. 155, fig. 94.

Canadian (Quebec—G): Cape Norman, Newfoundland.

Calathium (?Zittelella) infelix Ulrich and Everett.

Calathium (?Zittelella) infelix Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 274, pl. 5, figs. 1, 1a.

Black River (Platteville): Near Dixon, Illinois.

Calathium? pannosum Billings.

Calathium? pannosum Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 335, figs. 324a, b.

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

CALATHIUM? PARADOXICUM Billings. See Nipterella paradoxica.

CALAUROPS Whitfield. See Eccyliomphalus Portlock.

Calceocrinus of authors. See Deltacrinus, Eucheirocrinus, and Cremacrinus.

Calceocrinus Hall. Not recognized.

Calceocrinus Hall, Pal. New York, 2, 1852, p. 352, pl. 85, figs. 5, 6.—Ulrich, 14th Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 104.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 154.

Observation.—This genus was based upon a small triangular plate without a specific name and according to the rules of nomenclature can not be retained.

CALCEOCRINUS ALLENI Rowley. See Deltacrinus alleni.

CALCEOCRINUS ARTICULOSUS Wachsmuth and Springer. See Cremacrinus articulosus.

CALCEOCRINUS BARRANDEI Walcott. See Cremacrinus barrandei.

Calceocrinus bidentatus Ringueberg.

Calceocrinus bidentatus Ringueberg, Ann. New York Acad. Sci., 4, 1889, p. 404, pl. 10, fig. 10.

Clinton (Rochester): Lockport, New York.

Observation.—Description and figure insufficient for recognition.

CALCEOCRINUS CHRYSALIS Shumard. See Eucheirocrinus chrysalis.

CALCEOCRINUS CONTRACTUS Ringueberg. See Deltacrinus contractus.

CALCEOCRINUS FURCILLATUS Billings. See Cremacrinus furcillatus.

CALCEOCRINUS HALLI Ringueberg. See Deltacrinus halli.

CALCEOCRINUS INÆQUALIS Wachsmuth and Springer. See Cremacrinus inæqualis.

CALCEOCRINUS INDIANENSIS Miller. See Deltacrinus indianensis.

CALCEOCRINUS KENTUCKIENSIS Miller and Gurley. See Cremacrinus articulosus.

CALCEOCRINUS RADICULUS Ringueberg. See Eucheirocrinus radiculus.

CALCEOCRINUS RUGOSUS Billings. See Cremacrinus rugosus.

CALCEOCRINUS STIGMATUS Hall. See Deltacrinus stigmatus.

CALCEOCRINUS TUNICATUS Hall. See Deltacrinus tunicatus.

CALCEOCRINUS TYPUS Ringueberg. See Deltacrinus typus.

CALCEOLA Lamarck. Genotype: C. sandalina Lamarck.

Calceola Lamarck, Syst. Anim. sans Vert., 1801, p. 139.—Eichwald, Zool. Specialis, pt. 1, Vilnae, 1829, p. 289.—Steininger, Mem. Soc. Geol. France, 1, 1834, p. 366.—Fischer de Waldheim, Orygtographie Gouv. de Moscou, 1837, p. 146.—Phillips, Pal. Foss. Cornwall, Devon, and W. Somerset, 1841, p. 54.—McCoy, Syn. Char. Carb. Foss. Ireland, 1844, pp. 103, 105.—Murchison, Verneuil, Keyserling, Geol. Russie d'Europe et Mont d l'Oural, 2, 845, p. 45.—Davidson, Brit. Foss. Brachiopoda, Pal. Soc., 1853, p. 120.—Carpenter, ibid., p. 37.—Woodward, Man. Mollusca, pt. 2, 1854, p. 232, fig. 152; pl. 15, fig. 26.—Davidson, Mem. Soc. Linneenne de Normandie, 10, 1856, p. 224.—Pictet, Traite Pal., 2d ed., 4, 1857, p. 65.—Goldfuss, Petrefacta Germaniae, 2d ed., pt. 2, 1863, p. 273.—Lindstrom, Geol. Mag., 3, 1866, pp. 359, 408, 411.—Dybowski, Archiv. f. Natur. Liv-, Ehst-und Kurl., 5, 1873, p.

CALCEOLA—Continued.

340.—Zittel, Handb. Pal., 1, 1879, p. 236.—Lindstrom, Bihang till K. Sv. Vet.-Akad. Handl., 7, No. 4, 1882, p. 10.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 405.—Miller, N. A. Geol. Pal., 1889, p. 175.—Sherzer, Amer. Geol., 7, 1891, pp. 296–301.—Koken, Die Leitfossilien, Leipzig, 1896, p. 312, fig. 235.—Zittel-Eastman Textb. Pal., 1, 1900, p. 80.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 77.—Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 88.

Rhizophyllum Lindström, Ofver. K. Vet.-Akad. Forhandl., 22, No. 5, 1865, p. 287; Geol. Mag., 3, 1866, pp. 359, 411.—Dybowski, Archiv f. Natur. Liv-, Ehst- und Kurl., 5, 1873, p. 340.—Zittel, Handbuch d. Pal., 1, Munich, 1879, p. 235.—Lindstrom, Bihang till K. Sv. Vet.-Akad. Handl., 7, No. 4, 1882, p. 22.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 407.—Sherzer, Amer. Geologist, 7, 1891, pp. 296–301.—Koken, Die Leitfossilien, 1896, p. 313.—Pocta, Syst. Sil. du Centre Boheme, 8, pt. 2, 1902, p. 179. (Genotype: Calceola gotlandica Roemer.)

CALCEOLA AMERICANA Safford. See Calceola tennesseensis.

Calceola (Rhizophyllum) attenuata (Lyon).

Calceola attenuatus Lyon, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 45.

Rhizophyllum attenuatum Lindström, Bihang till K. Sv. Vet.-Akad. Handl., 7, No. 4, 1882, p. 38, pl. 3, fig. 17.

Calceola proteus Davis (part), Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, pl. 131, figs. 1, 2, 12.

Niagaran (Louisville): Near Louisville, Kentucky.

Plesiotype.—Cat. No. 52774, U.S.N.M.

Calceola (Rhizophyllum) corniculum (Lyon).

Calceola corniculum Lyon, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 43.

Calceola coxii Lyon, ibid., 1879, p. 44.

Calceola pusilla Hall, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 419 (ext. 1882, p. 15).

Calceola proteus Davis (part), Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 101, fig. 2, pl. 131, figs. 3–11, 13–17.

Niagaran (Louisville): Near Louisville, Kentucky.

Plesiotypes.—Cat. No. 52774, U.S.N.M.

CALCEOLA COXII Lyon. See Calceola (Rhizophyllum) corniculum.

CALCEOLA PROTEUS Davis. See Calceola (Rhizophyllum) attenuatus and Calceola (Rhizophyllum) corniculum.

CALCEOLA PUSILLA Hall. See Calceola (Rhizophyllum) corniculum.

CALCEOLA SANDALINA Troost. See Calceola tennesseensis.

Calceola (Rhizophyllum) tennesseensis Roemer.

Calceola sandalina Troost (not Lamarck), Trans. Geol. Soc. Pennsylvania, 1, 1835, p. 249; 5th Geol. Rep. Tennessee, 1840, p. 47.—Verneuil, Bull. Geol. Soc. France, 1840, p. 176.

Calceola tennesseensis Roemer, Leth. Geogn., 3d ed., Th. 2, 1854, p. 385; Sil. Fauna West Tennessee, 1860, p. 73, pl. 5, figs. 1a–e.—Lindström, Geol. Mag., 3, 1866, p. 411.—Safford, Geol. Tennessee, 1869, p. 321, pl. 5 (H), figs. 4a–e.—Lyon, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 43, footnote.—Fœrste, Jour. Geol., 11, 1903, p. 712 (loc. occ.).—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 77, fig. 121.

Calceola (Rhizophyllum) tennesseensis—Continued.

Calceola Americana Safford, Amer. Jour. Sci. and Arts, 2d ser., 29, 1860, p. 248.

Rhizophyllum tennesseense Lindström, Bihang till k. Sv. Vet.-Akad., 7, No. 4, 1882, p. 30, pl. 3, fig. 14; pl. 9, figs. 3–5.—Roemer, Leth. Geog., pt. 1, Leth. Pal., 1883, p. 408.

Niagaran (Brownsport): Decatur, Perry, Wayne, and Hardin Counties, Tennessee.

Callicrinites D'Orbigny. See Callicrinus D'Orbigny.

CALLICRINUS D'Orbigny. Genotype: C. costatus Hisinger.

Callicrinites D'Orbigny, Prodr. Pal. Strat., 1, 1849, p. 45; Cour. Element. Pal. Geol., 2, 1851, p. 141.—Chapman, Canadian Jour., n. s., 2, 1857, p. 304.

Callicrinus Pictet, Traite Pal., 2d ed., 4, 1857, p. 301.—Angelin, Icon. Crinoid., 1878, p. 14.—Zittel, Handb. Pal., 1, 1879, p. 378.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1885, p. 357. (Rev. Pal., pt. 3, sec. 1, p. 135.)—Ringueberg, Ann. New York Acad. Sci., 5, 1890, p. 302.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 675; 18th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1893, p. 260.—Weller, Jour. Geol., 5, 1897, p. 744, footnote; Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 117, fig. 47.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 164, fig. 77.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 149.—Zittel, Grundzuge Pal., 1, 1910, p. 164.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 560.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 192.

Cryptodiscus Hall, 20th Rep. New York State Cab. Nat. Hist., 1865, pl. 11, fig. 8; rev. ed., 1868, pl. 11 (2), fig. 18.—Weller, Jour. Geol., 5, 1897, p. 744 (footnote pp. 803–808).—Anon. (?Bather), Nat. Sci., 12, 1898, p. 154.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 121.—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 164.

Callicrinus acanthinus Ringueberg.

Callicrinus acanthinus Ringueberg, Ann. New York Acad. Sci., 5, 1890, p. 302, pl. 3, fig. 1.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., 20, Harvard, 1897, p. 356, pl. 83, fig. 18.

Niagaran (Lockport-Gasport member): Lockport, New York.

Callicrinus beachleri Wachsmuth and Springer.

Callicrinus beachleri Wachsmuth and Springer, Amer. Geol., 10, 1892, p. 140; Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 355, pl. 83, fig. 14a, b.

Niagaran (Laurel): St. Paul, Indiana.

Callicrinus bifurcatus Weller.

Callicrinus bifurcatus Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 125, pl. 8, fig. 7.

Niagaran (Racine): Joliet, Illinois.

Callicrinus bilobus (Weller).

Cryptodiscus bilobus Weller, Jour. Geol., 5, 1897, p. 749, pl., fig. 8.

Callicrinus bilobus Weller, Jour. Geol., 5, 1897, p. 808; Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 125, pl. 10, fig. 4.

Niagaran: (Racine): Joliet, Illinois.

Callicrinus cornutus (Hall).

Eucalyptocrinus cornutus Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, p. 322, pl. 11 (2), figs. 8–10; rev. ed., 1870, p. 363, pl. 11, figs. 8–10.—Whitfield, Geol. Wisconsin, 4, 1882, p. 285, pl. 16, figs. 5–8.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 191, fig.

Callicrinus cornutus—Continued.

Eucalyptocrinus cornutus var. excavatus Hall, 20th Rep. New York State Cab. Nat. Hist. (extras 1865), 1867, p. 322, pl. 11 (2), figs. 6, 7; rev. ed. 1870, p. 364, pl. 11, figs. 6–7.

Callicrinus cornutus Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 21, 1897, p. 357, pl. 83, figs. 15–17.—Anon. (Bather?), Nat. Sci., 12, 1898, p. 155.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, 1900, p. 118, pl. 8, figs. 1–3.

Niagaran (Racine): Waukesha and Racine, Wisconsin; Bridgeport and Romeo, Illinois.

Callicrinus corrugatus (Weller).

——— ——— Miller, 18th Rep. Geol. Nat. Hist. Indiana, 1894, p. 260, pl. 1, fig. 7, (adv. sheets, 1892, p. 6, pl. 1, fig. 7).

Cryptodiscus corrugatus Weller, Jour. Geol., 5, 1897, p. 747, pl., figs. 1, 2; p. 808.

Callicrinus corrugatus Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 123, pl. 11, figs. 6, 7.

Niagaran (Racine): Joliet, Illinois

Callicrinus desideratus Weller.

Callicrinus ——————— Weller, Jour. Geol., 5, 1897, pp. 805–806, figs. 2–4, 7–8.

Callicrinus desideratus Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 122, pl. 9, fig. 2; pl. 10, fig. 3; pl. 11, figs. 1–3.

Niagaran (Racine): Racine, Wisconsin.

Callicrinus digitatus (Weller).

Cryptodiscus digitatus Weller, Jour. Geol., 5, 1897, p. 749, pl., figs. 6, 7, 5?; p. 808.

Callicrinus digitatus Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 124, pl. 9, figs. 3, 4; pl. 11, fig. 5.

Niagaran (Racine): Lemont and Joliet, Illinois.

Callicrinus hydei (Weller).

Cryptodiscus hydei Weller, Jour. Geol., 5, 1897, p. 748, pl., figs. 3, 4.

Callicrinus hydei Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 124, pl. 8, fig. 8; pl. 9, fig. 1; pl. 10, figs. 1, 2.

Niagaran (Racine): Romeo and Joliet, Illinois; Racine, Wisconsin.

Callicrinus longispinus Weller.

Callicrinus longispinus Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 119, pl. 8, figs. 4, 5.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 560.

Niagaran (Racine): Joliet, Illinois.

Callicrinus pentangularis Weller.

Callicrinus pentangularis Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 120, pl. 8, fig. 6.

Niagaran (Racine): Bridgeport, Illinois.

Callicrinus? ramifer (Roemer).

Eucalyptocrinus ramifer Roemer, Sil. Fauna., West Tennessee, 1860, p. 51, pl. 4, figs. 4a, 4b.

Callicrinus? ramifer Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard. (N. A. Crin. Cam.), 20, 1897, p. 358.

Niagaran (Brownsport): Decatur and Wayne counties, Tennessee.

CALLITHAMNOPSIS Whitfield. Genotype: Oldhamia fruticosa Hall.

Callithamnopsis Whitfield, Bull. Amer. Mus. Nat. Hist., 6, 1894, pl. 354; Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 42.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 721.—Ruedemann, Bull. New York State Mus., 133, 1900, p. 201.

Callithamnopsis delicatula Ruedemann.

Callithamnopsis delicatula Ruedemann, Bull. New York State Mus., 133, 1909, p. 203, pl. 1, fig. 5; pl. 2, figs. 1, 2.

Black River (Lowville): Glens Falls, New York.

Callithamnopsis fruticosa Whitfield.

Oldhamia fruticosa Hall (part), Canadian Org. Rem., dec. 2, 1865, p. 50 (name only).

Callithamnopsis fruticosa Whitfield, Bull. Amer. Mus. Nat. Hist., 6, 1894, p. 354, pl. 11, figs. 4–8; Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 42, pl. 4, figs. 4–8.—Ruedemann, Bull. New York State Mus., 133, 1909, p. 202, figs. 4–8, pl. 1, figs. 3, 4.

Black River (Platteville): Platteville, Wisconsin.

Callocystis (part) Haeckel. (See Callocystites Hall.

CALLOCYSTITES Hall. Genotype: C. jewetti Hall.

Callocystites Hall, Pal. New York, 2, 1852, pp. 238, 248.—Chapman, Canadian Jour., n. s., 2, 1857, p. 303.—Pictet, Traité Pal., 2d ed., 4, 1857, p. 298.—Hall, Pal. New York, 3, 1861, p. 151.—Zittel, Handb. Pal., 1, 1879, p. 421.—Miller, N. A. Geol. Pal., p. 230.—Jaekel, Stammesg. Pelmat., 1, Thecoidea u. Cystoidea, 1899, p. 289.—Zittel-Eastman Textb. Pal., 1, 1900, p. 187.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 151; Bull. New York State Mus., 45, 1901, p. 151.—Schuchert, Smiths. Misc. Coll., 47, 1904, p. 242.—Zittel, Grundzuge Pal., 1, 1910, p. 188.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 469.

Callocystis Haeckel, Amphorideen u. Cystoideen, Leipzig, 1896, p. 131.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 62, fig. 31.

Anthocystis Haeckel, Amphorideen u. Cystoideen, Leipzig, 1896, p. 132, pl. 3, figs. 23, 24.—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 62.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 153.

(Genotype: Anthocystis halliana Haeckel=Callocystites jewetti Hall).

Callocystites canadensis (Billings).

Apiocystites Canadensis Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 90.

Callocystites canadensis Schuchert, Smiths. Misc. Coll., 47, 1904, p. 245, pl. 34, fig. 3.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 470, fig. 1780.

Callocystites tripectinatus Ringueberg, Bull. Buffalo Soc. Nat. Sci., 5, 1886, p. 12, pl. 1, fig. 10.

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

Callocystites jewetti Hall.

Callocystites jewettii Hall, Pal. New York, 2, 1852, p. 239, pl. 50, figs. 1–11, 12–18.—Pictet, Traité Pal., 2d ed., 1857, 4, p. 298, pl. 99, fig. 15.—Miller, N. A. Geol. Pal., 1889, p. 230, fig. 260.—Jaekel, Stammesg. Pelmat., 1, Thecoidea u. Cystoidea, 1899, p. 290, fig. 64, p. 291, pl. 15, figs. 1, 1a–c.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 151, fig. 47; Bull. New York State Mus., 45, 1901, p. 151, fig. 47.—Schuchert, Smiths. Misc. Coll., 47, 1904, p. 243, fig. 35, pl. 34, figs. 1, 2.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 469, fig. 1779.

Callocystites jewetti—Continued.

Callocystis Jewetti Zittel, Handb. Pal., 1, Munich, 1879, p. 410, fig. 290; p. 421, fig. 297.—Haeckel, Amphorideen u. Cystoideen, 1896, p. 131, pl. 3, figs. 21, 22.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 62, fig. 31.

Anthocystis Halliana Haeckel, Amphorideen u. Cystoideen, Leipzig, 1896, p. 132, pl. 3, figs. 23, 24.

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

CALLOCYSTITES TRIPECTINATUS Ringueberg. See Callocystites canadensis.

CALLOGRAPTUS Hall. Genotype: C. elegans Hall.

Callograptus Hall, Geol. Surv. Canada, dec. 2, 1865, p. 133; 20th Rep. New York State Cab. Nat. Hist., 1868, p. 218; rev. ed., 1870, p. 252.—Nicholson, Mon. Brit. Graptolit:, 1872, p. 128.—Hopkinson, Ann. Mag. Nat. Hist., 4th ser., 10, 1872, p. 233.—Zittel, Handb. Pal., 1, Munich, 1879, p. 289.—Spencer, Amer. Nat., 8, 1882, pp. 458–462, p. 165; Bull. Mus. Univ. State Missouri, 1, 1884, p. 20; Trans. Acad. Sci. St. Louis, 4, 1884, pp. 562, 570.—Miller, N. A. Geol. Pal., 1889, p. 175.—Pöcta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 179.—Matthew, Trans. New York Acad. Sci., 14, 1895, p. 271, pl. 48, fig. 5.—Roemer and Frech, Leth. geog., 1 Theil, Leth. Pal., 1, 3 Lief., 1897, p. 576.—Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 583, 584; Mem. 11, pt. 2, 1908, p. 146.

Callograptus compactus (Walcott).

Dendrograptus compactus Walcott, Trans. Albany Inst., 10, 1883, p. 21, pl. 1, fig. 1 (adv. sheets, 1879).—Gurley, Jour. Geol., 4, 1896, p. 94.

Callograptus compactus Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 146, fig. 52, pl. 1, fig. 1.

Utica: Holland Patent, Oneida County, New York.

Callograptus diffusus (Hall).

Dendrograptus? (Callograptus?) diffusus Hall, Canadian Org. Rem., dec. 2, 1865, p. 132, pl. 18, figs. 1–3; 20th Rep. New York State Cab. Nat. Hist., 1868, pl. 4, fig. 12; rev. ed., 1870, p. 224, pl. 4, fig. 12.

Dendrograptus? diffusus Hopkinson, Quart. Jour. Geol. Soc. London, 31, 1875, p. 664, pl. 36, figs. 7a, 7b.

Callograptus diffusus Ruedemann, Ann. Rep. New York State Pal., 1902, p. 570.

Callograptus cf. diffusus Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 586–587, fig. 20, pl. 4, fig. 7.

Canadian: Point Levis, Quebec (Levis, Diplograptus dentatus zone); Deepkill, Rensselaer County, New York (Deepkill).

Ordovician (Lower Arenig): Ramsey Island, Wales.

Callograptus elegans Hall.

Callograptus elegans Hall, Geol. Surv. Canada, dec. 2, 1865, p. 134, pl. 19, figs. 1–4; pl. 18, fig. 4; 20th Rep. New York State Cab. Nat. Hist., 1868, pl. 4, fig. 15; rev. ed., 1870, p. 224, pl. 4, fig. 15.—Hopkinson, Quart. Jour. Geol. Soc. London, 31, 1875, p. 666, pl. 36, fig. 9.—Roemer and Frech, Leth. geog., 1 Theil, Leth. Pal., 1, 3 Lief, 1897, p. 577.

Canadian (Levis, Didymograptus zone): Gros Maule, Quebec; Newfoundland.

Ordovician (Lower Arenig): Wales.

CALLOGRAPTUS GRABAUI Hahn. See Dictyonema furciferum.

CALLOGRAPTUS GRANTI Spencer. See Odontocaulis granti.

Callograptus minutus Spencer.

Callograptus minutus Spencer, Canadian Nat., 10, 1882, p. 165, nom. nud; Trans. Acad. Sci. St. Louis, 4, 1884, p. 572, pl. 1, fig. 12; Bull. Mus. Univ. State Missouri, 1, 1884, pp. 14, 22, pl. 1, fig. 12.—Gurley, Jour. Geol., 4, 1896, pp. 93, 308.—Bassler, Bull. U. S. Nat. Mus., 65, 1909, pp. 14, 15, fig. 13.

Niagaran dolomite: Hamilton, Ontario.

Callograptus minutus altus Gurley.

Callograptus minutus altus (Gurley MS.), Bassler, Bull. U. S. Nat. Mus., 65, 1909, p. 15, fig. 16.

Niagara dolomite: Hamilton, Ontario.

Callograptus multicaulis Spencer.

Callograptus (Dendrograptus) multicaulis Spencer, Canadian, 10, 1882, p. 165, nom. nud.

Callograptus multicaulis Spencer, Trans. Acad. Sci. St. Louis, 4, 1884, p. 572, pl. 1, fig. 11; Bull. Mus. Univ. State Missouri, 1, 1884, p. 22, pl. 1, fig. 11.—Gurley, Jour. Geol., 4, 1896, pp. 93, 308.—Bassler, Bull. U. S. Nat. Mus., 65, 1909, p. 13, fig. 14.

Niagaran dolomite: Hamilton, Ontario.

Callograptus niagarensis Spencer.

Callograptus Niagarensis Spencer, Canadian Nat., n. s., 8, 1878, p. 463; Trans. Acad. Sci. St. Louis, 4, 1884, p. 571, pl. 1, fig. 9; Bull. Mus. Univ. State Missouri, 1, 1884, p. 21, pl. 1, fig. 9.—Miller, N. A. Geol. Pal., 1889, p. 175, fig. 144.—Gurley, Jour. Geol., 4, 1896, pp. 93, 308.—Bassler, Bull. U. S. Mus., 65, 1909, pp. 13, 14, fig. 15.

Niagaran dolomite: Hamilton, Ontario.

Callograptus salteri Hall.

Callograptus salteri Hall, Canadian Org. Rem., dec. 2, Geol. Surv. Canada, 1865, p. 135, pl. 19, figs. 5–8; 20th Rep. New York State Cab. Nat. Hist., 1868, pl. 4, figs. 13, 14; rev. ed., 1870, p. 224, pl. 4, figs. 13, 14.—Hopkinson and Lapworth, Quart. Jour. Geol. Soc. London, 31, 1875, p. 667, pl. 36, fig. 10.—Gurley, Jour. Geol., 4, 1896, p. 300.—Roemer and Frech, Leth. pal., 1, 1897, p. 577, fig. 146.—Ruedemann, Ann. Rep. New York State Pal., 1902, pp. 554, 555, 565.—Cleland, Bull. Amer. Pal., 4, 1903, p. 20, pl. 4, fig. 4.—Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 584–586, figs. 18, 19, pl. 3, figs. 13–15.

Canadian: Point Levis, Quebec (Levis, Didymograptus, and Diplograptus dentatus zones); Deepkill, Rensselaer County, New York (Deepkill); Tribes Hill and Fort Hunter, New York.

Ordovician (Middle Arenig): St. Davids, Wales.

Callograptus strictus Gurley.

Callograptus strictus (Gurley MS.) Bassler, Bull. U. S. Nat. Mus., 65, 1909, p. 15, fig. 17; pl. 3, fig. 3.

Niagaran dolomite: Hamilton, Ontario.

CALLONEMA Hall. Genotype: Loxonema bellatula Hall.

Callonema Hall, Pal. New York, 5, pt. 2, 1879, p. 50.—Pilsbry, Zittel-Eastman Textb. Pal., 1, 1900, p. 458.

Callonema pristina Savage.

Callonema pristina Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 117, pl. 7, fig. 20.

Upper Medinan (Channahon): Near Channahon, Will County, Illinois.

CALLOPORA Dybowski. See Diplotrypa Nicholson.

CALLOPORA Hall. See Hallopora Bassler.

CALLOPORA ASPERA Hall. See Lioclema asperum.

Callopora?? cervicornis Hall.

Callopora cervicornis Hall, Trans. Albany Institute, 10, 1883, p. 59 (abstract, 1879, p. 3); 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 238.

Niagaran (Waldron): Waldron, Indiana.

Observation.—Can not be recognized without a restudy of the types.

CALLOPORA CRENULATA Ulrich. See Halloporina crenulata.

Callopora?? diversa Hall.

Callopora? diversa Hall, Trans. Albany Institute, 10, 1883, p. 60 (abstract, 1879, p. 4); 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 239.

Niagaran (Waldron): Waldron, Indiana.

Observation.—Can not be recognized without a restudy of the types.

CALLOPORA EXSUL Hall. See Lioclema? exsul.

CALLOPORA FLORIDA Hall. See Nicholsonella florida.

CALLOPORA LAMINATA Hall. See Fistulipora laminata.

CALLOPORA MILFORDENSIS James. See Ceramoporella granulosa milfordensis.

CALLOPORA NANA Nicholson. See Hallopora elegantula.

CALLOPORA NUMMIFORMIS Hall. See Mesotrypa nummiformis.

CALLOPORA OHIOENSIS Foerste. See Lioclemella ohioensis.

CALLOPORA RAMOSA var. RUGOSA of authors. See Hallopora rugosa.

CALLOPORA SIGILLARIOIDES Nickles. See Hallopora onealli sigillarioides.

CALLOPORA SINGULARIS Hall. See Trematopora? singularis.

CALLOPORELLA Ulrich. Genotype: Calloporella harrisi Ulrich=Monticulipora (Heterotrypa) circularis James.

Calloporella Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 154.—Miller, N. A. Geol. Pal., 1889, p. 296.—Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 373, 418.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1907, p. 36.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 742.

Calloporella circularis (James).

Monticulipora (Heterotrypa), circularis James, Paleontologist, No. 6, 1882, p. 46.

Monticulipora circularis James, Paleontologist, No. 7, 1883, p. 58, pl. 1, figs. 3, 3a.

Calloporella harrisi Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 91, pl. 1, figs. 5, 5c.

Monticulipora lens (not Nebulipora lens McCoy) James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 165.—J. F. James, ibid., 16, 1894, p. 181.

Calloporella circularis Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 193.—Bassler, Proc. U. S. Nat. Mus., 1906, p. 25.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 797, pl. 10, figs. 6, 6c.

Richmond (Waynesville): Oxford, Waynesville, etc., Ohio; Indiana.

Plesiotype.—Cat. No. 40386, U.S.N.M. (Holotype of C. harrisi).

CALLOPORELLA HARRISI Ulrich. See Calloporella circularis.

Calloporella? lens (Whitfield).

Fistulipora lens Whitfield, Ann. Rep. Wisconsin Geol. Surv. for 1877, 1878, p. 69; Geol. Surv. Wisconsin, 4, 1882, p. 256, pl. 11, figs. 5, 6.—Buell, Trans. Wisconsin Acad. Sci., 5, 1882, p. 188.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 173, fig.

Calloporella? lens—Continued.
Calloporella? lens Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 194 (gen. ref.).
Richmond (Maquoketa): Delafield, Wisconsin.

Calloporella? nodulosa Ulrich.
Calloporella? nodulosa Ulrich, Geol. Surv. Illinois, 8, 1890, p. 418, pl. 33, figs. 4, 4a.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 194.
Monticulipora verrucosa J. F. James, Jour. Cincinnati Soc. Nat. Hist., 18, 1895, p. 85.
Richmond (Maquoketa): Savannah, Illinois.

CALLOPORELLA? NUMMIFORMIS Ulrich. See Mesotrypa nummiformis.

CALLOPORINA Ulrich and Bassler. See Halloporina Bassler.

CALOPHYLLUM PHRAGMOCERAS Salter. See Amplexus phragmoceras.

CALOSTYLIS Lindström. Genotype: C. denticulata Kjerulf.
Calostylis Lindström, Ofver K. Vet.-Akad. Forhandl., 25, 1868, p. 421.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1878, p. 63.—Zittel, Handb. Pal., 1, 1879, p. 241.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 393.—Frech, Palæontographica, 37, 1890, p. 43.—Koken, Die Leitfossilien, 1896, p. 307.

Calostylis spongiosa Foerste.
Calostylis spongiosa Foerste, Bull. Geol. Surv. Kentucky, 7, 1906, p. 322, pl. 7, figs. 3a–g; pl. 8, figs. 1a, b.
Clinton (Waco): Near Estill Springs, etc., Kentucky.

CALVINELLA Walcott. Genotype: Dikelocephalus spiniger Hall.
Calvinella Walcott, Smiths. Misc. Coll., 57, 1914, p. 388.

Calvinella newtonensis (Weller).
Dikelocephalus newtonensis Weller, Geol. Surv. New Jersey, Pal. 3, 1903, p. 121, pl. 3, figs. 1–7.
Calvinella newtonensis Walcott, Smiths. Misc. Coll., 57, 1914, p. 389, pl. 70, figs. 7–11, 11a
Upper Cambrian or Ozarkian (Kittatinny): Near Newton, New Jersey.

Calvinella ozarkensis Walcott.
Calvinella ozarkensis Walcott, Smiths. Misc. Coll., 57, 1914, p. 389, pl. 70, figs. 1–6.
Ozarkian (Eminence): Near Eminence, Shannon County, and near Flat River, St. Francois County, Missouri.

Calvinella tenuisculpta Walcott.
Calvinella tenuisculpta Walcott, Smiths. Misc. Coll., 57, 1914, p. 391, pl. 64, figs. 7, 7a.
Pogonip (?Ozarkian): Ridge east of Hamburg Ridge, Eureka District, Nevada.

CALVINIA Savage. Genotype: C. edgewoodensis Savage.
Calvinia Savage, Bull. Geol. Surv., Illinois, 23, 1913, p. 65.

Calvinia edgewoodensis Savage.
Calvinia edgewoodensis Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 66, pl. 2, figs. 15–17.
Upper Medinan (Edgewood): Near Gale, Alexander County, Illinois.

CALYMENE Brongniart. Genotype: Trilobus tuberculatus Bronn.

Calymene Brongniart, Hist. Nat. Crust. Foss., 1822, p. 11.—Dekay, Annals Lyceum Nat. Hist. New York, 1, 1824, p. 175, footnote.—Eichwald, Zool. Specialis, pt. 2, Vilnae, 1830, p. 114.—Green, Mon. Tril. N. A., 1832, pp. 15, 27.—Eaton, Geol. Textbook, 2d ed., 1832, p. 31.—Steininger, Mem. Soc. Geol. France, 1, 1834, p. 350.—Murchison, Sil. Syst., 1839, p. 653.—Conrad, 5th Ann. Rep. New York Geol. Surv. 1841, p. 38.—Burmeister, Org. der Tril., 1843, p. 93.—Goldfuss, Neues Jahrb. f. Min., etc., 1843, pp. 541, 558.—Hawle and Corda, Abh. d. k. bohmischen Gesell. d. Wiss., 5 (extract), 1847, p. 85, pl. 5, fig. 50.—Rouault, Bull. Soc. Geol. France, 2d. ser., 4, 1847, p. 318.—Salter, Mem. Geol. Surv. Great Britain, 2, pt. 1, 1848, p. 341.—McCoy, Ann. Mag. Nat. Hist., 2d. ser., 4, 1849, p. 399.—Salter, Mem. Geol. Surv. United Kingdom, dec. 2, 1849, pl. 8.—Barrande, Neues Jahrb. f. Min., etc., 1850, p. 778; Syst. Sil. Centre Boheme, 1, 1852, p. 560.—McCoy, British Pal. Rocks and Fossils, 1854, p. 164.—Pictet, Traité Pal., 2d ed., 2, 1854, p. 503.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 213.—Chapman, Canadian Jour., n. s., 1, 1856, p. 285.—Nieszkowski, Archiv fur Naturk. Liv-, Ehst- und Kurl., 50, 1857, p. 540.—Chapman, Canadian Jour., n. s., 8, 1863, p. 31; Expos. Min. Geol. Canada, 1864, p. 139.—Salter, Mon. British Tril., Pal. Soc., 1865, p. 90; Cat. Camb. and Sil. Foss., 1873, pp. 52, 132.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, pp. 139, 140.—Zittel, Handb. Pal., 2, 1885, p. 604.—Clarke, Jour. Morphology, 2, 1888, p. 254.—Hall and Clarke, Pal. NewYork, 7, 1888, p. xxi, fig. 22.—Miller, N. A. Geol. Pal., 1889, p. 536.—W. D. Matthew, Trans. New York Acad. Sci., 12, 1893, p. 238.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 7th, ser., 42, 1894, pp. 7, 11.—Walcott, Geol. Mag., dec. 4, 1, 1894, p. 247.—Koken, Die Leitfossilien, Leipzig, 1896, p. 23, fig. 14, 1-3.—Beecher, Amer. Jour. Sci., 4th ser., 3, 1897, p. 105, pl. 3, fig. 26.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 34, No. 8, 1901, p. 48.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 224; Bull. New York State Mus., 45, 1901, p. 224.—Jaekel, Zeitz. d. d. geol. Gesell., 53, 1901, pp. 149, 156.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 314.—Slocom, Field Mus. Nat. Hist., Geol. Ser., 4, 1913, p. 66.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 724.

Calymmene Angelin, Pal. Scandinavica, 3d ed., Holmiæ, 1878, pp. 22, 28.—Pompeckj, Neues Jahrb. f. Min., Geol., Pal., 1, 1898, pp. 187, 196, 217.—Beecher, Zittel-Eastman Textb. Pal., 1, 1900, p. 634; Amer. Jour. Sci., 4th ser., 13, 1902, p. 167.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1051.

Calymene abbreviata Foerste.

Calymene abbreviata Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 83, pl. 3, fig. 17; Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 148.

Trenton (Cynthiana): One mile south of Rogers Gap, Kentucky.

Calymene altirostris Van Ingen.

Calymene altirostris Van Ingen, School of Mines Quart., 23, 1901, p. 35 (nom. nud.)

Niagaran (St. Clair): St. Clair Spring, Independence County, Arkansas.

CALYMENE BECKII Hall. See Triarthrus becki.

CALYMENE BLUMENBACHII Foerste. See Calymene vogdesi.

CALYMENE BLUMENBACHII Roemer. See Calymene niagarensis.

CALYMENE BLUMENBACHII Green. See Calymene senaria.

CALYMENE BLUMENBACHII var. NIAGARENSIS Hall. See Calymene niagarensis.

CALYMENE BLUMENBACHII var. SENARIA? Hall. See Calymene clintoni and C. senaria.

CALYMENE BLUMENBACHII var. VOGDESI Foerste. See Calymene vogdesi.

CALYMENE BUCKLANDII Anthony. See Ceraurus milleranus.

CALYMENE CALLICEPHALA Cumings. See Calymene meeki.

Calymene callicephala Green.

Calymene callicephala Green, Mon. Tril. N. A., 1832, p. 30, cast 2.—Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 699, fig. 2.—Foerste, Bull. Sci. Lab. Denison Univ., 14, 1910, p. 83.—Ruedemann, Pal. Univ., 4th ser., fasc. 1, 1912, p. 233.

Ordovician(?): Hampshire, Virginia (=Hampshire County, West Virginia).

Observation.—Of the numerous references to this species, the above only refer directly to Green's types, which are lost. Green's cast of the type can not be identified with any of the species of Calymene and the name might as well be abandoned.

CALYMENE CALLICEPHALA GRANULOSA Foerste. See Calymene granulosa.

Calymene camerata Conrad.

Calymene camerata Conrad, Jour. Acad. Nat. Sci. Philadelphia, 1st ser., 8, 1842, p. 278.—Hall, Pal. New York, 2, 1852, p. 337, pl. 78, figs. 1a–1f.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 250, pl. 22, figs. 22–25.—Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 494, pl. 89, fig. 9.

Cayugan (Cobleskill): Schoharie, New York.

Helderbergian: Cash Valley, Devils Backbone, Maryland; Keyser, West Virginia (Keyser); Nearpass Quarry, New Jersey (Decker Ferry).

CALYMENE CHRISTYI Hall. See Synhomalonotus christyi.

Calymene clintoni (Vanuxem).

Hemicrypturus clintonii Vanuxem, Geol. New York, pt. 3, 1842, p. 79, fig. 2.

Hemicrypturus tail Hall, Geol. New York, pt. 4, 1843, p. 77, tab. org. rem., 9, fig. 2.

Calymene blumenbachii? var. senaria Hall, Pal. New York, 2, 1852, p. 299, pl. A 66, figs. 6a–6e.

Calymene clintoni Hall, Pal. New York, 2, 1852, p.298, pl. A 66, figs. 5a–5d.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 823, fig. 637.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 109, figs.—Foerste, Cincinnati Soc. Nat. Hist., Jour. 21, 1909, p. 33, pl. 1, fig. 6.

Clinton: Herkimer and Cayuga Counties, New York; Kentucky, etc.

CALYMENE CLINTONI Vogdes. See Calymene vogdesi.

Calymene conradi Emmons. Not recognized.

Calymene conradi Emmons, Amer. Geol., 1, pt. 2, 1855, p. 236.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 320.

Lorraine shales: New York.

Observation.—Probably refers to the species or variety of Calymene occurring at this horizon.

CALYMENE CRASSIMARGINATUS Hall. See Proetus crassimarginatus.

Calymene diops Green.

Calymene diops Green, Mon. Tril. N. A., 1832, p. 37, cast No. 8, fig. 2.

Ordovician?: Horizon and locality unknown.

Observation.—Not recognized. Possibly a Phacops.

Calymene dubia Savage.

Calymene dubia Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 60, pl. 2, figs. 8, 9.

Upper Medinan (Girardeau): Alexander County, Illinois.

Calymene fayettensis Slocom.

Calymene fayettensis Slocom, Field Mus. Nat. Hist., Geol. Ser., 4, No. 3, 1913, p. 67, pl. 16, figs. 8, 9.

Richmond (Maquoketa): Clermont, Elgin, and Bloomfield, Iowa.

Calymene gracilis Slocom.

Calymene gracilis Slocom, Field Mus. Nat. Hist., Geol. Ser., 4, No. 3, 1913, p. 69, pl. 18, fig. 9.

Richmond (Maquoketa): Pattersons Springs, near Brainard, Iowa.

Calymene granulosa (Foerste).

Calymene callicephala granulosa Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 294.

Eden: Cincinnati, Ohio, and vicinity; New York (Indian Ladder).

Calymène macrophthalma D'Orbigny.

Calymene macrophthalma D'Orbigny, Voyage l'Amerique Merid., 3, pt. 4, 1847, p. 32, 8, Atlas, pl. 1, figs. 6, 7.

Silurian: Rio Grande, Bolivia.

Calymene mammillata Hall.

Calymene mammillata Hall, Geol. Surv. Wisconsin, 1861, p. 50; Geol. Wisconsin, 1, 1862, p. 432, figs. 1, 2.

Richmond (Maquoketa): Maquoketa Creek, twelve miles west of Dubuque, Iowa.

Calymene meeki Foerste.

Calymene senaria Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 173, pl. 14, figs. 14a–f.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 140.—White, 2d Ann. Rep. Indiana Dep. Stat. Geol., 1880, p. 493, pl. 2, figs. 1, 2.

Calymene callicephala Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1057, pl. 54, figs. 6–6c.—Bassler, Bull. Geol. Surv. Virginia, 2a, 1909, pl. 14, figs. 16, 17.

Calymene meeki Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 84, pl. 3, fig. 18.—Raymond, Zittel-Eastman Textb. Pal. 1913, p. 724.

Maysville and Richmond: Cincinnati, Ohio, and vicinity; Kentucky; Indiana; Tennessee; etc.

Calymene meeki retrorsa Foerste.

Calymene meeki-retrorsa Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 85, pl. 3, fig. 19.

Richmond (Waynesville): Near Dunlapsville, Indiana.

Calymene microps Green. See Pterygometopus microps.

Calymene multicosta Hall.

Calymene multicosta Hall, Pal. New York, 1, 1847, p. 228, pl. 69, fig. 3; 12th Rep. New York State Cab. Nat. Hist., 1859, p. 67.—Brainerd and Seely, Bull. Amer. Mus. Nat. Hist., 1890, 3, p. 22.

Calymene multicosta—Continued.

"Birdseye": Ile la Motte, Lake Champlain, Vermont.

Observation.—Not recognized. Possibly the same as Pliomerops canadensis, but original is too poorly preserved to decide.

CALYMENE NASUTA Ulrich. See Calymenella nasuta.

Calymene niagarensis Hall.

Calymene niagarensis Hall, Geol. New York, pt. 4, 1843, p. 102, fig. 3, p. 101, tab. org. rem., 10, fig. 3.—Owen, Amer. Jour. Sci. Arts, 48, 1845, p. 309, fig. 3.—Hall, Canadian Nat. Geol., 5, 1860, p. 156; Trans. Albany Inst., 4, 1863, p. 227; adv. sheets 18th Rep. New York State Cab. Nat. Hist., 1865, p. 30; 20th Rep., rev. ed., 1870, p. 425.—Hall and Whitfield, Pal. Ohio, 2, 1875, p. 153, pl. 6, figs. 14, 15.—Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1877, pl. 32, figs. 8–15; mus. ed., 1879, p. 187, pl. 32, figs. 8–15; 11th Rep. Dep. Geol. Nat. Hist. Indiana, 1882, p. 331, pl. 34, figs. 8–15.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 195, fig.—Hall and Clarke, Pal. New York, 7, 1888, pl. 1, figs. 10–14.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 109, fig.—Keyes, Geol. Surv. Missouri, 4, 1894, pl. 32, fig. 5.—Van Ingen, School of Mines Quart., 23, 1901, p. 35.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903 (p. 2), p. 107, pl. 21, fig. 12.—Whiteaves, Geol. Surv. Canada, Ann. Rep., n. s., 14, 1904, App. F, p. 57; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 269.—Rowley, Green's Contr. Indiana Pal., 2, pt. 2, 1906, p. 27, pl. 5, fig. 26.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, 1907, p. 261, pl. 23, figs. 9, 10.—Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1909, p. 34.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 315, fig. 1628.

Calymene Blumenbachii Chapman, Canadian Jour., n. s., 8, 1863, p. 31, fig. 147; p. 206, fig. 209.—Roemer, Sil. Fauna West Tennessee, 1860, p. 79, pl. 5, fig. 22.—Billings, Cat. Sil. Foss. Anticosti, Acad. Geol., 2d ed., 1868, p. 607.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 109, fig.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 2, 1895, p. 106.

Calymene blumenbachii var. niagarensis Hall, Pal. New York, 2, 1852, p. 307, pl. 67, figs. 11–12 (see for earlier synonymy); Geol. Surv. Wisconsin, 1, 1862, p. 432; 20th Rep. New York State Cab. Nat. Hist., 1867, p. 334.—Grabau, Bull. New York State Mus., 45, 1901, p. 224, fig. 156.

Calymene sp. Hall, Pal. New York, 2, 1852, p. 350, pl. 83, fig. 8.

Brassfield-Cayugan: Lockport, Rochester, etc., New York. Wide distribution in the United States and Canada, especially in the Niagaran.

CALYMENE PHLYCTAINOIDES Green. See Corydocephalus phlyctainoides.

Calymene platycephala Foerste.

Calymene platycephala Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 81, pl. 2, fig. 7; pl. 3, fig. 21.

Trenton (Saltillo): Clifton, Tennessee.

CALYMENE ROSTRATA Vogdes. See Calymenella rostrata.

Calymene rugosa Shumard.

Calymene rugosa Shumard, 1st and 2d Reps. Geol. Missouri, 1855, p. 200, pl. B, fig. 14.—Keyes, Missouri Geol. Surv., 4, 1895, p. 233.

Helderbergian(?): One mile below Birmingham, Missouri.

CALYMENE SELENECEPHALA Green. See Calymene senaria.

CALYMENE SENARIA Meek. See Calymene meeki.

Calymene senaria Conrad.

Calymene blumenbachii Green, Mon. Tril. N. A., 1832, p. 28, cast 1.

Calymene selenecephala Green, Mon. Tril. N. A., 1832, p. 31, cast 3.—Edwards, Hist. Nat. Crust., 3, 1840, p. 320.

Calymene senaria Conrad, 5th Ann. Rep. Geol. Surv. New York, 1841, pp. 38, 49.—Emmons, Nat. Hist. New York, Geol., 2, 1842, p. 390, fig. 2.—Vanuxem, ibid., 3, 1842, pp. 48, 55.—Owen (Emmons), Amer. Jour. Sci., 47, 1844, pp. 363, 364, fig. 2.—Hall, Pal., New York, 1, 1847, p. 238, pl. 64, figs. 3a–n.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 213, pl. 15, fig. 16; p. 216, fig. 9.—Billings, Canadian Nat. Geol., 1, 1856, p. 46, fig. 10.—Emmons, Man. Geol., 1860, p. 98, fig. 87.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 3, fig. 8.—Hitchcock, Geol. Vermont, 1, 1861, p. 300, fig. 213.—Salter, Mon. Brit. Tril., Pal. Soc., 1865, p. 97, pl. 9, figs. 5–11.—Billings, Quart. Jour. Geol. Soc. London, 26, 1870, p. 485, pl. 32, figs. 3–5.—Walcott, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1877, pp. 89–91; Mus. ed., 1879, pp. 89–91.—Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 591.—Emerson, Narrative Hall's 2d Arctic Exped., U. S. Navy Dep., 1879, p. 582 (loc. occ.).—Walcott 31st Rep. New York State Mus. Nat. Hist., 1879, p. 61, pl. 1, figs. 1, 2, 5; Bull. Mus. Comp. Zool., 8, 1881, pp. 198–216, pl. 1, figs. 6–10; pl. 2, figs. 5, 7, 10; pl. 3, figs. 1, 3, 8–10; pl. 4, fig. 3; pl. 5, figs. 1–6; pl. 6, figs. 1, 2.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 160, fig.—Walcott, Science, 3, 1884, pp. 279, 281, figs. 2, 3; Notes on some sections of Tril., 1887, pl. 1.—Clarke, Jour. Morph., 2, 1888, p. 254, footnote; p. 266, footnote.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 110, figs.—Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 700, fig. 3.—Keyes, Geol. Surv. Missouri, 4, 1894, p. 230.—Bernard, Quart. Jour. Geol. Soc. London, 1894, 50, p. 427, figs. 13, 15.—Walcott, Geol. Mag., dec. 4, 1, 1894, p. 247, pl. 8, figs. 7–10; Proc. Biol. Soc. Washington, 9, 1894, p. 90, pl. 1, figs. 7–10.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 231.—Pompeckj, N. Jahrb. Min., 1, 1898, pp. 197, 198 (footnote), 244, 246.—Ruedemann, Bull. New York State Mus., 49, 1901, p. 67.—Beecher, Amer. Jour. Sci., 4th ser., 13, 1902, pl. 5, fig. 7.—Beecher, Geol. Mag., dec. 4, 9, 1902, p. 158, fig. 4.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 203, pl. 15, fig. 23.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 315, fig. 1624c, d.—Foerste, Bull. Sci. Lab. Denison Univ., 14, 1910, p. 82, pl. 2, fig. 14.—Ruedemann, Bull. New York State Mus., 162, 1912, p. 120, pl. 9, figs. 6–10,

Calymene blumenbachii var. senaria Hall, Pal. New York, 2, 1852, p. 299, pl. 66a, figs. 6a–e.

Trenton: New York, New Jersey, Ohio, Minnesota, etc.

Plastotypes.—Cat. Nos. 4916, 5004, U.S.N.M.

CALYMENE SPINIFERA Conrad. See Cyphaspis girardeauensis.

CALYMENE? TRISULCATA Hall. See Phacops trisulcatus.

Calymene verneuilii D'Orbigny.

Calymene Verneuilii D'Orbigny, Voyage l'Amerique Merid., 3, pt. 4, 1847, p. 31, 8, Atlas, pl. 1, figs. 4, 5.

Silurian: Chuquisaca, Bolivia.

Calymene vogdesi Foerste.

Calymene clintoni Vogdes (not Vanuxem) Proc. Acad. Nat. Sci. Philadelphia, 1880, p. 178, figs. 3, 4; Pal. Cont., 1, 1881, p. 9, figs. 3–7; Desc. New Crust. Clint. of Georgia, etc., 1886, p. 6, figs. 3–4.

Calymene blumenbachii? Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 110, pl. 13, fig. 25.

Calymene vogdesi—Continued.

Calymene blumenbachii var. vogdesi Foerste, Proc. Bost. Soc. Nat. Hist., 1890, 24, p. 265.

Calymene blumenbachii (or senaria) Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, p. 55, pl. 8, fig. 1.

Calymene —— Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 109, pl. 13, fig. 24.

Calymene vogdesi Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 95, pl. 8, figs. 12–16; Geol. Surv. Ohio, 7, 1895, p. 526, pl. 25, figs. 24–25; pl. 27, figs. 12–16.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 315.

Upper Medinan (Brassfield): Catoosa Station, etc., Georgia; Centerville, Dayton, etc., Ohio; Indiana.

CALYMENELLA Bergeron. Genotype: C. boisseli Bergeron.

Calymenella Bergeron, Bull. Soc. Geol. France, 3d ser., 18, 1890, p. 367.

Calymenella nasuta (Ulrich).

Calymene nasuta Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 131, figs. 1–3, p. 132.

Calymenella nasuta Pompeckj, Neues Jahrb. Min., Geol. Pal., 1, 1898, p. 243.

Clinton (Osgood): Osgood, Indiana.

Cotype.—Cat. No. 41871, U.S.N.M.

Calymenella rostrata (Vogdes).

Calymene rostrata Vodges, Amer. Jour. Sci., 3d ser., 18, 1879, p. 477; Proc. Acad. Nat. Sci. Philadelphia, 1880, p. 176, figs. 1–2; Pal. Cont., 1, 1881, p. 8, pl., figs. 1, 2; Desc. New Crust. Clint. of Georgia, etc., 1886, p. 2, 4, figs. 1–2.—Foerste, Proc. Bost. Soc. Nat. Hist., 24, 1890, p. 267.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 315.

Calymenella rostrata Pompeckj, Neues Jahrb. Min., Geol. Pal., 1, 1898, p. 243.

Clinton: Catoosa Station, Georgia; New York.

CALYPTOGRAPTUS Spencer. Genotype: C. cyathiformis Spencer.

Calyptograptus Spencer, Canadian Nat., n. s., 8, 1878, p. 459.—Lapworth, Quart. Jour. Geol. Soc. London, 37, 1881, p. 173.—Spencer, Proc. Amer. Assoc. Adv. Sci., 31, 1883, p. 364; Bull. Mus. Univ. State Missouri, 1, 1884, p. 27; Trans. Acad. Sci. St. Louis, 4, 1884, p. 562, 577.—Miller, N. A. Geol. Pal., 1889, p. 175.—Gurley, Jour. Geol., 4, 1896, pp. 93, 308.

CALYPTOGRAPTUS? ARBUSCULUS Spencer. See Dictyonema arbuscula.

Calyptograptus cyathiformis Spencer.

Calyptograptus cyathiformis Spencer, Canadian Nat., n. s., 8, 1878, p. 459; Trans. Acad. Sci. St. Louis, 4, 1884, p. 578, pl. 3, fig. 3; Bull. Mus. Univ. State Missouri, 1, 1884, p. 28, pl. 3, fig. 3.—Miller, N. A. Geol. Pal., 1889, p. 175, fig. 145.—Gurley, Jour. Geol., 1896, pp. 93, 308.—Bassler, Bull. U. S. Nat. Mus., 1909, 65, pp. 38, 39, fig. 48.

Niagaran dolomite: Hamilton, Ontario.

Calyptograptus micronematodes Spencer.

Calyptograptus micronematodes Spencer, Canadian Nat., 10, 1882, p. 165 (nom. nud.); Trans. Acad. Sci. St. Louis, 4, 1884, p. 579, pl. 3, figs. 4, 4a; Bull. Mus. Univ. State Missouri, 1, 1884, p. 29, pl. 3, figs. 4, 4a.—Gurley, Jour. Geol., 4, 1896, pp. 93, 308.—Bassler, Bull. U. S. Nat. Mus., 65, 1909, pp. 39, 40, figs. 49, 50.

Niagaran dolomite: Hamilton, Ontario.

Calyptographus? radiatus Spencer.

Calyptographus radiatus Spencer, Canadian Nat., 10, 1882, p. 165 (nom. nud.); Trans. Acad. Sci., St. Louis, 4, 1884, p. 580, pl. 4, fig. 3; Bull. Mus. Univ. State Missouri, 1, 1884, p. 30, pl. 4, fig. 3.—Gurley, Jour. Geol., 4, 1896, pp. 93, 308.—Bassler, Bull. U. S. Nat. Mus., 65, 1909, p. 40, fig. 51.

Niagaran dolomite: Hamilton, Ontario.

CALYPTOGRAPTUS SUBRETIFORMIS Spencer. See Dictyonema subretiforme and D. polymorphum.

CAMARELLA Billings. Genotype: C. volborthi Billings.

Camarella Billings, Canadian Nat. Geol., 4, 1859, p. 301; 6, 1861, p. 316.—Zittel, Handb. Pal., 1, 1880, p. 692.—Waagen, Mem. Geol. Surv. India, Pal. Indica, 13th ser., 1, 1883, p. 412.—Walcott, Bull. U. S. Geol. Surv., 30, 1886, p. 122.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 48.—Miller, N. A. Geol. Pal., 1889, p. 338; 2d App., 1897, p. 759.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 219; 13th Ann. Rep. New York State Geol., 1895, p. 838.—Koken, Die Leitfossilien, Leipzig, 1896, p. 244.—Huene, Verh. d. Russ.-Kais. Mineral Gesell. zu St. Petersburg, 38, 1900, p. 228, fig. 1.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 321.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 271.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 394.

Camarella ambigua (Hall).

Atrypa ambigua Hall, Pal. New York, 1, 1847, p. 143, pl. 33, figs. 8, 9.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 190, pl. 10, figs. 8, 9, 8c.

Triplesia? ambigua Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 65.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1224, figs.

Camarella ambigua Miller, Amer. Pal. Foss., 1879, p. 107.

Trenton: Middleville, New York.

CAMARELLA BERNENSIS Sardeson. See Parastrophia hemiplicata.

CAMARELLA BISULCATA Miller. See Cyclospira bisulcata.

Camarella breviplicata Billings.

Camarella breviplicata Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 304, fig. 295.

Canadian (Beekmantown): Stanbridge, Quebec.

CAMARELLA CALCIFERA Billings. See Syntrophia calcifera.

CAMARELLA CONGESTA Nettelroth. See Hyattidina congesta.

Camarella(?) costata Billings.

Camarella? costata Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 305, fig. 296.

Canadian (Beekmantown): Stanbridge, Quebec.

CAMARELLA EXTANS Lesley. See Triplecia extans.

CAMARELLA HEMIPLICATA Billings. See Parastrophia hemiplicata.

Camarella inornata Weller.

Camarella inornata Weller, Geol. Surv. New Jersey, Pal. 3, 1903, p. 157, pl. 10, figs. 8–10.

Black River (Jacksonburg): Hainesburg, New Jersey.

CAMARELLA LENTICULARIS Billings. See Parastrophia lenticularis.

Camarella longirostris Billings.

Camarella longirostra Billings, Canadian Nat. Geol., 4, 1859, p. 302; p. 445, fig. 23; Geol. Canada, 1863, p. 127, fig. 53.—Raymond, Ann. Carnegie Mus., 7, 1911, p. 249, pl. 36, figs. 29, 30.

Triplecia gracilis Raymond, Bull. Amer. Pal., 3, 1902, p. 303, pl. 18, fig. 1.

Chazyan: Mingan Islands, Canada (Mingan); Crown Point, Valcour Island, Chazy, and Valcour, New York (Day Point, Valcour); East Tennessee (Lenoir).

CAMARELLA NUCLEUS Lesley. See Triplecia nucleus.

CAMARELLA OPS Billings. See Parastrophia ops.

CAMARELLA OWATONNENSIS Sardeson. See Cyclospira bisulcata.

Camarella panderi Billings.

Camarella panderi Billings, Canadian Nat. Geol., 4, 1859, p. 302; Geol. Canada, 1863, p. 143, fig. 78.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 220, pl. 62, figs. 19–23.—Raymond, Ann. Carnegie Mus., 7, 1911, p. 250, pl. 36, figs. 31, 32.

Black River (Leray): Pauquettes Rapids, Ottawa River, Canada; Curdsville, Kentucky.

Camarella parva Billings.

Camarella parva Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 219.—Matthew, Trans. Royal Soc. Canada, 11, 1893, p. 103, pl. 7, fig. 9.

Chazyan (Quebec— N, P): Table Head and four miles northeast Portland Creek, Newfoundland.

Canadian (Bretonian—Div. C 3a): St. John, New Brunswick.

Camarella polita Billings.

Camarella polita Billings, Pal. Foss., 1 Geol. Surv. Canada, 1865, pp. 304, 305, fig. 297.

?Canadian (Beekmantown): Stanbridge and Island of Orleans, Quebec.

Camarella varians Billings.

Camarella varians Billings, Canadian Nat. Geol., 4, 1859, p. 445, fig. 24; Geol. Canada, 1863, p. 127, fig. 52; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 220.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 271, fig. 326.—Raymond, Ann. Carnegie Mus., 7, 1911, p. 250, pl. 36, figs. 19–27, 33–36.

Chazyan: Mingan Islands, Gulf of St. Lawrence (Mingan); Table Head, four miles northeast Portland Creek, and south side of Cow Point, Newfoundland (Quebec N, P); Crown Point, Valcour Island, Plattsburg, Chazy, etc., New York (Crown Point, Valcour), East Tennessee (Lenoir).

Camarella volborthi Billings.

Camarella volborthi Billings, Canadian Nat. Geol., 4, 1859, p. 301; Geol. Canada, 1863, p. 143, fig. 77.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 220, pl. 62, figs. 11–18; pl. 84, fig. 42.—Miller, N. A. Geol. Pal., 1889, p. 338, fig. 546.

Black River (Leray): Pauquettes Rapids, Ottawa River, Canada.

CAMARIUM Hall. See Merista Suess.

CAMARIUM ELONGATUM Hall. See Merista typa.

CAMARIUM TYPUM Hall. See Merista typa.

CAMAROCLADIA Ulrich and Everett.

Genotype: C. dichotoma Ulrich and Everett.

Camarocladia Ulrich and Everett in Miller, N. A. Geol. Pal., 1889, p. 156; Geol. Surv. Illinois, 8, 1890, p. 280.

Camarocladia dichotoma Ulrich and Everett.

Camarocladia dichotoma Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 281, pl. 7, figs. 1, 1a, b.

Black River (Platteville): Near Dixon, Illinois.

Sections of *cotypes*.—Cat. No. 46549, U.S.N.M.

Camarocladia rugosa Ulrich.

Camarocladia rugosa Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. xcv, footnote.

Black River (Decorah): Mercer County, Kentucky; Goodhue County, Minnesota.

Cotypes.—Cat. No. 49833, U.S.N.M.

CAMAROCRINUS Hall. Genotype: C. stellatus Hall.

Camarocrinus Hall, 28th Rep. New York State Mus. Nat Hist., 1879, pp. 205–6; ext., with additions, 1880, pp. 3–5.—Zittel, Grundzuge Pal., 1895, p. 154.—Zittel-Eastman, Textb. Pal., 1896, p. 183.—Haeckel, Die Amphorideen Cystoideen, Leipzig, 1896, pp. 168, 169.—Barrande and Waagen, Syst. Sil. du Centre Boheme, 7, pt. 1, 1897, p. 1.—Bather, Treatise on Zool., 3, Echinoderma, 1900, pp. 77, 136, 161.—Foerste, Jour. Geol., 11, pp. 683–685.—Schuchert, Smiths. Misc. Coll., 47, p. 253.

Camarocrinus stellatus Hall.

Camarocrinus stellatus Hall, 28th Rep. New York State Mus. Nat. Hist., mus. ed., 1879, p. 207, pl. 35, figs. 1–8; ext., 1880, p. 5, pl. 35, figs. 1–8.—Schuchert, Smiths. Misc. Coll., 47, 1904, p. 269, pl. 44, figs. 1–5; Maryland Geol. Surv., Low. Dev., 1913, p. 227, pl. 31, figs. 1–5.

Helderbergian: Schoharie, New York (Manlius transition bed); Keyser, West Virginia; Devils Backbone, near Cumberland, Maryland (Keyser).

Plesiotypes.—Cat. No. 35080, U.S.N.M.

CAMAROTŒCHIA Hall and Clarke. Genotype: Atrypa congregata Conrad.

Camarotœchia Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 189; 13th Ann. Rep. New York State Geol., 1895, p. 826.—Girty, Mon. U. S. Geol. Surv., 32, pt. 2, 1899, p. 538.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 229.—Williams, Bull. U. S. Geol. Surv., 165, 1900, p. 59.—Schuchert, Zittel-Eastman, Textb. Pal., 1, 1900, p. 324.—Grabau, Bull. New York State Mus., 45, 9, 1901, p. 192; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 190.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 283.—Raymond, Ann. Carnegie Mus., 7, 1911, p. 219.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 397.

Stegerhynchus Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 98.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 397 (Genotype: Camarotœchia whitei Hall).

Camarotœchia(?) acinus (Hall).

Rhynchonella acinus Hall, Trans. Albany Inst., 4, 1863, p. 215; 28th Rep. New York State Mus. Nat. Hist., 1879, p. 163, pl. 26, figs. 7–11; 11th Rep. State Geol. Indiana, 1882, p. 306, pl. 26, figs. 7–11.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 73, pl. 26, figs. 6, 13, 14, pl. 32, figs. 13–16.—Beecher and Clarke, Mem. New York State Mus., 1, 1889, p. 35, pl. 4, figs. 9–11.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 882, figs.

Camarotœchia? acinus Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 190.—Grabau, Bull. New York State Mus., 45, 1901, p. 193, fig. 108; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 193, fig. 108.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 284, figs. 347, 348.

Camarotœchia cf. acinus Kindle and Breger, 28th Ann. Rep. Nat. Res. Indiana, 1904, p. 439, pl. 8, figs. 1, 2.

Camarotœchia(?) acinus—Continued.

Niagaran: Waldron, etc., Indiana; Newsom, etc., Tennessee (Waldron); Louisville, Kentucky (Louisville); Pendleton, Indiana; etc.

Plesiotypes.—Cat. No. 51366, U.S.N.M. (Nettelroth).

Camarotœchia(?) acinus convexa (Foerste).

Rhynchonella acinus var. convexa Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 318, pl. 6, fig. 13; Geol. Ohio, 7, 1895, p. 593, pl. 31, fig. 13.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 164.

Upper Medinan (Brassfield): Hanover, Indiana.

Camarotœchia acinus subrhomboidea Foerste.

Camarotœchia acinus-subrhomboidea Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1909, p. 12, pl. 2, fig. 4.

Clinton (West Union): Near Martins, Lewis County, Kentucky.

Camarotœchia æquiradiata (Hall).

Atrypa equiradiata Hall, Pal. New York, 2, 1852, p. 70, pl. 23, fig. 5.

Rhynchospira? equiradiata Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 77.

Rhynchonella æquiradiata Miller, N. A. Geol. Pal., 1889, p. 367.

Camarotœchia æquiradiata Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 190.

Protorhyncha æquiradiata Hall and Clarke, ibid., 1895, pl. 56, figs. 7–9.

Clinton: Oneida County, New York; Arisaig, Nova Scotia.

Camarotœchia altilis Hall and Clarke. See Camarotœchia plena.

Camarotœchia? antiqua Savage.

Camarotœchia? antiqua Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 82, pl. 5, figs. 1, 2.

Upper Medinan (Edgewood): Alexander County, Illinois, and near Edgewood, Missouri.

Camarotœchia argentea (Billings).

Rhynchonella? argentea Billings, Cat. Sil. Foss. Anticosti, 1866, p. 43.

Anticostian (Jupiter River): East of Otter River, Anticosti.

Camarotœchia(?) coalescens Whiteaves.

Camarotœchia(?) coalescens Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 272, pl. 25, fig. 7.

Niagaran: Winisk River, Canada.

Camarotœchia? concinna Savage.

Camarotœchia? concinna Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 81, pl. 5, figs. 4, 5.

Upper Medinan (Edgewood): Pike County, Missouri, and near Thebes, Illinois.

Camarotœchia congruens Foerste.

Camarotœchia congruens Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1909, p. 11, pl. 2, fig. 3A, B.

Clinton (Crab Orchard and West Union): Near Martins, etc., Lewis County, Kentucky.

Camarotœchia decemplicata (Sowerby).

Terebratula decemplicata Sowerby, Sil. Syst., 1839, pl. 21, fig. 17.

Rhynchonella decemplicata Davidson, Mon. Brit. Foss. Brach., 3, pt. 7, 1871, p. 177, pl. 23, figs. 20–24.—Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 320, pl. 6, figs. 23, 24.

Camarotœchia decemplicata—Continued.

Rhynchonella Eva Billings, Cat. Sil. Foss. Anticosti, 1866, p. 44.

Anabaia anticostiana Clarke, Archiv. Mus. Nac. Rio de Janeiro, 10, 1899, Eng. ed., p. 15, pl. 1, figs. 26–28.

Camarotœchia decemplicata Twenhofel, Bull. Victoria Mem. Mus., 3, 1914, p. 28.

Silurian: England; Cumberland Gap, Tennessee (Clinton); Anticosti (Gun River).

Camarotœchia ekwanensis Whiteaves.

Camarotœchia Ekwanensis Whiteaves, Ann. Rep. Geol. Surv. Canada, n. s., 14, App. F, 1904, p. 42; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 252, pl. 25, figs. 4, 4b.

Niagaran: Ekwan River, and Southampton Island, Canada.

Camarotœchia? festinata Savage.

Camarotœchia? festinata Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 50, pl. 1, figs. 24–26.

Upper Medinan (Girardeau): Thebes, Illinois.

Camarotœchia fringilla (Billings).

Rhynchonella fringilla Billings, Pal. Foss., 1, 1865 (adv. sheets, 1862), p. 141, fig. 118.

Camarotœchia fringilla Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 190, pl. 56, figs. 28–30.

Anticostian (Gun River): Gull Cape, Anticosti.

Camarotœchia gigantea Maynard.

Camarotœchia gigantea Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 354, pl. 63, figs. 15, 16.

Helderbergian (Keyser): Devils Backbone, near Cumberland and Cash Valley, Maryland.

Camarotœchia glacialis (Billings).

Rhynchonella glacialis Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 143, fig. 120 (adv. sheets, 1862).

Camarotœchia glacialis Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 190.

Anticostian (Gun River and Jupiter River): Gull Cape, etc., Anticosti.

Camarotœchia hudsonica Grabau.

Camarotœchia hudsonica Grabau, Bull. New York State Mus., 69, 1903, p. 1048, fig. 8; 92, 1906, p. 115.

Helderbergian (Decker Ferry="Manlius"): Becraft Mountain, near Hudson, New York.

Camarotœchia hydraulica (Whitfield).

Rhynchonella hydraulica Whitfield, Ann. New York Acad. Sci., 2, 1882, p. 194; Ibid., 5, 1891, p. 512, pl. 5, fig. 17; Geol. Ohio, 7, 1895, p. 414, pl. 1, fig. 17.—Sherzer, Geol. Surv. Michigan, 7, pt. 1, 1900, pl. 17, fig. 17.

Camarotœchia hydraulica Grabau, Michigan Geol. Surv., Geol. Ser. 2, 1909, p. 128, pl. 30, fig. 17.

Lower Monroan (Greenfield): Greenfield, Ohio.

Camarotœchia(?) indianensis (Hall).

Rhynchonella indianensis Hall, Trans. Albany Inst., 4, 1863, p. 215; 28th Rep. New York State Mus. Nat. Hist., 1879, p. 163, pl. 26, figs. 12–22; 11th Rep. State Geol. Indiana, 1882, p. 306, pl. 26, figs. 12–22; pl. 27, figs. 4–6.—Nettelroth, Kentucky, Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 76, pl. 33, figs. 18–20.—Beecher and Clarke, Mem. New York State Mus. 1, 1889, p. 42, pl. 3, figs. 17–28.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 890, figs.

Camarotœchia(?) indianensis—Continued.

Camarotœchia(?) indianensis Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 166.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 46, pl. 4, figs. 26, 27.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 284, fig. 348.

Niagaran: Waldron, Indiana; Newsom, Tennessee (Waldron); Louisville, Kentucky (Louisville); Shelby and Rochester, New York (Guelph); Wisconsin (Racine); Osgood, Indiana (Osgood); etc.

Plesiotype.—Cat. No. 51330, U.S.N.M. (Nettelroth).

Camarotœchia lamellata (Hall).

Atrypa lamellata Hall, Pal. New York, 2, 1852, p. 329, pl. 74, fig. 11.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 237, pl. 21, figs. 23–29.

Rhynchonella lamellata Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 78.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 359; Amer. Geol., 31, 1903, p. 167, figs.

Camarotœchia lamellata Grabau, Bull. New York State Mus., 92, 1906, p. 109, fig. 13.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 286, fig. 349.—Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 352, pl. 63, figs. 9, 10.

Cayugan (Cobleskill): Schoharie, New York.

Helderbergian: Pinto, Cumberland, and Cash Valley, Maryland (Keyser); New Jersey (Decker Ferry).

Camarotœchia leightoni Williams.

Camarotœchia leightoni Williams, Proc. U. S. Nat. Mus., 45, 1913, p. 338, pl. 30, figs. 9, 11, 12, 13.

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

Cotypes.—Cat. Nos. 58962, 58963, U.S.N.M.

Camarotœchia lindenensis Foerste.

Camarotœchia lindenensis Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 98, pl. 1, fig. 13.

Niagaran (Brownsport): Near Linden, Tennessee.

Camarotœchia litchfieldensis (Schuchert).

Atrypa sp. Hall, Pal. New York, 2, 1852, p. 330, pl. 74, figs. 11 and 12.

Rhynchonella(?) litchfieldensis Schuchert, Amer. Geol., 31, 1903, p. 167, figs.

Camarotœchia litchfieldensis Grabau, Bull. New York State Mus., 92, 1906, p. 109, fig. 14.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 286, fig. 350.—Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 353, pl. 63, figs. 11–14.

Rhynchonella agglomerata Weller, Geol. Surv. New Jersey, Pal. 3, 1903, pp. 234–235, pl. 21, figs. 5–11.

Cayugan (Cobleskill): Schoharie Valley, New York.

Helderbergian: Keyser, West Virginia; Maryland (Keyser); New Jersey (Decker Ferry).

Camarotœchia litchfieldensis angustata Holtedahl.

Camarotœchia litchfieldensis angustata Holtedahl, 2d Arctic Expl. "Fram," 1898–1902, No. 32, 1914, p. 22, pl. 8, fig. 1.

Helderbergian (Lower beds): Near Borgen, Southwest Ellesmereland, Arctic America.

Camarotœchia major Raymond.

Camarotœchia major Raymond, Amer. Jour. Sci., 4th ser., 20, 1905, p. 369; Ann. Carnegie Mus., 7, 1911, p. 226, pl. 34, figs. 11–14.

Chazyan (Valcour): Cystid Point, Valcour Island, New York.

Camarotœchia (Stegerhynchus) neglecta (Hall).

Atrypa neglecta Hall, Pal. New York, 2, 1852, p. 70. pl. 23, fig. 4; p. 274, pl. 57, fig. 1.—Billings, Canadian Nat. Geol., 1, 1856, p. 138, pl. 2, figs. 11, 12.

Rhynchonella neglecta Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 78.—Billings, Geol. Canada, 1863, p. 315, fig. 325.—Hall, Trans. Albany Inst., 4, 1863, p. 226.—Meek, Pal. Ohio, 1, 1873, p. 179, pl. 15, fig. 3.—Hall and Whitfield, ibid. 2, 1875, p. 134, pl. 7, fig. 15.—Hall, 28th Rep. New York State Mus. Nat. Hist., 1879, p. 162, pl. 26, figs. 1–6; 11th Rep. State Geol. Indiana, 1882, p. 305, pl. 26, figs. 1–6; pl. 27, fig. 3.—Beecher and Clarke, Mem. New York State Mus., 1, 1889, p. 37, pl. 4, figs. 3, 6–8.—Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 317, pl. 6, fig. 12.

Rhynchonella (Stenoschisma) neglecta Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 894, figs.

Rhynchonella neglecta var. scobina Meek, Amer. Jour. Sci., 3d ser., 4, 1872, p. 277.

Rhynchonella scobina Hall and Whitfield, Pal. Ohio, 2, 1875, p. 116.—Foerste, Geol. Ohio, 7, 1895, p. 592.

Camarotœchia? neglecta Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 190.—Grabau, Bull. New York State Mus., 45, 1901, p. 193, fig. 107; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 193, fig. 107.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 284, fig. 346.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 45, pl. 4, figs. 28–31.

Niagaran: Reynales Basin, Lockport, etc., New York (Clinton); Hamilton, Ontario; Dayton and Cedarville, Ohio; Hanover Indiana· Wisconsin; Arisaig, Nova Scotia; etc.

Camarotœchia (Stegerhynchus) neglecta cliftonensis Foerste.

Rhynchonella (Stegerhynchus) neglecta-cliftonensis Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 97, pl. 3, figs. 48 A, B, C.

Upper Medinan (Brassfield): Clifton, Tennessee.

Camarotœchia nutrix (Billings).

Rhynchonella nutrix Billings, Cat. Sil. Foss. Anticosti, 1866, p. 43.

Gamachian (Ellis Bay) and Anticostian (Gun River, Jupiter River): Gamache Bay, etc., Anticosti.

Camarotœchia obtusiplicata (Hall).

Atrypa obtusiplicata Hall, Pal. New York, 2, 1852, p. 279, pl. 58, fig. 2.

Rhynchonella obtusiplicata Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 78.

Camarotœchia obtusiplicata Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 190.—Grabau, Bull. New York State Mus., 45, 1901, p. 193, fig. 106; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 193, fig. 106.

Clinton: Lockport, etc., New York (Rochester); Arisaig, Nova Scotia.

Camarotœchia orientalis (Billings).

Rhynchonella orientalis Billings, Canadian Nat. Geol., 4, 1859, p. 443, fig. 21; Geol. Canada, 1863, p. 126, fig. 57.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 896, figs.

Camarotœchia orientalis Raymond, Ann. Carnegie Mus., 7, 1911, p. 223, pl. 33, figs. 19–22, 24, 33.

Chazyan: Mingan Islands (Mingan), St. Martin Junction, near Montreal and Aylmer, Canada (Aylmer).

Camarotœchia pisa (Hall and Whitfield).

Rhynchonella pisa Hall and Whitfield, Pal. Ohio, 2, 1875, p. 135, pl. 7, figs. 18–22.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 78, pl. 32, figs. 24–27.—Whiteaves, Pal. Foss. Geol. Surv. Canada, 3, pt. 2, p. 63.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 897, figs.

Camarotœchia pisa? Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1909, p. 12, pl. 2, figs. 1A, B.

Niagaran: Highland County, Ohio; Louisville, Kentucky; Ontario (Guelph); etc.

Plesiotype: Cat. No. 51325, U.S.N.M. (Nettelroth).

Camarotœchia plena (Hall).

Atrypa plena Hall, Pal. New York, 1, 1847, p. 21, pl. 4 bis, fig. 7.—Billings, Canadian Nat. Geol., 1, 1856, p. 208, figs. 17–19.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 817, fig. 592.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 191, pl. 3, fig. 28.

Rhynchonella plena Hitchcock, Geol. Vermont, 1, 1862, p. 278.—Chapman, Canadian Jour., n. s., 7, 1862, p. 114, fig. 103; 8, 1863, p. 195, fig. 164; Expos. Min. Geol. Canada, 1864, p. 117, fig. 103; p. 167, fig. 164.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 897, figs.—Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, pp. 65–66.—Billings, Canadian Nat. Geol., 4, 1859, p. 444, fig. 22; Geol. Canada, 1863, p. 126, fig. 50.

Camarotœchia plena Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 190.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 284, fig. 345.—Raymond, Ann. Carnegie Mus., 7, 1911, p. 221, pl. 33, figs. 7–18.

Atrypa plicifera Hall, Pal. New York, 1, 1847, p. 22, pl. 4 bis, fig. 8.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 191, pl. 3, fig. 29.

Rhynchonella plicifera Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 898, fig.

Atrypa altilis Hall, Pal. New York, 1, 1847, p. 23, pl. 4 bis, fig. 9.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 192, pl. 3, fig. 30.

Rhynchonella altilis Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 883.—Hitchcock, Geol. Vermont, 1, 1861, p. 277, fig. 176.

Chazyan: Chazy, etc., New York; South Hero, Vermont (Valcour); Ottawa Valley, Canada (Aylmer).

Camarotœchia pristina Raymond.

Camarotœchia pristina Raymond, Amer. Jour. Sci., 20, 1905, p. 368; Ann. Carnegie Mus., 7, 1911, p. 225, pl. 24, figs. 1–10.

Chazyan (Crown Point, Valcour): Valcour Island and Chazy, New York.

Camarotœchia pyrrha (Billings).

Rhynchonella pyrrha Billings, Cat. Sil. Foss. Anticosti, 1866, p. 44.

Anticostian (Gun River): East of Otter River, Anticosti.

Camarotœchia semiplicata (Conrad).

Atrypa semiplicata Conrad, 5th Ann. Rep. Geol. Surv. New York, 1841, p. 56.

Rhynchonella semiplicata Hall, 10th Rep. New York State Cab. Nat. Hist., 1857, p. 65, figs. 1, 2; Pal. New York, 3, 1859, p. 224, pl. 29, figs. 1a–o.

Camarotœchia semiplicata Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 129, pl. 16, figs. 13, 14; pl. 20, fig. 12.

Helderbergian (Coeymans): Schoharie and Carlisle, New York.

Upper Monroan (Lucas): Salt shaft, Detroit, Michigan.

Camarotœchia semiplicata angulata Grabau.

Camarotœchia semiplicata var. angulata Grabau, Bull. New York State Mus., 92, 1906, p. 118, fig. 27.

Helderbergian (Keyser—"Transition beds between Rondout and Manlius"): Schoharie Valley, New York.

Camarotœchia vicina (Billings).

Rhynchonella vicina Billings, Cat. Sil. Foss. Anticosti, 1866, p. 44.

Anticostian (Chicotte): Southwest Point, Anticosti.

Camarotœchia (Stegerhynchus) whitei (Hall).

Rhynchonella whitii Hall (not A. Winchell), Trans. Albany Inst., 4, 1863, p. 216; 28th Rep. New York State Mus. Nat. Hist., 1879, p. 164, pl. 26, figs. 23–33; 11th Rep. State Geol. Indiana, 1882, p. 307, pl. 26, figs. 23–33.—Beecher and Clarke, Mem. New York State Mus., 1, 1889, p. 39, pl. 4, figs. 1, 2, 4, 5.

Rhynchonella whitiana Miller, Amer. Pal. Fossils, 2d ed., 1883, p. 297.

Camarotœchia? whitii Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 190. Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 285, fig. 348.

Niagaran (Waldron): Waldron, etc., Indiana; Newsom, Tennessee,

Camarotœchia (Stegerhynchus) whitei præcursor (Foerste).

Rhynchonella (Stegerhynchus) whitii-præcursor Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 96, pl. 3, figs. 47A–C.

Upper Medinan (Brassfield): Clifton, Tennessee.

Camarotœchia winiskensis Whiteaves.

Camarotœchia(?) Winiskensis Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 272, pl. 25, figs. 5, 6.

Niagaran: Winisk River, Canada.

CAMEROCERAS Conrad. Genotype: C. trentonensis Conrad.

Cameroceras Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1842, p. 267.—Hall, Pal. New York, 1, 1847, p. 221, p. 198.—D'Orbigny, Prodr. de Pal., 1, 1849, p. 4.—Saemann, Palaeontographica, 3, 1852, p. 162.—Pictet, Traité Pal., 2d ed., 2, 1854, p. 642.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 148.—Salter, Quart. Jour. Geol. Soc. London, 15, 1859, p. 376, fig. 2.—Barrande, Syst. Sil. Centre Boheme, 2, pt. 3, 1874, p. 782.—Whitfield, Geol. Wisconsin, 4, 1882, p. 228.—Miller, N. A. Geol. Pal., 1889, p. 432.—Clarke, Geol. Minn., 3, pt. 2, 1897, p. 775.—Ruedemann, Bull. New York State Mus., 90, 1906, p. 404.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 39.

Sannionites Waldheim, Oryctographie Gouv. de Moscou, 1837, p. 125.—Barrande, Syst. Sil. Centre Boheme, 2, pt. 3, 1874, p. 769.—Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1883, p. 266.

Proterocameroceras Ruedemann, Bull. New York State Mus., 80, 1905, pp. 322, 325. (Genotype: Orthoceras brainerdi Whitfield.)

Suecoceras Holm, Sveriges Geol. Unders., ser. C, No. 163, 1896, p. 11; Geol. Foren. Stockholm Forhandl., 18, 1896, p. 402.

Cameroceras approximatum (Hall).

Endoceras approximatum Hall, Pal. New York, 1, 1847, p. 219, pl. 54, fig. 2a.—Barrande, Bull. Soc. Geol. France, 2d ser., 1855, p. 166; Neues Jahrb. f. Min., etc., 1855, p. 267.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 131.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 8, 1886, p. 244.

Cameroceras approximatum Whitfield and Hovey, Bull. Amer. Mus. Nat. Hist., 11, pt. 1, 1898, p. 58.

Trenton: Middleville, New York.

Cameroceras brainerdi (Whitfield).

Orthoceras brainerdi Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 319, pl. 27, figs. 14–16.—Seely, Rep. State Geol. Vermont, 7, 1910, pl. 56, fig. 5.

Orthoceras explorator Whitfield (not Billings), Bull. Amer. Mus. Nat. Hist., 3, 1890, p. 33, pl. 2, fig. 3.

Cameroceras (Proterocameroceras) brainerdi Ruedemann, Bull. New York State Mus., 80, 1905, pp. 296–339, figs. 5–18, pls. 6–9; Bull. 90, 1906, p. 405, pl. 1, figs. 5, 6; pl. 2, fig. 1.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 39, fig. 1234.

Canadian (Beekmantown): Fort Cassin, Vermont; Valcour, New York.

Cameroceras curvatum Ruedemann.

Cameroceras curvatum Ruedemann, Bull. New York State Mus., 90, 1906, p. 411, fig. 2, pl. 2, figs. 6, 7.

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

Cameroceras duplicatum (Hall).

Endoceras duplicatum Hall, Pal. New York, 1, 1847, p. 219, pl. 55, fig. 1.

Cameroceras duplicatum Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 580.

Trenton: Middleville, New York.

Cameroceras hennepini Clarke.

Cameroceras hennepini Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 779, pl. 52, figs. 1–3; pl. 53, figs. 1–3.

Endoceras hennepini Miller, N. A. Geol. Pal., 2d App., 1897, p. 773 (gen. ref.).

Trenton (Prosser): Two miles northeast of Spring Valley, Minnesota.

Cameroceras inæquabile (Miller).

Endoceras inæquabile Miller, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 86, pl. 4, figs. 3, 3a.

Suecoceras inæquabile Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 73, pl. 1, figs. 1, 2.

Richmond: Bristol, Illinois; Clarksville, Ohio; and Madison, Indiana (Waynesville).

Cameroceras lativentrum (Hall).

Endoceras lativentrum Hall, 3d Rep. New York State Cab. Nat. Hist., rev. ed., 1850, p. 181, pl. 5, fig. 1a, b (doc. ed., p. 173).

Cameroceras lativentrum Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 580 (gen. ref.).

Trenton: Near Lowville, New York.

Cameroceras marcoui (Barrande).

Endoceras marcoui Barrande, Syst. Sil. Centre Boheme, 2, 1874, p. 748, pl. 431, figs. 11–13.

Suecoceras marcoui Holm, Geol. Fören. Stockholm Förh., 18, 1896, pp. 403, 414.—Ruedemann, Bull. New York State Mus., 90, 1906, p. 425, figs. 9–11.

Canadian (Beekmantown): Phillipsburg, Quebec.

CAMEROCERAS PROTEIFORME Clarke. See Endoceras proteiforme.

CAMEROCERAS PROTEIFORME var. ELONGATUM Clarke and Reudemann. See Endoceras proteiforme elongatum.

Cameroceras tenuiseptum (Hall).

Orthoceras tenuiseptum Hall, Pal. New York, 1, 1847, p. 35, pl. 7, fig. 6.—Raymond, Amer. Pal. Bull. 5, 1, No. 14, 1902, p. 19.

Cameroceras tenuiseptum—Continued.

Cameroceras tenuiseptum Ruedemann, Bull. New York State Mus., 90, 1906, p. 408, pl. 3, figs. 1, 2; pl. 4, fig. 1; pl. 5, figs. 5, 6; pl. 6, fig. 2.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 40, fig. 1235.

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

Cameroceras trentonense Conrad.

Cameroceras Trentonensis Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1842, p. 267, pl. 16, fig. 3.—Owen (Emmons), Amer. Jour. Sci. and Arts, 47, 1844, p. 369, fig. 4.—Hall, Pal. New York, 1, 1847, p. 221, pl. 56, figs. 4a-c.—Verneuil and Marcou, Amer. Jour. Sci. and Arts, 2d ser., 17, 1854, p. 292.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 152.—Barrande, Neues Jahrb. f. Min., etc., 1855, p. 266; Bull. Soc. Geol. France, 2d ser., 12, 1855, p. 165.

Trenton: Middleville, New York.

Cameroceras velox (Billings).

Orthoceras velox Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 173.

Cameroceras velox Ruedemann, Bull. New York State Mus., 90, 1906, p. 410.

Chazyan: Mingan Island (Mingan), and Islands of Montreal and Bizard, Canada (Aylmer).

CAMPANULITES Troost. See Cleiocrinus Billings.

CAMPTOLITHUS Lindström. See Lyellia Edwards and Haime.

CANADOCYSTIS Jaekel. Genotype: Malocystites barrandi Billings.

Canadocystis Jaekel, Zeits. d. d. geol. Gesell., 52, 1900, p. 675.

Sigmacystis Hudson, Bull. New York State Mus., 149, 1911, p. 254. (Genotype: Malocystites emmonsi Hudson.)

Canadocystis barrandi (Billings).

Malocystites Barrandi Billings, Geol. Surv. Canada, dec. 3, 1858, pp. 67, 68, figs. 1, 2; pl. 7, figs. 2a-d.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 471.

Canadocystis Barrandei Jaekel, Zeit. d. d. geol. Ges., 52, 1900, pp. 675, 676, fig. 11.

Sigmacystis barrandi Hudson, Bull. New York State Mus., 149, 1911, p. 253 (gen. ref.).

Chazyan (Aylmer): Montreal, Quebec.

Canadocystis emmonsi (Hudson).

Malocystites emmonsi Hudson, Bull. New York State Mus., 80, 1905, pp. 270–277, figs. 1–3; pl. 1, figs. 3–7.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 471, fig. 1783.

Sigmacystis emmonsi Hudson, Bull. New York State Mus., 149, 1911, p. 253, figs. 35, 36.

Chazyan (Crown Point, Valcour): Valcour Island, etc., New York.

CANCER TRILOBIOIDES Eaton. See Triarthrus becki.

CANINIA Dana. See Zaphrentis Rafinesque.

CANISTROCRINUS Miller. See Glyptocrinus Hall.

CANNAPORA Hall. Genotype: C. junciformis Hall.

Cannapora Hall, Pal. New York, 2, 1852, p. 43.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 86.—Roemer, Lethæa geog., pt. 1, Leth. Pal., 1883, p. 498.—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 62.

CANNAPORA ANNULATA Nicholson and Hinde. See Cannapora junciformis.

Cannapora junciformis Hall.

Cannapora junciformis Hall, Pal. New York, 2, 1852, p. 43, pl. 18, figs. 1a–f.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 86, pl. 33, fig. 4.—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 63.

Cannapora annulata Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 138.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 58.

Niagaran: Ontario, Wayne County, and Rochester, New York (Clinton); Drummond Island, Lake Huron.

CAPELLINIA Hall and Clarke. Genotype: C. mira Hall and Clarke.

Capellinia Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 248, pl. 70, figs. 6–14; 13th Ann. Rep. New York State Geol., 1895, p. 847.—Miller, N. A. Geol. Pal., 2d. App., 1897, p. 759.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 395.

Capellinia mira Hall and Clarke.

Capellinia mira Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 249, pl. 70, figs. 6–14; 48th Rep. New York State Mus., 2, 1895, p. 368, pl. 13, figs. 5–13; 14th Rep. State Geol. New York, 1897, p. 368, pl. 13, figs. 5–13.

Niagaran (Racine): Milwaukee, Wisconsin.

CAPULUS AURIFORMIS Hall. See Diaphorostoma auriformis.

CAPULUS CANADENSIS Whiteaves. See Archinacella canadensis.

CARABOCRINUS Billings. Genotype: C. radiatus Billings.

Carabocrinus Billings, Geol. Surv. Canada, Rep. Prog. for 1853–1856, 1857, p. 275; Geol. Surv. Canada, dec. 4, 1859, p. 39, fig. 12.—Zittel, Handb. Pal., 1, Munich, 1879, p. 353.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 366 (Rev. Pal. pt. 1, p. 143); Ibid., 1886, p. 140; ibid., 1890, p. 380.—Billings, Trans. Ottawa Field Nat. Club, 1, 2, 1881, p. 34.—Miller, N. A. Geol. Pal., 1889, p. 230.—Bather, Ann. Mag. Nat. Hist., 6th ser., 5, 1890, p. 332, pl. 14, fig. 13; Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 172, fig. 84.—Zittel, Grundzuge Pal., 1, 1910, p. 152.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 504.—Springer, Zittel-Eastman Textb. Pal., 1913, p. 217.

Strophocrinus Sardeson, Amer. Geol., 24, 1889, p. 264. (Genotype: S. dicyclicus Sardeson.)

Carabocrinus dicyclicus (Sardeson).

Strophocrinus dicyclicus Sardeson, Amer. Geol., 24, 1899, p. 264, pl. 12.

Podolithus strophocrinus Sardeson, Jour. Geol., 14, 1908, p. 242, figs. 8–10.

Black River (Decorah): St. Paul, Minnesota; Ellsworth, Wisconsin.

Carabocrinus geometricus Hudson.

Carabocrinus geometricus Hudson, Bull. New York State Mus., 80, 1905, p. 282, pl. 1, figs. 1, 2, 7.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 504, fig. 1816.

Chazyan (Valcour): Valcour Island, Lake Champlain, New York.

Carabocrinus ovalis Miller and Gurley.

Carabocrinus ovalis Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 5, 1894, p. 25, pl. 2, figs. 20, 21.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 740, fig. 1323.

Trenton (Curdsville): Mercer County, Kentucky.

Carabocrinus radiatus Billings.

Carabocrinus radiatus Billings, Geol. Surv. Canada, Rep. Prog. for 1853–1856, 1857, p. 276; Geol. Surv. Canada, dec. 4, Can. Org. Rem., 1859, p. 31, pl. 2, figs. 3a–e.—Miller, N. A. Geol. Pal., 1889, p. 230, fig. 261.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 504, fig. 1817.—Springer, Mem. Geol. Surv. Canada, 15 P, 1911, p. 40 (loc. occ.).

Carabocrinus cf. radiatus Ruedemann, Bull. New York State Mus., 162, 1912, pl. 3, fig. 6.

Trenton: Ottawa and Kirkfield, Ontario (Curdsville); Snake Hill, Saratoga County, New York (Snake Hill).

Carabocrinus(?) tuberculatus Billings.

Carabocrinus(?) tuberculatus Billings, Geol. Surv. Canada, dec. 4, 1859, p. 33, pl. 10, fig. 2a–c.—Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 9 (loc. ref.).

Richmond (Charleton): Charleton Point, Anticosti.

Carabocrinus vancortlandti Billings.

Carabocrinus vancortlandti Billings, Geol. Surv. Canada, dec. 4, 1859, p. 32, pl. 2, fig. 4.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, 1900, p. 28, fig. 9.—Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 40.

Trenton (Curdsville): Township of McNab, and Kirkfield, Ontario.

CARCINOSOMA Miller. See Eusarcus Grote and Pitt.

CARCINOSOMA INGENS Claypole. See Eusarcus newlini.

CARCINOSOMA NEWLINI Claypole. See Eusarcus newlini.

CARDIODONTA Hall. See Stropheodonta Hall.

CARDIOMORPHA OBLIQUATA Meek. See Ceromyopsis obliquata.

CARDIOMORPHA POSTRIATA Emmons. See Lyrodesma postriata.

CARDIOMORPHA VENTRICOSA Emmons. See Whitella ventricosa.

CARDIOMORPHA VETUSTA Hall. See Cuneamya vetusta Hall.

CARDIUM IOWENSIS Owen. See Cypricardites iowensis.

CARINAROPSIS Hall. Genotype: C. carinata Hall.

Carinaropsis Hall, Pal. New York, 1, 1847, p. 183; 14th Rep. New York State Cab. Nat. Hist., 1861, p. 93.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 314; N. A. Geol. Pal., 1889, p. 400.—Koken, Bull. d. l'Acad. Imp. Sci. St. Petersburg, 7, 1897, p. 139.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, pp. 857–926.—Grabau and Shimer, N. A. Index Fossils, 3, 1909, p. 626.

Phragmostoma Hall, 14th Rep. New York State Cab. Nat. Hist., 1861, p. 94.—Zittel, Handb. Pal., 2, 1882, p. 184.—Koken, Neues Jahrb. f. Min., Geol. Pal., Beilage-Band, 6, 1889, p. 388.—Miller, N. A. Geol. Pal., 1889, p. 415.—Koken, Die Leitfossilien, Leipzig, 1896, p. 99.—Clarke, Archivos Mus. Nac. Rio de Janeiro, 10, author's Eng. ed., 1900, p. 42 footnote; Mem. New York State Mus., 6, 1904, p. 322 (Genotype: Carinaropsis cymbula Hall).

Carinaropsis acuta Ulrich and Scofield.

Carinaropsis acuta Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 928, pl. 62, figs. 6–9.

Black River (Decorah): Cannon Falls and near Fountain, Minnesota; Lincoln County, Missouri.

Cotypes.—Cat. Nos. 45736, 45737, U.S.N.M.

Carinaropsis carinata Hall.

Carinaropsis carinata Hall, Pal. New York, 1, 1847, p. 183, pl. 40, figs. 1a–c.—Ruedemann, Bull. New York State Mus., 49, 1901, p. 30.

Cyrtolites subcarinatus D'Orbigny, Prodr. Pal., 1, 1849, p. 9.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 167, pl. 6, figs. 25, 26.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, p. 183, figs.

Carinaropsis? subcarinata Ulrich and Scofield, Geol. Minnesota, 3, 1897, p. 859 (gen. ref.).

Trenton: Middleville and Trenton Falls, New York.

Carinaropsis cunulæ (Hall).

Carinaropsis (Phragmostoma) cunulæ Hall, 14th Rep. New York State Cab. Nat. Hist., 1861, p. 95.

Phragmostoma cunulæ Miller, N. A. Geol. Pal., 1889, p. 415 (gen. ref.).

Carinaropsis cunulæ Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 927, pl. 62, figs. 10–13.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 626, fig. 845a–c.

Trenton: Nashville, Tennessee (Catheys); Boyle County, Kentucky (Flanagan).

Plesiotypes.—Cat. No. 45738, U.S.N.M.

Carinaropsis cymbula (Hall).

Carinaropsis (Phragmostoma) cymbula Hall, 14th Rep. New York State Cab. Nat. Hist., 1861, p. 94.

Carinaropsis cymbula Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 927, pl. 62, figs. 1–4.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 626, fig. 845d–g.

Phragmostoma natator (in error for cymbula) Hall, 15th Rep. New York State Cab. Nat. Hist., 1862, pl. 6, figs. 12–14.

Phragmostoma cymbula Miller, N. A. Geol. Pal., 1889, p. 415, fig. 693.

Trenton: Allens Bluff, Tennessee (Catheys); Danville, Kentucky (Flanagan).

Plesiotypes.—Cat. No. 45739, U.S.N.M.

Carinaropsis deleta Sardeson. See Archinacella deleta.

Carinaropsis explanata Ulrich.

Carinaropsis explanata Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 929, pl. 62, fig. 5.

Trenton (Upper): Covington, Kentucky.

Holotype.—Cat. No. 45740, U.S.N.M.

Carinaropsis minima Ulrich and Scofield.

Carinaropsis minima Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 929, pl. 62, fig. 19.

Black River (Decorah): Near Cannon Falls, Minnesota.

Holotype.—Cat. No. 45741, U.S.N.M.

Carinaropsis orbiculatus Hall. See Archinacella orbiculata.

Carinaropsis patelliformis Hall. See Archinacella patelliformis and A. pulaskiensis.

Carinaropsis phalera (Sardeson).

Carinaropsis (or Bellerophon) phalera Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, 1892, p. 336, pl. 6, figs. 14–16.

Carinaropsis phalera Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 928, pl. 62, figs. 14–18.

Black River (Decorah): St. Paul, Minneapolis, and Chatfield, Minnesota; Lincoln County, Missouri.

Plesiotypes.—Cat. Nos. 45742, 45743, U.S.N.M.

CARINAROPSIS? SUBCARINATA Ulrich and Scofield. See Carinaropsis carinata.

CARINOPORA Zittel. See Semicoscinium Prout.

CARITODENS Foerste. See Pterinea Goldfuss.

CARPOMANON Rauff. Genotype: Spongia stellatimsulcatum Roemer.
Carpomanon Rauff, Palæontographica, 40, 1894, p. 314.

Carpomanon glandulosum Rauff.
Carpomanon glandulosum Rauff, Palæontographica, 40, 1894, p. 326, pl. 13, figs. 11, 12.
Niagaran (Brownsport): Decatur County, Tennessee.

Carpomanon stellatimsulcatum (Roemer).
Spongia stellatim-sulcata Roemer, Neues Jahrb. f. Min., etc., 1848, p. 686, pl. 9, fig. 5.
Astylospongia stellatim-sulcata Roemer, Sil. Fauna West Tennessee, 1860, p. 11, pl. 1, figs. 2, 2a, 2b; Cincinnati Quart. Jour. Sci., 1, 1874, p. 190; Leth. geog., 1 Theil, Leth. Pal., Erste Lief., 1880, p. 309.
Carpomanon stellatim-sulcatum Rauff, Palæontographica, 40, 1894, p. 325, pl. 12, figs. 4–13.
Caryomanon stellatim-sulcatum Foerste, Jour. Geol., 11, 1903, p. 714.
Niagaran (Brownsport): Brownsport, Perryville, etc., Tennessee.
Plesiotypes.—Cat. Nos. 46578, 49711, U.S.N.M.

Carpomanon stellatimsulcatum distorta Rauff.
Carpomanon stellatim-sulcatum var. distorta Rauff, Palæontographica. 40, 1894, p. 324, pl. 13, figs. 9, 10.
Niagaran (Brownsport): Decatur County, Tennessee.

CARYOCARIS Salter. Genotype: C. wrighti Salter.
Caryocaris Salter, Quart. Jour. Geol. Soc. London, 19, 1863, pp. 135, 139, fig. 15.—Jones, Rep. 53d Meeting Brit. Assoc. Adv. Sci., 1884, pp. 217, 221.—Zittel, Handb. Pal., 2, 1885, p. 659.—Jones and Woodward, Mon. Brit. Pal. Phyllopoda, Pal. Soc., 1888, p. 3; ibid., 1892, p. 89.—Whitfield, Geol. Surv. Ohio, Pal., 7, 1893, p. 455.—Gurley, Jour. Geol., 4, 1896, p. 85.—Ruedemann, Mem. New York State Mus., 7, pt. 1, Addendum, 1904, pp. 735–736.—Clarke, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 751.

Caryocaris curvilatus Gurley.
Caryocaris curvilatus Gurley, Jour., Geol., 4, 1896, p. 87, pl. 4, fig. 3; pl. 5, fig. 3.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 486, figs. 469, 470.
Caryocaris cf. curvilineatus Ruedemann, Mem. New York State Mus., 7, 1904, p. 738, pl. 17, fig. 17.
Canadian (Levis, Didymograptus zone): Point Levis, Quebec; Summit Nevada.

Caryocaris oblongus Gurley.
Caryocaris oblongus Gurley, Jour. Geol., 4, 1896, p. 87, pl. 4, fig. 2.
Caryocaris cf. oblongus Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, p. 738, fig. 104; pl. 17, figs. 14–16.
Canadian (Levis): Point Levis, Quebec.

Caryocaris wrighti Salter.
Caryocaris wrightii Salter, Quart. Jour. Geol. Soc. London, 19, 1863, p. 139, fig. 15.—Jones and Woodward, Mon. Brit. Phyllopoda, pt. 2, 1892, p. 91, fig. 6.—Gurley, Jour. Geol., 4, 1896, p. 87.—Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 736, 737, fig. 103; Mem. 11, pt. 2, 1908, pp. 486–488, fig. 482.
Lower Ordovician: Great Britain (Skiddaw); Nevada, Arkansas, etc. (Canadian).

CARYOCRINITES Say. Genotype: C. ornatus Say.

Caryocrinites Say, Jour. Acad. Nat. Sci. Philadelphia, 4, 1825, p. 289; Zool. Jour., London, 2, Oct., 1825, p. 311.—Von Buch, Quart. Jour. Geol. Soc. London, 2, 1846, p. 23.—Say (reprint), Bull. Amer. Pal., 1, 1876, p. 347.—Jaekel, Stamm. Pelm., 1, Thecoidea and Cystoidea, 1879, p. 313.—Zittel, Grundzuge Pal., 1, 1910, p. 186.

Caryocrinus Agassiz, Ann. Nat. Hist., 1, 1838, p. 448.—Austin and Austin, Mon. Recent and Fossil Crin., 1845, p. 53, fig.—D'Orbigny, Prodr. Pal., 1, 1847, p. 47.—Hall, Pal. New York, 2, 1852, pp. 216, 248.—Muller, Ann. Mag. Nat. Hist., 2d ser., 13, 1854, p. 247.—Pictet, Traite de Pal., 2d ed, 4, 1857, p. 300.—Billings, Amer. Jour. Sci. and Arts, 2d ser., 48, 1869, p. 72; 49, 1870, p. 53; Ann. Mag. Nat. Hist., 4th ser., 5, 1870, pp. 254, 411; Amer. Jour. Sci., 3d ser., 7, 1874, p. 530.—Zittel, Handb. Pal., 1, 1879, p. 418.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1887, pp. 100–113.—Miller, N. A. Geol. Pal., 1889, p. 231.—Carpenter, Rep. 60th Meeting British Assoc. Adv. Sci., 1891, p. 221.—Haeckel, Amphorideen u. Cystoideen, 1896, p. 143, pl. 4, figs. 2L, 21.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 67, fig. 36.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 149; Bull. New York State Mus., 45, 1901, p. 149.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 464.—Springer, Zittel-Eastman Textb. Pal. 1, 1913, p.153.

Caryocrinites bulbulus (Miller and Gurley).

Caryocrinus bulbulus Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 5, 1894, p. 11, pl. 2, figs. 15–18.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 740, fig. 1324.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 465.—Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 11, pl. 2, fig. 2.

Caryocrinites hexagonus Troost, Amer. Jour. Sci. and Arts, 2d ser., 8, 1849, p. 419; Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 60 (nom. nud.).

Caryocrinus hexagonus Shumard, Trans. Acad. Nat. Sci. St. Louis, 2, 1866, p. 359 (gen. ref.).

Niagaran (Brownsport): Wayne and Decatur Counties, Tennessee.

Plesiotype.—Cat. No. 39906, U.S.N.M. (Troost's type of C. hexagonus).

Caryocrinites ellipticus (Miller and Gurley).

Caryocrinus ellipticus Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 5, 1894, p. 10, pl. 2, figs. 13, 14.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 740, fig. 1325.

Clinton (Osgood): Osgood, Indiana.

Caryocrinites globosus (Troost).

Caryocrinites globosus Troost, Amer. Jour. Sci. and Arts, 2d. ser., 8, 1849, p. 419 (nom. nud.); Proc. Amer. Assoc. Adv. Sci., 2, 1850 (nom. nud.).

Caryocrinus globosus Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 351.—Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 11, pl. 2, fig. 1.

Niagaran (Brownsport): Decatur County, Tennessee.

Holotype.—Cat. No. 39907, U.S.N.M.

CARYOCRINITES GRANULATUS Troost. See Caryocrinites milliganæ.

Caryocrinites hammelli (Miller and Gurley).

Caryocrinus hammelli Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 9, 1896, p. 65, pl. 5, figs. 5, 6.

Clinton (Osgood): Madison County, Indiana.

CARYOCRINITES HEXAGONUS Troost. See Caryocrinites bulbulus.

Caryocrinites indianensis (Miller).

Caryocrinus indianensis Miller, 17th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1892, p. 629, pl. 5, figs. 9, 10 (adv. sheets 1891, p. 19); N. A. Geol. Pal., 1st App., 1892, p. 676, fig. 1218.

Clinton (Osgood): Jefferson County, Indiana.

CARYOCRINITES INSCULPTUS Troost. See Caryocrinites milliganæ.

Caryocrinites kentuckiensis (Miller and Gurley).

Caryocrinus kentuckiensis Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 6, 1895, p. 59, pl. 5, figs. 22–24.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 740, fig. 1320.

Niagaran (Louisville): Louisville, Kentucky.

CARYOCRINITES LORICATUS Say. See Caryocrinites ornatus.

CARYOCRINITES MECONIDEUS Troost. See Caryocrinites milliganæ.

Caryocrinites milliganæ (Miller and Gurley).

Caryocrinus milliganæ Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 9, 1896, p. 63, pl. 5, figs. 3, 4.

Caryocrinites granulatus Troost, Amer. Jour. Sci. and Arts, 2d ser., 8, 1849, p. 419 (nom. nud.); Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 60 (nom. nud.).

Caryocrinites meconideus Troost, Amer. Jour. Sci. and Arts, 2d ser., 8, 1849, p. 419; Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 60 (nom. nud.).

Caryocrinites insculptus Troost, Amer. Jour. Sci. and Arts, 2d ser., 8, 1849, p. 419; Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 60 (nom. nud.).

Caryocrinites Roemeri Jaekel, Stammes. Pelmat., Thecoidea u. Cystoidea, 1899, p. 314, pl. 17, fig. 3; p. 302, fig. 70.

Caryocrinus ornatus Roemer, Sil. Fauna West Tennessee, 1860, p. 33, pl. 3, figs. 1a–c.

Niagaran (Brownsport): Decatur County, Tennessee.

Plesiotypes.—Cat. Nos. 39904, 39905, U.S.N.M. (Troost's types of C. insculptus and C. granulatus).

Caryocrinites ornatus Say.

Caryocrinites ornatus Say, Jour. Acad. Nat. Sci. Philadelphia, 4, 1825, p. 290; Zool. Jour., London, 2, 1825, p. 311, pl. 11, fig. 1.—Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 51, pl. 25, fig. 2.—Buch, Bull. Soc. Geol. France, 2d ser., 1, 1844, p. 209, pl. 3, figs. 7–9, 11–15.—Say, Bull. Amer. Pal., 1, 1896, p. 348.—Jaekel, Stammes. Pelmat., 1, Thecoidea u. Cystoidea, 1899, p. 314, figs. 76, 77, pl. 17, fig. 1.—Von Buch, Abhandl. k. Akad. d. Wiss. for 1844, Berlin, 1846, p. 91, pl. 1, figs. 1–7; pl. 1, figs. 1–2.

Caryocrinus ornatus Owen, Amer. Jour. Sci. and Arts, 48, 1845, p. 314, figs. 1, 2.—Austin and Austin, Mon. Recent and Fossil Crinoidea, 1845, p. 53, pl. 7, figs. 3a–m.—Von Buch, Quart. Jour. Geol. Soc. London, 2, 1846, p. 11; Geol. Mem., p. 20, pl. 4, fig. 1.—Hall, Nat. Hist. New York, Geol., 4, 1843, p. 11, figs. 1, 2, etc.; Pal. New York, 2, 1852, p. 182, pl. A41, fig. 1; p. 216, pl. 49, figs. 1a–z; pl. 49A, figs. 1a–z.—Pictet, Traité de Pal., 2d ed., 4, 1857, p. 300, pl. 99, fig. 18.—Emmons, Man. Geol., 1860, p. 110, fig. 100.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 7, figs. 4, 5.—Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 91.—Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 357.—Billings, Canadian Nat., n. s., 4, 1869, p. 280, fig. 2; p. 285, fig. 4; p. 427, fig. 1; Amer. Jour. Sci. and Arts, 2d ser., 48, 1869, p. 72, fig. 3; p. 76, fig. 4; 49, 1870, p. 52, fig. 1—Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, pl. 11 (2), fig. 17; rev. ed., 1870, pl. 11, fig. 17.—

Caryocrinites ornatus—Continued.

Billings, Ann. Mag. Nat. Hist., 4th ser., 5, 1870, p. 254, fig. 3; p. 258, fig. 4; p. 410, fig. 1; Pal. Foss. Geol. Surv. Canada, 2, pt. 1, 1874, pp. 92, fig. 52; 93; 96; 97; fig. 53; 98; 105; fig. 64; 124.—Roemer, Leth. geog., 1, Leth. Pal., Atlas, 1876, pl. 11, fig. 4a.—Zittel, Handb. Pal., 1, 1879, p. 419, fig. 295.—Whitfield, Geol. Wisconsin, 4, 1882, p. 280, pl. 16, figs. 1, 2.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 191, fig.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1887, p. 113, pl. 4, fig. 6.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 119, figs.—Miller, N. A. Geol. Pal., 1889, p. 231, fig. 262.—Haeckel, Amphorideen u. Cystoideen, Leipzig, 1896, p. 144, fig. 23, pl. 4, figs. 20, 21.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 150, fig. 46; Bull. New York State Mus., 45, 1901, p. 150, fig. 46.—Rowley, Amer. Geol., 34, 1904, p. 280, pl. 16, figs. 47, 50, 52.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 465, figs. 1771–1773.

Caryocrinites loricatus Say, Jour. Acad. Nat. Sci. Philadelphia, 4, 1825, p. 291; Zool. Jour. London, 2, 1825, p. 312; Bull. Amer. Pal., 1, 1896, p. 349 (reprint).

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

CARYOCRINITES ROEMERI Jaekel. See Caryocrinites milliganæ.

CARYOCRINUS of authors. See Caryocrinites Say.

CARYOCRINUS HEXAGONUS Shumard. See Caryocrinites bulbulus.

CARYOCRINUS ORNATUS Roemer. See Caryocrinites milliganæ.

CARYOCYSTITES ALTERNATUM Hall. See Holocystites alternatus.

CARYOCYSTITES CYLINDRICUM Hall. See Holocystites cylindricus.

CARYOMANON Rauff. Genotype: Spongia incisolobata Roemer.

Caryomanon Rauff, Palæontographica, 40, 1894, p. 313.

Caryomanon incisolobatum Roemer.

Spongia incisolobata Roemer, Neues Jahrb. f. Min., etc., 1848, p. 685, pl. 9, fig. 4.

Astylospongia incisolobata Roemer, Sil. Fauna West. Tennessee, 1860, p. 11, pl. 1, figs. 3, 3a; Cincinnati Quar. Jour. Sci., 1, 1874, p. 191.—Hinde, Mon. British Foss. Sponges, Pal. Soc., 1888, p. 114, pl. 2, figs. 5, 5a.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 14.

Caryomanon incisolobatum Rauff, Palæontographica, 40, 1894, p. 325, pl. 14, figs. 7, 8.—Foerste, Jour. Geol., 11, 1903, p. 714.

Niagaran (Brownsport): Brownsport, Perryville, etc. Tennessee.

Caryomanon patei Foerste.

Caryomanon patei Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 107, pl. 1, fig. 15.

Niagaran (Brownsport): Near Martins Mills, Tennessee.

Caryomanon roemeri Rauff.

Caryomanon Roemeri Rauff, Palæontographica, 40, 1904, p. 323, pl. 14, figs. 4–6.

Astylospongia Roemeri Hinde, Cat. Foss. Sponges, 1883, p. 92, pl. 23, figs. 1a–b.

Niagaran (Brownsport): West Tennessee.

CARYOMANON STELLATIM-SULCATUM Foerste. See Carpomanon stellatimsulcatum.

CARYOSPONGIA Rauff. Genotype: Siphonia juglans Quenstedt.

Caryospongia Rauff, Palæontographica, 40, 1894, p. 296.

Caryospongia juglans nuxmoschata (Hall).

Astylospongia præmorsa var. nuxmoschata Hall, 28th Rep. New York State Mus. Nat. Hist., mus. ed. 1879, p. 104, pl. 3, figs. 12, 13; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 223, pl. 2, figs. 12, 13.

Caryospongia juglans (Quenstedt) var. nuxmoschata Rauff, Palæontographica, 40, 1894, p. 310, pl. 11, figs. 4–6.

Niagaran (Waldron): Waldron, Indiana; Newsom, Tennessee.

Plesiotype.—Cat. No. 46548, U.S.N.M.

CASTOCRINUS KENTUCKIENSIS Miller and Gurley. See Cremacrinus articulosus.

CASTOCRINUS Ringueberg. See Cremacrinus Ulrich.

CATASCHISMA Branson. Genotype: C. typa Branson.

Cataschisma Branson, Trans. Acad. Sci. St. Louis, 18, 1909, p. 43.

Cataschisma typa Branson.

Cataschisma typa Branson, Trans. Acad. Sci. St. Louis, 18, 1909, p. 43, pl. 7, fig. 15.

Black River (Auburn-Decorah): Lincoln County, Missouri.

CATAZYGA Hall and Clarke. Genotype: Athyris headi Billings.

Catazyga Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 157, fig. 151; 13th Ann. Rep. New York State Geol. 1895, p. 803.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 333.—Cumings, 32d Ann. Rep., Dep. Geol. Nat. Res. Indiana, 1908, p. 887.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 408.

CATAZYGA ERRATICA Hall and Clarke. See Zygospira erratica.

Catazyga headi (Billings).

Athyris headi Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 147, fig. 125 (adv. sheets, 1862); Geol. Canada, 1863, p. 212, fig. 214.

Zygospira headi Hall, 23d Rep. New York State Cab. Nat. Hist., 1872, pl. 13, figs. 23–25 (ext. 1871).—Davidson, Suppl. Brit. Sil. Brach., Pal. Soc., 1882, pp. 125, 126, fig.

Glassia headi Miller, N. A. Geol. Pal., 1889, p. 346.

Catazyga headi Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 158, fig. 151; pl. 54, figs. 24–26, 30.

Richmond: St. Lawrence River, opposite Three Rivers; near St. Nicholas, St. Croix, and Becancour River, Quebec.

CATAZYGA HEADI Cumings. See Catazyga headi schuchertana.

Catazyga headi anticostiensis (Billings).

Athyris Headi var. Anticostiensis Billings, Pal. Foss. 1, Geol. Surv. Canada, 1865, p. 147, fig. 127a, b (adv. sheets, 1862).

Athyris anticostiensis Billings, Geol. Canada, 1863, p. 212, fig. 215.

Zygospira anticostiensis Davidson, Suppl. Brit. Sil. Brach., Pal. Soc., 1882, p. 127, p. 128, figs. 1, 2.

Catazyga headi var. anticostiensis Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pl. 54, figs. 33, 34.

Richmond (English Head and Charleton): English Head, etc., Anticosti.

Catazyga headi borealis (Billings).

Athyris Headi var. borealis Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 147, fig. 126a, b (adv. sheets, 1862).

Athyris borealis Billings, Geol. Canada, 1863, p. 212, fig. 216.

Catazyga headi borealis Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pl. 54, figs. 31–32.

Richmond: Lake St. John and Anticosti, Canada.

CATAZYGA HEADI BOREALIS Hall and Clarke (part). See Catazyga headi schuchertana.

Catazyga headi schuchertana (Ulrich).

Glassia schuchertana Ulrich, Amer. Geol., 1, 1888, p. 186.

Zygospira headi Meek, Pal. Ohio, 1, 1873, p. 127, pl. 11, fig. 1.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 59.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1283, figs.

Catazyga headi var. borealis Hall and Clarke (part), Pal. New York, 8, pt. 2, 1895, pl. 54, fig. 27.

Catazyga headi Cumings, 32 Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 896, pl. 33, figs. 1–1c.

Catazyga headi schuchertana Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 32, pl. 2, fig. 3; pl. 3, figs. 2a–c, 11.

Richmond (Waynesville): Blanchester, etc., Ohio; Indiana; Kentucky.

Catazyga uphami (Winchell and Schuchert).

Zygospira uphami Winchell and Schuchert, Amer. Geol., 9, 1892, p. 291; Geol. Minnesota, 3, 1892, p. 468, pl. 34, figs. 45–48.

Catazyga uphami Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 170.

Trenton (Prosser): Near Spring Valley, Wykoff, and Fountain, Minnesota.

CATAZYGA UPHAMI AUSTRALIS Foerste. See Protorhyncha ridleyana.

CATENIPORA Lamarck. See Halysites Lamarck.

CATENIPORA ESCHAROIDES Lamarck. See Halysites catenularia.

CATENIPORA MEANDRINA Troost. See Halysites labyrinthica.

CATENIPORA MICHELINI Castelnau. See Halysites labyrinthica.

CAUNOPORA Phillips. Genotype: Coscinopora placenta Lonsdale.

Caunopora Phillips, Pal. Foss. Cornwall, Devon, and West Somerset, 1841, p. 18.—McCoy, British Pal. Rocks Foss., 1854, p. 66.—Winchell, Proc. Amer. Assoc. Adv. Sci., 15, 1867, p. 99.—Carter, Ann. Mag. Nat. Hist., 5th ser., 2, 1878, p. 310; 4, 1879, p. 101.—Nicholson and Murie, Jour. Linn. Soc. Zool., 14, 1878, pp. 219, 211.—Dawson, Quart. Jour. Geol. Soc. London, 35, 1879, p. 56.—Zittel, Handb. Pal., 1, 1879, p. 286.—Roemer, Geol. Mag., dec. 2, 7, 1880, p. 343.—Spencer, Bull. Mus. Univ. State Missouri, 1, 1884, p. 46; Trans. Acad. Sci. St. Louis, 4, 1884, p. 596.—Frech, Paleont. Abhandl., Dames and Kayser, 3, Heft 3, 1886, p. 115.—Nicholson, Mon. Brit. Stromatoporoids, Pal. Soc., 1886, pp. 11, 22, 110.—Miller, N. A. Geol. Pal., 1889, p. 156; Zittel Eastman Textb. Pal., 2d ed., 1913, p. 123.

Caunopora hudsonica Dawson.

Caunopora hudsonica Dawson, Quart. Jour. Geol. Soc. London, 35, 1879, p. 52, pl. 4, fig. 9; pl. 5, fig. 10.

Niagaran: Albany River, Hudson Bay, Canada.

Caunopora mirabilis Spencer.

Caunopora mirabilis Spencer, Bull. Mus. Univ. State Missouri, 1, No. 1, 1884, p. 47, pl. 6, figs. 10, 10a–b; Trans. Acad. Sci. St. Louis, 4, 1884, p. 597, pl. 6, figs. 10–10b.—Whiteaves, Canadian Rec. Sci., 7, 1896, p. 145.—Parks, Univ. Toronto Studies (Geol. Ser.), 5, 1908, p. 65.

Niagaran dolomite: Hamilton, Ontario.

CAUNOPORA WALKERI Spencer. See Protarea walkeri.

CENTROCRINUS TENNESSEENSIS Worthen. See Ormocrinus tennesseensis.

CENTRONELLA Billings. Genotype: Rhynchonella glansfagea Hall.

Centronella Billings, Canadian Nat. Geol., 4, 1859, p. 131, figs. 1–5; Canadian Jour., 6, 1861, p. 271.—Hall, 16th Rep. New York State Cab. Nat. Hist., 1863, p. 45, figs. 13–17; Amer. Jour. Sci., 2d ser., 35, 1863, p. 396.—Billings, ibid., 36, 1863, p. 237.—Hall, Trans. Albany Inst., 4, 1863, pp. 134, 148. Winchell, Proc. Acad. Nat. Sci. Philadelphia, 1865, p. 122.—Hall, Pal. New York, 4, 1867, p. 399.—Hall and Clarke, ibid., 8, pt. 2, 1893, p. 265; 13th Ann. Rep. New York State Geol., 1895, p. 853.

CENTRONELLA BILLINGSIANA Meek and Worthen. See Whitfieldella? billingsana.

Centronella? biplicata Weller.

Centronella? biplicata Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 261, pl. 24, figs. 1–8.

Helderbergian (Keyser—"Manlius"): Nearpass quarry, two miles south of Tri-States, New York.

CERAMOPHYLLA Ulrich. Genotype: Ceramophylla frondosa Ulrich.

Ceramophylla Ulrich, Geol. Minnesota, 3, 1893, p. 331.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 24.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 123.—Bassler, Zittel-Eastman Textb., Pal. 1913, p. 328.

Ceramophylla frondosa Ulrich.

Ceramophylla frondosa Ulrich, Geol. Minnesota, 3, 1893, p. 331, pl. 28, figs. 3–7; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 268, fig. 438.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 123, fig. 182b.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 328, fig. 466.

Black River (Decorah): St. Paul and Goodhue County, Minnesota.

Cotypes.—Cat. No. 43279, U.S.N.M.

CERAMOPORA Hall. Genotype: C. imbricata Hall.

Ceramopora Hall, Amer. Jour. Sci., 2d ser., 11, 1851, p. 400; Pal. New York, 2, 1852, p. 168.—Pictet, Traite de Pal., 4, 1857, p. 170.—Eichwald, Lethæa Rossica, 1, 1860, p. 412.—Zittel, Handb. Pal., 1880, p. 617.—Vine, Quart. Jour. Geol. Soc. London, 36, 1880, p. 358.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 156.—Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 169.—Hall and Simpson, Pal. New York, 6, 1887, p. xviii.—James and James, Jour. Cincinnati Soc. Nat. Hist., 11, 1888, p. 36.—Miller, N. A. Geol. Pal., 1889, p. 296.—Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 380, 462.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 112.—Ulrich, Zittel's Textb. Pal. (Engl. ed.), 1896, p. 267.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 563.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 23.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 162; Bull. New York State Mus., 45, 1901, p. 162.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 18.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 121.—Hennig, Archiv. fur Zool., 4, No. 21, 1908, p. 1.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 76; Zittel-Eastman Textb. Pal., 1913, p. 327.

CERAMOPORA AGELLUS Hall. See Ceramopora? confluens.

CERAMOPORA ALTERNATA James. See Cœloclema alternatum.

CERAMOPORA? BEANI James. See Paleschara beani.

Ceramopora concentrica James. Not recognized.

Ceramopora concentrica James, Paleontologist, 1, 1878, p. 5.—James and James, Jour. Cincinnati Soc. Nat. Hist., 11, 1888, p. 38, pl. 1, figs. 8, 8a.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 25.

Ceramopora concentrica—Continued.

Eden: Cincinnati, Ohio, and vicinity.

Observation.—Upon restudy in 1906 the type lot was found to contain a mixture of species. The only specimen ever illustrated (James and James, 1888) proved to be an example of Hallopora onealli sigillarioides.

Ceramopora? confluens Hall.

Ceramopora confluens Hall, 28th Ann. Rep. New York State Mus., doc. ed., 1876, pl. 7, figs. 4, 5; mus. ed., 1879, p. 119, pl. 8, figs. 4, 5; 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 243, pl. 7, figs. 4, 5.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, pl. 20, figs. 14, 15.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 197.

Ceramopora? (Berenicea) labecula Hall, 23th Ann. Rep. New York State Mus., doc. ed., 1876, pl. 8, figs. 1–3; mus. ed., 1879, p. 119, pl. 8, figs. 1–3.

Ceramopora labecula Hall, 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 242, pl. 7, figs. 1–3.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, pl. 20, fig. 11.

Ceramopora agellus Hall, 28th Ann. Rep. New York State Mus., doc. ed., 1876, pl. 8, fig. 6; mus. ed., 1879, p. 120, pl. 8, fig. 6.—Hall, 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 243, pl. 7, fig. 6.

Niagaran (Waldron): Waldron, Indiana.

Observation.—This species is probably a fistuliporoid. C. agellus and C. labecula are apparently young specimens.

Ceramopora? expansa (James).

Alveolites expansa James, Paleontologist, No. 3, 1879, p. 19.

Ceramopora expansa Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 169; 3, 1888, pl. 17, fig. 13.

Upper Medinan (Brassfield): Clinton County, Ohio.

Ceramopora? explanata Hall.

Ceramopora? (Lichenalia?) explanata Hall, Trans. Albany Inst., 10, 1883, p. 61 (abs., 1879, p. 5); 11th Ann. Rep. Indiana Geol. Nat. Hist, 1882, p. 245.

Niagaran (Waldron): Waldron, Indiana.

Observation.—Can not be recognized without restudy of types.

Ceramopora foliacea Hall. See Meekopora foliacea.

Ceramopora imbricata Hall.

Ceramopora imbricata Hall, Pal. New York, 2, 1852, p. 169, pl. 40e, figs. 1a–i.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 463, pl. 39, figs. 1–b.—Grabau, Bull. New York State Mus., 45, 1901, p. 163, fig. 58; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 163, fig. 58.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 19, pl. 6, figs. 1–10.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 121, fig. 181.

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

Plesiotypes.—Cat. Nos. 35464, 43280, U.S.N.M.

Ceramopora incondita Ulrich and Bassler.

Ceramopora? incondita Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 260, pl. 41, figs. 13–17; pl. 44, figs. 1–3.

Helderbergian (Keyser): Near Cumberland and Pinto, Maryland; Keyser, West Virginia.

Cotypes.—Cat. No. 53667, U.S.N.M.

Ceramopora incrustans Hall. See Fistulipora crustula.

CERAMOPORA? IRREGULARIS James. See Batostoma implicatum and B. jamesi.

CERAMOPORA? (BERENICEA) LABECULA Hall. See Ceramopora? confluens.

Ceramopora niagarensis Bassler.

Ceramopora niagarensis Bassler, Bull. U. S. Geol. Surv., 292, 1906, pp. 19, 20, pl. 6, figs. 11–13.

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

Cotypes.—Cat. No. 35736 , U.S.N.M.

Ceramopora nicholsoni James. Not recognized.

Ceramopora Nicholsoni James, Cat. Foss. Cincinnati Group, 1875, p. 3.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 27.

Monticulipora (Fistulipora) nicholsoni James and James, Jour. Cincinnati Soc. Nat. Hist., 11, 1888, p. 34, pl. 1, figs. 6, 6c.—J. F. James, ibid., 18, 1896, p. 121, fig. 12.

Maysville: Cincinnati, Ohio, and vicinity.

Observation.—A study of the types in 1906 showed they did not have the characters assigned them by the author of the species.

Ceramopora? notha Hall.

Ceramopora (Paleschara?) nothus Hall, Trans. Albany Inst., 10, 1883, p. 62 (abs., 1879, p. 6); 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 244.

Niagaran (Waldron): Waldron, Indiana.

Observation.—Can not be recognized without a restudy of types.

CERAMOPORA OHIOENSIS Nicholson. See Ceramoporella ohioensis.

CERAMOPORA ORBICULATA Ringueberg. See Ceramoporella orbiculata.

CERAMOPORA RADIATA James. See Ceramoporella granulosa milfordensis.

Ceramopora? raripora Hall.

Ceramopora raripora Hall, 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 244; Trans. Albany Inst., 10, 1883, p. 62 (abs., 1879, p. 6).

Niagaran (Waldron): Waldron, Indiana.

Observation.—Species can not be recognized from description.

CERAMOPORA WHITEI (James). See Ceramoporella whitei.

CERAMOPORELLA Ulrich. Genotype: C. distincta Ulrich.

Ceramoporella Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 156.—Miller, N. A. Geol. Pal., 1889, p. 297.—Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 380, 464; Geol. Minnesota, 3, 1893, p. 328.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 15.—Ulrich, Zittel's Textb. Pal. (Engl. ed.), 1896, p. 267.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 564.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 23.—Bassler, ibid., 292, 1906, p. 20.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 121.—Cumings, 32d Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 742.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 81; Zittel-Eastman Textb. Pal., 1913, p. 327.

Ceramoporella distincta Ulrich.

Ceramoporella distincta Ulrich, Geol. Surv. Illinois, 8, 1890, p. 464, pl. 39, figs. 6, 6a.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 200.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 122.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 799, pl. 10, fig. 7; pl. 11, figs. 2, 2a.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 327, fig. 462.

Ceramoporella distincta—Continued.

Not Ceramoporella distincta Ulrich, Geol. Minnesota, 3, 1893, p. 328, pl. 28, fig. 13; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 267, fig. 435.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 565, fig. 130.

Eden and Maysville (Fairview): Cincinnati, Ohio, and vicinity.

Cotypes.—Cat. No. 43225, U.S.N.M.

Ceramoporella granulosa Ulrich.

Ceramoporella granulosa Ulrich, Geol. Surv. Illinois, 8, 1890, p. 466, pl. 41, figs. 2, 2a.—Nickles and Bassler, Bull. U. S. Geol. Surv., p. 173, 1900, p. 200.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 799, pl. 11, figs. 3, 3a.

Richmond: Wilmington, Illinois; Iron Ridge, Wisconsin; Richmond and Versailles, Indiana; Oxford, Waynesville, and other localities in Ohio.

Sections of *holotype.*—Cat. No. 43227, U.S.N.M.

Ceramoporella granulosa milfordensis (James).

Callopora milfordensis James, Paleontologist, No. 2, 1878, p. 11.

Monticulipora (Fistulipora) milfordensis James and James, Jour. Cincinnati Soc. Nat. Hist., 11, 1888, p. 36, pl. 1, figs. 7–7b.—J. F. James, ibid., 18, 1896, p. 122.

Ceramoporella granulosa-milfordensis Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 200.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 28, pl. 6, fig. 7.

Ceramopora radiata James, Paleontologist, No. 2, 1878, p. 12.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 199.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 28.

Fistulipora sp.? Hall and Simpson, Pal. New York, 6, 1889, pl. 14, figs. 15–17; pl. 23, fig. 4.

Eden: Milford, Ohio; Cincinnati, Ohio, and vicinity.

Ceramoporella granulosa minor Bassler.

Ceramoporella granulosa minor Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 81, 82, fig. 22.

Black River (Decorah): Minnesota.

Ordovician (Jewe and Wassalem): Uxnorm, Esthonia, Russia.

Ceramoporella inclusa Ulrich.

Ceramoporella inclusa Ulrich, Geol. Minnesota, 3, 1893, p. 329, pl. 28, figs. 8–11.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 565, fig. 132.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 122, fig. 178j.

Black River (Decorah): Cannon Falls, St. Paul, etc., Minnesota.

Cotypes.—Cat. Nos. 43223, 54701, U.S.N.M.

Ceramoporella interporosa Ulrich.

Ceramoporella interporosa Ulrich, Geol. Minnesota, 3, 1893, p. 330, pl. 28, fig. 12.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 565, fig. 131.

Trenton (Prosser): Goodhue County, Minnesota.

Holotype.—Cat. No. 43226, U.S.N.M.

Ceramoporella irregularis Bassler. See Ceramoporella reticulata.

Ceramoporella? irregularis (Whitfield).

Alveolites irregularis Whitfield, Ann. Rep. Wisconsin Geol. Surv. for 1877, 1878, p. 72; Geol. Surv. Wisconsin, 4, 1882, p. 251, pl. 11, figs. 1, 2.

Ceramoporella? irregularis Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 200.

Richmond (Maquoketa): Iron Ridge, Wisconsin.

Ceramoporella ohioensis (Nicholson).

Ceramopora Ohioensis Nicholson, Pal. Ohio, 2, 1875, p. 265, pl. 25, figs. 10a, b, c (not 10c, d).—James and James, Jour. Cincinnati Soc. Nat. Hist., 11, 1878, p. 37.—Miller, N. A. Geol. Pal., 1889, p. 297, fig. 466.

Ceramoporella? ohioensis Ulrich, Geol. Surv. Illinois, 8, 1890, p. 466, pl. 39, figs. 2, 2a.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1907, p. 800, pl. 11, figs. 4–4g.—Grabau and Shimer, N. A. Index Fossils, 1, 1908, p. 122.

Eden—Richmond: Cincinnati, Ohio, and vicinity; Indiana; Kentucky; Tennessee; Illinois; Wisconsin.

Plesiotype.—Cat. No. 43224, U.S.N.M.

Ceramoporella orbiculata (Ringueberg).

Ceramopora orbiculata Ringueberg, Bull. Buffalo Soc. Nat. Hist., 5, 1886, p. 19, pl. 2, figs. 13, 13a.

Ceramoporella orbiculata Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 20, pl. 9, figs. 12–15.

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

Plesiotypes.—Cat. No. 35478, U.S.N.M.

Ceramoporella reticulata (Spencer).

Dictyostoma reticulatum Spencer, Bull. Missouri State Mus., 1, 1884, p. 51, pl. 6, figs. 14, 14a; Trans. Acad. Sci. St. Louis, 4, 1884, p. 601, pl. 6, figs. 14, 14a.

Dictyostroma reticulatum Whiteaves, Canadian Rec. Sci., 7, 1896, p. 145.

Ceramoporella irregularis Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 21, pl. 9, figs. 7–9.—Parks, Univ. Toronto Studies, geol. ser., No. 5, 1908, p. 63, pl. 9, fig. 9; pl. 14, fig. 1.

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

Plesiotype.—Cat. No. 35480, U.S.N.M. (Bassler's type of C. irregularis).

Ceramoporella stellata Ulrich.

Ceramoporella stellata Ulrich, Geol. Surv. Illinois, 8, 1890, p. 465, pl. 41, figs. 1, 1a.

Richmond (Maquoketa): Sterling, Illinois.

Ceramoporella triloba Cumings and Galloway.

Ceramoporella triloba Cumings and Galloway, 37th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1913, p. 74, pl. 6, figs. 1–1c.

Eden (McMicken): Big Four Railroad, near Guilford, Indiana.

Ceramoporella tubulosa Cumings and Galloway.

Ceramoporella tubulosa Cumings and Galloway, 37th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1913, p. 75, pl. 6, figs. 2, 2a; pl. 7, figs. 1–1c.

Eden (McMicken): Big Four Railroad, near Guilford, Indiana.

Ceramoporella whitei (James).

Ceramopora Whitei James, Paleontologist, No. 2, 1878, p. 12.—James and James, Jour. Cincinnati Soc. Nat. Hist., 11, 1888, p. 38, pl. 1, figs. 9, 9a.

Ceramoporella whitei Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 201 (gen. ref.).—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 29, pl. 5, fig. 6; pl. 6, figs. 8–10.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 801.

Maysville: Cincinnati, Ohio, and vicinity.

CERATELLA Ulrich. See Ceratopsis Ulrich.

CERATIOCARIS McCoy. Genotype: C. solenoides McCoy.

Ceratiocaris McCoy, Ann. Mag. Nat. Hist., 2d ser., 1849, p. 412; Cont. British Pal., 1854, p. 151, fig.—Miller, N. A. Geol. Pal., 1889, p. 537.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 375.—Clarke, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 750.

Ceratiocaris aculeata (Hall).

Ceratiocaris aculeatus Hall, Pal. New York, 3, 1859, p. 422, pl. 80A, fig. 10.—Jones, Rep. 55th Meeting British Assoc. Adv. Sci., 1886, p. 355.—Jones and Woodward, Mon. British Pal. Phyllopoda, Pal. Soc., 1888, p. 62.

Cayugan (Bertie): Waterville, New York.

Ceratiocaris acuminata Hall.

Ceratiocaris acuminatus Hall, Pal. New York, 3, 1859, p. 422, pl. 84, fig. 6.—Pohlman, Bull. Buffalo Soc. Nat. Sci., 5, 1886, p. 28, pl. 3, fig. 2.—Jones, Rep. 55th Meeting British Assoc. Adv. Sci., 1886, p. 354.—Jones and Woodward, Mon. British Pal. Phyllopoda, Pal. Soc., 1888, p. 27.—Stose, Proc. Boston Soc. Nat. Hist., 26, 1894, p. 369, figs.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 227, fig. 159; Bull. New York State Mus., 45, 1901, p. 227, fig. 159.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 375, fig. 1676.

Cayugan (Bertie): Buffalo, New York.

Ceratiocaris deweyi (Hall).

Onchus deweyi Hall, Pal. New York, 2, 1852, p. 320, pl. 71, figs. 3a–d.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 824, fig. 639.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 495, figs.

Ceratiocaris? deweyi Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 83.—Jones, Rep. 55th Meeting British Assoc. Adv. Sci., 1886, p. 354.

Ceratiocaris (Phasganocaris?) deweyi Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 227, fig. 160; Bull. New York State Mus., 45, 1901, p. 227, fig. 160.

Clinton (Rochester): Lockport and Rochester, New York.

CERATIOCARIS GRANDIS Pohlman. See Pterygotus (Erettopterus) grandis.

Ceratiocaris maccoyana Hall.

Ceratiocaris maccoyanus Hall, Pal. New York, 3, 1859, p. 421, pl. 84, figs. 1–5.—Jones, Rep. 55th Meeting British Assoc. Adv. Sci., 1886, p. 354.

Cayugan (Bertie): Buffalo, New York.

Ceratiocaris (Limnocaris) præcedens Clarke.

Ceratiocaris (Limnocaris) præcedens Clarke, 54th Rep. New York State Mus., 1901, p. 92, pl. 3, figs. 5–10.

Cayugan (Pittsford): Near Pittsford, Monroe County, New York.

CERATOCEPHALA Warder. Genotype: C. goniata Warder.

Ceratocephala Warder, Amer. Jour. Sci., 34, 1838, pp. 377, 378.—Vogdes, Proc. Acad. Nat. Sci. Philadelphia, 1877, p. 139.—Clarke, 10th Rep. State Geol. New York for 1890, 1891, pp. 63, 66–68; 44th Rep. New York State Mus., 1892, p. 93, 96–98.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 722.

Acanthaloma Conrad, 3d Ann. Rep. New York. Geol. Surv., 1840, p. 205.—Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 23.—Hall, Pal. New York, 3, 1861, p. 370.—Clarke, 10th Rep. State Geol. New York for 1890, 1891, p. 64; 44th Rep. New York State Mus., 1892, p. 94.

Ceratocephala anchoralis (Miller).

Acidaspis anchoralis Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 349, figs. 23, 24; N. A. Geol. Pal., 1889, p. 526, figs. 951, 952.

Maysville: Cincinnati, Ohio, and vicinity.

Ceratocephala ceralepta Anthony.

Ceratocephala ceralepta Anthony, Amer. Jour. Sci., 34, 1838, p. 379, figs.—Vogdes, Proc. Acad. Nat. Sci. Philadelphia, 1877, p. 140.—Clarke, 44th Rep. New York State Mus., 1892, pp. 98, 101.

Ceratocephala ceralepta—Continued.

Acidaspis ceralepta Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 169, pl. 14, figs. 8, 9.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 130.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1052, pl. 54, figs. 1, 1a.

Maysville: Cincinnati, Ohio, and vicinity.

Ceratocephala cincinnatiensis (Meek).

Acidaspis Cincinnatiensis Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 167, pl. 14, fig. 3.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 130.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1023, pl. 54, figs. 2, 4.

Ceratocephala cincinnatiensis Vogdes, Proc. Acad. Nat. Sci. Philadelphia, 1877, p. 140.

Acidaspis rhyncocephalus Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 169.—Miller, Cincinnati Quart. Jour. Sci., 1874, p. 131.

Eden: Cincinnati, Ohio and vicinity.

Ceratocephala coalescens Van Ingen.

Ceratocephala coalescens Van Ingen, School of Mines Quart., 23, 1901, p. 48, fig. 11, p. 41.

Niagaran (St. Clair): St. Clair Spring, Independence County, Arkansas.

Ceratocephala crosotus Vogdes. See Odontopleura crosota.

Ceratocephala depauperata Van Ingen.

Ceratocephala goniata depauperata Van Ingen, School of Mines Quart., 23, 1901, p. 42.

Niagaran (St. Clair): St. Clair Spring, Independence County, Arkansas.

Ceratocephala fimbriata (Hall).

Acidaspis fimbriata Hall, 11th Rep. Dep. Geol. Nat. Hist., Indiana, 1882, p. 334, pl. 33, fig. 11; Trans. Albany Inst., 10, 1883, p. 76.

Ceratocephala fimbriata Clarke, 44th Rep. New York State Mus., 1892, p. 101 (gen. ref.)

Niagaran (Waldron): Waldron, Indiana; Newson, Tennessee.

Ceratocephala goniata Warder.

Ceratocephala goniata Warder, Amer. Jour. Sci., 1st ser., 34, 1838, p. 378, fig.—Vogdes, Proc. Acad. Nat. Sci. Philadelphia, 1877, p. 140.—Clarke, 44th Rep. New York State Mus. Nat. Hist., 1892, pp. 91–100, pl. 1, fig. 1.—Kindle, 28th Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 480, pl. 24, fig. 13.—Van Ingen, School of Mines Quart., 23, 1901, p. 42, pl., figs. 3, 3a.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 255, pl. 23, figs. 1–2.—Raymond, Bull. Victoria Mem. Mus., 1, 1913, p. 38.

Acidaspis ida Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, pp. 106, 109, 112, pl. 3, fig. 13.—Vogdes, Proc. Acad. Nat. Sci. Philadelphia, 1877, p. 140.

Acidaspis danai Hall, Geol. Surv. Wisconsin, 1, 1862, p. 432 (no description); Adv. sheets, 18th Rep. New York State Cab. Nat. Hist., 1865, p. 28; 20th Rep., 1867, p. 333, pl. 21, figs. 8, 9, p. 389; rev. ed., 1870, p. 423, pl. 21, figs. 8, 9.

Niagaran: Near Springfield, Ohio; Bridgeport, etc., Illinois; Port Daniel, Bay of Chaleurs and Lake Memphremagog, Quebec.

Ceratocephala goniata depauperata Van Ingen. See Ceratocephala depauperata.

Ceratocephala halli Vogdes. See Odontopleura halli.

Ceratocephala horani (Billings).

Acidaspis horani Billings, Geol. Surv. Canada, Rep. Progr. for 1853–1856, 1857, p. 341; Geol. Canada, Geol. Surv. Canada, 1863, p. 190, fig. 190.

Ceratocephala Horani Vogdes, Proc. Acad. Nat. Sci. Philadelphia, 1877, p. 140.—Clarke, 10th Rep. State Geol. New York, 1891, pp. 69, 71; 44th Rep. New York State Mus., 1892, pp. 99, 101.

Trenton: Riviere a la Friponne near Cape Tourment, Canada.

Ceratocephala narrawayi Raymond.

Ceratocephala narrawayi Raymond, 7th Rep. State Geol. Vermont, 1910, p. 234, pl. 38, fig. 5; pl. 39, fig. 15; Ann. Carnegie Mus., 7, 1910, p. 73, pl. 18, fig. 5; pl. 19, fig. 15.—Perkins, 8th Rep. Vermont State Geol., 1912, pl. 18, fig. 5.

Chazyan (Crown Point): Chazy, New York.

Ceratocephala nodulata Van Ingen.

Ceratocephala nodulata Van Ingen, School of Mines Quart., 23, 1901, p. 44, fig. 10; p. 41, figs. 4, 5.

Niagaran (St. Clair): St. Clair Spring, Independence County, Arkansas.

CERATOCEPHALA TRENTONENSIS? Vogdes. See Odontopleura trentonensis.

CERATOPEA Ulrich. Genotype: C. keithi Ulrich.

Ceratopea Ulrich, Bull. Geol. Soc. Amer., 22, 1911, p. 665.

Ceratopea keithi Ulrich.

Operculum of ?Maclurea, Bassler, Bull. Geol. Surv. Virginia, 2a, 1909, pl. 20, fig. 3.

Ceratopea keithi Ulrich, Bull. Geol. Soc. Amer., 22, 1911, p. 665.

Canadian (Beekmantown): Wytheville, Virginia; Tennessee; Missouri.

CERATOPORA Grabau. Genotype: C. jacksoni Grabau.

Ceratopora Grabau, Proc. Boston Soc. Nat. Hist., 28, 1899, p. 414; Bull. Buffalo Soc. Nat. Hist., 6, 1899, p. 132.

Ceratopora? marylandica Swartz.

Ceratopora? marylandica Swartz, Maryland Geol. Surv., Low. Dev., 1913, p. 220, pl. 26, figs. 6, 7.

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

Ceratopora regularis Grabau.

Ceratopora regularis Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 109, pl. 11, fig. 8.

Upper Monroan (Amherstburg): Detroit River opposite Amherstburg, Ontario.

Ceratopora tenella (Rominger).

Syringopora tenella Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 81, pl. 30, fig. 4.

Ceratopora tenella Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 110, pl. 14, fig. 6.

Niagaran: Point Detour, Drummonds Island, Lake Huron.

Upper Monroan (Anderdon): Near Amherstburg, Ontario.

CERATOPSIS Ulrich. Genotype: Beyrichia chambersi Miller.

Ceratella Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 113 (nom. nud.).

Ceratopsis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 675; Zittel-Eastman Textb. Pal., 1, 1900, p. 644.—Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 308.—Bonnema, Mitt. Min. Geol. Inst. Groningen, 2, 1909, p. 39.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1040.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 352.—Bassler, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 738.

Ceratopsis chambersi (Miller).

Beyrichia chambersi Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 234, fig. 27; N. A. Geol. Pal., 1889, p. 534, fig. 975.

Tetradella chambersi Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 112.

Ceratopsis chambersi Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 676, pl. 46, figs. 19–22.—Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, pl. 39, figs. 13–16.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1042, pl. 53, figs. 1, 1a.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 352, fig. 1660a–c.—Ruedemann (var.), Bull. New York State Mus., 162, 1912, p. 121, pl. 9, fig. 15.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 738, fig. 1425k.

Black River and Trenton: Minneapolis, etc., Minnesota.

Eden: Cincinnati, Ohio, and vicinity; Albany County, New York (Indian Ladder).

Plesiotypes.—Cat. No. 41506, U.S.N.M.

Ceratopsis chambersi robusta Cumings. See Ceratopsis robusta.

Ceratopsis intermedia Ulrich.

Ceratopsis intermedia Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 676.

Trenton: Covington, etc., Kentucky.

Cotypes.—Cat. No. 41500, U.S.N.M.

Ceratopsis oculifera (Hall).

Beyrichia oculifera Hall, 24th Rep. New York State Mus. Nat. Hist., 1872, p. 232, pl. 8, figs. 9, 10 (extract, 1871, p. 8, pl. 4, fig. 10).—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 118.—Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 103, pl. 4, figs. 9, 10.—Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 21, pl. 4, figs. 19a, b, 20.

Tetradella oculifera Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 113, fig. 1.

Ceratopsis oculifera Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 676.—Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, pl. 39, figs. 19, 20.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1044, pl. 53, figs. 3, 3a.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 352, fig. 1662.

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

Ceratopsis? quadrifida (Jones).

Beyrichia quadrifida Jones, Geol. Surv. Canada, Cont. Micro-Pal., pt. 3, 1891, p. 66, pl. 11, figs. 9a, b.

Ceratopsis? quadrifida Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 308, pl. 39, figs. 21, 22.

Trenton: Lorette Falls, Quebec.

Ceratopsis robusta (Ulrich).

Beyrichia chambersi Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 104, pl. 4, figs. 11, 12.

Beyrichia chambersi var. robusta Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 677, fig. 50.

Ceratopsis chambersi var. robusta Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1043, pl. 53, figs. 2, 2a.

Ceratopsis robusta Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 308, pl. 39, figs. 17, 18.

Richmond: Waynesville, etc., Ohio; Richmond and Versailles, Indiana; near Spring Valley, Minnesota.

Holotype.—Cat. No. 41335, U.S.N.M.

CERATOPYGE Hawle and Corda. Genotype: Olenus forficula Sars.

Ceratopyge Hawle and Corda, Abh. bohmischen Gesell. d. Wiss., 5, 1847 (extract), p. 161, pl. 7, fig. 81.—Koken, Die Leitfossilien, Leipzig, 1896, p. 19, text fig. 12.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 34, No. 8, 1901, p. 25.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 717.

Ceratopyge canadensis Walcott.

Ceratopyge canadensis Walcott, Smiths. Misc. Coll., 57, 1912, p. 233, pl. 35, figs. 13–22.

Lower Ordovician (Goodsir): Mollison Creek, and Ice River Valley, ten miles southeast of Leanchoil, British Columbia.

CERAURINUS Barton. Genotype: C. marginatus Barton.

Cheirurus and Ceraurus (part) of authors.

Ceraurinus Barton, Bull. Mus. Comp. Zool., 54, 1913, p. 547.

Ceraurinus confluens Barton.

Ceraurinus confluens Barton, Bull. Mus. Comp. Zool., 54, 1913, p. 555, pl., fig. 3.

Trenton (Picton): Pefferlaw and Collingwood, Ontario.

Ceraurinus icarus (Billings).

Cheirurus Icarus Billings, Canadian Nat. Geol., 5, 1860, p. 67, fig. 2; Geol. Canada, Geol. Surv. Canada, 1863, p. 219, fig. 231; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 27 (loc. ref.).—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 128 (loc. occ.).

Ceraurus (Eccoptochile) icarus Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 738 (gen. ref.).

Ceraurus icarus Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 162, pl. 14, figs. 11a–c.—Miller, Cincinnati Quart. Jour. Sci. 1, 1874, p. 133.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1059, pl. 54, figs. 8, 8a.

Cerarus meekanus Miller, N. A. Geol. Pal., 1889, p. 537.

Eccoptochile? meekanus Slocom, Field Mus. Nat. Hist., Geol. Ser., 4, 1913, p. 75, pl. 17, figs. 6–9.

Ceraurinus icarus Barton, Bull. Mus. Comp. Zool., 54, 1913, p. 551, pl., fig. 7.

Richmond: Charleton Point, English Head, etc., Anticosti (English Head, Charleton, and Gamachian); Stony Mountain, Manitoba (Stony Mountain); Ohio; Indiana; Iowa.

Ceraurinus marginatus Barton.

Ceraurinus marginatus Barton, Bull. Mus. Comp. Zool., 54, 1913, p. 550, pl., fig. 1.

Richmond: Manitoulin Island, Lake Huron.

Ceraurinus polydorus (Billings).

Cheirurus Polydorus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 286, fig. 274.

Ceraurus polydorus Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 738 (gen. ref.).

Ceraurinus polydorus Barton, Bull. Mus. Comp. Zool., 54, 1913, 549.

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

Ceraurinus pompilius (Billings).

Cheirurus Pompilius Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 181, fig. 162.

Ceraurus (Ceraurus) pompilius Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 738.

Ceraurus (Crotalocephalus) pompilius Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 319.

Ceraurinus pompilius Barton, Bull. Mus. Comp. Zool., 54, 1913, p. 550.

Chazyan (Mingan): Large Island, Mingan Islands, Quebec.

Ceraurinus scofieldi (Clarke).

Cyrtometopus scofieldi Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 735, fig. 55.
Ceraurus scofieldi Miller, N. A. Geol. Pal., 2d App. 1897, p. 787 (gen. ref.).
Ceraurinus scofieldi Barton, Bull. Mus. Comp. Zool., 54, 1913, p. 554, pl., fig. 4.
Black River: Minneapolis, Minnesota (Platteville); Newport, New York.
?Stones River (Lebanon); Lebanon, Tennessee.
Holotype.—Cat. No. 41952, U.S.N.M.

Ceraurinus trentonensis Barton.

Ceraurinus trentonensis Barton, Bull. Mus. Comp. Zool., 54, 1913, p. 552, pl., figs. 5, 6.
Trenton (Curdsville): Goat Island, Manitoulin Islands, Lake Huron.

CERAURUS Green. Genotype: C. pleurexanthemus Green.

Ceraurus Green, Mon. Tril. N. A. 1832, p. 83; Monthly Amer. Jour. Geol., 1, 1832, p. 560.—Goldfuss, Neues Jahrb. f. Min., etc., 1843, pp. 540, 551.—Hawle and Corda, Abh. d. bohmischen Gesell. d. Wiss., 5 (ext.), 1847, p. 161, pl. 7, fig. 82.—Hall, Pal. New York, 1, 1847, p. 244.—Roemer, Neues Jahrb., f. Min., etc., 1848, p. 179.—McCoy, Ann. and Mag. Nat. Hist., 2d ser., 4, 1849, p. 400; British Pal. Rocks and Fossils, 1854, p. 153.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 217.—Chapman, Canadian Jour., n. s., 1, 1856, p. 282.—Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 67.—Hitchcock, Geol. Vermont, 1, 1862, p. 300.—Chapman, Canadian Jour., n. s., 8, 1863, p. 31; Expos. Min. Geol. Canada, 1864, p. 139.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 132.—Walcott, Annals Lyceum Nat. Hist. New York, 11, 1875, p. 155 footnote.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 7th ser., 30, 1881, p. 121.—Miller, N. A. Geol. Pal., 1889, p. 537.—W. D. Matthew, Trans. New York Acad. Sci., 12, 1893, p. 238.—Clarke, Geol. Minnesota, 3, pt. 2, 1894, pp. 736, 738.—Walcott, Geol. Mag., dec. 4, 1, 1894, pp. 247, 248; Proc. Biol. Soc. Washington, 9, 1894, p. 91.—Beecher, Amer. Jour. Sci., 4th ser., 13, 1902, p. 167.—Raymond, Annals Carnegie Mus., 3, 1905, p. 375.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1051.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 319.—Slocom, Field Mus. Nat. Hist., Geol. Ser., 4, 1913, p. 70.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 724.—Raymond and Barton, Bull. Mus. Comp. Zool., 54, 1913, p. 527.

Observation.—Most of the above references are to Ceraurus in the broad sense.

Ceraurus (Cyrtometopus) apollo Clarke. See Anacheirurus apollo.

Ceraurus bimucronatus Roemer. See Cheirurus niagarensis.

Ceraurus bispinosus Raymond and Barton.

Ceraurus bispinosus Raymond and Barton, Bull. Mus. Comp. Zool., 54, 1913, p. 536, pl. 1, figs. 3, 4.
Black River: Tetreauville, Quebec.

Ceraurus (Pseudosphærexochus) clintoni Foerste. See Pseudosphærexochus clintoni.

Ceraurus crosotus Locke. See Odontopleura crosota.

Ceraurus dentatus Raymond and Barton.

Ceraurus pleurexanthemus Hall (part), Pal. New York, 1, 1847, pl. 65, figs. 1d, h, i, m; pl. 66, figs. 1a–g.—Emmons, Geology 2d Dist. New York, 1842, p. 390, fig. 6; Amer. Geology, 1, 1855, pl. 15, figs. 1a, f, h, i, k.—Billings, Geol. Canada, 1863, p. 188, fig. 188.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 160, fig.—Miller, N. A. Geol. Pal., 1889, p. 538, fig. 984.—Cumings, 32d Ann. Rep. Indiana State Geol. Surv., 1908, pl. 54, figs. 9a–b (after Hall).—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 319, fig. 1632.

Ceraurus dentatus—Continued.

Ceraurus dentatus Raymond and Barton, Bull. Mus. Comp. Zool., 54, 1913, p. 534, pl. 1, fig. 1; pl. 2, figs. 4, 5.

Trenton: Middleville, etc., New York; Belleville, Coburg, Peterboro, Kirkfield, etc., Ontario.

Ceraurus elginensis Slocom.

Ceraurus elginensis Slocom, Field Mus. Nat. Hist., Geol. Ser., 4, 1913, p. 73, pl. 17, figs. 4–5.

Richmond (Maquoketa): Elgin and Bloomfield, Iowa.

Ceraurus (Nieszkowskia) glaucus Clarke. See Nieszkowskia glaucus.

Ceraurus granulosus Raymond and Barton.

Ceraurus pompilius Raymond (not Billings), Ann. Carnegie Mus., 3, 1905, pp. 365–6 (not fig. 6), pl. 14, fig. 14; 7th Rep. State Geol. Vermont, 1911, p. 240, pl. 36, fig. 14.

Ceraurus granulosus Raymond and Barton, Bull. Mus. Comp. Zool., 54, 1913, p. 536.

Chazyan (Crown Point): Sloop Bay, Valcour Island, New York.

Ceraurus hudsoni Raymond.

Ceraurus hudsoni Raymond, Ann. Carnegie Mus., 3, 1905, p. 367, pl. 14, fig. 15, p. 375; 7th Rep. State Geol. Vermont, 1910, p. 240, pl. 36, fig. 15.—Raymond and Barton, Bull. Mus. Comp. Zool., 54, 1913, p. 535.

Ceraurus (Crotalocephalus) hudsoni Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 319.

Chazyan (Crown Point): Sloop Bay, Valcour Island, New York.

Ceraurus hydei Weller. See Cheirurus hydei.

Ceraurus (Eccoptochile) icarus Clarke. See Ceraurinus icarus.

Ceraurus icarus Meek. See Ceraurinus icarus.

Ceraurus insignis Hall. See Cheirurus niagarensis.

Ceraurus meekanus Miller. See Ceraurinus icarus.

Ceraurus (Cyrtometopus) mercurius Clarke. See Pseudosphærexochus mercurius.

Ceraurus milleranus Miller and Gurley.

?Calymene bucklandii Anthony, Amer. Jour. Sci., 36, 1839, p. 106, figs. 1, 2.

Ceraurus milleranus Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 3, 1893, p. 80, pl. 8, fig. 10.—Raymond and Barton, Bull. Mus. Comp. Zool., 54, 1913, p. 538, pl. 1, figs. 6–8, pl. 2, fig. 6.—Slocom, Field Mus. Nat. Hist., Geol. Ser. 4, 1913, p. 71, pl. 17, figs. 1–3.

Maysville (Corryville): Cincinnati, Ohio.

Observation.—Calymene bucklandi Anthony probably refers to this species, but the description and figures are too poor for accurate identification.

Ceraurus miseneri Foerste.

Ceraurus miseneri Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 228, pl. 4, fig. 7A, B.—Raymond and Barton, Bull. Mus. Comp. Zool., 54, 1913, p. 539.

Richmond (Whitewater): Richmond, Indiana; Dayton, Ohio.

Ceraurus niagarensis of authors. See Cheirurus niagarensis.

Ceraurus numitor (Billings).

Cheirurus numitor Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 27, fig. 11.

Ceraurus (Nieszkowskia) numitor Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 738 (gen. ref).

Ceraurus numitor Raymond and Barton, Bull. Mus. Comp. Zool., 54, 1913, p. 540.

Richmond (English Head): English Head, Anticosti.

CERAURUS NUPERUS Miller. See Cheirurus nuperus.

CERAURUS (NIESZKOWSKIA) PERFORATOR Clarke. See Nieszkowskia perforator.

Ceraurus pleurexanthemus Green.

Ceraurus pleurexanthemus Green, Monthly Amer. Jour. Geol., 1, 1832, p. 560, pl. 4, fig. 10; Mon. Tril. N. A., 1832, p. 84, fig. 10, cast 33.—Hawle and Corda, Prodr. monogr. Bohem. trilobiten, 1847, p. 161, pl. 7, fig. 82.—Hall, Pal. New York, 1, 1847, p. 242, pl. 65, figs. 1a–c, 1e–g (not 1d, h, i, m nor pl. 66, fig. 1a–g=C. dentatus).—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 217, pl. 15, figs. 1b–1e, 1g (not 1a, h, i, k=C. dentatus).—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 3, fig. 7.—Hitchcock, Geol. Vermont, 1, 1862, p. 300, fig. 214.—Chapman, Canadian Jour., n. s., 8, 1863, p. 31, fig. 146; p. 201, fig. 197.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 3, 132.—Walcott, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1877, pp. 89, 95; Mus. ed., 1879; Annals Lyc. Nat. Hist., New York, 11, 1876, p. 155, pl. 11; 31st Rep. New York State Mus. Nat. Hist., 1880, pp. 61, 66, pl. 1, figs. 3, 4; Bull. Mus. Comp. Zool., 8, 1881, pp. 191–216, pl. 1, figs. 1–5; pl. 2, figs. 1–4, 6, 8; pl. 3, figs. 2–7; pl. 4, figs. 1, 2, 4–6, 8, 8a; pl. 6, figs. 3–5; Science, 3, 1884; p. 279.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 123, figs.—Clarke, Geol. Minnesota, 3, pt. 2, 1894, pp. 734, 738.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 174.—Ruedemann, Bull. New York State Mus., 49, 1902, p. 67.—Weller, Geol. Surv. New Jersey, Pal. 3, 1903, p. 204, pl. 15, fig. 28.—?Slocom, Field Mus. Nat. Hist., Geol. Ser., 4, 1913, p. 71.—Raymond and Barton, Bull. Mus. Comp. Zool., 54, 1913, p. 528, pl. 1, fig. 1; pl. 2, figs. 1, 2, 7.—Ruedemann, Pal. Univ., Ser. 4, fasc. 1, 1913, pl. 236.

Cheirurus pleurexanthemus Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 236.

Black River and Trenton: Trenton Falls, etc., New York; New Jersey; Ohio; Tennessee; Minnesota; Canada; etc.

Plastotype.—Cat. No. 25695, U.S.N.M.

CERAURUS PLEUREXANTHEMUS Hall (part). See Ceraurus dentatus.

CERAURUS POLYDORUS Clarke. See Ceraurinus polydorus.

CERAURUS POMPILIUS Clarke. See Ceraurinus pompilius.

CERAURUS POMPILIUS Raymond. See Ceraurus granulosus.

CERAURUS (PSEUDOSPHÆREXOCHUS) PROLIFICUS Clarke. See Pseudosphærexochus vulcanus.

CERAURUS? PUSTULOSUS Hall. See Eoharpes pustulosus.

CERAURUS RARUS Walcott. See Encrinurus rarus.

CERAURUS (SPHÆROCORYPHE) ROBUSTA Clarke. See Sphærocoryphe robustus.

CERAURUS (NIESZKOWSKIA) SATYRUS Clarke. See Nieszkowskia satyrus.

CERAURUS SCOFIELDI Miller. See Ceraurinus scofieldi.

Ceraurus?? solitarius (Billings).
Cheirurus solitarius Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 206.
Canadian (Beekmantown): Near St. Antoine above Quebec, Canada.

CERAURUS TARQUINIUS Miller. See Cheirurus tarquinius.

CERAURUS TRENTONENSIS Miller. See Pseudosphærexochus trentonensis.

CERAURUS VIGILANS Hall. See Encrinurus vigilans.

CERIONITES Meek and Worthen. Genotype: Lunulites dactyloides Owen.
Cerionites Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 346.—Miller, N. A. Geol. Pal., 1889, p. 156.

Cerionites dactyloides (Owen).
Lunulites? dactiloides Owen, Geol. Rep. Iowa, Wisconsin, Illinois, 1844, p. 69, pl. 13, fig. 4.
Lunulites dactyloides Kayser, Zeits. d. d. geol. Gesell., 27, 1875, p. 780.
Cerionites (Pasceolus) dactylioides Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 346, pl. 5, fig. 2.
Cerionites dactyloides Whitfield, Geol. Wisconsin, 4, 1882, p. 267, pl. 13, figs. 1–3.—Miller, N. A. Geol. Pal., 1889, p. 156, fig. 97.—Calvin, Proc. Iowa Acad. Sci., 1, pt. 3, 1893, p. 13; Amer. Geol., 12, 1893, pp. 53–57, fig.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895 (ext. 1893), p. 67.
Pasceolus? dactylioides Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 345, pl. 5, figs. 2a–c.
Cyclocrinus dactyloides Stolley, Archiv. f. Anthrop. u. Geol. Schleswig-Holsteins, 1, Heft 2, 1896, p. 215 (gen. ref.).
Niagaran: Carroll County, Illinois; Iowa; Wisconsin.

CERIOPORA CONSTELLATA Van Cleve. See Constellaria constellata.

Ceromyopsis Meek. Genotype: Cardiomorpha obliquata Meek.
Ceromyopsis Meek, Proc. Acad. Nat. Sci. Philadelphia, 1872, p. 327; Geol. Surv. Ohio, Pal., 1, 1873, p. 146.

Ceromyopsis obliquata Meek.
Cardiomorpha?? obliquata Meek, Proc. Acad. Nat. Sci. Philadelphia, 1872, p. 327 (Ceromyopsis n. gen. suggested); Geol. Surv. Ohio, Pal., 1, 1873, p. 146, pl. 12, figs. 4a, b.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 220.
Maysville: Cincinnati, Ohio.
Observation.—No additional specimens of this species have been found. The type is probably a compressed Cuneamya.

CHÆNODOMUS Ulrich. See Cymatonota Ulrich.

CHÆTETES Fischer. Genotype: C. radians Fischer.
Chætetes Fischer, Oryct. du Gouv. Moscou, 1837, p. 159.—Nicholson, Pal. Tab. Corals, 1879, p. 260.—Rominger, Amer. Geol., 10, 1892, p. 56.—Zittel-Eastman Textb. Pal., 1, 1900, p. 102; ibid., 2d ed., 1913, p. 117.
Not Chætetes of many authors, who have used the name for bryozoa.

CHÆTETES APPROXIMATUS Nicholson. See Hallopora dalei.

CHÆTETES (MONOTRYPELLA) ARBUSCULUS Hall and Simpson. See Monotrypella? arbuscula.

Chætetes arcticus Haughton.

Chætetes arcticus Haughton, Jour. Royal Soc. Dublin, 1, 1857, p. 246, pl. 10, figs. 3, 4.

Silurian: Beechy Island, Arctic America.

Observation.—Not recognizable. Refers to some species of Favosites.

CHÆTETES ATTRITUS Nicholson. See Dekayia aspera.

CHÆTETES BRIAREUS Nicholson. See Eridotrypa briareus.

CHÆTETES CALYCULUS James. See Aspidopora calycula.

CHÆTETES CINCINNATIENSIS James. See Monticulipora cincinnatiensis.

CHÆTETES? CLATHRATULUS Nicholson. See Escharopora pavonia.

CHÆTETES CLAVACOIDEUS James. See Leptotrypa clavacoidea.

CHÆTETES COLUMNARIS Hall. See Tetradium columnare.

CHÆTETES COMPRESSUS Ulrich. See Peronopora compressa.

CHÆTETES CONSIMILIS Hall. See Monotrypella? consimilis.

CHÆTETES CONSTELLATUS Quenstedt. See Constellaria florida.

CHÆTETES CORTICANS Nicholson. See Spatiopora corticans.

Chætetes crustulatus James.

Chætetes crustulatus James, Paleontologist, No. 1, 1878, p. 1; No. 3, 1879, p. 20.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 202.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 30.

Monticulipora crustulata James and James, Jour. Cincinnati Soc. Nat. Hist., 11, 1888, p. 23, pl. 1, figs. 2, 2a; 18, 1895, p. 82.

Cincinnatian: Cincinnati, Ohio.

Observation.—A variety of forms was included under this name, many of which have since been given other names. The type is lost and the description is so general that it can not be narrowed down to one recognizable form; hence, in the interests of science, the name has been dropped.

CHÆTETES DALEI Milne-Edwards and Haime. See Hallopora dalei.

CHÆTETES DALEI Nicholson. See Hallopora ramosa.

CHÆTETES DECIPIENS Rominger. See Peronopora decipiens.

CHÆTETES DELICATULUS Nicholson. See Bythopora delicatula.

CHÆTETES DISCOIDEUS James. See Amplexopora? discoidea.

CHÆTETES ELEGANS Ulrich. See Discotrypa elegans.

CHÆTETES EXPANSUS Ringueberg. See Orbignyella expansa.

CHÆTETES FILIASUS Milne-Edwards and Haime. See Amplexopora filiasa.

CHÆTETES FLETCHERI Nicholson. See Dekayella ulrichi.

CHÆTETES FRONDOSUS Milne-Edwards and Haime. See Heterotrypa frondosa.

CHÆTETES FRONDOSUS Nicholson. See Peronopora decipiens.

CHÆTETES FRONDOSUS LIMATUS Quenstedt. See Heterotrypa frondosa.

CHÆTETES FRUTICOSUS Hall. See Monotrypella? arbuscula.

CHÆTETES FUSIFORMIS Whitfield. See Lioclemella fusiformis.

CHÆTETES GRACILIS James. See Bythopora gracilis.

CHÆTETES GRANULIFERUS Ulrich. See Homotrypella granulifera.

CHÆTETES IMPLICATA Ulrich. See Batostoma implicatum.

CHÆTETES IRREGULARIS Ulrich. See Stigmatella irregularis.

CHÆTETES JAMESI Nicholson. See Batostoma jamesi.

CHÆTETES LÆVIRAMUS Quenstedt. See Bythopora gracilis.

Chætetes lycoperdon (Say) Hall.

Chætetes lycoperdon (Say MS.) Hall, Pal. New York, 1 1847, pp. 48, 64, 276; ibid., II, 1852, p. 40.

Chætetes (Monticulipora) lycoperdon Chamberlin, Geol. Wisconsin, 1, 1883, p. 153, fig.

Chætetes lycopodites James, Paleontologist, No. 3, 1879, p. 20.

Favosites Lycoperdon Owen, Amer. Jour. Sci. and Arts, 47, 1844, p. 363, fig. 3.

Ordovician: Various localities.

Observation.—Not recognized. The term lycoperdon was never properly defined and has been applied to many species of bryozoa, especially if they were hemispheric or globose in shape.

CHÆTETES LYCOPODITES James. See Chætetes lycoperdon James.

CHÆTETES MAMMULATUS of authors. See Monticulipora mammulata, M. epidermata and Heterotrypa frondosa.

CHÆTETES MEEKI James. See Bythopora meeki.

CHÆTETES MINUTUS James. See Bythopora arctipora.

CHÆTETES NEWBERRYI Nicholson. See Aspidopora newberryi.

CHÆTETES NODULOSUS Nicholson. See Hallopora nodulosa.

CHÆTETES? ONEALLI James. See Hallopora onealli.

CHÆTETES ORTONI Nicholson. See Atactoporella ortoni.

Chætetes papillatus Nicholson (not McCoy).

Chætetes papillatus Nicholson (not McCoy), Nicholson, Quart. Jour. Geol. Soc. London, 30, 1874, p. 513, pl. 29, figs. 12–12b; Pal. Ohio, 2, 1875, p. 210.—Nickles and Bassler, Bull. U. S. Geol. Surv. 173, 1900, p. 205.

Ordovician: Cincinnati, Ohio.

Observation.—The form so referred to can not be identified with certainty from Nicholson's description and figures, but it was probably a species of Petigopora, possibly the P. asperula Ulrich.

CHÆTETES PAVONIA Milne-Edwards and Haime. See Escharopora pavonia.

Chætetes perantiquus Whiteaves.

Chætetes perantiquus Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 238, figs. 17, 18, 19.

Black River or Richmond: Lower Fort Garry, Manitoba.

CHÆTETES PETECHIALIS Nicholson. See Petigopora petechialis.

CHÆTETES PETROPOLITANA Nicholson (part). See Mesotrypa whiteavesi.

CHÆTETES PETROPOLITANA James. See Amplexopora petasiformis.

CHÆTETES PETROPOLITANUS Lonsdale. See Dianulites petropolitana.

Chætetes petropolitanus of authors (not Pander).
Chætetes petropolitanus Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 304, pl. 2, figs. 8a, b.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 373.
Monticulipora petropolitana Emmons, Amer. Geology, 1, pt. 2, 1855, p. 229, fig. 80.
Ordovician: Various localities.
Observation.—These references are to undetermined species probably different from Chætetes (now Dianulites) petropolitana Pander.

CHÆTETES PULCHELLUS Nicholson. See Hallopora andrewsi.

CHÆTETES QUADRATUS Rominger. See Rhombotrypa quadrata.

CHÆTETES RAMOSUS Milne-Edwards and Haime. See Hallopora ramosa.

CHÆTETES RHOMBICUS Nicholson. See Rhombotrypa quadrata.

Chætetes?? rugosus Hall.
Chætetes rugosus Hall., Pal. New York, 1, 1847, p. 67, pl. 24, figs. 2a, b.
Trenton: Middleville, Herkimer County, New York.
Observation.—Possibly a species of Batostoma, but the generic position can not be determined from the description and figures given.

CHÆTETES RUGOSUS Milne-Edwards and Haime. See Hallopora rugosa.

CHÆTETES SIGILLARIOIDES Nicholson. See Hallopora onealli sigillarioides.

CHÆTETES SUBGLOBOSUS Ulrich. See Monotrypa subglobosa.

CHÆTETES SUBPULCHELLUS Nicholson. See Heterotrypa subpulchella.

CHÆTETES SUBROTUNDUS James. See Hindia subrotundus.

CHÆTETES TUBERCULATUS Milne-Edwards and Haime. See Spatiopora tuberculata.

CHÆTETES TUBERCULATUS Nicholson. See Spatiopora corticans.

Chætetes turbinatum James. Not recognized.
Chætetes turbinatum James, Paleontologist, No. 2, 1878, p. 11.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 31 (gives discussion of species).
Monticulipora turbinata James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 161, pl. 2, figs. 1a–c.—J. F. James, ibid., 15, 1893, p. 158.
Cincinnatian: Cincinnati, Ohio.

CHÆTETES UNDULATUS Nicholson. See Monotrypa undulata.

CHÆTETES VARIANS James. See Batostoma varians.

CHÆTETES VENUSTUS Ulrich. See Crepipora venusta.

CHÆTOCLADUS Whitfield. Genotype: C. plumula Whitfield.
Chætocladus Whitfield, Bull. Amer. Mus. Nat. Hist., 16, 1894, p. 356.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 721.—Ruedemann, Bull. New York State Mus., 133, 1909, p. 204.

Chætocladus plumula Whitfield.
Chætocladus plumula Whitfield, Bull. Amer. Mus. Nat. Hist., 6, 1894, p. 356, pl. 11, figs. 11–13; Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, pl. 4, figs. 11–13.—Ruedemann, Bull. New York State Mus., 133, 1909, p. 204, figs. 11–13.
Black River (Platteville): Platteville, Wisconsin.

Chætocladus sardesoni Ruedemann.

Chætocladus sardesoni Ruedemann, Bull. New York State Mus., 133, 1909, p. 204, pl. 2, figs. 3–11.

Black River (Platteville): Minneapolis, Minnesota.

CHÆTOMORPHA Kuntze. A genus of recent marine algae.

Chætomorpha?? prima Whitfield.

Oldhamia fruticosa Hall (part), Canadian Organic Remains, dec. 2, 1865, p. 50.

Chætomorpha? prima Whitfield, Bull. Amer. Mus. Nat. Hist., 6, 1894, p. 355, pl. 11, figs. 9, 10; Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, pl. 4, figs. 9, 10.—Ruedemann, New York State Mus., Bull. 133, 1909, p. 203, figs. 9, 10.

Black River (Platteville): Platteville, Wisconsin.

CHALAZODES Parks. See Lophiostroma Nicholson.

CHARIONELLA? HYALE Billings. See Whitfieldella hyale.

CHASMATOPORA Eichwald. Genotype: C. tenella Eichwald.

Retepora as applied by various authors to Ordovician and Silurian anastomosing bryozoa (not Lamarck, 1801).

Gorgonia(?) Hall, Pal. New York, 1, 1847, pp. 16, 76 (not Linnæus, 1745).

Intricaria Hall, Pal. New York, 1, 1847, p. 77.—Miller and Dyer, Contr. Pal., No. 2, 1878, p. 7.

Subretepora D'Orbigny, Prodr. Pal., 1, 1850, p. 22.—Miller, N. A. Geol. Pal., 1889, p. 326. (See Geol. Surv. Illinois, 8, pp. 683, 687.)

Chasmatopora Eichwald, Lethæa Rossica, 1, 1860, p. 370.—Pocta, Syst. Sil. Centre Boheme, 8, 1894, pt. 1, p. 27.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 169; Zittel-Eastman Textb. Pal., 1913, p. 340.

Phyllopora (in part) Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 150.

Nov. gen. (not named) Ulrich, Contr. Amer. Pal., 1, 1886, p. 5.

Phylloporina (Ulrich) Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 150.—Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 399, 639; Geol. Minnesota, 2, 1893, p. 208.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 17.—Ulrich, Zittel's Textb. Pal. (Engl. ed.), 1896, p. 283.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 37.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 168; Bull. New York State Mus., 45, 1901, p. 168.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 48.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 140.

Chasmatopora angulata (Hall).

Retepora angulata Hall, Pal. New York, 2, 1852, p. 49, pl. 19, figs. 3a–h.—Hall and Whitfield, Pal. Ohio, 2, 1875, p. 111, pl. 5, figs. 2–4; 12th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 269, pl. 14, figs. 1, 2.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 861, figs.

Phylloporina angulata Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 151; 3, 1888, pl. 15, fig. 1; Geol. Surv. Ohio, 7, 1895, p. 600, pl. 28, fig. 1.

Subretepora angulata Miller, N. A. Geol. Pal., 1889, p. 326, fig. 523.

Retepora daytonensis Hall and Whitfield, Geol. Surv. Ohio, Pal. 2, 1875, p. 111 (proposed at end of description).

Early Silurian: Sodus and Rochester, New York (Clinton); Flamborough Head, etc., Ontario (Cataract); Dayton, etc., Ohio; Kentucky; Tennessee; and Alabama; (Brassfield); West Ellis Bay, Anticosti (Ellis Bay).

Chasmatopora aspera (Hall).

Gorgonia? aspera Hall, Pal. New York, 1, 1847, p. 16, pl. 4, figs. 3a, b.

Subretepora aspera Miller, N. A. Geol. Pal., 1889, p. 326.

Chasmatopora aspera—Continued.

Phylloporina aspera Ulrich, Geol. Surv. Illinois, 8, 1890, p. 332, pl. 53, figs. 4–4c.

Fenestella aspera Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 69 (gen. ref.).

Chazyan: Chazy, New York; Mingan Islands, Quebec (Mingan).

Plesiotype.—Cat. No. 43438, U.S.N.M.

Chasmatopora asperatostriata (Hall).

Retepora asperato striata Hall, Pal. New York, 2, 1852, p. 161, pl. 40C, figs. 2a–h.

Subretepora asperato-striata Miller, N. A. Geol. Pal., 1889, p. 326.

Phylloporina asperato striata Ulrich, Geol. Surv. Illinois, 8, 1890, p. 332, pl. 53, figs. 5, 5b.—Grabau, Bull. New York State Mus., 45, 1901, p. 169, fig. 68; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 169, fig. 68.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 48, pl. 18, figs. 1–5.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 141, fig. 196.

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

Plesiotype.—Cat. No. 43441, U.S.N.M.

Chasmatopora clathrata (Miller and Dyer).

Intricaria clathrata Miller and Dyer, Contr. Pal., No. 2, 1878, p. 7, pl. 3, figs. 5, 5a.

Subretepora clathrata Miller, N. A. Geol. Pal., 1889, p. 326.

Phylloporina clathrata Ulrich, Geol. Surv. Illinois, 8, 1890, p. 639.

Maysville (Fairmount): Cincinnati, Ohio, and vicinity; central Tennessee.

Chasmatopora corticosa Ulrich.

Phyllopora? corticosa Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 61.

Subretepora corticosa Miller, N. A. Geol. Pal., 1889, p. 326.

Phylloporina corticosa Ulrich, Geol. Surv. Illinois, 8, 1890, p. 639, pl. 53, figs. 3, 3a; Geol. Minnesota, 3, 1893, p. 212, pl. 5, figs. 1–10.—Sardeson, Jour. Geol., 9, 1901, p. 162, pl. B, figs. 11, 12.—Cumings, Amer. Jour. Sci., 4th ser., 20, 1905, pl. 6, fig. 33; Bull. Geol. Soc. Amer., 23, 1912, p. 369, pl. 21, fig. 29.

Black River (Decorah): Goodhue County and St. Paul, Minnesota; Wisconsin.

Cotypes.—Cat. No. 43437, U.S.N.M.

Chasmatopora dawsoni (Ulrich).

Phylloporina dawsoni Ulrich, Geol. Surv. Illinois, 8, 1890, p. 331, pl. 54, figs. 1–1i.

Subretepora dawsoni (Ulrich, in press), Miller, N. A. Geol. Pal., 1889, p. 326.

Trenton: Montreal, Canada; Chimney Point, Vermont.

Cotypes.—Cat. No. 43439, U.S.N.M.

Chasmatopora fenestrata (Hall).

Retepora fenestrata Hall, 3d Ann. Rep. New York State Cab. Nat. Hist., 1850, p. 178, pl. 2, figs. 1a–e.

Subretepora fenestrata Miller, N. A. Geol. Pal., 1889, p. 326.

Phylloporina fenestrata Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 352 (gen. ref.).—Weller, Geol. Surv. New Jersey, Pal. 3, 1903, p. 143, pl. 7, fig. 6.

Retepora Trentonensis Nicholson, Geol. Mag., n. s., 2, 1875, p. 37, pl. 2, figs. 4–4b; Pal. Prov. Ontario, 1875, p. 15, pl. 2, figs. 4–4b.

Phylloporina trentonensis Ulrich, Contr. Micro-Pal. Cambro-Sil., pt. 2, 1889, p. 47, Geol. Surv. Illinois, 8, 1890, p. 640, pl. 53, figs. 1–1c.—Whiteaves, Pal. Foss., 3, 1897, p. 162.

Chasmatopora fenestrata—Continued.

Subretepora trentonensis Miller, N. A. Geol. Pal., 1889, p. 326.

Trenton: Lowville, New York; Peterboro, Ontario; St. Andrews, Manitoba; New Jersey.

Plesiotype.—Cat. No. 43440, U.S.N.M. (Ulrich).

Chasmatopora gracilis (Hall).

Retepora gracilis Hall, Pal. New York, 1, 1847, p. 15, pl. 4, figs. 2, 2a.

Fenestella gracilis Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 74 (gen. ref.).

Subretepora gracilis Miller, N. A. Geol. Pal., 1889, p. 326.

Chazyan: Chazy, New York.

Chasmatopora granistriata (Ulrich).

Phylloporina granistriata Ulrich, Geol. Surv. Illinois, 8, 1890, p. 639, pl. 29, figs. 3, 3a.

Upper Medinan (Girardeau): Alexander County, Illinois.

Richmond (Charleton): Anticosti.

Chasmatopora halli (Ulrich).

Phylloporina halli Ulrich, Jour. Cincinnati Soc. Nat. Hist., 12, 1890, p. 181, fig. 7; Geol. Minnesota, 3, 1893, p. 211, pl. 4, figs. 16–21.

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

Cotypes.—Cat. No. 43696, U.S.N.M.

Chasmatopora incepta (Hall).

Retepora incepta Hall, Pal. New York, 1, 1847, p. 15, pl. 4, figs. 1a, b.

Fenestella incepta Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 74, (gen. ref.).

Subretepora incepta Miller, N. A. Geol. Pal., 1889, p. 326.

Phylloporina incepta Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 352.

Chazyan: Chazy, Clinton County, New York.

Chasmatopora reticulata (Hall).

Intricaria? reticulata Hall, Pal. New York, 1, 1847, p. 77, pl. 26, figs. 8a–c.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 158, fig. 123.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 300, figs.

Subretepora reticulata Emmons, Amer. Geology, 1, pt. 2, 1855, p. 206, pl. 7, figs. 8a, 8b, c.—Miller, N. A. Geol. Pal., 1889, p. 326, fig. 524.

Phylloporina reticulata Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 332, 639, pl. 53, figs. 2, 2a; Geol. Minnesota, 3, 1893, p. 210, pl. 4, figs. 8–15.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 141, fig. 201a.

Chasmatopora reticulata Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 170, 171, fig. 86.

Black River and Trenton: Watertown, etc., New York; Vermont; Minnesota; Canada.

Ordovician (Wassalem): Uxnorm, Esthonia, Russia.

Plesiotypes.—Cat. Nos. 43731–43733, U.S.N.M.

Chasmatopora sublaxa (Ulrich).

Phylloporina sublaxa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 12, 1890, p. 179, fig. 6; Geol. Minnesota, 3, 1893, p. 209, pl. 4, figs. 1–7.

Chasmatopora sublaxa Bassler, Zittel-Eastman Textb. Pal., 1913, p. 340, fig. 497.

Stones River (Pierce and Lebanon): Lebanon, Lavergne, and Murfreesboro, Tennessee.

Chasmatopora sublaxa—Continued.
Black River (Decorah): Minneapolis, Minnesota.
Chazyan (Mingan): Mingan Islands, Quebec.
Cotypes.—Cat. Nos. 43697, 43698, U.S.N.M.

Chasmatopora variolata (Ulrich).
Phyllopora variolata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 160, pl. 6, fig. 14.
Subretepora variolata Miller, N. A. Geol. Pal., 1889, p. 326 (gen. ref.).
Phylloporina variolata Ulrich, Geol. Surv. Illinois, 8, 1890, p. 639 (gen. ref.).
Eden (McMicken): Cincinnati, Ohio, and vicinity.
Holotype.—Cat. No. 43704, U.S.N.M.

CHASMOPS McCoy. Genotype: Calymene odini Eichwald.
Chasmops McCoy, Ann. Mag. Nat. Hist., 2d ser., 4, 1849, p. 399; British Pal. Rocks and Fossils, 1854, p. 163; Cont. Brit. Pal., 1854, p. 141, fig.—Roemer, Zeits. d. d. geol. Gesell., 11, 1859, p. 563 footnote.—Salter, Mon. British Tril., Pal. Soc., 1864, pp. 15, 36.—Schmidt, Mem. Acad. Imp. Sci. St. Petersburg, 7th ser., 30, 1881, pp. 62, 67, 94.—Zittel, Handb. Pal., 2, 1885, p. 615.—Hall and Clarke, Pal. New York, 7, 1888, p. xxxiv, fig.—Oehlert, Bull. Soc. Geol. France, 3d ser., 17, 1889, p. 759.—Reed, Geol. Mag., dec. 4, 1, 1894, p. 241.—Koken, Die Leitfossilien, Leipzig, 1896, p. 32, fig. 22.—Beecher, Amer. Jour. Sci., 4th ser., 3, 1897, p. 105, pl. 3, fig. 31.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl. 34, No. 8, 1901, pp. 27, 49.—Jaekel, Zeits. d. d. geol. Gesell., 53, 1901, p. 157.

Chasmops anticostiensis (Billings).
Dalmanites Anticostiensis Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 61.
Richmond (Charleton) and Gamachian (Ellis Bay): Junction Cliff, etc., Anticosti.

Chasmops breviceps (Hall).
Dalmania breviceps Hall, Desc. n. sp. Crin. etc., 1866, p. 16; Desc. n. sp. Fossils, Cincinnati, Ohio, 1871, pl. 4, figs. 15, 16; 24th Rep. New York State Cab. Nat. Hist., 1872, p. 223, pl. 8, figs. 15, 16.—Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 108, pl. 4, figs. 16, 17.
Dalmanites breviceps Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 143.—Cumings, 32d. Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1059, pl. 54, figs. 10, 10a.
Dalmanites (Chasmops) breviceps Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 734.
Richmond (Waynesville and Liberty): Lebanon, etc., Ohio; Madison, Indiana.

Chasmops troosti Safford and Vogdes. See Pterygometopus troosti.

CHAUNOGRAPTUS Hall. Genotype: Dendrograptus novellus Hall.
Chaunograptus (subgenus of Dendrograptus) Hall, 11th Ann. Rep. Dep. Geol. Nat. Hist. Indiana, 1882, p. 225.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 223.

Chaunograptus gemmatus Ruedemann.
Chaunograptus gemmatus Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 226, 227, fig. 120, pl. 10, fig. 11; pl. 11, fig. 7.
Trenton (Canajoharie): Dolgeville, Herkimer County, New York.
Eden (Economy): Covington, Kentucky.
Plesiotype: Cat. No. 54270 U.S.N.M.

Chaunograptus novellus (Hall).

Dendrograptus (Chaunograptus) novellus Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 225, pl. 1, figs. 1, 2; Trans. Albany Inst., 10, 1883, p. 58 (abstract 1879, p. 2).—Spencer, Trans. Acad. Sci. St. Louis, 4, 1884, p. 570; Bull. Mus. Univ. State Missouri, 1, 1884, p. 20.

Chaunograptus novellus Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 41 (gen. ref.); Mem. New York State Mus., 11, pt. 2, 1908, p. 225, pl. 10, fig. 10; pl. 11, fig. 5.

Niagaran (Waldron): Waldron, Indiana.

Chaunograptus? rectilinea Ruedemann.

Chaunograptus? rectilinea Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 227–228, fig. 121, pl. 10, fig. 12.

Trenton (Snake Hill): Van Schaick Island, Cohoes, New York.

CHEILOPORELLA Ulrich. See Chiloporella Ulrich.

CHEILOTRYPA Ulrich. See Chilotrypa Ulrich.

CHEIROCRINUS Eichwald. Genotype: C. penniger Eichwald.

Cheirocrinus Eichwald, Bull. Soc. Imp. Nat. Moscou, 29, pt. 1, 1856, p. 123 (reprint, 1857, p. 69); Lethæa Rossica, livr. 5, 1859, p. 645.—Bather, Treatise on Zool., 3, Echinoderma, 1900, p. 63; Trans. Roy. Soc. Edinburgh, 49, pt. 2, 1913, p. 434.

Glyptocystites Billings (part), Geol. Surv. Canada, Rep. Prog., 1857, p. 280.—Chapman, Canadian Jour. n. s., 2, 1857, p. 303.—Billings, Canadian Org. Rem., dec. 3, 1858, p. 53.—Hall, Pal. New York, 3, 1859, p. 151.—Schmidt, Mem. Acad. Imp. Sci. St. Petersburg, 7th ser., 21, No. 2, 1874, p. 8.—Zittel, Handb. Pal., 1, 1879, p. 423.

Glyptocystis Angelin, Icon. Crin. Suec., 1878, p. 31.—Carpenter, Jour. Linn. Soc. Zool., 24, 1891, pp. 11, 12.—Haeckel (part), ibid., 1896, p. 150.

Homocystites Barrande (part), Sil. Syst. Centre Boheme, 7, pt. 1, 1887, pp. 77, 160.

Homocystis Carpenter, Journ. Linn. Soc. Zool., 24, 1891, p. 13.—Haeckel, Amphor. und Cyst., 1896, p. 149.—Bather, Treatise on Zool., 3, Echinoderma, 1900, p. 64.

Chirocrinus Jaekel, Stammesg. Pelmat., 1, 1899, p. 212.

Cheirocrinus anatiformis (Hall).

Echino-encrinites anatiformis Hall, Pal. New York, 1, 1847, pp. 89, 318, pl. 29, fig. 4a–f; 12th Rep. New York State Cab. Nat. Hist., 1860, p. 68.

Glyptocystites anatiformis Miller, N. A. Geol. Pal., 1889, p. 269 (gen. ref.).

Chirocrinus anatiformis Jaekel, Stammesg. Pelmat., 1, 1899, p. 221.

Trenton: Turin, Lewis County, New York.

Cheirocrinus angulatus (Wood).

Cyathocrinites sculptus Troost, Amer. Jour. Sci. Arts, 2d ser., 8, 1849, p. 419; Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 61 (nom. nud.).

Cyathocrinus sculptus Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 364 (gen. ref.).

Chirocrinus angulatus Wood (not Chirocrinus sculptus Schmidt), Bull. U. S. Nat. Mus., 64, 1909, p. 7, pl. 8, figs. 9, 10.

Chazyan (Ottosee): Knoxville, Tennessee.

Holotype: Cat. No. 39951 U.S.N.M. (Troost's type of C. sculptus.)

CHEIROCRINUS CHRYSALIS Hall. See Eucheirocrinus chrysalis.

Cheirocrinus forbesi (Billings).

Glyptocystites forbesi Billings, Geol. Surv. Canada, Rep. Progr. for 1853–1856, 1857, p. 283; Geol. Surv. Canada, dec. 3, 1858, p. 59, pl. 4, figs. 3a–3b.—Chapman, Expos. Min. Geol. Canada, 1864, p. 109.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 463.

Chirocrinus Forbesi Jaekel, Stammesges. der Pelmat., 1, Thecoidea u. Cystoidea, Berlin, 1899, p. 221.

Cheirocrinus forbesi Bather, Trans. Royal Soc. Edinburgh, 49, pt. 2, 1913, p. 441 (gen. ref.).

Chazyan (Aylmer): Caughnawaga, Quebec.

Cheirocrinus logani (Billings).

Glyptocystites logani Billings, Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, p. 282; Geol. Surv. Canada, dec. 3, 1858, p. 57, pl. 4, figs. 1a–1j.—Chapman, Canadian Jour., n. s., 6, 1861, p. 514, fig. 85; 8, 1863, p. 198, fig. 179; Expos. Min. Geol. Canada, p. 108, fig. 85; pp. 109, 170, fig. 179.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 464.

Glyptocystis logani Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 45 (loc. occ.).

Chirocrinus logani Jaekel, Stammesg. Pelmat., 1, Thecoidea u. Cystoidea, 1899, p. 220.

Cheirocrinus logani Bather, Trans. Roy. Soc. Edinburgh, 49, pt. 2, p. 441 (gen. ref.).

Trenton (Curdsville): Island of Montreal and Kirkfield, Canada.

Cheirocrinus logani gracilis (Billings).

Glyptocystites logani var. gracilis Billings, Geol. Surv. Canada, dec. 3, 1858, p. 59, pl. 4, fig. 2.

Glyptocystites gracilis Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 373.

Trenton: Montreal, Quebec.

CHEIROCRINUS STIGMATUS Hall. See Deltacrinus stigmatus.

Cheirocrinus walcotti (Jaekel).

Chirocrinus Walcotti Jaekel, Stammesg. Pelmat., 1, Thecoidea u. Cystoidea, 1899, p. 221, pl. 11, fig. 8.

Trenton: Trenton Falls, New York.

CHEIRURUS Beyrich. Genotype: C. exsul Beyrich.

Cheirurus Beyrich, Ueber einige bohmische Tril., 1845, p. 5.—Hawle and Corda, Abh. d. k. bohmischen Gesell. d. Wiss., 5 (extract), 1847, p. 133, pl. 6, fig. 70.—Salter, Mem. Geol. Surv. United Kingdom, dec. 7, 1853, pp. 1, 9.—Pictet, Traite Pal., 2d ed., 2, 1854, p. 519.—Nieszkowski, Archiv. f. Naturk. Liv.-Ehst-u. Kurl, 1, 1857, p. 588.—Salter, Mon. Brit. Tril. Pal. Soc., 1864, pp. 60, 61.—Angelin, Pal. Scandinavica, 3d ed., Holmiae, 1878, p. 31.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 7th ser., 30, 1881, pp. 122, 125, 126, 132.—Zittel, Handb. Pal., 2, 1885, pp. 616, 617.—Koken, Die Leitfossilien, Leipzig, 1896, p. 34.—Beecher, Amer. Jour. Sci., 4th ser., 3, 1897, p. 105, pl. 3, fig. 28; Zittel-Eastman Textb. Pal., 1, 1900, p. 635.—Raymond, Ann. Carnegie Mus., 3, 1905, p. 373; Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 724.

CHEIRURUS APOLLO Billings. See Anacheirurus apollo.

CHEIRURUS ERYX Billings. See Pseudosphærexochus eryx.

CHEIRURUS GLAUCUS Billings. See Nieszkowskia glaucus.

Cheirurus hydei (Weller).

Ceraurus hydei Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 264, pl. 24, fig. 22.

Cheirurus hydei Raymond and Barton, Bull. Mus. Comp. Zool., 54, 1913, p. 542 (gen. ref.)

Niagaran (Racine): Near Lemont, Illinois.

Cheirurus Icarus Billings. See Ceraurinus icarus.

Cheirurus mars Hudson. See Nieszkowskia mars.

Cheirurus mercurius Billings. See Pseudosphærexochus mercurius.

Cheirurus niagarensis (Hall).

Ceraurus insignis Hall (not Beyrich), Pal. New York, 2, 1852, pp. 300, 303, pl. 66A, fig. 4; pl. 67, figs. 9, 10; Geol. Surv. Wisconsin, 1, 1862, p. 433; adv. sheets 18th Rep. New York State Cab. Nat. Hist., 1865, p. 31; 20th Rep. New York State Cab. Nat. Hist., 1867, p. 335.

Ceraurus bimucronatus Roemer (not Murchison), Sil. Fauna West Tennessee, 1860, p. 80, pl. 5, fig. 19.

Sphærexochus romingeri? Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1877, pl. 32, fig. 16.

Ceraurus niagarensis Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, p. 376, pl. 21, figs. 10, 11; rev. ed. 1870, p. 427, pl. 21, figs. 10, 11; 11th Rep. Dep. Geol. Nat. Hist. Surv. Indiana, 1882, p. 335, pl. 34, fig. 16; pl. 33, fig. 10.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 195, fig.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 1, 1884, p. 42; pt. 2, 1895, p. 107.—Van Ingen, School of Mines Quart., 23, 1901, p. 35.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 263, pl. 24, figs. 20–21.

Ceraurus (Cheirurus) niagarensis Hall, 28th Rep. New York State Mus. Nat. Hist., mus. ed., 1879, p. 189, pl. 32, fig. 16.

Ceraurus (Crotalocephalus) niagarensis Kindle, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 483, pl. 23, figs. 1–2; pl. 24, fig. 8.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 319, fig. 1633.

Cheirurus niagarensis Raymond and Barton, Bull. Mus. Comp. Zool., 54, 1913, p. 542 (gen. ref.).

Niagaran (Rochester to Guelph): Rochester, etc., New York; Ontario; Indiana; Tennessee; Wisconsin; Illinois; etc.

Cheirurus numitor Billings. See Ceraurus numitor.

Cheirurus nuperus Billings.

Cheirurus nuperus Billings, Cat. Sil. Fossils Anticosti, Geol. Surv. Canada, 1866, p. 60, fig. 20.

Ceraurus nuperus Miller, N. A. Geol. Pal., 1889, p. 538 (gen. ref.).

Anticostian (Gun River—Chicotte): East Point, etc., Anticosti.

Cheirurus perforator Billings. See Nieszkowskia perforator.

Cheirurus pleurexanthemus Billings. See Ceraurus pleurexanthemus.

Cheirurus polydorus Billings. See Ceraurinus polydorus.

Cheirurus pompilius Billings. See Ceraurinus pompilius.

Cheirurus prolificus Billings. See Pseudosphærexochus vulcanus.

Cheirurus satyrus Billings. See Nieszkowskia satyrus.

CHEIRURUS SOL Billings. See Heliomera sol.

CHEIRURUS SOLITARIUS Billings. See Ceraurus solitarius.

Cheirurus tarquinius Billings.

Cheirurus Tarquinius Billings, Proc. Portland Soc. Nat. Hist., 1, 1863, p. 121, pl. 3, fig. 22.

Ceraurus tarquinius Miller, N. A. Geol. Pal., 1889, p. 538 (gen. ref.).—Whiteaves, Ann. Rep. Geol. Surv. Canada, n. s., 14, App. F, 1904, p. 59; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 267.

Silurian: Port Daniel, Bay of Chaleur, Quebec; Masardis, Maine.

CHEIRURUS VULCANUS Billings. See Pseudosphærexochus vulcanus and Nieszkowskia billingsi.

CHIASTOCLONELLA Rauff. Genotype: C. headi Rauff.

Chiastoclonella Rauff, Palæontographica, 41, 1895, p. 244.

Chiastoclonella headi Rauff.

Chiastoclonella Headi Rauff, Palæontographica, 41, 1895, p. 244, figs. 98–102, p. 117, figs. 5–7; pl. 18, fig. 1 (pls. in vol. 40).

Niagaran (Brownsport): Decatur County, Tennessee.

CHICAGOCRINUS Weller. Genotype: C. ornatus Weller.

Chicagocrinus Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt, 1, 1900, p. 126, fig. 48.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 193.

Chicagocrinus inornatus Weller.

Chicagocrinus inornatus Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 128, pl. 7, figs. 10–12.

Niagaran (Racine): Joliet, Illinois.

Chicagocrinus ornatus Weller.

Chicagocrinus ornatus Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 127, pl. 7, fig. 9.

Niagaran (Racine): Bridgeport, Illinois.

CHILOPORELLA Ulrich. Genotype: Fistulipora flabellata Ulrich.

Cheiloporella Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 157.

Chiloporella Miller, N. A. Geol. Pal., 1889, p. 297.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 381.—Simpson, 14th Ann. Rep. State Geologist New York for 1894, 1897, p. 565.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 23.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 742.

Chiloporella flabellata (Ulrich).

Fistulipora flabellata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 28, pl. 7, figs. 26, 26b.

Chiloporella flabellata Ulrich, Geol. Surv. Illinois, 8, 1890, p. 381, pl. 39, figs. 5, 5b.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 802, pl. 11, figs. 1, 1a; pl. 12, figs. 1, 1b.

Chiloporella nicholsoni (not Ceramopora nicholsoni James) Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 207.

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

Holotype and *plesiotpye*.—Cat. No. 44110, U.S.N.M.

CHILOPORELLA NICHOLSONI Nickles and Bassler. See Chiloporella flabellata.

CHILOTRYPA Ulrich. Genotype: Chilotrypa hispida Ulrich.

Cheilotrypa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 1884, 7, p. 49.

Chilotrypa Miller, N. A. Geol. Pal., 1889, p. 297.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 382; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 269.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 554.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 26.—Grabau, Bull. New York State Mus., 45, 1901, p. 163; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 163.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 24.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 125.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 330.—Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 267.

Chilotrypa circe (Billings).

Helopora Circe Billings, Cat. Sil. Foss. Anticosti, 1886, p. 39.

Anticostian (Jupiter River): Two miles east of Jupiter River, etc., Anticosti.

CHILOTRYPA? COALESCENS Nickles and Bassler. See Chilotrypa ostiolata.

Chilotrypa micropora Ulrich and Bassler.

Chilotrypa micropora Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 268, pl. 41, figs. 9–12.

Helderbergian (Keyser): Keyser, West Virginia.

Cotypes.—Cat. No. 53657, U.S.N.M.

Chilotrypa ostiolata (Hall).

Trematopora ostiolata Hall, Pal. New York, 2, 1852, p. 152, pl. 40A, figs. 5a–m.—Nicholson, Pal. Prov. Ontario, 1875, p. 60, fig. 26.

Cheilotrypa ostiolata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 7, 1884, pl. 3, figs. 7, 7a.

Chilotrypa ostiolata Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, pl. 21, figs. 1, 2.—Grabau, Bull. New York State Mus., 45, 1901, p. 164, fig. 60; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 164, fig. 60.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, pp. 24, 25, pl. 8, figs. 11–15; pl. 9, figs. 1–4.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 125, figs. 184a–b.

Trematopora coalescens Hall, Pal. New York, 2, 1852, p. 150, pl. 40A, figs. 2a, b.

Chilotrypa? coalescens Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 207.

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

Plesiotypes.—Cat. Nos. 43278, 44117, U.S.N.M.

Chilotrypa varia (Hall).

Trematopora varia Hall, 28th Ann. Rep. New York State Mus., doc. ed., 1876, pl. 10, figs. 15–23; mus. ed., 1879, p. 111, pl. 10, figs. 15–23; 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 232, pl. 9, figs. 15–23.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1202, figs.

Diamesopora varia Ulrich, Geol. Surv. Illinois, 8, 1890, p. 467.

Chilotrypa varia Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 208.

Niagaran (Waldron): Waldron, Indiana.

Chilotrypa variolata (Hall).

Trematopora variolata Hall, 28th Ann. Rep. New York State Mus., doc. ed., 1876, pl. 11, figs. 9, 10; mus. ed., 1879, p. 113, pl. 9, figs. 9, 10; 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 234, pl. 10, figs. 9, 10.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1203, figs.

Chilotrypa variolata Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 208.

Niagaran (Waldron): Waldron, Indiana.

CHIROCRINUS Jaekel. See Cheirocrinus Eichwald.

CHIROCRINUS LOGANI Jaekel. See Glyptocystites logani.

CHIROSPONGIA Miller. See Pattersonia Miller.

CHIROSPONGIA FABERI Miller. See Leptopoterion mammiferum.

CHIROSPONGIA WENTI Miller. See Pattersonia aurita.

CHITON CANADENSIS Billings. See Priscochiton canadensis.

Chlœphycus Miller and Dyer. Genotype: C. plumosum Miller and Dyer.
Chlœphycus Miller and Dyer, Contr. to Pal., No. 2, 1878, p. 3.—James, Jour. Cincinnati Soc. Nat. Hist., 7, 1884, p. 130.
Observation.—Abandoned by Miller as probably inorganic.

Chlœphycus filiciforme (James).
Buthotrephis filificormis James, Paleontologist, No. 2, 1878, p. 9; Jour. Cincinnati Soc. Nat. Hist., 14, 1891, p. 46.
Chlœphycus filiformis James, ibid., 7, 1885, p. 159.
Maysville: Lebanon, Ohio.

Chlœphycus plumosum Miller and Dyer.
Chlœphycus plumosum Miller and Dyer, Contr. to Pal., No. 2, 1878, p. 3, pl. 4, fig. 1.—James, Jour. Cincinnati Soc. Nat. Hist., 7, 1884, p. 130, pl. 6, fig. 3; ibid., 14, 1891, p. 46.
Eden: Cincinnati, Ohio.

CHONDRITES Sternberg. Genotype: Fucoides targionii Brongniart.
Chondrites Sternberg, Flora Vorwelt, 2 (Versuch), pt. 5, 6, 1833, p. 25.—Nathorst, Kongl. Sven. Vet.-Akad. Handl., 21, No. 14, 1886, p. 34.—Miller, N. A. Geol. Pal., 1889, p. 114.—Rauff, Neues Jahrb. f. Min. Geol. Pal., 2, 1891, p. 101.

Chondrites (Buthotrephis) cuneatus Whiteaves.
Chondrites (Bythotrephis) cuneatus Whiteaves, Pal. Foss. Geol. Surv. Canada, 3, pt. 3, p. 140, fig. 8.
Black River or Richmond: Cat Head, Lake Winnipeg, Canada.

Chondrites cupressinus Whiteaves.
Chondrites cupressinus Whiteaves, Canadian Rec. Sci., 6, 1896, p. 388; Pal. Foss. Geol. Surv. Canada, 3, pt. 3, 1897, p. 141, pl. 17, fig. 1.
Black River or Richmond: Cat Head, Lake Winnipeg, Canada.

Chondrites gracillimus Whiteaves.
Chondrites gracillimus Whiteaves, Canadian Rec. Sci., 6, 1896, p. 389; Pal. Foss., Geol. Surv. Canada, 3, pt. 3, p. 141, pl. 17, fig. 2.
Black River or Richmond: Inmost Island, Kinwow Bay, Lake Winnipeg.

Chondrites metissicus Dawson.
Chondrites Metissicus Dawson, Trans. Royal. Soc. Canada, 2d ser., 1, sec. 4, 1896, p. 121.
Canadian? (Levis?): Metis, Quebec.

Chondrites (Buthotrephis) patulus Whiteaves.
Chondrites patulus Whiteaves, Canadian Rec. Sci., 6, 1896, p. 387.
Chondrites (Bythotrephis) patulus Whiteaves, Pal. Foss. Geol. Surv. Canada, 3, pt. 3, 1897, pp. 137, 138, figs. 5, 6, 7.
Black River or Richmond: Inmost and Birch Islands, Kinwow Bay, Lake Winnipeg, Canada

CHONETES Fischer de Waldheim. Genotype: Orthis striatella Dalman.

Chonetes Fischer de Waldheim, Oryct. Gouv. Moscow, pt. 2, 1837, pp. 134, 193, pl. 26, figs. 8, 9.—Hall, Pal. New York, 2, 1852, p. 64.—Billings, Canadian Jour., 6, 1861, p. 349.—Meek and Hayden, Pal. Upper Missouri, Smithsonian Cont. Knowl., 172, 1864, p. 22.—Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, p. 242; Pal. New York, 4, 1867, p. 115.—Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 122.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1886, p. 66.—Miller, N. A. Geol. Pal., 1889, p. 339.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 303; 11th Ann. Rep. New York State Geol., 1894, p. 292.—Koken, Die Leitfossilien, Leipzig, 1896, p. 232, text fig. 192, 4, 7.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 84.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 200.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 316.—Beede, Univ. Geol. Surv. Kansas, 6, 1900, p. 67.—Grabau, Bull. New York State Mus., 45, 1901, p. 185; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 185.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 233.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 389.

Chonetes bastini Williams.

Chonetes bastini Williams, Proc. U. S. Nat. Mus., 45, 1913, p. 337, pl. 30, figs. 6, 7, 10.

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

Cotypes.—Cat. No. 58960, 58961, U.S.N.M.

Chonetes cobscooki Williams.

Chonetes cobscooki Williams, Proc. U. S. Nat. Mus., 45, 1913, p. 327, pl. 29, fig. 5.

Silurian (Edmunds): South of Field Point, west shore of Cobscook River, Washington County, Maine.

Holotype.—Cat. No. 58949, U.S.N.M.

Chonetes colliculus Foerste.

Chonetes colliculus Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1909, p. 24, pl. 1, figs. 10A, B, C.

Cayugan (Kokomo): Kokomo, Indiana.

Chonetes cornutus (Hall).

Strophomena cornuta Hall, Geol. New York, Rep. 4th Dist., 1843, p. 73, fig. 3.

Chonetes cornuta Dekoninck, Recher. Animaux Foss., pt. 1, 1847, p. 200, pl. 20, fig. 3.—Hall, Pal. New York, 2, 1852, p. 64, pl. 21, fig. 10; 2d Ann. Rep. New York State Geol., 1883, pl. 47, fig. 1.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 125, figs.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 16, fig. 1.—Grabau, Bull. New York State Mus., 45, 1901, p. 185, fig. 93.; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 185, fig. 93.

Chonetes cf. cornutus Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 432, pl. 2, fig. 12.

Upper Clinton: Wayne County, New York; Pennsylvania; Maryland.

Chonetes edmundsi Williams.

Chonetes edmundsi Williams, Proc. U. S. Nat. Mus., 45, 1913, p. 323, pl. 29, figs. 6–9.

Silurian (Edmunds): Edmunds Township, Washington County, Maine.

Cotypes.—Cat. No. 58945, U.S.N.M.

Chonetes jerseyensis Weller.

Chonetes jerseyensis Weller, Ann. Rep. Geol. New Jersey, 1900, p. 8; Geol. Surv. New Jersey, Pal., 3, 1903, p. 230, pl. 20, figs. 11–16.—Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 338, pl. 61, figs. 17–19.

Chonetes jerseyensis—Continued.
Helderbergian: Two miles south of Tristates, New York (Decker Ferry); Dawson, Cash Valley, Tonoloway, etc., Maryland; Keyser, West Virginia (Keyser).
Cayugan (Cobleskill): Schoharie and Litchfield, New York.

Chonetes jerseyensis spinosus Maynard.
Chonetes jerseyensis var. spinosus Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 339, pl. 61, fig. 20.
Helderbergian (Keyser): Hancock, Maryland.

CHONETES MINIMA Hall (not Sowerby). See Chonetes undulatus.

CHONETES NOVASCOTICA Hall, 1879. See Chonetes novascotica waldronensis.

Chonetes novascoticus Hall.
Chonetes novascotica Hall, Canadian Nat. Geol., 5, 1860, p. 144, fig. 2.—Dawson, Acadian Geol., Suppl. Chap., 1860, p. 68, fig. 48; Acadian Geol., 3d ed., 1878, p. 595, fig. 199.
Chonetes cfr. nova-scotia Clarke, Archivos Mus. Nac. Rio de Janeiro, 10, author's Engl. ed., p. 12, pl. 1, fig. 25.—Katzer, Grundz. d. Geol. d. unt. Amazonas, Leipzig, 1903, pl. 16, fig. 8.
Silurian (Moydart, Stonehouse): Arisaig, Nova Scotia.

Chonetes novascoticus waldronensis Foerste.
Chonetes novascotica waldronensis Foerste, Bull. Kentucky Geol. Surv., 7, 1906, p. 328.
Chonetes novascotica Hall, 28th Rep. New York State Mus. Nat. Hist., 1879, p. 155, pl. 22, figs. 11–14; 11th Rep. Indiana Geol. Nat. Hist., 1882, p. 293, pl. 22, figs. 11–14.
Niagaran (Waldron): Waldron, Indiana.

Chonetes (Eodevonaria) primigenius Twenhofel.
Chonetes (Eodevonaria) primigenius Twenhofel, Bull. Victoria Mem. Mus., 3, 1914, p. 26, pl. 1, figs. 4, 5.
Richmond (Charleton), Gamachian, and Anticostian: Ellis Bay, Jumpers, etc. Anticosti.

Chonetes striatellus (Dalman).
Orthis striatella Dalman, Kgl. Svens. Vet.-Akad. Handl., 1828, p. 111, pl. 1, fig. 5,
Chonetes striatella Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 595.—Koninck, Animaux Fossiles, pt. 1, 1847, p. 200, pl. 20, figs. 5a–g.—Davidson, Mon. Brit. Sil. Brachiopoda, Pal. Soc., 1871, p. 331, pl. 49, figs. 23–26.
Chonetes conf. striatella Emerson, Narrative Hall's Sec. Arctic Exped., U. S. Navy Dept., p. 578.
Silurian: Europe; Cape Louis Napoleon, Arctic America.

Chonetes tenuistriatus Hall.
Chonetes tenuistriata Hall, Canadian Nat. Geol., 5, 1860, p. 145, fig. 3.—Dawson, Acadian Geol., 3d ed., 1878, p. 596, fig. 200.
Silurian (Ross Brook and McAdam): East River, Nova Scotia.

Chonetes undulatus Hall.
Chonetes minima Hall (not Sowerby), 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1876, pl. 22, fig. 15.
Chonetes undulata Hall, ibid., 1879, p. 155, pl. 22, fig. 15; 11th Rep. State Geol. Indiana, 1882, p. 294, pl. 22, fig. 15.
Niagaran (Waldron): Waldron, Indiana.

Chonetes vetustus Foerste.

Chonetes vetusta Foerste, Bull. Geol. Surv. Kentucky, 7, 1906, p. 327; Jour. Cincinnati Soc. Nat. Hist., 21, 1909, p. 24, pl. 1, fig. 16.

Clinton (Alger): Lewis County, Kentucky.

CHONOPHYLLUM Edwards and Haime.

Genotype: Cyathophyllum perfoliatum Goldfuss.

Chonophyllum Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal. (Arch. du Mus. d'Hist. Nat., 5), 1851, pp. 169, 405.—Pictet, Traite Pal., 2d ed., 4, 1857, p. 457.—Milne-Edwards, Hist. Nat. d. Corall., 3, 1860, p. 398.—Lindstrom, Geol. Mag., 3, 1866, pp. 360, 411.—Hall and Whitfield, 23d Rep. New York State Cab. Nat. Hist., 1873, p. 233, footnote.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 115.—Zittel, Handb. Pal., 1, 1879, p. 229.—Roemer, Leth. geog., pt. 1, Leth Pal., 1883, p. 360.—Miller, N. A. Geol. Pal., 1889, p. 177.—Sherzer, Amer. Geol., 6, 1890, p. 61; 8, 1890, pp. 278–283; Bull. Geol. Soc. Amer., 3, 1892, p. 256, 258.—Nicholson, Rec. Geol. New South Wales, 4, 1894, p. 15.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 185.—Grabau, Bull. New York State Mus., 45, 1901, p. 139, fig. 32; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 139.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 2, 1902, p. 109.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 62.

Craterophyllum (new subg. of Chonophyllum) Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 102.

Chonophyllum belli Billings.

Chonophyllum belli Billings, Canadian Nat. Geol., n. s., 2, 1865, p. 432.—Sherzer, Amer. Geol., 6, 1890, p. 61; Bull. Geol. Soc. Amer., 3, 1892, p. 268.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 186, pl. 16, figs. 5–6.

Upper Medinan (Cataract?): Manitoulin Island, Lake Huron.

Chonophyllum (Craterophyllum) canadense (Billings).

Ptychophyllum Canadense Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 107 (adv. sheets, 1862); Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 34 (loc. ref.).

Chonophyllum Canadense Lambe, Ottawa Naturalist, 12, 1899, p. 222; Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 185, pl. 17, figs. 1–4.

Chonophyllum (Craterophyllum) canadense Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 102 (gen. ref.).

Anticostian (Jupiter River, Chicotte): Southwest Point, Anticosti.

Chonophyllum? capax Hall.

Chonophyllum capax Hall, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 410 (ext. 1882, p. 6).—Sherzer, Amer. Geol., 6, 1890, p. 61; Bull. Geol. Soc. Amer., 3, 1892, p. 273.

Niagaran (Louisville): Louisville, Kentucky.

Chonophyllum greenei Sherzer.

Chonophyllum greenei Sherzer, Bull. Geol. Soc. Amer., 3, 1892, p. 275, pl. 8, fig. 7.

Niagaran (Louisville): Louisville, Kentucky.

CHONOPHYLLUM NIAGARENSE Hall. See Cystiphyllum niagarense.

Chonophyllum nymphale (Billings).

Cyathophyllum nymphale Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 111 (adv. sheets, 1862).

Chonophyllum nymphale Lambe, Ottawa Naturalist, 12, 1899, p. 251; Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 187, pl. 18, figs. 1, 1a.

Silurian: Anse a la Vieille, Bay of Chaleurs, Quebec.

Chonophyllum solitarium Foerste.

Chonophyllum solitarium Foerste, Bull. Geol. Surv. Kentucky, 7, 1906, p. 317, pl. 7, fig. 2.

Clinton (Waco): North of Estill Springs, Kentucky.

Chonophyllum vadum Hall.

Chonophyllum vadum Hall, 12th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1883, p. 272, pl. 15, figs. 1–4; 35th Rep. New York State Mus. Nat. Hist., 1884, p. 410 (ext. 1882, p. 6).—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 130, figs.—Sherzer, Amer. Geol., 6, 1890, p. 61; Bull. Geol. Soc. Amer., 3, 1892, p. 273.

Niagaran (Louisville): Louisville, Kentucky.

Chonophyllum (Craterophyllum) vulcanius Foerste.

Chonophyllum (Craterophyllum) vulcanius Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 101, pl. 1, fig. 12.

Niagaran (Brownsport): West of Hope Creek, Perry County, Tennessee.

CHRISTIANIA Hall and Clarke. Genotype: Leptæna subquadrata Hall.

Christiania Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 298.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 687.—Hall, 11th Ann. Rep. New York State Geol., 1894, p. 290.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 314; 2d ed., 1913, p. 314.

Christiania subquadrata Hall.

Leptæna subquadrata Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 46, figs. 32, 33.

Christiania subquadrata Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 298, 351, pl. 15, figs. 32, 33; pl. 15A, fig. 36; pl. 20, figs. 18–20; 48th Rep. New York State Mus., 2, 1895, p. 351, pl. 6, figs. 13–18; 14th Rep. State Geol. New York for 1894, 1897, p. 351, pl. 6, figs. 13–18.

Chazyan (Ottosee): Blount County, Tennessee.

Christiania trentonensis Ruedemann.

Christiania trentonensis Ruedemann, Bull. New York State Mus., 49, 1901, p. 21, pl. 2, figs. 2–6.—Bassler, Bull. Geol. Surv. Virginia, 2a, 1909, pl. 3, figs. 14–16.

Mohawkian: Rysedorph Hill, Rensselaer County, New York (Rysedorph); Pennsylvania, Maryland, and Virginia (Chambersburg).

Cladograpsus Emmons. Genotype: C. dissimilaris Emmons.

Cladograpsus Emmons, Amer. Geology, 1, pt. 2, 1855, p. 107.

Cladograpsus dissimilaris Emmons.

Cladograpsus dissimilaris Emmons, Amer. Geology, 1, pt. 2, 1855, p. 107, pl. 1, fig. 15.

"Taconic": Locality not given.

Observation.—Figures and description not sufficient for recognition.

Cladograpsus gracilis Carruthers. See Nemagraptus gracilis.

Cladograpsus inæqualis Emmons.

Cladograpsus inæqualis Emmons, Amer. Geology, 1, pt. 2, 1855, p. 107.

Dicranograptus? inæqualis Gurley, Jour. Geology, 4, 1896, p. 96 (gen. ref.).

"Taconic": Parrotsville, Tennessee.

Observation.—Probably a species of Dicranograptus, but description is not sufficient for determination.

Cladograpsus linearis Carruthers. See Pleurograptus linearis.

CLADOGRAPSUS RAMOSUS Geinitz. See Dicranograptus ramosus.

CLADOPORA Hall. Genotype: C. seriata Hall.

Cladopora Hall, Amer. Jour. Sci. Arts, 2d ser., 11, 1851, p. 400; Pal. New York, 2, 1852, p. 137; Rep. Geol. Surv. Iowa, 1, pt. 2, 1858, p. 478.—Rominger, Amer. Jour. Sci. and Arts, 2d ser., 34, 1862, p. 390.—Hall and Whitfield, 23d Rep. New York State Cab. Nat. Hist. (extract, 1872, p. 11), 1873, p. 229.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 46.—Zittel, Handb. Pal., 1, 1880, p. 618.—Miller, N. A. Geol. Pal. 1889, p. 178.—Sardeson, Neues Jahrb. f. Min., Geol. Pal., Beilage-Band, 10, 1896, p. 319.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 29.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 146; Bull. New York State Mus., 45, 1901, p. 146.—Počta, Syst. Sil. Centre Boheme, 8, pt. 2, 1902, p. 253.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 92.

Cladopora aculeata Davis.

Cladopora aculeata Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 48, fig. 1; pl. 49, fig. 2.

Niagaran (Louisville): Near Louisville, Kentucky.

CLADOPORA ÆDILIS Eichwald. See Eridotrypa ædilis.

Cladopora bifurcata Grabau.

Cladopora bifurcata Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 115, pl. 10, figs. 2–4; pl. 12, figs. 7, 8; pl. 15, fig. 1.

Upper Monroan: Amherstburg, Ontario (Anderdon); Wayne County, Michigan (Amherstburg).

Cladopora cæspitosa Hall.

Cladopora cæspitosa Hall, Pal. New York, 2, 1852, p. 138, pl. 38, figs. 2a–c.

Niagaran (Lockport): Lockport, New York.

Cladopora cervicornis Hall.

Cladopora cervicornis Hall, Pal. New York, 2, 1852, p. 139, pl. 38, figs. 3a, b.

Cladopora cf. cervicornis Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 116, pl. 14, fig. 5.

Niagaran (Lockport): Lockport, New York.

?Upper Monroan (Amherstburg): Amherstburg, Ontario.

Cladopora complanata Davis.

Cladopora complanata Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 49, fig. 1.

Niagaran: Near Louisville, Kentucky (Louisville); near Linden, Tennessee (Brownsport).

CLADOPORA CRASSA Lambe. See Cœnites crassa.

Cladopora equisetalis Davis.

Cladopora equisetalis Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 48, fig. 7.

Niagaran (Louisville): Louisville, Kentucky.

Holotype.—Cat. No. 52642, U.S.N.M.

Cladopora fibrosa Hall.

Cladopora fibrosa Hall, Pal. New York, 2, 1852, p. 139, pl. 38, figs. 4a, b, and 5a, b.

Niagaran (Lockport-Gasport member): Lockport, New York.

Cladopora laqueata Rominger.

Cladopora laqueata Rominger, Geol Surv. Michigan, 3, pt. 2, 1876, p. 46, pl. 18, fig. 3.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 48, figs. 8, 9.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 131, fig.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 92.

Niagaran: Near Seul Choix, Michigan; Louisville, Kentucky (Louisville).

Plesiotypes.—Cat. No. 52641, U.S.N.M.

Cladopora lichenoides Winchell and Marcy.

Cladopora lichenoides Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 84, pl. 2, fig. 1.

Niagaran (Racine): Chicago, Illinois.

Cladopora macrophora Hall.

Cladopora macrophora Hall, Pal. New York, 2, 1852, p. 140, pl. 39, figs. 2a, b.

Niagaran (Lockport): Lockport, New York.

Cladopora menis Davis.

Cladopora menis Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 48, figs. 4, 5.

Niagaran (Louisville): Near Louisville, Kentucky.

Cladopora multipora Hall.

Cladopora multipora Hall, Pal. New York, 2, 1852, p. 140, pl. 39, figs. 1a–g.—Lambe, Cont. Can. Pal. Geol. Surv. Canada, 4, pt. 1, 1899, p. 29.—Grabau, Bull. New York State Mus., 45, 1901, p. 147, fig. 44; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 147, fig. 44.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 33.

Favosites multipora Nicholson, Canadian Jour., n. s., 14, 1873, p. 40.—Nicholson and Hinde, ibid., 14, 1874, p. 148.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 53.

Favosites Halliana Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 148.

Niagaran: Lockport and Shelby, New York (Lockport-Guelph); Lake Temiscaming, Quebec.

Cladopora multiseriata Weller.

Cladopora multiseriata Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 271, pl. 26, figs. 2, 3.—Swartz, Maryland Geol. Surv., Low. Dev., 1913, p. 217.

Helderbergian: Near Hainesville, New Jersey (Coeymans); near Cumberland, Maryland (Keyser).

Cladopora ordinata Davis.

Cladopora ordinata Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 48, fig. 2.

Niagaran (Louisville): Near Louisville, Kentucky.

Cladopora proboscidalis Davis.

Cladopora proboscidalis Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 48, fig. 3; pl. 97, fig. 21.

Niagaran (Louisville): Near Louisville, Kentucky.

Cladopora rectilineata Simpson.

Cladopora rectilineata Simpson, Trans. Amer. Phil. Soc., n. s., 16, 1889, p. 459, fig. 30.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 221, pl. 17, figs. 14–17.—Swartz, Maryland Geol. Surv., Low. Dev., 1913, p. 216, pl. 25, figs. 4–7.—Holtedahl, 2d Arct. Exp. "Fram," 1898–1902, No. 32, 1914, p. 14, pl. 4, fig. 7.

Cladopora rectilineata—Continued.

Helderbergian: Near Tristates, New York (Decker Ferry); Keyser, West Virginia; near Cumberland, Pinto, etc., Maryland (Keyser); southwestern Ellesmereland, Arctic America.

Cladopora reticulata Hall.

Cladopora reticulata Hall, Pal. New York, 2, 1852, p. 141, pl. 39, figs. 3a–e.—Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 85.—White, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 384, pl. 47, fig. 6.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 47, figs. 1, 2.—Miller, N. A. Geol. Pal., 1889, p. 178, fig. 152.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, p. 132, fig.

Omniretepora anastomosa D'Orbigny, Prodr. Pal., 1847, p. 45 (not defined).—Boule and Thevenin, Ann. Pal., 1, 1906, p. 7, pl. 3, figs. 3–5.

Niagaran: Louisville, Kentucky (Louisville); West Tennessee (Brownsport); Wisconsin; Lockport, New York.

Plesiotype.—Cat. No. 52640, U.S.N.M.

Cladopora sarmentosa Hall.

Cladopora sarmentosa Hall, Trans. Albany Inst., 10, 1883, p. 59.

Niagaran (Waldron): Waldron, Indiana.

Cladopora seriata Hall.

Cladopora seriata Hall, Pal. New York, 2, 1852, p. 137, pl. 38, figs. 1a–m.—Grabau, Bull. New York State Mus., 45, 1901, p. 146, fig. 43; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 146, fig. 43.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 93, fig. 148.

Favosites? seriata Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 149.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 54.

Niagaran (Rochester, Lockport): Lockport, etc., New York; Ontario.

Cladopora striata Davis.

Cladopora striata Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 48, fig. 6.

Niagaran (Louisville): Near Louisville, Kentucky.

Holotype: Cat. No. 51643, U.S.N.M.

Cladopora verticillata Winchell and Marcy. See Cœnites verticillata.

CLARKELLA Walcott. Genotype: Polytœchia? montanensis Walcott.

Clarkella Walcott, Smiths. Misc. Coll., 53, 1908, pp. 110–111, 142, 148, pl. 11; Mon. U. S. Geol. Surv., 51, 1912, p. 809.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 392.

Clarkella montanensis Walcott.

Polytœchia? montanensis Walcott, Proc. U. S. Nat. Mus., 28, 1905, p. 295.

Clarkella montanensis Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 810, pl. 104, figs. 2, 2a–d.

Canadian: East side of West Gallatin River, above Gallatin, Montana.

Holotype and *paratypes.*—Cat. No. 11857, U.S.N.M.

CLARKOCERAS Ruedemann. Genotype: Piloceras newton winchelli Clarke.

Clarkoceras Ruedemann, Bull. New York State Mus., 80, 1905, p. 337.

Clarkoceras newton winchelli (Clarke).

Piloceras newton-winchelli Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 767, figs. 8, 9; pl. 47, figs. 1–3.

Clarkoceras newton winchelli—Continued.

Piloceras winchelli Miller, N. A. Geol. Pal., 2d App., 1897, p. 776.

Clarkoceras newton-winchelli Ruedemann, Bull. New York State Mus., 80, 1905, pp. 336, 337, figs. 25, 26.

Canadian (Shakopee): Union township, Houston County, Minnesota.

CLATHRODICTYON Nicholson and Murie.

Genotype: C. vesiculosum Nicholson and Murie.

Clathrodictyon Nicholson and Murie, Jour. Linn. Soc. Zool., 14, 1878, p, 216, 220; Mon. Sil. Foss. Girvan Dist., 1880, p. 237.—Zittel, Handb. Pal., 1, 1879, p. 286.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 535.—Nicholson, Mon. Brit. Strom., Pal. Soc., 1886, pp. 16, 77; Ann. Mag. Nat. Hist., 5th. ser. 19, 1897, p. 2, footnote.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 149; Zittel-Eastman Textb. Pal., 1, 1900, p. 112.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 40.—Parks, Univ. Toronto Studies, Geol. Ser., No. 4, 1907, p. 12; No. 5, 1908, p. 14; No. 6, 1909, pp. 7, 28; Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 123.

Clathrodictyon cystosum Parks.

Stromatopora vesiculosa Rominger (not Nicholson and Murie), Proc. Acad. Nat, Sci. Philadelphia, 1886, p. 50.

Clathrodictyon cystosum Parks (Stromatopora cystosa Rominger MS.), Univ. Toronto Studies, Geol. Ser., No. 5, 1908, p. 21, pl. 7, figs. 3, 4; pl. 8, figs. 6. 8; No. 6, 1909, p. 29.

Niagaran: Drummond Island; Iowa; Drift at Ann Arbor, Michigan; ?Kentucky; Bessels Bay, Greenland.

Cotypes.—Cat. Nos. 36924, 54296, U.S.N.M.

Clathrodictyon cystosum cylindricum Parks.

Clathrodictyon cystosum var. cylindricum Parks, Univ. Toronto Studies, Geol. Ser., No. 6, 1909, p. 29.

Niagaran: Southampton Island, Hudson Bay, Canada.

Clathrodictyon cystosum lineatum Parks.

Clathrodictyon cystosum var. lineatum Parks, Univ. Toronto Studies, Geol. Ser., No. 5, 1908, p. 24, pl. 8, fig. 8; No. 6, 1909, p. 29, pl. 20, fig. 9.

Niagaran: Drift at Ann Arbor, Michigan; Beechy Island, Lancaster Sound, Canada.

Holotype.—Cat. No. 54238, U.S.N.M.

Clathrodictyon drummondense Parks.

Clathrodictyon drummondense Parks, Univ. Toronto Studies, Geol. Ser., No. 5, 1908, p. 26, pl. 7, fig. 7; pl. 8, figs. 3, 7; No. 6, 1909, p. 30, pl. 20, figs. 7, 8.

Niagaran: Drummond Island; Louisville, Kentucky; Rainy Island, Attawapiskat River, and Southampton Island, Hudson Bay, Canada.

Holotype and *paratype.*—Cat. Nos. 36814, 54237, U.S.N.M.

Clathrodictyon fastigiatum Nicholson.

Clathrodictyon fastigiatum Nicholson, Mon. British Strom., pt. 2, 1886, p. 43, fig. 3; 1888, p. 152, pl. 19, figs. 1–5; Ann. Nat. Hist., 5th ser., 19, 1887, p. 8, pl. 2, figs. 3, 4.—Whiteaves, Pal. Foss., 3, pt. 2, 1895, p. 52; Canadian Rec. Sci., 7, p. 135; Pal. Foss., 3, pt. 4, 1906, p. 328.—Parks, Univ. Toronto Studies, Geol. Ser., No. 4, 1907, p. 18, pl. 1, fig. 6; No. 5, 1908, p. 24, pl. 7, fig. 8; cf. pl. 7, fig. 4, pl. 8, fig. 6.

Niagaran: Glenelg Township, Elora and Aboyne, Ontario (Guelph); Drummond and Manitoulin Islands, Lake Huron; Drift, Ann Arbor, Michigan.

Plesiotype.—Cat. No. 54239, U.S.N.M.

CLATHRODICTYON FRANKLINENSE Ami. See Actinostroma franklinense.

Clathrodictyon ostiolatum (Nicholson).

Stromatopora ostiolata Nicholson, Ann. Mag. Nat. Hist., 4th ser., 12, 1873, p. 90, pl. 4, fig. 1a; Pal. Prov. Ontario, 1874, pl. 1, fig. 1, 1a; pt. 2, 1875, p. 63.—Nicholson and Murie, Jour. Linn. Soc. London, Zool., 14, 1878, p. 219, pl. 2, figs. 1, 2.—Nicholson, Ann. Mag. Nat. Hist., 4th ser., 12, 1890, pl. 5, fig. 1a.

Clathrodictyon (Stromatopora) ostiolatum Nicholson, Mon. British Strom., pt. 1, 1886, p. 14.

Clathrodictyon ostiolatum Nicholson, Ann. Mag. Nat. Hist., 5th ser., 19, 1887, p. 11, pl. 3, figs. 1–3.—Whiteaves, Pal. Foss., 3, pt. 2, 1895, p. 52; Can. Rec. Sci., 7, 1896, p. 135.—Ruedemann, Mem. New York State Mus., 5, 1903, p. 37, pl. 1, figs. 10–12.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 41.—Whiteaves, Pal. Foss., 3, pt. 4, 1906, p. 328.—Parks, Univ. Toronto Studies, Geol. Ser., No. 4, 1907, p. 12, pl. 2, figs. 1–2; pl. 5, figs. 7, 8; No. 5, 1908, p. 26.—Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 87, pl. 8, fig. 6; pl. 13, fig. 1; pl. 16, fig. 18.

Niagaran: Ontario and Shelby and Rochester, New York (Guelph); Owen Sound and Manitoulin Island.

Upper Monroan (Anderdon): Detroit River, Canada.

Clathrodictyon rectum Parks.

Clathrodictyon rectum Parks, Univ. Toronto Studies, Geol. Ser., No. 5, 1908, p. 28, pl. 14, figs. 5, 7.

Niagaran (Louisville): Louisville, Kentucky.

Clathrodictyon striatellum (D'Orbigny).

Stromatopora concentrica Lonsdale, Sil. Syst., 1839, p. 680, pl. 15, fig. 31.

Stromatopora striatella D'Orbigny, Prod. Pal., 1, 1850, p. 51.—Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 145.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 49.—Roemer, Leth. Geog., pt. 1, Leth. Pal., 1883, p. 540.—Whiteaves, Canadian Rec. Sci., 7, 1896, p. 144.

Stromatopora mammillata Schmidt, Sil. Form von Esthland, 1858, p. 232.—Von Rosen, Ueber die Natur. der Strom., 1867, p. 71, pl. 8, figs. 1–5.—Roemer, Leth. Geog., pt. 1, Leth. Pal., 1, 1883, p. 531, fig. 125.

Cœnostoma botryoideum Spencer, Bull. Mus. Univ. State Missouri, 1, 1884, p. 59, pl. 6, figs. 13–13b; Trans. Acad. Sci. St. Louis, 4, 1884, p. 600, pl. 6, figs. 13–13b.

Clathrodictyon striatellum Nicholson, Ann. Mag. Nat. Hist., 5th ser., 19, 1887, p. 6, pl. 1, figs. 9, 10; Mon. British Strom., 1886, p. 156, pl. 1, fig. 1, pl. 5, fig. 3; pl. 19, figs. 6–12.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 40, fig. 61b.—Parks, Univ. Toronto Studies, Geol. Ser., No. 4, 1907, p. 14, pl. 1, figs. 3, 4; pl. 6, fig. 8; No. 5, 1908, p. 25; No. 6, 1909, p. 28.

Silurian: England, Gotland, and Esthonia.

Niagaran: Guelph, Hamilton, Owen Sound, islands of Lake Huron, Southampton Island, Hudson Bay, etc., Canada.

Clathrodictyon variolare (Von Rosen).

Stromatopora variolaris Von Rosen, Ueber die Natur der Stromatoporen, 1867, p. 61, pl. 2, figs. 2–5.

Clathrodictyon variolare Nicholson, Ann. Mag. Nat. Hist., 5th ser., 7, 1887, p. 4, pl. 1, figs. 4–6; Mon. British Strom., 1892, p. 150, pl. 18, figs. 1–5, pl. 17, fig. 14.—Whiteaves, Canadian Rec. Sci., 7, 1897, p. 130.—Parks, Univ. Toronto Studies, Geol. Ser., No. 5, 1908, p. 19, pl. 7, fig. 2, pl. 8, figs. 1, 9.—1, 9.—Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 89, pl. 9, figs. 1, 2.

Clathrodictyon variolare—Continued.

Niagaran: Mann Island, Lake Temiscaming, Manitoulin Island, Drummond Island, and the north shore of Lake Michigan.

Upper Monroan (Anderdon): Near Amherstburg, Ontario.

Plesiotype.—Cat. No. 36825, U.S.N.M.

Clathrodictyon vesiculosum Nicholson and Murie.

Stromatopora striatella McCoy, British Pal. Foss., 1851, p. 12.

Clathrodictyon vesiculosum Nicholson, Ann. Mag. Nat. Hist., 5th ser., 19, 1877, p. 1, figs. 1–3.—Nicholson and Murie, Jour. Linn. Soc. Zool., 14, 1878, p. 220, pl. 2, figs. 11–13, p. 216.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan, 1880, p. 238, pl. 19, fig. 2.—Nicholson, Mon. British Strom., 1892, p. 147, pl. 17, figs. 10–13; pl. 18, fig. 12.—Whiteaves, Can. Rec. Sci., 7, 1896, p. 134.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 40, figs. 61a, 62, 63.—Parks, Univ. Toronto Studies, Geol. Ser., No. 5, 1908, p. 14, pl. 7, figs. 1, 6; pl. 8, figs. 3–5; No. 6, 1909, p. 28.—Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 68, pl. 3, fig. 8.

Stromatopora concentrica Spencer, Bull. Mus. Univ. Missouri, 1, 1882, p. 45.

Silurian: England and Scotland; Ontario, Michigan, New York, Iowa, Ohio, Illinois, Missouri, and Anticosti.

Clathrodictyon vesiculosum astrodistans Parks.

Clathrodictyon vesiculosum var. astrodistans Parks, Univ. Toronto Studies, Geol. Ser., No. 5, 1908, p. 19.

Niagaran: Drummond Island, Lake Huron.

Cotypes.—Cat. No. 36925, U.S.N.M.

Clathrodictyon vesiculosum minutum (Rominger).

Stromatopora minutum Rominger (part), Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 49.

Clathrodictyon vesiculosum var. minutum Parks, Univ. Toronto Studies, Geol. Ser., No. 5, 1908, p. 19, pl. 7, fig. 6; pl. 8, fig. 5; No. 6, 1909, p. 29.

Niagaran: Lake Temiscaming and Southampton Island, Hudson Bay, Canada.

CLATHROGRAPTUS GEINITZIANUS Lapworth. See Retiograptus geinitzianus.

CLATHROPORA Hall. Genotype: Clathropora frondosa Hall.

Clathropora Hall, Amer. Jour. Sci. Arts, 2d. ser., 11, 1851, p. 400; Pal., New York, 2,1852, p. 159.—Pictet, Traite de Paleontologie, 2d ed., 4, 1857, p. 170.—Nicholson, Geol. Mag., dec. 2, 1, 1874, p. 124; Pal. Prov. Ontario, 1874, p. 111.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 152.—Vine, Rep. 51st Meeting Brit. Assoc. Adv. Sci., 1882, p. 166.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 7, 1884, p. 39.—Foerste, Bull. Sci. Lab. Denison Univ., 2, 1884, p. 153.—Miller, N. A. Geol. Pal., 1889, p. 297.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 392; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 279.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 543.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 45.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 173; Bull. New York State Mus., 45, 1901, p. 173.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 56.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 156.

Clathropora alcicornis Hall.

Clathropora alcicornis Hall, Pal. New York, 2, 1852, p. 159, pl. 40B, figs. 4a–c.—Grabau, Bull. New York State Mus., 45, 1901, p. 174, fig. 76; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 174, fig. 76.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, pp. 56, 57, pl. 20, figs. 1–4.

Clinton (Rochester): Lockport, New York.

Figured section of *holotype.*—Cat. No. 35552, U.S.N.M.

CLATHROPORA CLINTONENSIS Hall and Whitfield. See Clathropora frondosa clintonensis.

CLATHROPORA FLABELLATA Hall. See Graptodictya proava.

Clathropora frondosa Hall.

Clathropora frondosa Hall, Pal. New York, 2, 1852, p. 160, pl. 40B, figs. 5a–e.—Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 139.—Nicholson, Pal. Prov. Ontario, 1875, p. 59.—(Van Cleve) White, 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 385, pl. 55, fig. 3.—Miller, N. A. Geol. Pal., 1889, p. 297, fig. 467.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 133, fig.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, fig. 104 (p. 544).—Grabau, Bull. New York State Mus., 45, 1901, p. 174, fig. 75; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 173, fig. 75.—Bassler, Bull. U. S. Geol. Surv., 292, p. 56, pl. 20, figs. 5–11; pl. 21, figs. 6–7.—Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1909, p. 11.

Clinton: Lockport, Clinton, etc., New York; Grimsby, etc., Ontario (Rochester); Lewis County, Kentucky (West Union).

Plesiotypes.—Cat. No. 44146, U.S.N.M.

CLATHROPORA FRONDOSA Foerste (part). See Clathropora frondosa clintonensis.

Clathropora frondosa clintonensis (Hall and Whitfield).

Clathropora clintonensis Hall and Whitfield, Pal. Ohio, 2, 1875, p. 113, pl. 5, fig. 7.—Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 154; 3, 1888, pl. 15, fig. 4; Geol. Surv. Ohio, 7, 1895, p. 598, pl. 28, fig. 4.

Clathropora frondosa Foerste Bull. Sci. Lab. Denison Univ., 2, 1887, p. 154; 3, 1888, pl. 15, fig. 3; Geol. Surv. Ohio, 7, 1895, p. 598, pl. 28, fig. 3.

Clathropora frondosa-clintonensis Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 209.

Upper Medinan: Dayton and Fairhaven, Ohio; Kentucky; Tennessee (Brassfield); Dundas, etc., Ontario (Cataract).

Clathropora frondosa intermedia (Nicholson and Hinde).

Clathropora intermedia Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 140, fig. 5.—Nicholson, Pal. Prov. Ontario, 1875, p. 59, figs. 29a, b.

Clathropora frondosa intermedia Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 56, pl. 20, figs. 6–8.

Clinton (Rochester): Thorold and Hamilton, Ontario.

CLATHROPORA GLOMERATA Whitfield and Hovey. See Stictopora? glomerata.

Clathropora? gracilis Spencer. Not recognizable.

Clathropora? gracilis Spencer, Trans. Acad. Sci. St. Louis, 4, 1884, p. 604, pl. 7, fig. 4; Bull. Mus. State Univ. Missouri, 1, 1884, p. 54, pl. 7, fig. 4.

Niagaran: Hamilton, Ontario.

CLATHROPORA INTERMEDIA Nicholson and Hinde. See Clathropora frondosa intermedia.

CLATHROSPIRA Ulrich and Scofield. Genotype: Pleurotomaria subconica Hall.

Pleurotomaria (part) of numerous American and European authors.

Clathrospira Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, pp. 954–1005.—Koken, Neues Jahrb. f. Min., Geol Pal., 1, 1898, p. 19.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 948.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 644.

Clathrospira conica Ulrich and Scofield.

Clathrospira conica Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1008, pl. 70, figs. 1–4.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 165.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 644, figs. 878d–f.

Black River and Trenton: Minneapolis, Goodhue and Fillmore Counties, Minnesota; Kentucky; Baffin Land.

Maysville: Cincinnati, Ohio, and vicinity.

Cotypes.—Cat. Nos. 45744, 45746, U.S.N.M.

Clathrospira convexa Ulrich and Scofield.

Clathrospira convexa Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1007, pl. 69, fig. 51.

Black River (Platteville): Calhoun County, Illinois.

Holotype.—Cat. No. 45747, U.S.N.M.

Clathrospira deiopeia (Billings).

Pleurotomaria Deiopeia Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 155.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 75, pl. 12, figs. 1, 1a.

Clathrospira Deiopeia (Ulrich) Whiteaves, Geol. Surv. Canada, Pal. Foss. 3, pt. 4, 1906, p. 332 (gen. ref.).

Niagaran (Guelph): Elora, Ontario.

Clathrospira subconica (Hall).

Pleurotomaria subconica Hall, Pal. New York, 1, 1847, p. 174, pl. 37, figs. 8a–e; p. 304, pl. 83, figs. 3a–e.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 160, pl. 17, fig. 9a, b.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 819, fig. 606.—Hall, Rep. Geol. Surv. Wisconsin, 1862, p. 39, fig. 1.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 180, fig. 174; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 17.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 317.—Whitfield, Geol. Wisconsin, 4, 1882, p. 216, pl. 6, fig. 1.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 157.—Whiteaves, Canadian Rec. Sci., 5, 1893, p. 319.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 716, figs.

Clathrospira subconica Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1006, pl. 69, figs. 47–50; pl. 70, figs. 5–6.—Ruedemann, Bull. New York State Mus., 49, 1901, p. 33.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 956, pl. 41, figs. 8, 8b.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 644, fig. 878a–c.

Black River—Richmond: Watertown, New York (Trenton); Canada; Ohio; Minnesota; Iowa; Tennessee; Anticosti; etc.

Plesiotype.—Cat. Nos. 45748, 46051; U.S.N.M.

Clavæblastus Hambach. See Troostocrinus Shumard.

Cleidophorus of authors. See Clidophorus Hall.

Cleidophorus major Ulrich. See Lyrodesma major.

CLEIOCRINUS Billings. Genotype: C. regius Billings.

Cleiocrinus Billings, Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, p. 276; Geol. Surv. Canada, dec. 4, 1859, p. 52, fig. 17.—Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 359.—Zittel, Handb. Pal., 1, 1879, p. 357.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 258 (Rev. Pal., pt. 1, p. 35, 147); ibid., 1886, p. 76 (Rev. Pal., pt. 3, p. 152).—Miller, N. A. Geol. Pal., 1889, p. 231.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 191.—Springer, Amer. Geology, 30, 1902, p. 94; Mem. Mus. Comp. Zool. Harvard, 25, No. 2, 1905, p. 93.—Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 100.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 562.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 186.

CLEIOCRINUS—Continued.

Cliocrinus Hudson, Bull. New York State Mus., 149, 1911, p. 211.

Campanulites Troost, Amer. Jour. Sci. Arts, 2d ser., 8, 1849, p. 419; Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 60 (nom. nud.).—Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 356.—Miller, N. A. Geol. Pal., 1889, p. 230.—Bather. Treatise on Zool., 3, Echinoderma, 1900, p. 202 (Genotype C. tessellatus Troost.)

Cleiocrinus billingsi Ford and Dwight.

Cleiocrinus billingsi Ford and Dwight, Amer. Jour. Sci. Arts, 3d ser., 31, 1886, p. 252, pl. 7, fig. 5.

Middle Ordovician: Canaan, New York.

Observation.—Not recognized. Founded on fragment of a column.

Cleiocrinus grandis Billings.

Cleiocrinus grandis Billings, Geol. Surv. Canada, dec. 4, 1859, p. 54, pl. 5, figs. 2a–2c.—Meek, Amer. Jour. Sci. Arts, 3d ser., 2, 1871, p. 301.

Trenton: Ottawa, Ontario.

Observation.—Based on root end of column.

CLEIOCRINUS LAEVIS Springer. See Cleiocrinus tessellatus.

CLEIOCRINUS LIBANUS Safford. See Cleiocrinus tessellatus.

Cleiocrinus magnificus Billings.

Cleiocrinus magnificus Billings, Geol. Surv. Canada, dec. 4, 1859, p. 54, pl. 5, fig. 3.—Dwight, Proc. Poughkeepsie Acad. Nat. Sci., 1880, p. 19 (loc. occ.).—Springer, Mem. Mus. Comp. Zool., Harvard, 25, 1905, p. 111, pl. 1, figs. 11, 12.

Trenton: Ottawa, Ontario.

Observation.—Based on column only.

Cleiocrinus perforatus (Hudson).

Cliocrinus perforatus Hudson, Bull. New York State Mus., 149, 1911, p. 211, figs. 2, 3.

Chazyan (Valcour): Valcour Island, Lake Champlain, New York.

Cleiocrinus regius Billings.

Cleiocrinus regius Billings, Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, p. 277; Geol. Surv. Canada, dec. 4, 1859, p. 53, pl. 5, figs. 1a–1g.—Miller, N. A. Geol. Pal., 1889, p. 232, fig. 264.—Springer, Mem. Mus. Comp. Zool., Harvard, 25, 1905, p. 110, pl. 1, figs. 1–10.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 562.—Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 41, pl. 5, figs. 7–9.

Trenton (Curdsville): Ottawa and Kirkfield, Ontario.

Cleiocrinus sculptus Springer.

Cleiocrinus sculptus Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 44, pl. 5, figs. 10a–f.

Trenton (Curdsville): Mercer County, Kentucky.

Cleiocrinus tessellatus (Troost).

Campanulites tesselatus Troost, Amer. Jour. Sci. and Arts, 2d ser., 8, 1849, p. 419 (nom. nud.); Proc. Amer. Assoc. Adv. Sci., 1850, p. 60.

Cleiocrinus tessellatus (Troost) Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 100, pl. 7, fig. 11.

Cleiocrinus tessellatus—Continued.

Cleiocrinus Libanus Safford, Geol. Tennessee, p. 285 (not defined).

Cleiocrinus lævis Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 44, pl. 5, figs. 11a–c.

Stones River (Lebanon): Duck River near Columbia, and Shelbyville, Tennessee.

Holotype.—Cat. No. 39910, U.S.N.M.

CLEIONYCHIA Ulrich. See Clionychia Ulrich.

CLEIONYCHIA AMYGDALINA Ulrich. See Ambonychia amygdalina.

CLEIONYCHIA ATTENUATA Ulrich. See Clionychia lamellosa.

CLEIONYCHIA? NITIDA Ulrich. See Mytilarca nitida.

CLELANDIA Cossmann. Genotype: Harrisia parabola Cleland.

Harrisia Cleland, Bull. Amer. Pal., 3, 1900, p. 127 (255).

Clelandia (Harrisia preoccupied) Cossmann, Revue Critique de Paleozoologie, 6, 1902, p. 52.

Clelandia parabola (Cleland).

Harrisia parabola Cleland, Bull. Amer. Pal., 3, 1900, p. 127 (255), pl. 16, figs. 1–3; 4, 1903, p. 11, pl. 3, figs. 4, 5.

Canadian (Tribes Hill): Near Fort Hunter, New York.

CLEMATOCRINUS PARVUS Jaekel. See Cordylocrinus plumosus.

CLEMATOCRINUS PLUMOSUS Jaekel. See Cordylocrinus plumosus.

CLEMATOGRAPTUS MULTIBRACHIATUS Lapworth. See Amphigraptus multifasciatus.

CLEMATOGRAPTUS MULTIFASCIATUS Hopkinson. See Amphigraptus multifaciatus.

CLIDOCHIRUS Angelin. Genotype: C. pyrum Angelin.

Clidochirus Angelin, Icon. Crin. Suec., 1878, p. 12.—Wachsmuth and Springer, Proc. Nat. Acad. Philadelphia, Rev. Pal., 1, 1879, p. 39.—Zittel, Handb. Pal., 1, 1879, p. 355.—Bather, Lankester's Treatise on Zool., 3, 1900, p. 188.—Springer, Amer. Geol., 30, 1902, p. 94; Jour. Geol., 14, 1906, pp. 479, 516; Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 204; Mon. Crin. Flex., Smiths. Inst. (in press).

Clidochirus americanus Springer.

Clidochirus americanus Springer, Mon. Crin. Flex., Smiths. Inst. (in press).

Upper Medinan (Brassfield): Dayton, Ohio.

Clidochirus keyserensis Springer.

Clidochirus keyserensis Springer, Mon. Crin. Flex., Smiths. Inst. (in press).

Helderbergian (Keyser): Keyser, West Virginia.

CLIDOPHORUS Hall. Genotype: Nuculites planulata Conrad.

Cleidophorus Hall, Pal. New York, 1, 1847, p. 300, footnote.—Pictet, Traite de Pal., 2d ed., 3, 1855, p. 534.—Meek and Hayden, Pal. Up. Missouri, Smiths. Cont. Knowl., 172, 14, 1865, p. 35.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 222.—Waagen, Mem. Geol. Surv. India, Pal. Indica, 13th ser., 1, 1881, p. 224.—Zittel, Handb. Pal., 2, 1881, p. 53.—Dall, Zittel-Eastman Textb. Pal., 1, 1900, p. 363; 2d ed., 1913, p. 440.

Clidophorus McCoy, Brit. Pal. Rocks and Foss., 1854, p. 273.—Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 228 (extr. 1871, p. 5).—Miller, N. A. Geol. Pal., 1889, p. 471.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 606.—Cumings, 32d Ann. Rep. Geol. Nat. Res. Indiana, 1908, p. 979.

Nuculites Grabau and Shimer (part), N. A. Index Fossils, 1, 1909 p. 397.

Clidophorus brazilianus Clarke.

Clidophorus brazilianus Clarke, Archivos Mus. Nac. Rio de Janeiro, 10, author's Engl. ed., 1900, p. 18, pl. 2, figs. 17–19.

Silurian: Rio Trombetas, Brazil.

Clidophorus chicagoensis (Miller).

Clidophorus chicagoensis Miller, Jour. Cincinnati Soc. Nat. Hist., 3, 1881, p. 314, pl. 8, figs. 2, 2a.

Niagaran (Racine): Bridgeport and Cicero, Illinois.

Clidophorus concentricus Hall.

Clidophorus concentricus Hall, Canadian Nat. Geol., 5, 1860, p. 149, fig. 7.—Dawson, Acadian Geol., Suppl. Chap., 1860, p. 68, fig. 53; 2d ed., 1868, p. 600, fig. 204.

Silurian: Arisaig, Nova Scotia.

Clidophorus consuetus Ulrich.

Clidophorus consuetus Ulrich, 19th Ann. Rep. Geol. and Nat. Hist. Surv. Minnesota, 1892, p. 223, fig. 9; Geol. Minnesota, 3, pt. 2, 1894, p. 606, pl. 37, figs. 32, 33.

Trenton (Prosser): Near Wykoff, Minnesota.

Holotype.—Cat. No. 46110, U.S.N.M.

Clidophorus cuneatus Hall.

Clidophorus cuneatus Hall, Canadian Nat. Geol., 5, 1860, p. 148.—Dawson, Acadian Geol., 2d ed., 1868, p. 600.

Silurian: Arisaig, Nova Scotia.

Clidophorus ellipticus (Ulrich).

Cleidophorus ellipticus Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 25, pl. 7, fig. 22.

Eden (Economy): Covington, Kentucky.

Holotype.—Cat. No. 46111, U.S.N.M.

Clidophorus elongatus Hall.

Clidophorus elongatus Hall, Canadian Nat. Geol., 5, 1860, p. 150, fig. 9.—Dawson, Acadian Geol., Suppl. Chap., 1860, p. 68, fig. 55; 2d ed., 1868, p. 601, fig. 206.

Silurian: Arisaig, Nova Scotia.

Clidophorus erectus Hall.

Clidophorus erectus Hall, Canadian Nat. Geol., 5, 1860, p. 149, fig. 8.—Dawson, Acadian Geol., Suppl. Chap., 1860, p. 68, fig. 54; 2d. ed., 1868, p. 600, fig. 295.

Silurian: Arisaig, Nova Scotia.

Clidophorus faberi Miller.

Clidophorus faberi Miller, N. A. Geol. Pal., 1889, p. 471, fig. 795.

Richmond: Near Versailles, Indiana; Butler County, Ohio.

Clidophorus fabula (Hall).

Clidophorus (Nucula) fabula Hall, Amer. Jour. Sci. Arts, 43, 1845, p. 295.

Clidophorus (Nuculites?) fabula Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 138, pl. 11, figs. 10a, b.

Cleidophorus fabula Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 222.

Clidophorus fabula Miller, N. A. Geol. Pal., 1889, p. 471, fig. 796.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 996, pl. 44, figs. 6, 6a.

Eden—Richmond: Cincinnati, etc., Ohio; Indiana; Kentucky; Tennessee.

Observation.—C. fabula is possibly only a dwarfed form of C. neglectus.

Clidophorus ferrugineus (Foerste).

Nuculites (Cleidophorus) ferrugineum Foerste, Geol. Surv. Ohio, Pal., 7, p. 564, pl. 37, figs. 2a, b.

Upper Medinan (Brassfield): Todds Fork, Clinton County, Ohio.

Clidophorus foerstei Ruedemann.

Clidophorus foerstei Ruedemann, Bull. New York State Mus., 162, 1912, pl. 5, figs. 15, 16.

Trenton (Snake Hill): Snake Hill, Saratoga County, New York.

Clidophorus mcchesneyanus Winchell and Marcy. See Matheria recta.

Clidophorus neglectus Hall.

Clidophorus neglectus Hall, Geol. Surv. Wisconsin, 1, 1862, p. 55.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 607, pl. 42, figs. 20–25.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 165, pl. 2, fig. 16.

Nuculites neglectus Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 397, fig. 508a–c.

Richmond (Maquoketa): Lafayette County, Wisconsin; Illinois; Iowa; Minnesota; and Missouri; (?)Trenton of New Jersey.

Clidophorus nuculiformis Hall.

Clidophorus nuculiformis Hall, Canadian Nat. Geol., 5, 1860, p. 150.—Dawson, Acadian Geol., 2d ed., 1868, p. 601.

Silurian: Arisaig, Nova Scotia.

Clidophorus obscurus Raymond.

Clidophorus obscurus Raymond, Amer. Jour. Sci., 20, 1905, p. 372.

Chazyan: (Crown Point) Sloop Bay, Valcour Island, New York.

Clidophorus planulatus (Conrad).

Nuculites planulata Conrad, 5th Ann. Rep. New York Geol. Surv., 1841, p. 50.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 397.

Nuculites scitula Emmons, Nat. Hist. New York, Geol., 2, 1842, p. 399, fig. 2.

Periploma planulata D'Orbigny, Prodr. de. Pal., 1, 1849, p. 11 (gen. ref.).—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 172, pl. 17, fig. 17; Manual Geology, 1860, p. 101, figs. 91, 92.

Cleidophorus planulatus Hall, Pal., New York, 1, 1847, p. 300, pl. 82, figs. 9a–e.—Pictet, Traité de Pal., 1855, 2d ed., 3, p. 534, pl. 79, fig. 18.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 36, fig. 11e.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 133, fig.

Clidophorus planulatus Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 302.

Eden and Maysville: Pulaski, etc., New York (Pulaski); Pennsylvania; Ohio; etc.

Clidophorus prævolutus Foerste.

Clidophorus prævolutus Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 303, pl. 1, figs. 6, 12.

Cincinnatian (Pulaski): Richelieu River, near Chambly, Quebec.

Clidophorus semiradiatus Hall.

Clidophorus semiradiatus Hall, Canadian Nat. Geol., 5, 1860, p. 150.—Dawson, Acad. Geol., 2d ed., 1868, p. 601.

Silurian: Arisaig, Nova Scotia.

Clidophorus subovatus Hall.

Clidophorus subovatus Hall, Canadian Nat. Geol., 5, 1860, p. 151.—Dawson, Acad. Geol., 2d ed., 1868, p. 602.

Silurian: Arisaig, Nova Scotia.

Clidophorus ventricosus Ruedemann.

Clidophorus ventricosus Ruedemann, Bull. New York State Mus., 162, 1912, pl. 5, figs. 11–14.

Trenton (Snake Hill): Snake Hill, Saratoga County, New York.

CLIFTONIA Foerste. See Triplecia subgenus Cliftonia.

CLIMACOGRAPSUS ANTENNARIUS Nicholson. See Cryptograptus antennarius.

CLIMACOGRAPTUS Hall. Genotype: Graptolithus bicornis Hall.

Climacograptus Hall, Geol. Surv. Canada, dec. 2, 1865, p. 111.—Carruthers, Geol. Mag., 5, 1868, p. 73, 131.—Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 217.—Hopkinson, Geol. Mag., 7, 1870, p. 354.—Zittel, Handb. Pal., 1, 1879, p. 300.—Tullberg, Sveriges Geol. Unders., Ser. C, No. 55, 1883, p. 13, 14.—Spencer, Trans. Acad. Sci. St. Louis, 4, 1884, p. 561.—Miller, N. A. Geol. Pal., 1889, p. 178.—James, Jour. Cincinnati Soc. Nat. Hist., 14, pt. 2, 1892, p. 158.—Koken, Die Leitfossilien, Leipzig, 1896, p. 329.—Wiman, Bull. Geol. Inst., Univ. Upsala, 2, pt. 2, 1896, p. 264; Nat. Sci., 9, 1896, p. 188.—Roemer and Frech, Leth. geog., 1 Theil, Leth. Pal., 1, 3 Lief., 1897, p. 608.—Gurich, Neues Jahrb. f. Min., Geol. Pal., Beilage-Band, 13, 1900, p. 333.—Zittel-Eastman Textb. Pal., 1, 1900, p. 119.—Ruedemann, Mem. New York State Mus., 7, 1904, p. 729; 11, pt. 2, 1908, pp. 400–406.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 31.—Ruedemann, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 130.

Climacograpsus Nicholson, Ann. Mag. Nat. Hist., 4th ser., 6, 1870, p. 370; Mon. British Grapt., 1872, p. 117.

CLIMACOGRAPTUS ANTENNARIUS Hall. See Cryptograptus antennarius.

Climacograptus antiquus Lapworth.

Climacograptus antiquus Lapworth, Geol. Mag., 10, 1873, p. 134 (nom. nud.); Trans. Roy. Soc. Canada, 5, sec. 4, 1886, p. 178.—Gurley, Jour. Geol., 6, 1896, pp. 74, 93, 207.—Elles and Wood, Mon. British Grapt., pt. 5, 1906, pp. 199, 200, fig. 130; pl. 27, fig. 4a–e.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 239–441, pl. 28, figs. 28, 29.

Climacograptus cf. antiquus Lapworth, Rep. Geol. Surv. Canada, 3, pt. 1, 1889, p. 95B.

Climacograptus cælatus Lapworth, Cat. West. Scotland Foss., 1876, p. 6, pl. 1, fig. 56; Ann. Rep. and Proc. Belfast Nat. Field Club, 1, pt. 4, 1877, p. 130, pl. 6, fig. 39; Science, 9, 1887, p. 320.

Middle Ordovician (Glenkiln): Great Britain.

Chazyan (Normanskill): Canada, Nevada, Arkansas, Oklahoma, etc.

Plesiotypes.—Cat. Nos. 54285, 54339, 54248, U.S.N.M

Climacograptus bicornis (Hall).

Graptolithus bicornis Hall, Pal. New York, 1, 1847, p. 268, pl. 73, figs. 2a–s.—Ford, Amer. Jour. Sci., 3d ser., 28, 1884, p. 206.

Diplograptus bicornis Geinitz, Die Graptolithen, 1852, p. 24.—McCoy, Ann. Mag. Nat. Hist., 9, 1862, p. 139.

Diplograpsus bicornis Nicholson, Ann. Mag. Nat. Hist., 1, 1868, p. 56, pl. 3, figs. 8–10.

Diplograptus (Climacograptus) bicornis McCoy, Prodr. Pal. Victoria, dec. 1, 1874, p. 12, pl. 1, fig. 8.

Climacograptus (Diplograptus) bicornis Etheridge, Mem. Geol. Surv. Great Britain, 2d ed., 3, 1881, p. 530, pl. 11A, fig. 1b, c.

Climacograptus bicornis—Continued.

Climacograptus bicornis Hall, Canadian Org. Rem. Geol. Surv. Canada, dec. 2, 1865, p. 112, pl. A, figs. 1a–c.—Nicholson, Ann. Mag. Nat. Hist., 6, 1870, p. 380, fig. 5; Mon. British Grapt., 1872, p. 61, figs. 29a–d.—Lapworth, Cat. West. Scotland Foss., 1876, p. 6, pl. 2, fig. 51; Rep. and Proc. Belfast Nat. Field Club, 1, pt. 4, 1877, p. 139, pl. 6, fig. 38a.—Whitfield, U. S. Geol. Surv. West 100th Merid., Wheeler's Rep. Pal., 4, 1877, p. 19.—Lapworth, Quart. Jour. Geol. Soc. London, 34, 1878, p. 250.—Linnarsson, Sver. Geol. Und., Ser. C, No. 31, 1879, p. 18.—Lapworth, Ann. Mag. Nat. Hist., 6, 1880, p. 22.—Tullberg, Sver. Geol. Und., Ser. C, No. 41, 1880; No. 50, 1882, p. 20.—Walcott, Trans. Albany Inst., 10, 1883, p. 3, (adv. sheets, 1879, p. 34).—Whitfield, Amer. Jour. Sci., 3d ser., 26, 1883, p. 380.—Lapworth, Trans. Roy. Soc. Canada, 4, 1887, 178f.—Miller, N. A. Geol. Pal., 1889, p. 178, fig. 153.—Ami, Rep. Canadian Geol. Surv., 2d ser., 3, pt. 2, 1889, p. 117K.—Gurley, Ann. Rep. Geol. Surv. Arkansas, 3, 1892, p. 410.—James, Jour. Cincinnati Soc. Nat. Hist., 14, 1892, pt. 2, p. 159.—Ami, Canadian Rec. Sci., 5, 1893, pp. 237, 239.—Gurley, Jour. Geol., 4, 1896, p. 297.—T. S. Hall, Proc. Roy. Soc. Victoria, 9, 1897, p. 184.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 148 (loc. occ.).—Roemer and Frech, Leth. Geog., 1 Theil, Leth. Pal., 1, 1897; pp. 610, 611, fig. 174.—Frech, Leth. Geog., 1 Theil, Leth. Pal., 1, 3 Lief, 1897, p. 553, fig. 131.—T. S. Hall, Geol. Mag., n. s., dec. 4, 6, 1899, p. 445.—Ruedemann, Bull. New York State Mus., 42, 1901, p. 496ff.—Clark, Geol. Mag., 4th ser., 9, 1902, p. 498.—T. S. Hall, Geol. Surv. Victoria, Rec., 1, pt. 1, 1902, p. 34.—Dale, Bull. U. S. Geol. Surv., 242, 1904, p. 33.—T. S. Hall, Proc. Roy. Soc. Victoria, 18, pt. 1, 1905, p. 21.—Ami, Geol. Surv. Canada, Sum. Rep., 1904, p. 12.—T. S. Hall, Geol. Surv. Victoria, Rec., 1, pt. 4, 1906, p. 275, pl. 34, fig. 8.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 32, figs. 50, 51a.—Elles and Wood, Mon. British Grapt., pt. 5, 1906, pp. 193, 194, fig. 126, pl. 26, fig. 8a–f.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 433–437, pl. 28, figs. 24–26, figs. 404, 405.

Climacograptus bicornis var. peltifer Lapworth, Cat. West. Scotland Foss., 1876, p. 6, pl. 2, fig. 53; Rep. and Proc. Belfast Field Club, 2d ser., 1, pt. 4, 1877, p. 139, pl. 6, fig. 38b.—Gurley, Jour. Geol., 4, 1896, p. 93.

Climacograptus bicornis var. tridentatus Lapworth, Cat. West Scotland Foss., 1876, p. 6, pl. 2, fig. 52; Rep. and Proc. Belfast Field Club, 2d ser., 1, pt. 4, 1877, p. 139, pl. 6, fig. 38c.—Gurley, Jour. Geol., 4, 1896, p. 93.

Climacograptus bicornis var. tuberculatus Lapworth, Cat. West Scotland Foss., 1876, p. 6.

Climacograptus bicornis var. longispina T. S. Hall, Geol. Surv. New South Wales, Rec., 7, pt. 2, 1902, p. 5, pl. 12, figs. 8, 9.

Chazyan (Normanskill): New York slate belt, north into Quebec and New Brunswick and south to Virginia and Alabama; Arkansas (Stringtown).

Middle Ordovician: Great Britain, Scandinavia, Australia.

CLIMACOGRAPTUS BICORNIS Hall (part). See Climacograptus parvus.

CLIMACOGRAPTUS BICORNIS var. CAUDATUS Ami. See Climacograptus caudatus.

CLIMACOGRAPTUS BICORNIS var. LONGISPINA Hall. See Climacograptus bicornis.

CLIMACOGRAPTUS BICORNIS var. PELTIFER Lapworth. See Climacograptus bicornis.

CLIMACOGRAPTUS BICORNIS var. TRIDENTATUS Lapworth. See Climacograptus bicornis.

CLIMACOGRAPTUS BICORNIS TUBERCULATUS Nicholson. See Climacograptus bicornis.

Climacograptus cælatus Lapworth. See Climacograptus antiquus.

Climacograptus caudatus Lapworth.

Climacograptus caudatus Lapworth, Cat. West. Scotland Foss., 1876, p. 6, pl. 2, fig. 48; Rep. and Proc. Belfast Field Club, 1, pt. 4, 1877, p. 138, pl. 6, fig. 34.—Linnarsson, Sver. Geol. Und. Ser. C, No. 31, 1879, p. 18.—Lapworth, Ann. Mag. Nat. Hist., 5th ser., 5, 1880, p. 358; 6, p. 22.—Tullberg, Sver. Geol. Und., Ser. C, No. 50, 1882, p. 20.—Lapworth, Geol. Mag., 3d ser., 6, pl. 2, 1889.—Gurley, Hour. Geol., 4, 1896, p. 297.—Roemer and Frech, Leth. Geog., Leth. Pal., 1, 1897, p. 614, fig. 179.—Ruedemann, Bull. New York State Mus., 42, 1901, p. 520.—Elles and Wood, Mon. British Grapt., pt. 5, 1906, p. 202, fig. 133; pl. 27, fig. 7.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 438, 439, pl. 28, figs. 17, 18, fig. 406.

Climacograptus bicornis var. caudatus Ami, Canadian Geol. Surv. Rep., 2d ser., 3, pt. 2, 1889, p. 116K.

Middle Ordovician shales: Great Britain and Scandinavia.

Trenton: Magog, Quebec (Magog); Mechanicsville, New York (Snake Hill).

Climacograptus caudatus laticaulis Gurley.

Climacograptus caudatus laticaulis Gurley, Jour. Geol., 4, 1896, pp. 75, 93 (nom. nud.).

Trenton (Magog): Magog, Quebec.

Climacograptus caudatus posterus Ruedemann.

Climacograptus caudatus mut. posterus Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 51 (nom. nud.).

Trenton shale of New York.

Climacograptus kamptotheca Gurley.

Climacograptus kamptotheca Gurley, Jour. Geol., 4, 1896, p. 76.

Trenton (Magog): Magog, Quebec.

Climacograptus mississippiensis Ruedemann.

Climacograptus mississippiensis Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 413, 414, pl. 28, fig. 13, text fig. 367.

Richmond (Sylvan): Arbuckle Mountains, Oklahoma.

Holotype and *paratype*.—Cat. No. 54268, U.S.N.M.

Climacograptus modestus Ruedemann.

Climacograptus modestus Ruedemann, Mem. New York State Mus., 11, 1908, pt. 2, pp. 432, 433, pl. 28, fig. 30, 400–403.

Chazyan (Normanskill): Mount Moreno, near Hudson, and Lansingburg, New York; Arkansas (Stringtown).

Climacograptus oligotheca Gurley.

Climacograptus oligotheca Gurley, Jour. Geol., 4, 1896, p. 76.

Climacograptus cf. oligotheca Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 441, pl. 28, fig. 27.

Trenton: Magog, Quebec (Magog); Arkansas.

Plesiotype.—Cat. No. 54264, U.S.N.M.

Climacograptus parvus Hall.

Climacograptus bicornis Hall, Pal. New York, 1, 1847, pl. 73, figs. 2e, k, o–s.

Climacograptus parvus Hall, Canadian Org. Rem., dec. 2, 1865, p. 57 (nom. nud.); 20th Rep. New York State Cab. Nat. Hist., 1868, p. 224.—Walcott, Trans. Albany Inst., 10, 1883 (adv. sheets 1879, p. 34); Bull. Geol. Soc. Amer., 1,

Climacograptus parvus—Continued.

1890, p. 339.—Roemer and Frech, Leth. geog., Leth. Pal., 1, 1897, p. 610.—Ruedemann, Bull. New York State Mus., 42, 1901, p. 523ff.—Dale, Bull. U. S. Geol. Surv., 242, 1904, p. 33.—Ruedemann, Mem. New York State Mus. 11, pt. 2, 1908, pp. 426–428, pl. 28, figs. 19–23, figs. 388–393.

Climacograptus phyllophorus Gurley, Jour. Geol., 4, 1896, p. 77, pl. 4, figs. 4–6.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 212, pl. 16, figs. 14, 15.

Chazyan (Normanskill): Glenmont, Mount Moreno, Troy, etc., New York; New Jersey.

Climacograptus phyllophorus Gurley. See Climacograptus parvus.

Climacograptus pungens Ruedemann.

Climacograptus n. sp. Ruedemann, Ann. Rep. New York State Pal., 1902, p, 571.

Climacograptus pungens Ruedemann Mem. New York State Mus., 7, pt. 1, 1904, p. 730, pl. 16, figs. 14–20.

Canadian: Deepkill, and Mount Moreno, New York (Deepkill, Diplograptus dentatus zone); Point Levis, Quebec (Levis, D. dentatus zone).

Climacograptus (Mesograptus) putillus (Hall).

Graptolithus putillus Hall, Geol. Surv. Canada, Org. Rem., dec. 2, 1865, pp. 27, 44, pl.A, figs. 10–12a.

Graptolithus (Diplograptus) putillus Hall, 20th Ann. Rep. New York State Cab. Nat. Hist., 1868, pp. 195, 211, pl. 2, figs. 10–12a; rev. ed., 1868 (1870) pp. 224, 225, 226; pl. 2, figs. 10–12.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p 82, fig. 3.

Diplograptus putillus Nicholson, Quart Jour. Geol. Soc. London, 24, 1868, p. 527, pl. 19, figs. 17, 18.—Tullberg, Sver. Geol. Unders., Ser. C, No. 50, 1882, p. 43.—Walcott, Trans. Albany Inst., 10, 1883 (adv. sheets 1879, p. 35).—Lapworth, Proc. and Trans. Roy. Soc. Can., 4, 1886, p. 170.—Walcott, Bull. Geol. Soc. Amer., 1, 1890, p. 339.—Ami, Canadian Rec. Sci., 5, 1893, p. 244.—Gurley, Jour. Geol., 4, 1896, p. 298.—Winchell and Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 111.—Ruedemann, Bull. New York State Mus., 42, 1901, p. 498.—Nickles, Jour. Cincinnati Soc. Nat. Hist., 20, 1902, p. 68.

Climacograptus putillus Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 415–419, pl. 28, figs. 14, 15, text figs. 368–374, 376, 377.

Diplograptus (Mesograptus) putillus Ruedemann, Bull. New York State Mus., 162, 1912, p. 80.

Diplograptus teretiusculus var. putillus Roemer and Frech, Leth. Pal., 1, 1896, p. 628.

Trenton-Richmond: Maquoketa Creek, Iowa (Maquoketa); Canada; New York; Vermont; Ohio; Minnesota; etc.

Plesiotype.—Cat. No. 54272, U.S.N.M.

Climacograptus (Mesograptus) putillus eximius Ruedemann.

Cf. Diplograptus putillus Lapworth, Proc. and Trans. Roy. Soc. Canada, 4, 1886, pp. 170, 178ff.

Diplograptus aff. putillus Ruedemann, Bull. New York State Mus., 42, 1901, p. 541.

Climacograptus putillus mut. eximius Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 420, pl. 28, figs. 16, 378–384.

Chazyan (Normanskill): Glenmont and Lansingburg, New York; Tartigo River, Cape Rouge, St. Lawrence region, Canada.

Climacograptus scalaris annulatus Ruedemann.

Climacograptus scalaris var. annulatus Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 421, pl. 28, fig. 32, figs. 385–387.

Climacograptus scalaris annulatus—Continued.

Boulder of Clinton (?) sandstone: Aroostook, Maine.

Observation.—For bibliography of C. scalaris which has not been found in America, see Ruedemann, op. cit., 1908, p. 421.

Climacograptus scharenbergi Lapworth.

Climacograptus scharenbergi Lapworth, Cat. West. Scot. Foss., 1876, p. 6, pl. s, fig. 35; Rep. and Proc. Belfast Field Club, 2d ser., 1, pt. 4, 1877, p. 138, pl. 6, fig. 36.—Linnarsson, Sver. Geol. Unders. Ser. C. No. 31, 1879, p. 18.—Tullberg, ibid., No. 50, 1882, p. 214.—Lapworth, Ann. Mag. Nat. Hist., 5th ser., 5, 1880, p. 276; Proc. and Trans. Roy. Soc. Canada, 4, 1887, p. 180; Geol. Mag., 3d ser., 6, 1889, pl. 2.—Tornquist, Sartr. Kongl. Fys. Sallsk. Lund. Handl., IV, 1893, p. 8, pl. 1, fig. 28.—Gurley, Jour. Geol., 4, 1896, p. 298.—Roemer and Frech, Leth. geog., Leth. Pal., 1, 1897, p. 609, fig. 176.—Elles Quart. Journ. Geol. Soc. London, 54, 1898, p. 519.—Ruedemann, Bull. New York State Mus., 42, 1901, p. 541ff, pl. 1, fig. 1; 49, p. 11, pl. 3, fig. 1.—Clark, Geol. Mag., 4th ser., 9, 1902, p. 498.—Elles and Wood, Mon. British Grapt., pt. 5, 1906, pp. 206, 207, fig. 139; pl. 27, fig. 14.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 428–431, pl. 28, fig. 31, figs. 394–399.

Middle Ordovician slates: Great Britain and Scandinavia.

Chazyan (Normanskill): New York; Canada; Tennessee; etc.

Climacograptus spiniferus Ruedemann.

Climacograptus typicalis mut. spinifer Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 411, 412, pl. 28, figs. 8, 9, fig. 236.

Climacograptus spiniferus Ruedemann, Bull. New York State Mus., 162, 1912, p. 84.

Trenton: Ballston, Saratoga, Sandy Hill., etc., New York (Canajoharie, Snake Hill, and Schenectady); Macasty Bay, Anticosti (Macasty).

Martinsburg (base): Virginia, etc.

Climacograptus typicalis Hall.

Climacograptus typicalis Hall, Geol. Surv. Canada, Can. Org. Rem., dec. 2, 1865, p. 27, pl. A, figs. 1–9.—Hall, 20th Ann. Rep., New York State Cab. Nat. Hist., rev. ed., 1868, p. 224, pl. 2, figs. 1–9.—Zittel, Handb. Pal., 1, Munich, 1879, p. 292, fig. 197; p. 300, fig. 208 a–c.—Walcott, Trans. Albany Inst., 5, 1883, p. 10 (Advance sheets, 1879, p. 34).—Ulrich, Amer. Geology, 1, 1888, p. 183.—Walcott, Bull. Geol. Soc. Amer., 1, 1890, p. 339.—James, Jour. Cincinnati Soc. Nat. Hist., 14, 1892, p. 159.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 82, text, fig. 4.—Gurley, Jour. Geol., 4, p. 298.—Roemer and Frech, Leth. geog., Leth. Pal., 1, 1897, p. 612.—Ruedemann, Bull. New York State Mus., 42, 1901, p. 523.—Nickles, Jour. Cincinnati Soc. Nat. Hist., 20, 1902, p. 68.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 407–411, pl. 28, figs. 6, 7, figs. 354, 356–358, 362.

Climacograptus typicus Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 32, fig. 51 b.

Trenton-Eden: New York, Canada, Ohio, Minnesota, etc.

Plesiotypes.—Cat. No. 54276, U.S.N.M.

Climacograptus typicalis magnificus Twenhofel.

Climacograptus typicalis magnificus Twenhofel, Bull. Victoria Mem. Mus., 3, 1914, p. 23.

Trenton (Macasty): Macasty Bay, Anticosti.

CLIMACOGRAPTUS TYPICALIS SPINIFER Ruedemann. See Climacograptus spiniferus.

CLIMACOGRAPTUS TYPICUS Grabau and Shimer. See Climacograptus typicalis.

Climacograptus ulrichi Ruedemann.

Climacograptus ulrichi Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 412, 413, pl. 28, fig. 11.

Richmond: Spencer, Missouri (Maquoketa); Oklahoma (Sylvan).

Holotype and *paratype*.—Cat. No. 54276, U.S.N.M.

CLIMACOSPONGIA Hinde. Genotype: C. radiata Hinde.

Climacospongia Hinde, Cat. Foss. Sponges British Mus., 1883, p. 18.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 223.—Rauff, Palæontographica, 41, 1895, p. 243, footnote.

Climacospongia radiata Hinde.

Climacospongia radiata Hinde, Cat. Foss. Sponges British Mus., 1883, p. 18, pl. 1, figs. 1, 1a.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 224.

Niagaran (Brownsport): Perry County, Tennessee.

CLIMACTICHNITES Logan. Genotype: C. wilsoni Logan.

Climactichnites Logan, Canadian Nat. Geol., 5, 1860, pp. 279–285, figs. 1–5.—Dawson, ibid., 7, 1862, p. 274.—Jones, The Geologist, London, 5, 1862, pp. 138–139.—Chapman, Expos. Min. and Geol. Canada, 1864, p. 160.—Billings, Quart. Jour. Geol. Soc. London, 26, 1870, p. 485.—Chapman, Canadian Jour. Sci., 15, 1877, pp. 486–490.—Nathorst, Kongl. Sven. Vet.-Akad. Handl., 18, No. 7, 1881, pp. 47, 99.—Todd, Trans. Wisconsin Acad. Sci., 5, 1882, pp. 276–281.—Dawson, Quart. Jour. Geol. Soc. London, 46, 1890, pp. 596 and 600.—Woodworth, Bull. New York State Mus., 69, 1903, pp. 956–966.—Clarke, Bull. New York State Mus., 80, 1905, pp. 18–20, pl. 3.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 248.—Walcott, Smiths. Misc. Coll., 57, No. 9, 1912, p. 259, pls. 38–40.—Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 142.

Climactichnites fosteri Todd.

Climactichnites Fosteri Todd, Trans. Wisconsin Acad. Sci., 5, 1882, p. 280, 277, fig. 1.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 132, fig.

Upper Cambrian (? Ozarkian): Near New Lisbon, Wisconsin.

Climactichnites wilsoni Logan.

Climactichnites Wilsoni Logan, Canadian Nat. Geol., 5, 1860, pp. 279–285, figs. 1–5; Amer. Jour. Sci., 31, 1861, pp. 17–23, figs. 1–5.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 107, fig. 18.—Chapman, Canadian Jour., n. s., 8, 1863, p. 188, fig. 157; Expos. Min. Geol. Canada, 1864, p. 160, fig. 157.—Marsh, Proc. Amer. Assoc. Adv. Sci., 17, 1879, p. 322.—Logan, 42d Rep. New York State Mus. Nat. Hist., 1889, p. 30, figs. 1–5.—Miller, N. A. Geol. Pal., 1889, p. 538, fig. 985.—Packard, Proc. Amer. Acad. Arts and Sci., 36, 1900, p. 64.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 248.—Walcott, Smiths. Misc. Coll., 57, 1912, p. 286, pl. 40.

Upper Cambrian or Ozarkian (Potsdam): Perth, Ontario; New York.

Climactichnites youngi Todd.

Climactichnites Youngi Todd, Trans. Wisconsin Acad. Sci., 5, 1882, p. 280, fig. 1.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 132, fig.—Walcott, Smiths. Misc. Coll., 57, 1912, p. 282, pls. 38, 39.

Upper Cambrian (?Ozarkian): Near New Lisbon, Wisconsin.

CLINOCERAS Mascke. Genotype: C. dens Mascke.

Clinoceras Mascke, Zeits. d. d. geol. Gesell., 28, 1876, p. 49.—Zittel, Handb. Pal., 2, Munich, 1884, p. 370.—Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 282.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 126.

CLINOCERAS EXIGUUM Schuchert. See Oncoceras exiguum.

Clinoceras mumiaforme (Whitfield).

Oncoceras mumiaforme Whitfield, Ann. Rep. Geol. Surv. Wisconsin for 1879, 1880, p. 58; Geol. Wisconsin, 4, 1882, p. 232, pl. 7, figs. 3–5.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 159, fig.

Clinoceras mumiæforme Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1883, p. 282 (gen. ref.).—Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 797, pl. 57, figs. 7–10.—Grabau and Shimer, N. A. Index Fossil, 2, 1910, p. 126, fig. 1371.

Black River (Platteville): Beloit and Janesville, Wisconsin.

CLINOPISTHA Meek and Worthen. Genotype: C. lævis Meek and Worthen.

Clinopistha Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1870, p. 43.—Hall, Pal. New York, 5, pt. 1, Lam. 2, 1885, p. liv.—Koninck, Ann. Mus. Roy. Hist. Nat. Belgique, 11, 1885, p. 125.—Miller, N. A. Geol. Pal., 1889, p. 472.—Hind, Mon. Brit. Carb. Lamellibranchiata, 1, Pal. Soc., 1900, p. 437.

Clinopistha antiqua Whiteaves.

Clinopistha? antiqua Whiteaves, Pal. Foss. Geol. Surv. Canada, 3, pt. 3, 1897, p. 185, pl. 20, fig. 6.

Black River or Richmond: Inmost or Birch Island, Kinwow Bay, Lake Winnipeg.

CLINTONELLA Hall and Clarke. Genotype: C. vagabunda Hall and Clarke.

Clintonella Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 159; 13th Ann. Rep. New York State Geol., 1895, p. 814.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 759.

Clintonella vagabunda Hall and Clarke.

Clintonella vagabunda Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 160, pl. 52, figs. 1–11; 48th Rep. New York State Mus. for 1895, 2, 1897, p. 361, pl. 9, figs. 17–26; 14th Rep. State Geol. New York for 1894, 1897, p. 361, pl. 9, figs. 17–26.

Clinton (drift): Orleans County, New York.

CLIOCRINUS Hudson. See Cleiocrinus Billings.

CLIODERMA Hall. See Pterotheca Koken.

CLIONYCHIA Ulrich. Genotype: Ambonychia lamellosa Hall.

Ambonychia Hall (part), Pal. New York, 1, 1847, p. 163.

Cleionychia Ulrich, Amer. Geology, 10, 1892, p. 97.

Clionychia Miller, N. A. Geol. Pal., 1st App. 1892, p. 699.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 493; Geol. Surv. Ohio, 7, 1893, p. 650.—Dall, Zittel-Eastman Textb. Pal., 1, 1900, p. 368; 2d ed., 1913, p. 445.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p, 979.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 435.

Clionychia erecta (Hall).

Ambonychia erecta Hall, Rep. Supt. Geol. Surv. Wisconsin, 1891, p. 32.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 59, pl. 7, figs. 1, 2.

Clionychia erecta Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 496, pl. 35, figs. 17, 18.

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

Plesiotype.—Cat. No. 46112, U.S.N.M.

Clionychia excavata Ulrich.

Clionychia excavata Ulrich, Geol. Surv. Ohio, 7, 1893, p. 651, pl. 51, figs. 4, 5.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 997, pl. 44, figs. 4, 4a.

Ambonychia excavata Miller, N. A. Geol. Pal., 2d App., 1897, p. 779 (gen. ref.).

Richmond (Whitewater): Richmond, Indiana.

Holotype.—Cat. No. 46113, U.S.N.M.

Clionychia(?) gibbosa Whiteaves.

Clionychia(?) gibbosa Whiteaves, Ottawa Nat., 22, 1908, p. 109, pl. 3, figs. 5, 6.

Black River (Lowville): Hog Back, Ottawa, Ontario.

Clionychia lamellosa (Hall).

Ambonychia lamellosa Hall, Rep. Sup. Geol. Surv. Wisconsin, 1861, p. 31 (cancellosa in error).—Whitfield, Geol. Rep. Wisconsin, 4, 1882, p. 205, pl. 5, fig. 5; Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 57, pl. 7, figs. 5–7.

Clionychia lamellosa Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 494, pl. 35, figs. 10–14.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 435, fig. 569a.

Ambonychia attenuata Whitfield, Geol. Rep. Wisconsin, 4, 1882, p. 206, pl. 5, fig. 6.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 156, fig.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 59, pl. 7, figs. 8–11.

Cleionychia attenuata Ulrich, Amer. Geol., 10, 1892, p. 97 (gen. ref.).

Black River (Platteville): Mineral Point, Beloit, Janesville, etc., Wisconsin; Minneapolis, etc., Minnesota.

Plesiotypes.—Cat. Nos. 46114–46116, U.S.N.M.

Clionychia marginalis Raymond.

Clionychia marginalis Raymond, Amer. Jour. Sci., 20, 1905, p. 373.

Chazyan (Day Point): Chazy and Valcour Island, New York.

Clionychia mytiloides (Hall).

Ambonychia mytiloides Hall, Pal. New York, 1, 1847, p. 315, pl. 33, figs. 2a–b.

Cleionychia mytiloides Ulrich, Amer. Geol., 10, 1892, p. 97 (gen. ref.).

Chazyan: Chazy, New York.

Clionychia nitida Ulrich.

Clionychia nitida Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 495, pl. 35, figs. 15, 16.

Black River (Platteville): Minneapolis, Minnesota.

Clionychia ottawaensis Whiteaves.

Clionychia ottawaensis Whiteaves, Ottawa Nat., 22, 1908, p. 108, pl. 3, fig. 4.

Black River (Lowville): Hog Back, Ottawa, Ontario.

Clionychia rhomboidea (Ulrich).

Cleionychia rhomboidea Ulrich, Amer. Geol., 10, 1892, p. 97.

Clionychia rhomboidea Miller, N. A. Geol. Pal., 1st App., 1892, p. 699, fig. 1257.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 496, pl. 35, figs. 19, 20.

Black River (Platteville): Minneapolis, Minnesota.

Plastotype.—Cat. No. 46117, U.S.N.M.

Clionychia subundata Ulrich.

Clionychia subundata Ulrich, Geol. Surv. Ohio, 7, 1893, p. 651, fig.

Ambonychia subundata Miller, N. A. Geol. Pal., 2d App., 1897, p. 779 (gen. ref.).

Trenton (Upper): Mouth of Licking River, Covington, Kentucky.

Holotype.—Cat. No. 46118, U.S.N.M.

Clionychia superba (Billings).

Ambonychia superba Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 50, fig. 16.

Cleionychia? superba Ulrich, Amer. Geol., 10, 1892, p. 97 (gen. ref.).

Gamachian (Ellis Bay): Junction Cliff, Anticosti.

Plastotype.—Cat. No. 46910, U.S.N.M.

Clionychia undata (Emmons).

Pterinea undata Emmons, Geol. Rep. New York, 2, 1842, p. 395, fig. 1.—Owen, Amer. Jour. Sci. and Arts, 47, 1844, p. 369, fig. 1; p. 366, fig.

Ambonychia undata Hall, Pal. New York, 1, 1847, p. 165, pl. 36, figs. 7a–b.—Hitchcock, Geol. Vermont, 1, 1861, p. 296, fig. 205.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 23, fig.

Cleionychia undata Ulrich, Amer. Geol., 10, 1892, p. 97 (gen. ref.).

Clionychia undata Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 497, pl. 35, figs. 21, 22.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 435, fig. 569b.

Posidonomya subundata Emmons, Amer. Geology, 1, pt. 2, 1855, p. 177, pl. 13, figs. 23, 25.

Trenton: Watertown, etc., New York; Fillmore and Goodhue Counties, Minnesota (Prosser).

Plesiotype.—Cat. No. 46119, U.S.N.M.

CLIOPTERIA Williams. Genotype: Cliopteria bicostata Williams.

Cliopteria Williams, Proc. U. S. Nat. Mus., 42, 1912, p. 391.

Cliopteria bicostata Williams.

Cliopteria bicostata Williams, Proc. U. S. Nat. Mus., 42, 1912, p. 392, pl. 50, figs. 1, 2, 7.

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

Cotypes.—Cat. No. 58441, U.S.N.M.

Cliopteria unicosta Williams.

Cliopteria unicosta Williams, Proc. U. S. Nat. Mus., 42, 1912, p. 393, pl. 50, figs. 3, 4, 6.

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

Cotypes.—Cat. No. 58442, U.S.N.M.

CLISIOPHYLLUM Dana. Genotype: C. danaanum Edwards and Haime.

Clisiophyllum Dana, Wilkes' U. S. Expl. Exped. 1838–42, 7, 1846, p. 361, pl. 26, figs. 6, 7; Amer. Jour. Sci. and Arts, 2d ser., 1, 1846, p. 187, fig. 2.—Edwards and Haime, Mon. Polyp. Foss. Terr. Pal. (Arch. Mus. d'Hist. Nat., 5), 1851, pp. 170, 409.—Billings, Canadian Jour., n. s., 4, 1859, p. 128.—Milne-Edwards, Hist. Nat. Corall., 3, 1860, p. 402.—Dybowski, Archiv. f. Nat. Liv-, Ehst- und Kurl., 5, 1873, p. 338.—Nicholson, Rep. Pal. Prov. Ontario, pt. 1, 1874, p. 20.—Thomson and Nicholson, Ann. Mag. Nat. Hist., 4th ser., 18, 1876, p. 71, fig. E.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 110.—Zittel, Handb. Pal., 1, p. 232.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 384.—Hall, 12th Rep. Indiana Dep. Geol. Nat. Hist., 1883, p. 299.—Miller, N. A. Geol. Pal., 1889, p. 179.—Koken, Die Leitfossilien, Leipzig, 1896, p. 309.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 173.

Clisiophyllum austini Houghton. See Acervularia austini.

Clisiophyllum danaanum Edwards and Haime.

Clisiophyllum danaanum Edwards and Haime, Mon. Polyp. Foss. Terr. Pal. (Arch. du Mus. d'Hist. Nat., 5), 1851, p. 412.—Milne-Edwards, Hist. Nat. Corall., 3, 1860, p. 404.

Silurian: Perry County, Tennessee.

CLISOSPIRA Billings. Genotype: C. curiosa Billings.

Clisospira Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 186.—Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 307.—Koken, Neues Jahrb. f. Min., Geol. Pal., Beilage, 6, 1889, p. 435.—Miller, N. A. Geol. Pal., 1889, p. 400.—Koken, Bull. Acad. Imp. Sci. St. Petersburg, 7, 1897, p. 199.

Clisospira bassleri Raymond.

Clisospira bassleri Raymond, Ann. Carnegie Mus., 4, 1908, p. 214, pl. 54, figs. 16, 17.
Chazyan (Day Point?): Isle La Motte, Vermont.
Holotype.—Cat. No. 53631, U.S.N.M.

Clisospira curiosa Billings.

Clisospira curiosa Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 186, fig. 167, p. 420, App., fig. 401, a, b.—Miller, N. A. Geol. Pal., 1889, p. 400, fig. 661.
Clisiospira curiosa Clarke, Amer. Geol., 13, 1894, p. 331.
Canadian (Beekmantown): Near St. Antonie, above Quebec, Canada.

Clisospira lirata Whitfield.

Clisospira lirata Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 308, pl. 24, figs. 16, 17.
Clisiospira (Onychocheilus?) lirata Clarke, Amer. Geology, 13, 1894, p. 331.
Clisiospira lirata Seely, Rep. State Geol. Vermont, 7, 1910, pl. 62, figs. 16, 17.
Canadian (Beekmantown): Fort Cassin, Vermont.

Clisospira occidentalis Whitfield.

Clisospira occidentalis, Whitfield, Ann. Rep. Wisconsin Geol. Surv. for 1877, 1878, p. 75; Geol. Wisconsin, 4, 1882, p. 222, pl. 5, fig. 21.
Clisiospira occidentalis Clarke, Amer. Geol., 13, 1894, p. 331.
Black River (Platteville): Beloit, Wisconsin.

CLITAMBONITES Pander. Genotype: Pronites adscendens Pander.

Klitambonites Pander, Beitrage zur Geognosie des Russischen Reiches, 1830, p. 70, pl. 3, fig. 14; pl. 28, figs. 16, 17.
Clitambonites Œhlert, Fischer's Manuel de Conchyliologie, 1887, p. 1289, fig. 1059.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 233.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 687.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 377.—Hall and Clarke, 11th Ann. Rep. New York State Geol., 1894, p. 274.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 320; 2d ed., 1913, p. 392.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 270.
Orthisina D'Orbigny, Compt. Rend. de l'Acad. Sci., 25, 1847, p. 267; Prod. Pal., 1, 1849, p. 16.—Davidson, British Foss. Brach., Pal. Soc., 1853, p, 104.—Woodward, Man. Mollusca, pt. 2, 1854, p. 230, fig. 148.—Pictet, Traité de Pal., 2d ed., 4, 1857, p. 57.—Chapman, Canadian Jour., n. s., 3, 1868, p. 160.—Pahlen, Mem. l'Acad. Imp. Sci. St. Petersburg, 7th ser., 24, No. 8, 1877, p. 7.—Zittel, Handb. Pal., 1, 1880, p. 676.—Waagen, Mem. Geol. Surv. India, Pal. Indica, 13th ser., 1, 1884, p. 576.—Miller, N. A. Geol. Pal., 1889, p. 360.—Koken, Die Leitfossilien, Leipzig, 1896, p. 234, fig. 194, p. 408.—Huene, Verh. d. Russ-Kais. Min. Gesell. zu St. Petersburg, 2d ser., 38, 1896, p. 224.

Clitambonites adscendens (?Pander).

Orthisina adscendens (Pander) Kayser, Paleontographica, Suppl., 3, 1876, p. 20, pl. 2, figs. 9–11.
Ordovician: Europe; Juan Pobre and Laja, Cordillere San Juan, Argentina.

CLITAMBONITES AMERICANUS Hall and Clarke. See Clitambonites diversus.

CLITAMBONITES AMERICANUS var. Hall and Clarke. See Clitambonites diversus altissimus.

Clitambonites(?) borealis (Castelnau).

Terebratula borealis Castelnau, Essai Syst. Sil. l'Amérique Septent., 1843, p. 40, pl. 14, fig. 14.

Terebratula turpis de Verneuil, ibid. 1843, p. 40, footnote.

Clitambonites(?) borealis Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 183. "Magnesian limestone of Green Bay, Wisconsin."

Observation.—The figure is not satisfactory. The species seems to be related to C. diversus Shaler (Schuchert).

Clitambonites diversus (Shaler).

Orthisina diversa Shaler, Bull. Mus. Comp. Zool., 1, 1865, p. 67.

Orthisina verneuili Billings (not Eichwald), Cat. Sil. Foss. Anticosti, 1866, pp. 43, 74.

Clitambonites diversa Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 378, pl. 30, figs. 11–17.—Whiteaves, Pal. Foss., 3, pt. 3, Geol Surv. Canada, 1897, p. 166.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 270, figs. 324e–g.

Orthisina (Clitambonites) diversa Huene, Verh. d. Russ. Kais. Mineral Gesell. zu St. Petersburg, 2d ser., 38, 1900, p. 225, fig. 2.

Hemipronites, americanus Whitfield, Ann. Rep. Geol. Surv. Wisconsin, 1877, p. 72; Geol. Wisconsin, 4, 1882, p. 243, pl. 10, figs. 15–17.

Streptorhynchus americanus Miller, N. A. Geol. Pal., 1889, p. 378.

Clitambonites americanus Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 239, pl. 15A, figs. 1–8.—Ruedemann, Bull. New York State Mus., 162, 1912, p. 94, pl. 4, figs. 14–19.

Trenton and Richmond: Island of Anticosti (Charleton and Ellis Bay); Oshkosh, Wisconsin; Cannon Falls, etc., Minnesota; Ontario; Manitoba; Snake Hill, New York.

Observation.—Probably two species are included in the above citations, but the types of both C. diversus and C. americanus are from the Richmond.

Clitambonites diversus altissimus Winchell and Schuchert.

Clitambonites americanus var. Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 15A, figs. 7, 8.

Clitambonites diversa var. altissima Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 381, pl. 30, figs. 18, 19.

Trenton (Prosser): Near Cannon Falls, Minnesota.

Clitambonites diversus-rogersensis Foerste. See Clitambonites rogersensis.

Clitambonites(?) johannensis Schuchert. See Eoorthis johannensis.

Clitambonites multicostus (Hudson).

Syntrophia multicosta Hudson, Bull. New York State Mus., 80, 1903, p. 285, pl. 5, figs. 8–15.

Clitambonites multicostus Raymond, Ann. Carnegie Mus., 7, 1911, p. 247, fig. 23; pl. 36, figs. 10–14.

Chazyan (Valcour): Eastern side of Valcour Island, Bluff Point, and Chazy, New York.

Clitambonites multistriatus Foerste.

Clitambonites multistriata Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, p. 131, pl. 10, fig. 12.

Trenton (Perryville): Near Danville, Kentucky.

Clitambonites piger Schuchert and Twenhofel. See Orthis(?) piger.

Clitambonites planus retroflexus (Verneuil).

Gonambonites plana var. retroflexa Verneuil, Beitr. zur Geog. Russ. Reiches, 1830, p. 77, pl. 25, figs. 1, 2.

Clitambonites (Gonambonites) plana var. retroflexa Matthew, Trans. Roy. Soc. Canada, 2d ser., 1, 1896, p. 266, pl. 2, figs. 1a–1c.

Canadian (Bretonian): McFeel, Cape Breton, Nova Scotia.

Clitambonites porcia (Billings).

Orthis porcia Billings, Canadian Nat. Geol., 4, 1859, p. 439, figs. 16–18; Geol. Canada, Geol. Surv. Canada, 1863, p. 130, fig. 58.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 531, figs.

Clitambonites porcia Raymond, Ann. Carnegie Mus., 7, 1911, p. 248, pl. 36, figs. 15, 16.

Chazyan (Aylmer): Two miles south of Montreal, Quebec.

Clitambonites rogersensis (Foerste).

Clitambonites diversus-rogersensis Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 323, pl. 7, figs. 14a, b.

Clitambonites rogersensis Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 69; Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 132, pl. 2, figs. 6a–d.

Trenton (Upper): Rogers Gap and north of Ford, Kentucky.

Clonograpsus Nicholson. See Clonograptus Hall.

CLONOGRAPTUS Hall. Genotype: Graptolithus rigidus Hall.

Clonograpsus Hall in Nicholson, Ann. Mag. Nat. Hist., 4th ser., 11, 1873, p. 138.

Clonograptus Zittel, Handb. Pal., 1, 1879, p. 299.—Herman, Geol. Mag., dec. 3, 3, 1886, p. 24.—Barrois, Ann. Soc. Geol. Nord, 21, 1893, p. 108.—Wiman, Bull. Geol. Inst. Univ. Upsala, 2, pt. 2, No. 4, 1896, p. 265.—Koken, Die Leitfossilien, 1896, p. 416.—Roemer and Frech, Leth. geog., 1 Theil Leth. Pal., 1, 2 Lief, 1897, p. 598.—Elles, Quart. Jour. Geol. Soc. London, 54, 1898, p. 472.—Elles and Wood, Mon. British Graptolites, Pal. Soc., 1902, p. 82.

Clonograptus abnormis (Hall).

Graptolithus abnormis Hall, Canadian Nat. Geol., 3, 1858, p. 144; Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 117; Pal. New York, 3, 1859, p. 503; 12th Rep. New York State Cab. Nat. Hist., 1859, p. 51; Geol. Surv., Canada, dec. 2, 1865, p. 106, pl. 11, fig. 6.

Graptolithus (Monoprion) abnormis Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 226; rev. ed., 1870, pp. 223, 261.

Clonograptus abnormis Elles and Wood, Mon. British Grapt., Pal. Soc., 1903, p. 51 (gen. ref.).

Dichograptus abnormis Gurley, Jour. Geol., 4, 1896, pp. 65, 95 (gen. ref.).

Canadian (Levis): Point Levis, Quebec.

Clonograptus flexilis (Hall).

Graptolithus flexilis Hall, Geol. Surv. Canada, Rep. for 1857, 1858, pp. 119, 145.—Billings, Geol. Canada, Geol. Surv. Canada, 1868, p. 228, fig. 235.—Hall, Geol. Surv. Canada, dec. 2, 1865, p. 11, fig, 8; p. 103, pl. 10, figs. 3–9.

Dichograpsus flexilis Nicholson, Mon. British Graptolites, 1872, p. 108, fig. 51.—Gurley, Jour. Geol., 4, 1896, p. 95.

Graptolithus (Dichograptus) flexilis Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 176, fig. 9; p. 226, pl. 3, figs. 28, 29; rev. ed., 1870, p. 209, fig. 9, pl. 3, figs. 28, 29.

Graptolithus (Monoprion) flexilis Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 223.

Clonograptus flexilis—Continued.

Clonograpsus flexilis Nicholson, Ann. Mag. Nat. Hist., 4th ser., 11, 1873, p. 138 (gen. ref.).

Clonograptus flexilis Matthew, Trans. Royal Soc. Canada, 10, sec. 4, 1893, p. 97.—Pritchard, Proc. Royal Soc. Victoria, n. s., 7, 1895, p. 29.—Roemer, Leth. geog., 1 Theil., Leth. Pal., 1, 3 Lief, 1897, p. 599, fig. 164.—Elles, Quart. Jour. Geol. Soc. London, 54, 1898, p. 473.—T. S. Hall, Proc. Soc. Victoria, n. s., 11, 1898, p. 169, pl. 19, fig. 20.

Clonograptus cf. flexilis Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, p. 618.

Canadian: Point Levis, Quebec (Levis, Clonograptus zone); St. John, New Brunswick (Bretonian, Div. C 3d); near Defreestville, Rensselaer County, New York (Deepkill); Victoria.

Clonograptus milesi (Hall).

Graptolithus milesi Hall, Geol. Vermont, 1, 1861, p. 372; 2, pl. 12, figs. 2–4; Geol. Surv. Canada, dec. 2, 1865, p. 20, fig. 27; 20th Rep. New York State Cab. Nat. Hist., 1868, p. 188, fig. 29; p. 226; rev. ed., 1870, p. 217, fig. 29.

Graptolithus (Monoprion) milesi Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 223.

Dichograpsus (Graptolithus) milesi Nicholson, Mon. Brit. Grapt., 1872, p. 65, fig. 34.

Temnograptus milesi Nicholson, Geol. Mag., dec. 2, 3, 1876, p. 248 (gen. ref.).

Clonograptus milesi Ruedemann, Bull. New York State Mus., 69, 1903, p. 939; Mem. New York State Mus., 7, 1904, p. 617 and footnote.

Canadian (Levis): Monckton, Vermont.

Clonograptus proximatus Matthew. See Staurograptus dichotomus.

Clonograptus remotus (Gurley).

Dichograpsus remotus Gurley, Jour. Geol., 4, 1896, p. 64.

Clonograptus remotus Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 133 (gen. ref.).

Canadian (Levis): Point Levis, Quebec.

Clonograptus Richardsoni Elles and Wood. See Hologra ptus richardsoni.

Clonograptus rigidus (Hall).

Graptolithus rigidus Hall, Canadian Nat. Geol., 3, 1858, p. 146; Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 121; Geol. Surv. Canada, dec. 2, 1865, p. 105, pl. 11, figs. 1–5.

Graptolithus (Monoprion) rigidus Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 226; rev. ed., 1870, pp. 223, 261.

Dichograpsus rigidus Gurley, Jour. Geol., 4, 1896, p. 95 (gen. ref.).

Clonograptus rigidus Nicholson, Ann. Mag. Nat. Hist., 4th ser., 11, 1873, p. 138 (gen. ref.).—Roemer and Frech, Leth. geog., 1 Theil, Leth. Pal., 1, 3 Lief., 1897, p. 599.—T. S. Hall, Proc. Royal Soc. Victoria, n. s., 11, 1898, p. 170, pl. 18, fig. 22; pl. 19, fig. 21.—Elles and Wood, Mon. Brit. Grapt. Pal. Soc., 1903, p. 51 (gen. ref.).

Canadian (Levis, Clonograptus zone): Point Levis, Quebec. Lower Ordovician slates of Victoria.

Clonograptus? spinosus Matthew.

Clonograptus (?) spinosus Matthew, Trans. Royal Soc. Canada, 10, sec. 4, 1893, p. 97, pl. 7, figs. 2 a, b.

Canadian (Bretonian, Div. C 3b): Navy Island, New Brunswick.

Observation.—Possibly same as Staurograptus dichotomus Emmons.

CLORINDA Barrande. Genotype: C. armata Barrande.

Clorinda Barrande, Syst. Sil. Boheme, 5, pt. 1, 1879, p. 109, pl. 119; Brach. Ext. Syst. Sil. Centre Boheme, 5, 1879, p. 172.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 322.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 276.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 395.

Barrandella Hall and Clarke, Pal. New York, 8, pt. 2, 1893, pp. 241, 243; Ann. Rep. New York State Geol., 1895, p. 844.—Grabau, Bull. New York State Mus., 45, 1901, p. 191; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 191.

Clorinda arcuosa (McChesney).

Pentamerus arcuosus McChesney, Descriptions New Pal. Foss., 1861, p. 87.

Clorinda arcuosa Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 184

Niagaran (Racine): Milwaukee, Wisconsin.

Clorinda areyi (Hall and Clarke).

Barrandella areyi Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pp. 242, 368, pl. 71, figs. 14–16; 48th Rep. New York State Mus. for 1895, 2, 1897, p. 369, pl. 13, figs. 1–3; 14th Rep. State Geol. New York for 1894, 1897, p. 369, pl. 13, figs. 1–3.

Clorinda areyi Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 184.

Clinton: Rochester, New York.

CLORINDA BARRANDEI Schuchert. See Virgiana barrandei.

Clorinda fornicata (Hall).

Pentamerus fornicatus Hall, Pal. New York, 2, 1852, p. 81, pl. 24, fig. 7.

Pentamerus fornicatus var. Hall, Desc. n. sp. Fossils, Waldron, Indiana, 1879, p. 16; 11th Rep. State Geol. Indiana, 1882, p. 299, pl 27, fig. 15; Trans. Albany Inst., 10, 1883, p. 72.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 616, figs.

Barrandella fornicata Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 243, pl. 70, figs. 11–13.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 191, fig. 104; Bull. New York State Mus., 45, 1901, p. 191, fig. 104.

Clorinda fornicata Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 184.

Clorinda (Barrandella) fornicata Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 276, fig. 335.

Niagaran: Lockport, New York (Clinton-Irondequoit); Waldron, Indiana (Waldron); Wisconsin.

Clorinda? thebesensis Savage.

Clorinda? thebesensis Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 79, pl. 5, figs. 7, 8.

Upper Medinan (Edgewood): Near Thebes, Illinois; Louisiana; and near Clarksville, Pike County, Missouri (Noix oolite).

Clorinda ventricosa (Hall).

Pentamerus ventricosa Hall, Geol. Surv. Wisconsin, Rep. Prog., 1860, p. 2.—Whitfield, Geol. Wisconsin, 4, 1882, p. 291, pl. 17, figs. 11–13.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 192, fig.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Surv., 1889, p. 64, pl. 33, figs. 12–14.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 619, 2 figs.

Pentamerus chicagoensis Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 94, pl. 2, fig. 11.—Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 392.

Pentamerus (Pentamerella?) ventricosa Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 374, pl. 13, figs. 18–21.

Clorinda ventricosa—Continued.

Pentamerus (Pentamerella) ventricosus Hall and Whitfield, Pal. Ohio, 2, 1875, p. 138, pl. 7, figs. 7, 8.

Pentamerus (Barrandella) ventricosus Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 65.

Barrandella ventricosa Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 243, pl. 71, figs. 4–10; pl. 84, fig. 46.

Clorinda (Barrandella) ventricosa Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 276, fig. 336a–b.

Clorinda ventricosa Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 185.

Niagaran: Waukesha, Wisconsin; Bridgeport, Illinois (Racine); Louisville, Kentucky; Ohio.

Plesiotype.—Cat. No. 51323 (Nettelroth).

CLOSTEROCRINUS Hall. Genotype: C. elongatus Hall.

Closterocrinus Hall, Pal. New York, 2, 1852, p. 179.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 329.—Miller, N. A. Geol. Pal., 1889, p. 232.—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 173.

Closterocrinus elongatus Hall.

Closterocrinus elongatus Hall, Pal. New York, 2, 1852, p. 179, pl. A 41, figs. 2a–f.

Clinton (Irondequoit): Lockport, New York.

Cnemidium? Trentonensis Worthen. See Zittelella trentonensis.

COCCOCRINUS Müller. Genotype: C. rosaceus Roemer.

Coccocrinus Müller, in Zeiler and Wirtgen, Verh. Naturh. Verein Rheinl., 12, 1855, p. 20.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 310.—Roemer, Sil. Fauna West. Tennessee, 1860, p. 51.—Dujardin and Hupé Hist. Nat. Zooph., 1862, p. 107.—Allman, Trans. Royal Soc. Edinburgh, 23, 1864, p. 248, fig. 3.—Schultze, Denk. d. Kais. Akad. der Wiss., Math.-Naturw., Cl. 26, Abth. 2, 1867, p. 200, fig. 16.—Zittel, Handb. d. Pal., 1, 1879, p. 347.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 232. (Rev. Pal., pt. 2, p. 58); 1886, pp. 280, 336 (Rev. Pal., pt. 3, pp. 58, 114); 1887, pp. 97–113; ibid., 1890, pp. 351, 355.—Neumayr, Stämme des Thierreicher, 1889, p. 470.—Miller, N. A. Geol. Pal., 1889, p. 232.—Bather, Geol. Mag., dec. 4, 4, 1897, p. 343.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 21, 1897, p. 738.—Bather, Treatise on Zool., pt. 3, Echinoderma, 1900, p. 156.—Zittel, Grundzuge Pal., 1, 1910, p. 149.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 515.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 199.

Coccocrinus bacca Roemer.

Coccocrinus bacca Roemer, Sil. Fauna West. Tennessee, Breslau, 1860, p. 51, pl. 4, figs. 5a, 5b, 5c.—Miller, N. A. Geol. Pal., 1889, p. 232, fig. 265.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 21, 1897, p. 739, pl. 75, fig. 15.—Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 29, pl. 4, fig. 9.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 515, fig. 1835.

Platycrinites Ann Dixoni Troost, Amer. Jour. Sci. and Arts, 2d ser., 8, 1849, p. 420 (nom. nud.); Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 61.

Niagaran (Brownsport): Perry and Decatur Counties, Tennessee.

Plesiotype.—Cat. No. 39888, U.S.N.M. (Troost's type of P. Ann Dixoni).

Coccocrinus conicus (Troost).

Coccocrinus conicus (Cupellacrinites conicus Troost MS. 1850) Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 29, pl. 15, fig. 1.

Niagaran (Brownsport): Decatur County, Tennessee.

Holotype.—Cat. No. 39933, U.S.N.M.

CODASTER OSGOODENSIS Wachsmuth and Springer. See Stephanocrinus osgoodensis.

CODASTER PENTALOBUS Hall. See Stephanocrinus pentalobus.

CODASTER PULCHELLUS Miller and Dyer. See Stephanocrinus pulchellus.

CODONOCHILUS Whiteaves. Genotype: C. striatum Whiteaves.
Codonocheilus Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 17.
Codonochilus Miller, N. A. Geol. Pal., 1889, p. 400.

Codonochilus striatum Whiteaves.
Codonocheilus striatum Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 17, pl. 3, fig. 3.
Codonochilus striatum Fischer, Man. de Conchyl., 1885, pp. 832, 833.—Miller, N. A. Geol. Pal., 1889, p. 400, fig. 662.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 93.
Niagaran (Guelph): Hespeler and Durham, Ontario.

CŒLASTER AMERICANUS D'Orbigny. See Petraster americana.

CŒLASTER MATUTINA D'Orbigny. See Hudsonaster matutina.

CŒLIDIUM Clarke and Ruedemann. See Cœlocaulus Œhlert.

CŒLOCAULUS Œhlert. Genotype: Murchisonia (Cœlocaulus) davidsoni Œhlert.
Murchisonia (part) Lindstrom, Billings, and other authors.
Cœlocaulus (new subgenus of Murchisonia) Œhlert, Bull. Soc. d'Etudes Sci. d'Angers, 7, 1888, p. 84.—Koken, Neues Jahrb. f. Min., Geol. Pal., 6, Beilage-Band, 1889, p. 371.—Donald, Quart. Jour. Geol. Soc. London, 48, 1892, p. 572; 51, 1895, p. 211.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, pp. 959–1019.—Koken, Neues Jahrb. f. Min., Geol. Pal., 1, 1898, p. 20.
Cœlidium Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 65.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 652.

Cœlocaulus bivittatus (Hall).
Murchisonia bivittata Hall, Pal. New York, 2, 1852, p. 345, pl. 83, fig. 1a, b.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 339, fig. 343.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 70, pl. 3, figs. 7 (not fig. 8); Quart. Jour. Geol. Soc. London, 31, 1875, p. 546, pl. 26, fig. 7.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 427, fig.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 82, pl. 12, figs. 5, 6.
Murchisonia (Cœlocaulus) bivittata Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 462, pl. 13, fig. 4.
Cœlocaulus bivittatus Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1020 (gen. ref.).
Niagaran: Galt, Ontario (Guelph); Huntington, Indiana.
Plesiotype.—Cat. No. 52948, U.S.N.M.

Cœlocaulus estella (Billings).
Murchisonia Estella Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 157, fig. 139.—Koken, Neues Jahrb. f. Min., Geol. Pal., Beilage-Band, 6, 1889, p. 368.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 11, 1895, p. 83.
Cœlocaulus estella Whiteaves, ibid., 3, pt. 4, 1906, p. 334 (gen. ref.).
Niagaran (Guelph): Galt, Ontario.
Observation.—Probably the same as C. turritiformis (Hall).

Cœlocaulus linearis (Billings).
Murchisonia linearis, Billings, Canadian Nat. Geol., 4, 1859, p. 359, fig. 8g; Geol. Canada, Geol. Surv. Canada, 1863, p. 119, fig. 31.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 429, fig.

Cœlocaulus linearis—Continued.

Cœlocaulus linearis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1020 (gen. ref.).

Cœlidium linearis Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 652.

Chazyan (Mingan): Mingan Islands, Canada.

CŒLOCAULUS LOGANI Hall. See Cœlocaulus macrospira.

Cœlocaulus longispira (Hall).

Murchisonia longispira Hall, Pal. New York, 2, 1852, p. 345, pl. 83, fig. 2a, b.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 70, pl. 3, figs. 11, 12; Quart. Jour. Geol. Soc. London, 31, 1875, p. 546, pl. 26, figs. 11, 12.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 83.

Cœlocaulus longispira Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1020 (gen. ref.).

Niagaran (Guelph): Galt, Ontario; Wisconsin.

Cœlocaulus macrospira (Hall).

Murchisonia macrospira Hall, Pal. New York, 2, 1852, p. 346, pl. 83, fig. 5.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 339, fig. 334.—Nicholson, Quart. Jour. Geol. Soc. London, 31, 1875, p. 545, pl. 26, fig. 9; Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 70, pl. 3, fig. 9.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 193, fig.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 27, pl. 4, figs. 7, 7a.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 429, fig.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 81.

Cœlidium macrospira Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 65, pl. 7, figs. 2–8; pl. 10, fig. 13.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 652, fig. 892.

Cœlocaulus macrospira Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 333 (gen. ref.).

Murchisonia loganii Hall, Pal. New York, 2, 1852, p. 346, pl. 84, figs. 4a, b.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 70, pl. 3, figs. 3, 4; Quart. Jour. Geol. Soc. London, 31, 1875, p. 544, pl. 26, figs. 3, 4.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 80.

Cœlocaulus logani Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1020 (gen. ref.).

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

Cœlocaulus neglectus Ulrich and Scofield.

Cœlocaulus neglectus Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1020, pl. 82, figs. 29–31.

Trenton (Prosser): Near Cannon Falls, Minnesota.

Holotype.—Cat. No. 45749, U.S.N.M.

Cœlocaulus obtusus (Hall).

Murchisonia? obtusa Hall, Pal. New York, 2, 1852, p. 333, pl. 76, fig. 3.

Cayugan (Cobleskill): Schoharie, New York.

Cœlocaulus œhlerti Ulrich and Scofield.

Cœlocaulus œhlerti Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1020, pl. 70, figs. 61–63.

Cœlidium œhlerti Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 652, fig. 893 a, b.

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

Trenton (Galena): Jo Daviess County, Illinois.

Cotypes: Cat. No. 45750, U.S.N.M.

Cœlocaulus petila (Hall and Whitfield).

Murchisonia petila Hall and Whitfield, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 186; 27th Rep., 1875, p. 186, pl. 13, fig. 8.—Nettelroth, Kentucky Foss. Shells, Geol. Surv. Kentucky, 1889, p. 170, pl. 31, fig. 5.

Niagaran (Louisville): Falls of the Ohio.

Cœlocaulus terebralis (Hall).

Murchisonia? terebralis Hall, Pal. New York, 2, 1852, p. 334, pl. 76, fig. 4.

Cayugan (Cobleskill): Schoharie, New York.

Cœlocaulus turritiformis (Hall).

Murchisonia turritiformis Hall, Pal. New York, 2, 1852, p. 347, pl. 83, fig. 6a, b.—Nicholson, Quart. Jour. Geol. Soc. London, 31, 1875, p. 545, pl. 26, fig. 10; Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 70, pl. 3, fig. 10.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 26, pl. 4, fig. 5; pt. 2, 1895, p. 84, pl. 12, fig. 4.

Cœlocaulus turritiformis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1020 (gen. ref.).

Niagaran (Guelph): Galt, Ontario; Wisconsin.

Observation.—See C. estella (Billings) for a probable synonym.

Cœlocaulus vitellia (Billings).

Murchisonia Vitellia Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 156, fig. 138 (adv. sheets 1862).—Nicholson, Quart. Jour. Geol. Soc. London, 30, 1875, p. 547, pl. 26, fig. 6; Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 71, pl. 3, fig. 6.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 80.

Cœlidium cf. vitellia Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 67, pl. 7, figs. 9, 10.

Cœlocaulus(?) Vitellia Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 333 (gen. ref.).

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

CŒLOCLEMA Ulrich. Genotype: Diamesopora vaupeli Ulrich.

Cœloclema Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 137; 7, 1884, p. 49 (not defined).—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, pp. 24, 211.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 21.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 122.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 742.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 83; Zittel-Eastman Textb. Pal., 1913, p. 328.

Diamesopora (part) Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 380, 467; Geol. Minnesota, 3, 1893, p. 330; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 268.

Cœloclema alternatum (James).

Ceramopora alternata James, Paleontologist, No. 1, 1878, p. 5.

Monticulipora (Fistulipora) alternata James and James, Jour. Cincinnati Soc. Nat. Hist., 11, 1888, p. 34, pl. 1, figs. 5-5b.

Diamesopora vaupeli Ulrich, Geol. Surv. Illinois, 8, 1890, p. 468, pl. 39, figs. 3, 3b; pl. 41, figs. 4-4c.

Cœloclema alternatum Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 211.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 33.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 803, pl. 12, figs. 2-2d; pl. 27, fig. 16.

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

Plesiotypes.—Cat. No. 43292, U.S.N.M. (cotypes of D. vaupeli).

Cœloclema cavernosum Bassler.

Cœloclema cavernosa Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 21, pl. 23, figs. 10–13.

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

Cotypes.—Cat. No. 35471, U.S.N.M.

Cœloclema commune (Ulrich).

Diamesopora communis Ulrich, Geol. Surv. Illinois, 8, 1890, p. 469, pl. 39, 3a, pl. 41, figs. 5, 5b.

Cœloclema concentricum Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 212 (not Ceramopora concentrica James).

Cœloclema commune Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 804, pl. 12, figs. 3, 3c; pl. 27, fig. 17.

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

Cotypes.—Cat. No. 43293, U.S.N.M.

Cœloclema concentricum Nickles and Bassler. See Cœloclema commune.

Cœloclema imbricata Ulrich. See Diamesopora subimbricata.

Cœloclema infrequens Ulrich. See Diamesopora infrequens.

Cœloclema osculum Ulrich. See Diamesopora osculum.

Cœloclema oweni (James).

Fistulipora oweni James, Jour. Cincinnati Soc. Nat. Hist., 7, 1884, p. 21, figs. 2–2g.

Monticulipora (Fistulipora) oweni James and James, ibid., 11, 1888, p. 34.—J. F. James, ibid., 18, 1896, p. 119.

Diamesopora oweni Ulrich, Geol. Surv. Illinois, 8, 1890, p. 467.

Cœloclema oweni Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 212 (gen. ref.).—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 34, pl. 6, figs. 5, 6.

Maysville (Mount Auburn): Lebanon, Cincinnati, etc., Ohio; Indiana; Kentucky.

Cœloclema trentonense (Ulrich).

Diamesopora trentonensis Ulrich, Geol. Minnesota, 3, 1893, p. 330, pl. 28, fig. 14; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 268, fig. 439.

Cœloclema trentonense Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 212 (gen. ref.).—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 122, fig. 178.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 328, fig. 463.

Black River (Decorah): St. Paul and Cannon Falls, Minnesota.

Trenton: St. Paul, etc., Minnesota (Prosser); Trenton Falls, New York; Ottawa, Ontario.

Cotypes.—Cat. No. 43294, U.S.N.M.

CŒLOCYSTIS Schuchert. Genotype: Hemicosmites subglobosus Hall.

Hemicosmites Hall (not Von Buch), 20th Rep. New York State Cab. Nat. Hist., rev. ed., 1868, p. 359.

Sphærocystites Jaekel (not Hall), Stammesg. Pelmat., 1, 1899, p. 289, fig. 63; p. 307.

Cœlocystis Schuchert, Amer. Geol., 32, 1903, p. 234; Smiths. Misc. Coll., 47, 1904, p. 246.

Cœlocystis subglobosus (Hall).

Hemicosmites subglobosus Hall, 25th Rep. New York State Cab. Nat. Hist., 1868, (extras Dec., 1864), p. 316, pl. 12 (3), fig. 13; rev. ed., 1868 (1870), p. 359, pl. 12, fig. 13.

Cœlocystis subglobosus—Continued.

Sphærocystites dolomiticus Jaekel, Stammesg. Pelmat., 1, Thecoidea u. Cystoidea, 1899, p. 289, fig. 63.

Cœlocystis subglobosus Schuchert, Amer. Geol., 32, 1903, p. 235; Smiths. Misc. Coll., 47, 1904, p. 248, figs. 36, 37.

Niagaran (Racine): Racine, Wisconsin; Chicago, Illinois.

Plesiotypes.—Cat. Nos. 35061, 35155, U.S.N.M.

CŒLOSPIRA Hall. Genotype: Leptocœlia concava Hall.

Cœlospira Hall, 16th Rep. New York State Cab. Nat. Hist., 1863, p. 59; Trans. Albany Inst., 4, 1863, p. 146; Pal. New York, 4, 1867, p. 328.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 134, figs. 122, 123.—Davidson, Mon. British Foss. Brach., 5, Sil. Suppl., Pal. Soc., 1882, p. 84.—Miller, N. A. Geol. Pal., 1889, p. 340.—Koken, Die Leitfossilien, Leipzig, 1896, p. 241.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 338; 2d ed., 1913, p. 338.

Leptocœlia Hall, 10th Rep. New York State Cab. Nat. Hist., 1857, p. 108; 12th Rep., 1859, p. 32, figs. 1, 2, 4; Pal. New York, 3, 1859, p. 447.—Billings, Canadian Jour., 6, 1861, p. 351.—Hall, Amer. Jour. Sci., 36, 1863, p. 14.—Rominger, Amer. Jour. Sci., 35, 1863, p. 84.—Hall, Trans. Albany Inst., 4, 1863, p. 145; Pal. New York, 4, 1867, p. 365.—Davidson, Mon. British Sil. Brach., Pal. Soc., 1867, p. 138, footnote.—Dall, Amer. Jour. Conch., 6, 1870, p. 98, footnote; 7, 1871, p. 60.—Zittel, Handb. Pal., 1, 1880, p. 704.—Davidson, Mon. British Foss. Brach., 5, App. to Suppl., Pal. Soc., 1884, p. 365.—Miller, N. A. Geol. Pal., 1889, p. 348.—Nettleroth, Kentucky Fossil Shells, Mem. Geol. Surv. Kentucky, 1889, p. 151.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 136.—Ulrich, Neues Jahrb. f. Min., Geol., Pal. Beilage-Band, 8, 1893, p. 60.—Koken, Die Leitfossilien, Lepizig, 1896, p. 249.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 417. (Subgenus of Cœlospira; genotype L. flabellites Hall.)

Anoplotheca Grabau, Bull. New York State Mus., 45, 1901, p. 205; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 205.—Schuchert and Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 433.

Cœlospira concava tonolowayensis (Swartz).

Anoplotheca concava var. tonolowayensis Swartz, Maryland Geol. Surv., Low. Dev., 1913, p. 435, pl. 73, figs. 20, 21.

Helderbergian (Keyser): Tonoloway, Maryland.

Cœlospira congregata (Kindle and Breger).

Anoplotheca congregata Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 444, pl. 9, figs. 18–20.—Foerste, Cincinnati Soc. Nat. Hist., Jour., 21, No. 1, 1909, p. 20.

Cayugan (Kokomo): Logansport and Kokomo, Indiana.

Cœlospira hemispherica (Sowerby).

Atrypa hemispherica Sowerby, Murchison's Sil. Syst., 1839, p. 639, pl. 20, fig. 7.—Hall, Pal. New York, 2, 1852, p. 74, pl. 23, fig. 10.—Billings, Geol. Canada, 1863, p. 318, fig. 337.

Atrypa hemispherica ? Hall, Geol. New York; Rep. Fourth Dist., 1843, p. 73, fig. 4.

Leptocœlia hemispherica Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 77.—Nettelroth, Kentucky Fossil Shells, Mem. Geol. Surv. Kentucky, 1889, p. 152, pl. 32, figs. 21–23, 36–39.—Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 325, pl. 6, figs. 18, 19.

Atrypa flabella Shaler, Bull. Mus. Comp. Zool., 4, 1865, p. 68.

Cœlospira hemispherica—Continued.

Cœlospira ? hemispherica Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 136, pl. 82, figs. 1–4 (? pl. 52, fig. 16).

Anoplotheca hemispherica Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 145.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 204, fig. 132; Bull. New York State Mus., 45, 1901, p. 205, fig. 132.

Anoplotheca (Cœlospira) hemispherica Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 350, fig. 455.

Silurian: England; Rochester, Sodus, and Walcott, New York; Kentucky; Tennessee; Georgia; Alabama; Nova Scotia (Clinton); The Jumpers, etc., Anticosti (Anticostian, Gun River-Chicotte).

Plesiotype.—Cat. No. 51322, U.S.N.M.

Cœlospira planoconvexa (Hall).

Atrypa planoconvexa Hall, Pal. New York, 2, 1852, p. 75, pl. 23, fig. 11.—Billings, Geol. Canada, 1863, p. 318, fig. 336.

Leptocœlia planoconvexa Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 78.—Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 144.

Cœlospira? planoconvexa Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 136, pl. 52, fig. 15; pl. 53, figs. 11–16.

Anoplotheca planoconvexa Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 145.

Silurian: Flamborough Head, etc., Ontario (Cataract); Island of Anticosti (Gun River).

Cœlospira plicatula (Hall).

Atrypa plicatula Hall, Geol. New York, Rep. 4th Dist., 1843, p. 71, fig. 4; Pal. New York, 2, 1852, p. 74. pl. 23, fig. 9.

Leptocœlia? plicatula Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 78.

Rhynchonella plicata Miller, N. A. Geol. Pal., 1889, p. 369.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 898, fig.

Cœlospira? plicatula Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 136, pl. 52, figs. 12–14; pl. 82, fig. 5.

Anoplotheca plicatula Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 145.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 205, fig. 133; Bull. New York State Mus., 45, 1901, pp. 205, 206, fig. 133.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 350, fig. 456.

Clinton: Reynales Basin, etc., New York.

Cœlospira saffordi (Foerste).

Anoplotheca (Cœlospira) saffordi Foerste, Jour. Geol., 11, 1903, p. 709.

Anoplotheca saffordi Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 89, pl. 1, fig. 6.

Niagaran (Brownsport): Near Martins Mills, Bath Springs, etc., Tennessee.

CŒNITES Eichwald. Genotype: C. juniperinus Eichwald.

Cœnites Eichwald, Zool. Specialis, pt. 1, Vilnae, 1829, p. 179.—Edwards and Haime, Mon. Polyp. Foss. Terr. Pal. (Arch. Mus. d'Hist. Nat., 5), 1851, pp. 157, 301.—McCoy, British Pal. Rocks and Fossils, 1854, p. 21.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 444.—Milne-Edwards, Hist. Nat. Corall, 3, 1860, p. 308.—Duncan, Rep. 41st Meeting British Assoc. Adv. Sci., 1872, p. 130.—Salter, Cat. Camb. and Sil. Foss., 1873, p. 105.—Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 150.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 54.—Nicholson and Etheridge, Jour. Linn. Soc., Zool., 13, 1877, p. 361.—Nicholson, Tab. Corals Pal. Period, 1879, p. 130.—Zittel, Handb. Pal., 1, 1880, p. 619.—Roemer, Leth. Geog., pt. 1, Leth. Pal., 1883, p. 444.—

CŒNITES—Continued.

Miller, N. A. Geol. Pal., 1889, p. 179.—Sardeson, Neues Jahrb. f. Min., Geol. Pal. Beilage-Band, 10, 1896, pp. 252, 320.—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 26.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 2, 1902, p. 255.

Limaria Steininger, Mem. Soc. Geol. France, 1, 1834, p. 339, pl. 20, figs. 6, 6a.—Dana, Wilkes U. S. Expl. Exped. 1838–1842, 7, Zoophytes, 1846, p. 702.—Hall, Pal. New York, 2, 1852, p. 142.—Rominger, Amer. Jour. Sci. Arts, 2d ser., 34, 1862, p. 390; Geol. Surv. Michigan, 3, pt. 2, 1876, p. 44.

Observation.—See Dictyostroma Nicholson for a probable synonym.

Cœnites crassus (Rominger).

Limaria crassa Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 45, pl. 18, fig. 1.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 341, fig.

Cœnites crassa Davis, Kentucky Foss. Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 4, fig. 6.

Cladopora crassa Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 30.

Niagaran: Point of Barques, Lake Michigan; Lake Temiscaming, Quebec; Louisville, Kentucky.

Cœnites fruticosus (?Steininger) Hall.

Limaria fruticosa Steininger, Bull. Soc. Geol. France, 1, 1834, p. 339.—Hall. Pal. New York, 2, 1852, p. 143, pl. 39, figs. 5a, b.

Cœnites fruticosa Miller, N. A. Geol. Pal., 1889, p. 179 (gen. ref.).

Silurian: England; Lockport, New York (Lockport).

Cœnites juniperinus Eichwald.

Cœnites juniperinus Eichwald, Zool. Spec., 1, 1829, p. 197.—Edwards and Haime, Polyp. Foss. Terr. Pal., 1851, p. 301; Mon. British Foss. Corals, Pal. Soc., 1854, p. 276, pl. 65, figs. 4, 4a.—Nicholson, Pal. Tab. Corals, 1879, p. 134, pl. 6, figs. 5, 5b.—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 1899, p. 27.

Silurian: England; Thorold, Ontario (Niagaran-Lockport).

Cœnites laminatus (Hall).

Limaria laminata Hall, Pal. New York, 2, 1852, p. 143, pl. 39, figs. 6a–d.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 45, pl. 18, fig. 2.

Cœnites laminata Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 151.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 55, fig. 25d. e.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 4, fig. 5.

Niagaran: Lockport, New York (Lockport); Drummond Island, Lake Huron; Louisville, Kentucky (Louisville).

Cœnites lunatus (Nicholson and Hinde).

Cœnites lunata Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 151, fig. 2.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 55, fig. 25a–c.—Miller, N. A. Geol. Pal., 1889, p. 179, fig. 155.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 28.

Niagaran: Owen Sound, Ontario; North end of Lake Temiscaming, Quebec.

Anticostian (Jupiter River): The Jumpers, Anticosti.

Cœnites ramulosus (Hall).

Limaria ramulosa Hall, Pal. New York, 2, 1852, p. 142, pl. 39, figs. 4a–d.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 44.

Cœnites ramulosa Miller, N. A. Geol. Pal., 1889, p. 179 (gen. ref.).

Niagaran (Lockport): Lockport, New York.

Cœnites verticillatus (Winchell and Marcy).

Cladopora verticillata Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 84.

Limaria verticillata Rominger, Geol. Surv. Mich., 3, pt. 2, 1876, p. 45 (gen. ref.).

Cœnites verticillata Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 46, figs. 1–4.

Niagaran: Chicago, Illinois (Racine); Louisville, Kentucky (Louisville); Tennessee (Brownsport).

Cœnograptus Hall. See Nemagraptus Emmons.

Cœnograptus (?Pleurograptus? Pterograptus) divergens Hall. See Amphigraptus divergens.

Cœnograptus exilis Lapworth. See Nemagraptus exilis.

Cœnograptus gracilis Hall. See Nemagraptus gracilis.

Cœnograptus (Pleurograptus) linearis Roemer and Frech. See Pleurograptus linearis.

Cœnograptus surcularis Hall. See Nemagraptus gracilis surcularis.

Cœnostoma Spencer. See Cœnostroma Winchell.

Cœnostoma botryoideum Spencer. See Clathrodictyon striatellum.

Cœnostoma constellatum Spencer. See Stromatopora constellata.

Cœnostroma constellatum of authors. See Stromatopora constellata.

Cœnostroma galtense Dawson. See Stromatopora galtensis.

COLEOLUS Hall. Genotype: C. tenuicinctus Hall.

Coleolus Hall, Pal. New York, 5, pt. 2, 1879, p. 184.—Zittel, Handb. Pal., 2, 1882, p. 315.—Miller, N. A. Geol. Pal., 1889, p. 389.—Whidborne, Mon. Dev. Fauna South England, 3, Pal. Soc., 1896, p. 38.—Koken, Die Leitfossilien, Leipzig, 1896, p. 96.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 283.

Coleolus clintonensis Foerste.

Coleolus Clintonensis Foerste, Geol. Surv. Ohio, 7, 1893, p. 547, pl. 37A, fig. 11.

Upper Medinan (Brassfield): Soldiers' Home, near Dayton, Ohio.

Coleolus iowensis James.

Coleolus iowensis James, Amer. Geol., 5, 1890, p. 355.

Richmond (Maquoketa): Illinois and Iowa.

Coleolus spinulus Hall.

Coleolus spinulus Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 322, pl. 33, fig. 8; Trans. Albany Inst., 10, 1883, p. 74.

Niagaran (Waldron): Waldron, Indiana.

COLEOPRION Sandberger. Genotype: C. gracilis Sandberger.

Coleoprion Sandberger, Neues Jahrb. f. Min., etc., 1847, p. 24.—Woodward, Man. Mollusca, pt. 2, 1854, p. 206.—Pictet, Traité de Pal., 2d ed., 3, 1855, p. 320.—Ludwig, Paleontographica, 11, 1864, p. 317.—Barrande, Syst. Sil. Centre Boheme, 3, 1867, p. 108.—Hall, Pal. New York, 5, pt. 2, 1879, p. 183.—Zittel, Handb. Pal., 1882, p. 315.—Miller, N. A. Geol. Pal., 1889, p. 390.—Koken, Die Leitfossilien, Leipzig, 1896, p. 96.

Coleoprion minuta Walcott.
Coleoprion minuta Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 85, pl. 11, figs. 17, 17a; pl. 12, fig. 21.
Upper Pogonip: Lone Mountain and Pogonip Ridge, Nevada.
Cotypes.—Cat. No. 17373, U.S.N.M.

Colpoceras Hall. See Endoceras Hall.

COLPOMYA Ulrich. Genotype: C. constricta Ulrich.
Colpomya Ulrich, Geol. Surv. Ohio, 7, 1893, p. 659; Geol. Minnesota, 3, pt. 2, 1894, p. 522.—Miller, N. A. Geol., Pal., 2d App., 1897, p. 780.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 516.

Colpomya abrupta Savage.
Colpomya abrupta Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 94, pl. 5, fig. 27.
Upper Medinan (Edgewood): Near Edgewood, Missouri.

Colpomya constricta Ulrich.
Colpomya constricta Ulrich, Geol. Surv. Ohio, 7, 1893, p. 659, pl. 52, figs. 17–19; Geol. Minnesota, 3, pt. 2, 1894, p. 523, fig. 41.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 516, figs. 695a, b.
Trenton (Perryville): Frankfort, Kentucky.
Cotypes.—Cat. No. 46120, U.S.N.M.

Colpomya demissa Ulrich.
Colpomya demissa Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 524, pl. 36, figs. 21, 22.
Black River (Decorah): Chatfield, Minnesota.
Holotype.—Cat. No. 46121, U.S.N.M.

Colpomya faba (Emmons).
Nuculites faba Emmons, Nat. Hist. New York, Geol., 2, 1842, p. 385, fig. 5.
Lyonsia faba Conrad in Emmons, Amer. Geology, 1, pt. 2, 1855, p. 172, pl. 14, figs. 14, 15.
Modiolopsis faba Hall, Pal. New York, 1, 1847, p. 158, pl. 35, figs. 6a–d.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 408, fig.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 169, pl. 11, figs. 13–15.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 511.
Trenton: Watertown, etc., Middleville, New York; New Jersey; etc.

Colpomya faba pusilla Foerste.
Modiolopsis faba Hall, Pal. New York, 1; 1847, pl. 82, figs. 4a–b.
Colpomya faba pusilla Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 275, pl. 2, fig. 10; pl. 3, figs. 4a, b.
Cincinnatian (Pulaski): Pulaski, New York; Chambly, Quebec.

COLUMNARIA Goldfuss. Genotype: C. alveolata Goldfuss.
Columnaria Goldfuss, Petrefacta Germaniæ, 1, 1826, p. 72.—Eaton, Geol. Textb., 2d ed., 1832, p. 40.—Steininger, Mem. Soc. Geol. France, 1, 1834, p. 343.—Koninck, Desc. Animaux Fossiles, Liege, 1842–1844, p. 25.—Dana, Amer. Jour. Sci. Arts, 2d ser., 1, 1846, p. 188; Wilkes U. S. Expl. Exped., 1838–1842, 7. Zoophytes, 1846, p. 362, pl. 26, figs. 9, 9a, 9b, 10.—McCoy, Ann. Mag. Nat, Hist., 2d ser., 3, 1849, p. 121.—D'Orbigny, Prodr. de Pal., 1, 1849, p. 25.—Edwards and Haime, Mon. Polyp. Foss. Terr. Pal., 1851 (Arch Mus. Hist. Nat., 5), pp. 159, 308.—McCoy, Cont. British Pal., 1854, p. 90; British Pal., Rocks and Foss., 1854, p. 92.—Billings, Candian Nat. Geol., 1, 1856, p. 124; 3, 1858, p. 420; Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 166; Pictet,

COLUMNARIA—Continued.

Traite Pal., 2d ed., 4, 1857, p. 448.—Milne-Edwards, Hist. Nat. Corall., 3, 1860, p. 317.—Goldfuss, Petrefacta, 2d ed., pt. 1, 1862, p. 67.—Ludwig, Paleontographica, 10, 1862, p. 191.—Verrill, Amer. Jour. Sci., 3d ser., 3, 1872, p. 191.—Duncan, Rep. 41st Meeting British Assoc. Adv. Sci., 1872, p. 132.—Verrill, Ann. Mag. Nat. Hist., 4th ser., 9, 1872, p. 360.—Nicholson, Rep. 44th Meeting British Assoc. Adv. Sci., Notes and Abstracts, 1875, p. 89.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 89.—Nicholson, Tab. Corals Pal. Period, 1879, p. 191—Roemer, Leth. geog., pt 1, Leth. Pal., 1883, p. 463.—Miller, N. A. Geol. Pal., 1889, p. 179.—Frech, Paleontographica, 37, 1890, p. 84.—Sherzer, Amer. Geol., 7, 1891, pp. 278–283.—James, Jour. Cincinnati Soc. Nat. Hist., 15, pt. 3, 1892, p. 97.—Weissermel, Zeits. d. d. geol. Gesell., 49, 1897, pp. 866, 868, 880.—Zittel-Eastman Textb. Pal. 1., 1900, p. 79.—Lambe, Cont. Canadian, Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 97.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 71.—Cumings, 32d Ann. Rep. Geol. Nat. Res. Indiana, 1908, p. 699.—Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 87.

Favistella Dana, Wilkes U. S. Expl. Exped., 1838–1842, 7, Zoophytes, 1846, p. 538.—D'Orbigny, Prodr. de Pal., 1, 1849, p. 24.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 229.—Hall, Pal. New York, 1, 1847, p. 275; ibid., 2, 1852, p. 120.—Nicholson, Geol. Surv. Ohio, Pal., 2, 1875, p. 184; Rep. 44th Meeting British Assoc. Adv. Sci., Notes and Abstracts, 1875, p. 89; Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 21; Trans. Royal. Soc. Edinburgh, 27, 1876, p. 249 (obiter); Tab. Corals Pal. Period, 1879, p. 192.—Zittel, Handb. Pal., 1, 1879, p. 230.—Miller, N. A. Geol. Pal., 1889, p. 188. (Genotype: F. stellata Hall.)

Palæophyllum Billings, Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 168; Canadian Nat. Geol., 3, 1858, p. 422.—Nicholson, Geol. Surv. Ohio, Pal., 2, 1875, p. 219.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1878, pp. 68, 69.—Zittel, Handb. Pal., 1, 1879, p. 228.—Miller, N. A. Geol. Pal., 1889, p. 198.—Sherzer, Amer. Geol., 7, 1891, pp. 284–289.—James, Jour. Cincinnati Soc. Nat. Hist., 15, pt. 4, 1893, p. 146.—Lambe, Ottawa Naturalist, 12, 1899, p. 217. (Genotype: Palæophyllum rugosum Billings.)

COLUMNARIA ALVEOLARIS Hitchcock. See Columnaria alveolata.

Columnaria alveolata Goldfuss.

Columnaria alveolata Goldfuss, Petrefacta Germaniæ, 1, 1826, p. 72, pl. 24, figs. 7a–c; 2d ed., pt. 1, 1862, p. 68.—Edwards and Haime (part), Mon. Polyp. Foss. Terr. Pal. (Arch. Mus. Hist. Nat., 5), 1851, p. 309.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 229, pl. 4, fig. 10; Man. Geol., 1860, p. 94, fig. 80.—Milne-Edwards, Hist. Nat. Corall., 3, 1860, p. 317.—Chapman, Canadian Jour., n. s., 6, 1861, p. 510, fig. 78; 8, 1863, p. 197, fig. 168; Expos. Min. Geol. Canada, 1864, p. 104, fig. 78; p. 169, fig. 168.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 1, fig. 7.—Nicholson, Tab. Corals Pal. Period, 1879, p. 195, pl. 10, figs. 1, 1a.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 464, fig. 113.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 153, fig.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 6, fig. 3; pl. 7, fig. 2.—Miller, N. A. Geol. Pal., 1889, p. 180, fig. 157.—James, Jour. Cincinnati Soc. Nat. Hist., 15, pt. 3, 1892, p. 98.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 151.—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 2, p. 98, pl. 6, figs. 1, 1a.—Foerste, Amer. Geol., 31, 1903, p. 343.—Hayes and Ulrich, U. S. Geol. Surv., fol. 95, illus. sheet, 1903, fig. 25.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 71; fig. 110.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 703, pl. 1, figs. 4, 4a.—Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 312, pl. 11, fig. 3.

Columnaria alveolata—Continued.

Columnaria sulcata Eaton, Geol. Textb., 2d ed., 1832, p. 4, pl. 5, fig. 51.—Clarke, 11th Rep. State Geol. New York, 1, 1894, p. 35; 45th Rep. New York State Mus. 1894, p. 351.

Columnaria multiradiata Castelnau, Essai Syst. Sil. Amer. Sept., 1843, p. 44, pl. 19, fig. 1.

Columnaria Blainvilli Billings, Canadian Nat. Geol., 3, 1858, p. 421; Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 166.

Favistella stellata Hall, Pal. New York, 1, 1847, p. 275, pl. 75, figs. 1a–c.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 229, fig. 81.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 206, fig. 202.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 22; Geol. Surv. Ohio, Pal. 2, 1875, p. 185.—White, Rep. U. S. Geogr. Surv. West 100th Merid., 4, 1877, p. 67, pl. 4, figs. 6a–c; 11th Ann. Rep. Indiana Dep. Geol., Nat. Hist., 1882, p. 378, pl. 44, figs. 1, 2.—Hall, 12th Rep., ibid., 1883, p. 247, pl. 1, figs. 2–4.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 236, figs.—Miller, N. A. Geol. Pal., 1889, p. 188, fig. 173.

Favistella alveolaris Dana, Wilkes U. S. Expl. Exped. 1838–1842, 7, Zoophytes, 1846, p. 538.

Columnaria stellata Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 91, pl. 28, fig. 1; pl. 34, fig. 3.—Davis, Kentucky Foss. Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 7, fig. 1.—Keyes, Missouri Geol. Surv., 4, 1894, p. 116, pl. 13, fig. 3.

Stones River–Richmond: An abundant and widespread fossil of the United States and Canada.

Columnaria alveolata-calycina Foerste. See Columnaria calicina.

Columnaria alveolata discreta Foerste.

Columnaria alveolata discreta Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 124.

Black River: Ottawa, Cloche Island, etc., Canada.

Columnaria alveolata interventa Foerste.

Columnaria alveolata interventa Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 122, pl. 4, figs. 1a–j.

Trenton (Cynthiana): Near Brannon, etc., central Kentucky.

Columnaria alveolata minima Foerste.

Columnaria alveolata minima Foerste Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 123.

Trenton (Cynthiana): Near New Forest, Kentucky.

Columnaria alveolata rigida (Billings).

Columnaria rigida Billings, Canadian Nat. Geol., 3, 1858, p. 421; Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 167.

Richmond: Lake St. John, Canada.

Columnaria Blainvilli Billings. See Columnaria alveolata.

Columnaria calicina (Nicholson).

Favistella (Columnaria) calicina Nicholson, Rep. 44th Meeting Brit. Assoc. Adv. Sci., Notes and Abstracts, 1874, p. 89.

Favistella calicina Nicholson, Rep. Prov. Ontario, pt. 2, 1875, p. 24, fig. 9.

Columnaria calicina Nicholson, Tab. Corals Pal. Period, 1879, p. 197, pl. 10, figs. 2, 2a; p. 198, fig. 28, 1a, b.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 464.—James, Jour. Cincinnati Soc. Nat. Hist., 15, pt. 3, 1892, p. 98.—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 102, pl. 6, fig. 4.

Columnaria calicina—Continued.

Columnaria alveolata-calycina Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 313.

Columnaria herzeri Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 91.

Richmond: Cape Smyth, Lake Huron; Credit River at Streetsville, Ontario; east of White Cliff, Gamache Bay, Anticosti; Ohio; Kentucky; Indiana.

Columnaria carterensis Safford.

Columnaria carterensis Safford, Geol. Tennessee, 1869, p. 285.

Black River (Carters): Carters Creek, etc., central Tennessee.

Columnaria divergens Troost. Not recognized.

Columnaria divergens Troost, 5th Geol. Rep. Tennessee, 1840, p. 73.

Mountain limestone: Near Nashville, Tennessee.

Columnaria erratica Billings. See Columnaria (Palæophyllum) stokesi.

Columnaria Goldfussi Billings. See Lyopora goldfussi and Nyctopora billingsii.

Columnaria halli Nicholson.

Columnaria ——— Emmons, Geol. New York, Rep. 2d dist., 1842, p. 276, fig. 2.

Columnaria alveolata Hall, Pal. New York, 1, 1847, p. 47, pl. 12, figs. 1a-1c.—Billings, Canadian Nat. Geol., 1, 1857, p. 124, figs. 9, 10.—Nicholson, Pal. Prov. Ontario, 1863, pp. 8, 24, figs. 2, 9.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 139, fig. 70.—Rominger, Foss. Corals Michigan, 1876, p. 89, pl. 34, figs. 1, 2, 4.

Columnaria(?) Halli Nicholson, Tab. Corals Pal. Period, 1879, p. 200, fig. 28, 2; p. 201, fig. 29, pl. 10, figs. 3, 3a.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 465.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 85, pl. G, figs. 14-16.—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 100, pl. 6, figs. 2, 2a.—Foerste, Amer. Geology, 31, 1903, pp. 343, 345.—Hayes and Ulrich, U. S. Geol. Surv., folio 95, illust. sheet, 1903, fig. 47.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 71.

Black River and Trenton: Canada; New York; Michigan; Kentucky; Tennessee; Minnesota; Illinois; Iowa.

Plesiotype.—Cat. No. 35403, U.S.N.M. (Hayes and Ulrich).

Columnaria? helderbergiæ Swartz.

Columnaria? helderbergiæ Swartz, Maryland Geol. Surv., Low. Dev., p. 207, pl. 21, figs. 10, 11.

Helderbergian (Keyser): Warrior Mountain, Alleghany County, Maryland.

Columnaria herzeri Rominger. See Columnaria calicina.

Columnaria inæqualis Hall. See Prismatophyllum inæquale.

Columnaria incerta Billings. See Fletcheria incerta.

Columnaria mamillaris Castelnau. Not recognized.

Columnaria mamillaris Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 45, pl. 19, fig. 3.

Silurian?: Shores of Lake Huron.

Columnaria multiradiata Castelnau. See Columnaria alveolata.

Columnaria parva Billings. See Stylaræa parva.

Columnaria rigida Billings. See Columnaria alveolata rigida.

Columnaria rugosa Lambe. See Columnaria (Palæophyllum) stokesi.

COLUMNARIA STELLATA Rominger. See Columnaria alveolata.

Columnaria (Palæophyllum) stokesi (Edwards and Haime).
Lithostrotion Stokesi Edwards and Haime, Mon. Polyp. Foss. Terr. Pal., 1851, p., 440, pl. 20, fig. 2.
Diphyphyllum Stokesi Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897 p. 152, pl. 17, figs. 5a, b.
Sarcinula? obsoleta Hall, Geol. Lake Sup. Land Dist., Foster and Whitney's Rep., 1851, p. 213, pl. 29, figs. 2, a, b.
Columnaria erratica Billings, Canadian Nat. Geol., 3, 1858, p. 421; Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 167.
Palæophyllum rugosum Billings, Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 168; Canadian Nat. Geol., 3, 1858, p. 422.
Columnaria rugosa Lambe, Ottawa Naturalist, 12, 1899, p. 217; Contr. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 101, pl. 6, figs. 3, 3a, b.
Richmond: Lake Winnipeg, Lake St. John, etc., Canada; Green Bay, Wisconsin.

COLUMNARIA SULCATA Eaton. See Columnaria alveolata.

Columnaria? sutherlandi Salter.
Columnaria Sutherlandi Salter, Sutherland's Jour. Voyage in Baffin's Bay, etc., 2, 1852, p. 231, pl. 6, fig. 8.
Silurian (?): Seal Island, Wellington Channel, Arctic America.

Columnaria (Palæophyllum) thomi (Hall).
Columnaria thomi Hall, Rep. U. S. Mexican Bound. Surv., Emory, 1857, pl. 20, figs. 1a–d.
Cyathophylloides thomii Walcott, Pal. Univ., ser. 1, fas. 2, 1903, pl. 29.
Richmond: El Paso, Texas.
Holotype.—Cat. No. 9851, U.S.N.M.
Observation.—Probably the same as Columnaria (Palæophyllum) stokesi (Edwards and Haime).

Columnaria troosti Castelnau. Not recognized.
Columnaria Troosti Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 44, pl. 19, fig. 2.
Silurian(?): Kentucky.

Columnaria vacua Foerste.
Columnaria(?) halli James, Jour. Cincinnati Soc. Nat. Hist., 15, pt. 3, 1892, p. 99.
Columnaria vacua Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 313, pl. 11, fig. 2.
Richmond: Ohio, Indiana, Kentucky, etc.
Observation.—This name has been proposed for the Richmond form of Columnaria closely related to C. halli which is restricted to Mohawkian strata. Some of the references under C. halli doubtless refer in part to C. vacua.

COLUMNOPORA Nicholson. See Calapœcia Billings.

COLUMNOPORA RAYI Davis. See Calapœcia cribiformis.

COMAROCYSTIS Haeckel. See Comarocystites Billings.

COMAROCYSTITES Billings. Genotype: C. punctatus Billings.
Comarocystites Billings, Canadian Jour., 2, 1854, pp. 268, 269; Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, p. 288; Geol. Surv. Canada, dec. 3, 1858, p. 61.—Chapman, Expos. Min. Geol. Canada, 1864, p. 109.—Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1865, p. 143; Geol. Surv.

COMAROCYSTITES—Continued.

Illinois, 3, 1868, p. 291.—Zittel, Handb. Pal., 1, 1879, p. 418.—Miller, N. A. Geol. Pal., 1889, p. 233.—Jaekel, Zeits. d. d. geol. Gesell. 52, 1900, p. 676.—Zittel, Grundzuge Pal., 1, p. 184.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 472.

Comarocystis Haekel, Amphorideen u. Cystoideen, 1896, p. 70, pl. 1, figs. 4–4C.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 55.

Comarocystites obconicus (Meek and Worthen).

Comarocystites Shumardi var. obconicus Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1865, p. 144; Geol. Surv. Illinois, 3, 1868, p. 294, pl. 1, fig. 2a, b.

Comarocystites obconicus Miller, N. A. Geol. Pal., 1889, p. 234.—Keyes, Missouri Geol. Surv., 4, p. 132, pl. 18, fig. 1.

Black River (Kimmswick): Cape Girardeau, Missouri.

Comarocystites punctatus Billings.

Comarocystites punctatus Billings, Canadian Jour., 2, 1854, p. 270, figs. 1-3; Geol. Surv. Canada Rep. Progr. for 1853–56, 1857, p. 288; Geol. Surv. Canada, dec. 3, 1858, p. 61, pl. 5, figs. 1, 1b, 2, 2b; also footnote, pl. 5.—Grant, Trans. Ottawa Field Nat. Club, 1, 1880, p. 29, pl. 1, figs. 1–5.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 472.

Comarocystis punctata Haeckel, Amphorideen u. Cystoideen, 1896, p. 70, pl. 1, figs. 4–4c.

Trenton (Curdsville): Ottawa, Ontario.

Comarocystites shumardi Meek and Worthen.

Comarocystites Shumardi Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1865, p. 143; Geol. Surv. Illinois, 3, 1868, p. 292, fig.; pl. 1, figs. 1a, b.—Miller, N. A. Geol. Pal., 1889, p. 233, fig. 270.—Keyes, Missouri Geol. Surv., 4, 1894, p. 132, pl. 18, fig. 2.—Jaekel, Zeits. d. d. geol. Gesell., 52, 1900, p. 676.

Black River (Kimmswick): Cape Girardeau, Missouri.

Comarocystites Shumardi var. obconicus Meek and Worthen. See Comarocystites obconicus.

COMPSOCRINUS Miller. Genotype: Glyptocrinus harrisi Miller.

Compsocrinus Miller, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, pp. 219, 233.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1885, p. 180 (Rev. Pal., 3, p. 104).—Miller, N. A. Geol. Pal., 1889, p. 234.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 516.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 165, fig. 78, 4.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 194.

Compsocrinus harrisi (Miller).

Glyptocrinus harrisi Miller, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 74, pl. 1, figs. 4, 4a.

Compsocrinus harrisi Miller, ibid., 6, 1883, p. 234, pl. 7, figs. 4, 4a; N. A. Geol. Pal., 1889, p. 234, figs. 271, 272.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 21, 1897, figs. 8a, b.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 165, fig. 78.

Mariacrinus Harrisi Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1885, pp. 311, 326 (Rev. Pal., pt. 3, p. 104).—James, Jour. Cincinnati Soc. Nat. Hist., 19, 1897, p. 118.

Richmond (Liberty): Waynesville, Ohio.

Holotype and *plesiotype*.—Cat. No. 40759, U.S.N.M.

Compsocrinus miamiensis (Miller).

Glyptocrinus miamiensis Miller, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 34, pl. 1, fig. 1; 6, 1883, p. 224.—James, ibid., 19, 1897, p. 115.

Compsocrinus miamiensis Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 21, 1897, p. 518, pl. 21, figs. 7a, b.

Richmond (Liberty): Waynesville, Ohio.

Holotype.—Cat. No. 40760, U.S.N.M.

CONASPIS OWENI Hall. See Ptychoparia oweni.

CONCHICOLITES Nicholson. See Cornulites Schlotheim.

CONCHIDIUM Linnæus. Genotype: C. biloculare Linnæus.

Conchidium Linnæus, Mus. Tessinianum, 1753, p. 90; Syst. Nat., XI, 2, 1760, p. 163.—Œhlert, Fischer's Manuel de Conchyliologie, 1887, p, 1311.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 231; 13th Ann. Rep. New York State Geol., 1895, p. 842.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 321.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 273.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 394.

Helmintholitus Linnæus, Sys. Nat., 4, 1766, p. 163.

Pentamerus Sowerby (not Pentamera Dumeril, 1806), Mineral Conchology, 1, 1813, p. 73.

Gypidia Dalman, Kongl. Svenska Vet.-Akad. Handl., för 1827, 1828, pp. 93, 100.—Zittel, Handb. Pal., 1, 1880, p. 694.—Koken, Die Leitfossilien, Leipzig, 1896, p. 244, fig. 206.

Pentamerus Billings, Canadian Jour., 6, 1861, p. 269.—Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, p. 163; Pal. New York, 4, 1867, pp. 369, 373.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 52.

Antirhynchonella Quenstedt, Petref. Deutschlands, Brach., 1871, p. 231.

Zdimir Barrande, Syst. Sil. Bohème, 6, 1881, p. 171.

Conchidium arcticum Holtedahl.

Conchidium arcticum Holtedahl 2d Arct. Exp. "Fram," 1898–1902, No. 32, 1914, p. 5, pl. 6, figs. 5–7.

Niagaran: Baadkap, North Devon, Arctic America.

Conchidium biloculare Linnæus.

Conchidium biloculare Linnæus, Syst. Nat., XI, 2, 1760, p. 163.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 233, pl. 6, figs. 11–14.—Schuchert, Bull. U. S. Geol. Surv. 87, 1897, p. 185.

Pentamerus conchidium Emerson, Geol. Frobischer Bay; Nourses Narr. Hall's Arctic Exped., 1879, p. 578.—Salter, Sutherland's Jour. Voyage in Baffin's Bay, etc., 2, App., p. 225, 1852, pl. 5, figs. 9, 10.

Silurian: Europe; Rescue Harbor, Arctic America.

Conchidium colletti (Miller).

Pentamerus colletti Miller, 17th Rep. State Geol. Indiana, 1891, p. 77, pl. 13, figs. 5, 6 (ad. sheets, 1891, p. 77).

Conchidium colletti Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 235, pl. 66, figs. 16, 17.—Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1909, p. 30.

Cayugan (Kokomo): Kokomo, Indiana.

Conchidium crassiplica Hall and Clarke.

Conchidium crassiplica Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pp. 235, 369, pl. 66, figs. 24, 25; 48th Rep. New York State Mus. for 1895, 2, 1897, p. 367, pl. 11, figs. 3, 4.; 14th Rep. State Geol. New York for 1894, 1897, p. 367, pl. 11, figs. 3, 4.

Niagaran (Louisville): Near Louisville, Kentucky.

CONCHIDIUM CRASSIRADIATUM Schuchert. See Conchidium crassoradius.

Conchidium crassoradius (McChesney).

Pentamerus crassoradius McChesney, Descr. New Pal. Foss., 1861, p. 87.

Conchidium crassiradiatum Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 185.

Niagaran (Racine): Milwaukee, Wisconsin.

Conchidium decussatum (Whiteaves).

Pentamerus decussatus Whiteaves, Canadian Rec. Sci., 1891, p. 295, pl. 3, figs. 3, 4.—Calvin, Bull. Lab. Nat. Hist., State Univ. Iowa, 11, 1892, p. 164, pl. 11, figs. 1–3; pl. 12, fig. 2.

Conchidium decussatum Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 235, pl. 65, figs. 1, 2; pl. 66, fig. 15.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 293, pl. 26, figs. 1, 2.

Niagaran: Grand Rapids of the Saskatchewan, etc., Canada.

Conchidium exponens Hall and Clarke.

Conchidium exponens Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pl. 66. figs. 6–9; 48th Rep. New York State Mus. for 1895, 2, 1897, p. 366, pl. 10, figs. 20–23; 14th Rep. State Geol. New York for 1894, 1897, p. 366, pl. 10, figs. 20–23.

Niagaran (Louisville): Louisville, Kentucky.

Conchidium georgiæ Hall and Clarke.

Conchidium georgiæ Hall and Clarke, Pal. New York, 8, pt. 2, 1895, p. 369, pl. 66, figs. 18, 19; 48th Rep. New York State Mus. for 1895, 2, 1897, p. 367, pl. 11, figs. 10, 11; 14th Rep. State Geol. New. York for 1894, 1899, p. 367, pl. 11, figs. 10, 11.

Clinton: Trenton, Georgia.

Conchidium greenii Hall and Clarke.

Conchidium greenii Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pp. 235, 368, pl. 66, figs. 20–22; 48th Rep. New York State Mus. for 1895, 2, 1897, p. 367, pl. 11, figs. 5–7; 14th Rep. State Geol. New York for 1894, 1897, p. 367, pl. 11, figs. 5–7.

Niagaran (Racine): Near Milwaukee, Wisconsin.

Conchidium knappi (Hall and Whitfield).

Pentamerus knappi Hall and Whitfield, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 184; 27th Rep., 1875, pl. 10, figs. 10–12.—Nettelroth Kentucky Foss. Shells, Mem. Kentucky Geol. Surv., 1889, p. 55, pl. 28, figs. 1–4.

Conchidium knappi Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 235, pl. 64, figs. 11–13.

Niagaran (Louisville): Louisville, Kentucky; Tennessee.

Plesiotype.—Cat. No. 51352, U.S.N.M.

Conchidium laqueatum (Conrad).

Pentamerus laqueatus Conrad, Proc. Acad. Nat. Sci. Philadelphia, 7, 1855, p. 441.—Hall, 42d Rep. New York State Mus. Nat. Hist., 1889, p. 384 (footnote).

Pentamerus nobilis Emmons, Man. Geol., 1860, p. 107, fig.

Conchidium laqueatus Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 232, fig. 168; p. 234, pl. 65, figs. 3–9.—Kindle and Breger, 28th Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 434, pl. 3, figs. 1, 2; pl. 4, fig. 3; pl. 6.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 274.

Niagaran: Delphi, Huntington, Georgetown, etc., Indiana.

Conchidium legoense Foerste.

Conchidium legoensis Foerste, Jour. Geol., 11, 1903, p. 711; Bull. Sci. Lab. Denison Univ., 14, 1909, p. 69, pl. 2, fig. 36A, B.

Niagaran (Brownsport): Short Creek, northeast of Lego, Tennessee.

Conchidium lindenense Foerste.

Conchidium lindenensis Foerste, Jour. Geol., 11, 1903, p. 711.—Bull. Sci. Lab. Denison Univ., 14, 1909, p. 69, pl. 2, fig. 35A, B.

Niagaran (Brownsport): Coon Creek, near Linden, Tennessee.

Conchidium littoni (Hall).

Pentamerus littoni Hall, Pal. New York, 3, 1859, p. 262.—Hall and Whitfield, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 186; 27th Rep., 1875, pl. 10, figs. 8, 9.—Nettelroth, Kentucky Foss. Shells, Mem. Kentucky Geol. Surv., 1889, p. 58, pl. 27, figs. 12, 13.

Conchidium littoni Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pl. 64, figs. 9, 10.—Foerste, Jour. Geol., 11, 1903, p. 711 (loc. occ.).

Conchidium cf. littoni Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 435, pl. 3, figs. 3–6; pl. 4, figs. 1, 2, 4; pl. 5, figs. 4, 5.

Niagaran: Hardin County, Tennessee (Brownsport); Louisville, Kentucky (Louisville); ?Georgetown, Indiana.

Conchidium multicostatum (Hall).

Pentamerus multicostatus Hall, Geol. Surv. Wisconsin, Rep. Progr., 1860, p. 1; 20th Rep. New York State Cab. Nat. Hist., 1867, p. 373, pl. 13, figs. 22–24.

Conchidium multicostatum Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pl. 64, fig. 6; pl. 66, fig. 10.

Conchidium cf. multicostatum Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 435, pl. 6, fig. 3.

Niagaran: Wauwatosa and Waukesha, Wisconsin (Racine and Guelph); Connors Mills, Hamilton County, Indiana (Noblesville).

Conchidium nettelrothi Hall and Clarke.

Pentamerus knightii Nettelroth (not Sowerby), Kentucky Fossil Shells, Mem. Geol. Surv. Kentucky, 1889, p. 57, pl. 29, figs. 1, 2, 17.

Conchidium nettelrothi Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 234.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 273, fig. 332.

Onondaga? (?Niagaran): Louisville, Kentucky.

Cotypes.—Cat. No. 51312, U.S.N.M.

Conchidium nysius (Hall and Whitfield).

Pentamerus nysius var. crassicosta Hall and Whitfield, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 184; 27th Rep., 1875, pl. 10, figs. 4–7.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Survey, 1889, p. 60, pl. 28, figs. 5–8.

Pentamerus nysius var. tenuicostatus Nettelroth, ibid., 1889, p. 60.

Conchidium nysius Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 235, pl. 64, figs. 1, 8, 27.

Niagaran (Louisville): Louisville, Kentucky; Tennessee.

Conchidium obsoletum Hall and Clarke.

Conchidium obsoletum Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pl. 67, figs. 8, 9; 48th Rep. New York State Mus. for 1895, 2, 1897, p. 366, pl. 11, figs. 1, 2; 14th Rep. State Geol. New York for 1894, 1897, p. 366, pl. 11, figs. 1, 2.

Niagaran (Guelph): Genoa, Ottawa County, Ohio.

Conchidium occidentale Hall.

Pentamerus occidentalis Hall, Pal. New York, 2, 1852, p. 341, pl. 79, figs. 1, 2.—Billings, Geol. Canada, 1863, p. 337, fig. 341.—Nicholson, Pal. Prov. Ontario, 1875, p. 67, fig. 35.—Whitfield, Geol. Wisconsin, 4, 1882, p. 314, pl. 17, fig. 10; pl. 23, figs. 1, 2.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 239.

Conchidium(?) occidentalis Hall and Clarke, ibid., 1895, pl. 67, figs. 1–5.—Lesley, Geol. Surv. Pennsylvania., Rep. P 4, 1889, p. 618, fig.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 273, fig. 331.

Niagaran (Guelph): Gault and Guelph, Ontario; Point St. Vital, Lake Huron; Williamstown, Wisconsin.

Conchidium scoparium Hall and Clarke.

Conchidium scoparium Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pl. 67, figs. 6, 7; 48th Rep. New York State Mus. for 1895, 2, 1897, p. 366, pl. 11, figs. 8, 9; 14th Rep. State Geol. New York for 1894, 1897, p. 366, pl. 11, figs. 8, 9.

Niagaran (Guelph): Durham, Ontario.

Conchidium tenuicostatum (Hall and Whitfield).

Pentamerus nysius var. tenuicosta Hall and Whitfield, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 184; 27th Rep., 1875, pl. 10, figs. 1–3.

Pentamerus complanatus Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Survey, 1889, p. 53, pl. 27, figs. 14–16.

Conchidium tenuicostatus Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 235. pl. 64, figs. 3–5.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 187.

Niagaran (Louisville): Louisville, Kentucky.

Plesiotypes.—Cat. No. 51353, U.S.N.M. (Nettelroth's types of P. complanatus).

Conchidium trilobatum Kindle and Breger.

Conchidium trilobatum Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 436, pl. 5, figs. 1–3.

Niagaran: Huntington, Indiana.

Cotypes.—Cat. No. 52933, U.S.N.M.

Conchidium unguiforme (Ulrich).

Gypidia unguiformis Ulrich, Contrib. Amer. Pal., 1886, p. 28, pl. 3, fig. 2.

Gypidula unguiformis Miller, N. A. Geol. Pal., 1889, p. 346.

Conchidium unguiformis Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 235, pl. 66, figs. 1–4.—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 436, pl. 6, figs. 4, 5.

Niagaran: Louisville, Kentucky (Louisville); Carroll County, Indiana.

Conchita rhomboidalis Wilckens. See Leptæna rhomboidalis.

CONCHOPELTIS Walcott. Genotype: C. alternata Walcott.

Conchopeltis Walcott, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875, p. 93; mus. ed., 1879, p. 93.—Miller, N. A. Geol. Pal., 1889, p. 400.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 823.—Berkey, Amer. Geol., 21, 1898, p. 278.

Conchopeltis alternata Walcott.

Conchopeltis alternata Walcott, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875, p. 93; mus. ed., 1879, p. 93.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 823, fig. 2.

Trenton: Trenton Falls, New York.

Conchopeltis compressa Miller. See Scenella compressa.

CONCHOPELTIS MINNESOTENSIS Walcott. See Scenella superba.

CONCHOPELTIS OBTUSA Sardeson. See Scenella obtusa.

CONILITES Pusch. See Actinoceras Bronn.

CONILITES CAPRICORNULUS Troost. See Cyrtoceras capricornulus.

CONOCARDIUM Dekoninck. Genotype: C. hibernicum Dekoninck.

ConocardiumDekoninck, Desc. Animaux Fossiles, Suppl., Liege, 1851, p. 673.—McCoy, British Pal. Rocks and Foss., 1854, p. 516.—Woodward, Man. Mollusca, pt. 2, 1854, p. 292, pl. 19, fig. 5.—Pictet, Traité Pal., 2d ed., 3, 1855, p. 477.—Barrande, Syst. Sil. Centre Boheme, 6, 1881, p. 66; Acephales: Ext. Syst. Sil. Centre Boheme, p. 103.—Zittel, Handb. Pal., 2, 1881, p. 100.—Dekoninck, Ann. Mus., Royal Hist. Nat. Belgique, 11, 1885, p. 99.—Hall, Pal. New York, 5, pt. 1, Lam. 2, 1885, p. 34.—Barrois, Mem. Soc. Geol. Nord, 3, Lille, 1889, p. 155; Mem. Soc. Agriculture et Arts de Lille, 4th ser., 17, 1889, p. 155.—Nettelroth, Kentucky Foss. Shells, Geol. Surv. Kentucky, 1889, p. 202.—Miller, N. A. Geol. Pal., 1889, p. 472.—Whidborne, Mon. Dev. Fauna South England, 2, Pal. Soc., 1892, p. 18.—Koken, Die Leitfossilien, Leipzig, 1896, p. 210, fig. 176, 1–3.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 261.—Hind, Mon. Brit. Carb. Lam., 1, Pal. Soc., 1900, p. 449.

Conocardium antiquum (Owen).

Pleurorhynchus antiqua Owen, Geol. Wisconsin, Iowa, and Minnesota, 1852, pl. 2, fig. 19.

Conocardium antiquum Billings, Geol. Surv. Canada, Pal. Foss., 1, 1865, p. 42 (adv. sheets, 1862) (gen. ref.).—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 187.

Richmond: Lower Fort Garry, Red River, Canada.

Holotype.—Cat. No. 17897, U.S.N.M.

Conocardium beecheri Raymond.

Conocardium beecheri Raymond, Amer. Jour. Sci., 20, 1905, p. 374.

Chazyan: Sloop Island, east of Valcour Island and at Chazy, New York (Valcour); Mingan Islands, Canada (Mingan).

CONOCARDIUM BLUMENBACHII Billings. See Euchasma blumenbachi.

Conocardium elegantulum Billings.

Conocardium elegantulum, Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 53.

Anticostian (Jupiter River and Chicotte): Southwest Point, Anticosti.

Conocardium elrodi Miller.

Conocardium elrodi Miller, 17th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1892, p. 705, pl. 20, fig. 14 (adv. sheets, 1891, p. 95).

Niagaran (Laurel): Hartsville, Indiana.

Conocardium immaturum Billings.

Conocardium immaturum Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 143, fig. 83a; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 41, text fig. 43 (adv. sheets, 1862).

Black River (Leray): Pauquettes Rapids, Ottawa River, Canada.

Conocardium monroicum Grabau.

Conocardium monroicum Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 171, pl. 16, figs. 1–3; pl. 20, figs. 14, 15; pl. 22, fig. 3.

Upper Monroan: Salt shaft at Detroit, Michigan (Anderdon); opposite Amherstburg, Ontario (Amherstburg); Wayne County, Michigan (Lucas).

Conocardium multistriatum Kindle and Breger.

Conocardium multistriatum Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 449, pl. 10, fig. 4.

Niagaran: Georgetown, Indiana.

Conocardium niagarense Winchell and Marcy.

Conocardium niagarensis Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 97, pl. 2, fig. 14.

Niagaran (Racine): Chicago, Illinois.

Conocardium ornatum Winchell and Marcy.

Conocardium ornatum Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 111, pl. 2, fig. 15.

Niagaran (Racine): Chicago, Illinois.

Conocardium oweni Kindle and Breger.

Conocardium oweni Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 450, pl. 10, figs. 2, 3.

Niagaran (Noblesville): Little Deer Creek and Connors Mill, Hamilton County, Indiana.

Conocardium richmondense Foerste.

Conocardium richmondensis Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 71, pl. 2, fig. 21A, B.

Richmond (Elkhorn): Elkhorn Creek, three miles south of Richmond, Indiana.

Conocardium tegulum Hall.

Conocardium tegulum Hall, Pal. New York, 5, pt. 1, Lam. 2, 1885, p. 415, pl. 68, figs. 30, 31 (adv. sheets, 1883).

Niagaran: Locality not given.

CONOCEPHALE Edwards. See Conocephalites Zenker.

CONOCEPHALINA Gronwall. See Conokephalina Brögger.

CONOCEPHALITES Zenker. Genotype: Conocephalus costatus Zenker.

Conocephalites Zenker, Beitr. z. Naturg. Urwelt., 1833, p. 48.—Barrande, Neues Jahrb. f. Min., etc., 1850, p. 779; Syst. Sil. Centre Boheme, 1, 1852, p. 415, pls. 13, 14, 29.—Pictet, Traite Pal., 2d ed. 2, 1854, p. 493.—Hall, 16th Ann. Rep. New York State Cab. Nat. Hist., 1863, pp. 147, 148.—Chapman, Canadian Jour., n. s., 8, 1863, p. 32, fig. 150; p. 192, fig. 161; Expos. Min. Geol. Canada, 1864, p. 140.—Hall, Trans. Albany Inst., 5, 1867, p. 129.—Billings, Canadian Nat., n. s., 6, 1872, p. 474; Pal. Foss., Geol. Surv. Canada, 2, pt. 1, 1874, p. 72.—Meek, U. S. Geol. Expl. 40th Parl., 4, 1877, p. 22.—Woodward, Geol. Mag., dec. 3, 1, 1884, p. 343.—Walcott, Science, 3, 1884, p. 281.—Zittel, Handb. Pal., 2, 1855, p. 600.—Œhlert, Bull. Soc. Geol. de France, 3d ser., 23, 1895, p. 319.—Wallerius, Unders. ofver. Zonen med. Agnostus lævigatus i Vestergotland, Lund, 1895, pp. 49, 50; Geol. Foren. Stockholm Forhandl. 18, 1896, p. 167.—Koken, Die Leitfossilien, Leipzig, 1896, p. 21.—Jaekel, Zeits. d. d. geol. Gesell., 53, 1901, p. 156.

Conocephale Edwards, Hist. Nat. Crustaces, 3, 1840, p. 335.

Conocephalus Burmeister, Org. der Tril., Berlin, 1843, p. 85.—Goldfuss, Neues Jahrb. f. Min., etc., 1843, pp. 541, 556.—Emmrich, ibid., 1845, p. 43.—Burmeister, Org. Tril. London, 1846, p. 72.—Frech, Leth. geog., 1 Th., Leth. Pal., 2, 1897, p. 26, footnote.

CONOCEPHALITES CALCIFERUS Walcott. See Lonchocephalus calciferus.

Conocephalites(?) contiguus Matthew.

Conocephalites(?) contiguus Matthew, Trans. Royal Soc. Canada, 9, sec. 4, 1892, p. 58, pl. 13, figs. 14a, b.

Canadian (Bretonian Div. C 3a): St. John, New Brunswick.

CONOCEPHALITES DEVINEI Matthew. See Ptychoparia? devinei.

CONOCEPHALITES HARTII Walcott. See Dikelocephalus harti.

CONOCEPHALITES HISINGERI Matthew. See Lisania? hisingeri.

CONOCEPHALITES MINUTUS Bradley. See Ptychoparia minuta.

CONOCEPHALITES OWENI Hall. See Ptychoparia oweni.

CONOCEPHALITES ZENKERI Billings. See Ptychoparia zenkeri.

CONOCEPHALUS Burmeister. See Conocephalites Zenker.

CONOCERAS ANGULOSUM Saemann. See Actinoceras bigsbyi.

CONOCORYPHE (PTYCHOPARIA) GALLATINENSIS Meek. See Ptychoparia oweni.

CONOKEPHALINA Brögger. Genotype: Conocephalites ornatus Brögger.

Conokephalina Brögger, Geol. Foren. i. Stockholm Forhandl., No. 101, 8, pt. 3, 1886, p. 206.—Walcott, Research in China, 3, Carnegie Inst., Washington, Publ. 54, 3, 1913, p. 137, pl. 13; Smiths. Misc. Coll., 57, 1914, p. 387.

Conocephalina Gronwall, Danmarks Geol. Unders. Raekke, 2, No. 13, 1902, p. 150.—Lorenz, Zeits. d. d. geol. Gesell., 58, pt. 2, 1906, p. 64.

Conokephalina? cristata (Billings).

Dikelocephalus cristatus Billings, Canadian Nat. Geol., 5, 1860, p. 312, fig. 10; Geol. Canada, Geol. Surv. Canada, 1863, p. 236, fig. 258; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 404, fig. 381.

Dicellocephalus cristatus Matthew, Trans. Royal Soc. Canada, 10, sec. 4, 1893, p. 11, footnote.

Conokephalina? cristata Walcott, Smiths. Misc. Coll., 57, 1914, p. 350 (gen. ref.).

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

Conokephalina inexpectans (Walcott).

Dicellocephalus inexpectans Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 90, pl. 1, fig. 10.—Matthew, Trans. Royal Soc. Canada, 10, sec. 4, 1893, p. 11, footnote.

Dicellocephalus inexpectatus Frech, Leth. geog., 1, Th., Leth. Pal., 2, 1897, p. 44, footnote.

Conokephalina inexpectans Walcott, Smiths. Misc. Coll., 57, 1914, p. 351 (gen. ref.).

Lower Pogonip: Ridge east of Hamburg Ridge, Eureka district, Nevada.

Cotypes.—Cat. No. 24564, U.S.N.M.

Conokephalina megalops (Billings).

Dikelocephalus megalops Billings, Canadian Nat. Geol., 5, 1860, p. 311, fig. 9; Geol. Canada, Geol. Surv. Canada, 1863, p. 236, fig. 257; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 403, fig. 380.

Dicellocephalus megalops Matthew, Trans. Royal Soc. Canada, 10, sec. 4, 1893, p. 11, footnote.

Conokephalina megalops Walcott, Smiths. Misc. Coll., 57, 1914, p. 351 (gen. ref.).

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

Conokephalina whitehallensis (Walcott).

Conocephalina whitehallensis Walcott, Smiths. Misc. Coll., 57, 1912, p. 269, pl. 44, figs. 9–11a.

Conokephalina whitehallensis—Continued.
Upper Cambrian or Ozarkian (Potsdam): Whitehall, Washington County, New York.
Holotype and *paratypes*.—Cat. Nos. 58579–58581, U.S.N.M.

CONOLICHAS Dames. Genotype: Lichas æquiloba Steinhardt.
Conolichas Dames, Zeits. d. d. Geol. Gesell., 29, 1877, p. 806.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 7th ser., 33, 1885, pp. 30, 40, 87.—Zittel, Handb. Pal., 2, 1885, p. 624.—Hall and Clarke, Pal. New York, 7, 1888, p. xxxix, fig.—Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 754.—Koken, Die Leitfossilien, Leipzig, 1896, p. 30.—Gurich, Neues Jahrb. f. Min., Geol. Pal., 14, Beilage-Bd., 1901, p. 522, pl. 20, fig. 16.

Conolichas cornutus (Clarke).
Lichas (Conolichas) cornutus Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 749, figs. 72, 73.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 237.
Trenton: Trenton Falls, New York; Lake Winnipeg, Canada.

Conophrys pusilla Brögger. See Shumardia pusilla.

Conophyllum Hall. See Cystiphyllum Lonsdale.

CONOTRETA Walcott. Genotype: C. rusti Walcott.
Conotreta Walcott, Proc. U. S. Nat. Mus., 12, 1890, p. 365 (extract 1889).—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 104, 167; 11th Ann. Rep. New York State Geol., 1894, p. 250.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 687.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 308; 2d ed., 1913, p. 376.—Matthew, Trans. Royal Soc. Canada, 2d ser., 7, sec. 4, 1901, p. 94.

Conotreta rusti Walcott.
Conotreta rusti Walcott, Proc. U. S. Nat. Mus., 12, 1890, p. 365, figs. 1–4 (extract 1889).—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 104, pl. 4K, figs. 16–21.
Trenton: Trenton Falls, New York; Covington, Kentucky.
Cotypes.—Cat. No. 18443, U.S.N.M.

Conotubularia Troost. See Actinoceras Bronn.

Conotubularia Brongniartii Troost. See Orthoceras brongniarti Troost.

Conotubularia Cuvierii Troost. See Actinoceras cuvieri.

Conotubularia Defrancii Troost. See Orthoceras defranci.

Conotubularia Goldfussi Troost. See Orthoceras goldfussi.

Conradella Ulrich and Scofield. See Phragmolites Conrad.

Conradia Hall. See Dinobolus Hall.

CONSTELLARIA Dana.
Genotype: Ceriopora constellata (Van Cleve, MS.), Dana.
Constellaria Dana, Zoophyta, 1846, p. 537.—Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal. (Arch. Mus. d'Hist. Nat., 5), 1851, pp. 154, 278.—Pictet, Traité de Pal., 2d ed., 4, 1857, p. 154.—Nicholson, Pal. Ohio, 2, 1875, p. 214; Pal. Tab. Corals, 1879, p. 292.—Zittel, Handb. Pal., 1, 1880, p. 615; Genus Monticulipora, 1881, p. 97.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 156; 6, 1883, p. 265.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 475.—James and James, Jour. Cincinnati Soc. Nat. Hist., 11, 1888, p. 29.—Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 374, 423.—Rominger, Amer. Geol.,

CONSTELLARIA—Continued.

6, 1890, p. 113.—Ulrich, Geol. Minnesota, 3, 1893, p. 311; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 276.—J. F. James, Jour. Cincinnati Soc. Nat. Hist., 18, 1896, p. 117.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 34.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 135.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 742.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 218, 219; Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 334.

Stellipora Milne-Edwards, Hist. Nat. des Corall., 3, 1860, p. 281 (in part).—Dybowski, Die Chætetiden d. Ostbalt, Silur-Form., 1877, p. 42.

CONSTELLARIA ANTHELOIDEA Milne-Edwards. See Constellaria florida.

Constellaria constellata (Van Cleve) Dana.

Ceriopora constellata Van Cleve (MS.) Plates of Fossils.

Constellaria constellata Dana, Zoophyta, 1846, p. 537, pl. 52, figs. 6, 6a.

Observation.—Van Cleve's illustrations could apply equally well to C. florida or C. polystomella. His specimens were said to be from the vicinity of Dayton, Ohio, and hence were probably of the latter species. In view of this uncertainty the name had better be dropped.

CONSTELLARIA CONSTELLATA-PLANA Nickles and Bassler. See Constellaria florida plana.

CONSTELLARIA CONSTELLATA PROMINENS Nickles and Bassler. See Constellaria florida prominens.

Constellaria emaciata (Ulrich and Bassler).

Constellaria florida var. emaciata Hayes and Ulrich, U. S. Geol. Surv., folio 95, illustration sheet, 1903, fig. 30.—Ulrich and Bassler, Smiths. Misc. Coll., 47, 1904, p. 37.

Constellaria emaciata Nickles, Bull. Kentucky Geol. Surv., 5, 1905, p. 44, pl. 1, figs. 7, 8.—Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 126.

Trenton: Columbia, Nashville, etc., Tennessee (Bigby and Catheys); Kentucky (Cynthiana).

Cotypes.—Cat. No. 43208, U.S.N.M.

Constellaria fischeri Ulrich.

Constellaria fischeri Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 270, pl. 14, figs. 6-6c.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 214.

Trenton: Winchester, etc., Kentucky (Cynthiana); Nashville, etc., Tennessee (Catheys).

Holotype.—Cat. No. 44068, U.S.N.M.

Constellaria florida Ulrich.

Constellaria florida Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 257; 6, 1883, p. 267, pl. 14, figs. 2-2f; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 276, fig. 461.—Nickles, Bull. Kentucky Geol. Surv., 5, 1905, p. 54, pl. 3, fig. 5.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 136, fig. 188i.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 334, fig. 484.

Monticulipora (Constellaria) polystomella (not Nicholson) James and James, (in part) Jour. Cincinnati Soc. Nat. Hist., 11, 1888, p. 30; James, ibid., 18, 1896, p. 118.

Chætetes constellatus Quenstedt (not Van Cleve) Rœhren-und Sternkorallen, 1881, p. 79, pl. 146, figs. 21–25.

Constellaria constellata Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 213.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 804, pl. 12, figs. 4–4e; pl. 27, fig. 19.

Constellaria florida—Continued.

Stellipora antheloidea D'Orbigny (not Hall), Prodr. de Pal., 1, 1850, p. 22.—Milne-Edwards, Hist. Nat. Corall., 3, 1860, p. 281.

Constellaria antheloidea Milne-Edwards and Haime, Pol. Foss. Terr. Pal., 1851, p. 279, pl. 20, figs. 7, 7b.—Nicholson, Pal. Ohio, 2, 1875, p. 214; Ann. Mag. Nat. Hist., 4th ser., 18, 1876, p. 92, pl. 5, fig. 10.—James, Paleontologist, No. 2, 1878, p. 13.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 476, fig. 116.—Nicholson, Pal. Tab. Corals, 1879, p. 301, pl. 14, figs. 5, 5b.—White, 11th Ann. Rep. Indiana Geol. Nat. Hist. Surv., 1882, p. 379, pl. 46, figs. 1–3.

Hellipora (Constellaria) antheloidea Rominger (not Hall), Proc. Acad. Nat. Sci. Philadelphia, 1866, p. 118.

Maysville (Fairview): Cincinnati, Ohio and vicinity; Tennessee.

Cotypes.—Cat. No. 43808, U.S.N.M.

CONSTELLARIA FLORIDA var. EMACIATA Hayes and Ulrich. See Constellaria emaciata.

Constellaria florida plana Ulrich.

Constellaria florida var. plana Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 269, pl. 14, fig. 4.

Constellaria constellata-plana Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 213.

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

Holotype.—Cat. No. 43645, U.S.N.M.

Constellaria florida prominens Ulrich.

Constellaria florida var. prominens Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 269, pl. 14, fig. 3.

Constellaria constellata-prominens Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 214.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1907, p. 806, pl. 27, fig. 18.

Constellaria prominens Nickles, Bull. Kentucky Geol. Surv., 5, 1905, p. 52, pl. 2, fig. 15.

Eden (McMicken) and Maysville (Fairview): Cincinnati, Ohio, and vicinity.

Holotype.—Cat. No. 43644, U.S.N.M.

Constellaria limitaris (Ulrich).

Stellipora limitaris Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 126, pl. 12, figs. 8–8c.

Constellaria limitaris Ulrich, ibid., 6, 1883, p. 269, pl. 14, fig. 5, 5a.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 806, pl. 13, fig. 2; pl. 28, fig. 2.

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

Cotypes and *plesiotypes*.—Cat. Nos. 43642, 43643, U.S.N.M.

Constellaria parva Ulrich.

Constellaria parva Ulrich, Geol. Surv. Illinois, 8, 1890, p. 424, pl. 34, figs. 1–1b.

Monticulipora (Constellaria) parva J. F. James, Jour. Cincinnati Soc. Nat. Hist., 18, 1896, p. 119.

Richmond (Fernvale): Wilmington, Illinois.

Sections of *holotype*.—Cat. No. 43747, U.S.N.M.

Constellaria polystomella Nicholson.

Constellaria polystomella Nicholson, Pal. Ohio, 2, 1875, p. 215, pl. 22, figs. 7, 7a.—Whitfield, Geol. Surv. Wisconsin, 4, 1882, p. 257, pl. 12, figs. 3, 4.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 173, fig.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 214.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 808, pl. 13, figs. 1, 1b; pl. 18, fig. 1.

Constellaria polystomella—Continued.

Stellipora polystomella Miller, N. A. Geol. Pal., 1889, p. 203, fig. 217.

Monticulipora (Constellaria) polystomella (in part) J. F. James, Jour. Cincinnati Soc. Nat. Hist., 18, p. 118.

Richmond: Delafield, Wisconsin (Maquoketa); Wilmington, Illinois (Fernvale); Ohio; Indiana; and Kentucky (Waynesville-Whitewater).

CONSTELLARIA PROMINENS Nickles. See Constellaria florida prominens.

Constellaria punctata (Whitfield).

Monticulipora punctata Whitfield, Ann. Rep. Wisconsin Geol. Surv. for 1877, 1878, p. 71; Geol. Surv. Wisconsin, 4, 1882, p. 249, pl. 11, figs. 3, 4.—Buell, Trans. Wisconsin Acad. Sci., 5, 1882, p. 189.

Constellaria punctata Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 214.

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

Constellaria teres Ulrich and Bassler.

Constellaria teres Ulrich and Bassler, Smiths. Misc. Coll., 47, 1904, p. 37.—Hayes and Ulrich, U. S. Geol. Surv., fol. 95, illus. sheet, 1903, fig. 31.

Trenton (Bigby and Catheys): Columbia, etc., Tennessee; Kentucky.

Cotypes.—Cat. No. 43205, U.S.N.M.

Constellaria varia Ulrich.

Constellaria varia Ulrich, Geol. Minnesota, 3, pt. 1, 1893, p. 311, pl. 21, figs. 1–7.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 219–221, figs. 120–122.

Trenton: Cannon Falls, etc., Minnesota (Prosser); Belleville, Ontario; Belfast, Tennessee.

Ordovician (Wassalem and Jewe): Uxnorm and Jewe, Esthonia, Russia.

Cotypes and *plesiotypes.*—Cat. Nos. 43546, 57300, 57301, U.S.N.M.

CONULARIA Miller. Genotype: C. quadrisulcata Miller.

Conularia Miller, in Sowerby's Min. Conchology, 3, 1821, p. 107.—Dekoninck, Desc. Animaux Fossiles, Liege, 1842–1844, 1844, p. 494.—Hall, Pal. New York, 1, 1847, p. 222, footnote.—Sandberger, Neues Jahrb. f. Min., etc., 1847, p. 11.—Brown, Illust. Foss. Conch. Great Britain and Ireland, 1849, p. 43.—D'Orbigny, Prodr. de Pal., 1, 1849, p. 9.—Dana, Wilkes U. S. Expl. Exped., 1838–1842, Geol., 1849, p. 708.—Woodward, Man. Mollusca, pt. 2, 1854, p. 206, fig. 108.—McCoy, British Pal. Rocks and Foss., 1854, p. 287.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 207.—Pictet, Traite de Pal., 2d ed., 3, 1855, p. 319.—Hall, Pal. New York, 3, 1859, p. 347, and footnote.—Chapman, Expos. Min. Geol. Canada, 1864, p. 122.—Barrande, Syst. Sil. Centre Boheme, 3, 1867, p. 1.—Salter, Cat. Camb. Sil. Foss., 1873, p. 67.—Etheridge, Geol. Mag., 10, 1873, p. 295.—Hall, Pal. New York, 5, pt. 2, 1879, p. 205.—Lindström, Kongl. Sven. Vet.-Akad. Handl., 19, No. 6, 1881, p. 39.—Zittel, Handb. Pal., 2, 1882, p. 315.—Koninck Ann. Mus. Royal Hist. Nat. Belgium, 8, 1883, p. 219.—Miller, N. A. Geol. Pal., 1889, p. 390; 1st App., 1892, p. 692.—Holm, Sveriges Geol. Unders., Ser. C, No. 112, 1893, p. 113, 154.—Matthew, Canadian Rec. Sci., 5, 1893, p. 433.—A. Ulrich, Neues Jahrb. f. Min., Geol. Pal., Beilage-Band, 8, 1893, p. 25.—Koken, Die Leitfossilien, Leipzig, 1896, p. 98, fig. 76.—Ruedemann, Amer. Geol., 17, 1896, p. 158; 18, p. 65.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 284.—Pilsbry, Zittel, Eastman Textb. Pal., 1, 1900, p. 490; 2d ed., 1913, p. 572.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 213; Bull. New York State Mus., 45, 1901, p. 213.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 12.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 950.

Conularia amazonica Clarke.

Conularia amazonica Clarke, Archivos Mus. Nac. Rio de Janeiro, 10, author's Engl. ed., 1900, p. 20, pl. 2, figs. 23–25.

Silurian: Rio Trombetas, Brazil.

Conularia asperata Billings.

Conularia asperata Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 21.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 201, pl. 21, figs. 2, 2a.

Richmond: Macasty Bay, Anticosti (English Head): Lake Winnipeg, Canada.

Conularia bifurca Ringueberg.

Conularia bifurca Ringueberg, Bull. Buffalo Soc. Nat. Hist., 5, 1886, p. 18, pl. 2, fig. 11.

Clinton (Rochester): Lockport, New York.

Conularia bilineata Foerste.

Conularia bilineata Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 547, pl. 37A, fig. 12.

Upper Medinan (Brassfield): Soldiers Home, near Dayton, Ohio.

Conularia formosa Miller and Dyer.

Conularia formosa Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 38, pl. 1, figs. 12, 12a.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 958, pl. 42, fig. 2.

Maysville and Richmond: Versailles, etc., Indiana; Cincinnati, Ohio, and vicinity.

Conularia gattingeri Safford.

Conularia Gattingeri Safford, Geol. Tennessee, 1869, p. 289.

Trenton: Nashville, Tennessee.

Conularia gracilis Hall.

Conularia gracile Hall, Pal. New York, 1, 1847, p. 224, pl. 59, figs. 7a, b.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 207, pl. 16, fig. 7.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 144, figs.—Ruedemann, Amer. Geol., 17, 1896, pp. 158–165, pl. 18, figs. 1–6; pl. 9, figs. 1–7; 18, pp. 65–71, pl. 2, figs. 1, 2; 15th Rep. State Geol. New York for 1895, 1898, p. 701, pls. 1–4; 49th Rep. New York State Mus., 2, 1898, p. 701, pls. 1–4.

Trenton: Near Middleville and Dolgeville, New York.

Conularia granulata Hall.

Conularia granulata Hall, Pal. New York, 1, 1847, p. 223, pl. 59, figs. 5a, b.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 207, pl. 16, figs. 5a, b.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 144, figs.

Trenton: Middleville, New York.

Conularia hudsoni Emmons.

Conularia Hudsoni Emmons, Amer. Geology, 1, pt. 2, 1855, p. 208, fig. 65; Man. Geol., 1860, p. 103, fig. 93.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 144, text fig.

Cincinnatian (Pulaski): Lorraine, Jefferson County, New York.

Conularia indentata Conrad.

Conularia indentata Conrad, Proc. Acad. Nat. Sci. Philadelphia, 7, 1854, p. 31.

Trenton: Galena, Illinois.

Conularia infrequens Hall.

Conularia infrequens Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 321, pl. 33, fig. 7; Trans. Albany Inst., 10, 1883, p. 73.

Niagaran (Waldron): Waldron, Indiana.

Conularia laqueata Conrad.
Conularia laqueata Conrad, 5th Ann. Rep. New York Geol. Surv., 1841, p. 57.—Hall, 15th Rep. New York State Cab. Nat. Hist., 1861, pl. 11, fig. 20.
Clinton (Rochester): Albion, Wayne County, New York.

Conularia longa Hall.
Conularia longa Hall, Pal. New York, 2, 1852, p. 295, pl. 65, figs. 2a–d.
Clinton (Rochester): Lockport, New York.

Conularia magnifica Spencer.
Conularia magnifica Spencer, Canadian Nat., n. s., 9, 1879, p. 63; Trans. Acad. Sci. St. Louis, 4, 1884, p. 607, pl. 9, figs. 1, 1a, b; Bull. Mus. Univ. State Missouri, 1, 1884, p. 58, pl. 9, figs. 1a–b.
Niagaran dolomite: Hamilton, Ontario.

Conularia multipuncta Ringueberg.
Conularia multipuncta Ringueberg, Bull. Buffalo Soc. Nat. Sci., 5, 1886, p. 18, pl. 2, fig. 10.
Clinton (Rochester): Lockport, New York.

Conularia niagarensis Hall.
Conularia niagarensis Hall, Pal. New York, 2, 1852, p. 294, pl. 65, figs. 1a–h.—Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 286, pl. 5, fig. 16; Geol. Surv. Ohio, Pal., 7, 1898, p. 547, pl. 30, fig. 16.—Grabau, Bull. New York State Mus., 45, 1901, p. 214, fig. 145; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 214, fig. 145.
Early Silurian: Lockport, etc., New York (Rochester); Dayton, Ohio (Brassfield).

Conularia papillata Hall.
Conularia papillata Hall, Pal. New York, 1, 1847, p. 223, pl. 59, figs. 6a, b.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 207, pl. 16, fig. 6.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 145, figs.
Trenton: Near Middleville, New York.

Conularia quadrata Walcott.
Conularia quadrata Walcott, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875, p. 93; mus. ed., 1879, p. 93.
Trenton: Prospect Bridge, Oneida County, New York.

Conularia quadrisulcata (Miller?) Hall.
Conularia quadrisulcata Miller in Sowerby's Min. Conch., 3, 1821, p. 107.—Hall, Geol. New York, 4, 1843, p. 110, fig. 2; p. 111, tab. ill. 17, fig. 2.—Yandell and Shumard, Cont. Geol. Kentucky, 1847, p. 15.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 145, fig.—Miller, N. A. Geol. Pal., 1889, p. 390, fig. 644.
Silurian: Europe; Lockport, Rochester, etc., New York (Niagaran).

Conularia rugosa Spencer.
Conularia rugosa Spencer, Bull. Missouri State Mus., 1, 1884, p. 59, pls. 8, 9, figs. 2, 2a; Trans. Acad. Sci. St. Louis, 4, 1884, p. 608, pls. 8, 9, figs. 2, 2a.
Niagaran dolomite: Hamilton, Ontario.

Conularia splendida Billings.
Conularia splendida Billings, Cat. Sil. Foss Anticosti, Geol. Surv. Canada, 1866, p. 21.
Richmond (Charleton): Charleton Point, Anticosti.

Conularia transversa Ringueberg.

Conularia transversa Ringueberg, Bull. Buffalo Soc. Nat. Hist., 5, 1886, p. 19, pl. 2, fig. 12.

Clinton (Rochester): Lockport, New York.

Conularia trentonensis Hall.

Conularia trentonensis Hall, Pal. New York, 1, 1847, p. 222, pl. 59, figs. 4a–f.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 207, pl. 16, figs. 4a–f.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 819, fig. 609.—Hall, Pal. New York, 3, 1859, p. 347–348.—Chapman, Canadian Jour., n. s., 7, 1862, p. 118, fig. 116; 8, 1863, p. 199, fig. 191; Expos. Min. Geol. Canada, 1864, p. 122, fig. 116; p. 171, fig. 191.—Emerson, Narrative Hall's 2d Arctic Exped., U. S. Navy Dep., 1879, p. 578.—Ami, Trans. Ottawa Field Nat. Club, 1, 1882, p. 64.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 167, fig.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 146, 2 figs.—Ruedemann, Bull. New York State Mus., 8, 1901, p. 520.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 188, pl. 3, figs. 7, 8.

Trenton: Middleville, Trenton Falls, etc., New York; Canada; Iowa; New Jersey; etc.

Conularia trentonensis multicosta Ruedemann.

Conularia trentonensis var. multicosta Ruedemann, Bull. New York State Mus., 162, 1912, p. 115.

Trenton: Watervliet, New York (Snake Hill); Schoharie Junction and Schenectady, New York (Schenectady).

Conularia trentonensis rogersensis Foerste.

Conularia trentonensis rogersensis Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 142, pl. 1, fig. 16.

Trenton (Upper): Rogers Gap, Kentucky.

Conularia triangulata Raymond.

Conularia triangulata Raymond, Amer. Jour. Sci., 4th ser. 20, 1905, p. 379; Ann. Carnegie Mus., 4, 1908, p. 216, pl. 54, fig. 18.

Chazyan (Valcour): Valcour Island, New York.

Conularia wilkinsi Spencer.

Conularia wilkinsi Spencer, Bull. Missouri State Mus., 1, 1884, p. 59, pl. 8, fig. 3; Trans. Acad. Sci. St. Louis, 4, 1884, p. 609, pl. 8, fig. 3.

Niagaran dolomite: Hamilton, Ontario.

CORALLIDOMUS Whitfield. Genotype: C. concentricus Whitfield.

Corallidomus Whitfield, Geol. Surv. Ohio, Pal., 7, 1893, p. 493.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 780.

Corallidomus concentricus Whitfield.

Corallidomus concentricus Whitfield, Geol. Surv. Ohio, Pal., 7, 1893, p. 493, pl. 13, fig.; Ulrich, ibid., pl. 55, figs. 15, 16.

Richmond (Liberty): Brown County, Ohio.

CORALLIUM GOTHLANDICUM Linnæus. See Favosites gothlandica.

CORDYLOCRINUS Angelin. Genotype: C. comtus Angelin.

Cordylocrinus Angelin, Icon. Crinoid, 1878, p. 3, pl. 23, fig. 6.—Zittel, Handb. Pal., 1, 1879, p. 365.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, pp. 232, 234 (Rev. Pal., pt. 2, pp. 58, 60); 1886, p. 337; 1890, p. 353.—Miller, N. A. Geol. Pal., 1889, p. 234.—Treatise on Zool. (Lankester), pt. 3, 1900, p. 156.—Zittel, Grundzuge Pal., 1, 1910, p. 157.

Cordylocrinus? dubius Rowley.

Cordylocrinus? dubius Rowley, Amer. Geol., 34, 1904, p. 272, pl. 16, figs. 20–22.

Niagaran (Bainbridge): Near St. Mary's, Ste. Genevieve County, Missouri.

CORDYLOCRINUS PARVUS Wachsmuth and Springer. See Cordylocrinus plumosus.

Cordylocrinus plumosus (Hall).

Platycrinus plumosus Hall, Pal., New York, 3, 1859, pp. 113, 148, pl. 4, figs. 1–5.

Platycrinus parvus Hall, Pal., New York, 3, 1859, p. 114, pl. 4, figs. 6–9.

Cordylocrinus plumosus Wachsmuth and Springer, Rev. Pal., pt. 2, 1881, p. 61; Proc. Acad. Nat. Sci. Philadelphia, 33, 1882, p. 235; N. Amer. Cri. Cam., 2, 1897, p. 737; Atlas, pl. 75, fig. 20.—Talbot, Amer. Jour. Sci., 20, 1905, p. 28, fig. 3, pl. 3, figs. 2, 4.

Cordylocrinus parvus Wachsmuth and Springer, Rev. Pal., pt. 2, 1881, p. 60; Proc. Acad. Nat. Sci. Philadelphia, 33, 1882, p. 234; N. Amer. Crin. Cam., 2, 1897, p. 737.

Clematocrinus plumosus Jaekel, Zeit. d. d. Geol. Gesell., 49, 1897, Verhandl., p. 47.

Clematocrinus parvus Jaekel, ibid., p. 737.

Helderbergian (Manlius transition beds or Coeymans): Jerusalem Hill and North Litchfield, New York.

COREMATOCLADUS Ruedemann. Genotype: C. densa Ruedemann.

Corematocladus Ruedemann, Bull. New York State Mus., 133, 1909, p. 205.

Corematocladus densa Ruedemann.

Corematocladus densa Ruedemann, Bull. New York State Mus., 133, 1909, p. 206, pl. 3, figs. 1–5.

Black River (Lowville): Glens Falls, New York.

CORNULITES Schlotheim. Genotype: C. serpularius Schlotheim.

Cornulites Schlotheim, Petrefaktenkund, 1820, p. 378.—McCoy, Brit. Pal. Rocks and Foss., 1854, p. 63.—Barrande, Syst. Sil. Centre Boheme, 3, 1867, p. 167.—Nicholson, Amer. Jour. Sci., 3d ser., 3, 1872, pp. 202, 204.—Hall, Pal. New York, 5, pt. 2, 1879, p. 164.—Zittel, Handb. Pal., 1, 1879, p. 564.—Vine, Quart. Jour. Geol. Soc. London, 38, 1882, pp. 378, 379.—Hall, Pal., New York, 7, sup. 1888, p. 8.—Miller, N. A. Geol. Pal., 1889, p. 517.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 150.—Hinde, Zittel-Eastman Textb. Pal., 1, 1900, p. 253.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 161; Bull. New York State Mus., 45, 1901, p. 161.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 238.—Zittel-Eastman Textb., Pal., 2d ed., 1913, p. 139.

Conchicolites Nicholson, Amer. Jour. Sci., 3d ser., 3, 1872, pp. 203–204; Geol. Mag., 10, 1873, p. 54; Cincinnati Quart. Jour. Sci., 1, 1874, p. 236.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 7, p. 238.—Zittel, Handb. Pal., 1, 1879, p. 564.—Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1880, p. 260.—Vine, Quart. Jour. Geol. Soc. London, 38, 1882, pp. 378, 381.—Miller, N. A. Geol. Pal., 1889, p. 517.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 237.—Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 139 (Genotype C. gregarius Nicholson).

Ortonia Nicholson, Geol. Mag., 9, 1872, pp. 447, 448; Rept. 42d Meeting Brit, Assoc. Adv. Sci., Notes and Abstracts, 1873, p. 119; Cincinnati Quart. Jour. Sci., 1, 1874, p. 236.—Miller, Cincinnati Quart Jour. Sci., 1, 1874, pp. 9, 10. 238.—Zittel, Handb. Pal., 1, Munich, 1879, p. 564.—Etheridge, Geol. Mag., dec. 2, 7, 1880, p. 366.—Vine, Quart. Jour. Geol. Soc. London, 38, 1882, pp. 378.—Nicholson, Rept. Pal. Prov. Ontario, pt. 1, 1874, p. 122.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 239.—Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 139 (Genotype O. conica Nicholson).

Cornulites arcuatus Conrad.

Cornulites arcuatus Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1842, p. 276, pl. 17, fig. 8.—Hall, Nat. Hist. New York, Geol., 4, 1843, p. 109, fig. 3; p. 110; tab. ill. 16, fig. 3.—Emmons, Man. Geol., 1860, p. 108, fig. 98.—Hall, Pal. New York, 7, Sup., 1888, p. 19, pl. 116A, fig. 9.—Miller, N. A. Geol. Pal., 1889, p. 518, fig. 937.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 105, pl. 4, figs. 1–5.—Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 201, pl. 22, figs. 4–6.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 239, fig. 1524.

Silurian (Lockport-Guelph, Cobleskill): Albion, Orleans County, etc., New York.

Upper Monroan (Amherstburg): Detroit River, opposite Amherstburg, Ontario.

Cornulites bellistriatus Hall.

Cornulites ——— Hall, Pal. New York, 2, 1852, p. 353, pl. 85, figs. 12–17.

Cornulites bellistriatus Hall, Pal. New York, 7, Sup., 1888, p. 20, pl. 116A, figs. 12,13.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 161, fig. 56; Bull. New York State Mus., 45, 9, 1901, p. 161, fig. 56.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 238, fig. 1523.

Clinton (Rochester): Western New York; Ontario.

Cornulites cingulatus Hall.

Cornulites cingulatus Hall, Pal. New York, 7, 1888, p. 20 (supplement to 5), pl. 114, fig. 29.—Clarke, Mem. New York State Mus., 3, No. 3, 1900, p. 27, pl. 2, figs. 35–38.—Weller, Geol. Surv. New Jersey Pal., 3, 1903, p. 272, pl. 32, fig. 3.—Ohern, Maryland Geol. Surv., Low. Dev., 1913, p. 258, pl. 40, fig. 16.

Helderbergian: New York (New Scotland); Pinto, Maryland (Keyser); New Jersey. Also Oriskany of New York.

Cornulites clintoni Hall.

Cornulites flexuosus Hall (not Hall, 1847), Pal. New York, 2, 1852, p. 98, pl. 28, fig. 12a–e; 5, pt. 2, 1879, p. 156, footnote; 28th Rep. New York State Mus. Nat. Hist., mus. ed., 1879, p. 184.

Cornulites clintoni Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 330; Pal. New York, 7, Sup., 1888, p. 18, pl. 116, fig. 22; pl. 116A, fig. 9.—Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1909, p. 10.

Cornulites serpularius var. clintoni Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 274, pl. 5, fig. 8, pl. 7, fig. 8.

Clinton: Lockport, etc., New York; Hamilton, etc., Ontario (Irondequoit and Rochester); Lewis County, Kentucky.

Cornulites clintoni gracilis (Hall).

Cornulites flexuosus var. gracilis Hall, Canadian Nat. Geol., 5, 1860, p. 155.—Dawson, Acadian Geol., 2d ed., 1868, p. 606.

Silurian: Arisaig, Nova Scotia.

Cornulites conicus (Nicholson).

Ortonia conica Nicholson, Geol. Mag., 9, 1872, pp. 447, 448, fig. 1; Rep. 42d Meeting Brit. Assoc. Adv. Sci., Notes and Abstracts, 1873, p. 119.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 11, fig. 4.—Hall, Pal. New York, 7, Sup., 1888, p. 17, pls. 115, fig. 27; 116A, figs. 15, 16.

Maysville: Cincinnati, Ohio, and vicinity.

Cornulites contractus Ringueberg.

Cornulites contractus Ringueberg, Proc. Acad. Nat. Sci. Philadelphia, 1884, p. 148, pl. 3, fig. 6.

Clinton (Rochester): Lockport, New York.

Cornulites corrugatus (Nicholson).

Conchicolites corrugatus Nicholson, Geol. Mag., 10, 1873, p. 55, pl. 4, fig. 2.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 7.—Hall, Pal. New York, 7, Sup., 1888; p. 17, pls. 115, fig. 27; 116A, figs. 17, 18.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 237, fig. 1522.

Maysville: Cincinnati, Ohio, and vicinity.

Cornulites distans Hall.

Tentaculites distans Hall, Pal. New York, 2, 1852, p. 184, pl. 41A, figs. 9, a, b.—Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 144.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 48.

Cornulites distans Hall, 28th Rep. New York State Mus. Nat. Hist., mus. ed., 1879, p. 185; Pal. New York, 5, pt. 2, 1879, p. 163 (gen. ref.); 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 330 (gen. ref.); Pal. New York, 7, Sup., 1888, p. 18, pl. 116, fig. 23.—Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 274, pl. 5, fig. 7; pl. 6, figs. 10, 11; Geol. Surv. Ohio Pal., 7, 1893, p. 532, pl. 30, fig. 7; pl. 31, figs. 10, 11.—Miller, N. A. Geol. Pal., 1889, p. 518, fig. 938.

Upper Medinan: Flamborough Head, etc., Ontario (Cataract); Dayton, Ohio (Brassfield); Arisaig, Nova Scotia.

Cornulites flexuosus (Hall).

Tentaculites? flexuosa Hall, Pal. New York, 1, 1847, p. 92, pl. 29, figs. 6a–d; p. 284, pl. 78, fig. 2a, b.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 225, pl. 17, fig. 6.—Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 76.—Emmons, Man. Geol., 1860, p. 102, fig. 6.—Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1865, p. 255; Geol. Surv. Illinois, 3, 1868, p. 343.

Cornulites flexuosus Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 330; Pal. New York, 7, Sup., 1888, p. 18, pl. 115, figs. 41, 42.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1067, pl. 32, fig. 11.

Conchicolites flexuosus Miller, N. A. Geol. Pal., 1889, p. 517, fig. 936.

Trenton: Lowville, New York.

Cincinnatian: Turin, Pulaski, etc., New York (Pulaski); Cincinnati, Ohio, and vicinity (Maysville).

Cornulites flexuosus Hall (part). See Cornulites clintoni.

Cornulites flexuosus var. gracilis Hall. See Cornulites clintoni gracilis.

Cornulites gregarius (Nicholson).

Conchicolites gregarius Nicholson, Man. Pal., 1, 1889, p. 477, fig. 342; Amer. Jour. Sci., 3d ser., 3, 1872, p. 204.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 238.

Ordovician: England; Cincinnati, Ohio(?).

Cornulites immaturus Hall.

Cornulites immaturus Hall, Pal. New York, 7, Sup., 1888, p. 18, pl. 115, fig. 40.

Utica: Holland Patent, Oneida County, New York.

Cornulites incurvus (Shumard).

Tentaculites incurvus Shumard, 1st and 2d Ann. Rep. Geol. Surv. Missouri, pt. 2, 1855, p. 195, pl. B, fig. 6a, b.—Keyes, Missouri Geol. Surv., 5, 1894, p. 217, pl. 35, fig. 3.

Cornulites incurvus Hall, Pal. New York, 7, Sup., 1888, p. 18, pls. 115, fig. 31; pl. 116, fig. 31.—Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 41, pl. 2, fig. 7.

Upper Medinan (Girardeau): Near Cape Girardeau, Missouri.

Cornulites minor (Nicholson).

Ortonia minor Nicholson, Geol. Mag., 10, 1873, p. 56, pl. 4, fig. 3.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 10.—Hall, Pal. New York, 7, Sup., 1888, p. 17, pl. 115, fig. 3; pl. 116A, figs. 19, 20.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 240, fig. 1525c.

Conchicolites minor Miller, N. A. Geol. Pal., 1889, p. 517.

Maysville: Cincinnati, Ohio, and vicinity.

Cornulites nodosus Ringueberg.

Cornulites nodosus Ringueberg, Proc. Acad. Nat. Sci. Philadelphia, 1884, p. 149, pl. 3, fig. 7.

Clinton (Rochester): Lockport, New York.

Cornulites proprius Hall.

Cornulites propius Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875, 1877, pl. 31, figs. 1–13; mus. ed., 1879, p. 182, pl. 31, figs. 1–13; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 327, pl. 32, figs. 1–13; Pal. New York, 7, Sup., 1888, p. 19, pl. 116, figs. 1–21.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 238, fig.

Niagaran: Waldron, etc., Indiana; Tennessee (Waldron); Nova Scotia.

Cornulites richmondensis (Miller).

Tentaculites Richmondensis Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 234, fig. 28.—Hall, Pal. New York, 5, pt. 2, 1879, p. 163; 7, Sup., 1888, p. 18, pl. 115, figs. 28–30, 33–39.—Miller, N. A. Geol. Pal., 1889, p. 393, fig. 650.

Cornulites richmondensis Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1065, pl. 42, fig. 5.

Richmond (Whitewater): Richmond, etc., Indiana.

Observation.—Compare C. sterlingensis Meek and Worthen.

CORNULITES SERPULARIS var. CLINTONI Foerste. See Cornulites clintoni.

Cornulites sterlingensis (Meek and Worthen).

Tentaculites Sterlingensis Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1865, p. 255; Geol. Surv. Illinois, 3, 1868, p. 343, pl. 4, fig. 8.—Hall, Pal. New York, 5, pt. 2, 1879, p. 163; 7, Sup., 1888, p. 17, pl. 115, figs. 5–7, 32.

Richmond (Maquoketa): Sterling, Illinois.

Cornulites tenuistriatus (Meek and Worthen).

Tentaculites tenuistriatus Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1865, p. 254; Geol. Surv. Illinois, 3, 1868, p. 341, pl. 4, figs. 7a, b.

Cornulites tenuistriatus Cumings, 32d Ann. Rep. Dep. Geol. Nat Res. Indiana, 1908, p. 1066.—Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 41, pl. 2, fig. 6.

Upper Medinan (Girardeau): Alexander County, Illinois.

?Richmond: Richmond, Indiana.

CORYDOCEPHALUS Hawle and Corda.

Genotype: C. flabellatus Hawle and Corda.

Corydocephalus Hawle and Corda, Abh. d. k. Bohmischen Gesell. d. Wiss., 5 (extract), 1847, p. 139, pl. 7, fig. 74.—Reed, Quart. Jour. Geol. Soc. London, 58, 1902, pp. 61–63, sec. A, pp. 70, 81, 82.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 309.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 721.

Corydocephalus byrnesanus (Miller and Gurley).

Lichas byrnesanus Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 3, 1893, p. 78, pl. 8, figs. 8, 9.

Niagaran (Laurel): Near Madison, Indiana.

Corydocephalus depauperatus (Van Ingen).
Arges phlyctainoides depauperatus Van Ingen, School of Mines Quart., 23, 1901, p. 57.
Niagaran (St. Clair): St. Clair Spring, Independence County, Arkansas.

Corydocephalus phlyctainoides (Green).
Calymene phlyctainoides Green, Amer. Jour. Sci., 32, 1837, p. 167.
Arges phlyctainodes Hall, Pal. New York, 2, 1852, p. 314, pl. 70, figs. 2a–2c.—Van Ingen, School of Mines Quart., 23, 1901, p. 57, pl., figs., 18, 18a.
Lichas hanoverensis Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 3, 1893, p. 78, pl. 8, figs. 6–7.
Lichas phlyctainoides Foerste, Geol. Surv. Ohio Pal., 7, 1893, p. 529, pl. 37A, fig. 15; pl. 27, fig. 11.
Corydocephalus phlyctainoides Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 234, pl. 22, figs. 1–4.
Corydocephalus phlyctainodes Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 310, fig. 1621b–e.
Niagaran: Springfield, Ohio; Indiana; New York; Illinois; Arkansas.
Plesiotype: Cat. No. 4918, U. S.N.M. (Green).

Corydocephalus ptyonurus (Hall and Clarke).
Lichas (Dicranogmus) ptyonurus Hall and Clarke, Pal. New York, 7, 1888, p. 86, pl. 19B, figs. 19–21.
Cayugan (Cobleskill): Schoharie, New York.

Corydocephalus tuberculatus (Weller).
Arges tuberculatus Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 199, pl. 15, figs. 11–13.
Trenton: Near Iliff's Pond, New Jersey.

Corydocephalus wesenbergensis paulianus (Clarke).
Lichas (Arges) wesenbergensis var. paulianus Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 744, figs. 62–64.
Lichas paulianus Miller, N. A. Geol. Pal., 2d App., 1897, p. 788 (gen. ref.).
Trenton (Prosser): St. Paul and Wykoff, Minnesota.

CORYMBOCRINUS Angelin. Genotype: Eucalyptocrinus polydorus McCoy.
Corymbocrinus Angelin, Icon. Crinoid., 1878, p. 18, pl. 8, figs. 1, 6–12; pl. 21, fig. 17.—Zittel, Handb. Pal., 1, 1879, p. 373.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 308 (Rev. Pal., pt. 2, p. 134); 1885, p. 328.—Weller, Jour. Geol., 6, 1898, p. 700; Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 99, fig. 45.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 147.—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 162.—Zittel, Grundzuge Pal., 1, 1910, p. 163.

Corymbocrinus chicagoensis Weller.
Corymbocrinus chicagoensis Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 100, pl. 4, figs. 1–3.
Niagaran (Racine): Chicago, Cicero, and Romeo, Illinois.

Corymbocrinus niagarensis Weller.
Corymbocrinus niagarensis Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 101, pl. 4, figs. 4. 5.
Niagaran (Racine): Chicago, Illinois.

CORYNOGRAPTUS Hopkinson. See Corynoides Nicholson.

CORYNOIDES Nicholson. Genotype: C. calicularis Nicholson.

Corynoides Nicholson, Geol. Mag., 4, 1867, p. 108; Mon. British Grapt., 1872, p. 132.—Zittel, Handb. Pal., 1879, p. 289.—Nicholson and Lydekker, Man. Pal., 1887, p. 215.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 228–234.

Corynograptus Hopkinson, Quart. Jour. Geol. Soc. London, 31, 1875, p. 633.

Corynoides calicularis Nicholson.

Graptolite germs Hall, Pal. New York, 3, 1859, p. 508, fig. 7; Can. Org. Rem., dec. 2, 1865, pl. B, fig. 19.

Corynoides calicularis Nicholson, Geol. Mag., 4, 1867, p. 108; pl. 7, figs. 9–11.—Hopkinson, Geol. Mag., 9, 1872, p. 502.—Nicholson, Mon. British Grapt., 1872, p. 132, fig.; Ann. Mag. Nat. Hist., 11, 1873, p. 143.—Lapworth, Cat. West. Scot. Foss., 1876, p. 7, pl. 4, fig. 91; Rep. and Proc. Belfast Nat. Field Club, 1, pt. 4, App., 1877, pl. 7, fig. 18.—Linnarsson, Sveriges Geol. Unders., ser. C, No. 31, 1879, p. 18.—Lapworth, Proc. and Trans. Roy. Soc. Canada, 4, 1887, p. 177.—Nicholson and Lydekker, Man. Pal., 1889, p. 215, fig. 96.—Gurley, Jour. Geol., 4, 1896, pp. 94, 301.—Ruedemann, Bull. New York State Mus., 42, 1901, p. 515.—Clarke, Geol. Mag., 4th ser., 9, 1902, p. 498.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 214, pl. 16, figs. 12, 13.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 234–237, figs. 122–132; pl. 13, figs. 1, 6–8.—Bassler, Bull. Virginia Geol. Surv., 2a, 1909, pl. 7, figs. 9, 10.

Chazyan: (Normanskill): Glenmont, Albany, and other localities in slate belt of New York; Pennsylvania; Maryland; Virginia.

Ordovician: Wales; Scotland; Scandinavia.

Corynoides curtus Lapworth.

Corynoides curtus Lapworth, Cat. West. Scot. Foss., 1876, p. 7, pl. 4, fig. 92; Rep. and Proc. Belfast Nat. Field Club, 1, pt. 4, App., 1877, pl. 7, fig. 19.—Ruedemann, Bull. New York State Mus., 42, 1901, p. 514ff; Mem. New York State Mus., 11, pt. 2, 1908, pp. 240, 241, figs. 140–144; pl. 13, figs. 4, 17–21.

Trenton (Snake Hill): Albany, Amsterdam, etc., New York; Panton, Vermont.

Ordovician (Hartfell): Ireland.

Corynoides curtus comma Ruedemann.

Corynoides curtus Ruedemann, Bull. New York State Mus., 42, 1901, p. 526.

Corynoides curtus var. comma Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 242, pl. 13, figs. 5, 22–24, 145–148.

Trenton (Snake Hill): Mechanicsville, New York.

Corynoides gracilis Hopkinson.

Corynoides gracilis Hopkinson, Geol. Mag., 9, 1872, p. 502, pl. 12, fig. 1.—Lapworth, Cat. West. Scot. Foss., 1876, p. 7, pl. 4, fig. 93.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 237–239, figs. 133–135; pl. 13, figs. 2, 2, 12, 15, 16.

Ordovician: Scotland (Hartfell); Lansingburg, Troy, and Baker Falls, New York (Trenton–Snake Hill).

Corynoides gracilis perungulatus Ruedemann.

Corynoides gracilis mut. perungulatus Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 239–240, figs. 136–139; pl. 13, figs. 3, 9, 10, 11, 13, 14.

Chazyan (Normanskill): Glenmont, Speigletown, near Troy, and Mount Moreno, near Hudson, New York; Arkansas.

CORYNOTRYPA Bassler. Genotype: Hippothoa delicatula James.

Stomatopora (part) of authors.

Corynotrypa Bassler, Proc. U. S. Nat. Mus., 39, 1911, p. 501; Bull. U. S. Nat. Mus., 77, 1911, p. 61; Zittel-Eastman Textb. Pal., 1913, p. 319.

Corynotrypa abrupta Bassler.

Corynotrypa abrupta Bassler, Proc. U. S. Nat. Mus., 39, 1911, p. 517, figs. 16, 17; Bull. U. S. Nat. Mus., 77, 1911, pp. 65, 66, figs. 11, 12.

Richmond (Maquoketa): Iron Ridge, Wisconsin.

Lyckholm limestone: Kertel, Island of Dago, Baltic Sea.

Holotype and *paratype*.—Cat. Nos. 54173, 57109, U.S.N.M.

Corynotrypa barberi Bassler.

Corynotrypa barberi Bassler, Proc. U. S. Nat. Mus., 39, 1911, p. 509, fig. 8; Bull. U. S. Nat. Mus., 77, 1911, pp. 63, 64, fig. 9.

Chazyan (Ottosee): Knoxville, etc., Tennessee; southwest Virginia.

Lyckholm limestone: Hohenholm, Island of Dago, Baltic Sea.

Holotype and *paratype*.—Cat. No. 57105, 57106, U.S.N.M.

Corynotrypa canadensis (Whiteaves).

Stomatopora canadensis Whiteaves, Pal. Foss., 3, 1897, p. 161, pl. 18, figs. 4, 4a.

Corynotrypa canadensis Bassler, Proc. U. S. Nat. Mus., 39, 1911, p. 526, fig. 27.

Black River or Richmond: Little Black Island, Lake Winnipeg, Canada.

Corynotrypa curta Bassler.

Corynotrypa curta Bassler, Proc. U. S. Nat. Mus., 39, 1911, p. 518, fig. 18.

Richmond (Maquoketa): Savannah, Illinois.

Cotypes.—Cat. No. 54171, U.S.N.M.

Corynotrypa delicatula (James).

Hippothoa delicatula James, Paleontologist, No. 1, 1878, p. 6.

Stomatopora proutana Miller, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 39, pl. 1, figs. 4–4b.—Ulrich, ibid., 12, 1890, p. 175, fig. 2c; Geol. Minnesota, 3, 1893, p. 117, pl. 1, figs. 8–12.

Rhopalonaria pertenuis Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv., Minnesota, 1886, p. 59.

Stomatopora delicatula Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 419.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 118, fig. 178b.—Bassler, Proc. U. S. Nat. Mus., 30, 1908, p. 55, pl. 3, figs. 4–7.

Stomatopora tenuissima Ulrich, Jour. Cincinnati Soc. Nat. Hist., 12, 1890, p. 175, fig. 2; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 261, fig. 412A; Geol. Minnesota, 3, pt. 1, 1893, p. 116, pl. 1, figs. 16, 17.

Stomatopora delicatula-tenuissima Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 419.

Corynotrypa delicatula Bassler, Proc. U. S. Nat. Mus., 39, 1911, p. 506, figs. 3a, 4–7; Bull. U. S. Nat. Mus., 77, 1911, pp. 61–63, fig. 8; Zittel-Eastman Textb. Pal., 1913, p. 319, figs. 439a.

Stones River-Richmond: Various localities in the United States and Canada.

Middle Ordovician: Esthonia, Russia.

Plesiotypes.—Cat. Nos. 13615, 43260, 43263, 54156, 54165, U.S.N.M.

Corynotrypa dissimilis (Vine).

Aulopora sp. Hall, Pal. New York, 2, 1852, pl. 50, figs. 27, 29.

Stomatopora dissimilis Vine, Quart. Jour. Geol. Soc. London, 37, 1881, pp. 615, 616, figs. 1–8; 38, 1882, p. 50.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, pp. 15, 16, pl. 4, figs. 15–19.

Corynotrypa dissimilis—Continued.

Corynotrypa dissimilis Bassler, Proc. U. S. Nat. Mus., 39, 1911, p. 523, figs. 23, 24; Bull. U. S. Nat. Mus., 77, 1911, pp. 68, 69, fig. 14.

Stomatopora recta Ringueberg, Bull. Buffalo Soc. Nat. Hist., 5, 1886, p. 20, pl. 2, pp. 15, 15a.

Stomatopora minor Hennig, Archiv fur Zool., Kongl. Sven. Vet.-Akad. Stockholm, 3, No. 10, 1906, p. 24, pl. 3, fig. 6.

Silurian: England, Gotland, and Esthonia; Island of Anticosti; New York and Ontario (Rochester); Indiana, Kentucky, and Tennessee (Osgood-Louisville).

Plesiotypes.—Cat. Nos. 35473, 35475, 57112, U.S.N.M.

Corynotrypa elongata (Vine).

Stomatopora dissimilis var. elongata Vine, Quart. Jour. Geol. Soc. London, 38, 1882, p. 50.

Stomatopora elongata Vine, Ann. Mag. Nat. Hist., 5th ser., 14, 1884, p. 85, fig. 4, 2.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, pp. 14, 15, pl. 4, figs. 10–14.

Corynotrypa elongata Bassler, Proc. U. S. Nat. Mus., 39, 1911, p. 510, fig. 9.

Stomatopora parva Ringueberg, Bull. Buffalo Soc. Nat. Hist., 5, 1886, p. 20, pl. 2, fig. 16.

Silurian: Shropshire, England (Wenlock); Sevenmile Creek, near Eaton, Ohio (Brassfield); Rochester and Lockport, New York (Rochester); Newsom, Tennessee (Waldron); Island of Anticosti.

Plesiotypes.—Cat. Nos. 35475, 57107, U.S.N.M.

Corynotrypa inflata (Hall).

Alecto inflata Hall, Pal. New York, 1, 1847, p. 77, pl. 26, figs. 7a, b.

Hippothoa inflata Nicholson, Pal. Ohio, 2, 1875, p. 268, pl. 25, figs. 1–1b; Rep. 44th Meeting British Assoc. Adv. Sci., Notes and Abstracts, 1875, p. 90.—Vine, Rep. 51st Meeting British Assoc. Adv. Sci., 1882, p. 163.

Stomatopora inflata Vine, Quart. Jour. Geol. Soc. London, 37, 1881, p. 615.—Ulrich, Jour Cincinnati Soc. Nat. Hist., 12, 1890, p. 176, fig. 3c; Geol. Minnesota, 3, 1893, p. 117, pl. 1, figs. 13–21; Zittel's Textb. Pal. (Engl. ed.), 1896, fig. 412B (p. 261).—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, figs. 202–204 (p. 597).—Ruedemann, Bull. New York State Mus., 49, 1902, p. 12, pl. 1, figs. 2, 3.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 118, fig. 178a.—Cumings, 32d Ann. Rep. Geol. Nat. Res. Indiana, 1908, p. 886, pl. 32, figs. 1, 1a.

Stromatopora inflata Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1106, figs.

Corynotrypa inflata Bassler, Proc. U. S. Nat. Mus., 39, 1911, p. 515, figs. 12–14; Bull. U. S. Nat. Mus., 77, 1911, pp. 64, 65, fig. 10; Zittel-Eastman Textb. Pal., 1913, p. 319, fig. 439b.

Black River-Richmond: Trenton Falls, etc., New York; Canada; Minnesota; Kentucky; Tennessee; etc.

Middle Ordovician (Wesenberg): Esthonia, Russia.

Plesiotypes.—Cat. Nos. 54146, 54162, 54169, U.S.N.M.

Corynotrypa medialis Bassler.

Corynotrypa medialis Bassler, Proc. U. S. Nat. Mus., 39, 1911, p. 519, fig. 19.

Richmond (Maquoketa): Three miles north of Spring Valley, Minnesota.

Holotype—Cat. No. 57110, U.S.N.M.

Corynotrypa tennesseensis Bassler.

Corynotrypa tennesseensis Bassler, Proc. U. S. Nat. Mus., 39, 1911, p. 525, fig.25.

Stones River (Pierce): Near Murfreesboro, Tennessee.

Cotypes—Cat. No. 54177, U.S.N.M.

Corynotrypa turgida (Ulrich).

Stomatopora turgida Ulrich, Jour. Cincinnati Soc. Nat. Hist., 12, 1890, p. 176, fig. 3; Geol. Minnesota, 3, 1893, p. 118, pl. 1, figs. 22, 23.

Corynotrypa turgida Bassler, Proc. U. S. Nat. Mus., 39, 1911, p. 520, fig. 20.

Richmond (Fernvale): Wilmington, Illinois.

Holotype and *plesiotype*.—Cat. Nos. 43258, 54155, U.S.N.M.

COSCINIUM PROAVUS Eichwald. See Graptodictya proava.

COSCINOPORA SULCATA Owen. See Receptaculites oweni.

CRANIA Retzius. Genotype: Anomia craniolaris Linnæus.

Crania Retzius, Schrift. Ges. Naturf. Freunde, Berlin, 2, 1871, p. 72.—Eichwald, Zool. Specialis, pt. 1, Vilnae, 1829, p. 273.—Davidson, British Foss. Brach., Pal. Soc., 1853, pp. 37, 122.—Woodward, Man. Mollusca, pt. 2, 1854, p. 236, figs. 157, 159.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 66.—Davidson, Mon. British Carb. Brach., Pal. Soc., 1861, p. 192.—Dall, Amer. Jour. Conch., 7, 1871, p. 71; Bull. Mus. Comp. Zool., 3, 1871, p. 27.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, pp. 11, 12.—Dall, Bull. U. S. Nat. Mus., 8, 1877, p. 21.—Winchell, 8th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1880, p. 63.—Miller, N. A. Geol. Pal., 1889, p. 341.—Nettelroth, Kentucky Foss. Shells, Mem. Geol. Surv. Kentucky, 1889, p. 31.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 145, 169.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 372.—Hall and Clarke, 11th Ann. Rep. New York State Geol., 1894, p. 260.—Koken, Die Leitfossilien, Leipzig, 1896, p. 232, figs. 191, 1-3.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 80.—Huene, Neues Jahrb. f. Min., Geol. and Pal., 1, 1899, p. 142.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 185.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 311.

Crania acadiensis Hall.

Crania acadiensis Hall, Canadian Nat. Geol., 5, 1860, p. 144, fig. 1.—Dawson, Acadian Geol., Suppl. Chap., 1860, p. 68. fig. 47; 3d ed., 1878, p. 595, fig. 198.

Silurian: East River, Nova Scotia.

Crania albersi Miller and Faber.

Crania albersi Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 17, 1894, p. 154, pl. 8, figs. 17–19.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 760, fig. 1406.

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

CRANIA ALTERNATA James. See Crania scabiosa.

Crania anna Spencer.

Crania anna Spencer, Bull. Univ. Missouri, 1, 1884, p. 57; Trans. St. Louis Acad. Sci., 4, 1886, p. 607, pl. 8, fig. 4.

Niagaran dolomite: Hamilton, Ontario.

CRANIA ASPERULA James. See Crania scabiosa.

CRANIA CORRUGATA Lesley. See Lichenalia concentrica.

CRANIA COSTATA James. See Crania scabiosa.

CRANIA? DEFORMATA Miller. See Archinacella deformata.

Crania dentata Ringueberg.

Crania dentata Ringueberg, Bull. Buffalo Soc. Nat. Sci., 5, 1886, p. 16, pl. 2, fig. 6.

Clinton (Rochester): Lockport, New York.

Crania? dub a Foerste.

Crania? dubia Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 565, pl. 37A, figs. 17a, b.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 189.

Upper Medinan (Brassfield): Soldiers' Home, near Dayton, Ohio.

Crania dyeri Miller.

Crania dyeri Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 13, fig. 3; N. A. Geol. Pal., 1889, p. 341, fig. 553.

Eden (Economy): Cincinnati, Ohio and vicinity.

Crania excentrica Miller. See Orbicula excentrica.

Crania filosa Hitchcock. See Schizocrania filosa.

Crania gracilis Ringueberg.

Crania gracilis Ringueberg, Bull. Buffalo Soc. Nat. Sci., 5, 1886, p. 17, pl. 2, fig. 7.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 190.

Crania pannosa Ringueberg, Bull. Buffalo Soc. Nat. Sci., 5, 1886, p. 17, pl. 2, fig. 8.

Clinton (Rochester): Lockport, New York.

Crania granulosa N. H. Winchell.

Crania granulosa N. H. Winchell, 8th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1880, p. 63.—Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, 1892, p. 343.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 373, pl. 29, figs. 34, 35.

Black River (Platteville): Minneapolis, Minnesota.

Crania granulosa cumberlandensis Foerste.

Crania granulosa-cumberlandensis Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 41, pl. 5, fig. 8.

Black River (Lowville): Wells Creek Basin, near Cumberland, Tennessee; High Bridge, Kentucky.

Crania halli Sardeson. See Petrocrania ulrichi.

Crania lælia Hall.

Crania lælia Hall, Descriptions n. sp. Crinoidea and Other Fossils, 1866, p. 13; 24th Rep. New York State Cab. Nat. Hist., 1872, p. 220, pl. 7, fig. 16.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 12.—Hall and Whitfield, Pal. Ohio, 2, 1875, p. 75, pl. 1, fig. 16.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 4H, fig. 1.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 207, fig. 242.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 897, pl. 33, fig. 2.

Maysville and Richmond: Cincinnati, Ohio, and many localities in Ohio, Indiana, Kentucky, Tennnessee, etc.

Crania minutula Miller. See Schizotreta minutula.

Crania multipunctata Miller. See Crania scabiosa.

Crania pannosa Ringueberg. See Crania gracilis.

Crania parallela Ulrich. See Crania scabiosa.

Crania percarinata Ulrich. See Crania scabiosa.

Crania prona Raymond. See Petrocrania prona.

Crania reticularis Miller. See Trematis reticularis.

Crania(?) reversa Sardeson.

Crania(?) reversa Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 77, pl. 3, figs. 6, 7.

St. Peter sandstone: St. Paul, Minnesota.

Crania scabiosa Hall.

Crania scabiosa Hall, Descriptions n. sp. Crinoidea and other Foss., 1866, p. 13.; 24th Rep. New York State Cab. Nat. Hist., 1872, p. 220, pl. 7, fig. 15.—Hall and Whitfield, Pal. Ohio, 2, 1875, p. 74, pl. 1, fig. 17.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 12.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 148, pl. 4H, figs. 23–28, 30, 31.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 191.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 206, fig. 240.—Cumings, 32d Ann. Rep., Dep. Geol. Nat. Res. Indiana, 1908, p. 898, pl. 33, fig. 3–3a.

Crania multipunctata Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 13, fig. 4.—N. A. Geol. Pal., 1887, p. 341, fig. 554.

Crania percarinata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 98, pl. 4, fig. 12.

Crania parallela Ulrich, ibid., 1878, p. 98, pl. 4, fig. 13.

Crania asperula James, Palæontologist, 3, 1879, p. 22.

Crania costata James, ibid., 1879, p. 22.

Crania alternata James, ibid., 1879, p. 23.

Philhedra scabiosa Huene, Neues Jahrb. f. Min., Geol. and Pal., 1, 1898, p. 147 (gen. ref.).

Eden-Richmond: Cincinnati, etc., Ohio; Indiana; Kentucky; Tennessee; Wisconsin; etc.

Crania setifera Hall.

Crania setifera Hall, Trans. Albany Inst., 4, 1863, p. 209 (not Hall, 1866); 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1876, pl. 21, figs. 8–10; Mus. ed., 1879, p. 148, pl. 21, figs. 8–10; 11th Rep. State Geol. Indiana, 1882, p. 283, pl. 21, figs. 8–10.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 4H, fig. 18.—Crane, Geol. Mag., dec. 4, 2, 1895, pl. 5, fig. 20.

Niagaran (Waldron): Waldron, Indiana.

Crania setigera Hall.

Crania setigera Hall, Descriptions n. sp. Crinoidea and other Fossils, 1866, p. 12; 24th Rep. New York State Cab. Nat. Hist., 1872, p. 220, pl. 7, fig. 15.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 4H, figs. 14–16.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 372, pl. 29, figs. 32, 33.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 207, fig. 241e–f.

Black River (Platteville and Decorah): Mineral Point and Beloit, Wisconsin; Decorah, Iowa; Minneapolis, Cannon Falls, etc., Minnesota.

Crania siluriana Hall.

Crania siluriana Hall, Trans. Albany Inst., 4, 1863, p. 208; 28th Rep. New York State Mus. Nat. Hist., 1879, p. 148, pl. 21, figs. 3–7; 11th Rep. State Geol. Indiana, 1882, p. 282, pl. 21, figs. 3–7.—Beecher and Clarke, Mem. New York State Mus., 1, 1889, p. 13, pl. 1, figs. 1, 2.

Niagaran (Waldron): Waldron, Indiana; Tennessee.

Crania socialis Ulrich.

Crania socialis Ulrich, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 98, pl. 4, fig. 14.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 4H, fig. 29.

Eden: Cincinnati, Ohio and vicinity.

Crania spinigera Hall.

Crania spinigera Hall, Descriptions n. sp. Foss. Waldron, Indiana, 1879, p. 13; 11th Rep. State Geol. Indiana, 1882, p. 283, pl. 27, fig. 1; Trans. Albany Inst., 10, 1883, p. 69.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 4H, fig. 17.

Niagaran (Waldron): Waldron, Indiana.

Crania trentonensis Hall.

Crania trentonensis Hall, Desc. n. sp. Crinoidea and other Fossils, 1866, p. 12; 24th Rep. New York State Cab. Nat. Hist., 1872, p. 219, pl. 7, figs. 11, 12.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 4H, figs. 21, 22.—Winchell and Schuchert, Geol. Minnesota, 1893, p. 374, pl. 29, figs. 36, 37.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 207, fig. 241c-d.

Trenton: Middleville, New York; Cannon Falls, Minnesota; Janesville, Wisconsin; Dixon, Illinois.

CRANIELLA Œhlert. See Petrocrania Raymond.

CRANIOPS Hall. See Pholidops Hall.

Crateripora Ulrich.

Crateripora Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 29.

Observation.—The forms for which this genus was proposed have been found to be the basal articulating sockets of species of Escharopora and Arthropora.

CRATERIPORA ERECTA Ulrich. See Arthropora shafferi.

CRATERIPORA LINEATA Ulrich. See Escharopora falciformis.

CRATERIPORA LINEATA var. EXPANSA Ulrich. See Escharopora falciformis.

CRATEROPHYLLUM Foerste. See Chonophyllum, subgenus Craterophyllum.

CREMACRINUS Ulrich. Genotype: C. punctatus Ulrich.

Cremacrinus Ulrich, Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 14, 1886, p. 107.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 201 (Rev. Pal., pt. 3, sec. 2, p. 277).—Ringueberg, Ann. New York Acad. Sci., 4, 1889, p. 396, 405.—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 148.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 213.

Castocrinus Ringueberg, Ann. New York Acad. Sci., 4, 1889, p. 392, pl. 11, fig. 1; Bather, Ann. Mag. Nat. Hist., 6th ser., 5, 1890, p. 332, pl. 14, fig. 9; Kongl. Sv. Vet. Akad. Handl., 25, No. 2, 1893, p. 21, 58, 61, fig. 13a, 63.—Miller, N. A. Geol. Pal., 2d App., 1907, p. 740.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 148, fig. 61, 1.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 154.—Zittel, Grundzuge Pal., 1, 1910, p. 152.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1890, p. 387. (Genotype: Calceocrinus furcillatus Billings.)

Cremacrinus articulosus (Billings).

Heterocrinus articulosus Billings, Geol. Surv. Canada, dec. 4, 1859, p. 51, pl. 4, fig. 8.

Calceocrinus (Heterocrinus) articulosus Walcott, 35th Rep. New York State Mus. Nat. Hist., 1883, p. 212.

Calceocrinus articulosus Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 130 (Rev. Pal., pt. 3, sec. 2, p. 206).—Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 113.

Cremacrinus articulosus—Continued.

Castocrinus articulosus Ringueberg, Ann. New York Acad. Sci., 4, 1889, p. 395, pl. 10, fig. 4.—Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 25 (loc. occ.).

Calceocrinus kentuckiensis Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 5, 1894, p. 29, pl. 2, fig. 24, 25.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 740, fig. 1322.

Castocrinus Kentuckiensis Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 5, 1894, p. 30.

Trenton (Curdsville): Ottawa and Kirkfield, Ontario; Mercer County, Kentucky.

Cremacrinus barrandei (Walcott).

Calceocrinus Barrandei Walcott, 35th Rep. New York State Mus. Nat. Hist., 1883, p. 212, pl. 17, figs. 1, 2 (author's ed., p. 6).

Cremacrinus barrandei Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, pp. 111, 113 (gen. ref.).

Trenton: Trenton Falls, New York.

Cremacrinus billingsianus (Ringueberg).

Castocrinus billingsianus Ringueberg, Ann. New York Acad. Sci., 4, 1889, p. 394, pl. 10, fig. 3 (separate, p. 7).

Trenton (?Curdsville): Ottawa, Ontario.

CREMACRINUS CHRYSALIS Ulrich. See Eucheirocrinus chrysalis.

Cremacrinus furcillatus (Billings).

Calceocrinus furcillatus Billings, Ottawa Naturalist, 1, 1887, p. 51, pl., fig.

Castocrinus furcillatus Ringueberg, Ann. New York Acad. Sci., 4, 1889, p. 393, pl. 10, fig. 1.

Trenton (?Curdsville): Ottawa, Ontario.

Cremacrinus inæqualis (Billings).

Heterocrinus inæqualis Billings, Geol. Surv. Canada, dec. 4, 1859, p. 51, pl. 4, fig. 7a.

Calceocrinus inæqualis Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, pp. 130, 205 (Rev. Pal., pt. 3, sec. 2, pp. 206, 281).

Cremacrinus inæqualis Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, pp. 111, 113 (gen. ref.).

Castocrinus inæqualis Ringueberg, Ann. New York Acad. Sci., 4, 1889, p. 395, pl. 10, fig. 5.—Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 25 (loc. occ.).

Trenton (Curdsville): Ottawa and Kirkfield, Ontario.

Cremacrinus punctatus Ulrich.

Cremacrinus punctatus Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 107, fig. 1.

Black River (Decorah): Minneapolis, Minnesota.

CREMACRINUS RADICULUS Ulrich. See Eucheirocrinus radiculus.

Cremacrinus rugosus (Billings).

Calceocrinus rugosus Billings, Ottawa Naturalist, 1, 1887, p. 53, pl., figs.—Miller, N. A. Geol. Pal., 1889, p. 230, fig. 259.

Castocrinus rugosus Ringueberg, Ann. New York Acad. Sci., 4, 1889, p. 393, pl. 10, fig. 2.

Trenton (Curdsville): Belleville, Ontario.

CREPICEPHALUS (LOGANELLUS) CENTRALIS Whitfield. See Ptychoparia oweni.

CREPICEPHALUS (LOGANELLUS) GRANULOSUS Hall and Whitfield. See Ptychoparia granulosa.

CREPICEPHALUS (LOGANELLUS) HAGUEI Hall and Whitfield. See Ptychoparia haguei.

CREPICEPHALUS (LOGANELLUS) MACULOSUS Hall and Whitfield. See Ptychoparia maculosa.

CREPICEPHALUS (LOGANELLUS) UNISULCATUS Hall and Whitfield. See Ptychoparia unisulcata.

CREPIPORA Ulrich. Genotype: C. simulans Ulrich.

Crepipora Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 157.—Miller, N. A. Geol. Pal., 1889, p. 299.—Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 380, 469; Geol. Minnesota, 3, 1893, p. 322.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 15.—Ulrich, Zittel's Textb. Pal. (Engl. ed.), 1896, p. 268.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 566.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 23.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 122.—Hennig, Archiv. fur Zool., 4, No. 21, 1908, p. 9.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 85, 86; Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 328.

CREPIPORA EPIDERMATA Ulrich. See Favositella epidermata.

Crepipora hemispherica Ulrich.

Crepipora hemispherica Ulrich, Geol. Surv. Illinois, 8, 1890, p. 472, pl. 40, figs. 5–5b.

Richmond: Wilmington, Illinois (Fernvale); Delafield, Wisconsin (Maquoketa).

Cotype.—Cat. No. 43234, U.S.N.M.

CREPIPORA IMPOLITA Ulrich. See Anolotichia impolita.

Crepipora impressa Ulrich.

Crepipora impressa Ulrich, Geol. Surv. Illinois, 8, 1890, p. 471, pl. 40, figs. 2, 2a.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 566, figs. 135, 136.

Maysville (Fairmount): Covington, Kentucky.

Holotype.—Cat. No. 43231, U.S.N.M.

Crepipora perampla Ulrich.

Crepipora perampla Ulrich, Geol. Minnesota, 3, 1893, p. 323, pl. 28, figs. 29–32; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 267, figs. 436A–C.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 328, figs. 464a–c.

Black River (Platteville): Chatfield and near Spring Valley, Minnesota.

Part of *holotype.*—Cat. No. 43235, U.S.N.M.

Crepipora simulans Ulrich.

Crepipora simulans Ulrich, Geol. Surv. Illinois, 8, 1890, p. 470, pl. 39, figs. 4, 4a, pl. 40, figs. 3, 3a; p. 320, fig. 8b.—(Ulrich in press) Miller, N. A. Geol. Pal., 1889, p. 299, fig, 468.—Ulrich, Zittel's Textb. Pal. (Engl. ed.), 1896, fig. 436D (p. 267).—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 566, figs. 133, 134.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 217.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 122, fig. 178k.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 328, fig. 464d.

Maysville (Fairmount): Cincinnati, Ohio; Indiana; Kentucky; Tennessee.

Cotypes.—Cat. No. 43230, U.S.N.M.

Crepipora? solida Ulrich.
Crepipora solida Ulrich, Geol. Surv. Illinois, 8, 1890, p. 472, pl. 40, figs. 4–4b.
Eden (Economy): Covington, Kentucky
Cotypes.—Cat. No. 43232, U.S.N.M.

Crepipora spatiosa Ulrich.
Crepipora spatiosa Ulrich, Geol. Minnesota, 3, 1893, p. 323.
Trenton (Cynthiana): Harrodsburg and Frankfort, Kentucky.
Holotype.—Cat. No. 43228, U.S.N.M.

Crepipora subæquata Ulrich.
Crepipora subæquata Ulrich, Geol. Minnesota, 3, 1893, p. 322, pl. 28, figs. 26–28.
Black River (Decorah): St. Paul, Minnesota.
Holotype.—Cat. No. 43233, U.S.N.M.

Crepipora venusta (Ulrich).
Chætetes venustus Ulrich, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 93, pl. 4, figs. 7, 7a.
Crepipora venusta Ulrich, ibid., 5, 1882, p. 257.—Nickles, Bull. Kentucky Geol. Surv., 5, 1905, p. 49, pl. 2, fig. 7.—Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 126.
Monticulipora (Fistulipora) venusta James and James, Jour. Cincinnati Soc. Nat. Hist., 11, 1888, p. 33.
Trenton (Upper) and Eden (Economy): Covington, etc., Kentucky; Ohio; Indiana.
Holotype.—Cat. No. 43236, U.S.N.M.

Creseis corrugata Matthew. See Styliola corrugata.

Creseis minuta Matthew. See Styliola minuta.

Crinocystis Bather. See Crinocystites Hall.

CRINOCYSTITES Hall. Genotype: C. chrysalis Hall.
Crinocystites Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 317, extras, 1864; rev. ed., 1870, p. 361.—Miller, N. A. Geol. Pal., 1889, p. 234.
Crinocystis Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 77.

Crinocystites chrysalis Hall.
Crinocystites chrysalis Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 318, pl. 12a (1), figs. 10, 11; extras, 1864; rev. ed., 1870, p. 362, pl. 12a, figs. 10, 11.
Crinocystis chrysalis Haeckel, Amphorideen u. Cystoideen, 1896, p. 69.
Niagaran (Racine): Racine, Wisconsin.

Crinocystites(?) rectus (Hall).
Crinocystites? rectus Hall, 20th Rep. New York State Nat. Hist., 1868, p. 318 (extras, 1864).
Rhodocrinus(?) rectus Hall, ibid., 1868, p. 379, pl. 10 (1), fig. 2; rev. ed., 1870, p. 368, pl. 11, fig. 10 (pl. 10, fig. 2).
Niagaran (Racine): Racine Wisconsin.

Crinosoma antiqua Castelnau. See Arthrophycus alleghaniensis.

Crisinella œilensis Wiman. See Protocrisina exigua.

Cromus Barrande. See Encrinurus Emmrich.

Cromus arcticus Haughton. See Encrinurus lævis.

CROTALOCRINITES Austin and Austin. See Crotalocrinus Austin and Austin.

CROTALOCRINUS Austin and Austin. Genotype: Cyathocrinites rugosus Miller.

Crotalocrinites Austin and Austin, Ann. Mag. Nat. Hist., 11, 1843, p. 198.

Crotalocrinus Morris, Cat. British Foss., 1st ed., 1848, p. 50.—Muller, Ann. Mag. Nat. Hist., 2d ser., 13, 1854, p. 254.—McCoy, British Pal. Rocks and Foss., 1854, p. 54.—Salter, in Murchison, Siluria, 2d ed., 1854, p. 219.—Pictet, Traité de Pal., 2d ed., 4, 1857, p. 312.—Austin, Cat. Camb. Sil. Foss., 1873, p. 123.—Angelin, Icon. Crinoid., 1878, p. 26.—Zittel, Handb. Pal., 1, 1879, p. 356.—DeLoriol, Pal. Francaise, 2, 1882, p. 51.—Carpenter, Ann. Mag. Nat. Hist., 5th ser., 18, 1886, p. 397.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, pp. 66, 69, (Rev. Pal., pt. 3, sec. 2, pp. 142, 145); 1888, pp. 264-390.—Jaekel, Zeits. d. d. geol. Gesell., 49, 1897, p. 47.—Weller, Jour. Geol., 6, 1898, p. 700.—Bather, Geol. Mag., dec. 4, 5, 1898, p. 327, figs. 1, 3, 4; Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 176, fig. 92, 3.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, pp. 19, 141, fig. 52.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 216.

CROTALOCRINUS AMERICANUS Weller. See Crotalocrinus cora.

Crotalocrinus cora (Hall).

Cyathocrinus cora Hall, adv. sheets 18th Rep. New York State Cab. Nat. Hist., 1865, p. 20, pl. (2), figs. 13, 14; doc. ed., 1867; 20th Rep., 1868, p. 324, pl. 11 (2), figs. 13, 14; rev. ed., 1870, p. 366, pl. 11, figs. 13, 14.—Miller, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 174.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 191.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 62, pl. 14, figs. 6-10.

Crotalocrinus americanus Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 143, pl. 14, fig. 1.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 561.

Crotalocrinus cora Weller, Jour. Geol., 10, 1902, pp. 532, 534, pl. 3, figs. 1-5.—Slocom, Field Columbian Mus., 2, Geol. Ser., No. 10, 1908, p. 292, pl. 86, figs. 3, 4.

Niagaran (Racine): Racine, Wisconsin; Chicago, etc., Illinois.

Crotalocrinus? vanhornei (Miller).

Cyathocrinus vanhornei Miller, Jour Cincinnati Soc. Nat. Hist., 4, 1881, p. 261, pl. 6, fig. 3.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 64, pl. 14, fig. 5.

Crotalocrinus? vanhornei Weller, Jour. Geology, 10, 1902, p. 533 (gen. ref.).

Niagaran (Racine): Bridgeport, Illinois.

CRUMENÆCRINITES Troost. See Periechocrinus Austin.

CRUMENÆCRINITES OVALIS Troost. See Periechocrinus tennesseensis.

CRUZIANA D'Orbigny. Genotype: C. rugosa D'Orbigny.

Cruziana D'Orbigny, Voyage l'Amerique Merid., 3, pt. 4, 1842, p. 30.—Pictet, Traité de Pal., 2d ed., 2, 1854, p. 559.—Salter, Proc. Geol. Soc. London, 1860, p. 70; Mem. Geol. Surv. Great Britain, 3, 1866, p. 291; 2d ed., 1881, p. 482.—Nathorst, Kongl. Sven. Vet.-Akad. Handl., 18, No. 7, 1881, pp. 33, 87.—James, Jour. Cincinnati Soc. Nat. Hist., 7, 1885, pp. 153-157.—Lebesconte, Bull. Soc. Geol. France, 3d ser., 14, 1886, p. 810.—Bornemann, Nova Acta K. Leop. Carol. Deutsch. Akad. der Natur., 51, No. 1, 1886, p. 11.—Nathorst, Kongl. Sven. Vet.-Akad. Handl., 21, No. 14, 1886, p. 16.—Walcott, Proc. U. S. Nat. Mus., 12, 1890, p. 35.—Miller, N. A. Geol. Pal., 1889, p. 115.

Observation.—Possibly the same as Rusophycus.

CRUZIANA ASPERA James. See Rusophycus asper.

CRUZIANA BILOBATA Hall. See Rusophycus bilobatus.

CRUZIANA CARLEYI James. See Rusophycus carleyi.

Cruziana cucurbita Salter.

Cruziana cucurbita Salter, Quart. Jour. Geol. Soc. London, 17, 1861, p. 71, pl. 5, figs. 4–6.

Ordovician?: Valleys of Unduavi and Aceromarka, Bolivia.

Cruziana furcifera D'Orbigny.

Cruziana furcifera D'Orbigny, Voyage l'Amerique Merid., 3, pt. 4, 1847, p. 31, 8, Atlas, pl. 1, figs. 2, 3.

Cruziana furcifera Ulrich, Neues Jahrb. f. Min., Geol. Pal., 8, Beilage-Band, 1893, p. 86.

Ordovician: Cochabamba, Bolivia.

CRUZIANA PUDICA James. See Rusophycus pudicum.

Cruziana rugosa D'Orbigny.

Cruziana rugosa D'Orbigny, Voyage l'Amerique Merid., 3, pt. 4, 1842, p. 30, 8, Atlas, pl. 1, fig. 1.

Silurian: Cochabamba, Bolivia.

CRUZIANA SUBANGULATA James. See Rusophycus subangulatus.

Cruziana unduavi Salter.

Cruziana unduavi Salter, Quart. Jour. Geol. Soc. London, 17, 1861, p. 71, pl. 5, figs. 7, 8.

Ordovician?: Valleys of Aceromarka and Unduavi, Bolivia.

CRYPTOCERAS UNDATUM Chapman. See Plectoceras halli.

CRYPTODISCUS Hall. See Callicrinus D'Orbigny.

CRYPTOGRAPTUS Lapworth. Genotype: Diplograptus tricornis Carruthers.

Cryptograptus Lapworth, Ann. Mag. Nat. Hist., 5th ser., 5, 1880, p. 174.—Ruedemann, Mem. New York State Mus., 11, pt. 2, pp. 442, 443.

Cryptograptus? antennarius (Hall).

Climacograptus antennarius Hall, Geol. Surv. Canada, dec. 2, 1865, p. 112, pl. 13, figs. 11–13.—Roemer and Frech, Lethaea Pal., 1, 1897, p. 611.—Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 731–732, pl. 16, figs. 21–26.

Climacograpsus antennarius Nicholson, Ann. Mag. Nat. Hist., 4th ser., 6, 1870, p. 382, fig. 6; Mon. Brit. Grapt., 1872, p. 49, fig. 16.

Diplograpsus antennarius Nicholson, Quart. Jour. Geol. Soc. London, 24, 1868, p. 139.

Cryptograptus? antennarius Lapworth, Ann. Mag. Nat. Hist., 5th ser., 5, 1880, p. 174.—Gurley, Jour. Geol., 4, 1896, p. 299 (gen. ref.).—Elles, Quart. Jour. Geol. Soc. London, 54, 1898, p. 519, fig. 31, p. 520.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 443.

Diplograptus laxus Ruedemann, Ann. Rep. New York State Pal., 1902, p. 571; Mem. New York State Mus., 7, pt. 1, 1904, pp. 722, 723, pl. 16, figs. 1–10.

Canadian: Point Levis, Quebec (Levis, Diplograptus dentatus zone); Deepkill and Mount Moreno, New York (Deepkill, D. dentatus zone); Arkansas; Great Britain.

CRYPTOGRAPTUS MARCIDUS Dodge. See Cryptograptus tricornis.

Cryptograptus tricornis (Carruthers).

Diplograptus tricornis Carruthers, Trans. Royal Phys. Soc. Edinburgh, 1, 1858, p. 468, fig. 2; Ann. Mag. Nat. Hist., 3, 1859, p. 25, fig. 2; Geol. Mag., 5, 1868, p. 131, fig. 11.—Hopkinson and Lapworth, Quart. Jour. Geol. Soc. London, 31, 1875, p. 658, fig. 6.—Lapworth, Cat. West Scott. Foss., 1876, fig. 30; Rep. and Proc. Belfast Nat. Field Club, 2d ser., 1, pt. 4, app., 1877, p. 132, pl. 6, fig. 10.—Ami, Rep. Geol. Surv. Canada, 2d ser., 3, pt. 2, 1889, pp. 50K, 117K.

Cryptograptus tricornis Lapworth, Ann. Mag. Nat. Hist., 5th ser., 5, 1880, p. 171, pl. 5, figs. 27a–27e; Proc. and Trans. Royal Soc. Canada, 4, 1887, p. 177; Science, 9, 1887, p. 320; Canadian Rec. Sci., 3, 1888, p. 141; Rep. Geol. Surv. Canada, 2d ser., 3, pt. 1, 1889, p. 95B.—Gurley, Jour. Geol., 4, 1896, p. 298.—Elles, Quart. Jour. Geol. Soc. London, 54, 1898, p. 527.—Hall, Proc. Royal Soc. Victoria, 18, pt. 1, 1905, p. 21.—Ami, Geol. Surv. Canada, Sum. Rep. for 1904, 1905, p. 12.—Hall, Rec. Geol. Surv. Victoria, 1, pt. 4, 1906, p. 275.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 443 448, pl. 28, figs. 1–4; figs. 410–417.

Cryptograptus (Idiograptus) tricornis, Perner, Etudes sur les Grapt. Boheme, pt. 2, 1895, p. 26, pl. 7, figs. 7–10.

Diplograptus etheridgii Hopkinson, Geol. Mag., 9, 1872, p. 504, fig. 5.

Graptolithus marcidus Hall, Pal. New York, 3, 1859, p. 515, figs. 1–3; 13th Ann. Rep. New York State Cab. Nat. Hist., 1860, pp. 58, 59, figs. 1–3.

Diplograptus marcidus Walcott, Trans. Albany Inst., 10, 1883 (adv. sheet 1879, p. 34).—Whitfield, Amer. Jour. Sci., 3d ser., 26, 1883, p. 380.—Walcott, Bull. Geol. Soc. Amer., 1, 1890, p. 339.

Cryptograptus marcidus Dodge, Amer. Jour. Sci., 3d ser., 40, 1890, p. 153.

Middle Ordovician: South Scotland (Glenkiln and Hartfell); New York slate belt (Normanskill); Canada; Tennessee; Arkansas; Australia; Bohemia; etc.

Cryptograptus tricornis insectiformis Ruedemann.

Cryptograptus tricornis mut. insectiformis Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 448, 449, pl. 28, figs. 5, 419–422.

Trenton (Snake Hill): Van Schaick Island, Cohoes, New York

CRYPTOLITHUS Green. Genotype: C. tesselatus Green.

Cryptolithus Green, Mon. Tril. N. Amer., 1832, p. 72.—Goldfuss, Neues Jahrb. f. Min., etc., 1843, pp. 540–542.—Emmrich, ibid., 1845, p. 44.—Hall, Pal. New York, 1, 1847, p. 235, footnote.

Nuttainia Eaton, Geol. Textb., 2d ed., 1832, p. 33.—Green, Mon. Tril. N. Amer., 1832, p. 88.—Hall, Pal. New York, 1, 1847, p. 235, footnote.—Reed, Quart. Jour. Geol. Soc. London, 58, 1902, p. 62.

Trinucleus Murchison, Sil. Syst., 1839, p. 659.—Emmons, Nat. Hist. New York, Geol., 2, 1842, p. 115.—Salter, Quart. Jour. Geol. Soc. London, 3, 1847, p. 251.—Hawle and Corda, Abh. d. k. bohm. Gesell. Wiss., 5 (extract), 1847, p. 38, pl. 3, fig. 17.—Salter, Mem. Geol. Surv. United Kingdom, dec. 7, 1853, pl. 7.—McCoy, Brit. Pal. Rocks and Foss., 1854, p. 144.—Pictet, Traite de Pal., 2d ed., 2, 1854, p. 508.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 212.—Chapman, Canadian Jour., n. s., 1, 1856, p. 273; 8, 1863, p. 28; Expos. Min. Geol. Canada, 1864, p. 136.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 126.—Zittel, Handb. Pal., 2, 1885, p. 593.—Miller, N. A. Geol. Pal., 1889, p. 568.—Beecher, Amer. Jour. Sci., 3d ser., 46, 1893, p. 143.—Vogdes, Cal. Acad. Sci., Occ. Pap., 4, 1893, p. 359.—Beecher, Amer. Jour. Sci., 3d ser., 49, 1895, p. 307; Amer. Geol., 16, 1895, pp. 167, 176.—Koken, Die Leitfossilien, Leipzig, 1896, p. 15, fig. 9, 1.—Beecher, Amer. Jour. Sci., 4th ser., 3, 1897, pp. 105, 184, 186, pl. 3, fig. 12.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 258.

Cryptolithus bellulus (Ulrich).

Trinucleus bellulus Ulrich, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 99, pl. 4, fig. 15.

Eden: Covington, Kentucky, and vicinity (Economy); New York (Indian Ladder).

Holotype.—Cat. No. 41876, U.S.N.M.

Cryptolithus bigsbii Green. Not recognized.

Cryptolithus Bigsbii Green, Mon. Tril. N. Amer. 1832, p. 76.

Ordovician: Montmorency, near Quebec, Ontario.

Cryptolithus boliviensis (Lake).

Trinucleus boliviensis Lake, Quart. Jour. Geol. Soc. London, 62, 1906, p. 427, pl. 40, figs. 4, 5.

Ordovician: Near Apolo, Bolivia.

Cryptolithus kruegeri (Hoek).

Trinucleus kruegeri Hoek, Neues Jahrb. Min., Geol., Pal., 34, 1912, p. 236, pl. 10, figs. 7, 8.

Ordovician: Cochabamba, Bolivia.

Cryptolithus tessellatus Green.

Cryptolithus tessellatus Green, Mon. Tril. North Amer., 1832, p. 73, cast 38, pl. 1, fig. 4; Monthly Amer. Jour. Sci., 1, 1832, pl. 1, fig. 4.—Conrad, Amer. Jour. Sci., 38, 1840, p. 91, footnote.—Vanuxem, Nat. Hist. New York, Geol., 3, 1842, p. 48.—Locke, Proc. Acad. Nat. Sci. Philadelphia, 1, 1842, pp. 196, 236, fig.—Rouault, Bull. Soc. Geol. France, 2d ser., 6, 1849, p. 83.—Foerste, Bull. Sci. Lab. Denison Univ., 14, 1910, p. 78 (gives history of genus and species); 17, 1914, p. 317.

Trinucleus tessellatus Emmons, Nat. Hist. New York, Geol., 2, 1842, pp. 115, 390, 391, fig. 7.—Owen, Amer. Jour. Sci., 47, 1844, pp. 363, 364, fig. 7.

Nuttainia concentrica Eaton, Geol. Textb., 2d ed., 1832, p. 34, pl. 1, fig. 2.—Green, Mon. Tril. North Amer., 1832, p. 76.

Trinucleus caractaci Emmons, Nat. Hist. New York, Geol., 2, 1842, p. 403, fig. 1.—Owen, Amer. Jour. Sci., 47, 1844, p. 377, 378.—De Verneuil, ibid., 2d ser., 7, 1849, p. 223.—Emmons, Man. Geol., 1860, p. 103, fig. 93.

Trinucleus concentricus Hall, Pal. New York, 1, 1847, p. 249, pl. 65, figs. 4a, c; p. 255, pl. 67, figs. 1a–h.—Salter, Mem. Geol. Surv. United Kingdom, dec. 7, 1853, p. 51, pl. 7.—Emmons, Amer. Geol., 1, pt. 2, 1855, p. 212, pl. 15, fig. 4a, b; pl. 16, fig. 7; pl. 17, fig. 1.—Chapman, Canadian Jour., n. s., 1, 1856, p. 273; 3, 1858, p. 514, fig.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 820, fig. 611.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, p. 47, pl. 3, fig. 5; pl. 4, fig. 12.—Hitchcock, Geol. Vermont, 1, 1861, p. 300, fig. 215.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 190, fig. 191a, b.—Chapman, Canadian Jour., n. s., 8, 1863, p. 28, fig. 139; p. 200, fig. 195; Expos. Min. Geol. Canada, 1864, p. 136, fig. 139; p. 172, fig. 195.—Salter, Mem. Geol. Surv. Great Britain, 3, 1866, p. 320, pl. 19, fig. 4; Cat. Camb. Sil. Foss., 1873, p. 49.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 126.—Walcott, Bull. Mus. Comp. Zool., 8, 1881, p. 199.—Salter, Mem. Geol. Surv. Great Britain, 3, 2d ed., 1881, p. 517, pl. 19, fig. 4.—Miller, N. A. Geol. Pal., 1889, p. 569, fig. 1063.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1223, fig.—Beecher, Amer. Jour. Sci., 3d ser., 49, 1895, p. 309, pl. 3, figs. 1–6.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 192, pl. 14, figs. 3, 4.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1064, pl. 44, fig. 11.—Bassler, Bull. Geol. Surv. Virginia, 2a, 1909, pl. 7, fig. 3.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 259, fig. 1547.

Cryptolithus tessellatus—Continued.
Trenton-Maysville: Glens Falls, near Waterford, etc., New York; Canada; Pennsylvania; New Jersey; Ohio; Kentucky; Oklahoma; Virginia; etc.
Plastotype.—Cat. No. 4921, U.S.N.M.

CRYPTONYMUS Eichwald. See Asaphus Brongniart and Encrinurus Emmrich.

CRYPTOPHRAGMUS Raymond. Genotype: C. antiquatus Raymond.
Cryptophragmus Raymond, Bull. Victoria Mem. Mus., 5, 1914, p. 8.

Cryptophragmus antiquatus Raymond.
Cryptophragmus antiquatus Raymond, Bull. Victoria Mem. Mus., 5, 1914, p. 8, pls. 1–4.
Black River (Lowville): Carden, etc., Ontario; Quebec; New York.

CRYPTOPORA Nicholson. See Semicoscinium Prout.

CRYPTOZOON Hall. Genotype: C. proliferum Hall.
Cryptozoon Hall, 36th Rep. New York State Mus. Nat. Hist., 1884, expl. of pl. 6.—Miller, N. A. Geol. Pal., 1889, p. 157.—Dawson, Canadian Rec. Sci., 7, 1896, p. 204.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 46.—Seely, Rep. State Geol. Vermont, 5, 1906, p. 160.—Walcott, Smiths. Misc. Coll., 57, 1912, p. 257.—Wieland, Bull. Amer. Mus. Nat. Hist., 33, 1914, p. 239.

Cryptozoon bassleri Wieland.
Cryptozoon bassleri Wieland, Bull. Amer. Mus. Nat. Hist., 33, 1914, p. 239, figs. 1, 2, pls. 14–18.
Upper Cambrian or Ozarkian: Near Pennsylvania State College, Center County, Pennsylvania.

Cryptozoon boreale Dawson.
Cryptozoon boreale Dawson, Canadian Rec. Sci., 7, 1896, p. 207, fig. 1.
Trenton: Lake St. John, Quebec.

Cryptozoon giganteum Chaney.
Cryptozoon giganteum Chaney, Bull. Minnesota Acad. Nat. Sci., 3, 1891, p. 283.
Canadian (Shakopee): Northfield, Minnesota.

Cryptozoon lachutense Dawson.
Cryptozoon Lachutense Dawson, Canadian Rec. Sci., 7, 1896, p. 206.—Seely, Rep. State Geol. Vermont, 5, 1906, p. 168.
Canadian (Beekmantown): Lachute, Quebec.

Cryptozoon minnesotense Winchell.
Cryptozoon Minnesotense Winchell, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 313, pl. 1, figs. 1, 2; pl. 2, fig. 3.—Chaney, Bull. Minnesota Acad. Nat. Sci., 3, 1891, p. 280.—Dawson, Canadian Rec. Sci., 7, 1896, p. 206.
Canadian (Shakopee): Cannon Falls, Northfield, and Mankato, Minnesota.

Cryptozoon minnesotense libertatis Winchell.
Cryptozoon Minnesotense var. libertatis Winchell, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 315, pl. 2, fig. 4.
Canadian (Shakopee): Northfield, Minnesota.

Cryptozoon perkinsi Seely.
Cryptozoon? perkinsi Seely, Rep. State Geol. Vermont, 4, 1904, p. 150.
Chazyan: Isle la Motte, Vermont.

Cryptozoon proliferum Hall.

Cryptozoon proliferum Hall, 36th Rep. New York State Mus. Nat. Hist., 1884, pl. 6.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 163, fig.—Dawson, Canadian Rec. Sci., 7, 1896, p. 204, fig. 2.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 46.—Seely, Rep. State Geol. Vermont, 5, 1906, p. 161.—Bassler, Bull. Geol. Surv. Virginia, 2a, 1909, p. 155, pl. 18, fig. 2.—Wieland, Bull. Amer. Mus. Nat. Hist., 33, 1914, p. 244, fig. 2.—Walcott, Smiths. Misc. Coll., 57, 1912, p. 258, pl. 37, figs. 1–3.

Upper Cambrian or Ozarkian: Saratoga and Herkimer Counties, New York (Hoyt); Pennsylvania; Maryland; Virginia (Conococheague).

Plesiotype.—Cat. Nos. 56629, 58541, 58543, U.S.N.M.

Cryptozoon saxiroseum Seely.

Cryptozoon saxiroseum Seely, Rep. State Geol. Vermont, 5, 1906, p. 162, pls. 36, 37, figs. 3–6.—Perkins, Rep. State Geol. Vermont, 8, 1912, pl. 16.

Canadian (Beekmantown): Beekmantown, New York.

Cryptozoon steeli Seely.

Cryptozoon steeli Seely, Rep. State Geol. Vermont, 5, 1906, p. 161, pls. 34, 36, 43, fig. 1.

Canadian (Beekmantown): Clinton County, New York; Pennsylvania; Maryland.

Cryptozoon wingi Seely.

Cryptozoon wingi Seely, Rep. State Geol. Vermont, 5, 1906, p. 163, pl. 38.

Canadian (Beekmantown): Mount Independence, Orwell County, Vermont.

CRYSTALLOCYSTIS AURANTIUM Haeckel. See Echinosphærites aurantium.

CTENOBOLBINA Ulrich. Genotype: Beyrichia ciliata Emmons.

Ctenobolbina Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 108.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 706.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 673.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 309.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 19, 1900, p. 180.—Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 309.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1040.—Bonnema, Mitt. Min. Geol. Inst. Groningen, 2, 1909, p. 43.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 353.

Ctenobolbina alata Ulrich.

Ctenobolbina alata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 110, pl. 7, figs. 4a–c.—Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 282, fig. 6, pl. 40, figs. 6–8.

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

Cotypes.—Cat. No. 41489, U.S.N.M.

Ctenobolbina bispinosa Ulrich.

Ctenobolbina bispinosa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 110, pl. 7, fig. 6.—Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, pl. 40, fig. 9.

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

Holotype.—Cat. No. 41490, U.S.N.M

Ctenobolbina ciliata (Emmons).

Beyrichia ciliata Emmons, Amer. Geology, 1, pt. 2, 1855, p. 219, fig. 74c.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 351.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 89, fig.—Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 19, pl. 3, figs. 12–16; pl. 4, figs. 16–18.

Ctenobolbina ciliata—Continued.

Ctenobolbina ciliata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 108, pl. 7, figs. 1a, b.—Ruedemann, Bull. New York State Mus., 42, Pal., 8, 1901, p. 575, pl. 2, figs. 8, 9.—Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 282, fig. 7, pl. 40, figs. 1, 2.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 353, fig. 1660, t, t'.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 738, fig. 1425e.

Beyrichia tumifrons Hall, Desc. n. sp. Fossils, Cincinnati, Ohio, 1871, p. 7, pl. 4, fig. 11; 24th Rep. New York State Mus. Nat. Hist., 1872, p. 231, pl. 8, fig. 11.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 119.—Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 102, pl. 4, fig. 8.

Eden: Cincinnati, Ohio, and vicinity.

Trenton (Snake Hill): Green Island, Albany County, New York.

Plesiotypes.—Cat. No. 41492, U.S.N.M.

Ctenobolbina ciliata cornuta Ruedemann.

Ctenobolbina ciliata cornuta Ruedemann, Bull. New York State Mus., 42, Pal., 1901, p. 575, pl. 2, figs. 5–7.

Trenton (Snake Hill): Mechanicsville, Saratoga County, and Green Island, Albany County, New York.

CTENOBOLBINA CILIATA var. CURTA Ulrich. See Ctenobolbina curta.

CTENOBOLBINA CILIATA var. EMACIATA Ulrich. See Ctenobolbina emaciata.

CTENOBOLBINA CILIATA var. HAMMELLI Cumings. See Ctenobolbina hammelli.

Ctenobolbina crassa (Ulrich).

Jonesella crassa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 123, pl. 7, figs. 11a–c.

Ctenobolbina crassa Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 675, pl. 44, figs. 12–16.—Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, pl. 40, figs. 15, 16.

Black River (Decorah): Minneapolis, Cannon Falls, etc., Minnesota.

Cotypes.—Cat. No. 41497, U.S.N.M.

Ctenobolbina curta (Ulrich).

Ctenobolbina ciliata var. curta Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 109, pl. 7, fig. 2.

Ctenobolbina curta Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 310.

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

Ctenobolbina denticula Ulrich and Bassler.

Ctenobolbina? denticula Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 524, pl. 96, figs. 6–9.

Helderbergian (Keyser): Cumberland, Maryland.

Holotype.—Cat. No. 43307, U.S.N.M.

Ctenobolbina? dubia Ulrich and Bassler.

Ctenobolbina? dubia Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 525, pl. 96, figs. 10–12.

Helderbergian (Keyser): Cumberland, Maryland.

Holotype.—Cat. No. 53277, U.S.N.M.

Ctenobolbina duryi (Miller).

Beyrichia duryi Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 232, figs. 24, 25.—Miller, N. A. Geol. Pal., 1889, p. 534, figs. 976, 977.

Ctenobolbina duryi Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 108.

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

Ctenobolbina emaciata (Ulrich).

Ctenobolbina ciliata var. emaciata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 109, pl. 7, figs. 3a–c.

Ctenobolbina emaciata Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 310, pl. 40, figs. 3–5.

Richmond (Maquoketa): Savannah, Illinois.

Holotype.—Cat. No. 41325, U.S.N.M

Ctenobolbina fulcrata Ulrich.

Ctenobolbina fulcrata Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 674, pl. 44, figs. 8–11.—Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 297, fig. 40, pl. 40, figs. 13, 14.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 353, fig. 1660, r, r′, s.

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

Cotypes.—Cat. No. 41322, U.S.N.M.

Ctenobolbina hammelli (Miller and Faber).

Beyrichia hammelli Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 17, 1894, p. 156, pl. 8, fig. 26.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 787, fig. 1458.

Ctenobolbina hammelli Ulrich and Bassler, Proc. U. S. Nat. Mus. 35, 1908, p. 310.

Ctenobolbina ciliata var. hammelli Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1045, pl. 53, fig. 6.

Richmond (Arnheim-Waynesville): Versailles, etc., Indiana; Lebanon, etc., Ohio.

Ctenobolbina obliqua Ulrich.

Ctenobolbina obliqua Ulrich, Jour. Cincinnati Soc. Nat. Hist., 19, 1900, p. 180, pl. 8, fig. 4.—Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, pl. 40, fig. 10.

Trenton (Prosser): Kenyon, Minnesota.

Holotype.—Cat. No. 41328, U.S.N.M.

Ctenobolbina punctata Ulrich.

Ctenobolbina punctata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1891, p. 186, pl. 12, figs. 5a–c.—Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, pl. 40, figs. 19, 20.

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

Holotype.—Cat. No. 41578, U.S.N.M.

Ctenobolbina suberassa Ulrich.

Ctenobolbina suberassa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 19, 1900, p. 180, pl. 8, figs. 1–3.—Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 293, fig. 27; p. 297, fig. 42, pl. 40, figs. 17, 18.

Stones River (Ridley): High Bridge, Kentucky.

Cotype.—Cat. No. 41316, U.S.N.M.

Ctenobolbina subrotunda Ruedemann.

Ctenobolbina subrotunda Ruedemann, Bull. New York State Mus., 42, Pal., 1901, p. 576, pl. 2, figs. 1–4.

Trenton (Snake Hill): Port Schuyler, New York.

Ctenobolbina tumida Ulrich. See Beyrichia tumida.

Ctenocrinus lævis Roemer. See Melocrinus roemeri.

Ctenocrinus ornatus Hall. See Macrostylocrinus ornatus.

Ctenocrinus striatus Hall. See Macrostylocrinus striatus.

CTENODONTA Salter. Genotype: Tellinomya nasuta Hall.

Nucula Hall (not Lamarck), Geol. Rep. 4th Dist. New York, 1842, p. 76· Amer. Jour. Sci., 48, 1843, p. 292; Pal. New York, 1, 1847, pp. 150, 316.

Lyrodesma Hall (part), Pal. New York, 1, 1847, p. 302.

Ctenodonta Salter, Rep. British Assoc. Adv. Sci., 1851, p. 63; Rep. 21st Meeting, British Assoc. Adv. Sci., Notes and Abstracts, 1852, p. 64; Geol. Surv. Canada, dec. 1, 1859, p. 34.—Winchell, Proc. Acad. Nat. Sci. Philadelphia, 1865, p. 128–129.—Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 308.—Zittel, Handb. d. Pal., 2, 1881, p. 51.—Lesley, Proc. Geol. Assoc. London, 10, 1888, p. 395.—Barrois, Ann. Soc. Geol. Nord, 19, Lille, 1891, p. 184.—Ulrich, Geol Surv. Ohio, 7, 1893, p. 679; Geol. Minnesota, 3, pt. 2, 1894, p. 578.—Whidborne, Mon. Dev. Fauna South England, 3, Pal. Soc., 1896, p. 98.—Koken, Die Leitfossilien, Leipzig, 1896, p. 194.—Hind, Mon. British Carb. Lamellibranchiata, 1, Pal. Soc., 1897, pp. 177, 209.—Dall, Zittel-Eastman Textb. Pal., 1, 1900, p. 363.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 979.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 393.—Dall, Zittel-Eastmann Textb. Pal., 2d ed., 1913, p. 440.

Tellinomya Hall, Pal. New York, 1, 1847, p. 151.—Pictet, Traite de Pal., 2d ed., 3, 1855, p. 534.—Hall, Canadian Nat. Geol., 1, 1856, p. 391; 10th Rep. New York State Cab. Nat. Hist., 1857, pp. 181, 182, (extr., pp. 141, 142); Amer. Jour. Sci. and Arts, 2d ser., 25, 1858, p. 108; Pal. New York, 3, 1859, p. 14, footnote; 12th Rep. New York State Cab. Nat. Hist., 1859, p. 76.—Hitchcock, Geol. Vermont, 1, 1861, p. 295.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, pp. 228, 229.—Salter, Mem. Geol. Surv. Great Britain, 2d ed., 1881, p. 550.—Koninck, Ann. d. Mus., Royal d'Hist. Nat. de Belgique, 11, 1885, p. 138.—Miller, N. A. Geol. Pal., 1889, p. 514.—Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 17, 1894, pp. 148–150.—Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 73.—Hind, Mon. British Carb. Lamellibranchiata, 1, Pal. Soc., 1897, p. 177 (Genotype: T. nasuta Hall).

Not Tellinomya, the correct form of Tellimya Brown, 1827, as given by Agassiz in his "Nomenclator Zoologicus" in 1846.

Palæoconcha Miller, N. A. Geol. Pal., 1889, p. 498 (Genotype: P. faberi Miller).

Ctenodonta abrupta Billings.

Ctenodonta abrupta Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 46, figs. 48a–c (adv. sheets, 1862); Geol. Canada, Geol. Surv. Canada, 1863, p. 143, figs. 79a–c; p. 175, figs. 161a–b.

Tellinomya abrupta Miller, N. A. Geol. Pal., 1889. p. 514 (gen. ref.).

Black River (Leray): Pauquettes Rapids, Ottawa River, Canada.

Ctenodonta? absimilis (Sardeson).

Tellinomya absimilis Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 74, pl. 3, figs. 1, 2.

St. Peter: Highland Park, Minnesota.

Ctenodonta albertina Ulrich.

Ctenodonta albertina Ulrich, Geol. Minnesota, 3, 1894, p. 598, pl. 42, figs. 76–82.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 394, fig. 502m.

Richmond (Waynesville): Clarksville, etc., Ohio,

Cotypes.—Cat. No. 46122, U.S.N.M

Ctenodonta alta (Hall),

Tellinomya alta Hall. Rep. Geol. Surv. Wisconsin, 1861, p. 27.- Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 309, pl. 2, figs. 6a, b.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 50, pl. 6, figs. 5–8.

Ctenodonta alta—Continued.

Ctenodonta alta Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 602, pl. 42, figs. 93, 94.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 394, fig. 502k–l.

Trenton: Mount Carrol, Illinois; Dodgeville, Wisconsin (Galena); Fountain, Minnesota (Prosser).

Plesiotype.—Cat. No, 46123, U.S.N.M.

Ctenodonta angela Billings.

Ctenodonta Angela Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 221, fig. 203.

Tellinomya Angela Miller, N. A. Geol. Pal., 1889, p. 514 (gen. ref.).

Chazyan (Quebec—M): Table Head, Newfoundland.

Ctenodonta? angustata (Hall).

Tellinomya angustata Hall, Canadian Nat. Geol., 5, 1860, p. 152.

Silurian: Arisaig, Nova Scotia.

Ctenodonta astartæformis Salter.

Ctenodonta astartæformis Salter, Geol. Surv. Canada, dec. 1, 1859, p. 39, pl. 8, figs. 7, 7a.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 175, figs. 164 a, b.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 184 (loc. ccc.).—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 394.

Ctenodonta cf. astartæformis Ruedemann, Bull. New York State Mus., 49, 1901, p. 28.

Tellinomya astartæformis Miller, N. A. Geol. Pal., 1889, p. 515 (gen. ref.).

Black River: Allumette Island, Ottawa River, Canada (Leray); Lake Winnipeg, Manitoba.

Ctenodonta? attenuata (Hall).

Tellinomya attenuata Hall, Canadian Nat. Geol., 5, 1860, p. 151.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1164.

Silurian: Arisaig, Nova Scotia.

Ctenodonta auburnensis Branson.

Ctenodonta auburnensis Branson, Trans. Acad. Sci. St. Louis, 18, No. 4, 1909, p. 40, pl. 7, figs. 2–4.

Black River (Auburn-Decorah): Lincoln County, Missouri.

Ctenodonta baffinensis Ulrich.

Ctenodonta baffinensis Ulrich in Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 161, pl. 13, figs. 7–10.

Mohawkian: Head of Frobisher Bay, Baffin Land.

Ctenodonta bidorsata Raymond.

Ctenodonta? bidorsata Raymond, Ann. Carnegie Mus., 3, 1906, p. 577.

Chazyan (Crown Point): Valcour Island, New York.

Ctenodonta calvini Ulrich.

Ctenodonta calvini Ulrich, Geol. Minnesota, 3, 1894, p. 596, pl. 42, figs. 61–64.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 394, fig. 502n.

Tellinomya calvini Miller, N. A. Geol. Pal., 1897, p. 785 (gen. ref.).

Richmond (Maquoketa): Graf, etc., Iowa; Scales Mound, Illinois.

Cotypes.—Cat. No. 46124, U.S.N.M.

Ctenodonta candens (Sardeson).

Tellinomya candens, Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, 1892, p. 339, pl. 6, fig. 24; p. 343.

Black River (Decorah): Minneapolis, Minnesota.

Ctenodonta carinata Ulrich.

Ctenodonta carinata Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 589, pl. 42, figs. 41–43.

Tellinomya carinata Miller, N. A. Geol. Pal., 2d App., 1897, p. 785 (gen. ref.).

Trenton (Prosser): East of Fountain, Minnesota.

Cotypes.—Cat. No. 46124, U.S.N.M.

Ctenodonta carpenderi Schuchert.

Ctenodonta carpenderi Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 160, pl. 13, figs. 1–3.

Mohawkian: Head of Frobisher Bay, Baffin Land.

Cotypes.—Cat. No. 28164, U.S.N.M.

Ctenodonta cingulata (Ulrich).

Tellinomya cingulata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 23, pl. 7, figs. 19, 19a.

Ctenodonta cingulata Ulrich, Geol. Surv. Ohio, 7, 1893, p. 680, pl. 48, figs. 10–12.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 997, pl. 44, figs. 5, 5a.

Richmond: Marble Hill, near Madison, Indiana; Dayton, Ohio; Boyle and Oldham Counties, Kentucky.

Holotype and *plesiotypes.*—Cat. Nos. 46126, 46127, U.S.N.M

Ctenodonta clarkei Bassler (new name).

Tellinomya pulchella Clarke (not Hall, 1856), Archivos Mus. Nac. Rio de Janeiro, 10, author's Engl. ed., 1900, p. 17, pl. 2, figs. 13–15.

Silurian: Rio Trombetas, Brazil.

Ctenodonta clintonensis (Foerste).

Tellinomya (Nucula?) Clintonensis Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 563, pl. 37, fig. 15.

Clinton: Near Mifflintown, Juniata County, Pennsylvania.

Ctenodonta compressa (Ulrich).

Tellinomya compressa Ulrich, 19th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1892, p. 216, fig. 2.

Ctenodonta compressa Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 600, pl. 37, fig. 29; pl. 42, figs. 88–90.

Black River (Decorah): Goodhue County, Minnesota.

Holotype and *plesiotypes.*—Cat. No. 46128, U.S.N.M.

Ctenodonta contracta Salter.

Ctenodonta contracta Salter, Geol. Surv. Canada, dec. 1, 1859, p. 37, pl. 8, figs. 4, 5.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 175, fig. 160a, b.

Tellinomya contracta Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 76, pl. 11, 1884, figs. 15, 15a.

Tellinomya cuneata Hall, 10th Rep. New York State Cab. Nat. Hist., 1857, p. 183 (ext., p. 143), figs. 6, 7 (not described; probably in error for contracta); Rep. Geol. Surv. Wisconsin, 1862, p. 38, figs. 1, 2.

Black River (Leray): Pauquettes Rapids, Ottawa River, etc., Canada.

Upper Pogonip: Eureka and White Pine Districts, Nevada.

Plesiotype.—Cat. No. 17284, U. S. N.M. (Walcott).

Ctenodonta costata Branson.

Ctenodonta costata Branson, Trans. Acad. Sci. St. Louis, 18, No. 4, 1909, p. 40, pl. 7, figs. 7, 8.

Black River (Auburn-Decorah): Lincoln County, Missouri.

Ctenodonta cuneiformis Ulrich.

Ctenodonta cuneiformis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 587, pl. 42, figs. 31–33.

Tellinomya cuneiformis Miller, N. A. Geol. Pal., 1897, p. 785 (gen. ref.).

Black River (Decorah): Six miles south of Cannon Falls, Minnesota.

Cotypes.—Cat. No. 46129, U.S.N.M.

Ctenodonta curta (Hall).

Tellinomya curta Hall, Pal. New York, 2, 1852, p. 86, pl. 27, figs. 10, 13.

Lower Clinton: Wolcott, Wayne County, New York.

Ctenodonta declivis Ruedemann.

Ctenodonta declivis Ruedemann, Bull. New York State Mus., 162, 1912, p. 101, pl. 6, figs. 2, 3.

Trenton (Snake Hill): Snake Hill, Saratoga County, New York.

Ctenodonta diminuens (Simpson).

Tellinomya (Palæoneilo) diminuens Simpson, Trans. Amer. Philos. Soc., n. s., 16, 1889, p. 453, fig. 22.—Simpson in Lesley Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1165, fig.

Tellinomya cuneata Simpson in Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1164, fig.

Tellinomya (Palæoneilo) cuneata Simpson, Trans. Amer. Philos. Soc., n. s., 16, 1889, p. 453, fig. 21.

Clinton: Near Lewistown and Orbisonia, Pennsylvania.

Ctenodonta donaciformis (Hall).

Nucula? donaciformis Hall, Pal. New York, 1, 1847, p. 316.

Tellinomya donaciformis Hall, Canadian Nat. Geol., 1, 1856, p. 395 (gen. ref.).

Ctenodonta donaciformis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 581 (gen. ref.).

Trenton: Middleville, New York.

Ctenodonta dubia (Hall).

Tellinomya dubia Hall, Pal. New York, 1, 1847, p. 153, pl. 34, figs. 6a–f; Canadian Nat. Geol., 1, 1856, p. 392, figs. 4, 5.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1165, figs.

Lyonsia dubia Emmons, Amer. Geology, 1, pt. 2, 1855, p. 170, pl. 14, figs. 7, 8, 12, 13.

Ctenodonta dubia Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 175, fig. 163a, b.

Trenton: Middleville, Watertown, Trenton Falls, etc., New York.

Ctenodonta dubiaformis Raymond.

Ctenodonta dubiaformis Raymond, Amer. Jour. Sci., 20, 1905, p. 371.

Chazyan (Crown Point): Sloop Bay, Valcour Island, New York.

Ctenodonta elliptica (Hall).

Tellinomya elliptica Hall, Pal. New York, 2, 1852, p. 102, pl. 30, fig. 4b.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1165, fig.—Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 562, pl. 37, figs. 4a–c.

Upper Clinton: Near Mohawk, New York.

Upper Medinan (Brassfield): Todds Fork near Wilmington, Ohio.

Ctenodonta equilatera (Hall).

Tellinomya? equilatera Hall, Pal. New York, 2, 1852, p. 330, pl. 75, fig. 1a–d.—Grabau, Bull. New York State Mus., 92, 1906, p. 109, fig. 15.

Ctenodonta equilatera—Continued.

Tellinomya (Ctenodonta) equilatera Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 520 (gen. ref.).

Ctenodonta equilatera Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 395.

Cayugan (Cobleskill): Schoharie, New York.

Ctenodonta fecunda (Hall).

Nucula (Tellinomya) fecunda Hall, Geol. Surv. Wisconsin, 1, 1862, p. 55, fig. 1.

Ctenodonta fecunda Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 595, pl. 42, figs. 67–73.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 394, fig. 502g–h.

Richmond (Maquoketa): Dubuque, Iowa; Scales Mound, Illinois; Wisconsin; Minnesota.

Plesiotypes.—Cat. No. 46130, U.S.N.M.

Ctenodonta filistriata Ulrich.

Tellinomya levata Hall and Whitfield (not Hall, 1847), Pal. Ohio, 2, 1875, p. 82.

Ctenodonta filistriata Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 599, fig. 44a–e.

Eden: Covington, Kentucky, and vicinity.

Cotypes.—Cat. No. 46131, U.S.N.M.

Ctenodonta frobisherensis Schuchert.

Ctenodonta frobisherensis Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 161, pl. 13, figs. 11–14.

Mohawkian: Head of Frobisher Bay, Baffin Land.

Cotypes.—Cat. No. 28165, U.S.N.M.

Ctenodonta gibberula Salter.

Ctenodonta gibberula Salter, Canadian Org. Rem., dec. 1, 1857, p. 38, pl. 8, fig. 6.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 587, pl. 42, fig. 37; fig. 44f–g, p. 599.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 393, fig. 502c–d.

Tellinomya ventricosa Hall, Rep. Sup. Geol. Surv. Wisconsin, 1861, p. 27; Rep. Geol. Surv. Wisconsin, 1862, p. 38, fig. 4.—Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 307, pl. 2, figs. 7a–c.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 156.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 51, pl. 6, figs. 1–4.

Black River: Pauquette Rapids, etc., Canada (Leray), Beloit, Wisconsin; Minnesota; Illinois; Iowa; etc.

Stones River (Murfreesboro): Murfreesboro, Tennessee.

Plesiotype.—Cat. No. 46132, U.S.N.M.

Ctenodonta gibbosa (Hall).

Tellinomya gibbosa Hall, Pal. New York, 1, 1847, p. 153, pl. 34, figs. 5a,b.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1168, figs.

Tellinomya (Ctenodonta) gibbosa Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 520 (gen. ref.).

Lyonsia gibbosa Emmons, Amer. Geology, 1, pt. 2, 1855, p. 170, pl. 14, fig. 3.

Ctenodonta gibbosa Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 176, fig. 165.

Trenton: Middleville, New York.

Ctenodonta hamburgensis (Walcott).

Tellinomya Hamburgensis Walcott, Mon. U. S. Geol Surv., 8, 1884, p. 76, pl. 11, figs. 1, 1a.

Ctenodonta hamburgensis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 605, pl. 42, figs. 91, 92.

Upper Pogonip: Eureka District, Nevada.

Black River (Decorah): Chatfield, Minnesota.

Holotype and *plesiotype.*—Cat. Nos. 17286, 46133, U.S.N.M.

Ctenodonta hartsvillensis Safford.

Ctenodonta Hartsvillensis Safford, Geol. Tennessee, 1869, p. 287, pl. 2 (F), figs. 3a–f.

Tellinomya (Ctenodonta) hartsvillensis Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1168, figs.

Trenton: Hartsville, etc., Tennessee (Catheys); Kentucky (Flanagan).

Ctenodonta? hilli (Miller).

Tellinomya hilli Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 230, fig. 20; N. A. Geol. Pal., 1889, p. 515, fig. 931.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1021, pl. 48, fig. 6.

Ctenodonta? hilli Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 581 (gen ref.).

Richmond (Whitewater-Saluda): Near Osgood, Indiana.

Ctenodonta inflata (Hall).

Tellinomya inflata Hall, Rep. Geol. Surv. Wisconsin, 1861, p. 26; 1862, p. 38, figs. 4, 5.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 49, pl. 6, figs. 10–12.

Black River (Platteville): Mineral Point, Wisconsin.

Ctenodonta intermedia (Ulrich).

Tellinomya intermedia Ulrich, 19th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1892, p. 218, text fig. 4.

Ctenodonta intermedia Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 601, pl. 42, figs. 95–97.

Trenton (Prosser): Wykoff, etc., Minnesota.

Cotypes.—Cat. No. 46134, U.S.N.M.

Ctenodonta iphigenia Billings.

Ctenodonta Iphigenia Billings, Geol Canada, Geol. Surv. Canada, 1863, p. 216, fig. 221; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 152, fig. 132 (adv. sheets 1862).

Tellinomya Iphigenia Miller, N. A. Geol. Pal., 1889, p. 515 (gen. ref.).

Richmond: Cape Smyth, Lake Huron.

Ctenodonta jerseyensis Weller.

Ctenodonta jerseyensis Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 164, pl. 11, fig. 17.

Black River (Jacksonburg): Jacksonburg, New Jersey.

Ctenodonta? lata (Hall).

Tellinomya lata Hall, Pal. New York, 2, 1852, p. 85, pl. 27, fig. 7.

Clinton: Wolcott, New York.

Ctenodonta levata (Hall).

Nucula levata Hall, Pal. New York, 1, 1847, p. 150, pl. 34, figs. 1a–i.—McCoy, Brit. Pal. Rocks and Foss., 1854, p. 285, pl. 1 K, figs. 4, 5.

Leda levata Emmons, Amer. Geology, 1, pt. 2, 1855, p. 173, pl. 14, fig. 10.

Tellinomya levata Hall, Canadian Nat. Geol., 1, 1856, p. 395 (gen. ref.).—Hitchcock, Geol. Vermont, 1, 1861, p. 295.—Hall, Desc. N. Sp. Fossils, Cincinnati, Ohio, 1871, pl. 3, fig. 27.—Emerson, Narrative Hall's 2d Arctic Exped., U. S. Navy Dep., 1879, p. 578, fig. 3.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1168, figs.

Tellinomya (Ctenodonta) levata Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 521 (gen. ref.).

Ctenodonta levata—Continued.

Ctenodonta levata Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 175, figs. 162a, b.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 165, pl. 11, figs. 18–22.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 394.—Ruedemann, Bull. New York State Mus., 162, 1912, p. 100, pl. 6, fig. 1.

Trenton: Middleville, Trenton Falls, etc., New York; New Jersey; Pennsylvania; Kentucky, etc.

CTENODONTA LIMBATA Raymond. See Vanuxemia limbata.

CTENODONTA LOGANI Salter (part). See Ctenodonta nasuta.

Ctenodonta logani Salter.

Tellinomya dubia Hall (not Hall, 1847), 10th Ann. Rep. Reg. Univ. New York, 1857, p. 183, figs. 4, 5.

Ctenodonta logani Salter, Canadian Org. Rem., dec. 1, 1859, p. 36, pl. 8, figs. 3, 3a.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 591, pl. 42, figs. 26–28.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 394, fig. 502a–b.

Black River: Pauquettes Rapids, Ottawa River, etc., Canada (Leray); Beloit, Wisconsin (Platteville).

Ctenodonta longa (Ulrich).

Tellinomya longa Ulrich, Amer. Geol., 10, 1892, p. 103, pl. 7, figs. 17, 18.

Ctenodonta longa Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 590, pl. 38, figs. 30, 31.

Black River (Decorah): Goodhue County, Minnesota.

Holotype.—Cat. No. 46135, U.S.N.M.

Ctenodonta lorrainensis Foerste.

Ctenodonta lorrainensis Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 305, pl. 3, figs. 8a–b.

Cincinnatian (Pulaski): Near Worthville and Lorraine, New York; Chambly, Quebec.

Ctenodonta machæriformis (Hall).

Nucula machæriformis Hall, Geol. Rep. 4th Dist. New York, 1843, p. 76, fig. 2; tab. ill. 8, fig. 2.—Owen, Amer. Jour. Sci. and Arts, 48, 1845, p. 306, fig. 2.

Tellinomya machæriformis Hall, Pal. New York, 2, 1852, p. 85, pl. 27, figs. 8a–d, 9.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1169, fig.

Ctenodonta machæriformis Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 394.

Cypricardia? angusta Hall, Nat. Hist. New York, Geol., 4, 1843, p. 76, fig. 6; tab. ill. 8, fig. 6.—Owen, Amer. Jour. Sci. and Arts, 48, 1845, p. 306, fig. 6.

Cypricardites angustus Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 178, fig.

Lower Clinton: Wolcott, New York.

Ctenodonta mactriformis (Hall).

Nucula mactræformis Hall, Nat. Hist. New York, Geol., 4, 1843, p. 76, fig. 4; tab. ill. 8, fig. 4.

Nucula mactriformis Owen, Amer. Jour. Sci. and Arts, 48, 1845, p. 306. fig. 4.

Tellinomya mactriformis Miller, N. A. Geol. Pal., 1889, p. 515 (gen. ref.)—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1169, fig.

Lower Clinton: New York.

Ctenodonta madisonensis Ulrich.

Ctenodonta madisonensis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 597, pl. 42, figs. 65–66.

Richmond (Arnheim): Madison, Indiana.

Holotype.—Cat. No. 46136, U.S.N.M.

Ctenodonta medialis Ulrich.

Ctenodonta medialis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 593, pl. 42, figs. 50–52.

Black River (Decorah): Minneapolis, and near Cannon Falls Minnesota; Lincoln County, Missouri.

Cotypes.—Cat. Nos. 46137, 46138, U.S.N.M.

Ctenodonta minima (Foerste).

Nucula minima Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 93, pl. 14, figs. 8a–c.

Tellinomya (Nucula?) minima Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 563, pl. 26, figs. 8a–c; pl. 37, figs. 13a–c.

Upper Medinan (Brassfield): Huffman's Quarry, near Dayton, Ohio.

Ctenodonta nasuta (Hall).

Tellinomya nasuta Hall, Pal. New York, 1, 1847, p. 152, pl. 34, figs. 3a–c.—Pictet, Traite de Pal., 2d ed., 3, 1855, p. 534, pl. 79, fig. 19.—Hall, Canadian Nat. Geol., 1, 1856, p. 392, figs. 1–3; 10th Rep. New York State Cab. Nat. Hist., 1857, p. 183 (ext., p. 143), fig. 2 (part).—Hitchcock, Geol. Vermont, 1, 1861, p. 296, fig. 204.—Whitfield, Geol. Wisconsin, 4, 1882, p. 207, pl. 5, fig. 12.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 156, fig.—Miller, N. A. Geol. Pal., 1889, p. 515, fig. 932.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1169, fig.—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 446, pl. 10, fig. 1.

Tellinomya (Ctenodonta) nasuta Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 521 (gen. ref.).

Lyonsia nasuta Emmons, Amer. Geology, 1, pt. 2, 1855, p. 170, fig. 40.

Ctenodonta logani Salter, (not Salter, 1859), Rep. Brit. Assoc. Adv. Sci., 1851 p. 63.

Ctenodonta nasuta Salter, Canadian Org. Rem., dec. 1, 1859, p. 35, pl. 8, figs. 1, 2.—Billings, Canadian Nat. Geol., 4, 1859, p. 446; Geol. Canada, Geol. Surv. Canada, 1863, p. 176, figs. 166a, b.—Roemer, Leth. geog., 1, Leth. Pal., Atlas, 1876, pl. 4, fig. 15a.—Œhlert, Bull. Soc. Geol. France, 3d ser., 16, 1888, p. 663, pl. 16, figs. 3–3b.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 584, pl. 42, fig. 30.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 163, pl. 11, fig. 1.—Whiteaves, Ottawa Naturalist, 22, 1908, p. 106.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 393, fig. 502o.

Trenton: Trenton Falls, etc., New York.

Black River: Pauquettes Rapids, Ottawa River, etc., Canada; New Jersey; Indiana; Wisconsin; Missouri; Illinois; Minnesota; etc.

Plesiotype.—Cat. No. 46137, U.S.N.M.

Ctenodonta nasuta robusta Ulrich.

Tellinomya nasuta Hall (part), 10th Rep., New York State Cab. Nat. Hist., 1857, p. 183, figs. 1, 3.

Ctenodonta nasuta var. robusta Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 585, pl. 42, fig. 30.

Black River: Beloit, Wisconsin (Platteville); Pauquettes Rapids, Ottawa River, Canada (Leray).

Holotype.—Cat. No. 46140, U.S.N.M.

Ctenodonta nitida (Ulrich).

Tellinomya nitida Ulrich, 19th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1892, p. 215, fig. 1.

Ctenodonta nitida—Continued.

Ctenodonta nitida Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 592, pl. 42, figs. 44–49.

Black River (Decorah): Minneapolis, etc., Minnesota.

Cotypes.—Cat. No. 46141, U.S.N.M.

Ctenodonta novicia (Sardeson).

Tellinomya novicia Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 74, pl. 3, fig. 3.

St. Peter: South St. Paul and Daytons Bluff, Minnesota.

Ctenodonta? nucleiformis (Hall).

Tellinomya nucleiformis Hall, Pal. New York, 3, 1859, p. 263, pl. 49, fig. 1.

Cayugan (Manlius): Winfield, Herkimer County, New York.

Ctenodonta nuculiformis (Hall).

Modiolopsis? nuculiformis Hall, Pal. New York, 1, 1847, p. 298, pl. 82, figs. 5a, b.

Tellinomya nuculiformis Miller, N. A. Geol. Pal., 1889, p. 515 (gen. ref.).

Lyonsia nuculiformis Emmons, Amer. Geology, 1, pt. 2, 1855, p. 172.

Ctenodonta nuculiformis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 581 (gen. ref.).

Utica: Turin and Waterford, New York.

Ctenodonta obliqua (Hall).

Nucula obliqua Hall, Amer. Jour. Sci. and Arts, 43, 1845, p. 292.

Tellinomya? obliqua Meek, Pal. Ohio, 1, 1873, p. 139, pl. 11, figs. 11a–c.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 229.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1169, figs.

Ctenodonta obliqua Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 604, pl. 42, figs. 83–87.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 394, fig. 502i–j.

Palæoconcha obliqua Miller, N. A. Geol. Pal., 1889, p. 498 (gen. ref.).

Palæoconcha faberi Miller, N. A. Geol. Pal., 1889, p. 498, fig. 878.—Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 17, 1894, p. 150.

Trenton-Richmond: Cincinnati, Ohio, and vicinity; Kentucky; Tennessee; Illinois; Iowa; etc.

Plesiotypes.—Cat. No. 46142, 46143, U.S.N.M.

Ctenodonta ohioensis Bassler (new name).

Tellinomya (Nucula?) socialis Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 563, pl. 37, figs. 12a–c.

Upper Medinan (Brassfield): Near Dayton, Ohio.

Ctenodonta ovata (Hall).

Tellinomya ovata Hall, Rep. Sup. Geol. Surv. Wisconsin, 1861, p. 28.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 52, pl. 6, fig. 9.

Ctenodonta ovata Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 581 (gen. ref.).

Black River (Platteville): Beloit, Wisconsin.

Ctenodonta oviformis Ulrich.

Ctenodonta oviformis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 586, pl. 42, fig. 29.

Trenton (Prosser): Near Cannon Falls, Minnesota.

Black River (Auburn): Lincoln County, Missouri.

Holotype.—Cat. No. 46144, U.S.N.M.

Ctenodonta parvidens Raymond.

Ctenodonta parvidens Raymond, Amer. Jour. Sci., 20, 1905, p. 372.—Whiteaves, Ottawa Nat., 22, 1908, p. 113, pl. 3, fig. 16.

Chazyan (Aylmer): Hog Back, Ottawa, Ontario.

Ctenodonta pectunculoides (Hall).

Tellinomya pectunculoides Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 228, pl. 7, fig. 26. (Separate, 1871, p. 4, pl. 3, fig. 26.)—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 229.—Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 81, pl. 1, fig. 24.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1169, fig.

Eden-Maysville: Cincinnati, Ohio, and vicinity.

Ctenodonta peracuta Raymond.

Ctenodonta peracuta Raymond, Amer. Jour. Sci., 20, 1905, p. 371.

Chazyan (Crown Point, Valcour): Sloop Bay, Valcour Island, New York.

Ctenodonta perminuta Ulrich.

Ctenodonta perminuta Ulrich, Geol. Surv. Ohio, 7, 1893, p. 680, pl. 46, figs. 11–14.

Eden-Maysville: Cincinnati, Ohio, and vicinity.

Cotypes.—Cat. No. 46145, U.S.N.M.

Ctenodonta planodorsata (Ulrich).

Tellinomya planodorsata Ulrich, 19th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1892, p. 217, fig. 3.

Ctenodonta planodorsata Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 589, pl. 37, figs. 25–28; pl. 42, figs. 38–40.

Black River (Decorah): Cannon Falls, etc., Minnesota.

Holotype and *plesiotypes.*—Cat. No. 46146, U.S.N.M.

Ctenodonta prosseri Ruedemann.

Ctenodonta prosseri Ruedemann, Bull. New York State Mus., 162, 1912, pl. 6, figs. 4, 5.

Trenton (Snake Hill): Snake Hill, etc., Saratoga and Albany Counties, New York.

Ctenodonta pulchella (Hall).

Lyrodesma pulchella Hall, Pal. New York, 1, 1847, p. 302, pl. 82, figs. 12a–d.

Tellinomya pulchella Hall, Canadian Nat. Geol., 1, 1856, p. 395 (gen. ref.).

Leda pulchella Emmons, Amer. Geology, 1, pt. 2, 1855, p. 173.

Ctenodonta pulchella Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 581 (gen. ref.).

Trenton: Near Watertown, etc., New York.

Ctenodonta radiata Ruedemann.

Ctenodonta radiata Ruedemann, Bull. New York State Mus., 162, 1912, p. 102, pl. 6, fig. 6.

Trenton (Snake Hill): Snake Hill, Saratoga County, New York.

Ctenodonta recta Ruedemann.

Ctenodonta recta Ruedemann, Bull. New York State Mus., 162, 1912, p. 102, pl. 6, figs. 7, 8.

Trenton (Snake Hill): Snake Hill, Saratoga County, New York.

Ctenodonta recurva (Ulrich).

Tellinomya recurva Ulrich, 19th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1892, p. 221, fig. 7.

Ctenodonta recurva Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 603, pl. 42, figs. 98–101.

Richmond: Spring Valley, etc.; Minnesota; Oxford, Waynesville, etc., Ohio; Richmond, Indiana.

Cotypes.—Cat. No. 46147, U.S.N.M.

Ctenodonta retrorsa Ulrich.

Ctenodonta retrorsa Ulrich, Geol. Surv. Ohio, 1893, p. 679, pl. 50, figs. 14, 15.
Trenton (Hermitage): Near Burgin, Kentucky.
Holotype.—Cat. No. 46149, U.S.N.M.

Ctenodonta sanguinolaroidea (Hall).

Tellinomya sanguinolaroidea Hall, Pal. New York, 1, 1847, p. 152, pl. 34, figs. 4a, b.
Tellinomya (Ctenodonta) sanguinolaroidea Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 521 (gen. ref.).
Lyonsia sanguinolaroidea D'Orbigny, Prodr. Pal., 1, 1850, p. 10 (gen. ref.).—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 170, pl. 14, fig. 2.
Trenton: Canajoharie and Middleville, New York.

Ctenodonta scofieldi Ulrich.

Ctenodonta scofieldi Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 593, pl. 42, figs. 53–58.
Tellinomya scofieldi Miller, N. A. Geol. Pal., 2d App., 1897, p. 785 (gen. ref.).
Black River (Decorah): Cannon Falls and Minneapolis, Minnesota.
Cotypes.—Cat. Nos. 46150, 46151, U.S.N.M.

Ctenodonta similis (Ulrich).

Tellinomya similis Ulrich, 19th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, March, 1892, p. 220, fig. 6.
Ctenodonta similis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 604, pl. 42, figs. 102–106.
Tellinomya (Nucula) lepida Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, April, 1892, p. 339, pl 6, figs. 18–20.
Richmond: Spring Valley, etc., Minnesota; Blanchester, Ohio.
Cotypes and *plesiotypes.*—Cat. Nos. 46147, 46152, U.S.N.M.

Ctenodonta simulatrix Ulrich.

Ctenodonta simulatrix Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 600, pl. 42, figs. 74, 75.
Richmond (Maquoketa): Near Spring Valley, Minnesota.
Holotype.—Cat. No. 46153, U.S.N.M.

Ctenodonta sinuosa (Simpson).

Nucula sinuosa Simpson, Trans. Amer. Phil. Soc., n. s., 16, 1890, p. 451, fig. 19.
Clinton: Seven miles northwest of Lewistown, Pennsylvania.

Ctenodonta socialis Ulrich.

Ctenodonta socialis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 594, pl. 42, figs. 59, 60.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 394, fig. 502e–f.
Tellinomya socialis Miller, N. A. Geol. Pal., 2d App., 1897, p. 785 (gen. ref.).
Black River (Decorah): Minneapolis, Chatfield, etc., Minnesota.
Trenton (Hermitage): Central Kentucky.
Cotypes.—Cat. Nos. 46154, 46155, U.S.N.M.

Ctenodonta subcuneata Ruedemann.

Ctenodonta subcuneata Ruedemann, Bull. New York State Mus., 162, 1912, p. 103, pl. 6, figs. 9, 10.
Trenton (Snake Hill), Snake Hill, Saratoga County, New York.

Ctenodonta subelliptica Savage.

Ctenodonta subelliptica Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 93, pl. 5, fig. 25.

Upper Medinan (Edgewood): Near Edgewood, Missouri.

Ctenodonta subnasuta Ulrich.

Ctenodonta subnasuta Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 585, pl. 42, figs. 34–36.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 185.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 160, pl. 13, figs. 4–6.

Trenton: Near Cannon Falls, Minnesota (Prosser); Lake Winnipeg and Baffin Land, Canada.

Holotype and *plesiotype*.—Cat. Nos. 46156, 28163, U.S.N.M.

Ctenodonta subovata Whiteaves.

Ctenodonta subovata Whiteaves, Ann. Rep. Geol. Surv. Canada, n. s., 14, App. F, 1904, p. 47; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 256, pl. 27, figs. 9, 9a.

Niagaran: Ekwan River, Canada.

Ctenodonta subrecta (Clarke).

Tellinomya subrecta Clarke, Archivos. Mus. Nac. Rio de Janeiro, 10, author's Eng. ed., 1900, p. 17, pl. 2, fig. 16.

Silurian: Rio Trombetas, Brazil.

Ctenodonta subrotunda (Ulrich).

Tellinomya subrotunda Ulrich, 19th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1892, p. 219, fig. 5.

Ctenodonta subrotunda Hayes and Ulrich, U. S. Geol. Surv. Folio 95, illus. sheet, 1903, figs. 40, 41.

Trenton: Mercer County, Kentucky (Curdsville); near Cannon Falls, Minnesota (Prosser); Tennessee (Bigby).

Holotype.—Cat. No. 46157, U.S.N.M.

Ctenodonta subtrigona (Simpson).

Nucula subtrigona Simpson in Lesley, Geol. Surv. Pennsylvania, Rep. P 4, p. 472, figs.; Trans. Amer. Phil. Soc., n. s., 16, p. 452, fig. 20.

Clinton: Orbisonia, Huntington County, Pennsylvania.

CTENOPLEURON Matthew. Genotype: C. nerepisense Matthew.

Ctenopleuron Matthew, Trans. Royal Soc. Canada, 3d ser., 1, sec. 4, 1907, p. 7.

Ctenopleuron nerepisense Matthew.

Ctenopleuron nerepisense Matthew, Trans. Royal Soc. Canada, 3d ser., 1, sec. 4, 1907, p. 7, 1 pl.

Clinton??: Cunningham Brook, near Nerepis Station, Kings County, New Brunswick.

CTENOPTERUS Clarke and Ruedemann. See Stylonurus subgenus Ctenopterus.

CTENOPYGE Linnarsson. Genotype: Olenus (Sphærophthalmus) pecten Salter.

Ctenopyge Linnarsson, Geol. Fören. Stockholm Forh., 5, 1880, p. 145; Sver. Geol. Unders., ser. C, No. 43, 1880, p. 15.—Brögger, Die sil. Etagen 2–3, Kristiania, 1882, p. 113.—Zittel, Handb. d. Pal., 2, 1885, p. 596.—Matthew Trans. Royal Soc. Canada, 9, sec. 4, 1892, p. 55.—Koken, Die Leitfossilien, Leipzig, 1896, p. 20, fig. 11; figs. 7, 14.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., No. 8, 1901, pp. 26, 29.—Lake, Paleontographical Soc., 1913, p. 78.

Ctenopyge acadica Matthew.

Ctenopyge acadica Matthew, Trans. Royal Soc. Canada, 11, sec. 4, 1894, p. 109, pl. 17, figs. 13a–e.

Canadian (Bretonian—Div. C3b): St. John, New Brunswick.

CTENOPYGE FLAGELLIFER Angelin. See Sphærophthalmus flagellifer.

Ctenopyge? lobata (Brögger).

Leptoplastus (Ctenopyge?) lobata Brögger, Die sil. Etagen 2–3, Kristiania, 1882, p. 121, pl. 12, fig. 11.

Ctenopyge lobata? Matthew, Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, p. 223.

Lower Ordovician: Europe; McNeil Brook, Cape Breton, Nova Scotia (Bretonian—Div. C3b).

Ctenopyge pecten (Salter).

Olenus (Sphærophthalmus) pecten Salter, Mem. Geol. Surv., dec. 11, 1864, p. 9, pl. 8, figs. 11, 13; Quart. Jour. Geol. Soc. London, 21, 1865, p. 481, figs. 4, 5.

Ctenopyge pecten Linnarsson, Geol. For. Stockholm Forh., 5, 1880, p. 146 (cites bibliography); Afh. Sveriges Geol. Unders, ser. C, No. 43, 1880, p. 16, pl. 2, figs. 3–9.—Lake, Paleontographical Soc., 1913, p. 85 (see for complete bibliography).

Lower Ordovician: Great Britain; East Bay, east of Bras d'Or Lake, Cape Breton, Nova Scotia; St. John, New Brunswick (Bretonian—Div. C3a, b).

Ctenopyge spectabilis (Brögger).

Leptoplastus (Ctenopyge) spectabilis Brögger, Die sil. Etagen 2–3, Kristiania, 1882, p. 120, pl. 2, fig. 18a, b; pl. 12, fig. 12a–c.

Ctenopyge spectabilis var. Matthew, Trans. Royal Soc. Canada, 9, sec. 4, 1892, p. 57, pl. 13, figs. 13a, b.

Ctenopyge spectabilis Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 34, No. 8, 1901, p. 51.

Lower Ordovician: Europe; St. John, New Brunswick (Bretonian—Div. C3b).

CUNEAMYA Hall and Whitfield. Genotype: C. miamiensis Hall and Whitfield.

Cuneamya Hall and Whitfield, Pal. Ohio, 2, 1875, p. 90.—Zittel, Handb. Pal., 2, 1881, p. 128.—Miller, N. A. Geol. Pal., 1889, p. 473.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 620.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 378.

Cuneamya acutifrons Ulrich.

Cuneamya acutifrons Ulrich in Ruedemann, Bull. New York State Mus., 162, 1912, p. 106, pl. 6, figs. 15, 16, text fig. 30.

Trenton: Covington, Kentucky; Snake Hill, Saratoga County, New York (Snake Hill).

Holotype.—Cat. No. 47314, U.S.N.M.

Cuneamya alveata Whitfield and Hovey.

Orthonota curta? Hall (not Hall, 1843), Pal. New York, 2, 1852, pp. 86, 285, pl. 27, figs. 11a, b; pl. 59, fig. 8.

Cuneamya alveata Whitfield and Hovey, Bull. Amer. Mus. Nat. Hist., 11, 1899, pt. 2, p. 188.

Lower Clinton: Walcott, New York.

Cuneamya? caswelli (Foerste).

Grammysia Caswelli Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 92, pl. 14, figs. 12a, b.

Cuneamya? caswelli—Continued.

Cypricardites Caswelli Foerste, Geol. Surv. Ohio Pal., 7, 1893, p. 561, pl. 26, figs. 12a, b; pl. 37, figs. 1a–c.

Upper Medinan (Brassfield): Soldier's Home, near Dayton, Ohio.

Cuneamya coriformis Miller.

Cuneamya coriformis Miller, N. A. Geol. Pal., 1889, p. 474, figs. 805, 806.

Maysville (McMillan): Cincinnati, Ohio.

Cuneamya curta Whitfield.

Cuneamya curta Whitfield, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 138, pl. 6, figs. 6, 6a.—Ulrich, Geol. Minnesota, 3, 1894, pt. 2, p. 477, fig. 35.

Richmond (Waynesville): Clarksville, etc., Ohio.

Plesiotype.—Cat. No. 46158, U.S.N.M.

Cuneamya elliptica Miller.

Cuneamya elliptica Miller, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 317, pl. 8, figs. 3, 3a.

Maysville (McMillan): Cincinnati, Ohio.

Cuneamya miamiensis Hall and Whitfield.

Cuneamya Miamiensis Hall and Whitfield, Geol. Surv. Ohio Pal., 2, 1875, p. 91, pl. 2, figs. 9, 10.—Miller, N. A. Geol. Pal., 1889, p. 474, figs. 807, 808.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 378, fig. 481.

Richmond (Waynesville): Waynesville, etc., Ohio.

Cuneamya neglecta (Meek).

Sedgwickia (Grammysia?) neglecta Meek, Proc. Acad. Nat. Sci. Philadelphia, 1872, p. 325; Geol. Surv. Ohio, Pal., 1, 1873, p. 142, pl. 12, fig. 8.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 220.—Lesley, Geol. Surv. Pennsylvania Rep. P 4, 1890, p. 947, figs.

Grammysia neglecta Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 91, pl. 2, fig. 11.

Cuneamya neglecta Miller, N. A. Geol. Pal., 1889, p. 474 (gen. ref.).

Richmond (Waynesville): Clinton County, Ohio.

Cuneamya oblonga Ulrich.

Cuneamya oblonga Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 623, pl. 36, figs. 40–41.

Trenton (Galena): Dixon, Illinois.

Holotype.—Cat. No. 46159, U.S.N.M.

Cuneamya parva Miller.

Cuneamya parva Miller, Jour. Cincinnati Soc. Nat. Hist., 3, 1881, p. 316, pl. 8, figs. 5, 5a.

Eden (Southgate): Cincinnati, Ohio.

Cuneamya scapha Hall and Whitfield.

Cuneamya scapha Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 92, pl. 2, fig. 12.

Richmond (Waynesville): Near Waynesville, Ohio.

Cuneamya scapha brevior Foerste.

Cuneamya scapha brevior Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 307, pl. 2, fig. 12.

Cincinnatian (Pulaski): Riviere des Hurons, near St. Jean Baptiste, etc., Quebec.

CUNEAMYA SULCODORSATA Ulrich. See Saffordia sulcodorsata.

Cuneamya truncatula Ulrich.

Cuneamya truncatula Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 622, p. 36, fig. 39.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 162, pl. 11, fig. 6.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 378, fig. 482a.

Trenton: Near Wykoff and Pleasant Grove, Minnesota (Prosser); New Jersey.

Holotype.—Cat. No. 46160, U.S.N.M.

Cuneamya vetusta (Hall).

Cardiomorpha vetusta Hall, Pal. New York, 1, 1847, p. 154, pl. 34, fig. 8.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 116, text. fig.

Cypricardites vetusta Miller, N. A. Geol. Pal., 1889, p. 476 (gen. ref.).

Trenton: Middleville, New York.

CUPELLACRINUS CORRUGATUS Shumard. See Marsipocrinus corrugatus.

CUPELLACRINUS MAGNIFICUS Shumard. See Marsipocrinus magnificus.

CUPELLACRINUS PENTAGONALIS Shumard. See Marsipocrinus pentagonalis.

CUPELLACRINUS STELLATUS Wachsmuth and Springer. See Marsipocrinus pentagonalis.

CUPELLÆCRINITES Troost. See Marsipocrinus Bather.

CUPELLÆCRINITES BUCHII Troost. See Marsipocrinus tennesseensis.

CUPELLÆCRINITES CONICUS Troost. See Coccocrinus conicus.

CUPELLÆCRINITES INFLATUS Troost. See Marsipocrinus striatus.

CUPELLÆCRINITES LÆVIS Troost. See Marsipocrinus tennesseensis.

CUPELLÆCRINUS Meek and Worthen. See Marsipocrinus Bather.

CUPELLÆCRINUS LÆVIS Shumard. See Marsipocrinus tennesseensis.

CUPELLÆOCRINUS Meek and Worthen. See Marsipocrinus Bather.

CUPULOCRINUS D'Orbigny. Genotype: Scyphocrinus heterocostalis Hall.

Scyphocrinus Hall (not Zenker, 1839), Pal. New York, 1, 1847, p. 85.

Cupulocrinus D'Orbigny, Prod. Pal. Strat., 1, 1849, p. 23; Cours. Elementaire de Pal. et Geol., 2, 1851, p. 144.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 224.—Zittel, Handb. Pal., 1, 1879, p. 375.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 395 (Rev. Pal., pt. 2, p. 221).—Miller, N. A. Geol. Pal., 1889, p. 235.—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 202.—Springer, Mem. Geol. Surv. Canada, 15 P, 1911, p. 28; Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 215.

Cupulocrinus conjugans (Billings).

Dendrocrinus conjugans Billings, Geol. Surv. Canada, Rep. Progr. for 1853–1856, 1857, p. 268; Geol. Surv. Canada, dec. 4, 1859, p. 41, pl. 4, figs. 1a, b, 2a, b.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 504.

Cupulocrinus conjugans Springer, Mem. Geol. Surv. Canada, 15 P, 1911, p. 37.

Dendrocrinus cylindricus Billings, Geol. Surv. Canada, dec. 4, 1859, p. 44, pl. 3, figs. 8a, 8b.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 505.

Trenton (Curdsville): Ottawa and Kirkfield, Ontario; Montreal, Qubec.

Cupulocrinus heterocostalis (Hall).

Scyphocrinus heterocostalis Hall, Pal. New York, 1, 1847, p. 85, pl. 28, figs. 3d, e; 12th Rep. Regents Univ. State New York, 1860, p. 75.

Cupulocrinus heterocostalis—Continued.

Cupulocrinus heterocostalis D'Orbigny, Prod. Pal. Strat., 1, 1849, p. 23 (gen. ref.).—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 225.—Springer, Mem. Geol. Surv. Canada, 15 P, 1911, p. 30, fig. 3.

Trenton: Middleville, New York.

Cupulocrinus humilis (Billings).

Dendrocrinus humilis Billings, Geol. Surv. Canada, Rep. Progr. for 1853–1856, 1857, p. 270.—Geol. Surv. Canada, dec. 4, 1859, p. 39, pl. 3, fig. 4.

Cupulocrinus humilis Springer, Mem. Geol. Surv. Canada, 15 P, 1911, p. 28, pl. 1, figs. 8, 9; pl. 3, figs. 1–3, p. 29, fig. 2.

Trenton (Curdsville): Ottawa and Kirkfield, Ontario.

Cupulocrinus jewetti (Billings).

Dendrocrinus Jewettii Billings, Geol. Surv. Canada, dec. 4, 1859, p. 43, fig. 15; Trans. Ottawa Field Nat. Club., 1, 1883, p. 51, pl. figs.—Miller, N. A. Geol. Pal., 1889, p. 238, fig. 283.

Cupulocrinus jewetti Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 28, pl. 3, figs. 5–7.

Trenton (Curdsville): Bay of Quinte, and Kirkfield, Ontario.

Cupulocrinus jewetti kentucklensis Springer.

Cupulocrinus jewetti var. kentuckiensis Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 28, pl. 3, figs. 8, 9.

Trenton (Curdsville): Woodford County, Kentucky.

Cupulocrinus latibrachiatus (Billings).

Dendrocrinus latibrachiatus Billings, Geol. Surv. Canada, Rep. Progr. for 1853–1856, 1857, p. 270; Geol. Surv. Canada, dec. 4, 1859, p. 39, pl. 3, figs. 5a–c; Cat. Sil. Fossils Anticosti, Geol. Surv. Canada, 1866, p. 9 (loc. ref.).—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 505.

Cupulocrinus latibrachiatus Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 29 (gen. ref.).

Richmond (Charleton): Charleton Point, Anticosti.

Cupulocrinus polydactylus (Shumard).

Homocrinus polydactylus Shumard, Trans. Acad. Sci. St. Louis, 1, 1857, p. 78, pl. 1, figs. 6a, b.

Poteriocrinites (Dendrocrinus) polydactylus Meek, Proc. Acad. Nat. Sci. Philadelphia, 1871, p. 314.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 740, fig.

Poteriocrinus (Dendrocrinus) polydactylus Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 22, pl. 3 bis, fig. 9.

Dendrocrinus polydactylus Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 719, pl. 3, fig. 4.—Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 83.

Cupulocrinus polydactylus Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 29 (gen. ref.).

Cyathocrinites conglobatus Troost, Proc. Amer. Ass. Adv. Sci., 2, 1850, p. 61 (nom. nud).

Richmond (Waynesville-Whitewater): Richmond, etc., Indiana; Oxford, etc., Ohio.

Plesiotype.—Cat. No. 39950, U.S.N.M. (Troost's type of C. conglobatus).

CYATHASPIS Lankester. Genotype: C. banksi Huxley and Salter.

Cyathaspis Lankester, Rep. 24th Meeting British Asso. Adv. Sci., 1865, p. 100. (See Hay, Bull. U. S. Geol. Surv., 179, for additional refs.)

Diplaspis Matthew, Bull. Nat. Hist. Soc. New Brunswick, 6, 1887, p. 69.

Cyathaspis acadica (Matthew).

Pteraspis acadica Matthew, Canadian Rec. Sci., 2, 1886, pp. 251, 323.

Diplaspis acadica Matthew, Trans. Royal Soc. Canada, 6, 1888, p. 49, pl. 4; Amer. Geol., 8, 1891, p. 61.

Cyathaspis acadica Hay, Bull. U. S. Geol. Surv., 179, 1902.

Silurian??: Nerepis Hills, near St. John, New Brunswick.

CYATHAXONIA COLUMELLATA Hall. See Lindströmia? columellata.

CYATHAXONIA GAINESI Davis. See Lindströmia gainesi.

CYATHAXONIA HERZERI Hall. See Lindströmia herzeri.

CYATHAXONIA WISCONSINENSIS Whitfield. See Lindströmia wisconsinensis.

CYATHOCRINITES Meek and Worthen. See Cyathocrinus Miller.

CYATHOCRINITES CONGLOBATUS Troost. See Cupulocrinus polydactylus.

CYATHOCRINITES PYRIFORMIS Hall. See Ichthyocrinus lævis.

CYATHOCRINITES SCULPTUS Troost. See Chirocrinus angulatus.

CYATHOCRINITES TENNESSEEÆ Troost. See Cyathocrinus brittsi.

CYATHOCRINUS Miller. Genotype: C. planus Miller.

Cyathocrinus Miller, Nat. Hist. Crin., 1821, p. 85.—Agassiz, Ann. Nat. Hist., 1, 1838, p. 447.—Koninck, Desc. Animaux Fossiles, Leige, p. 48.—McCoy, Syn. Char. Foss. Ireland, 1844, p. 178.—Austin and Austin, Mon. Recent and Fossil Crin., 1845, p. 58, fig. 65 (1846).—D'Orbigny, Prodr. de Pal., 1, 1849, pp. 46, 103.—King, Mon. Permian Foss. England, Pal. Soc., 1850, p. 50.—McCoy, British Pal. Rocks Foss., 1854, p. 76.—Koninck and Le Hon, Recher. Crin. Terr. Carb. Belgique (Mem. L'Acad. Royale Sci., 28), 1854, p. 79, fig.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 317.—Hall, Rep. Geol. Surv. Iowa, 1, pt. 2, 1858, pp. 622, 623, fig. 98.—White, Boston Jour. Nat. Hist., 7, 1863, pp. 493, 496.—Meek and Worthen, Geol. Surv. Illinois, 2, 1866, p. 175; Proc. Acad. Nat. Sci. Philadelphia, 1868, p. 324; Canadian Nat., n. s., 4, 1869, p. 436; Amer. Jour. Sci. and Arts, 2d ser., 48, 1869, p. 25.—Billings, ibid., p. 73, footnote.—Thomson, Proc. Royal Soc. Edinburgh, 7, 1871, p. 416.—Salter, Cat. Camb. Sil. Foss., 1873, p. 123.—Billings, Pal. Foss., Geol. Surv. Canada, 2, pt. 1, 1874, p. 94, footnote.—Wachsmuth, Amer. Jour. Sci., 3d ser., 14, 1877, p. 183; Ann. Mag. Nat. Hist., 5th ser., 1, 1878, p. 455.—Angelin, Icon. Crin., 1878, p. 22.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1878, p. 256; ibid, 1879, p. 302 (Rev. Pal., pt. 1, p. 79); ibid., 1883, p. 376, fig. 7; ibid., 1887, p. 101; ibid., 1890, p. 351.—Zittel, Handb. Pal., 1, 1879, p. 351.—Waagen, Mem. Geol. Surv. India, Pal. Indica, 13th ser., 1, 1885, p. 822.—Miller, N. A. Geol. Pal., 1889, p. 235.—Bather, Ann. Mag. Nat. Hist., 6th ser., 5, 1890, p. 324, pl. 14, fig. 20; pl. 15, fig. 3; ibid., 9, 1892, p. 202; Kongl. Sv. Vet. Akad. Handl., 25, No. 2, 1893, pp. 126, 127, fig. 18.—Springer, Amer. Geol., 26, 1900, p. 133.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 156.—Bather, Amer. Geol., 26, 1900, p. 308; Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 173, fig. 89.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 61, fig. 33.—Bather, Geol. Mag., dec. 4, 6, 1899, p. 35, fig. 15.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 506.

Anthocrinus Miller, Ann. Mag. Nat. Hist., 2d ser., 13, 1854, p. 255.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 312 (Genotype: A. loveni Miller).

CYATHOCRINUS—Continued.

Cyathocrinites Meek and Worthen, Proc. Acad. Nat. Sci., Philadelphia, 1868, p. 336; Geol. Surv. Illinois, 5, 1874, p. 400.—Meek, Amer. Jour. Sci. and Arts, 3d ser., 7, 1874, p. 369.

Cyathocrinus? æmulus Hall.

Cyathocrinus (Poteriocrinus) æmulus Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 266; Trans. Albany Inst., 10, 1883, p. 66 (prelim. notice, 1879, p. 10.).

Homocrinus? æmulus Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 158 (Rev. Pal., pt. 3, sec. 2, p. 234).

Niagaran (Waldron): Waldron, Indiana.

CYATHOCRINUS? ALTERNATUS Hall. See Dendrocrinus alternatus.

CYATHOCRINUS ANGULATUS Wachsmuth and Springer. See Palæocrinus angulatus.

Cyathocrinus benedicti Miller.

Cyathocrinus benedicti Miller, 17th Ann. Rep. Dep. Geol. Nat. Res., Indiana, 1892, pl. 658, p. 9. fig. 7 (adv. sheets, 1891, p. 48).

Niagaran (Waldron): Hartsville, Indiana.

Cyathocrinus brittsi Miller and Gurley.

Cyathocrinites tennesseeæ Troost, Proc. Amer. Assoc. Adv. Sci., 2, 1850 (nom. nud.).

Cyathocrinus tennesseeæ Miller, N. A. Geol. Pal., 1889, p. 237.

Cyathocrinus brittsi Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 7, 1895, p. 70, pl. 4, figs. 35, 36.—Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 81, pl. 15, figs. 2, 3.

Niagaran (Brownsport): Decatur County, Tennessee.

(?Burlington: Sedalia, Missouri).

Observation.—Although recorded from the Burlington, the type of C. brittsi is probably from the Niagaran of West Tennessee.

Plesiotype.—Cat. No. 39948, U.S.N.M. (Troost's type of C. tennesseeæ).

CYATHOCRINUS CORA Hall. See Crotalocrinus cora.

CYATHOCRINUS FASCIATUS Hall. See Macrostylocrinus fasciatus.

Cyathocrinus globosus (Troost).

Cyathocrinites globosus Troost, Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 60 (nom. nud.).

Cyathocrinus globosus Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 82, pl. 5, figs. 17, 18.

Niagaran (Brownsport): Decatur County, Tennessee.

CYATHOCRINUS NUCLEUS Hall. See Botryocrinus nucleus.

Cyathocrinus? ovalis Rowley.

Cyathocrinus? ovalis Rowley, Amer. Geol., 34, 1904, p. 271, pl. 16, figs. 13–16.

Niagaran (Bainbridge): Near St. Marys, Ste. Genevieve County, Missouri.

CYATHOCRINUS PISIFORMIS Whitfield. See Lecanocrinus pisiformis.

CYATHOCRINUS POLYXO Hall. See Botryocrinus polyxo.

CYATHOCRINUS PULCHELLUS Wachsmuth and Springer. See Palæocrinus pulchellus.

CYATHOCRINUS PUSILLUS Hall. See Lecanocrinus pusillus.

CYATHOCRINUS PYRIFORMIS Lesley. See Ichthyocrinus lævis.

CYATHOCRINUS RHOMBIFERUS Wachsmuth and Springer. See Palæocrinus rhombiferus.

CYATHOCRINUS SCULPTUS Wachsmuth and Springer. See Chirocrinus angulatus.

CYATHOCRINUS STRIATUS Wachsmuth and Springer. See Palæocrinus striatus.

CYATHOCRINUS TENNESSEEÆ Miller. See Cyathocrinus brittsi.

Cyathocrinus turbinatus Weller.

Cyathocrinus turbinatus Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 65, pl. 14, fig. 13.

Niagaran (Racine): Chicago, Illinois.

CYATHOCRINUS VANHORNEI Miller. See Crotalocrinus vanhornei.

CYATHOCRINUS WALDRONENSIS Miller and Dyer. See Dimerocrinus waldronensis.

CYATHOCRINUS WAUKOMA Hall. See Lecanocrinus waukoma.

CYATHODICTYA Hall and Clarke. See Cyathophycus Walcott.

CYATHOPHYCUS Walcott. Genotype: C. reticulatus Walcott.

Cyathophycus, Walcott, Trans. Albany Inst., 10, 1883, p. 18 (adv. sheets, 1879).—Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1881, p. 15.—Hall, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 466.—Dawson, Canadian Rec. Sci., 3, 1888, pp. 58, 67, footnote.—Miller, N. A. Geol. Pal., 1889, p. 158.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 14, pt. 1, 1891, p. 63.—Rauff, Palæontographica, 40, 1894, p. 250.—James, Amer. Nat., 29, 1895, p. 542, fig. 6.

Cyathospongia Dawson, Canadian Rec. Sci., 3, 1888, p. 68, footnote.

Cyathospongia (Cyathophycus) Dawson and Hinde, Trans. Royal Soc. Canada, 7, sec. 4, 1890, p. 44.

Cyathodictya (new name for Cyathophycus), Hall and Clarke, Mem. New York State Mus., 2, 1898, p. 24.

Cyathophycus quebecense Dawson.

Cyathophycus Quebecensis Dawson, Canadian Rec. Sci., 3, 1888, p. 54.—Hinde, ibid., p. 67.—Rauff, Palæontographica, 40, 1894, p. 251.—Dawson, Trans. Royal Soc. Canada, 2d ser., 2, sec. 4, 1896, p. 109, figs. 18, 19.

Cyathospongia Quebecensis Dawson and Hinde, Trans. Royal Soc. Canada, 7, sec. 4, 1890, p. 44, figs. 16, 17, pl. 3, fig. 7.

Canadian? (Levis?): Little Metis, Canada.

Cyathophycus reticulatum Walcott.

Cyathophycus reticulatus Walcott, Amer. Jour. Sci. Arts, 3d ser., 22, 1881, p. 395; Trans. Albany Inst., 10, 1883, p. 18, pl. 2, figs. 16, 16a–d.—Hall, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 468, pl. 18, fig. 1.—Dawson, Canadian Rec. Sci., 3, 1888, p. 55.—Hinde, ibid., p. 65.—Rauff, Palæontographica, 40, 1894, p. 252.

Cyathodictya reticulata Hall and Clarke, Mem. New York State Mus., 2, 1898, p. 24, pl. 1, figs. 1–13; 15th Rep. State Geol. New York for 1895, 1899, p. 764, pl. 1, figs. 1–13.

Utica: Holland Patent, Oneida County, New York.

Plesiotype.—Cat. No. 25349, U.S.N.M.

CYATHOPHYCUS SILURIANA James. See Trichophycus siluriana.

CYATHOPHYCUS SUBSPHERICUS Walcott. See Teganium subsphericus.

Cyathophycus? tubulare (Ruedemann).
Cyathodictya? tubularis Ruedemann, Bull. New York State Mus., 162, 1912, p. 75, figs. 8–12.
Trenton (Canajoharie): Canajoharie, New York.

Cyathophycus(?) walcotti (Rauff).
Dictyophytra(?) Walcotti Rauff, Palæontographica, 40, 1894, p. 249, pl. 4, fig. 12.—Hall and Clarke, Mem. State Mus. New York, 2, 1898, p. 50.
Utica: Holland Patent, Oneida County, New York.
Plesiotype.—Cat. No. 25348, U.S.N.M.

CYATHOPHYLLOIDES THOMII Walcott. See Columnaria (Palæophyllum) thomi.

CYATHOPHYLLUM Goldfuss. Genotype: C. cæspitosum Goldfuss.
Cyathophyllum Goldfuss, Petrefacta, 1826, pp. 54, 244.—Koninck, Desc. Animaux Fossiles, Liege, 1842, p. 20.—Dana, Wilkes' U. S. Expl. Exped., 1838–42, 7, Zoophytes, 1846, p. 355.—Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal., 1851 (Arch. du Mus. d'Hist. Nat., 5, pp. 167, 360).—McCoy, British Pal. Rocks Foss., 1854, p. 69.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 455.—Milne-Edwards, Hist. Nat. d. Corall., 3, 1860, p. 364.—Goldfuss, Petrefacta, 2d ed., pt. 1, 1862, p. 51.—Lindstrom, Geol. Mag., 3, 1866, p. 359.—Koninck, Animaux Foss. Terr. Carb. Belgique (Mem. l'Acad. Royale Sci. de Belgique, 39, p. 46), 1872.—Dybowski, Archiv. f. Naturf. Liv., Ehst. und Kurl., 5, 1873, p. 336.—Rominger, Geol. Surv. Mich., 3, pt. 2, 1876, p. 98.—Zittel, Handb. Pal., 1, 1879, p. 230.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 335.—Frech, Pal. Abh. Dames and Kayser, 3, Heft 3, 1886, p. 53.—Miller, N. A. Geol. Pal., 1889, p. 181.—Sherzer, Amer. Geology, 7, 1891, pp. 290–295; Bull. Geol. Soc. Amer., 3, 1892, p. 279.—Koken, Die Leitfossilien, Leipzig, 1896, p. 309.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 727.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 128; 7, 1901, p. 138; Bull. New York State Mus., 45, 1901, p. 138.—Zittel-Eastman Textb. Pal., 1, 1900, p. 76; ibid., 2d ed., 1913, p. 84.—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 133.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 2, 1902, p. 87.

Cyathophyllum agglomeratum Castelnau. Not recognized.
Cyathophyllum agglomeratum Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 49, pl. 21, fig. 5.
Silurian: Manitoulin Islands, Lake Huron.

Cyathophyllum ammonis Castelnau. Not recognized.
Cyathophyllum ammonis Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 48, pl. 21, fig. 1.
Silurian?: New York.

Cyathophyllum anticostiense Billings.
Cyathophyllum Anticostiense Billings, Pal. Foss., 1, 1865, Geol. Surv. Canada, p. 109 (adv. sheets, 1862); Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 34 (loc. ref.).—Lambe, Ottawa Nat., 12, 1899, p. 237; Cont. Canadian, Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 134, pl. 10, figs. 5–8.
Anticostian (Jupiter River and Chicotte): Southwest Point, etc., Anticosti.

Cyathophyllum arborescens Castelnau. Not recognized.
Cyathophyllum arborescens Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 40, pl. 22, fig. 2.
Silurian: Northern shore of Lake Huron.

Cyathophyllum articulatum (Wahlenberg).

Madreporites articulatus Wahlenberg, Nov. Act. Sco. Upsala, 8, 1821, p. 87.

Cyathophyllum articulatum Milne-Edwards and Haime, Polyp. Foss. des. Terr. Pal., 1851, p. 377; British Foss. Corals, 1855, p. 282, pl. 67, figs. 1, 1a.—Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 584.—Lambe, Ottawa Nat., 12, 1899, p. 219; Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 135, pl. 10, figs. 9a, b.

Silurian: Gotland and England; "The Forks," Scaumenac River, Isle of Man, Lake Temiscaming, Quebec; Dobbins Bay, Arctic America (Niagaran).

Cyathophyllum atlas Castelnau. Not recognized.

Cyathophyllum atlas Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 47, pl. 20, fig. 2.

Silurian: Drummond Island, Lake Huron.

Cyathophyllum bullulatum Hall.

Cyathophyllum bullulatum Hall, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 416.

Niagaran?: Perry County, Tennessee.

Cyathophyllum caliculare Owen. Not recognized.

Cyathophyllum caliculare Owen, Geol. Expl. Iowa, Wisconsin, and Illinois, 2d ed., 1844, p. 69, pl. 13, fig. 5.

Niagaran: Iowa and Wisconsin.

Cyathophyllum calyculum Foerste. See Enterolasma calyculus.

Cyathophyllum celator var. daytonensis Foerste. See Zaphrentis celator daytonensis.

Cyathophyllum clarkl Swartz.

Cyathophyllum clarki Swartz, Maryland Geol. Surv., Low Dev., 1913, p. 201, pl. 19, figs. 5–9.

Helderbergian (Keyser): Devils Backbone, near Cumberland; Pinto, etc., Maryland.

Cyathophyllum conicum Castelnau. Not recognized.

Cyathophyllum conicum Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 48, pl. 21, fig. 4.

Silurian?: Banks of the Ohio, Illinois.

Cyathophyllum coritheum Owen. See Ptychophyllum expansum.

Cyathophyllum densiseptatum Foerste.

Cyathophyllum densiseptatum Foerste, Bull. Geol. Surv. Kentucky, 7, 1906, p. 314, pl. 6, figs. 2a–f.

Clinton (Waco): Near Estill Springs, etc., Kentucky.

Cyathophyllum dilatatum Castelnau. Not recognized.

Cyathophyllum dilatatum Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 48, pl. 21, fig. 3.

Silurian: Banks of Lake Huron.

Cyathophyllum distinctum Castelnau. Not recognized.

Cyathophyllum distinctum Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 49, pl. 22, fig. 8.

Silurian: Manitoulin Islands, Lake Huron.

Cyathophyllum Eriphyle Billings. See Omphyma eriphyle.

Cyathophyllum euryone Billings.

Cyathophyllum Euryone Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 110 (adv. sheets, 1862); Cat. Sil. Fossils Anticosti, Geol. Surv. Canada, 1866, p. 34 (loc. ref.).—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 135, pl. 11, figs. 1, 1a, b.

Anticostian (Gun River-Chicotte): The Jumpers, etc., Anticosti.

Cyathophyllum facetum Foerste.

Cyathophyllum facetus Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 341, pl. 9, fig. 8.

Upper Medinan (Brassfield): Near Dayton, and Todds Fork, near Wilmington, Ohio.

Cyathophyllum flos Davis.

Cyathophyllum flos Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 78, figs. 11–14; pl. 83, fig. 10.

Niagaran (Louisville): Near Louisville, Kentucky.

Cyathophyllum goldfussi Castelnau. Not recognized.

Cyathophyllum Goldfussii Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 47, pl. 21, fig. 2.

Silurian(?): Buffalo, New York.

Cyathophyllum goliath Castelnau. Not recognized.

Cyathophyllum Goliath Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 47, pl. 20, fig. 1.

Silurian: Drummond Island, Lake Huron.

Cyathophyllum gracile Troost. Not recognized.

Cyathophyllum gracile Troost, 5th Geol. Rep. Tennessee, 1840, p. 63.

Silurian(?): Perry County, Tennessee.

Cyathophyllum hydraulicum Simpson.

Cyathophyllum hydraulicum (Simpson MS.) Grabau, Bull. Geol. Soc. Amer., 2, 1900, p. 364, pl. 21, figs. 1a–d; Bull. New York State Mus., 45, 1901, p. 138, fig. 31; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 138, fig. 31.—Schuchert, Amer. Geol., 31, 1903, p. 163 (loc. occ.).—Grabau, Michigan Geol. Surv., Geol. Ser. 1, 1909, p. 97, pl. 31, figs. 1a–d.

Cayugan: Erie County (Akron), and Howes Cave, near Schoharie, New York (Manlius).

Cyathophyllum inequale Swartz. See Prismatophyllum inequale.

Cyathophyllum interruptum Billings.

Cyathophyllum interruptum Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 109 (adv. sheets 1862).—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 137, pl. 11, figs. 3, 3a, b.

Silurian: L'Anse a le Barbe, Baie des Chaleurs, Quebec.

Cyathophyllum intertrium Hall.

Cyathophyllum intertrium Hall, 12th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1883, p. 273, pl. 15, figs. 9–11; 35th Rep. New York State Mus. Nat. Hist., 1884, p. 416 (ext. 1882, p. 12).—Lesley, Geol. Surv. Pennsylvania Rep. P. 4, 1889, p. 169, figs.

Niagaran (Louisville): Louisville, Kentucky.

Cyathophyllum marylandicum Swartz.

Cyathophyllum marylandicum Swartz, Maryland Geol. Surv., Low. Dev., 1913, p. 204, pl. 21, figs. 1, 2.

Helderbergian (Keyser): Keyser, West Virginia.

Cyathophyllum michelini Castelnau. Not recognized.

Cyathophyllum Michelini Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 48, pl. 22, fig. 3.

Silurian: Drummond Island, Lake Huron.

CYATHOPHYLLUM MULTIPLICATUM Owen. See Ptychophyllum expansum.

CYATHOPHYLLUM NYMPHALE Billings. See Chonophyllum nymphale.

Cyathophyllum pasithea Billings.

Cyathophyllum Pasithea Billings, New sp. L. Sil. Fossils, Geol. Surv. Canada, 1865, p. 112 (adv. sheets, 1862).—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 148, pl. 12, figs. 5, a, b.

Silurian: L'Anse a la Vieille, Bay of Chaleurs, Quebec.

Cyathophyllum pauciradiatum D'Orbigny.

Cyathophyllum pauciradiatum D'Orbigny, Prod. de Pal., 1847, p. 47.—Boule and Thevenin, Ann. de Pal., 1, 1906, p. 7, pl. 3, figs. 6, 7.

Silurian (?): Falls of the Ohio.

Observation.—Although considered a Silurian species and synonymous with Amplexus shumardi, the figures given by Boule and Thevenin refer to a Devonian species of Blothrophyllum.

CYATHOPHYLLUM PELAGICUM Billings. See Diplophyllum cæspitosum.

Cyathophyllum pennanti Billings.

Cyathophyllum Pennanti Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 107 (adv. sheets, 1862).—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 138, pl. 11, figs. 4, a, b.

Silurian: L'Anse a Gascon, Bay of Chaleurs, Quebec.

Cyathophyllum pickthorni (Salter).

Strephodes Pickthornii Salter, Sutherland's Jour. Voyage in Baffin's Bay, etc., 2, 1852, p. 230, pl. 6, fig. 5.—Lambe, Cruise of the "Arctic" in 1908–9, 1910, p. 480.

Cyathophyllum pickthorni Miller, N. A. Geol. Pal., 1889, p. 182, (gen. ref.).

Niagaran: Cape Riley and Beechey, Griffith's and Cornwallis Islands, Arctic America.

Cyathophyllum plicatum Goldfuss. Not recognized.

Cyathophyllum plicatum Goldfuss, Petrefacta, 1826, p. 54, pl. 15, fig. 12; 2d ed., 1862, pt. 1, p. 51.—Troost, 5th Geol. Rep. Tennessee, 1840, p. 61.—Sherzer, Bull. Geol. Soc. Amer., 3, 1892, p. 254.

Silurian?(?Devonian): Kentucky.

Cyathophyllum plicatulum Castelnau. Not recognized.

Cyathophyllum plicatulum Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 48, pl. 22, fig. 4.

Silurian: Drummond Island, Lake Huron.

CYATHOPHYLLUM PROFUNDUM Conrad. See Streptelasma (Petraia) profundum.

Cyathophyllum (Calophyllum) pustulatum Conrad. Not recognized.
Cyathophyllum (Calophyllum) pustulatum Conrad, Proc. Acad. Nat. Sci. Philadelphia, 3, 1846, p. 22, pl. 1, fig. 24.
Silurian: Ohio.

Cyathophyllum radicula Rominger.
Cyathophyllum radicula Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 109, pl. 39, fig. 3.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 86, figs. 1–6.—Swartz, Maryland Geol. Surv., Low. Dev., 1913, p. 202, pl. 19, figs. 12–17.
Niagaran: Drummond Island and Point Detour, Michigan; Masonville, Iowa; Louisville, Kentucky, and vicinity.
Helderbergian (probably Keyser): Near Cumberland, Maryland.

Cyathophyllum rollinii Castelnau. Not recognized.
Cyathophyllum Rollinii Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 49, pl. 22, fig. 5.
Silurian: Drummond Island, Lake Huron.

Cyathophyllum schucherti Swartz.
Cyathophyllum schucherti Swartz, Maryland Geol. Surv., Low. Dev., 1913, p. 203, pl. 20, figs. 5–9.
Helderbergian (Keyser): Pinto, Cash Valley, etc., Maryland; Hyndman, Pennsylvania.

Cyathophyllum sedentarium Foerste.
Cyathophyllum sedentarium Foerste, Bull. Geol. Surv. Kentucky, 7, 1906, p. 315, pl. 6, figs. 3a–c.
Clinton (Waco): Near Estill Springs, Panola, and Waco, Kentucky.

Cyathophyllum shumardi Edwards and Haime. See Amplexus shumardi.

Cyathophyllum solitarium Billings.
Cyathophyllum solitarium Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 93.
Niagaran: Portage Bay, Manitoulin Islands, Lake Huron.

Cyathophyllum striatulum Castelnau. Not recognized.
Cyathophyllum striatulum Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 48, pl. 22, fig. 1.
Silurian (?): Banks of Lakes Huron and Erie.

Cyathophyllum tetragonum Quenstedt. See Goniophyllum pyramidale.

Cyathophyllum thoroldense Lambe.
Cyathophyllum Thoroldense Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 147, pl. 11, figs. 5, 5a, b.—Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 96, pl. 16, fig. 16.
Niagaran (Lockport): Thorold and St. Catherines, Ontario.
Upper Monroan (Anderdon): Detroit, Michigan.

Cyathophyllum turbinatum Owen. Not recognized.
Cyathophyllum turbinatum Owen (not Goldfuss), Geol. Expl. Iowa, Wisconsin and Illinois, 2d ed., 1844, p. 78, pl. 14, fig. 6.
Niagaran: Iowa and Wisconsin.

Cyathophyllum undatum et multiplicatum Owen. See Ptychophyllum expansum.

Cyathophyllum vesiculosum Owen. Not recognized.
Cyathophyllum vesiculosum Owen, Geol. Expl. Iowa, Wisconsin, Illinois, 2d ed., 1844, p. 78, pl. 14, fig. 8.
Niagaran: Iowa and Wisconsin.

Cyathophyllum vicinum Castelnau. Not recognized.
Cyathophyllum vicinum Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 48, pl. 22, fig. 6.
Silurian(?): Northern New York.

Cyathophyllum wahlenbergi Billings.
Cyathophyllum Wahlenbergii Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 108 (adv. sheets, 1862); Cat. Sil. Foss., Anticosti, Geol. Surv. Canada, 1866, p. 34 (loc. ref.).—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 136, pl. 11, figs. 2, 2a, b.
Anticostian (Becsie River-Gun River): East Point, Anticosti.

Cyathospongia Dawson. See Cyathophycus Walcott.

CYATHOSPONGIA Hall. Genotype: C. excrescens Hall.
Cyathospongia Hall, 35th Rep. New York State Mus. Nat. Hist. (ext. 1882, p. 15), 1884, p. 419.—Miller, N. A. Geol. Pal., 1889, p. 158.

Cyathospongia excrescens Hall.
Cyathospongia excrescens Hall, 35th Rep. New York State Mus. Nat. Hist., 1884 (ext. 1882, p. 15), p. 419.
Niagaran: Falls of the Ohio, and Perry County, Tennessee.

Cyathospongia Quebecensis Dawson and Hinde. See Cyathophycus quebecensis.

Cybele ella Raymond and Narraway. See Cybeloides ella.

Cybele mirus Clarke. See Cybeloides mirus.

Cybele prima Raymond. See Cybeloides primus.

Cybele punctata Hall. See Encrinurus ornatus.

Cybele valcourensis Raymond. See Cybeloides primus.

Cybele vigilans Hall. See Encrinurus vigilans.

Cybele winchelli Clarke. See Cybeloides winchelli.

CYBELOIDES Slocom. Genotype: C. iowensis Slocom.
Cybeloides Slocom, Field Mus. Nat. Hist., Geol. Ser., 4, 1913, p. 63.

Cybeloides ella (Raymond and Narraway).
Cybele ella Raymond and Narraway, Annals Carnegie Mus., 3, 1906, p. 598, fig. 1.
Cybeloides ella Slocom, Field Mus. Nat. Hist., Geol. Ser., 4, 1913, p. 64.
Black River: Petite Chaudiere, near Ottawa, Ontario.

Cybeloides iowensis Slocom.
Cybeloides iowensis Slocom, Field Mus. Nat. Hist., Geol. Ser., 4, 1913, p. 64, pl. 16, figs. 1–4.
Richmond (Maquoketa): Elgin and Bloomfield, Iowa.

Cybeloides mirus (Billings).
Encrinurus mirus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 292, fig. 282.
Cryptonymus mirus Vogdes, Mon. Genera Zethus, etc., 1878, p. 34.

Cybeloides mirus—Continued.

Cybele mirus Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 743.

Chazyan (Quebec—N. P): Table Head, Pistolet Bay, and Portland Creek, Newfoundland.

Cybeloides primus (Raymond).

Glaphurus primus Raymond, Ann. Carnegie Mus., 3, 1905, p. 362, pl. 14, figs. 7, 8.

Cybeloides prima Slocom, Field Mus. Nat. Hist., Geol. Ser., 4, No. 3, 1913, p. 64.

Cybele valcourensis Raymond, Ann. Carnegie Mus., 3, 1905, p. 362, pl. 14, fig. 9.

Cybele prima Raymond and Carraway, Ann. Carnegie Mus., 3, 1906, p. 601.—Raymond, ibid., 7, 1910, p. 75, pl. 19, fig. 19; 7th Rep. State Geol. Vermont, 1910, p. 237, pl. 36, figs. 7–9; pl. 39, fig. 19.

Chazyan (Day Point, Crown Point): Valcour Island, New York.

Cybeloides? winchelli (Clarke).

Cybele winchelli Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 742, fig. 59.

Cybeloides? winchelli Slocom, Field Mus. Nat. Hist., Geol. Ser., 4, 1913, p. 64.

Trenton (Prosser): Fillmore County, Minnesota.

CYCLASTER Billings. See Edrioaster Billings.

CYCLENDOCERAS Grabau and Shimer. See Endoceras Hall.

CYCLOCERAS McCoy. Genotype: Orthoceras annulare Fleming.

Cycloceras McCoy, Synop. Carb. Foss. Ireland, 1844, p. 10.—Saemann, Palæontographica, 3, 1852, p. 162.—McCoy, British Pal. Rocks Foss., 1854, p. 318.—Barrande, Syst. Sil. Centre Boheme, 2, pt. 3, 1874, p. 770.—Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 275; Zittel-Eastman Textb. Pal., 1, 1900, p. 518.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 57.—Hyatt, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 599.

Heloceras Barrande, Syst. Sil. Centre Boheme, 2, pt. 3, 1874, p. 773.

Cycloceras amycus (Hall).

Orthoceras amycus Hall, 11th Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 324, pl. 33, figs. 3, 4; Trans. Albany Inst., 10, 1883, p. 74.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 541, figs.

Orthoceras (Cycloceras) amycus Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 546, pl. 33, fig. 5.

Niagaran (Waldron): Waldron, Indiana; Newsom, Tennessee.

Upper Medinan (Brassfield): Dayton, Ohio.

Cycloceras crocus (Billings).

Orthoceras perannulatum Billings (not Portlock, 1843), Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, p. 319.

Orthoceras Crocus Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 22.

Richmond (English Head) and Gamachian: West End, etc., Anticosti.

Cycloceras inceptum (Foerste).

Orthoceras inceptum Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 117, pl. 13, figs. 1a–c; Proc. Boston Soc. Nat. Hist., 24, 1889, p. 286.

Orthoceras (Cycloceras) inceptum Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 543, pl. 25, figs. 1a–c.

Upper Medinan (Brassfield): Todds Fork near Wilmington and Dayton, Ohio.

Cycloceras inceptum acceleratum (Foerste).

Orthoceras inceptum var. acceleratum Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 545, pl. 37A, fig. 10.

Upper Medinan (Brassfield): Soldiers' Home, near Dayton, Ohio.

Cycloceras lesueuri (Clarke).

Orthoceras lesueuri Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 785, pl. 53, fig. 4; pl. 55, figs. 8, 9.

Cycloceras lesueuri Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 57, fig. 1256.

Black River (Platteville): Cannon Falls, Minnesota.

Cotypes.—Cat. No. 46528, U.S.N.M.

Cycloceras nicolleti (Clarke).

Orthoceras nicolleti Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 784, pl. 55, figs. 1–2.

Cycloceras nicolletti Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 58, fig. 1258.

Black River (Platteville): Belle Creek, Minnesota.

Cycloceras novacarlislense (Foerste).

Orthoceras (Cycloceras) novacarlislensis Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 281, pl. 5, fig. 25; pl. 8, fig. 1; Geol. Surv. Ohio, Pal., 7, 1893, p. 545, pl. 30, fig. 25; pl. 33, fig. 1.

Upper Medinan (Brassfield): Brown's Quarry, near New Carlisle, Ohio.

Cycloceras olorus (Hall).

Orthoceras vertebrale Hall (not Schlotheim), Pal. New York, 1, 1847, p. 201, pl. 43, figs. 5a–c.—Billings, Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, p. 328.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 819, fig. 608.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 3, fig. 4.—Hitchcock, Geol. Vermont, 1, 1861, p. 298, fig. 208.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 158, fig.

Orthoceras olorus Hall in Miller's American Pal. Foss., 1877, p. 245.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 554, fig.—Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 788, pl. 55, figs. 3, 5.

Cycloceras olorus Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 57, fig. 1257.

Trenton: Middleville, etc., New York; Wykoff, etc., Minnesota (Prosser).

Black River (Platteville): Mineral Point and Janesville, Wisconsin; St. Charles and Holden, Minnesota.

Cycloceras olorus baffinense (Schuchert).

Orthoceras olorus var. baffinensis Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 169, pl. 12, figs. 19–22.

Mohawkian: Head of Frobisher Bay, Baffin Land.

Cotypes.—Cat. No. 28192, U.S.N.M.

Cycloceras perroti (Clarke).

Orthoceras perroti Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 785, pl. 54, figs. 4, 5.

Richmond (Maquoketa): Granger, Minnesota.

Cycloceras? rectiannulatum (Hall).

Orthoceras rectiannulatum Hall, Pal. New York, 1, 1847, p. 34, pl. 7, figs. 2, 2a.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 149.

Cycloceras? (Spyrocceras?) rectiannulatum Ruedemann, Bull. New York State Mus., 90, 1906, p. 506.

Chazyan: Clinton County, New York.

Cycloceras teretiforme (Hall).

Orthoceras teretiforme Hall, Pal. New York, 1, 1847, p. 198, pl. 42, figs. 8a, b.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 149.

Orthoceras (Cycloceras) teretiforme Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 642 (gen. ref.).

Trenton: Watertown, New York.

CYCLOCŒLIA Foerste. See Plectorthis, subgenus Encuclodema Foerste.

CYCLOCONCHA Miller. Genotype: C. mediocardinalis Miller.

Anodontopsis (part) Meek (not McCoy), Amer. Jour. Sci. Arts, 3d ser., 2, 1871, p. 297; Pal. Ohio, 1, 1873, p. 140.

Cycloconcha Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 231.—Ulrich, Geol. Surv. Ohio, 7, 1893, p. 686.—Zittel, Handb. Pal., 2, 1881, p. 103.—Miller, N. A. Geol. Pal., 1889, p. 474.

Orthodontiscus Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 140.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res., Indiana, 1908, p. 983.

Observation.—See Ulrich (1893) for a discussion of the name Orthodontiscus.

Cycloconcha mediocardinalis Miller.

Cycloconcha mediocardinalis Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 231, figs. 21, 22; N. A. Geol. Pal., 1889, p. 474, fig. 809.—Ulrich, Geol. Surv. Ohio, 7, 1893, p. 686, pl. 48, fig. 12; pl. 51, figs. 14–21.

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

Plesiotype.—Cat. No. 46161, U.S.N.M.

Cycloconcha milleri (Meek).

Anodontopsis? Milleri Meek, Amer. Jour. Sci., 3d ser., 2, 1871, p. 297; Geol. Surv. Ohio, Pal., 1, 1873, p. 140, pl. 12, figs. 1a–d.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 227; N. A. Geol. Pal., 1889, p. 462, fig. 775.

Cycloconcha milleri Ulrich, Geol. Surv. Ohio, 7, 1893, p. 686 (gen. ref.).

Orthodontiscus milleri Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1015, pl. 47, figs. 8, 8c.

Richmond (Waynesville): Versailles, Indiana.

Cotypes and *plesiotypes*.—Cat. Nos. 26409, 46162, U.S.N.M.

Cycloconcha oblonga Foerste.

Cycloconcha oblonga Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 137, pl. 1, fig. 6.

Trenton (Upper): Near Rogers Gap, Kentucky.

Cycloconcha ovata Ulrich.

Cycloconcha ovata Ulrich, Geol. Surv. Ohio, 7, 1893, p. 687, pl. 48, figs. 13–15.

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

Cotypes.—Cat. No. 46163, U.S.N.M.

CYCLOCRINITES Eichwald. Genotype: C. spaskii Eichwald.

Cyclocrinites Eichwald, Schicht. Esthland, 1840, p. 192.—Edwards and Haime, Mon. Polyp. Foss. Terr. Pal. (Arch. du Mus. d'Hist. Nat., 5), 1851, pp. 177, 468.—Eichwald, Leth. Ross. Pal. Russie, 1, 1860, p. 637.—Milne-Edwards, Hist. Nat. d. Corall., 3, 1860, p. 452.—Niles, Proc. Boston Soc. Nat. Hist., 10, 1865, p. 19.

Cyclocrinus Kayser, Zeits. d. d. geol. Gesell., 27, 1875, p. 780.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1878, pp. 15, 16.—Roemer, Leth. geog., 1 Theil, Leth. Pal., Erste Lief, 1880, p. 292.—Zittel, Handb. Pal., 1, 1880, p. 728.—Rauff, Zeits. d. d. geol. Gesell., 40, 1888, p. 609.—Roemer,

CYCLOCRINITES—Continued.

Neues Jahrb. f. Min., Geol. Pal., 1, 1888, p. 74.—Stolley, Archiv. f. Anthrop. Geol. Schleswig-Holsteins, 1, Heft. 2, 1896, pp. 189, 276.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 77.

Observation.—See Pasceolus for a probable synonym.

Cyclocrinites spaskii Eichwald.

Cyclocrinites spaskii Eichwald, Ueber Silur. Schicht. Esthland, 1840, p. 192 (German ed.), p. 204 (French ed.); Urwelt von Russland, Heft 2, 1842, p. 32, pl. 1, fig. 8; Leth. Ross. Pal. Russie, 1, 1860, p. 638, pl. 32, figs. 21a–d.

Cyclocrinus spaskii Eichwald, Bull. Soc. Imp. Nat. Moscou, 29, 1856, p. 124.

Middle Ordovician: Esthonia, Russia. Doubtfully identified in the Appalachian Valley.

CYCLOCRINUS Kayser. See Cyclocrinites Eichwald.

CYCLOCRINUS CLAUDII Stolley. See Pasceolus claudii.

CYCLOCRINUS DACTYLOIDES Stolley. See Cerionites dactyloides.

CYCLOCRINUS DARWINII Stolley. See Pasceolus darwini.

CYCLOCRINUS GLOBOSUS Stolley. See Pasceolus globosus.

CYCLOCRINUS GREGARIUS Stolley. See Nidulites gregarius.

CYCLOCRINUS HALLI Stolley. See Pasceolus halli.

CYCLOCRINUS INTERMEDIUS Stolley. See Nidulites intermedius.

CYCLOCRINUS SPASKII Eichwald. See Cyclocrinites spaskii.

CYCLOCYSTOIDES Billings and Salter. Genotype: C. halli Billings.

Cyclocystoides Billings and Salter, Geol. Surv. Canada, dec. 3, 1858, p. 86.—Hall, Decrip. new spec. Crin., 1866, p. 10; 24th Rep. New York State Cab. Nat. Hist., 1872, p. 217.—Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 34.—Miller, N. A. Geol. Pal., 1889, p. 237.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 210, fig. 8.—Raymond, Bull. Victoria Mem. Mus., 1, 1913, p. 25.

Cyclocystoides anteceptus Hall.

Cyclocystoides anteceptus Hall, Desc. new spec. Crin., etc., 1866, p. 12; 24th Rep. New York State Cab. Nat. Hist., 1872, p. 219.

Black River: Escanaba River, Michigan.

Cyclocystoides bellulus Miller and Dyer.

Cyclocystoides bellulus Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 34, pl. 2, figs. 10, 10a.

Maysville (Fairmount): Cincinnati, Ohio.

Cyclocystoides cincinnatiensis Miller and Faber.

Cyclocystoides cincinnatiensis Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 15, 1892, p. 84, pl. 1, figs. 7, 8.

Maysville (Corryville): Cincinnati, Ohio.

Cyclocystoides halli Billings.

Cyclocystoides Halli Billings, Geol. Surv. Canada, dec. 3, 1858, p. 86, pl. 10 bis, figs. 1–7.—Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 45 (loc. occ.).—Raymond, Bull. Victoria Mem. Mus., 1, 1913, p. 25, pl. 3, figs. 1, 3, 4.

Trenton (Curdsville): Ottawa, Kirkfield, Hull, and Lake St. John, Canada.

Cyclocystoides huronensis Billings.

Cyclocystoides Huronensis Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 393, fig. 369.—Raymond, Bull. Victoria Mem. Mus., 1, 1913, p. 29, pl. 3. fig. 2.

Richmond: Rabbit Island, Lake Huron.

Cyclocystoides illinoisensis Miller and Gurley.

Cyclocystoides illinoisensis Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 6, 1895, p. 61, pl. 5, figs. 27, 28.—Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 40, pl. 1, fig. 2.

Upper Medinan (Girardeau): Orchard Creek, Alexander County, Illinois.

Cyclocystoides magnus Miller and Dyer.

Cyclocystoides magnus Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 32, pl. 2, figs. 8, 8a.—Miller, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 70, pl. 1, figs. 2, 2a; N. A. Geol. Pal., 1889, p. 237.

Cyclocystoides sp. (?C. magnus) Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 15, 1892, p. 85, pl. 1, figs. 13–15.

Richmond (Waynesville): Near Morrow and Waynesville, Ohio.

?Maysville: Cincinnati, Ohio.

Plesiotype.—Cat. No. 40733, U.S.N.M.

Cyclocystoides minus Miller and Dyer.

Cyclocystoides minus Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 33, pl. 2, fig. 5.

Richmond: Morrow, Ohio.

Cyclocystoides mundulus Miller and Dyer.

Cyclocystoides mundulus Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 34, pl. 2, fig. 7.

Richmond: Morrow, Ohio.

Cyclocystoides nitidus Faber.

Cyclocystoides nitidus Faber, Jour. Cincinnati Soc. Nat. Hist., 9, 1886, p. 17, pl. 1, fig. 1.

Maysville (Corryville): Near Transit, Ohio.

Cyclocystoides parvus Miller and Dyer.

Cyclocystoides parvus Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist. 1, 1878, p. 33, pl. 2, fig. 6.

Richmond: Morrow, Ohio.

Cyclocystoides salteri Hall.

Cyclocystoides salteri Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 218, pl. 6, fig. 16 (adv. sheets, 1871).—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 211, fig. 8.

Trenton: Near Saratoga, New York.

CYCLOGNATHUS Linnarsson. Genotype: C. micropygus Linnarsson.

Cyclognathus Linnarsson, Geol. Foren. Stockholm Forh., 2, No. 12, 1875, p. 500.—Brögger, Die sil. Etagen 2–3, Kristiania, 1882, p. 109.—Zittel, Handb. d. Pal., 2, 1885, p. 596.—Koken, Die Leitfossilien, Leipzig, 1896, p. 19.

Cyclognathus rotundifrons Matthew.

Cyclognathus rotundifrons Matthew, Trans. Royal Soc. Canada, 10, sec. 4, 1893, p. 107, pl. 7, figs. 16a, b.

Canadian (Bretonian—Div. C3d): St. John, New Brunswick.

CYCLOGRAPTUS Spencer. Genotype: C. rotadentatus Spencer.

Cyclograptus Spencer, Proc. Amer. Assoc. Adv. Sci., 31, 1883, p. 365; Bull. Mus. Univ. State Missouri, 1, 1884, p. 42; Trans. Acad. Sci. St. Louis, 4, 1884, p. 563, 592.—Miller, N. A. Geol. Pal., 1889, p. 182.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 182.

Cyclograptus rotadentatus Spencer.

Cyclograptus rotadentatus Spencer, Trans. Acad. Sci. St. Louis, 4, 1884, p. 592, pl. 6, figs. 6, 6a; Bull. Mus. Univ. State Missouri, 1, 1884, No. 1, p. 42, pl. 6, figs. 6, 6a.—Miller, N. A. Geol. Pal., 1889, p. 182, fig. 162.—Gurley, Jour. Geol., 4, 1896, pp. 94, 309.—Ruedemann, Mem. New York State Mus., 11, 1908, p. 184, pl. 2, fig. 5, figs. 91, 92.—Bassler, Bull. U. S. Nat. Mus., 65, 1909, pp. 45, 46, figs. 57, 58.

Niagaran dolomite: Hamilton, Ontario.

Clinton (Rochester): Clinton, New York.

CYCLOLITES ROTULOIDES Hall. See Palæocyclus rotuloides.

CYCLOLITUITES Remele. Genotype: C. applanatus Remele.

Cyclolituites Remeles Zeits. d. d. geol. Gesell., 38, 1886, p. 467.—Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 505.

Cyclolituites americanus Hyatt.

Cyclolituites americanus Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 505.

Canadian (Quebec): Gargamelle Cove, Newfoundland.

CYCLONEMA Hall. Genotype: Pleurotomaria bilix Conrad.

Cyclonema Hall, Pal. New York, 2, 1853, p. 89.—Salter, Geol. Surv. Canada, Can. Org. Rem., dec. 1, 1859, pp. 23, 25.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 319.—Zittel, Handb. Pal., 2, 1882, p. 187.—Nettelroth, Kentucky Foss. Shells, Geol. Surv. Kentucky, 1889, p. 187.—Miller, N. A. Geol. Pal., 1889, p. 400.—Koken, Neues Jahrb. f. Min., Geol. Pal., Beilage-Band, 6, 1889, p. 427.—Koken, Die Leitfossilien, Leipzig, 1896, p. 120, fig. 101.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1056.—Koken, Bull. Acad. Imp. Sci. St. Petersburg, 7, 1897, p. 191; Neues Jahrb. f. Min., Geol. Pal., 1, 1898, p. 24.—Pilsbry, Zittel-Eastman Textb. Pal., 1, 1900, p. 448.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 949.—Grabau and Shimer, N. A. Index Fossils, 3, 1909, p. 668.—Dall, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 530.

CYCLONEMA (part) of Hall, Salter and others. See Trochonema Salter.

Cyclonema bellulum Billings.

Cyclonema bellula Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 55.

Anticostian (Gun River): The Jumpers, Anticosti.

CYCLONEMA BILEX Foerste. See Cyclonema daytonense.

CYCLONEMA BILEX (part) Hall. See Cyclonema mediale.

CYCLONEMA BILEX var. CONICA Miller. See Cyclonema bilix.

CYCLONEMA BILEX var. LATA Meek. See Cyclonema bilix.

Cyclonema bilix (Conrad).

Pleurotomaria bilix Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1842, p. 271, pl. 16, fig. 10.—Hall (part), Pal. New York, 1, 1847, p. 305, pl. 83, figs. 4a–e.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 820, fig. 620.

Cyclonema bilix—Continued.

Turbo bilix D'Orbigny, Prod. de Pal., 1, 1849, p. 5 (gen. ref.).—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 158.

Cyclonema (Pleurotomaria) bilix Zittel, Handb. Pal., 2, 1882, p. 188, fig. 234.

Cyclonema bilix Hall, Pal. New York, 2, 1852, p. 89 (gen. ref.); 14th Rep. New York State Cab. Nat. Hist., 1861, p. 92.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 217, fig. 225.—Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, pl. 8, fig. 3.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 319.—White, 2d Ann. Rep. Indiana Dep. Stat. Geol., 1889, p. 492, pl. 2, figs. 3, 4, 5.—Ulrich, Amer. Geol., 1, 1888, p. 188, footnote.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 172, fig.—Miller, N. A. Geol. Pal., 1889, p. 400, fig. 663.—Keyes, Missouri Geol. Surv., 5, 1894, p. 154.—Koken, Bull. Acad. Imp. Sci. St. Petersburg, 7, 1897, p. 191, fig. 34.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1058, pl. 58, figs. 35–39.

Cyclonema bilex Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 958, pl. 40, figs. 2–2d.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 668, figs. 925 a, b.

Cyclonema bilex lata Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 152, pl. 13, figs. 5e, 5f.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 320.

Cyclonema bilex conica Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 320.

Richmond (Arnheim-Whitewater): Richmond, etc., Indiana; Ohio; Kentucky; etc.

Plesiotypes.—Cat. Nos. 45763–45765, U.S.N.M. (Ulrich and Scofield).

Cyclonema bilix fluctuatum (James).

Cyclonema fluctuata James, Cat. L. Sil. Foss. Cincinnati Group, 1871, p. 8 (nom. nud.); Cincinnati Quart. Jour. Sci., 1, 1874, p. 152.

Cyclonema bilix var. fluctuatum Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1058, pl. 78, figs. 40–42.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 959, pl. 40, figs. 3–3b.

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

Plesiotype.—Cat. No. 45767, U.S.N.M.

Cyclonema cancellatum Hall. See Strophostylus cancellatus.

Cyclonema cincinnatiense Miller. See Cyclonema varicosum.

Cyclonema commune Billings.

Cyclonema communis Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 55.

Anticostian (Jupiter River, Chicotte): The Jumpers, Anticosti.

Cyclonema cushingi Ruedemann.

Cyclonema cushingi Ruedemann, Bull. New York State Mus., 162, 1912, pl. 7, figs. 8–10.

Trenton (Snake Hill): Snake Hill, Saratoga County, New York.

Cyclonema daytonense Foerste.

Cyclonema bilex Foerste (not Conrad), Bull. Sci. Lab. Denison Univ., 1, 1885, p. 94; Proc. Boston Soc. Nat. Hist., 24, 1889, p. 290, pl. 5, fig. 15; Geol. Surv. Ohio, Pal., 7, p. 551, pl. 26, fig. 15, var. p. 130, fig. 15.

Cyclonema daytonensis Foerste, 24th Ann. Rep. Indiana Geol. Nat. Hist. Surv., 1899, p. 77; Jour. Geol., 11, 1903, p. 707.—Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 100, pl. 6, fig. 4; pl. 7, fig. 21.

Upper Medinan: Dayton and Todds Fork, Ohio (Brassfield); Thebes, Illinois; and Edgewood, Missouri (Edgewood).

Cyclonema decorum Billings.

Cyclonema decora Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 56.

Anticostian (Chicotte): Southwest Point, Anticosti.

CYCLONEMA ELEVATA Hall. See Strophostylus elevatus.

CYCLONEMA FLUCTUATA James. See Cyclonema bilix fluctuatum.

Cyclonema gracile Ulrich.

Cyclonema gracile Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1062, pl. 82, figs. 55–61.

Maysville (Mt. Hope): Cincinnati, Ohio, and vicinity.

Cotypes.—Cat. Nos. 45768, 45769, U.S.N.M

Cyclonema gracile striatulum Ulrich.

Cyclonema gracile var. striatulum Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1062, pl. 82, figs. 59–61 (striatellum on plate).

Maysville (Mt. Hope): Cincinnati, Ohio, and vicinity.

Holotype.—Cat. No. 45770, U.S.N.M.

Cyclonema hageri Billings.

Cyclonema Hageri Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 178, fig. 169; Pal. Fossils, 1, Geol. Surv. Canada, 1863, p. 29, fig. 27 (adv. sheets 1862).—Miller, N. A. Geol. Pal., 1889, p. 401, fig. 664.

Trenton: Smith's Quarries, Montreal, Quebec.

Cyclonema hallianum Salter.

Cyclonema Halliana Salter, Geol. Surv. Canada, dec. 1, 1859, p. 26, pl. 6, fig. 1.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 178, fig. 168.—Miller, N. A. Geol. Pal., 1889, p. 401, fig. 665.

Black River (Leray): Pauquette's Rapids, Ottawa River, Canada.

Cyclonema humerosum Ulrich.

Cyclonema humerosum Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1061, pl. 78, figs. 43–46.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 960, pl. 40, figs. 5–5c.

Maysville (McMillan) and Richmond: Cincinnati, Ohio, and vicinity; Indiana; Kentucky; Tennessee.

Cotypes.—Cat. Nos. 45771, 45772, U.S.N.M.

CYCLONEMA HUMILIS Billings. See Diaphorostoma humile.

Cyclonema inflatum Ulrich.

Cyclonema inflatum Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1060, pl. 78, figs. 31, 32.

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

Cotypes.—Cat. No. 45773, U.S.N.M.

Cyclonema (?Holopea) limatum Ulrich.

Cyclonema (?Holopea) limatum Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1063, pl. 82, figs. 62–64.

Maysville (Fairmount): Cincinnati, Ohio.

Cotypes.—Cat. No. 45774, U.S.N.M.

Cyclonema mediale Ulrich.

Cyclonema bilex Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 151, pl. 13, figs. 5a, c, d (not g).

Cyclonema mediale—Continued.

Cyclonema mediale, Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1059, pl. 78, figs. 29, 30.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 960, pl. 40, figs. 4, 4a.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 669, fig. 925c, d.

Maysville (Fairmount): Cincinnati, Ohio; Kentucky and Indiana.

Cotypes.—Cat. No. 45775, U.S.N.M.

CYCLONEMA MEDIOCRIS Billings. See Holopea mediocris.

Cyclonema? minor James. Not recognized.

Cyclonema? minor James, The Paleontologist, No. 1, 1878, p. 6.

Maysville: Cincinnati, Ohio.

Cyclonema montrealense Billings.

Cyclonema Montrealensis Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 30, text fig. 28. (adv. sheets, 1862); Geol. Canada, Geol. Surv. Canada, 1863, p. 178, fig. 170.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 186, pl. 12, fig. 33.—Ruedemann, Bull. New York State Mus., 162, 1912, p. 110, pl. 7, fig. 7.

Trenton: Island of Montreal, Canada; Snake Hill, Saratoga County, New York (Snake Hill); New Jersey.

CYCLONEMA? NORMALIANA Raymond. See Gyronema historicum.

CYCLONEMA? OBSOLETA Hall. See Holopea obsoleta.

CYCLONEMA PERCARINATA of authors. See Gyronema percarinatum.

Cyclonema percingulatum Billings.

Cyclonema percingulata Billings, Geol. Surv. Canada, Rep. Progr. for 1853-56, 1859, p. 304; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 55 (loc. ref.).

Anticostian (Jupiter River): Southwest Point, Anticosti.

CYCLONEMA PERVETUSTA Whitfield and Hovey. See Euconia? pervetusta.

Cyclonema phædra Billings.

Cyclonema Phædra Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 188.

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

Cyclonema (?Gyronema) præcIptum Ulrich.

Cyclonema (?Gyronema) præciptum Ulrich, Geol. Minnesota, 3, pt. 2, 1897, pl. 78, fig. 26.

Stones River (Murfreesboro): Murfreesboro, Tennessee.

Holotype.—Cat. No. 46052, U.S.N.M.

Cyclonema pyramidatum James.

Cyclonema pyramidata James, Cat. L. Sil. Fossils Cincinnati Group, 1871, p. 8; Cincinnati Quart. Jour. Sci., 1, 1874, p. 152.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1061, pl. 78, figs. 33, 34.

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

Plesiotype.—Cat. No. 45776, U.S.N.M.

CYCLONEMA RUGÆLINEATA Nettelroth. See Poleumita rugilineata.

CYCLONEMA SEMICARINATA Salter. See Gyronema semicarinatum.

Cyclonema simulans Ulrich.

Cyclonema simulans Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1061, pl. 78, fig. 47.

Maysville (Corryville): Cincinnati, Ohio.

Holotype.—Cat. No. 45777, U.S.N.M.

Cyclonema sublæve Ulrich.

Cyclonema sublæve Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1062, pl. 78, figs. 48, 49.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 669, fig. 925j.

Maysville (Mt. Hope): Cincinnati, Ohio, and vicinity

Cotypes.—Cat. No. 45778, U.S.N.M.

Cyclonema sulcata Billings. See Poleumita? sulcata.

Cyclonema tennesseense Miller. See Strophostylus tennesseensis.

Cyclonema textile Miller. See Strophostylus textilis.

Cyclonema thalia Billings.

Pleurotomaria Thalia Billings, Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, p. 303.

Cyclonema Thalia Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 17, fig. 5; p. 55.

Richmond (Charleton): Charleton Point, Anticosti.

Gamachian (Ellis Bay): Gamache Bay, Anticosti.

Cyclonema transversum Ulrich.

Cyclonema transversum Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1062, pl. 82, figs. 65–67.

Maysville (Fairmount): Covington, Kentucky, and vicinity.

Cotypes.—Cat. Nos. 45779, 45780, U.S.N.M.

Cyclonema varians Billings.

Cyclonema varians Billings, Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, p. 305; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 55 (loc. ref.).

Anticostian (Chicotte): Southwest Point, Anticosti.

Cyclonema varicosum Hall.

Cyclonema varicosa Hall, 14th Rep. New York State Cab. Nat. Hist., 1861, p. 91, 110; Desc. N. Sp. Foss. Cincinnati Group, 1871, pl. 4, figs. 1–3; 24th Rep. New York State Cab. Nat. Hist., 1872, pl. 8, figs. 1, 2.—Meek, Geol. Surv. Ohio, 1, 1873, p. 152.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 321.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1060, pl. 78, figs. 27, 28.—Hayes and Ulrich, U. S. Geol. Surv. Folio 95, illust. sheet, 1903, figs. 28, 29.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 669, fig. 925h–i.—Bassler, Bull. Geol. Surv. Virginia, 2a, 1909, p. 184, fig. 21.

Cyclonema ventricosa (in error for varicosa) Hall, 24th Rep. New York State Mus. Nat. Hist., 1870, pl. 8.

Cyclonema cincinnatiense Miller, Journ. Cincinnati Soc. Nat. Hist., 5, 1882, p. 230, pl. 9, figs. 8, 8a–c.

Cyclonema varicosum-cincinnatense Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 139, pl. 1, figs. 12a, b.

Trenton: Nashville, etc., Tennessee (Catheys); Kentucky; Ohio; Minnesota; Virginia.

Plesiotypes.—Cat. Nos. 45781, 45782, U.S.N.M

Cyclonema varicosum-cincinnatense Foerste. See Cyclonema varicosum.

CYCLONEMA VENTRICOSUM Hall. See Cyclonema varicosum and Strophostylus ventricosus.

CYCLOPORA JAMESII Prout. See Escharopora pavonia.

CYCLOPORINA Simpson. See Semicoscinium Prout.

CYCLORA Hall. Genotype: C. minuta Hall.

Cyclora Hall, Amer. Jour. Sci. Arts, 48, 1845, p. 294.—Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 153.—Miller, Cincinnati Quart. Jour. Sci., 1874, p. 312.—Zittel, Handb. Pal., 2, 1882, p. 193.—Miller, N. A. Geol. Pal., 1889, p. 401.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 949.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 673.

Cyclora alta Foerste.

Cyclora alta Foerste, Bull. Sci. Lab. Denison Univ., 1, 1855, p. 96, pl. 14 figs. 17a, b; Geol. Surv. Ohio, Pal., 7, 1893, p. 552, pl. 26, figs. 17a, b.

Upper Medinan (Brassfield): Huffman's Quarry, near Dayton, Ohio.

Cyclora depressa Ulrich.

Cyclora depressa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 13, pl. 7, figs. 9, 9a.

Maysville: Hamilton, etc., Ohio; Indiana; Kentucky.

Cotypes.—Cat. No. 45685, U.S.N.M.

Cyclora hoffmanni Miller.

Cyclora Hoffmanni Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 313, fig. 33; N. A. Geol. Pal., 1889, p. 401, fig. 666.

Mohawkian and Cincinnatian: Cincinnati, Ohio, and many other American localities.

Cyclora minuta Hall.

Cyclora minuta Hall, Amer. Jour Sci. Arts, 48, 1845, p. 294.—Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 152, pl. 13, figs. 7a–e.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 312.—Whiteaves, Pal. Fossils, Geol. Surv. Canada, 3, pt. 2, 1895, p. 124 (loc. occ.).—Miller, Amer. Geol., 17, 1896, pp. 74–76.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 961, pl. 40, figs. 6–6c.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 673, fig. 932.

Holopea nana Meek, Proc. Acad. Nat. Sci. Philadelphia, 1871, p. 172.

Mohawkian and Cincinnatian: Cincinnati, Ohio, and numerous other American localities.

Cyclora parvula (Hall).

Turbo? parvulus Hall, Amer. Jour Sci. Arts, 48, 1845, p. 294.

Cyclora? parvula Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 154.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 313.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 962.

Mohawkian and Cincinnatian: Cincinnati, Ohio, and numerous other American localities.

Cyclora pulcella Miller.

Cyclora pulcella Miller, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 231, pl. 9, figs. 9, 9a–b.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 962, pl. 40, figs. 7–7b.

Richmond (Arnheim, Waynesville): Versailles, Indiana; Ohio; etc.

CYCLOSPIRA Hall and Clarke. Genotype: Orthis bisulcata Emmons.

Cyclospira Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 146.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 469.—Hall and Clarke, 13th Ann. Rep. New York State Geol., 1895, p. 808.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 760.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 309.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 410.

Cyclospira bisulcata (Emmons).

Orthis bisulcata Emmons, Geol. New York, Rep. 2d Dist., 1842, p. 396, fig. 4.

Atrypa bisulcata Hall, Pal. New York, 1, 1847, p. 139, pl. 33, fig. 3.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 190, pl. 10, figs. 3a–e.

Genus? bisulcata Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 65.

Camarella bisulcata Miller, Amer. Pal. Foss., 1877, p. 107.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 3, figs.

Camarella owatonnensis Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, 1892, p. 328, pl. 4, figs. 1–3.

Rhynchonella bisulcata Safford, Geol. Tennessee, 1869, p. 275, figs. 7, 14.

Cyclospira bisulcata? Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 470, pl. 34, figs. 49–54.

Cyclospira bisulcata Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 147, figs. 133–136, pl. 54, figs. 38–40.—Whiteaves, Pal. Foss., 3, pt. 3, 1897, p. 180.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 309, figs. 386d–h.

Trenton: Adams, Jefferson County, New York; Ottawa, Ontario; Cannon Falls, etc., Minnesota; Lake Winnipeg, Manitoba.

Cyclospira(?) sparsiplica Foerste.

Cyclospira(?) sparsiplica Foerste, Geol. Ohio, 7, 1895, p. 593, pl. 37A, fig. 18.

Upper Medinan (Brassfield): Dayton, Ohio.

CYCLOSTOMA? PERVETUSTA Conrad. See Euconia(?) pervetusta.

CYCLOSTOMICERAS Hyatt. Genotype: Gomphoceras cassinense Whitfield.

Cyclostomiceras Hyatt, Zittel-Eastman Textb. Pal., 1, 1900, p. 530.—Ruedemann, Bull. New York State Mus., 90, 1906, p. 500.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 119.—Hyatt, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 611.

Cyclostomiceras(?) brevicorne (Hall).

Cyrtoceras brevicorne Hall, 20th Rep. New York. State Cab. Nat. Hist., 1868, p. 356, pl. 18 (8), figs. 8, 9; rev. ed., 1870, p. 407, pl. 18, figs. 8, 9; pl. 25, fig. 14.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 194, fig.

Cyrtoceras brevicorne Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 89, pl. 13, figs. 11, 12.

Cyclostomiceras(?) brevicorne Grabau and Shimer, N. A. Index Fossils, 3, 1910, p. 121, fig. 1361.

Niagaran: Racine, Wisconsin (Racine and Guelph); Shelby and Rochester, New York (Guelph).

Cyclostomiceras cassinense (Whitfield).

Gomphoceras cassinense Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 322, pl. 29, figs. 1–3.—Seely, Rep. State Geol. Vermont, 7, 1910, pl. 56, fig. 4.

Cyclostomiceras cassinense Hyatt, Zittel-Eastman Textb. Pal., 1, 1900, p. 530.—Ruedemann, Bull. New York State Mus., 90, 1906, p. 501, fig, 56; pl. 37, figs. 1–3; pl. 38, figs. 5, 6.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 120, fig. 1357.

Canadian (Beekmantown): Fort Cassin, Vermont.

Cyclostomiceras minimum (Whitfield).

Gomphoceras minimum Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 321, pl. 27, figs. 3–5.

Cyclostomiceras minimum Ruedemann, Bull. New York State Mus., 90, 1906, p. 502, pl. 35, figs. 5–6, fig. 57.

Canadian (Beekmantown): Fort Cassin, Vermont.

Cyclostomiceras orodes (Billings).

Cyrtoceras Orodes Billings, Pal. Foss., 1, Geol. Surv. Canada (adv. sheets, 1862), 1865, p. 162.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 103, pl. 14, figs. 7, 7a, 8a, b, 9.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 88, pl. 15, fig. 3–11.

Cyrtoceras (Cyclostomiceras) orodes Grabau, Michigan, Geol. Surv., Geol. Ser., 1, 1909, p. 197, pl. 28, figs. 6, 7; pl. 29, figs. 2, 3.

Cyclostomiceras orodes Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 120, fig. 1358–60.

Niagaran (Guelph): New Hope, Ontario.

Monroan (Amherstburg and Raisin River): Detroit River region.

CYLICOCRINUS Miller. See Barrandeocrinus Angelin.

CYLINDROCŒLIA Ulrich. Genotype: C. endoceroidea Ulrich.

Cylindrocœlia Ulrich, Amer. Geol., 3, 1889, pp. 235, 245.—Miller, N. A. Geol. Pal., 1889, p. 158.—James, Jour. Cincinnati Soc. Nat. Hist., 14, 1891, p. 56.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 77.

Cylindrocœlia covingtonensis Ulrich.

Cylindrocœlia covingtonensis Ulrich, Amer. Geol., 3, 1889, p. 247.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 14, pt. 1, 1891, p. 56.

Maysville (Fairmount): Covington, Kentucky.

Cotypes.—Cat. No. 46550, U.S.N.M.

Cylindrocœlia endoceroidea Ulrich.

Cylindrocœlia endoceroidea Ulrich, Amer. Geol., 3, 1889, p. 246, figs. 9, 10.

Black River (Lowville): High Bridge, Kentucky.

Cylindrocœlia minnesotensis Ulrich.

Cylindrocœlia minnesotensis Ulrich, Amer. Geol., 3, 1889, p. 248.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 78, pl. G, figs. 1–3.

Black River (Decorah): Minneapolis, St. Paul, and Fountain, Minnesota.

Cotypes.—Cat. Nos. 46551, 46552, U.S.N.M.

Cylindrocœlia minor Ulrich.

Cylindrocœlia minor Ulrich, Amer. Geol., 3, 1889, p. 248.

Trenton: Harrodsburg Junction, Kentucky.

CYLINDROHELIUM Grabau. Genotype: C. profundum Grabau.

Cylindrohelium Grabau, Geol. Surv. Michigan, Geol. Ser., 1, 1909, p. 102.

Cylindrohelium heliophylloides Grabau.

Cylindrohelium heliophylloides Grabau, Geol. Surv. Michigan, Geol. Ser., 1, 1909, p. 103, pl. 10, fig. 7.

Upper Monroan (Lucas): Salt shaft, Detroit, Michigan.

Cylindrohelium profundum Grabau.

Cylindrohelium profundum Grabau, Geol. Surv. Michigan, Geol. Ser., 1, 1909, p. 102, pl. 11, figs. 4–6, 7.

Upper Monroan (Lucas): Salt shaft, Detroit, Michigan; near Sylvania, Ohio.

Silurian: North Fork of Saskatchewan River, Canada.

CYMATONOTA Ulrich. Genotype: C. typicalis Ulrich.

Orthonota Conrad (part), New York Ann. Geol. Rep., 1841, p. 51.—Hall, 1847, Pal. New York, 1, 1841, p. 299.

Orthodesma Hall and Whitfield (part), Pal. Ohio, 2, 1875, p. 93.

Chænodomus Ulrich, Geol. Minnesota, 3, pt. 2, 1893, p. 477 (not defined).

Cymatonota Ulrich, Geol. Surv. Ohio, 7, 1893, p. 661.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 980.

Cymatonota attenuata Ulrich.

Cymatonota attenuata Ulrich, Geol. Surv. Ohio, 7, 1893, p. 664, pl. 55, figs. 12–14.

Richmond (Waynesville); Waynesville, Ohio.

Cotypes.—Cat. No. 46164, U.S.N.M.

Cymatonota constricta Ulrich.

Cymatonota constricta Ulrich, Geol. Surv. Ohio, 7, 1893, p. 664, pl. 55, figs. 10, 11.

Richmond (Waynesville): Butler County, Ohio, and Versailles, Indiana.

Holotype.—Cat. No. 46165, U.S.N.M.

Cymatonota cylindrica (Miller and Faber).

Orthodesma cylindricum Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 17, 1894, p. 22, pl. 1, figs. 1–4.

Richmond (Waynesville): Warren County, Ohio.

Cymatonota lenior Foerste.

Cymatonota lenior Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 290, pl. 1, fig. 9.

Cincinnatian (Pulaski): Riviere des Hurons, near St. Jean Baptiste, Quebec.

Cymatonota parallela (Hall).

Orthonota parallela Hall, Pal. New York, 1, 1847, p. 299, pl. 82, fig. 7 (not 7a, b, d).—?Emmons, Amer. Geology, 1, pt. 2, 1855, p. 173, pl. 13, fig. 14.—(?)Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 216, fig. 224.—(?)Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 221.

(?)Orthodesma parallela Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 96.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 565, figs.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, pl. 47, fig. 5.

Cincinnatian: Pulaski, Lorraine, etc., New York (Pulaski); Cincinnati, Ohio (Maysville).

Cymatonota pholadis (Conrad).

Pterinea pholadis Conrad, Amer. Geol. Rep. New York, 1838, p. 118.

Orthonota pholadis Hall, Pal. New York, 1, 1847, p. 299, pl. 82, fig. 6.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 174.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 222.

Cymatonota pholadis Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 291, pl. 3, fig. 7.

Cincinnatian: Pulaski, etc., New York (Pulaski); (?)Cincinnati, Ohio (Maysville).

Cymatonota productifrons Ulrich.

Cymatonota productifrons Ulrich, Geol. Surv. Ohio, 7, 1893, p. 665, pl. 55, figs. 17, 18.

Orthodesma productifrons Miller, N. A. Geol. Pal., 2d App., 1897, p. 783 (gen. ref.).

Eden (Economy): Covington, Kentucky.

Holotype.—Cat. No. 46166, U.S.N.M.

Cymatonota recta Ulrich.

Cymatonota recta Ulrich, Geol. Surv. Ohio, 7, 1893, p. 662, pl. 55, figs. 8, 9.
Maysville (McMillan): Cincinnati, Ohio, and vicinity.
Cotypes.—Cat. Nos. 46167, 46178, U.S.N.M.

Cymatonota semistriata Ulrich.

Cymatonota semistriata Ulrich, Geol. Surv. Ohio, 7, 1893, p. 663, pl. 55, figs. 6, 7.
Orthodesma semistriatum Miller, N. A. Geol. Pal., 2d App., 1897, p. 784 (gen. ref.).
Richmond (Waynesville): Clarksville and Waynesville, Ohio.
Holotype.—Cat. No. 46169, U.S.N.M.

Cymatonota typicalis Ulrich.

Chænodomus typicalis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 477, fig. 4 (not defined).
Cymatonota typicalis Ulrich, Geol. Surv. Ohio, 7, 1893, p. 662, pl. 55, figs. 1–5.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 998, pl. 45, figs. 1–1c.
Richmond (Waynesville): Waynesville, etc., Ohio; southeastern Indiana.
Cotypes.—Cat. No. 46170, U.S.N.M.

CYPHASPIS Burmeister. Genotype: Phacops ceratophthalma Goldfuss.

Cyphaspis Burmeister, Org. Tril., Ray Soc., 1846, p. 98.—Hawle and Corda, Abh. d. k. bohmischen Gesell. d. Wiss., 5 (extract), 1847, p. 80, pl. 4, fig. 40.—Barrande, Syst. Sil. du Centre Boheme, 1, 1852, p. 479.—Pictet, Traite de Pal., 2d ed., 2, 1854, p. 497.—Nieszkowski, Archiv. f. Naturk. Liv.-Ehst-u. Kurl., 1, 1857, p. 562.—Alth, Abhandl. der k.-k. Geol. Reichsanstalt, 7, Heft 1, 1874, p. 61.—Œhlert, Bull. Soc. d'Etudes Sci. d'Angers, 1885, p. 3.—Zittel, Handb. Pal., 2, Munich, 1885, p. 624.—Hall and Clarke, Pal. New York, 7, 1888, p. 47, 48, fig.—Clarke, Jour. Morph., 2, 1888, p. 254.—Whidborne, Mon. Dev. Fauna South England, 1, Pal. Soc. 1889, p. 17.—Miller, N. A. Geol. Pal., 1889, p. 541.—Koken, Die Leitfossilien, Leipzig, 1896, p. 24, fig. 15, fig. 5.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 317.—Lindström, Kongl. Sven. Vet.-Akad. Handl., 34, No. 8, 1901, p. 26.—Grabau and Shimer, N. A. Index Fossils, 2, 1908, p. 302.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 721.

Cyphaspis arkansanus Van Ingen.

Cyphaspis arkansanus Van Ingen, School of Mines Quart., 23, 1901, p. 35 (nom. nud.).
Niagaran (St. Clair): St. Clair Spring, Independence County, Arkansas.

Cyphaspis brevimarginatus Walcott. See Haploconus brevimarginatus.

Cyphaspis christyi Hall.

Cyphaspis christyi Hall, Trans. Albany Inst., 4, 1864, p. 220; 28th Rep. New York St. Mus. Nat. Hist., doc. ed., 1877, pl. 32, figs. 5–7; Mus. ed., 1879, p. 188, pl. 32, figs. 5–7.—White, 2d Ann. Rep. Dep. State Geol., Indiana, 1880, p. 498, pl. 3, fig. 9.—Hall, 11th Rep. Dep. Geol. Nat. Hist. Indiana, 1882, p. 333, pl. 34, figs. 5–7.—Miller, N. A. Geol. Pal., 1889, p. 541, fig. 990.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 174, figs.
Niagaran (Waldron): Waldron, Indiana; Newsom, Tennessee.

Cyphaspis clintonensis Foerste. See Cyphaspis clintoni.

Cyphaspis clintoni Foerste.

Proetus —— Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 92, pl. 8, fig. 5.
Cyphaspis clintoni Foerste, Proc. Bost. Soc. Nat. Hist., 24, 1890, p. 272, pl. 6, fig. 22.

Cyphaspis clintoni—Continued.

Cyphaspis clintonensis Foerste, Geol. Surv. Ohio, 7, 1893, p. 524, pl. 27, fig. 5; pl. 31, fig. 22.

Upper Medinan (Brassfield): Dayton, Ohio; Cumberland Gap, Tennessee.

Cyphaspis(?) frobisheri Emerson.

Cyphaspis? frobisheri Emerson, Narrative Hall's 2d Arctic Exped., U. S. Navy Dep., 1879, p. 583, fig. 11.

Richmond (Utica?): Frobisher Bay, Baffin Land.

Plastotype.—Cat. No. 60627, U.S.N.M.

CYPHASPIS GALENENSIS Clarke. See Haploconus galenensis.

Cyphaspis girardeauensis Shumard.

Cyphaspis girardeauensis Shumard, 1st and 2d Ann. Rep. Geol. Surv. Missouri, pt. 2, 1855, p. 197, pl. B, fig. 11 a, b.—Emmons, Man. Geol., 1860, p. 159, fig. 2.—Keyes, Missouri Geol. Surv., 4, 1895, p. 228, pl. 32, fig. 2.—Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 58, pl. 2, fig. 13.—Miller, N. A. Geol. Pal., 1889, p. 541, fig. 991.

Calymene spinifera Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1842, p. 277.

Upper Medinan (Girardeau): Near Cape Girardeau, Missouri.

Holotype.—Cat. No. 57102, U.S.N.M.

CYPHASPIS HUDSONICA Ruedemann. See Proetus undulostriatus.

Cyphaspis intermedia Weller.

Cyphaspis intermedia Weller, Bull. Chicago Acad. Sci., 4, pt. 2, 1907, p. 231, pl. 20, figs. 3–5.—Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 121, pl. 7, fig. 26.

Upper Medinan: Near Channahon, Will County (Channahon), and Thebes, Illinois; Edgewood, Missouri (Edgewood).

Cyphaspis matutina Ruedemann.

Cyphaspis matutina Ruedemann, Bull. New York State Mus., 49, 1901, p. 62, pl. 4, figs. 5–7.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 302.

Mohawkian (Rysedorph): Rysedorph Hill, Rensselaer County, New York.

Cyphaspis spinulocervix Van Ingen.

Cyphaspis spinulocervix Van Ingen, School of Mines Quart., 23, 1901, p. 35, (nom. nud.).

Niagaran (St. Clair): St. Clair Spring, Independence County, Arkansas.

Cyphaspis trentonensis Weller.

Cyphaspis trentonensis Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 197, pl. 15, figs. 8–10.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 302.

Trenton: Jacksonburg, New Jersey.

CYPHOCRINUS Miller. Genotype: C. gorbyi Miller.

Cyphocrinus Miller, 18th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1894, p. 304. (adv. sheets, 1892); N. A. Geol. Pal., 2d. App., 1897, p. 741.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 199.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, p. 75, fig. 37 (includes discussion of synonymy).—Zittel, Grundzuge Pal., 1, 1910, p. 161.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 187.

Hyptiocrinus Wachsmuth and Springer, Amer. Geol., 10, 1892, p. 138; Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 200.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 145.

Cyphocrinus chicagoensis Weller.

Cyphocrinus chicagoensis Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 76, pl. 1, figs. 1–4.

Niagaran (Racine): Bridgeport, Illinois.

Cyphocrinus gorbyi Miller.

Cyphocrinus gorbyi Miller, N. A. Geol. Pal., 1st App., 1892, p. 676, figs. 1221–22; 18th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1894, p. 305, pl. 7, figs. 14–16; adv. sheets, 1892, p. 51, pl. 7, figs. 14–16.

Hyptiocrinus typus Wachsmuth and Springer, Amer. Geol., 10, 1892, p. 138; Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 201, pl. 19, figs. 6 a–c.

Niagaran (Laurel): St. Paul, Shelby County, Indiana.

CYPHOTRYPA Ulrich and Bassler. Genotype: Leptotrypa acervulosa Ulrich.

Cyphotrypa Ulrich and Bassler, Smiths. Misc. Coll., 47, 1904, pp. 24, 29.

Cyphotrypa acervulosa (Ulrich).

Leptotrypa acervulosa Ulrich, Geol. Minnesota, 3, 1893, p. 318, pl. 27, figs. 24, 25.

Cyphotrypa acervulosa Ulrich and Bassler, Smiths. Misc. Coll., 47, 1904, p. 30, pl. 8, figs. 1–3.

Trenton: Decorah, Iowa; Goodhue County, Minnesota (Prosser); Burgin and Frankfort, Kentucky; Ontario.

Holotype.—Cat. No. 43189, U.S.N.M.

Cyphotrypa bulbosa (Billings).

Stenopora bulbosa Billings, Canadian Nat. Geol., 2d ser., 2, 1865, p. 429; Catal. Sil. Foss. Anticosti, 1866, p. 32.

Gamachian (Ellis Bay): Gamache Bay, etc., Anticosti.

Cyphotrypa corrugata (Weller).

Monotrypa corrugata Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 223, pl. 18, figs. 1–5.

Cyphotrypa corrugata Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 269, pl. 42, figs. 5–9; pl. 44, fig. 4; pl. 52, figs. 1, 2.

Helderbergian: Near Tri States, New York (Decker Ferry); Cash Valley, etc., Maryland (Keyser).

Plesiotypes.—Cat. No. 53651, U.S.N.M.

Cyphotrypa frankfortensis Ulrich and Bassler.

Cyphotrypa frankfortensis Ulrich and Bassler, Smiths. Misc. Coll., 47, 1904, p. 30, pl. 8, figs. 7–9.

Trenton (Cynthiana): Frankfort and Burgin, Kentucky.

Holotype.—Cat. No. 43188, U.S.N.M.

Cyphotrypa informis (Ulrich).

Leptotrypa informis Ulrich, Geol. Minnesota, 3, 1893, p. 317, pl. 27, figs. 22, 23.

Cyphotrypa informis Ulrich and Bassler, Smiths. Misc. Coll., 47, 1904, p. 30 (gen. ref.).

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

Cyphotrypa semipilaris (Ulrich).

Leptotrypa semipilaris Ulrich, Geol. Surv. Illinois, 8, 1890, p. 457, pl. 36, figs. 5–5d.—J. F. James, Jour. Cincinnati Soc. Nat. Hist., 16, 1894, p. 181.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 580, fig. 148 (not 149, 150=Leptotrypa acervulosa).

Cyphotrypa semipilaris Ulrich and Bassler, Smiths. Misc. Coll., 47, 1904, p. 30 (gen. ref.).

Maysville (Fairmount): Covington, Kentucky, and vicinity.

Cotypes.—Cat. No. 43395, U.S.N.M.

Cyphotrypa stidhami (Ulrich).

Leptotrypa stidhami Ulrich, Geol. Surv. Illinois, 8, 1890, p. 456, pl. 36, figs. 4–4b.

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

Cyphotrypa stidhami Ulrich and Bassler, Smiths. Misc. Coll., 47, 1904, p. 30 (gen. ref.).

Richmond (Whitewater): Brown County, and near Eaton, Ohio.

Cotypes.—Cat. No. 43394, U.S.N.M.

Cyphotrypa wilmingtonensis Ulrich and Bassler.

Cyphotrypa wilmingtonensis Ulrich and Bassler, Smiths. Misc. Coll., Quart., 47, 1904, p. 31, pl. 8, figs. 4–6.

Richmond (Fernvale): Wilmington, Illinois.

Holotype.—Cat. No. 43192, U.S.N.M.

CYPRICARDIA ALATA Hall. See Modiolopsis primigenia.

CYPRICARDIA AMERICANA Emmons. See Goniophora carinata.

CYPRICARDIA? ANGUSTA Hall. See Ctenodonta machæriformis.

CYPRICARDIA MODIOLARIS Owen. See Modiolopsis modiolaris.

CYPRICARDIA OBSOLETA Hall. See Modiolopsis subalatus.

CYPRICARDIA ORTHONOTA Hall. See Modiolopsis orthonota.

CYPRICARDIA SUBTRUNCATA Emmons. See Whitella subtruncata.

CYPRICARDINIA Hall. Genotype: C. lamellosa Hall.

Cypricardinia Hall, Pal. New York, 3, 1859, p. 266; Prelim. Notice Lam., pt. 2, 1870, p. 81; 23d Rep. New York State Cab. Nat. Hist., 1873, pl. 14, figs. 3–6.—Barrande, Syst. Sil. Centre Boheme, 1881, p. 14, 112.—Zittel, Handb. Pal., 2, 1881, p. 108.—Hall, Pal. New York, 5, pt. 1, Lam., 2, 1885, p. xlvi.—Herrick, Bull. Sci. Lab. Denison Univ., 2, pt. 1, 1889, p. 35.—Miller, N. A. Geol. Pal., 1889, p. 475.—Nettelroth, Kentucky Foss. Shells, Geol Surv. Kentucky, 1889, p. 204.—Whidborne, Mon. Dev. Fauna South England, 2, Pal. Soc., 1892, p. 5.—Koken, Die Leitfossilien, Leipzig, 1896, p. 524.—Hind, Mon. Brit. Carb. Lamellibranchiata, 1, Pal. Soc., 1897, p. 129.—Grabau, Bull. Buffalo Soc. Nat. Hist., 6, 1889, p. 268.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 535.

Cypricardinia arata Hall.

Cypricardinia arata Hall, 20th Rep. New York State Cab. Hist., 1868, p. 337, pl. 14 (5), fig. 6; rev. ed., 1870, p. 385, pl. 14, fig. 6; 28th Rep. New York State Mus. Nat. Hist., mus. ed., 1879, p. 174; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 317, pl. 27, fig. 23.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 535.

Niagaran: Racine, Wisconsin, and Bridgeport, Illinois (Racine); Waldron, Indiana; Tennessee (Waldron).

Cypricardinia canadensis Grabau.

Cypricardinia canadensis Grabau, Geol. Surv. Michigan, Geol. Ser., 1, 1909, p. 170, pl. 23, figs. 14, 15.

Upper Monroan (Amherstburg): Bed of Detroit River, opposite Amherstburg, Ontario.

CYPRICARDINIA INFLATA Lesley. See Cypricardites inflatus.

Cypricardinia lamellosa Hall.

Cypricardinia lamellosa Hall, Pal. New York, 3, 1859, p. 266, pl. 49a, figs. 1a–c.

Cypricardinia cf. lamellosa Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 463, pl. 78, figs. 6, 7.

Helderbergian: Albany County, New York (New Scotland); Keyser, West Virginia (Keyser).

Cypricardinia subovata Miller and Dyer.

Cypricardinia subovata Miller and Dyer, Cont. to Pal., 2, 1878, p. 10, pl. 3, figs. 8, 8a.

Niagaran (Waldron): Waldron, Indiana.

Cypricardinia subquadrata Savage.

Cypricardinia subquadrata Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 95, pl. 5, fig. 26.

Upper Medinan (Edgewood-Noix): Near Louisiana, Missouri.

Cypricardinia undulostriata (Hall).

Modiolopsis? undulostriata Hall, Pal. New York, 2, 1852, p. 284, pl. 59, figs. 6a, b.

Cyrtodonta undulostriata Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 410.

Cypricardinia undulostriata Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 561, pl. 37, figs. 9a, b.

Clinton (Rochester): Lockport, New York.

Upper Medinan (Brassfield): Dayton, Ohio.

Cypricardites Conrad. Genotype: C. curtus Conrad.

Cypricardites Conrad, 5th Ann. Rep. New York Geol. Surv, 1841, p. 51.

Not Cypricardites of most authors.

Observation.—See Geology of Minnesota, 2, 1897, p. 535, for remarks on this genus.

Cypricardites of authors. See Cyrtodonta Billings, Ortonella Ulrich, and Vanuxemia Billings.

Cypricardites acutumbona Miller. See Vanuxemia acutumbona.

Cypricardites affinis Miller. See Cyrtodonta affinis.

Cypricardites amplus Miller. See Cyrtodonta ampla.

Cypricardites amygdalina Miller. See Ambonychia amygdalina.

Cypricardites angusta Miller. See Ctenodonta machæriformis.

Cypricardites angustifrons Conrad. See Modiolopsis modiolaris.

Cypricardites anodontoides Emmons. See Modiolopsis sinuata.

Cypricardites anticostiensis Miller. See Cyrtodonta? anticostiensis.

Cypricardites billingsi Miller. See Cyrtodonta billingsi.

Cypricardites breviuscula Miller. See Cyrtodonta breviuscula.

Cypricardites canadensis Miller. See Cyrtodonta canadensis.

Cypricardites? carinata Meek. See Whitella carinata.

Cypricardites caswelli Foerste. See Cuneamya caswelli.

Cypricardites cingulata Ulrich. See Cyrtodonta cingulata.

Cypricardites cordiformis Miller. See Plethocardia? cordiformis.

Cypricardites curtus Conrad. Not recognized.

Cypricardites curta Conrad, 5th Ann. Rep. New York Geol. Surv., 1841, p. 53.

Salmon River: Near Rome, New York, and Richmond, Indiana.

Observation.—Foerste (Bull. Sci. Lab. Denison Univ., 17, 1914, p. 298) attempts to resurrect this form as a species of Ischyrodonta with the well-known I. unionoides as a synonym. Conrad's definition is worthless, and the figures given by Hall (12th Rep. New York State Cab. Nat. Hist., 1859, p. 9) is a view of the interior of some unknown Cyrtodonta.

CYPRICARDITES DESCRIPTUS Sardeson. See Cyrtodonta descriptus.

CYPRICARDITES DIGNUS Sardeson. See Cyrtodonta dignus.

CYPRICARDITES EMMA Miller. See Rhytimya emma.

CYPRICARDITES FERRUGINEUM Hall and Whitfield. See Cyrtodonta? ferruginea.

CYPRICARDITES FINITIMUS Sardeson. See Cyrtodonta finitimus.

CYPRICARDITES (VANUXEMIA) FRAGOSA. See Vanuxemia fragosa.

CYPRICARDITES GANTI Miller. See Modiolodon ganti.

CYPRICARDITES GERMANUS Ulrich. See Cyrtodonta grandis germana.

CYPRICARDITES GLABELLA Ulrich. See Cyrtodonta glabella.

CYPRICARDITES GRANDIS Ulrich. See Cyrtodonta grandis.

CYPRICARDITES HAINESI Miller and Faber. See Ortonella hainesi.

CYPRICARDITES HALLI Nettelroth. See Cyrtodonta halli.

CYPRICARDITES HARRIETTA Miller. See Cyrtodonta? harrietta.

CYPRICARDITES HAYNIANUS Ulrich. See Vanuxemia hayniana.

CYPRICARDITES HINDI Miller. See Whitella hindi.

CYPRICARDITES HURONENSIS Miller. See Cyrtodonta huronensis.

Cypricardites inflatus (Emmons). Not recognized.

Nuculites inflata Emmons, Nat. Hist. Geol. New York, 2, 1842, p. 395, fig. 2.

Cypricardites inflatus Miller, N. A. Geol. Pal., 1889, p. 476 (gen. ref.).

Cypricardinia inflata Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 177. figs.

Trenton: Watertown, New York.

CYPRICARDITES INSULARIS Miller. See Cyrtodonta? insularis.

Cypricardites iowensis (Owen).

Cardium Iowensis Owen, Geol. Expl. Iowa, Wisconsin, Illinois, 2d ed., 1844, p. 84, pl. 17, fig. 8.

Cypricardites iowensis Miller, N. A. Geol. Pal., 1889, p. 477 (gen. ref.).

Mohawkian: Iowa and Wisconsin.

Observation.—Side view of cast of some unrecognizable pelecypod.

CYPRICARDITES ISLANDICUS Hall. See Cyrtodonta huronensis.

CYPRICARDITES LATUS Miller. See Modiolopsis latus.

CYPRICARDITES LEUCOTHEA Miller. See Cyrtodonta leucothea.

CYPRICARDITES LUCULENTUS Sardeson. See Cyrtodonta grandis luculenta.

CYPRICARDITES MEGAMBONUS Whitfield. See Whitella megambona.

CYPRICARDITES MINNESOTENSIS Sardeson. See Cyrtodonta glabella.

CYPRICARDITES MISENERI Miller. See Ischyrodonta miseneri.

CYPRICARDITES? MODESTUS Ulrich. See Saffordia modesta.

CYPRICARDITES MODIOLARIS Emmons. See Modiolopsis modiolaris.

CYPRICARDITES NANUS Ulrich. See Vanuxemia nana.

CYPRICARDITES NASUTA Conrad. See Orthodesma nasutum.

CYPRICARDITES NIOTA Hall and Whitfield. See Vanuxemia niota.

CYPRICARDITES OBLIQUUS Meek and Worthen. See Cyrtodonta obliqua.

CYPRICARDITES OBSOLETUS Lesley. See Modiolopsis subalatus.

CYPRICARDITES OBTUSIFRONS Ulrich. See Vanuxemia obtusifrons.

CYPRICARDITES OBTUSUS Miller. See Cyrtodonta obtusa.

CYPRICARDITES OVALIS Miller. See Ischyrodonta ovalis.

CYPRICARDITES OVATA Conrad. See Modiolopsis modiolaris.

CYPRICARDITES OVIFORMIS Ulrich. See Cyrtodonta oviformis.

CYPRICARDITES PERSIMILIS Miller. See Cyrtodonta persimilis.

CYPRICARDITES PLEBEIA Miller. See Whitella plebeia.

CYPRICARDITES PONDEROSA Miller. See Cyrtodonta ponderosa.

CYPRICARDITES QUADRANGULARIS Whitfield. See Whitella quadrangularis.

Cypricardites?? quadrilatera Hall.

Cypricardites? quadrilatera Hall, 20th Rep. New York State Cab. Hist., 1868, p. 340, pl. 14 (5), figs. 8–10; rev. ed. 1868 (1870), p. 388, pl. 14, figs. 8–10.

Niagaran (Racine): Bridgeport, Illinois.

CYPRICARDITES RECTIROSTRIS Whitfield. See Vanuxemia rectirostris.

CYPRICARDITES ROTUNDATA Hall and Whitfield. See Vanuxemia rotundata.

CYPRICARDITES ROTUNDATUS (part) Whitfield. See Vanuxemia suberecta.

CYPRICARDITES RUGOSUS Miller. See Cyrtodonta rugosa.

CYPRICARDITES SAFFORDI Hall. See Cyrtodonta saffordi.

CYPRICARDITES SARDESONI Ulrich. See Vanuxemia sardesoni.

CYPRICARDITES SIGMOIDEA Miller. See Whitella? sigmoidea.

CYPRICARDITES SINUATA Emmons. See Modiolopsis sinuata.

CYPRICARDITES SPINIFERA Miller. See Cyrtodonta spinifera.

CYPRICARDITES STERLINGENSIS Miller. See Whitella sterlingensis.

CYPRICARDITES SUBANGULATUS Miller. See Cyrtodonta subangulata.

CYPRICARDITES SUBCARINATA Miller. See Cyrtodonta subcarinata.

CYPRICARDITES SUBOVATUS Miller. See Cyrtodonta huronensis.

CYPRICARDITES SUBSPATULATA Miller. See Prolobella subspatulata.

CYPRICARDITES SULCODORSATUS Miller. See Saffordia sulcodorsata.

CYPRICARDITES TENELLUS Ulrich. See Cyrtodonta tenella.

CYPRICARDITES TERMINALIS Ulrich. See Vanuxemia terminalis.

CYPRICARDITES TRIANGULARIS Sardeson. See Vanuxemia hayniana.

CYPRICARDITES UNGULATA Miller. See Vanuxemia ungulata.

CYPRICARDITES VENTRALIS Miller. See Saffordia ventralis.

CYPRICARDITES VENTRICOSA Miller. See Whitella ventricosa.

CYPRICARDITES VENTRICOSUS Whitfield. See Cyrtodonta billingsi.

CYPRICARDITES VETUSTA Miller. See Cuneamya vetusta.

CYPRICARDITES VICINUS Sardeson. See Vanuxemia obtusifrons.

CYPRICARDITES WINCHELLI Miller. See Modiolodon winchelli.

CYPRICARDITES WORTHENI Ulrich. See Vanuxemia wortheni.

CYPRIDINA Milne-Edwards.

Cypridina Milne-Edwards in Lamarck's Anim. sans Vert., 5, 1838, p. 178.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 706.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 741.

Cypridina antiqua Jones.

Cypridina antiqua Jones, Geol. Mag., dec. 5, 1, 1904, p. 438, fig. 1.

Trenton?: Wenoma, Lake Ontario, near Hamilton, Ontario.

CYRTACTINOCERAS Hyatt. Genotype: Cyrtoceras rebelle Barrande.

Cyrtactinoceras Hyatt, Zittel-Eastman Textb. Pal., 1900, p. 528; ibid., 2d ed., 1913, p. 609.—Ruedemann, Bull. New York State Mus., 90, 1906, p. 448.

Cyrtactinoceras boycii (Whitfield).

Cyrtoceras boycii Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 326, pl. 29, fig. 4.—Brainerd and Seely, Bull. Amer. Mus. Nat. Hist., 3, 1890, p. 22.

Cyrtactinoceras boycii Ruedemann, Bull. New York State Mus., 90, 1906, p. 489, pl. 35, figs. 1–4; figs. 45–47.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 117, fig. 1352.

Chazyan (Crown Point, Valcour): Isle La Motte, Vermont.

Cyrtactinoceras champlainense Ruedemann.

Cyrtactinoceras champlainense Ruedemann, Bull. New York State Mus., 90, 1906, p. 491, pl. 34, fig. 3; pl. 36, figs. 1, 2, figs. 48–50.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 117.

Chazyan (Valcour): Near Chazy, and Saranac River at Plattsburg, New York.

CYRTENDOCERAS Remele.

Cyrtendoceras (Remele) Hyatt, Zittel-Eastman Textb. Pal., 1, 1900, p. 515; 2d ed., 1913, p. 596.

Cyrtendoceras(?) priscum Ruedemann.

Cyrtendoceras(?) priscum Ruedemann, Bull. New York State Mus., 90, 1906, p. 430, pl. 2, figs. 2–5.

Canadian (Beekmantown): Beekmantown, New York.

CYRTHIA D'Orbigny. See Cyrtia Dalman.

CYRTIA Dalman. Genotype: Anomites exporrectus Wahlenberg.

Cyrtia Dalman, Kongl. Svenska Vet.-Akad. Handl. for 1827, 1828, pp. 93, 97.—Davidson, British Foss. Brach. Pal. Soc., 1853, p. 83; 1859, p. 66.—Billings, Canadian Jour., 6, 1861, p. 262.—Zittel, Handb. Pal., 1, 1880, p. 683.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 93.—Miller, N. A. Geol. Pal., 1889, p. 342.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 40; 13th Ann. Rep. New York State Geol., 1895, p. 759.—Koken, Die Leitfossilien, Leipzig, 1896, p. 243, fig. 204, 3.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 336; 2d ed., 1913, p. 412.

Cyrthia D'Orbigny, Prodr. Pal., 1, 1849, p. 41.

Cyrtia cliftonensis Foerste.

Cyrtia cliftonensis Foerste, Jour. Geol., 11, 1903, p. 709; Bull. Sci. Lab. Denison Univ., 14, 1909, p. 91, pl. 2, fig. 32.

Niagaran (Brownsport): Near Clifton, Tennessee.

CYRTIA EXPORRECTA Hall and Whitfield, 1875. See Cyrtia exporrecta myrtia.

Cyrtia exporrecta (Wahlenberg).

Anomites exporrectus Wahlenberg, Nova Acta Regiæ Soc. Scient. Upsal, 8, 1821, p. 64.

Spirifera (Cyrtia) trapezoidalis Hall and Whitfield, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 183.

Cyrtia trapezoidalis Hall and Whitfield, 27th Rep. ibid., 1875, pl. 9, figs. 19–21.

Cyrtia exporrecta Dalman, Kongl. Vet.-Akad. Handl. for 1827, 1828, p. 118.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 93, pl. 27, figs. 6–8, 20.—Miller, N. A. Geol. Pal., p. 342, 1889, fig. 557.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 42, pl. 28, figs. 1, 48, 49, 51.

Silurian: Europe; Louisville, Kentucky (Louisville); Osgood, Indiana (Osgood).

Plesiotype.—Cat. No. 51326, U.S.N.M.

CYRTIA EXPORRECTA var. ARRECTA Nettelroth. See Cyrtia exporrecta myrtia.

Cyrtia exporrecta myrtia (Billings).

Cyrtia myrtia Billings, Pal. Fossils, 1, 1862, p. 165, fig. 149.—Hall and Clarke Pal. New York, 8, pt. 2, 1893, p. 42.—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 443, pl. 9, figs. 10, 12.

Cyrtia trapezoidalis var arrecta Hall and Whitfield, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 183.

Cyrtia exporrecta Hall and Whitfield, 27th Rep. ibid., 1875, pl. 9, figs. 22, 23.

Cyrtia exporrecta var. arrecta Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 94, pl. 27, fig. 21; pl. 34, fig. 35; pl. 37, figs. 60, 61.—Hall. and Clarke, Pal. New York, 8, pt. 2, 1895, pl. 28, figs. 2, 3; pl. 39, fig. 32.

Anticostian (Chicotte): Southwest Point, Anticosti.

Niagaran: Louisville, Kentucky (Louisville); Indiana and Tennessee (Osgood and Waldron); Wisconsin (Racine).

Plesiotype.—Cat. No. 51327, U.S.N.M. (Nettelroth types of C. exporrecta-arrecta).

Cyrtia meta (Hall).

Spirifer radiatus (part) Hall, Pal. New York, 2, 1852, p. 66, pl. 22, figs. 2a–2c, 2f.

Spirifera meta Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, p. 372, pl. 13, figs. 12, 13.

Cyrtia radians Hall and Clarke, Pal. New York, 8, pt. 2, 1893, pp. 42, 362, pl. 28, figs. 4, 5, 50, 52; pl. 39, fig. 33.

Niagaran: Rochester, New York (Clinton); Milwaukee, Wisconsin (Racine).

CYRTIA MYRTIA Billings. See Cyrtia exporrecta myrtia.

CYRTIA RADIANS Hall and Clarke. See Cyrtia meta.

CYRTIA TRAPEZOIDALIS var. ARRECTA Hall and Whitfield. See Cyrtia exporrecta myrtia.

CYRTIDOCRINUS Angelin. See Lecanocrinus Hall.

CYRTINA Davidson. Genotype: Cyrtia heteroclita Defrance.

Cyrtina Davidson, Mon. British Carb. Brach. Pal. Soc., 1859, p. 66.—Hall, Pal. New York, 4, 1867, p. 263; 20th Rep. New York State Cab. Nat. Hist., 1867, p. 251.—Zittel, Handb. d. Pal., 1, 1880, p. 683.—Davidson, Mon. British Foss. Brach., 5, Sil. Suppl., Pal. Soc., 1882, p. 80.—Herrick, Bull. Sci. Lab. Denison Univ., 4, 1888, p. 14.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 95.—Miller, N. A. Geol. Pal., 1889, p. 342.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 43; 13th Ann. Rep. New York State Geol., 1895, p. 763.—Koken, Die Leitfossilien, Leipzig, 1896, p. 243, figs. 204, 6.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 219.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 335, 2d ed., 1913, p. 412.—Grabau, Bull. New York State Mus., 45, 1901, p. 197; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 197.

Cyrtina magnaplicata Weller.

Cyrtina magnaplicata Weller, Geol. Surv. New Jersey Pal., 3, 1903, p. 238, pl. 21, figs. 46–49.

Helderbergian (Decker Ferry): Two miles south of Tristates, New York.

Cyrtina pyramidalis (Hall).

Spirifer pyramidalis Hall, Pal. New York, 2, 1852, p. 266, pl. 54, fig. 7.

Cyrtina pyramidalis Miller, N. A. Geol. Pal., 1889, p. 343.—Grabau, Bull. New York State Mus., 45, 1901, p. 197, fig. 115; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 197, fig. 115.

Clinton (Rochester): Lewiston, New York.

CYRTOCERAS Goldfuss. Genotype: C. depressum Goldfuss.

Cyrtoceras Goldfuss, in De la Beche's Handbuch der Geognosie, 1832, p. 536.—Portlock, Rep. Geol. Londonderry, 1843, p. 411.—McCoy, Syn. Char. Carb. Foss. Ireland, 1844, p. 11.—D'Orbigny, Prodr. de Pal., 1, 1849, p. 1.—Woodward, Man. Mollusca, pt. 1, 1851, p. 91.—Saemann, Palæontographica, 3, 1852, pp. 156, 161.—McCoy, Brit. Pal. Rocks Foss., 1854, p. 312.—Pictet, Traité de Pal., 2d ed., 2, 1854, p. 652.—Barrande, Bull. Soc. Geol. France, 2d ser., 12, 1855, p. 158.—Emmons, Amer. Geology, 1, pt. 3, 1855, p. 147.—Billings, Canadian Nat. Geol., 2, 1857, p. 136, pl. 2, fig. 3.—Chapman, Canadian Jour., n. s., 2, 1857, p. 266; 8, 1863, p. 22.—Salter, Geol. Surv. Canada, dec. 1, 1859, p. 31.—Barrande, Syst. Sil. Centre Boheme, 2, pt. 1, 1867, p. 375.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 131.—Hall, Pal. New York, 5, pt. 2, 1879, pp. 354, 368, 389.—Blake, Mon. Brit. Foss. Cephalopoda, 1882, p. 54.—Zittel, Handb. d. Pal., 2, 1884, p. 373.—Foord, Cat. Foss. Ceph. Brit. Mus.,

CYRTOCERAS—Continued.

vol. 1, 1888, p. 262.—Miller, N. A. Geol. Pal., 1889, p. 432.—Whidborne, Mon. Dev. Fauna South England, 1, Pal. Soc., 1890, p. 102.—Koken, Die Leitfossilien, Leipzig, 1896, p. 49, fig. 33.—Clarke, Geol. Minnesota, 3, pt.2, 1897, p. 803.—Grabau, Bull. New York State Mus., 45, 1901, p. 216; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 216.—Hyatt, Zittel-Eastman Textb. Pal., 1, 1900, p. 530.—Foord, Mon. Carb. Ceph. Ireland, pt. 5, Pal. Soc., App., 1903, p. 212.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 94.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1026.—Hyatt, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 611.

Glyptodendron Claypole, Amer. Jour. Sci. Arts, 15, 1878, p. 302. (Genotype: G. eatonense Claypole).—Foerste, Amer. Geol., 12, 1893, pp. 134–139.

Glyptoceras Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 537. (Genotype: G. eatonense Claypole.).

CYRTOCERAS? ABRUPTUM Hall. See Orthoceras abruptum.

Cyrtoceras? acinacellum Whitfield.

Cyrtoceras acinacellum Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 327, pl. 27, figs. 10–13.—Ruedemann, Bull. New York State Mus., 90, 1906, p. 508.

Canadian (Beekmantown): Fort Cassin, Vermont.

Cyrtoceras alethes Billings.

Cyrtoceras Alethes Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 193, text fig. 177a–c.

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

Cyrtoceras amœnum Miller.

Cyrtoceras amœnum Miller, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 105, pl. 3, fig. 8.—James, J. F., ibid., 8, 1886, p. 247.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1027, pl. 49, fig. 1.

Richmond (Whitewater): Richmond, Indiana.

CYRTOCERAS (PHRAGMOCERAS) AMPLICORNE Hall. See Halloceras hercules.

CYRTOCERAS ANNULATUM Hall. See Spyroceras subannulatum.

CYRTOCERAS ARCTICAMERATUM Hall. See Mælonoceras arcticameratum.

CYRTOCERAS ARCUATUM Hall. See Cyrtoceras subarcuatum.

Cyrtoceras aristides Billings.

Cyrtoceras aristides Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 316.

Canadian (Beekmantown): Phillipsburg, Quebec.

Cyrtoceras baffinense Schuchert.

Cyrtoceras baffinensis Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 171, pl. 14, figs. 11–13.

Mohawkian: Head of Frobisher Bay, Baffin Land.

Holotype.—Cat. No. 28198, U.S.N.M.

Cyrtoceras beekmanense Whitfield.

Cyrtoceras beekmanensis Whitfield, Bull. Amer. Mus. Nat. Hist., 2, 1889, p. 57, pl. 10, figs. 2, 3.—Ruedemann, Bull. New York State Mus., 90, 1906, p. 506.

Canadian (Beekmantown): Beekmantown, New York.

CYRTOCERAS BILLINGSI Salter. See Zitteloceras billingsii and Z. hallianum.

CYRTOCERAS BONDI Safford. See Plectoceras bondi.

Cyrtoceras bovinum Clarke and Ruedemann.

Cyrtoceras bovinum Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 90, pl. 16, figs. 8, 9; pl. 18, figs. 5, 6.

Niagaran (Guelph): Rochester, New York.

CYRTOCERAS BOYCII Whitfield. See Cyrtactinoceras boycii.

CYRTOCERAS BREVICORNE Hall. See Cyclostomiceras brevicorne.

Cyrtoceras camurum Hall.

Cyrtoceras camurum Hall, Pal. New York, 1, 1847, p. 196, pl. 42, fig. 6.—Emmons, Amer. Geology, 1, pt, 2, 1855, p. 148.—Whitfield, Geol. Wisconsin, 4, 1882, p. 231, pl. 7, figs. 7, 8, 9.—Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 805, pl. 60, figs. 5, 6.

Mohawkian: Middleville, New York (Trenton): Beloit, Wisconsin (Black River).

CYRTOCERAS? CANCELLATUM Hall. See Cyrtoceras subcancellatum.

Cyrtoceras capricornulus (Troost). Not recognized.

Conilites capricornulus Troost, 5th Geol. Rep. Tennessee, 1840, p. 50.

Cyrtoceras capricornulus Troost, 6th Geol. Rep. Tennessee, 1841, p. 178.

Ordovician(?): Davidson County, Tennessee.

Cyrtoceras carrollense Worthen.

Cyrtoceras Carrollensis Worthen, Geol. Surv. Illinois, 6, 1875, p. 496, pl. 23, fig. 3.

Trenton (Galena): Carroll County, Illinois.

Cyrtoceras cinctutum Foerste.

Cyrtoceras cinctutus Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 61, pl. 3, figs. 37a–b.

Niagaran (Osgood): Clifton, Tennessee.

Cyrtoceras clintonense Foerste.

Cyrtoceras Clintonense Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 534, pl. 36, figs. 2a–e.

Upper Medinan (Brassfield): Huffmans quarry, near Dayton, Ohio.

Cyrtoceras clitus Billings.

Cyrtoceras clitus Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 85, fig. 24.

Niagaran (Lockport): Grimsby, Ontario.

Cyrtoceras confertissimum Whitfield.

Cyrtoceras confertissimum Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 327, pl. 27, figs. 7–9.—Ruedemann, Bull. New York State Mus., 90, 1906, p. 506, pl. 38, figs. 1–4.

Canadian (Beekmantown): Fort Cassin, Vermont; Valcour, New York.

Cyrtoceras conicum Owen. Not recognized.

Cyrtoceras conicum Owen, Geol. Expl. Iowa, Wisconsin, Illinois, 2d ed., 1844, p. 70, pl. 16, fig. 9.

Mohawkian: Wisconsin.

Cyrtoceras conoidale Wetherby.

Cyrtoceras conoidale Wetherby, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 78, pl. 2, figs. 6, 6a.

Maysville: Maury County, Tennessee (Leipers); Boyle and Garrard Counties, Kentucky.

Cyrtoceras constrictostriatum Hall.

Cyrtoceras constrictostriatum Hall, Pal. New York, 1, 1847, p. 195, pl. 42, figs. 2a, b, 3c, d.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 147.

Trenton: Middleville, New York.

Cyrtoceras constrictum Billings. See Oncoceras constrictum.

Cyrtoceras cordatum Parks.

Cyrtoceras cordatum Parks in Tyrrell, 22d Rep. Ontario Bur. Mines, 1913, p. 42.

Niagaran: Mouth of Nelson River, Manitoba.

Cyrtoceras corniculum Hall. See Cyrtoceras tenuistriatum.

Cyrtoceras cornulum Schuchert.

Cyrtoceras cornulum Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 170, pl. 14, figs. 8–10.

Mohawkian: Head of Frobisher Bay, Baffin Land.

Cotype.—Cat. No. 28121, U.S.N.M.

Cyrtoceras corydon Billings.

Cyrtoceras Corydon Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 85, fig. 23.

Niagaran (Lockport): Grimsby, Ontario.

Cyrtoceras(?) cuneatum Whiteaves.

Cyrtoceras(?) cuneatum Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 282; Ottawa Nat., 20, p. 133, figs.

Niagaran: Stonewall, Manitoba.

Cyrtoceras? dactyloides Dwight.

Cyrtoceras? dactyloides Dwight, Amer. Jour. Sci. Arts, 3d ser., 27, 1884, p. 255, pl. 7, figs. 9, 9a.

Canadian (Beekmantown): Rochdale, New York.

Cyrtoceras dardanum Hall. See Cyrtorizoceras dardanum.

Cyrtoceras dictys Billings.

Cyrtoceras Dictys Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 192, fig. 176.

Canadian (Levis): Point Levis, Quebec.

Cyrtoceras dresbachense Sardeson.

Cyrtoceras dresbachense Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 102, pl. 6, fig. 4.

Ozarkian (Oneota): Dresbach, Minnesota.

Cyrtoceras dunleithense Miller and Gurley.

Cyrtoceras dunleithense Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 11, 1896, p. 30, pl. 3, figs. 11, 12.

Black River (Platteville): Dunleith, Illinois.

Cyrtoceras (Glyptoceras) eatonense (Claypole).

Glyptodendron eatonense Claypole, Amer. Jour. Sci. Arts (3), 15, 1878, p. 302; Geol. Mag., dec. 2, 5, 1878.—Miller, N. A. Geol. Pal., 1889, p. 119, fig. 39.

Cyrtoceras (Glyptoceras) eatonense Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 535, pl. on p. 536, figs. 1a–c, 2.

Cyrtoceras (Glyptodendron) eatonense Foerste, Amer. Geol., 12, 1893, p. 139, pl. 7, figs. 1, 2.

Upper Medinan (Brassfield): Near Eaton and near Dayton, Ohio.

Cyrtoceras euglum Hall.

Cyrtoceras euglum Hall, Rep. Geol. Surv. Wisconsin, 1861, p. 49.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 66, pl. 9, figs. 3, 4.

Black River (Platteville): Beloit, Wisconsin.

CYRTOCERAS EXIGUUM Billings. See Oncoceras exiguum.

Cyrtoceras faberi J. F. James.

Cyrtoceras faberi James, J. F., Jour. Cincinnati Soc. Nat. Hist., 8, 1886, p. 246, pl. 4, figs. 3a, b.

Richmond: Waynesville, Ohio.

CYRTOCERAS FALX Billings. See Mælonoceras falx.

Cyrtoceras featherstonhaughi Clarke.

Cyrtoceras featherstonhaughi Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 807, pl. 58, figs. 12–15.

Black River (Platteville): Cannon Falls, Minnesota.

Cyrtoceras filosum (Conrad).

Cyrtoceras filosum (Conrad M. S.) Emmons, Nat. Hist. New York Geol., 2, 1842, p. 392, fig. 4.—Owen, Amer. Jour. Sci. Arts, 47, 1844, p. 369, fig. 4 on p. 365.—D'Orbigny, Prodr. de Pal., 1, 1849, p. 2.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 181, fig.

Cyrtolites filosum Hall, Pal. New York, 1, 1847, p. 190, pl. 41, figs. 3a, b.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 167, pl. 12, fig. 4; Man. Geol., 1860, p. 98, fig. 87.

Trenton: Watertown, New York.

CYRTOCERAS FOSTERI Hall. See Cyrtorizoceras fosteri.

CYRTOCERAS FRAGILE Billings. See Oncoceras fragile.

CYRTOCERAS FULTONENSIS Meek and Worthen. See Cyrtorizoceras dardanum.

CYRTOCERAS GIGANTEUM McChesney. See Nautilus?? cancellatus.

Cyrtoceras gracile Cleland.

Cyrtoceras sp. Cleland, Amer. Pal., 3, Bull. 13, 1900, p. 19, pl. 17, figs. 5, 6.

Cyrtoceras gracilis Cleland, Bull. Amer. Pal., 4, 1903, p. 13, pl. 3, fig. 11.

Canadian (Tribes Hill): Fort Hunter, Tribes Hill, and Canajoharie, New York.

CYRTOCERAS HALLEANUS D'Orbigny. See Zitelloceras hallianum.

CYRTOCERAS HERCULES Hall. See Protophragmoceras hercules.

CYRTOCERAS HERTZERI Hall and Whitfield. See Hexameroceras hertzeri.

Cyrtoceras hitzi Foerste.

Cyrtoceras hitzi Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 78, pl. 1, fig. 7a, b; pl. 2, figs. 23a–c.

Richmond (Whitewater-Saluda): Madison, Indiana.

Cyrtoceras houghtoni Clarke.

Cyrtoceras houghtoni Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 807, pl. 59, figs. 12–15.

Black River (Platteville): Cannon Falls, Minnesota.

Cyrtoceras howardi Miller.

Cyrtoceras howardi Miller, 18th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1894, p. 323, pl. 12, fig. 1; adv. sheets, 1892, p. 69, pl. 12, fig. 1.

Niagaran (Laurel): St. Paul, Indiana.

CYRTOCERAS HURONENSE Billings. See Oncoceras huronense.

Cyrtoceras indianense Miller.
Cyrtoceras indianensis Miller, 17th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1892, p. 698, pl. 18, fig. 1, 2; adv. sheets, 1891, p. 88.
Niagaran (Laurel): St. Paul and Hartsville, Indiana.

Cyrtoceras infundibulum Whitfield.
Cyrtoceras infundibulum Whitfield, Ann. Rep. for 1879, Geol. Surv. Wisconsin, 1880, p. 66; Geol. Wisconsin, 4, 1882, p. 300, pl. 20, figs. 4, 5.
Niagaran (Racine): Racine, Wisconsin.

Cyrtoceras irregulare Wetherby.
Cyrtoceras irregulare Wetherby, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 79, pl. 2, fig. 3.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 8, 1886, p. 246.
Richmond (Waynesville): Oregonia (Freeport) and Waynesville, Ohio; Versailles, Indiana.

CYRTOCERAS ISODORUS Billings. See Cyrtorizoceras isodorus.

Cyrtoceras juvenalis Billings.
Cyrtoceras Juvenalis Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 177; App., p. 420, fig. 400a, b.
Trenton: Montreal, Quebec.

CYRTOCERAS KIRBYI Whitfield. See Ooceras kirbyi.

CYRTOCERAS LAMELLOSUM Hall. See Zitteloceras hallianum.

Cyrtoceras laterale Hall.
Cyrtoceras laterale Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 357, pl. 18 (9), figs. 4–6; rev. ed., 1870, p. 407, pl. 18, figs. 4–6, pl. 24, fig. 5.
Niagaran (Racine and Guelph): Racine, Wisconsin.

Cyrtoceras laticurvatum Whiteaves.
Cyrtoceras laticurvatum Whiteaves, Canadian Rec. Sci., 6, 1895, p. 395.; Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 224, fig. 14.
Black River or Richmond: Lake Winnipeg, Canada.

Cyrtoceras ligarius Billings.
Cyrtoceras Ligarius Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 176.
Richmond: Drummond Island, Lake Huron.

Cyrtoceras loculosum Hall.
Cyrtoceras loculosum Hall, Rep. Sup. Geol. Surv. Wisconsin, 1861, p. 42.—Whitfield, Mem. Amer. Mus. Nat Hist., 1, pt. 2, 1895, p. 67, pl. 9, figs. 6–9.
Ozarkian (Oneota): Madison, Wisconsin.

Cyrtoceras lucillum Hall.
Cyrtoceras lucillum Hall, 20th Rep. New York State Cab. Nat. Hist. (extras, 1865), 1868, p. 349, pl. 18 (9), fig. 7; rev. ed., 1870, p. 406, pl. 18, fig. 7.
Niagaran (Racine): Wauwatosa, Wisconsin.

Cyrtoceras luthei Calvin.
Cyrtoceras luthei Calvin, Amer. Geol., 10, 1892, p. 147; Bull. Lab. Nat. Hist. State Univ. Iowa, 2, 1892, p. 193.
Ozarkian (Oneota): Northeastern Iowa.

Cyrtoceras lysander Billings.
Cyrtoceras Lysander Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 161, fig. 146a-d (adv. sheets, 1862).
Richmond: Cape Smyth, Manitoulin Island, Lake Huron.

Cyrtoceras macrostomum Hall.

Cyrtoceras marginalis Conrad (not Phillips, 1841), Proc. Acad. Nat. Sci. Philadelphia, 1, 1843, p. 334.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 147, fig. 30.

Cyrtoceras macrostomum Hall, Pal. New York, 1, 1847, p. 194, pl. 42, figs. 1a–c, 3a–b.—Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 584.

Black River: Mineral Point, Wisconsin (Platteville); Middleville, New York; Carlisle, Pennsylvania.

Cyrtoceras magister Miller.

Cyrtoceras obscura Miller (not Barrande), Cincinnati Quart. Jour. Sci., 2, 1875, p. 132, text fig. 17.

Cyrtoceras magister Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 284.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 8, 1886, p. 246.—Miller, N. A. Geol. Pal., 1889, p. 434, fig. 729.

Eden (Southgate): Cincinnati, Ohio.

Cyrtoceras manitobense Whiteaves.

Cyrtoceras Manitobense Whiteaves, Trans. Royal Soc. Canada, 7, sec. 4, 1890, p. 80, pl. 13, figs. 3–5; pl. 15, fig. 4; Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 223.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 170.

Oncoceras manitobense Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 799.

Black River or Richmond: Lake Winnipeg, Manitoba; Baffin Land.

CYRTOCERAS MARGINALIS Conrad. See Cyrtoceras macrostomum.

Cyrtoceras markœi Castelnau. Not recognized.

Cyrtoceras Markœi Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 30, pl. 9, fig. 3.

Ordovician: Montmorency River, Canada.

Cyrtoceras massiense Safford.

Cyrtoceras Massiense Safford, Geol. Tennessee, 1869, p. 290, pl. 4 (G 3), fig. 4a, b.

Trenton: Nashville, Tennessee.

Cyrtoceras mccoyi Billings.

Cyrtoceras McCoyi Billings, Canadian Nat. Geol., 4, 1859, p. 467.

Chazyan: Mingan Islands, Quebec.

CYRTOCERAS METELLUS Billings. See Mælonoceras metellus.

Cyrtoceras microscopicum Dwight.

Cyrtoceras microscopicum Dwight, Amer. Jour. Sci. Arts (3), 27, 1884, p. 256, pl. 7, fig. 11.

Canadian (Beekmantown): Rochdale, New York.

CYRTOCERAS MINNEAPOLIS Clarke. See Cyrtorizoceras minneapolis.

Cyrtoceras missisquoi Billings.

Orthoceras Missisquoi Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 314, fig. 303.

Cyrtoceras missisquoi Miller, N. A. Geol. Pal., 1889, p. 435 (gen. ref.).

Canadian (Beekmantown): Phillipsburg, Quebec.

Cyrtoceras multicameratum Hall.

Cyrtoceras multicameratum Hall, Pal. New York, 1, 1847, p. 195, pl. 42, fig. 4.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 147.

Trenton: Middleville, New York.

CYRTOCERAS MYRICE Hall and Whitfield. See Kionoceras darwini.

Cyrtoceras nashvillense Miller.

Cyrtoceras nashvillensis Miller, 17th Ann. Rep. Dep. Geol. Nat. Res. Indiana, p. 697, pl. 16, fig. 1; adv. sheets, 1891, p. 87.

Niagaran (Osgood or Laurel): West of Nashville, Tennessee.

CYRTOCERAS NELEUS Hall. See Mælonoceras neleus.

Cyrtoceras norwoodi Clarke.

Cyrtoceras norwoodi Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 809, pl. 60, figs. 7–9.

Black River (Platteville): Rockton, Illinois.

CYRTOCERAS OBSCURA Miller. See Cyrtoceras magister.

CYRTOCERAS ORCAS Hall. See Oncoceras orcas.

Cyrtoceras orestes Billings.

Cyrtoceras Orestes Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 177.

Upper Medinan (Cataract): West Flamborough, Ontario.

CYRTOCERAS ORODES Billings. See Cyclostomiceras orodes.

CYRTOCERAS PLANODORSATUM Whitfield. See Tripteroceras planodorsatum.

Cyrtoceras postumius Billings.

Cyrtoceras Postumius Billings, Pal. Foss, 1, Geol. Surv. Canada, 1865, p. 178.

Richmond: Cape Smyth, Manitoulin Island, Lake Huron.

Cyrtoceras pusillum Hall.

Cyrtoceras pusillum Hall. 20th Rep. New York State Cab. Nat. Hist., 1868, p. 357; rev. ed., 1870, p. 407.

Niagaran (Racine): Racine, Wisconsin.

Cyrtoceras quebecense Whiteaves.

Cyrtoceras Quebecense Whiteaves, Ottawa Nat., 12, 1898, p. 120; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 315, pl. 35, figs. 1, 1a.

Canadian (Levis limestone): Point Levis, Quebec.

CYRTOCERAS RAEI Whitfield. See Ooceras? raei.

Cyrtoceras rectum Whitfield.

Cyrtoceras rectum Whitfield, Ann. Rep. for 1877, 1878, p. 85; Geol. Wisconsin, 4, 1882, p. 319, pl. 24, figs. 6, 8.

Niagaran (Guelph): Carlton, Wisconsin.

Cyrtoceras regulare Billings.

Cyrtoceras regulare Billings, Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, p. 314.

Black River (Leray): Pauquettes Rapids, Ottawa River, Canada.

Cyrtoceras reversum Spencer. Not recognized.

Cyrtoceras reversum Spencer, Bull. Missouri State Mus., 8, 1884, p. 60, pl. 7, fig. 8; Trans. Acad. Sci. St. Louis, 4, 1884, p. 610, pl. 7, fig. 8.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 96.

Niagaran (Lockport): Limehouse Station, Ontario.

Observation.—Cast of the living chamber probably of Poterioceras sauridens Clarke and Ruedemann, figured in a reversed position.

Cyrtoceras rigidum Hall.

Cyrtoceras rigidum Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 358, fig., pl. 16 (7), figs. 3–5; rev. ed., 1870, p. 408, pl. 16, figs. 3–5, text fig. 5.

Niagaran (Racine): Bridgeport, Illinois.

Cyrtoceras saffordi Miller.

Cyrtoceras saffordi Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 698, pl. 17, figs. 2, 3; adv. sheets, 1891, p. 88.

Trenton (Catheys): Nashville, Tennessee.

Cyrtoceras scofieldi Clarke.

Cyrtoceras scofieldi Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 810, pl. 49, figs. 9–11.

Black River (Platteville): Janesville, Wisconsin.

Cyrtoceras septoris Hall and Whitfield. See Septameroceras septore.

Cyrtoceras shumardi Clarke.

Cyrtoceras shumardi Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 810, pl. 60, figs. 1–4.

Black River (Platteville): Cannon Falls, Minnesota.

Cyrtoceras simplex Billings.

Cyrtoceras simplex Billings, Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, p. 313.

Black River: "Lot N. concession A. Nepean," Canada.

Cyrtoceras sinuatum Billings.

Cyrtoceras sinuatum Billings, Geol. Surv. Rep. Progr. for 1853–56, 1857, p. 315.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 312, pl. 40, figs. 3, 3a.

Black River (Leray): La Petite Chaudiére, Ottawa River, Canada.

Cyrtoceras? stonense Safford.

Cyrtoceras? stonense Safford, Geol. Tennessee, 1869, p. 290, pl. 4 (G. 3), figs. 2a–c.

Stones River (Murfreesboro): Murfreesboro, Tennessee.

Cyrtoceras subannulatus D'Orbigny. See Spyroceras subannulatum.

Cyrtoceras subarcuatum D'Orbigny.

Cyrtoceras arcuatum Hall (not Steininger, 1830), Pal. New York, 1, 1847, p. 196, pl. 42, figs. 5a–c.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 147.

Cyrtoceras subarcuatum D'Orbigny, Prodr. de Pal., 1, 1849, p. 2.

Trenton: Middleville, New York.

Cyrtoceras subcancellatum Hall.

Cyrtoceras? cancellatum Hall (preoccupied), Pal. New York, 2, 1852, p. 290, pl. 61, figs. 2a–c.

Cyrtoceras subcancellatum Hall, Miller's N. A. Geol. Pal., 1st ed., 1877, p. 243.—Grabau, Bull. New York State Mus., 45, 1901, p. 216, fig. 148; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 216, fig. 148.

Clinton (Rochester): Niagara Falls, etc., New York.

Cyrtoceras (Glyptoceras) subcompressum Beecher.

Cyrtoceras subcompressum Beecher, 5th Rep. State Geol. New York for 1885, 1886, pl. 14, figs. 2, 3; Pal. New York, 7, Sup., 1888, p. 35, pl. 129, figs. 2, 3.—Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 276, pl. 7, fig. 7.

Cyrtoceras (Glyptoceras) subcompressum—Continued.

Cyrtoceras (Glyptoceras) subcompressum Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 535, pl. 32, figs. 7a–d; fig. 3 of pl. on p. 536.

Cyrtoceras (Glyptodendron) subcompressum Foerste, Amer. Geol., 12, 1893, p. 139, pl. 7, fig. 3.

Upper Medinan (Brassfield): Near New Carlisle and near Springfield, Ohio.

Cyrtoceras subrectum Hall.

Cyrtoceras subrectum Hall, Pal. New York, 3, 1859, 1861, p. 342, pl. 69, figs. 3a–3d.

Cayugan (Manlius): Herkimer County, New York.

Cyrtoceras subturbinatum Billings.

Cyrtoceras subturbinatum Billings, Geol. Surv. Canada, Rep. Progr. for 1853–1856, 1857, p. 312.

Chazyan (Mingan): Mingan Island, Quebec.

Cyrtoceras surgens Barrande.

Cyrtoceras surgens Barrande, Syst. Sil. Centre Boheme, 2, pt. 3, 1870, p. 728, pl. 431, figs. 16, 17.

Canadian (Levis): Point Levis, Quebec.

Cyrtoceras syphax Billings. See Eremoceras syphax.

Cyrtoceras tenuiseptum Faber.

Cyrtoceras tenuiseptum Faber, Jour. Cincinnati Soc. Nat. Hist., 9, 1886, p. 18, pl. 1, figs. 3a, b, c.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1028, pl. 49, figs. 2, 2a.

Richmond (Waynesville): Near Waynesville, Ohio; Versailles, Indiana.

Cyrtoceras tenuistriatum Hall.

Cyrtoceras corniculum Hall (preoccupied), Rep. Geol. Surv. Wisconsin, 1862, p. 41, figs. 1, 2.—Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 809, pl. 59, fig. 16.

Cyrtoceras tenuistriatum Hall, in Miller's Amer. Pal. Foss., 1877, p. 243.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, pl. 9, fig. 12.

Black River: Mineral Point, Wisconsin (Platteville): Warsaw, Minnesota (Decorah).

Cyrtoceras thompsoni Miller.

Cyrtoceras thompsoni Miller, 18th Ann. Rep. Indiana, Dep. Geol., Nat. Res., 1894, p. 323, pl. 10, figs. 7, 8 (adv. sheets 1892).—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1029, pl. 49, figs. 3, 3a.

Richmond: Longwood, Fayette County, Indiana.

Cyrtoceras trentonense (Emmons).

Orthoceratites trentonensis Emmons, Nat. Hist. New York, Geol., 2, 1842, p. 396, fig. 2.

Cyrtoceras Trentonensis D'Orbigny, Prodr. de Pal., 1, 1849, p. 2 (gen. ref.).—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 181, fig.

Oncoceras trentonense Lesley, Ibid., p. 494, fig.

Trenton: New York.

Cyrtoceras vallandighami Miller.

Cyrtoceras Vallandighami Miller, Cincinnati Quart., Jour. Sci., 1, 1874, p. 232, fig. 23.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 8, 1886, p. 245.—Miller, N. A. Geol. Pal., 1889, p. 435, fig. 730.

Maysville: Cincinnati, Ohio, and vicinity (Fairmount); Nashville and Columbia, Tennessee (Leipers).

Cyrtoceras vassarina Dwight.

Cyrtoceras Vassarina Dwight, Amer. Jour. Sci. Arts, 3d ser., 27, 1884, p. 254, pl. 7, figs. 7, 7a, 8.

Canadian (Beekmantown): Rochdale, New York.

Cyrtoceras ventricosum Miller.

Cyrtoceras ventricosa Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 131, fig. 16.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 8, 1886, p. 246.—Miller, N. A. Geol. Pal., 1889, p. 435, fig. 731.

Eden (Southgate): Cincinnati, Ohio.

Cyrtoceras whitneyi Hall.

Cyrtoceras whitneyi Hall, Rep. Sup. Geol. Surv. Wisconsin, 1861, p. 39.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 65, pl. 9, fig. 5.

Richmond (Maquoketa): Maquoketa Creek, Iowa.

Cyrtoceras(?) winonicum Sardeson.

Cyrtoceras(?) winonicum Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 102, pl. 6, figs. 2, 3.

Ozarkian (Oneota): Near Dresbach, Winona County, Minnesota.

CYRTOCERINA Billings. Genotype: C. typica Billings.

Cyrtocerina Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 178.—Barrande, Syst. Sil. Centre Boheme, 2, pt. 1, 1867, p. 451.—Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 266.—Miller, N. A. Geol. Pal., 1889, p. 436.—Holm, Geol. Foren. Stockholm Forenhandl., 14, 1892, pp. 126, 209.—Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 774.—Hyatt, Zittel-Eastman Textb. Pal., 1, 1900, p. 517; 2d ed., 1913, p. 597.

Cyrtocerina madisonensis (Miller).

Tryblidium madisonense Miller, 18th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1894, p. 318, pl. 9, fig. 38 (adv. sheets, 1892).—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res., Indiana, 1908, p. 977, pl. 39, fig. 10.

Cyrtocerina madisonensis Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 17, 1894, p. 32.—Foerste, Bull. Sci. Lab. Denison Univ., 14, 1910, p. 74.

Richmond (Whitewater-Saluda): Madison, Indiana.

Cyrtocerina mercurius Billings.

Cyrtocerina Mercurius Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 194, text fig. 179.

Canadian (Levis): Point Levis, Quebec.

Cyrtocerina(?) schoolcrafti Clarke.

Cyrtocerina(?) schoolcrafti Clarke, Geol. Minnesota, 3, pt. 2 1897 p. 774, pl. 47 figs. 12–14.

Black River (Decorah): Near Cannon Falls, Minnesota.

Holotype: Cat. No. 46526, U.S.N.M.

Cyrtocerina typica Billings.

Cyrtocerina typica Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 178, text fig. 159.—Miller, N. A. Geol. Pal., 1889, p. 436, fig. 732.

Black River (Leray): Pauquette Rapids, Ottawa River, Canada.

CYRTODONTA Billings. Genotype: C. rugosus and C. canadense Billings.

Cyrtodonta Billings, Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 179; Canadian Nat. Geol., 3, 1858, p. 431; ibid., 4, 1859, p. 303; ibid., 6, 1861, p. 353; ibid., 7, 1862, p. 392.—Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 310.—Zittel, Handb. Pal., 2, 1881, p. 50.—Salter, Mem. Geol. Surv. Great

CYRTODONTA—Continued.

Britain, 2d ed., 1881, p. 546.—Ulrich, Geol. Minnesota, Pal., 3, pt. 2, 1894, p. 534.—Dall, Zittel-Eastman Textb. Pal., 1, 1900, p. 365.—Koken, Die Leitfossilien, Leipzig, 1896, p. 185, fig. 151, 2.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 980.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 409.—Dall, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 442.

Palæarca Hall, Pal. New York, 3, 1859, p. 27.—Salter, Mem. Geol. Surv. Great Britain, 3, 1866, p. 341.—Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 310, footnote.—Salter, Cat. Camb. Sil. Foss., 1873, p. 66.

Angellum Miller, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 105 (Genotype: A. cuneatum Miller).

Cypricardites Vanuxem (not Conrad), Nat. Hist. New York, Geol. 3, 1842, p. 65, footnote.—Hall, Pal. New York, 1, 1847, p. 157 footnote; 12th Rep. New York State Cab. Nat. Hist., 1859, pp. 9, 13; Pal. New York, 3, 1859, p. 270, footnote; p. 524; 15th Rep. New York State Cab. Nat. Hist., 1861, pp. 192, 193, pl. 11, fig. 4.—Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 309.—Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 134.—Miller, Cincinnati, Quart. Jour. Sci., 1, 1874, p. 147.—Nettelroth, Kentucky Foss. Shells, Geol. Surv. Kentucky, 1889, p. 206.—Miller, N. A. Geol. Pal., 1889, p. 476.—Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 17, 1894, pp. 29–31.

Observation.—See Bodmania Miller for a probable synonym.

CYRTODONTA (part) Safford. See Modiolodon Ulrich.

CYRTODONTA ACUTUMBONA Billings. See Vanuxemia acutumbona.

Cyrtodonta affinis Ulrich.

Cyrtodonta affinis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 540, pl. 39, figs. 20–23.
Cypricardites affinis Miller, N. A. Geol. Pal., 2d App., 1897, p. 781 (gen. ref.).
Black River (Decorah): Six miles south of Cannon Falls, Minnesota.
Holotype.—Cat. No. 46171, U.S.N.M.

Cyrtodonta affinis fillmorensis Ulrich.

Cyrtodonta affinis var. fillmorensis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 540, pl. 39, fig. 23.
Trenton (Prosser): Near Wykoff, Fillmore County, Minnesota.
Holotype.—Cat. No. 46172, U.S.N.M.

Cyrtodonta? alata (Hall).

Posidonia? alata Hall, Geol. Rep. 4th Dist. New York, 1843, p. 72, fig. 7; Pal. New York, 2, 1852, p. 87, pl. 27, fig. 4.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 737, fig.
Posidonomya alata Miller, N. A. Geol Pal., 1889, p. 504 (gen. ref.).
Clinton: Rochester, New York.

Cyrtodonta ampla Ulrich.

Cyrtodonta ampla Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 538, pl. 39, fig. 34.
Cypricardites amplus Miller, N. A. Geol. Pal., 2d App., 1897, p. 781 (gen. ref.).
Black River (Platteville): Cannon Falls, Minnesota.
Holotype.—Cat. No. 46173, U.S.N.M.

Cyrtodonta? anticostiensis Billings.

Cyrtodonta? Anticostiensis Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 14.
Cypricardites anticostiensis Miller, N. A. Geol. Pal., 1889, p. 476 (gen. ref.).
Richmond (English Head and Charleton): English Head, Anticosti.

Cyrtodonta billingsi Ulrich.

Cypricardites ventricosus Whitfield (not Hall), Geol. Winconsin, 4, 1882, p. 209, pl. 5, fig. 9.

Cyrtondonta billingsi Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 538, pl. 40, figs. 2–6.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 166, pl. 11, fig. 7.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 409, figs. 528d, e.

Black River: Dunleith, Illinois; Beloit, Mineral Point, etc., Wisconsin; Cannon Falls, etc., Minnesota (Platteville); Lincoln County, Missouri (Decorah); New Jersey (Jacksonburg).

Cotypes.—Cat. Nos. 46174, 46175, U.S.N.M.

Cyrtodonta breviuscula Billings.

Cyrtodonta breviuscula Billings, Canadian Nat. Geol., 4, 1859, p. 446.—Whiteaves, Ottawa, Nat., 22, 1908, p. 107, pl. 3, fig. 3.

Cypricardites breviuscula Miller, N. A. Geol. Pal., 1889, p. 476 (gen. ref.).

Stones River (Pamelia): Near Ottawa, Ontario.

Cyrtodonta canadensis Billings.

Cyrtodonta Canadensis Billings, Canadian Nat. Geol., 3, 1858, p. 434, figs. 8–11; Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 182, figs. 8–10; p. 183, fig. 11; Geol. Canada, Geol. Surv. Canada, 1863, p. 148, fig. 106.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 241.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 167, pl. 11, fig. 3.

Cypricardites canadensis Miller, N. A. Geol. Pal., 1889, p. 476 (gen. ref.).

Black River: St. Josephs Island, La Petite Chaudiere Rapids, Pauquettes Rapids, and Lake Winnipeg, Canada; New Jersey.

Cyrtodonta canadensis Grabau and Shimer. See Megalomus canadensis.

Cyrtodonta cingulata (Ulrich).

Cypricardites cingulata Ulrich, 19th Ann. Rep. Geol. and Nat. Hist. Surv. Minnesota, 1892, p. 235, fig. 21.

Cyrtodonta cingulata Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 545, pl. 40, figs. 7, 8.

Black River (Decorah): Minneapolis, Minnesota.

Holotype.—Cat. No. 46176, U.S.N.M.

Cyrtodonta clochensis Foerste.

Cyrtodonta clochensis Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 297, pl. 2, figs. 6a–b.

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

Cyrtodonta cordiformis Billings. See Plethocardia? cordiformis.

Cyrtodonta cuneata (Miller).

Angellum cuneatum Miller, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 106, pl. 3, fig. 11; N. A. Geol. Pal., 1889, p. 462, fig. 774.

Cyrtodonta cuneata Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 999, pl. 45, fig. 2.

Richmond (Whitewater): Richmond, Indiana.

Cyrtodonta descriptus (Sardeson).

Cypricardites descriptus Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 70, pl. 2, fig. 2.

St. Peter: Highland Park, Minnesota.

Cyrtodonta dignus (Sardeson).

Cypricardites dignus Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 71, pl. 2, figs. 4, 5.

St. Peter: South St. Paul, Minnesota.

CYRTODONTA EMMA Billings. See Rhytimya emma.

Cyrtodonta? ferruginea (Hall and Whitfield).

Cypricardites ferrugineum Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 116, pl. 5, fig. 11.—Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 93.

Avicula whitfieldi, Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 558, pl. 37, fig. 5.

Upper Medinan (Brassfield): Near Wilmington, Ohio.

Plastotype.—Cat. No. 46544, U.S.N.M.

Cyrtodonta finitima (Sardeson).

Cypricardites finitimus Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 70, pl. 2, fig. 6.

St. Peter: Highland Park, Minnesota.

CYRTODONTA GANTII Safford. See Modiolodon ganti.

Cyrtodonta gibbera Ulrich.

Cyrtodonta gibbera Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 542, pl. 39, figs. 13–15.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 162, pl. 13, figs. 34, 36.

Trenton: Thirteen miles south of Cannon Falls, Minnesota (Prosser); Baffin Land.

Holotype.—Cat. No. 46177, U.S.N.M.

Cyrtodonta glabella (Ulrich).

Cypricardites glabella Ulrich, 19th Ann. Rep. Geol. and Nat. Hist. Surv. Minnesota (March), 1892, p. 234, fig. 20.

Cyrtodonta glabella Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 543, pl. 39, figs. 37, 40.

Cypricardites minnesotensis Sardeson, Bull. Minnesota Acad. Nat. Sci., 3 (April), 1892, p. 338, pl. 6, fig. 21.

Black River: Minneapolis, Minnesota (Platteville and Decorah); Beloit, Wisconsin, and Dunleith, Illinois (Platteville).

Holotype and *plesiotype*.—Cat. Nos. 46178–46180, U.S.N.M.

Cyrtodonta grandis (Ulrich).

Cypricardites grandis Ulrich, Amer. Geol., 6, 1890, p. 387, figs. 19a–c.

Cyrtodonta grandis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 547, pl. 40, fig. 11, fig. 43a–i.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 409, fig. 529.

Trenton: Between Burgin and Danville, Kentucky; Cannon Falls, Kenyon, etc., Minnesota; Decorah, Iowa; Oshkosh, Wisconsin.

Cotypes and *plesiotypes*.—Cat. Nos. 46182, 46859, U.S.N.M.

Cyrtodonta grandis germana (Ulrich).

Cypricardites germanus Ulrich, 19th Ann. Rep. Geol. and Nat. Hist. Surv. Minnesota, 1892, p. 236, fig. 22.

Cyrtodonta grandis var. germana Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 549, pl. 40, figs. 9, 10, 12, fig. 43j.

Trenton: Between Burgin and Danville, Kentucky; Cannon Falls, etc., Minnesota; Iowa; Wisconsin.

Holotype and *plesiotype*.—Cat. Nos. 46181, 46862, U.S.N.M.

Cyrtodonta grandis intermedia Ulrich.

Cyrtodonta grandis var. intermedia Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 549, fig. 43k.

Trenton (Catheys): Haynie's Mill, central Tennessee.

Cotype.—Cat. No. 46183, U.S.N.M.

Cyrtodonta grandis luculenta (Sardeson).

Cypricardites luculentus Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, 1892, p. 338, pl. 6, figs. 25, 26.

Cyrtodonta grandis var. luculenta Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 549, pl. 40, figs. 13, 14.

Richmond (Maquoketa): Granger, Bristol, etc., Minnesota.

Cyrtodonta halli (Nettelroth).

Cypricardites halli Nettelroth, Kentucky Foss. Shells, Geol. Surv. Kentucky, 1889, p. 206, pl. 34, figs. 1–6.

Cyrtodonta halli Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 541 (gen. ref.).

Richmond: Oldham County, Kentucky.

Cotypes.—Cat. No. 51342, U.S.N.M.

Cyrtodonta? harrietta Billings.

Cyrtodonta harrietta Billings, Pal. Foss., Geol. Surv. Canada, 1865, p. 149, fig. 129 (adv. sheets, 1862); Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 13 (loc. ref.).

Cypricardites harrietta Miller, N. A. Geol. Pal., 1889, p. 476 (gen. ref.).

Richmond (English Head and Charleton): English Head, Anticosti.

CYRTODONTA HAYNIANA Safford. See Vanuxemia hayniana.

CYRTODONTA HINDI Billings. See Whitella hindi.

Cyrtodonta huronensis Billings.

Cyrtodonta huronensis Billings, Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 180, figs. 3, 4; Canadian Nat. Geol., 3, 1858, p. 432, figs. 3, 4; Geol. Canada, Geol. Surv. Canada, 1863, p. 147, figs. 102 a, b.—Bassler, Bull. Virginia Geol. Surv., 2a, 1909, pl. 23, figs. 1–3.

Palæarca ventricosa Hall (not Hall, 1847), Pal. New York, 3, 1859, pp. 270, 271, figs. 1–3; 12th Rep. New York State Cab. Nat. Hist., 1859, p. 10, figs. 1–3.

Cypricardites huronensis Miller, N. A. Geol. Pal., 1889, p. 476 (gen. ref.).

Cypricardites islandicus Hall in Miller, N. A. Geol. Pal., 1st ed., 1877, p. 189.

Cyrtodonta subovata Ulrich, Geol. Minnesota, 3, 1894, p. 536, pl. 39, figs. 28, 29, 31–33?, 30, ?45.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 410, fig. 528a–c.

Cypricardites subovatus Miller, N. A. Geol. Pal., 2d App., 1897, p. 781 (gen. ref.).

Black River: Near Point Palladeau and St. Joseph Island, Lake Huron; Point Claire, island of Montreal, Canada; High Bridge, Kentucky; Tennessee and Virginia (Lowville); St. Paul and Cannon Falls, Minnesota (Decorah).

Plesiotypes.—Cat. Nos. 46192, 46849, etc., U.S.N.M. (cotypes of C. subovata).

CYRTODONTA HURONENSIS var. SUBCARINATA Chapman. See Cyrtodonta subcarinata.

Cyrtodonta? insularis Billings.

Cyrtodonta? insularis Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 14.

Cypricardites insularis Miller, N. A. Geol. Pal., 1889, p. 476 (gen. ref.).

Richmond (English Head): West End, Anticosti.

Cyrtodonta janesvillensis Ulrich.

Cyrtodonta janesvillensis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 537, pl. 39, figs. 26, 27.

Black River (Platteville): Janesville and Beloit, Wisconsin.

Cyrtodonta? lamellosa Hudson.

Cyrtodonta? lamellosa Hudson, Bull. New York State Mus., 80, 1905, p. 287, pl. 4, figs. 10–13.

Chazyan (Valcour): Valcour Island, Lake Champlain.

Cyrtodonta leucothea Billings.

Cyrtodonta Leucothea Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 46, fig. 49 (adv. sheets, 1862); Geol. Canada, Geol. Surv. Canada, 1863, p. 143, fig. 82.

Cypricardites leucothea Miller, N. A. Geol. Pal., 1889, p. 477 (gen. ref.).

Black River (Leray): Pauquette Rapids, Ottawa River, Canada.

Cyrtodonta normanensis Safford.

Cyrtodonta Normanensis Safford, Geol. Tennessee, 1869, p. 287 (nom. nud.).

Mohawkian: Tennessee.

Cyrtodonta obesa Ulrich.

Cyrtodonta obesa Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 542, pl. 39, figs. 10, 11, 12.

Black River: Mercer County, Kentucky; St. Paul and Preston, Minnesota (Decorah).

Cotypes.—Cat. Nos. 46184, 46185, U.S.N.M.

Cyrtodonta obliqua (Meek and Worthen).

Cypricardites obliquus Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 311, pl. 2, fig. 9a, b.

Cyrtodonta obliquus Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 540, p. 39, figs. 35, 36.

Trenton: Scales Mound, Illinois (Galena); Fillmore County, Minnesota (Prosser).

Cyrtodonta obtusa (Hall).

Ambonychia obtusa Hall, Pal. New York, 1, 1847, p. 167, pl. 36, figs. 8a–b.

Cyrtodonta obtusa Billings, Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 184, figs. 13, 14; Canadian Nat. Geol., 3, 1858, p. 436, figs. 13, 14; Geol. Canada, Geol. Surv. Canada, 1863, p. 147, fig. 101a, b.

Posidonomya obtusa Emmons, Amer. Geology, 1, pt. 2, 1855, p. 177.

Palæarca obtusa Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 65 (gen. ref.).

Cypricardites obtusus Miller, N. A. Geol. Pal., 1889, p. 477 (gen. ref.).

Trenton: Watertown, New York; Canada.

Cyrtodonta oviformis (Ulrich).

Cypricardites oviformis Ulrich, Amer. Geol., 10, 1892, p. 99, pl. 7, figs. 3, 4.

Cyrtodonta oviformis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 544, pl. 39, fig. 46; pl. 40, fig. 1.

Black River (Platteville): Janesville, Wisconsin.

Holotype.—Cat. No. 46186, U.S.N.M.

Cyrtodonta parva Ulrich.

Cyrtodonta parva Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 541, pl. 39, figs. 24, 25.

Trenton (Prosser): Near Fountain, Minnesota.

Holotype.—Cat. No. 46187, U.S.N.M.

Cyrtodonta persimilis Ulrich.

Cyrtodonta persimilis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 544, pl. 39, figs. 41, 44.

Cypricardites persimilis Miller, N. A. Geol. Pal., 1897, p. 781 (gen. ref.).

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

Cotypes.—Cat. Nos. 46188, 46189, U.S.N.M.

CYRTODONTA? PLEBEIA Billings. See Whitella plebeia.

Cyrtodonta ponderosa Billings.

Cyrtodonta ponderosa Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 150 (adv. sheets, 1862).

Cypricardites ponderosa Miller, N. A. Geol. Pal., 1889, p. 477 (gen. ref.).

Richmond: Cape Smyth, Manitoulin Island, Lake Huron.

Cyrtodonta rotulata Ulrich.

Cyrtodonta rotulata Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 541, pl. 39, figs. 16–19.

Black River: Mercer County, Kentucky; Minneapolis and near Fountain, Minnesota (Decorah).

Cotypes.—Cat. Nos. 46190, 46855, U.S.N.M.

Cyrtodonta rugosa Billings.

Cyrtodonta rugosa Billings, Canadian Nat. Geol., 3, 1858, p. 432, figs. 1, 2; Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 179, figs. 1, 2; Geol. Canada, Geol. Surv. Canada, 1863, p. 148, fig. 104a, b.

Cypricardites rugosus Miller, N. A. Geol. Pal., 1889, p. 477 (gen. ref.).

Black River: Near Ottawa, Ontario.

Cyrtodonta saffordi (Hall).

Palæarca saffordi Hall, Pal. New York, 3, 1859, p. 271, figs. 4, 5; 12th Rep. New York State Cab. Nat. Hist., 1859, p. 11, figs. 4, 5,

Cyrtodonta Saffordi Safford, Geol. Tennessee, 1869, p. 287, pl. 2 (F), figs. 2a–g.

Cypricardites saffordi Hall and Whitfield, Geol. Surv. Ohio, 2, 1875, p. 177, (gen. ref.).—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 179, figs.

Trenton (Catheys): Nashville, etc., Tennessee.

Plesiotype.—Cat. No. 46191, U.S.N.M.

Cyrtodonta scala Raymond.

Cyrtodonta scala Raymond, Annals Carnegie Mus., 3, 1906, p. 578.

Chazyan (Crown Point): Valcour Island, New York.

CYRTODONTA SIGMOIDEA Billings. See Whitella? sigmoidea.

Cyrtodonta sillimanensis Ulrich.

Cyrtodonta sillimanensis Ulrich, Proc. U. S. Nat. Mus., 22, 1900, p. 162, pl. 13, figs. 31–33.

Mohawkian: Head of Frobisher Bay, Baffin Land.

Cotypes.—Cat. No. 28159, U.S.N.M.

Cyrtodonta solitaria Raymond.

Cyrtodonta solitaria Raymond, Amer. Jour. Sci., 20, 1905, p. 373.

Chazyan (Crown Point): Near Tracy Brook, Chazy, New York.

Cyrtodonta spinifera Billings.

Cyrtodonta spinifera Billings, Canadian Nat. Geol., 3, 1858, p. 435, fig. 12; Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 183, fig. 12.

Cypricardites spinifera Miller, N. A. Geol. Pal., 1889, p. 477 (gen. ref.).

Black River (Leray): Pauquette Rapids, and Fourth Chute of Bonnechere, Canada.

Cyrtodonta subangulata (Hall).

Edmondia? subangulata Hall, Pal. New York, 1, 1847, p. 156, pl. 35, fig. 2a, b.

Palæarca subangulata Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 68 (gen. ref.).

Cyrtodonta subangulata—Continued.

Cyrtodonta subangulata Billings, Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 185; Canadian Nat. Geol., 3, 1858, p. 437.

Cypricardites subangulatus Miller, N. A. Geol. Pal., 1889, p. 477 (gen. ref.).

Trenton: Watertown, New York.

Cyrtodonta subcarinata Billings.

Cyrtodonta subcarinata Billings, Canadian Nat. Geol., 3, 1858, p. 433, figs. 5–7; Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 181, fig. 5–7; Geol. Canada, Geol. Surv. Canada, 1863, p. 148, fig. 105.

Cypricardites subcarinata Miller, N. A. Geol. Pal., 1889, p. 477 (gen. ref.).

Cyrtodonta Huronensis var. subcarinata Chapman, Canadian Jour., n. s., 7, 1862, p. 117, fig. 112; Expos. Min. Geol. Canada, 1864, p. 120, fig. 112.

Black River: Pointe Claire and Valley of the Ottawa, Canada.

CYRTODONTA SUBOVATA Ulrich. See Cyrtodonta huronensis.

CYRTODONTA SUBTRUNCATA Billings. See Whitella subtruncata.

Cyrtodonta tenella (Ulrich).

Cypricardites tenellus Ulrich, 19th Ann. Rep. Geol. Nat. Hist. Surv. Minn., 1892, p. 237, fig. 23.

Cyrtodonta tenella Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 546, pl. 40, fig. 15–19.

Black River (Decorah): Six miles south of Cannon Falls, Minnesota.

Cotypes.—Cat. No. 46193, U.S.N.M.

CYRTODONTA TRANCEPS Raymond. See Endodesma tranceps.

CYRTODONTA UNDULOSTRIATA Grabau and Shimer. See Cypricardinia undulostriata.

CYRTODONTA? UNGULATA Billings. See Vanuxemia ungulata.

CYRTODONTA WINCHELLI Safford. See Modiolodon winchelli.

CYRTOGRAPTUS Carruthers. Genotype: C. murchisoni Carruthers.

Cyrtograpsus Carruthers, Rep. 37th meeting British Assoc. Adv. Sci., Notes and Abstracts, 1868, p. 57; Geol. Mag., 5, 1868, pp. 73, 127.

Cyrtograptus Lapworth, Geol. Mag., dec. 2, 3, 1876, p. 544.—Zittel, Handb. Pal., 1, 1879, p. 297.—Wiman, Bull. Geol. Inst. Univ. Upsala, 2, pt. 2, No. 4, 1896, p. 267.—Roemer and Frech, Leth. geog., 1 Theil, Leth. Pal., 1, 3 Lief, 1897, p. 650.—Koken, Die Leitfossilien, Leipzig, 1896, p. 328.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 459.

Cyrtograptus ulrichi Ruedemann.

Cyrtograptus ulrichi Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 459, pl. 29, fig. 4, figs. 442, 443.

Niagaran (Bainbridge): Bainbridge, Cape Girardeau County, Missouri.

Cotypes.—Cat. No. 54273, U.S.N.M.

CYRTOLITES (part) of authors. See Oxydiscus Koken, Phragmolites Conrad and Cyrtolitina Ulrich.

CYRTOLITES Conrad. Genotype: C. ornatus Conrad.

Cyrtolites Conrad, Ann. Rep. Nat. Hist. Surv. New York, 1838, p. 118.—Hall (part), Pal. New York, 1, 1847, p. 189 footnote.—D'Orbigny, Prodr. de Pal., 1, 1849, p. 9.—Woodward, Man. Mollusca, pt. 2, 1854, p. 201.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 166.—Hall, 15th Rep. New York State Cab. Nat. Hist., 1862, pl. 11, fig. 19.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 308.—Waagen (part), Pal. Indica (13), pt. 1, 1880, p. 132.—Lind-

CYRTOLITES—Continued.

strom, Kongl. Sven. Vet.-Akad. Handl., 19, No. 6, 1881, pp. 70, 81.—Zittel, Handb. Pal., 2, 1882, p. 185.—Koken, Neues Jahrb. f. Min., Geol., Pal., 6, Beliage-Band, 1889, pp. 393, 467.—Miller, N. A. Geol. Pal., 1889, p. 401.—Matthew, Trans. Royal Soc. Canada, 11, sec. 4, 1894, p. 93.—Koken, Die Leitfossilien, Leipzig, 1896, p. 100; Neues Jahrb. f. Min., Geol., Pal., 1, 1898, p. 4.; Bull. de l'Acad. Imp. Sci. St. Petersburg, 7, 1897, p. 138.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, pp. 846–858.—Pilsbry, Zittel-Eastman Textb. Pal., 1, 1900, p. 445.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 949.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 609.—Dall. Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 522.

CYRTOLITES ACUTUS Emmons. See Sinuites cancellata acutus.

Cyrtolites carinatus Miller.

Cyrtolites carinatus Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 311, fig. 32; N. A. Geol. Pal., 1889, p. 401, text fig. 667.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 862, pl. 62, figs. 50–52.—Grabau and Shimer, N. A. Index Fossils 1, 1909, p. 610, figs. 815 e–g.

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

Plesiotypes.—Cat. No. 45783, U.S.N.M.

CYRTOLITES COMPRESSUS Hall. See Phragmolites compressus.

Cyrtolites conradi Hall.

Cyrtolites conradi Hall, Rep. Geol. Surv. Wisconsin, 1862, p. 35, fig. 6.

Richmond (Maquoketa): Southwestern Wisconsin.

CYRTOLITES COSTATUS James. See Dyeria costata.

CYRTOLITES CRISTATUS Safford. See Oxydiscus cristatus.

CYRTOLITES DESIDERATUS Billings. See Phragmolites desideratus.

Cyrtolites? dilatatus Ulrich and Scofield.

Cyrtolites(?) dilatatus Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 865, pl. 62, figs. 20–26.

Black River (Decorah): Goodhue County, Minnesota; Beloit, Wisconsin.

Cotype.—Cat. No. 45784, U.S.N.M.

Cyrtolites disjunctus Ulrich and Scofield.

Cyrtolites disjunctus Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 864, pl. 62, figs. 48, 49.

Richmond (Maquoketa): Near Spring Valley, Minnesota.

Holotype.—Cat. No. 45785, U.S.N.M.

CYRTOLITES DYERI of authors. See Phragmolites dyeri and P. elegans.

CYRTOLITES DYERI var. CELLULOSA Ulrich and Scofield. See Phragmolites dyeri cellulosus.

CYRTOLITES ELEGANS Miller. See Phragmolites elegans.

CYRTOLITES FILOSUS Hall. See Cyrtoceras filosum.

CYRTOLITES FIMBRIATUS Miller. See Phragmolites fimbriatus.

CYRTOLITES IMBRICATUS Meek and Worthen. See Phragmolites imbricatus.

CYRTOLITES (MICROCERAS) INORNATUS Meek. See Microceras inornatum.

CYRTOLITES MAGNUS Miller. See Oxydiscus magnus.

CYRTOLITES NITIDULUS Ulrich. See Cyrtolitina nitidula.

Cyrtolites ornatus Conrad.

Cyrtolites ornatus Conrad, Ann. Geol. Rep. New York, 1838, p. 118; ibid., 1839, p. 63; ibid., 1841, p. 37.—Vanuxem, Nat. Hist. New York, Geol. Rep., 3, 1842, pp. 64, 65, fig. 2.—Owen, Amer. Jour. Sci. Arts, 47, 1844, p. 376, fig. 2.—Hall Pal. New York, 1, 1847, p. 308, pl. 84, figs. 1a–g.—Billings, Canadian Nat. Geol., 1, 1856, p. 43, fig. 6.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 820, fig. 619.—Chapman, Canadian Jour., new ser., 7, 1862, p. 119, fig. 119; 8, 1863, p. 206, fig. 207.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 217, fig. 226.—Chapman, Expos. Min. Geol. Canada, 1864, p. 123, fig. 119; p. 178, fig. 207.—Meek, Pal. Ohio, 1, 1873, p. 148, pl. 13, figs. 3a, b.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 308.—Roemer, Leth. geog., 1, Leth. Pal., Atlas, 1876, pl. 5, fig. 8a.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 182, figs.—Miller, N. A. Geol. Pal., 1889, p. 402, fig. 669.—Koken, Neues Jahrb. f. Min., Geol., Pal., 6, Beilage-Band, 1889, p. 483, pl. 13, fig. 3.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 860, pl. 62, figs. 27–29.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 962, pl. 40, figs. 8, 8a.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 609, fig. 815a, b.

Porcelia ornata Sharpe, Quart. Jour. Geol. Soc. London, 4, 1847, p. 181.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 167, pl. 17, fig. 21; Man. Geology, 1860, p. 102, fig. 7 only.

Maysville and Richmond: Oswego County, etc., New York (Pulaski); Canada; Pennsylvania to Alabama; Ohio Valley; etc.

Plesiotypes.—Cat. Nos. 17898, 45786, U.S.N.M.

Cyrtolites ornatus minor Ulrich and Scofield.

Cyrtolites ornatus var. minor Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 860, pl. 62, figs. 30–31.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 174, pl. 12, figs. 6, 7.

Trenton: Cannon Falls, Minnesota (Prosser); New Jersey.

Holotype.—Cat. No. 45787, U.S.N.M.

CYRTOLITES PANNOSUS Billings. See Phragmolites pannosus.

Cyrtolites parvus Ulrich.

Cyrtolites parvus Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 864, pl. 62, figs. 45–47.

Trenton (Upper): Covington, Kentucky.

Holotype.—Cat. No. 45788, U.S.N.M.

Cyrtolites retrorsus Ulrich and Scofield.

Cyrtolites retrorsus Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 861, pl. 62, figs. 32–37.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 610, fig. 815c, d.

Trenton: Near Burgin, Covington, etc., Kentucky; Nashville, etc., Tennessee.

Cotypes.—Cat. Nos. 45789, 45790, U.S.N.M.

Cyrtolites retrorsus fillmorensis Ulrich and Scofield.

Cyrtolites retrorsus var. fillmorensis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 862, pl. 62, figs. 38, 39.

Black River (Decorah): Chatfield and near Fountain, Minnesota; Lincoln County, Missouri.

Cotypes.—Cat. No. 45791, U.S.N.M.

Cyrtolites sinuatus Hall and Whitfield.

Cyrtolites sinuatus Hall and Whitfield, U. S. Geol. Expl. 40th Parl., 4, 1877, p. 237, pl. 1, figs. 23, 24.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 127, pl. 4, fig. 9.

Ordovician: White Pine District, Nevada (Upper Pogonip); Columbia, New Jersey (Beekmantown).

Holotype.—Cat. No. 17363, U.S.N.M.

Cyrtolites sinuosus Hall.

Cyrtolites sinuosus Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1877, pl. 30, figs. 16–18; mus. ed., 1879, p. 178, pl. 30, figs. 16–18; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 321, pl. 31, figs. 16–18.

Niagaran (Waldron): Waldron, Indiana.

CYRTOLITES SUBACUTUS Miller. See Oxydiscus subacutus.

CYRTOLITES SUBCARINATUS Emmons. See Carinaropsis carinata.

CYRTOLITES SUBCOMPRESSUS Meek. See Microceras inornatum.

Cyrtolites subplanus Ulrich.

Cyrtolites subplanus Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 846, pl. 62, figs. 40–44.

Trenton (Catheys): Nashville, Tennessee.

Cotypes.—Cat. No. 45792, U.S.N.M.

CYRTOLITES TRENTONENSIS Conrad. See Eccyliomphalus trentonensis.

Cyrtolites youngi Foerste.

Cyrtolites Youngi Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 289, pl. 6, fig. 7; Geol. Surv. Ohio, Pal., 8, 1893, p. 549, pl. 31, figs. 7, 7a.

Upper Medinan (Brassfield): Hanover, Indiana.

CYRTOLITINA Ulrich. Genotype: Cyrtolites lamellifer Lindström.

Cyrtolites Ulrich (part), Jour. Cin. Soc. Nat. Hist., 2, 1879, p. 12.—Lindström, Silurian Gastropoda of Gotland, 1884, pp. 82–84.

Cyrtolitina Ulrich, Geol. Minnesota, 3, pt. 2, 1897, pp. 847–866.—Dall, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 521.

Cyrtolitina nitidula (Ulrich).

Cyrtolites nitidulus Ulrich, Jour. Cin. Soc. Nat. Hist., 2, 1879, p. 12, pl. 7, figs. 7, 7a.

Cyrtolitina nitidula Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 866, pl. 62, figs. 53–55.

Trenton (Upper): River quarries, Covington, Kentucky.

Holotype.—Cat. No. 45793, U.S.N.M.

CYRTOMETOPUS SCOFIELDI Clarke. See Ceraurinus scofieldi.

CYRTORIZOCERAS Hyatt. Genotype: Cyrtoceras minneapolis Clarke.

Cyrtorizoceras Hyatt, Zittel-Eastman Textb. Pal., 1900, p. 529; ibid, 2d ed., 1913, p. 610.

Cyrtorizoceras curvicameratum Clarke and Ruedemann.

Cyrtorhizoceras curvicameratum Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 90, pl. 17, figs. 1–10.

Niagaran (Lockport-Guelph): Shelby, New York.

Cyrtorizoceras dardanum (Hall).

Cyrtoceras dardanum Hall, Rep. Sup. Geol. Surv. Wisconsin, 1861, p. 43; 20th Rep. New York State Cab. Nat. Hist., 1868 (extras Jan., 1865), p. 349, pl. 17(8), figs. 3–5; rev. ed., 1870, p. 406, pl. 17, figs. 3–5.—Meek and Worthen, Geol. Surv. Illinois, 6, 1875, p. 506, pl. 25, figs. 6a, b.

Cyrtoceras Fultonensis Meek and Worthen, Geol. Surv. Illinois, 6, 1875, p. 506.

Cyrtorhizoceras dardanus Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 91 (gen. ref.).

Niagaran: Waukesha, Wisconsin (Racine); Fulton City, Illinois.

Cyrtorizoceras fosteri (Hall).

Cyrtoceras fosteri Hall, Rep. Sup. Geol. Surv. Wisconsin, 1861, p. 41.—Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 102.—Hall, 20th Rep. New York State Cab. Nat. Hist., 1868 (extras Jan., 1865), p. 349, pl. 16(7), figs. 11–13; rev. ed., 1870, p. 406, pl. 16, figs. 11–13.

Cyrtorhizoceras fosteri Clarke and Ruedemann, New York State Mus., 5, 1903, p. 91 (gen. ref.).

Niagaran (Racine): Chicago, Illinois; Wisconsin.

Cyrtorizoceras isodorus (Billings).

Cyrtoceras Isodorus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 175, fig. 157a, b.

Black River: St. Joseph Island, Lake Huron.

Cyrtorizoceras minneapolis (Clarke).

Cyrtoceras minneapolis, Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 808, pl. 59, figs. 1–8.

Cyrtorizoceras minneapolis Hyatt, Zittel-Eastman Textb. Pal., 1900, p. 529 (gen. ref.).

Black River (Platteville): Minneapolis, Minnesota.

Cotype.—Cat. No. 46525, U.S.N.M.

CYRTOSPIRA Ulrich.

Genotypes: C. tortilis Ulrich and Subulites ventricosus Hall.

Cyrtospira Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1073.

Cyrtospira abbreviata (Hall).

Subulites abbreviata Hall, 3d Rep. New York State Cab. Nat. Hist., rev. ed., 1850, p. 180, pl. 3, fig. 2a–c; doc. ed., p. 172.

Cyrtospira abbreviata Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1070 (gen. ref.).

Trenton: Near Watertown, New York.

Cyrtospira attenuata Ruedemann.

Cyrtospira attenuata Ruedemann, Bull. New York State Mus., 49, 1901, p. 35, pl. 2, fig. 8.

Mohawkian (Rysedorph): Rysedorph Hill, Rensselaer County, New York.

Cyrtospira bicurvata Ulrich.

Cyrtospira bicurvata Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1074, pl. 81, figs. 21, 22.

Black River (Lowville): High Bridge, Kentucky.

Holotype.—Cat. No. 45794, U.S.N.M.

Cyrtospira notata (Billings).

Subulites notatus Billings, Cat. Sil. Fossils, Anticosti, Geol. Surv. Canada, 1866, p. 54.

Cyrtospira notatus Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1070, (gen. ref.).

Anticostian (Ellis Bay): Junction Cliff, Anticosti.

Cyrtospira parvulus (Billings).

Subulites parvulus Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 36 (adv. sheets, 1862).

Cyrtospira parvulus Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1070 (gen. ref.).

Black River (Leray): Pauquette Rapids, Ottawa River and near L'Original, Canada.

Cyrtospira raymondi (Hudson).

Subulites raymondi Hudson, Bull. New York State Mus., 80, 1905, p. 293, pl. 4, figs. 1, 2.

Cyrtospira raymondi Raymond, Ann. Carnegie Mus., 4, 1908, p. 210, pl. 54, figs. 14, 15.

Chazyan (Crown Point, Valcour): Valcour Island and Chazy, New York.

Cyrtospira tortilis Ulrich.

Cyrtospira tortilis Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1074, pl. 81, figs. 24, 25.

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

Stones River (Murfreesboro): Murfreesboro, Tennessee.

Holotype.—Cat. No. 46053, U.S.N.M.

Cyrtospira ventricosa (Hall).

Subulites ventricosa Hall, Pal. New York, 2, 1852, p. 347, pl. 83, fig. 7a, b.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 339, fig. 346.—Hall, 20th Rep. New York State Cab. Hist., 1868, p. 346, pl. 15 (6), fig. 1; rev. ed. (1870), p. 398, pl. 15, fig. 1; p. 433.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 71, pl. 3, fig. 5; Quart. Jour. Geol. Soc. London, 31, 1875, p. 549, pl. 26, fig. 5.—Lindström, Kongl. Sven. Vet.-Akad. Handl., 19, No. 6, 1881, p. 193, pl. 15, figs. 19–21; pl. 18, fig. 58, 59.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 193, fig.—Lesley, Geol. Surv. Pennsylvania Rep. P 4, 1890, p. 1144, fig.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 96.

Cyrtospira ventricosa Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1073 (gen. ref.).—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 338.

Niagaran (Guelph): Gault, etc., Ontario; Wisconsin.

Cyrtospira wykoffensis Ulrich and Scofield.

Cyrtospira wykoffensis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1074, pl. 81, fig. 23.

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

Trenton (Prosser): Wykoff, Minnesota.

Holotype.—Cat. No. 45795, U.S.N.M.

CYRTOTHECA CORRUGATA Matthew. See Styliola corrugata.

CYRTOTHECA MINUTA Matthew. See Styliola minuta.

CYSTASTER Hall. See Hemicystites Hall.

CYSTIPHOROLITES Miller. Genotype: Vesicularia major Rominger.

Vesicularia Rominger (not Thompson), Geol. Surv. Michigan, 3, pt. 2, 1876, p. 135.

Cystiphorolites Miller, N. A. Geol. Pal., 1889, p. 183.—Sherzer, Amer. Geol., 7, 1891, pp. 296–301.

Cystiphorolites major (Rominger).

Vesicularia major Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 135, pl. 49, upper tier.

Cystiphorolites major Miller, N. A. Geol. Pal., 1889, p. 183 (gen. ref.).

Niagaran: Point Detour; Drummonds Island, Michigan.

Cystiphorolites minor (Rominger).

Vesicularia minor Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 136, pl. 49, upper tier.

Cystiphorolites minor Miller, N. A. Geol. Pal., 1889, p. 183 (gen. ref.).

Niagaran: Masonville, Iowa.

Cystiphorolites variolosus (Rominger).

Vesicularia variolosa Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 136, pl. 49, fig. 4.

Cystiphorolites variolosa Miller, N. A. Geol. Pal., 1889, p. 183 (gen. ref.).

Niagaran: Point Detour, Michigan.

CYSTIPHYLLUM Lonsdale. Genotype: C. siluriense Lonsdale.

Cystiphyllum Lonsdale in Murchison's Sil. Syst., 1839, p. 691.—Dana, Wilkes' U. S. Expl. Exped., 1838–1842, 7, Zoophytes, 1846, p. 360; Amer. Jour. Sci. Arts (2), 1, 1846, p. 186.—Edwards and Haime, Mon. d. Polyp. Foss. d. Terr., Pal., 1851 (Arch. du Mus. d'Hist. Nat., 5), pp. 175, 462.—McCoy, British Pal. Rocks Foss., 1854, p. 32.—Pictet, Traité de Pal., 2d ed., 4, 1857, p. 462.—Billings, Geol. Surv. Canada, Rep. Progr. for 1857, p. 178; Canadian Nat. Geol., 3, 1858, p. 430; Canadian Jour., n. s., 4, 1859, p. 136.—Milne-Edwards, Hist. Nat. Corall., 3, 1860, p. 447.—Lindstrom, Geol. Mag., 3, 1866, p. 359.—Dybowski, Archiv. f. Naturf. Liv-, Ehst- und Kurl., 5, 1873, pp. 340, 522.—Nicholson, Rep. Pal. Prov. Ontario, pt. 1, 1874, p. 35.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 137.—Zittel, Handb. Pal., 1, Munich, 1879, p. 234.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 399.—Frech, Pal. Abh., Dames and Kayser, bd. 3, Heft 3, 1886, p. 108.—Miller, N. A. Geol. Pal., 1889, p. 183.—Frech, Palaeontographica, 37, 1890, p. 43.—Sherzer, Amer. Geol., 7, 1891, pp. 277, 296–301.—Koken, Die Leitfossilien, Leipzig, 1896, p. 312.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 126.—Zittel-Eastman Textb. Pal., 1, 1900, p. 79.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt 2, 1901, p. 190.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 2, 1902, p. 160.—Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 87.

Conophyllum Hall, Pal. New York, 2, 1852, p. 114; Amer. Jour. Sci. and Arts, 2d ser., 11, 1851, p. 399 (Genotype: C. niagarense Hall).

Cystiphyllum americanum anderdonense Grabau.

Cystiphyllum americanum mut. anderdonense Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 104, pl. 12, figs. 3–5.

Upper Monroan: Detroit River region (Amherstburg); Amherstburg, Ontario (Anderdon).

Cystiphyllum gemmula Greene.

Cystiphyllum gemmula Greene, Cont. Indiana Pal., pt. 2, 1899, p. 12, pl. 6, figs. 8, 9.

Niagaran (Louisville): Louisville, Kentucky.

Cystiphyllum granillneatum Hall.

Cystiphyllum granilineatum Hall, 12th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1883, p. 274, pl. 15, fig. 13; pl. 23, fig. 13; 35th Rep. New York State Mus. Nat. Hist., p. 418 (ext., 1882, p. 14).—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, p. 184, figs.

Niagaran (Louisville): Louisville, Kentucky.

CYSTIPHYLLUM HURONENSE Billings. See Cystiphyllum niagarense.

Cystiphyllum incurvum Davis.

Cystiphyllum incurvum Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 124, figs. 6–8.

Niagaran (Louisville): Louisville, Kentucky.

Cystiphyllum lineatum Davis.

Cystiphyllum lineatum Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 128, figs. 1–4.

Niagaran (Louisville): Louisville, Kentucky.

Cystiphyllum louisvillense Greene.

Cystiphyllum louisvillensis Greene, Cont. Indiana Pal., 1, pt. 6, 1901, p. 45, pl. 16 figs. 7–10.

Niagaran (Louisville): Louisville, Kentucky.

Cystiphyllum maritimum Billings.

Cystiphyllum maritima Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, pp. 112 (adv. sheets, 1862).—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 191, pl. 18, figs. 2, 2a.

Silurian: L'Anse a la Vieille, Bay of Chaleurs, Quebec.

Cystiphyllum niagarense (Hall).

Chonophyllum niagarense Hall, Pal. New York, 2, 1852, p. 114, pl. 32, fig. 4a–n.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 190, fig.—Miller, N. A. Geol. Pal., 1889, p. 177, fig. 150.—Sherzer, Bull. Geol. Soc. Amer., 3, 1892, p. 266.—Grabau, Bull. New York State Mus., 45, 1901, p. 139, fig. 32.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 62, fig. 92.

Cystiphyllum Niagarense Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 138, pl. 49, fig. 3.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 124, figs. 1–5.—Lambe, Ottawa Nat., 12, 1899, p. 224; Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 190, pl. 16, fig. 7.

Cystiphyllum Huronense Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 92.

Niagaran: Lockport, etc., New York (Lockport); Louisville, Kentucky (Louisville); Drummond Island, etc., Lake Huron; Wisconsin; Anticosti.

Cystiphyllum spinulosum Foerste.

Cystiphyllum spinulosum Foerste, Bull. Kentucky Geol. Surv., 7, 1906, p. 321, pl. 5, figs. 1a–k.

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

CYSTOCRINUS Roemer. Genotype: C. tennesseensis Roemer.

Cystocrinus Roemer, Silur. Fauna West Tennessee, 1860, p. 56.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 404 (Rev. Pal., pt. 2, p. 230).—Miller, N. A. Geol. Pal., 1889, p. 237.

Cystocrinus tennesseensis Roemer.

Cystocrinus tennesseensis Roemer, Sil. Fauna West Tennessee, Breslau, 1860, p. 56, pl. 4, figs. 8a–d.—Miller, N. A. Geol. Pal., 1889, p. 237, fig. 279.—Bather, Geol. Mag., dec. 4, 5, 1898, p. 327, fig. 2.—Foerste, Jour. Geol., 11, 1903, p. 712.

Niagaran (Brownsport): Decatur and Perry Counties, Tennessee.

CYSTOSTYLUS Whitfield. Genotype: C. typicus Whitfield.

Cystostylus Whitfield, Ann. Rep. Wisconsin Geol. Surv. for 1879, 1880, p. 63; Geol. Wisconsin, 4, 1882, p. 273.—Miller, N. A. Geol. Pal., 1889, p. 184.—Sherzer, Amer. Geol., 8, 1891, pp. 296–301.

Cystostylus infundibulus (Whitfield).

Syringopora infundibula Whitfield, Ann. Rep. Wisconsin Geol. Surv. for 1877, 1878, p. 79.—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 53.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 35, pl. 1, figs. 6–9.

Cystostylus infundibulus Whitfield, Geol. Wisconsin, 4, 1882, p. 274, pl. 14, fig. 7.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 188, fig.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 2 (loc. occ.); ibid., pt. 2, 1895, p. 49 (loc occ.).

Niagaran: Milwaukee and Wauwatosa, Wisconsin (Racine); Durham, Ontario, and Shelby, New York (Guelph).

Cystostylus typicus Whitfield.

Cystostylus typicus Whitfield, Ann. Rep. for 1879, Wisconsin Geol. Surv., 1880, p. 64; Geol. Wisconsin, 4, 1882, p. 274, pl. 14, figs. 8, 9.

Niagaran (Racine-Waukesha): Cato and Sturgeon Bay, Wisconsin.

Cythere baltica Roemer. See Leperditia hisingeri.

Cythere Cincinnatiensis Meek. See Elpe cincinnatiensis.

Cythere irregularis Miller. See Elpe irregularis.

Cythere sublævis Shumard. See Leperditia sublævis.

CYTHERELLA Jones. Genotype: C. ovata (Roemer).

Cytherella Jones, Mon. Entom. Cret. Form., 1848, p. 28.—Bosquet, Desc. Entom. Foss. Terr. Tert., 1852, p. 10.—Bonnemann, Zeits. d. d. geol. Gesell ., 7, 1855, p. 353.—Richter, Zeits. d. d. geol. Gesell., 19, 1867, p. 226.—Jones, Kirkby, and Brady, Mon. Brit. Foss. Biv. Entom. Carb. Form., Pal. Soc., 1874, p. 6; ibid., 1884, p. 57, 70.—Zittel, Handb. Pal., 1885, p. 556.—Jones and Kirkby, Proc. Geol. Assoc. London, 9, 1886, p. 502.—Jones, Ann. Mag. Nat. Hist., 5th ser., 19, 1887, p. 192.—Vogdes, Annals New York Acad. Sci., 5, 1889, p. 4, pl. 2, fig. 4.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 707.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 684.—Koken, Die Leitfossilien, Leipzig, 1896, p. 40.—Zittel-Eastman Textb. Pal., 1, 1900, p. 646.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 366.—Bassler, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 740.

Cytherella? rugosa (Jones).

Cytheropsis rugosa Jones, Ann. Mag. Nat. Hist., 3d ser., 1, 1858, p. 249, pl. 10, fig. 5; Geol. Surv. Canada, dec. 3, 1858, p. 100.

Primitia rugosa Jones and Holl, Ann. Mag. Nat. Hist., 4th ser., 2, 1868, p. 55, footnote (gen. ref.).

Cytherella? rugosa—Continued.

Cytherella? rugosa Jones, Cont. Micro-Pal., Geol. Surv. Canada, pt. 3, 1891, p. 89 (gen. ref.).—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 686, pl. 43, figs. 21–24.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 366, fig. 1666, t, u.

Black River (Leray): Pauquette Rapids, Ottawa River, Canada.

Trenton (Prosser): Near Cannon Falls, Minnesota.

Plesiotypes.—Cat. No. 41814, U.S.N.M.

Cytherella? rugosa arcta Ulrich.

Cytherella? rugosa var. arcta Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 686, pl. 43, fig. 25.

Trenton (Prosser): Near Cannon Falls, Minnesota.

Holotype.—Cat. No. 41815, U.S.N.M.

Cytherella? subrotunda Ulrich.

Cytherella? subrotunda Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 685, pl. 44, fig. 43.

Black River (Decorah): Minneapolis, Minnesota.

CYTHERINA ALTA Conrad. See Leperditia alta and L. jonesi.

CYTHERINA BALTHICA Hisinger (part). See Leperditia hisingeri.

CYTHERINA CRENULATA Emmons. See Cytheropsis crenulata.

CYTHERINA CYLINDRICA Hall. See Leperditia cylindrica.

CYTHERINA EMMONSI Vogdes. See Cytheropsis emmonsi.

CYTHERINA FABULITES Conrad. See Leperditia fabulites.

CYTHERINA PHASEOLUS Hisinger. See Leperditia phaseolus.

CYTHERINA SPINOSA Hall. See Æchmina spinosa.

CYTHERINA SUBCYLINDRICA Emmons. See Cytheropsis emmonsi.

CYTHERINA SUBELLIPTICA Emmons. See Cytheropsis subelliptica.

CYTHERODON Hall. Genotype: C. nasutus Hall.

Cytherodon Hall, 23d Rep. New York State Cab. Nat. Hist., 1873, pl. 14, figs. 19–21; Pal. New York, 5, pt. 1, Lam. 2, 1885, p. 53.—Miller, N. A. Geol. Pal., 1889, p. 477.

Cytherodon? placidus Billings.

Cytherodon? placidus Billings, Pal. Foss., Geol. Surv. Canada, 2, pt. 1, 1874, p. 137, pl. 8, fig. 10 (var. pl. 8, fig. 11).

Silurian: Arisaig, Nova Scotia.

Cytherodon? socialis Billings.

Cytherodon? socialis Billings, Pal. Foss., Geol. Surv. Canada, 2, pt. 1, 1874, p. 138, pl. 8, fig. 12.

Silurian: Arisaig, Nova Scotia.

CYTHEROPSIS McCoy. Genotype: C. aldensis McCoy.

Cytheropsis McCoy, Ann. Mag. Nat. Hist., 2d ser., 4, 1849, p. 414; Cont. British Pal., 1854, p. 153; Synopsis British. Pal. Rocks., 1855, pl. 1 L, fig. 2.—Jones, Ann. Mag. Nat. Hist. (3), 1, 1858, p. 248; Geol. Surv. Canada, dec. 3, 1858, p. 98.—Barrande, Syst. Sil. du Centre Boheme, 1, Suppl., 1872, p. 508.—Miller, N. A. Geol. Pal., 1889, p. 541.

CYTHEROPSIS CINCINNATIENSIS Miller. See Elpe cincinnatiensis.

CYTHEROPSIS CONCINNA Jones. See Aparchites concinnus and Primitia muta.

Cytheropsis crenulata (Emmons).
Cytherina crenulata Emmons, Amer. Geology, 1, pt. 2, 1855, p. 220, figs. 75d, c.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 187, figs.
Cytheropsis crenulata Miller, N. A. Geol. Pal., 1889, p. 541 (gen. ref.).
Trenton: Middleville, New York.

Cytheropsis emmonsi (Vogdes).
Cytherina subcyclindrica Emmons (preoccupied), Amer. Geology, 1, pt. 2, 1855, p. 220, fig. 75b.
Cytheropsis subcyclindrica Miller, N. A. Geol. Pal., 1889, p. 542 (gen. ref.).
Cytherina emmonsi Vogdes, Annals New York Acad. Sci., 5, 1889, p. 13k.
Trenton: Middleville, New York.

CYTHEROPSIS IRREGULARIS Miller. See Elpe irregularis.

CYTHEROPSIS RUGOSA Jones. See Cytherella? rugosa.

CYTHEROPSIS SILIQUA Jones. See Macrocypris? siliqua.

CYTHEROPSIS SUBCYLINDRICA Emmons. See Cytheropsis emmonsi.

Cytheropsis subelliptica (Emmons).
Cytherina subelliptica Emmons, Amer. Geology, 1, 1855, p. 220, fig. 75a.
Cytheropsis subelliptica Miller, N. A. Geol. Pal., 1889, p. 542 (gen. ref.).
Trenton: Near Watertown, New York.

CYTOCRINUS Roemer. See Melocrinus Goldfuss.

DACTYLOPHYCUS Miller and Dyer.
Genotype: D. tridigitatum Miller and Dyer.
Dactylophycus Miller and Dyer, Cont. to Pal., 2, 1878, p. 1.—James, Jour. Cincinnati Soc. Nat. Hist., 7, 1885, p. 164.—Miller, N. A. Geol. Pal., 1889, p. 116.

Dactylophycus quadripartitum Miller and Dyer.
Dactylophycus quadripartitum Miller and Dyer, Cont. to Pal., 2, 1878, p. 2, pl. 3, fig. 1.
Eden (Economy): Cincinnati, Ohio, and vicinity.

Dactylophycus tridigitatum Miller and Dyer.
Dactylophycus tridigitatum Miller and Dyer, Cont. to Pal., 2, 1878, p. 2, pl. 3, fig. 2.—James, Jour. Cincinnati Soc. Nat. Hist., 7, 1885, p. 164.—Miller, N. A. Geol. Pal., 1889, p. 116, fig. 29.
Eden (Economy): Cincinnati, Ohio, and vicinity.

DÆDALUS Rouault. Genotype: D. newtoni Rouault.
Dædalus Rouault, Bull. Soc. Geol. France, 2d ser., 7, 1850, p. 736.—Sarle, Proc. Rochester Acad. Sci., 4, 1906, p. 203.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 247.
Vexillum Rouault, Bull. Soc. Geol. France, 2d ser., 7, 1850, p. 733 (Genotype: V. labechei Rouault).

Dædalus archimedes (Ringueberg).
Arthrophycus sp. Hall, Pal. New York, 2, 1852, p. 6, pl. 2, fig. 2.
Spirophyton archimedes Ringueberg, Proc. Acad. Nat. Sci. Philadelphia, 1884, p. 144, pl. 2, fig. 1.
Taonurus archimedes Miller, N. A. Geol. Pal., 1889, p. 146 (gen. ref.).

Dædalus **archimedes**—Continued.
Dædalus archimedes Sarle, Proc. Rochester Acad. Sci., 4, 1906, p. 203.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 248.
Upper Medinan: Lockport, etc., New York; Pennsylvania; Maryland; Virginia; Tennessee.

DALMANELLA Hall and Clarke. Genotype: Orthis testudinaria Dalman.
Orthis (group of O. testudinaria) Hall, Bull. Geol. Soc. Amer., 1, 1889, p. 21.
Dalmanella Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 205, 223.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 439.—Hall and Clarke, 11th Ann. Rep. New York State Geol., 1894, p. 170.—Wysogorski, Zeits. d. d. geol. Gesell., 52, 1900, p. 225.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 187; Bull. New York State Mus., 45, 1901, p. 187.—Grabau and Shimer, N., A. Index Fossils, 1, 1907, p. 259.—Cumings, 32d Ann. Rep., Dep. Geol. Nat. Res. Indiana, 1908, p. 888.

Dalmanella amœna Schuchert. See Pianodema amœna.

Dalmanella arcuaria Hall and Clarke.
Dalmanella arcuaria Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 224, 341, pl. 5C, figs. 20, 21.—Foerste, Jour. Geol., 11, 1900, p. 711 (loc. occ.).
Orthis (Dalmanella) arcuaria Hall and Clarke, 48th Rep. New York State Mus. for 1895, 2, 1897, p. 340, pl. 4, figs. 13, 14; 14th Rep. State Geol. New York for 1894, 1897, p. 340, pl. 4, figs. 13, 14.
Niagaran (Brownsport): Perry County, Tennessee.

Dalmanella bassleri Foerste.
Dalmanella bassleri Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 215.
Trenton (Upper): Carnestown, etc., Kentucky; Florence, Indiana.

Dalmanella bellula Hall and Clarke. See Pianodema bellula.

Dalmanella breviculus Foerste. See Dalmanella emacerata brevicula.

Dalmanella centrilineata (Hall).
Orthis centrilineata Hall, Pal. New York, 1, 1847, p. 289, pl. 79, fig. 5.
Dalmanella centrilineata Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 260.
Cincinnatian (Pulaski): Lorraine and Turin, New York.

Dalmanella clarki Maynard.
Dalmanella clarki Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 300, pl. 54, figs. 7–10.
Helderbergian: (Keyser): Cash Valley, Maryland.

Dalmanella concinna (Hall).
Orthis concinna Hall, Pal. New York, 3, 1859, p. 172, pl. 10a, figs. 1–3.
Dalmanella concinna Hall and Clarke, Pal. New York, 8, 1892, pt. 1, pp. 207, 224.—Maynard, Maryland Geol. Surv., Low Dev., 1913, p. 301, pl. 54, figs. 11–13.
Helderbergian (Keyser): Cumberland, etc., Maryland; Keyser, West Virginia; Pleasant Valley and Hyndman, Pennsylvania.

Dalmanella corpulenta (Sardeson).
Orthis corpulenta Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, 1892, p. 330, pl. 5, figs. 8–10; Amer. Geol., 19, 1897, p. 101, pl. 4, figs. 11–19.
Orthis (Dalmanella) testudinaria var. meeki Winchell and Schuchert (not Miller), Geol. Minnesota, 3, 1893, p. 445, pl. 23, figs. 25–29.
Richmond (Maquoketa): Granger and Spring Valley, Minnesota.

DALMANELLA CRISPATA Hall and Clarke. See Hebertella (Glyptorthis) crispata.

Dalmanella edgewoodensis Savage.

Dalmanella edgewoodensis Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 76, pl. 4, figs. 11–13, pl. 7, fig. 9.

Upper Medinan: Near Thebes, Illinois; Missouri (Edgewood); Will County, Illinois (Channahon).

Dalmanella electra (Billings).

Orthis Electra Billings, Pal. Fossils, 1, 1865, p. 79, fig. 72; p. 217; Geol. Canada, 1863, p. 231, fig. 246.—White, Wheeler's Rep. Geol. Geogr. Expl. west 100 Merid., 4, 1875, p. 55.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 513, figs.

Dalmanella electra Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 223.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 125, pl. 4, fig. 13.

Canadian: Point Levis, Quebec; Point Rich, etc., Newfoundland; St. John, New Brunswick; House Range, Utah; Columbia, New Jersey.

Dalmanella electra lævis (Matthew).

Orthis electra var. lævis Matthew, Trans. Royal Soc. Canada, 10, 1893, p. 100.

Dalmanella electra lævis Schuchert, Bull. U. S. Geol. Surv., 87, 1899, p. 200.

Canadian (Bretonian—Div. C 3d): St. John, New Brunswick.

Dalmanella electra major (Matthew).

Orthis electra var. major Matthew, Trans. Royal Soc. Canada, 10, 1893, p. 100, pl. 7, fig. 3.

Dalmanella electra major Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 200.

Canadian (Bretonian—Div. C 3d): St. John, New Brunswick.

Dalmanella elegantula (Dalman).

Orthis elegantula Dalman, Kongl. Svenska Vet.-Akad. Handl., 1828, p. 117, pl. 2, fig. 6.—Hall, Pal. New York, 2, 1852, p. 252, pl. 52, fig. 3.—Billings. Canadian Nat. Geol., 1, 1856, p. 136, pl. 2, fig. 5.—Roemer, Sil. Fauna West Tennessee, 1860, p. 62, pl. 5, fig. 7.—Billings, Geol. Canada, 1863, p. 312, fig. 320.—Chapman, Canadian Jour., n. s., 8, 1863, p. 212, fig. 218; Expos. Min. Geol. Canada, 1864, p. 184, fig. 218.—Davidson, Mon. British Sil. Brach., Pal. Soc., 1869, p. 205, figs. 1, 2; p. 211, pl. 27, figs. 1–9.—Hall, 28th Rep. New York State Mus. Nat. Hist., 1879, p. 150, pl. 21, figs. 11–17; 11th Rep. State Geol. Indiana, 1882, p. 285, pl. 21, figs. 11–17; 2d Ann. Rep. State Geol., 1883, pl. 35, figs. 34–37; 36th Rep. New York State Mus. Nat. Hist., 1884, p. 75, pl. 3, figs. 8, 9.—Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 84, pl. 13, fig. 1.—Miller, N. A. Geol. Pal., 1889, p. 357, fig. 590.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 514, figs.—Nettelroth, Kentucky Foss. Shells, Mem. Kentucky Geol. Surv., 1889, p. 37, pl. 32, figs. 52–57.—Beecher and Clarke, Mem. New York State Mus., 1, 1889, p. 14, pl. 1, figs. 3–12.—Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 307.

Orthis canalis Hall, Geol. New York, Rep. 4th Dist., 1843, p. 105, fig. 6.—Owen, Amer. Jour. Sci. Arts, 48, 1845, p. 313, fig. 6.—Emmons, Man. Geol., 1860, p. 109, fig. 99.

Orthis elegantula? var. Hall, Pal. New York, 2, 1852, p. 57, pl. 20, fig. 7.

Dalmanella elegantula Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 207, 224, pl. 5C, figs. 15–19.—Grabau, Bull. New York State Mus., 45, 1901, p. 187, fig. 97; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 187, fig. 97.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 41, pl. 4, fig. 9.—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 433, pl. 2, fig. 9.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 261, fig. 312.—Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1909, p. 27.

Dalmanella elegantula—Continued.

Orthis (Dalmanella) elegantula Foerste, Geol. Ohio, 7, 1895, p. 581, pl. 25, figs. 11, 17.

Silurian: Europe. Widely distributed in all of the post-Richmond Silurian formations of eastern North America.

Plesiotypes.—Cat. No. 51345, U.S.N.M. (Nettelroth.)

Dalmanella elegantula media (Shaler).

Orthis media Shaler, Bull. Mus. Comp. Zool., 1, 1865, p. 65.—Billings, Cat. Sil. Fossils of Anticosti, 1866, p. 41.

Rhipidomella media Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 349.

Anticostian (Jupiter River and Chicotte): Southwest Point, etc., Anticosti.

Dalmanella elegantula parva (Foerste).

Orthis elegantula var. parva Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 85, pl. 13, fig. 17.

Dalmanella elegantula var. parva Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 224.

Upper Medinan (Brassfield): Dayton, Ohio.

DALMANELLA EMACERATA Foerste (1909). See Dalmanella fultonensis.

Dalmanella emacerata (Hall).

Orthis emacerata Hall, 13th Rep. New York State Cab. Nat. Hist., 1860, p. 121; 15th Rep. ibid., 1862, pl. 2, figs. 1, 3.—Billings, Canadian Nat. Geol., 7, 1862, p. 393.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 24,—Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 34, figs. 14, 15.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 515, figs.—Keyes, Geol. Surv. Missouri, 5, 1895, p. 58.—Sardeson, Amer. Geol., 19, 1897, p. 102, pl. 5, figs. 14, 18, 28.

Orthis cyclus James, Cincinnati Quart, Jour. Sci., 1, 1874, p. 19.

Dalmanella emacerata Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 207, 224, pl. 5C, figs. 1, 2.—Grabau and Shimer, N. A. Index Foss., 1, 1907, p. 260, fig. 311i–m.—Foerste, Sci. Lab. Denison Univ., Bull. 17, 1912, p. 128, pl. 8, figs. 3a, b.

Dalmanella testudinaria var. emacerata Cumings, 32d Ann. Rep., Dep. Geol. Nat. Res., Indiana, 1908, p. 898, pl. 33, figs. 5–5a.

Dalmanella emacerata filosa Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 214, pl. 4, fig. 1.

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

Dalmanella emacerata brevicula (Foerste).

Dalmanella breviculus Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, pp. 216, 322, pl. 7, fig. 5.

Orthis emacerata (part) Hall, 15th Rep. New York State Cab. Nat. Hist., 1862, pl. 2, fig. 2.

Dalmanella emacerata brevicula Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, p. 128.

Eden (Southgate): Cincinnati, Ohio; Vevay, Indiana.

DALMANELLA EMACERATA FILOSA Foerste. See Dalmanella emacerata.

Dalmanella(?) evadne (Billings).

Orthis evadne Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 81, fig. 74; p. 79 (adv. sheets 1862).—Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 300, pl. 24, fig. 8.—Seely, Vermont State Geol., Rep., 7, 1910, pl. 62, fig. 8.

Dalmanella? evadne Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 223, pl. 5B, figs. 25, 26.

Canadian: Point Levis, Quebec (Levis); Fort Cassin, Vermont (Beekmantown).

Dalmanella fairmountensis Foerste.
Dalmanella fairmountensis Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 216, pl. 4, figs. 2a–c; p. 322, pl. 7, fig. 2.
Maysville (Bellevue): Hamilton and Cincinnati, Ohio; New Trenton, etc., Indiana.

Dalmanella fertilis Bassler.
Orthis (Dalmanella) testudinaria Hayes and Ulrich, U. S. Geol. Surv., folio 95, Illust. Sheet, 1903, figs. 42, 43.
Orthis (Dalmanella) fertilis Bassler, Bull. Virginia Geol. Surv., 2, 1909, pl. 24; fig. 5.
Trenton (Hermitage): Central Tennessee, Kentucky, and Virginia.
Cotypes and *plesiotypes*.—Cat. No. 35455, U.S.N.M.

Dalmanella fissiplica Foerste. See Orthostrophia (Schizoramma) fissiplica.

Dalmanella freitana (Clarke).
Orthis (Dalmanella) freitana Clarke, Archivos Mus. Nac. Rio de Janeiro, 10, author's Engl. ed., 1900, p. 10, pl. 1, figs. 22–24.
Silurian: Rio Trombetas, Brazil.

Dalmanella fultonensis Foerste.
Dalmanella emacerata Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 321, pl. 7, fig. 1.
Dalmanella fultonensis Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, p. 129.
Eden (Fulton): Cincinnati, Ohio.

Dalmanella futilis (Sardeson).
Orthis futilis Sardeson, Amer. Geol., 19, 1897, p. 104, pl. 5, figs. 25–27.
Dalmanella testudinaria futilis Schuchert, Bull. U. S. Geol. Surv., 87, p. 205.
Richmond (Maquoketa): Near Granger and Wykoff, Minnesota.

Dalmanella gibbosa Hall and Clarke. See Pianodema subæquata gibbosa.

Dalmanella hamburgensis (Walcott).
Orthis hamburgensis Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 73, pl. 2, fig. 5.
Orthis (Dalmanella) hamburgensis? Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 440, pl. 33, figs. 14–16.
Upper Pogonip: Eureka District, Nevada.
Black River: St. Paul, etc., Minnesota (Decorah); High Bridge, Kentucky (Lowville).
Cotypes.—Cat. No. 17259, U.S.N.M.

Dalmanella holiensis Cleland.
Dalmanella holiensis Cleland, Bull. Amer. Pal., 3, 1900, p. 130 (258), pl. 17, fig. 9.
Canadian (Tribes Hill): Near Fort Hunter, New York.

Dalmanella ignota (Sardeson).
Orthis ignota Sardeson, Amer. Geol., 19, 1897, pp. 99, 181, pl. 5, figs. 1–7.
Dalmanella testudinaria ignota Schuchert, Bull. U. S. Geol. Surv., 87, 1907, p. 205.
Richmond (Maquoketa): Near Spring Valley, Minnesota.

Dalmanella jugosa Foerste. See Dalmanella meeki.

Dalmanella lunata (Sowerby).
Orthis lunata Sowerby, Sil. Syst., 1839, p. 611, pl. 5, fig. 15.—Davidson, British Sil. Brach., 1869, p. 215, pl. 28, figs. 1–5.

Dalmanella lunata—Continued.

Dalmanella lunata Williams, Proc. U. S. Nat. Mus., 45, 1913, p. 337, pl. 30, figs. 1–5, 8.

Orthis orbicularis Sowerby, Sil. Syst., 1839, p. 611, pl. 5, fig. 16.

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

Plesiotypes.—Cat. Nos. 58957–58959, U.S.N.M.

Dalmanella macleodi (Whitfield).

Orthis macleodi Whitfield, Bull. Amer. Mus. Nat. Hist., 2, 1889, p. 43, pl. 7, figs. 1–4.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 523, figs.

Dalmanella macleodi Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 224.

Canadian (Beekmantown): Beekmantown, New York.

Dalmanella macrior (Sardeson).

Orthis macrior Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, 1892, p. 330, pl. 5, figs. 5–7.

Orthis (Dalmanella) testudinaria var. emacerata Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 445, pl. 33, figs. 23–24.

Orthis emacerata Sardeson, Amer. Geol., 19, 1897, p. 102, pl. 5, figs. 14–18, 28.

Richmond (Maquoketa): Spring Valley and Granger, Minnesota.

Dalmanella meeki (Miller).

Orthis emacerata Meek (not Hall), Pal. Ohio, 1, 1873, p. 109, pl. 8, figs. 1, 2.

Orthis parva Billings (not Verneuil), Cat. Sil. Foss. Anticosti, 1866, p. 41.

Orthis meeki Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 20.—Sardeson, Amer. Geol., 19, 1897, p. 98, pl. 4, figs. 24–29.

Dalmanella meeki Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 206, 224, pl. 5C, fig. 3.—Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 218 (synonymy and history discussed).

Dalmanella testudinaria var. meeki Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 899, pl. 33, figs. 6–6g.

Orthis jugosa James, Paleontologist, 4, 1879, p. 31.

Dalmanella jugosa Foerste, Bull. Sci. Lab. Denison Univ., 4, 1909, pl. 14, figs. 16a–b, p. 218; Ohio Nat., 12, No. 3, 1912, p. 453, pl. 22, fig. 1.

Richmond: Oxford, etc., Ohio; Indiana; Kentucky; Anticosti; etc.

Dalmanella melita (Hall and Whitfield).

Leptæna melita Hall and Whitfield, King's U. S. Geol. Surv., 40th Parl., 4, 1877, p. 208, pl. 1, figs. 13, 14.—Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 22.

Dalmanella melita Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 202.

Lower Pogonip: Eureka District, Nevada.

Dalmanella modesta Savage.

Dalmanella modesta Savage, Bull. Geol. Surv., Illinois, 23, 1913, p. 48, pl. 1, figs. 14, 15.

Upper Medinan (Girardeau): Alexander County, Illinois.

Dalmanella multisecta (Meek).

Orthis multisecta James, Cat. L. Sil. Foss. Cincinnati Group, 1871, p. 10 (nom. nud.).—Sardeson, Amer. Geol., 19, 1897, p. 97, pl. 4, figs. 20–23.

Orthis emacerata var. multisecta Meek, Pal. Ohio, 1, 1873, p. 112, pl. 8, fig. 3.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 22.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 515, figs.

Dalmanella testudinaria var. multisecta Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 901, pl. 33, figs. 4, 4c.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 205.

Dalmanella multisecta—Continued.

Dalmanella multisecta Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 207–224.—Cumings, Amer. Geol., 28, 1901, p. 374.—Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 217.—Bassler, Bull. Virginia Geol. Surv., 2a, 1909, pl. 14, figs. 4–6.

Eden: Cincinnati, Ohio, and vicinity; Maryland; Virginia; East Tennessee; Albany County, New York (Indian Ladder).

DALMANELLA PERVETA Hall and Clarke. See Pianodema subæquata and P. subæquata perveta.

DALMANELLA? PLICIFERA Schuchert. See Leptæna incrassata.

Dalmanella porrecta (Sardeson).

Orthis porrecta Sardeson, Amer. Geol., 19, 1897, p. 104, pl. 5, figs. 19–24.

Dalmanella testudinaria porrecta Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 205.

Richmond (Maquoketa): Near Granger, Minnesota.

Dalmanella postelegantula Weller.

Dalmanella postelegantula Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 232, pl. 20, figs. 21–24.

Helderbergian (Decker Ferry): Two miles south of Tristates, New York.

Dalmanella rogata (Sardeson).

Orthis rogata Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, 1892, p. 331, pl. 5, figs. 1–4; Amer. Geol., 19, 1897, p. 95, pl. 4, figs. 1–10.

Orthis (Dalmanella) testudinaria Hall, Pal. New York, 8, pt. 1, 1892, pl. 5B, figs. 27 to 31.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 441, pl. 33, figs. 17–22.

Black River and Trenton: St. Paul, etc., Minnesota; Iowa and Wisconsin.

Dalmanella? ruida (Billings).

Orthis ruida Billings, Cat. Sil. Fossils of Anticosti, 1866, p. 42.

Gamachian (Ellis Bay): Gamache Bay, Anticosti.

Dalmanella smithi (Clarke).

Orthis (Dalmanella) smithi Clarke, Archivos Mus. Nac. Rio de Janeiro, 10, author's Eng. ed., 1900, p. 11, pl. 1, figs. 12–16.

Silurian: Rio Trombetas, Brazil.

DALMANELLA STONENSIS Hall and Clarke. See Pianodema stonensis.

DALMANELLA SUBÆQUATA Hall and Clarke. See Pianodema subæquata.

DALMANELLA SUBÆQUATA var. PERVETUS Ruedemann. See Pianodema subæquata perveta.

Dalmanella tersa (Sardeson).

Orthis tersus Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, 1892, p. 331, pl. 5, figs. 11–13; Amer. Geol., 19, 1897, p. 100, pl. 5, figs. 8–13.

Dalmanella tersa Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 204.

Richmond (Fernvale): Wilmington, Illinois; Tennessee.

Dalmanella testudinaria (Dalman).

Orthis testudinaria Dalman, Kongl. Svenska Vet.-Akad. Handl., 1828, p. 115, pl. 2, fig. 4.—Conrad, Ann. Rep. Geol. Surv. New York, 1839, p. 63.—Emmons, Geol. New York, Rep. 2d Dist., 1842, p. 404, fig. 4.—Hall, Pal. New York, 1, 1847, p. 117, pl. 32, fig. 1; p. 288, pl. 79, fig. 4.—Emmons, Amer. Geol., 1,

Dalmanella testudinaria—Continued.

pt. 2, 1855, p. 194, pl. 9, figs. 1a–i; pl. 17, fig. 12.—Billings, Canadian Nat. and Geol., 1, 1856, p. 40, fig. 1.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 818, fig. 601.—Emmons, Man. Geol., 1860, p. 102, fig. 3; p. 99, fig. 88.—Hitchcock, Geol. Vermont, 1, 1862, p. 294, fig. 201.—Chapman, Canadian Jour., n. s., 7, 1862, p. 111, fig. 90; ibid., 8, 1863, p. 199, fig. 182.—Billings, Geol. Canada, 1863, p. 165, fig. 144.—Chapman, Expos. Min. Geol. Canada, 1864, p. 114, fig. 90; p. 171, fig. 182.—Safford, Geol. Tennessee, 1869, p. 275, fig. 8.—Miller, Cincinnati Quart. Jour. Sci., 1875, p. 20.—White, Wheeler's Expl. Surv. west 100th Merid., 4, 1875, p. 72.—Shaler, Mem. Geol. Surv. Kentucky, 1, 1876, p. 31.—Whitfield, Geol. Wisconsin, 4, 1882, p. 258, pl. 12, figs. 5–7.—Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 34, figs. 1–4, 6–13.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 155, fig.—Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 72, pl. 11, fig. 10.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 536, figs.; p. 537, figs.—Sardeson, Amer. Geol., 19, 1897, pp. 92, 95.

Orthis striatula Emmons, Geol. New York, Rep. 2d Dist., 1842, p. 394, fig. 3.—Owen, Amer. Jour. Sci. Arts, 47, 1844, p. 366, fig. 3.

Orthis disparilis Owen (not Conrad), Geol. Surv. Wisconsin, Iowa, Minnesota, 1852, pl. 2B, fig. 23.

Dalmanella testudinaria Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 190, 206, 218, 224, pl. 5B, figs. 31–39.—Ruedemann, Bull. New York State Mus., 49, 1902, p. 25.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 155, pl. 10, figs. 1, 2; p. 216, pl. 16, figs. 4, 5.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 260, fig. 311a–e.

Orthis (Dalmanella) testudinaria Whiteaves, Pal. Foss. Geol. Surv. Canada, 3, pt. 2, 1895, p. 121; ibid., 3, pt. 3, 1897, pp. 177, 241.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 156.

Middle and Upper Ordovician: Europe and America.

Observation.—The above miscellaneous citations refer to a variety of forms.

DALAMANELLA TESTUDINARIA var. EMACERATA Cumings. See Dalmanella emacerata.

DALMANELLA TESTUDINARIA FUTILIS Schuchert. See Dalmanella futilis.

DALMANELLA TESTUDINARIA IGNOTA Schuchert. See Dalmanella ignota.

DALMANELLA TESTUDINARIA var. MEEKI Cumings. See Dalmanella meeki.

DALMANELLA TESTUDINARIA var. MULTISECTA Schuchert. See Dalmanella multisecta.

DALMANELLA TESTUDINARIA PORRECTA Schuchert. See Dalmanella porrecta.

Dalmanella wemplei Cleland.

Dalmanella (Orthis) wemplei Cleland, Bull. Amer. Pal., 3, 1900, p. 129 (257), pl. 17, figs. 10–13.

Dalmanella wemplei Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 124, pl. 4, figs. 10–12.—Cleland, Bull. Amer. Pal., 4, 1903, p. 19.

Canadian (Tribes Hill): Tribes Hill, Fort Hunter, etc., New York; New Jersey.

DALMANIA Salter. See Dalmanites Barrande.

DALMANIA BICORNIS Hall. See Dalmanites bicornis.

DALMANIA BREVICEPS Hall. See Chasmops breviceps.

DALMANIA CALLICEPHALA Hall. See Pterygometopus callicephalus.

DALMANIA CAUDATA Roemer. See Dalmanites limulurus.

DALMANIA DANAE Meek and Worthen. See Dalmanites danae.

DALMANIA LIMULURUS Lincklaen. See Dalmanites limulurus.

DALMANIA LOGANI Hall. See Dalmanites logani Hall.

DALMANIA META Hall. See Pterygometopus meta.

DALMANIA VERRUCOSA Hall. See Dalmanites verrucosus.

DALMANIA VIGILANS Hall. See Dalmanites vigilans and D. halli.

DALMANITES Barrande. Genotype: Trilobus caudatus Bronn.

Dalmania Emmrich, Zur. Naturg. d. Tril., 1844, p. 15; Neues Jahrb. f. Min., etc., 1845, p. 40.—Salter, Mem. Geol. Surv. Great Britain, 2, pt. 1, 1848, p. 336.—Barrande, Neues Jahrb. f. Min., etc., 1850, p. 779; Syst. Sil. du Centre Boheme, 1, 1852, p. 528.—Pictet, Traite de Pal., 2d ed., 2, 1854, p. 501.—Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1865, p. 256.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 7, ser. 30, 1881, p. 61.

Dalmanites Barrande, Syst. Sil. du Centre, Boheme, 1, 1852, p. 934.—Chapman, Canadian Jour., n. s., 8, 1863, p. 30; Expos. Min. Geol. Canada, 1864, p. 138.—Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 367.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 142.—Hall, 28th Rep. New York State Mus. Nat. Hist., mus. ed., 1879, p. 191.—Packard, Amer. Nat., 14, 1880, p. 504.—Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 337.—Zittel, Handb. Pal., 2, 1885, p. 615.—Clarke, Jour. Morph., 2, 1888, p. 254.—Hall and Clarke, Pal. New York, 7, 1888, p. 29.—Miller, N. A. Geol. Pal., 1889, p. 542.—Beecher, Amer. Jour. Sci., 3d ser., 46, 1893, p. 143.—Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 733.—Beecher, Amer. Geol., 16, 1895, pp. 167, 174, 178.—Œhlert, Bull. Soc. Geol. France, 3d ser., 24, 1896, p. 112, fig. 29–31.—Beecher, Amer. Jour. Sci., 4th ser., 3, 1897, pp. 104, 184, pl. 3, figs. 5–8, 29; Zittel-Eastman Textb. Pal., 1, 1900, p. 637.—Grabau, Bull. New York State Mus., 45, 1901, p. 223; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 223.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 34, No. 8, 1901, pp. 27, 52.—Jaekel, Zeits. d. d. geol. Gesell., 53, 1901, p. 157.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res., Indiana, 1908, p. 1051.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 324.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 726.

DALMANITES ARCHATES Billings. See Pterygometopus achates.

Dalmanites arkansanus Van Ingen.

Dalmanites (Synphoria) arkansanus Van Ingen, School of Mines Quart., 23, 1901, p. 69, figs. 20–22, pl. figs. 33–37.

Dalmanites arkansanus Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 278, pl. 24, fig. 5.

Niagaran: St. Clair Springs, Independence County, Arkansas (St. Clair); near Lemont and Romeo, Illinois (Racine).

Dalmanites aspinosus Weller.

Dalmanites aspinosa Weller, Pal. New Jersey, 3, 1903, p. 252, pl. 22, fig. 1.—Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 499, pl. 91, fig. 16.

Helderbergian: Two miles south Tristates, New York (Decker Ferry); Devil's Backbone, near Cumberland and Cash Valley, Maryland (Keyser).

Dalmanites bebryx Billings.

Dalmanites Bebryx Billings, Canadian Nat. Geol., 5, 1860, p. 61, fig. 8; Geol. Canada, Geol. Surv. Canada, 1863, p. 187, fig. 185.

Trenton: Ottawa, Ontario.

Dalmanites bicornis (Hall).

Dalmania bicornis Hall, 28th Rep. New York State Mus. Nat. Hist. (doc. ed.), 1877, pl. 33, fig. 18, 1877.

Dalmanites bicornis Hall, 28th Rep. New York State Mus. Nat. Hist., Mus. ed., 1879, p. 196, pl. 33, fig. 18; 11th Rep. Dep. Geol. Nat. Hist. Indiana, 1882, p. 342, pl. 35, fig. 18.

Niagaran (Waldron): Waldron, Indiana; Tennessee.

DALMANITES BREVICEPS Miller. See Chasmops breviceps.

DALMANITES CALLICEPHALUS Billings. See Pterygometopus callicephalus.

DALMANITES CARLEYI Meek. See Pterygometopus carleyi.

DALMANITES CARLEYI ROGERSENSIS Foerste. See Pterygometopus carleyi rogersensis.

Dalmanites danae (Meek and Worthen).

Dalmania Danae Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1865, p. 264

Dalmanites danae Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 363, pl. 6, figs. 1a–1f.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 325.

Dalmanites danai Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 106, pl. 6, figs. 16, 17.

Upper Medinan (Edgewood): Near Thebes, Illinois; Edgewood and Louisiana, Missouri.

DALMANITES EBORACEUS Miller. See Pterygometopus eboraceus.

DALMANITES (PTERYGOMETOPUS) GOODRIDGII Schuchert. See Pterygometopus goodridgii.

Dalmanites halli Weller.

Dalmania vigilans Hall (not Hall, 1862), 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1877, pl. 33, figs. 1–4.

Dalmanites vigilans Hall, ibid., mus. ed., 1879, p. 193, pl. 33, figs. 1–4; 11th Rep. Dep. Geol. Nat. Hist. Indiana, 1882, p. 339, pl. 35, figs. 1–4; pl. 33, fig. 9.

Dalmanites halli Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 195.

Niagaran (Waldron): Waldron, Indiana.

Dalmanites illinoisensis Weller.

Dalmanites illinoisensis Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 275, pl. 25, figs. 1–2.

Niagaran (Racine): Joliet, Bonfield, etc., Illinois.

DALMANITES INTERMEDIUS Walcott. See Pterygometopus intermedius.

Dalmanites keyserensis Swartz.

Dalmanites keyserensis Swartz, Maryland Geol. Surv., Low. Dev., 1913, p. 499, pl. 91, figs. 8, 9.

Helderbergian (Keyser): Tonoloway, Maryland.

Dalmanites limulurus (Green).

Asaphus limulurus Green, Mon. Tril. N. A. 1832, p. 48.—Harlan, Trans. Geol. Soc. Pennsylvania, 1, pt. 1, 1834, p. 101.—Castelnau, Essai Syst. Sil. l'Amerique Septent, 1843, p. 18, pl. 4, fig. 1.—Hall, Geol. New York, pt. 4, 1843, p. 101, figs. 1–2; tab. org. rem., 10, figs. 1–2.—Owen, Amer. Jour. Sci. Arts, 46, 1845, pp. 309–310, figs. 1, 2.

Dalmanites limulurus—Continued.

Phacops limulurus Hall, Pal. New York, 2, 1852, p. 303, pl. 67, figs. 1–8.—Billings, Can. Nat. Geol., 1, 1856, p. 57, pl. 1, fig. 7.

Dalmania limulurus Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 8, figs. 2, 3.—Hall, Pal. New York, 3, 1859, p. 357.

Dalmanites limulurus Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 320, fig. 340.—Chapman, Canadian Jour., n. s., 8, 1863, p. 31, fig. 145, p. 212, fig. 221; Expos. Min. Geol. Canada, 1864, p. 138, fig. 145; p. 184, fig. 221.—Miller, N. A. Geol. Pal., 1889, p. 543, fig. 998.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 188, figs.—Clarke, 45th Rep. New York State Mus., 1892, p. 355; 11th Rep. State Geol. New York for 1891, 1894, p. 39.—Grabau, Bul. New York State Mus., 45, 1901, pp. 223–224, fig. 155; Bull. Buffalo Soc. Nat. Sci., 1901, p. 224, fig.155.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 325, fig. 1641.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 726, fig. 1408.

Asaphus caudatus Green, Mon. Tril. N. A., 1832, p. 50.—Eaton, Geol. Textb., 2d ed., 1832, p. 31, pl. 2, fig. 18.—Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 19.

Dalmania caudata Roemer, Sil. Fauna West Tennessee, 1860, p. 82, pl. 5, fig. 21.

Asaphus wetherilli Green, Mon. Tril. N. A., 1832, p. 57.—Harlan, Trans. Geol. Soc. Pennsylvania, 1, pt. 1, 1834, p. 101.

Asaphus edwardsi Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 19.

Asaphus cordieri Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 18, pl. 4, fig. 2.

Clinton (Rochester-Osgood): Rochester, Lockport, etc., New York; Ontario; Indiana; Tennessee; Maryland; Pennsylvania.

Plastotype.—Cat. No. 4954, U.S.N.M.

Dalmanites limulurus brevicaudatus Foerste.

Dalmanites limulurus brevicaudatus Foerste, Cincinnati Soc. Nat. Hist., Jour., 21, 1909, p. 35, pl. 2, figs. 20a–c.

Clinton (West Union): New Martins, Lewis County, Kentucky.

Dalmanites logani (Hall).

Dalmania logani Hall, Canadian Nat. Geol., 5, 1860, p. 156.—Dawson, Acadian Geol., Suppl. Chap., 1860, p. 68, fig. 64; ibid., 2d ed., 1868, p. 608, fig. 215.

Silurian (Stonehouse): Arisaig, Nova Scotia.

Dalmanites lunatus Lambert.

Dalmanites lunatus Lambert, Bull. Geol. Soc. America, 15, 1904, p. 482, pl. 44, figs. 1–3, 5; Lambert in Hitchcock's Geol. of Littleton, 1905, pp. 33–38.

Silurian: Near Littleton, New Hampshire.

Cotypes.—Cat. No. 50459, U.S.N.M.

Dalmanites platycaudatus Weller.

Dalmanites platycaudatus Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 272, pl. 25, figs. 3–5.

Niagaran (Racine): Near Lemont, Illinois.

DALMANITES SCHMIDTI Miller. See Pterygometopus schmidti.

DALMANITES TROOSTI Safford. See Pterygometopus troosti.

Dalmanites verrucosus (Hall).

Dalmania verrucosa Hall, 28th Rep. New York State Mus. Nat. Hist., Mus. ed., 1877, p. 195, pl. 33, figs. 5–17; pl. 34, figs. 13–15.

Dalmanites verrucosus—Continued.

Dalmanites verrucosa Hall, Trans. Albany Inst., 4, 1864, p. 218; 11th Rep. Dep. Geol. Nat. Hist. Indiana, 1882, p. 341, pl. 35, figs. 5–17; pl. 36, figs. 13–15.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 191, figs.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 280, pl. 25, figs. 6–7.

Niagaran: Waldron, Indiana; Tennessee (Waldron); Bonfield, and Jersey County, Illinois.

Dalmanites vigilans Hall.

Dalmanites vigilans Hall, Rep. Prog. Geol. Surv. Wisconsin, 1861, p. 51.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 276, pl. 24, figs. 1–4.

Dalmania vigilans Hall, Adv. sheets 18th Rep. New York State Cab. Nat. Hist., 1862, p. 31; Geol. Surv. Wisconsin, 1, 1862, p. 433, figs. 3–4; 20th Rep. New York State Cab. Nat. Hist., 1867, p. 335, figs. 1–2; p. 375, pl. 21, figs. 16–18; rev. ed., 1870, p. 426, figs. 13–14, pl. 21, figs. 16–18.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 195, fig.

Dalmanites (Synphoria) vigilans Van Ingen, School of Mines Quart., 23, 1901, p. 67, pl., figs. 28–32.—Kindle, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 485, pl. 23, figs. 4–7; pl. 24, fig. 20.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 325.

Dalmanites (Odontochile) vigilans Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 699 (gen. ref.).

Niagaran: Waukesha, Wauwatosa, etc., Wisconsin; Anderson and Pendleton, Indiana; Joliet and Lemont, Illinois; St. Clair Springs, Independence County, Arkansas.

DALMANITES VIGILANS Hall (1877). See Dalmanites halli.

Dalmanites werthneri Foerste.

Dalmanites werthneri Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 116; 2, 1887, p. 101, pl. 8, figs. 22, 22a, 23–25; Geol. Surv. Ohio, 7, 1895, p. 530, pl. 27, figs. 22, 22a, 23–25.

Upper Medinan (Brassfield): Near Dayton, Ohio.

DANIA Edwards and Haime. Genotype: D. huronica Edwards and Haime.

Dania Edwards and Haime, Compt. Rend. de l'Acad. Sci., 29, 1849, p. 261; Mon. d. Polyp. Foss. d. Terr. Pal. (Arch. du Mus. d'Hist. Nat., 5), 1851, p. 154, 275.—Pictet, Traite de Pal., 2d ed., 1857, p. 443.—Milne-Edwards, Hist. Nat. d. Corall., 3, 1860, p. 280.—Nicholson, Tab. Corals Pal. Period, 1879, p. 327.—Zittel, Handb. Pal., 1, 1880, p. 617.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 461.—Miller, N. A. Geol. Pal., 1889, p. 184.

Dania huronica Edwards and Haime.

Dania huronica Edwards and Haime, Mon. Polyp. Foss. Terr. Pal. (Arch. Mus. Hist. Nat., 5), 1851, p. 275, pl. 18, fig. 2, 2a, 2b.—Milne Edwards, Hist. Nat. d. Corall., 3, 1860, p. 281.—Roemer, Leth. geog., Leth. Pal., 1883, p. 461, fig. 112.

Niagaran: Drummond Island, Lake Huron.

DAWSONIA Nicholson. Genotype: D. campanulata Nicholson.

"Ovarian vesicles of graptolites" Nicholson, Mon. British Grapt., pt. 1, 1872, p. 71.

Dawsonia Nicholson, Ann. Mag. Nat. Hist., 4th ser., 11, 1873, p. 139.—Nicholson and Lyddecker, Man. Pal., 1, 1889, p. 214.—Miller, N. A. Geol. Pal., 1889, p. 184.—James, Jour. Cincinnati Soc. Nat. Hist., 14, pt. 2, 1892, p. 162.—Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 738–740; ibid., Mem. 11, pt. 2, 1908, p. 484.

Dawsonia acuminata Nicholson.

Dawsonia acuminata Nicholson, Ann. Mag. Nat. Hist., 4th ser., 11, 1878, p. 140, fig. 3a, a′.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 485, fig. 466.

Lower Ordovician: Point Levis, Quebec (Levis); Scotland (Llandeilo).

DAWSONIA CAMPANULATA Ruedemann. See Azygograptus? simplex.

Dawsonia monodon Gurley.

Dawsonia monodon Gurley, Jour. Geol., 4, 1896, p. 88, pl. 5, fig. 4.—Ruedemann, New York State Pal. Ann. Rep., 1902, pp. 554, 556; Mem. New York State Mus., 7, pt. 1, Addendum, 1904, pp. 741, 742, pl. 17, figs. 21–26, fig. 105.

Canadian: Point Levis, Quebec (Levis, Didymograptus zone); Deepkill, Rensselaer County, New York (Deepkill, Tetragraptus zone).

DAWSONIA ROTUNDA Nicholson. See Acrothele rotunda.

DAWSONIA SILIQUARIA James. See Lockeia siliquaria.

Dawsonia tenuistriata Nicholson.

Dawsonia tenuistriata Nicholson, Ann. Mag. Nat. Hist., 4th ser., 11, 1873, p. 141, fig. 3c, c′, d, d′.

Canadian (Levis): Point Levis, Quebec.

Observation.—The specimens figured by Nicholson are very probably small brachiopods.

Dawsonia tridens Gurley.

Dawsonia tridens Gurley, Jour. Geol., 4; 1896, p. 88, pl. 5, fig. 5.—Ruedemann, New York State Pal. Ann. Rep., 1902, p. 556; Mem. New York State Mus., 7, pt. 1, Addendum, 1904, p. 741, pl. 17, figs. 18–20.

Canadian: Point Levis, Quebec (Levis, Tetragraptus zone); Deepkill, Rensselaer County, New York (Deepkill, Tetragraptus zone).

DAWSONOCERAS Hyatt. Genotype: Orthoceras annulatum Sowerby.

Dawsonoceras Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 276; Zittel-Eastman Textb. Pal., 1, 1900, p. 518; 2d ed., 1913, p. 599.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 82.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 58.

Dawsonoceras annulatum (Sowerby).

Orthoceras annulatum Sowerby, Min. Conch., 2, 1818, p. 77; Eaton, Geol. Textb., 2d ed., 1832, p. 29, pl. 3, fig. 24.—Hall, Nat. Hist. New York, Geol., 4, 1843, p. 110, fig. 1; tab. ill. 17, fig. 1; Pal. New York, 2, 1852, p. 96, pl. 29, fig. 3.—Marcou, Geol. Map United States and British Provinces, etc., 1853, p. 27, pl. 2, fig. 1.—Roemer, Sil. Fauna West Tennessee, Breslau, 1860, p. 78, pl. 5, figs. 18a, 18b.—Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 83.—Hall, 20th Rep. New York State Cab. Nat. Hist., 1868 (Extras, 1865), p. 351, pl. 20 (11), figs. 4–6 (see expl. of pls., p. 393); rev. ed., 1870, p. 411, pl. 20, figs. 4–6; pl. 24, figs. 2–4, p. 433.—Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1895, p. 147, pl. 9, fig. 1.—Whitfield, Geol. Wisconsin, 4, 1882, p. 298, pl. 19, fig. 1.—Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 324.—White, ibid., 1882, p. 358, pl. 38, fig. 1.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 194.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, 1884, pt. 1, p. 38.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 542, figs.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 215, fig. 147; Bull. New York State Mus., 45, 1901, p. 215, fig. 147.

Dawsonoceras annulatum—Continued.

Orthoceras (Dawsonoceras) cf. annulatum Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 472, pl. 19, figs. 3, 4.

Orthoceras (Cycloceras) annulatum Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 282, pl. 8, fig. 5.

Dawsonoceras annulatum Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 58, figs. 1260, 1261.

Orthoceras annulatum var. americanum Foord, Cat. Fossil Ceph. British Mus., 1888, p. 56.—Whiteaves, Pal. Foss. Geol. Surv. Canada, 3, pt. 2, 1895, p. 101.

Orthoceras (Dawsonoceras) annulatum var. americanum Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 472.

Dawsonoceras annulatum var. americanum Clarke and Ruedemann, New York State Mus., 5, 1903, p. 81, pl. 10, figs. 9–21; pl. 11, fig. 1.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 58.—Grabau, Michigan Geol. Surv., Geol. (1), 1909, p. 196, pl. 28, fig. 8; pl. 29, fig. 1.

Orthoceras nodocostum McChesney, Desc. New Fossils, 1861, p. 94; Plates Illust. N. Sp. Fossils, 1865, pl. 9, fig. 5.—Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 101.

Orthoceras nodocostatum McChesney, Trans. Chicago Acad. Sci., 1, 1868, p. 53, pl. 9, fig. 5.

Orthoceras Laphami McChesney, Desc. New Fossils, 1861, p. 91.

Orthoceras bartonense Spencer, Bull. Missouri State Mus., 1, 1884, p. 60, pl. 7, fig. 7; Trans. Acad. Sci. St. Louis, 4, 1884, p. 609, pl. 7, fig. 7.—Clarke and Ruedemann, Mem. New York State Mus., 5, p. 83.

Orthoceras undulatum Hall, Pal. New York, 2, 1852, p. 293, pl. 64, fig. 1a–f; pl. 65, fig. 3.

Silurian: England; Gotland. Niagaran: New York; Canada; Ohio; Indiana; Tennessee; Wisconsin; etc. Upper Monroan: Michigan and Ontario.

Observation.—Several species may be included in the above synonymy.

Dawsonoceras hammelli (Foerste).

Orthoceras (Dawsonoceras) hammelli Foerste, Bull. Sci. Lab., Denison Univ., 16, 1910, p. 74, pl. 1, fig. 4.

Richmond: Dog Falls and Madison, Indiana; Jefferson County, Kentucky (Whitewater-Saluda); West Milton, Ohio (Elkhorn).

Dawsonoceras tenuilineatum Savage.

Dawsonoceras tenuilineatum Savage, Bull. Geol. Surv., Illinois, 23, 1913, p. 119, pl. 7, fig. 22.

Upper Medinan: Pike County, Missouri (Edgewood); Will County, Illinois (Channahon).

DEIPHON Barrande. Genotype: D. forbesi Barrande.

Deiphon Barrande, Neues Jahrb. Min., etc., 1850, p. 779.—Pictet, Traité de Pal., 2d ed., 2, 1854, p. 522.—Zittel, Handb. Pal., 2, 1885, p. 618.—Koken, Die Leitfossilien, Leipzig, 1896, p. 33.—Reed, Geol. Mag., dec. 4, 5, 1898, p. 211.—Beecher, Zittel-Eastman Textb. Pal., 1, 1900, p. 636.—Raymond, ibid., 2d ed., 1913, p. 725.

Deiphon americanus Weller.

Deiphon americanus Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, 1907, p. 268, pl. 24, fig. 14.

Niagaran (Racine): Joliet, Romeo, etc., Illinois.

Deiphon forbesi Barrande.

Deiphon forbesii Barrande, Haidinger's Berichte, 1850, p. 6.—Salter, Mon. British Tril., 1865, p. 88, pl. 7, figs. 1–12.—Van Ingen, School of Mines Quart., 23, 1901, p. 35.

Delphon forbesi—Continued.

Sphærexochus pisum Foerste, Geol. Surv. Ohio, 7, 1895, p. 528, pl. 37A, figs. 14a–14b.

Deiphon pisum Foerste, Amer. Jour. Sci., 4th ser., 18, 1904, p. 340.

Silurian: Bohemia and England; Dayton, Ohio (Brassfield); Lockport, New York (Rochester); Arkansas (St. Clair).

DEIPHON PISUM Foerste. See Deiphon forbesi.

DEIROCERAS Hyatt. See Actinoceras subgenus Deiroceras.

DEKAYELLA Ulrich. Genotype: Dekayella obscura Ulrich

Dekayella Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 155; ibid., 6, 1883, p. 90.—Miller, N. A. Geol. Pal., 1889, p. 184.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 372; Geol. Minnesota, 3, 1893, p. 269; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 273.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 589.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 31.—Cumings, Amer. Geol., 29, 1902, p. 200.—Ulrich and Bassler, Smiths. Misc. Coll., 47, 1904, pp. 24, 27.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 132.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 205; Zittel-Eastman Textb. Pal., 1913, p. 333.

DEKAYELLA CYSTATA Cumings. See Heterotrypa frondosa.

Dekayella foliacea Ulrich and Bassler.

Dekayella foliacea Ulrich and Bassler, Smiths. Misc. Coll., Quart., 47, 1904, p. 28, pl. 7, figs. 10–12.

Trenton (Cynthiana): Lexington, Kentucky.

Holotype.—Cat. No. 43187, U.S.N.M.

Dekayella obscura Ulrich.

Dekayella obscura Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 89, pl. 1, figs. 4–4b; Zittel's Textb. Pal. (Engl. ed.), 1896, fig. 454 (p. 274).—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, figs. 180–182 (p. 589).—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 132.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 333, fig. 480.

Dekayia obscura Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 816, pl. 14, figs. 3, 3a.

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

Cotypes.—Cat. No. 43659, U.S.N.M.

DEKAYELLA PERFRONDOSA PROLIFICA Cumings. See Heterotrypa subramosa prolifica.

Dekayella prænuntia Ulrich.

Dekayella prænuntia Ulrich, Geol. Minnesota, 3, 1893, p. 270, pl. 23, figs. 32–47.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, figs. 177–179 (p. 589).—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 132, figs. 188b, 190b.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 205, 206, fig. 111.

Black River (Decorah): Minneapolis, etc., Minnesota; Iowa.

Middle Ordovician (Wassalem and Kuckers): Esthonia, Russia.

Holotype.—Cat. No. 43528, U.S.N.M.

Dekayella prænuntia echinata Ulrich.

Dekayella prænuntia var. echinata Ulrich, Geol. Minnesota, 3, 1893, p. 271, pl. 23, figs. 32–38.

Black River (Decorah): Near Fountain, Minneapolis and St. Paul, Minnesota.

Cotypes.—Cat. No. 43530, U.S.N.M.

Dekayella prænuntia multipora Ulrich.

Dekayella prænuntia var. multipora Ulrich, Geol. Minnesota, 3, 1893, p. 272, pl. 23, figs. 44–47.

Black River (Decorah): Minneapolis, St. Paul, and Goodhue and Fillmore Counties, Minnesota.

Holotype.—Cat. No. 43531, U.S.N.M.

Dekayella prænuntia nævigera Ulrich.

Dekayella prænuntia var. nævigera Ulrich, Geol. Minnesota, 3, 1893, p. 271.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 207.

Black River (Decorah): Fillmore County, Minnesota.

Middle Ordovician (Wassalem): Esthonia, Russia.

Holotype.—Cat. No. 43532, U.S.N.M.

Dekayella prænuntia simplex Ulrich.

Dekayella prænuntia var. simplex Ulrich, Geol. Minnesota, 3, 1893, p. 271, pl. 23, figs. 39–42.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 207, fig. 111.

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

Middle Ordovician (Wassalem): Esthonia, Russia.

Cotypes.—Cat. No. 43529, U.S.N.M.

Dekayella robusta Foord. See Dekayella ulrichi.

Dekayella singularis (Ulrich).

Heterotrypa singularis Ulrich, Geol. Surv. Illinois, 8, 1890, p. 415, pl. 37, figs. 3–3e; Geol. Minnesota, 3, 1893, p. 268.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, fig. 147 (p. 579).

Monticulipora singularis J. F. James, Jour. Cincinnati Soc. Nat. Hist., 18, 1895, p. 77.

Dekayella singularis Ulrich and Bassler, Smiths. Misc. Coll. Quart., 47, 1904, p. 27 (gen. ref.).

Richmond (Fernvale): Wilmington, Illinois; Tennessee; Wisconsin.

Sections of *cotype*.—Cat. No. 43750, U.S.N.M.

Dekayella trentonensis (Ulrich).

Dekayia trentonensis Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1883, p. 151, pl. 6, figs. 6, 6a; Geol. Minnesota, 3, 1893, p. 274.

Dekayella trentonensis Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 227.—Nickles, Bull. Kentucky Geol. Surv., 5, 1905, p. 42, pl. 1, fig. 3.

Trenton: Burgin and Frankfort, Kentucky (Wilmore); St. Paul and Cannon Falls, Minnesota (Prosser).

Holotype.—Cat. No. 43660, U.S.N.M.

Dekayella ulrichi (Nicholson).

Chætetes Fletcheri (not Milne-Edwards and Haime) Nicholson, Quart. Jour. Geol. Soc. London, 30, 1874, p. 504, pl. 29, figs. 6, 6a; Pal. Ohio, 2, 1875, p. 197, pl. 21, figs. 7, 7a; Ann. Mag. Nat. Hist., 4th ser., 18, 1876, p. 90, pl. 5, fig. 14.—Quenstedt, Rœhren- und Sternkorallen, 1891, p. 83, pl. 146, fig. 27.

Monticulipora (Heterotrypa) Ulrichii Nicholson, Genus Monticulipora, 1881, p. 131, fig. 22.

Monticulipora ulrichii Hall, 12th Ann. Rep. Indiana Geol. Nat. Hist., 1883, p. 249, pl. 11, fig. 10.—James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 179.—James, ibid., 16, 1894, p. 201.

Dekayella ulrichi Ulrich, Jour. Cincinnati Soc. Nat. Hist., 7, 1883, pp. 91, 153.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 227.—Cumings, Amer. Geol., 28, 1901, p. 374.—Nickles, Bull. Kentucky Geol. Surv., 5,

Dekayella ulrichi—Continued.

1905, p. 47, pl. 2, fig. 4.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 35, pl. 2, figs. 13, 14.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 132.

Dekayia ulrichi Cumings, Amer. Geol., 29, 1902, p. 13, pl. 9, fig. 1; 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 824, pl. 14, figs. 4, 4b; pl. 28, fig. 7.

Dekayella robusta Foord, Ann. Mag. Nat. Hist. (5), 13, 1884, p. 341, pl. 12, figs. 2–2d.

Dekayella ulrichi-robusta Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 228.

Dekayia ulrichi-robusta Cumings, Amer. Geol., 29, 1902, p. 212, pl. 9, fig. 4, pl. 10, fig. 9; 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 826, pl. 14, fig. 2, 2b; pl. 27, fig. 22.

Monticulipora ohioensis James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 183; ibid., 16, 1894, p. 207.

Eden: Cincinnati, Ohio, and vicinity.

DEKAYELLA ULRICHI var. ROBUSTA Nickles and Bassler. See Dekayella ulrichi.

DEKAYIA Milne-Edwards and Haime.

Genotype: D. aspera Milne-Edwards and Haime.

Dekayia Milne-Edwards and Haime, Pol. Foss. Terr. Pal., 1851, p. 277—Pictet, Traite de Pal., 2d ed., 1857, p. 443.—Milne-Edwards, Hist. Nat. des Corall., 3, 1860, p. 283.—Nicholson, Pal. Tab. Corals, 1879, p. 291; Zittel Handb. Pal., 1, 1880, p. 615; Genus Monticulipora, 1881, p. 98.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1832, p. 155; ibid., 6, 1883, p. 148.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 479.—Waagen and Wentzel, Pal. Indica (13), 1886, p. 874.—James and James, Jour. Cincinnati Soc. Nat. Hist., 11, 1888, p. 28.—Miller, N. A. Geol. Pal., 1889, p. 184.—Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 371, 415.—Rominger, Amer. Geol., 6, 1890, pp. 105–106–114.—Ulrich, Geol. Minnesota, 3, 1893, p. 274; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 273.—J. F. James, Jour. Cincinnati Soc. Nat. Hist., 18, 1896, p. 115.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 578.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 31.—Cumings, Amer. Geol., 29, 1902, p. 197.—Ulrich and Bassler, Smiths. Misc. Coll. Quart., 47, 1904, p. 24.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1907, p. 743.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 133.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 333.

Dekayia appressa Ulrich.

Dekayia appressa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 7, 1883, p. 152, pl. 6, figs. 7–7b.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 809, pl. 13, fig. 3.

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

Holotype.—Cat. No. 43655, U.S.N.M.

Dekayia aspera Milne-Edwards and Haime.

Dekayia aspera Milne-Edwards and Haime, Pol. Foss. Terr. Pal., 1851, p. 278, pl. 16, figs. 2, 2a.—Milne-Edwards, Hist. Nat. des Corall., 3, 1860, p. 283.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 148, pl. 6, 5; Zittel's Textb. Pal. (Engl. ed.), 1896, fig. 455, p. 274.—Miller, N. A. Geol. Pal., 1889, p. 184, fig. 165.—Cumings, Amer. Geol., 29, 1902, p. 214, pl. 9, fig. 10; pl. 10, fig. 10.—Nickles, Bull. Kentucky Geol. Surv., 5, p. 54, pl. 3, fig. 4.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 133, fig. 190c.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 810, pl. 13, figs. 5–5b; pl. 27, fig. 20.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 333, fig. 481.

Monticulipora (Dekayia) aspera James and James, Jour. Cincinnati Soc Nat. Hist., 11, 1888, p. 28.—James, ibid., 18, 1896, p. 116.

Dekayia aspera—Continued.

Chætetes attritus Nicholson, Quart. Jour. Geol. Soc. London, 30, 1874, p. 503, pl. 30, fig. 4, 4a; Pal. Ohio, 2, 1875, p. 194, pl. 21, fig. 4.—Buell, Trans. Wisconsin Acad. Sci., 5, 1882, p. 191.

Monticulipora (Chætetes) attritus Chamberlin, Geol. Wisconsin, 1, 1883, p. 172, fig.

Dekayia attrita Nicholson, Ann. Mag. Nat. Hist., 4th ser., 18, 1876, p. 93, pl. 5, figs. 12, 12a; Pal. Tabulate Corals, 1879, p. 298, pl. 15, figs. 1–1c.

Maysville (Fairmount): Cincinnati, Ohio, and vicinity; Nashville and Columbia, Tennessee.

DEKAYIA ATTRITA Nicholson. See Dekayia aspera.

DEKAYIA FRONDOSA Cumings. See Heterotrypa frondosa.

DEKAYIA FRONDOSA var. CYSTATA Cumings. See Heterotrypa frondosa.

DEKAYIA INFLECTA Cumings. See Heterotrypa inflecta.

Dekayia maculata James.

Dekayia maculata James, Paleontologist, No. 5, 1881, p. 37.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 35, pl. 2, figs. 13, 14.

Monticulipora (Dekayia) maculata J. F. James, Jour. Cincinnati Soc. Nat. Hist., 18, 1896, p. 116, fig. 11.

Eden (McMicken): Loveland and Cincinnati, Ohio, and vicinity.

Dekayia magna Cumings.

Dekayia magna Cumings, Amer. Geol., 28, 1901, p. 375, pl. 34, figs. 1–6; 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 815, pl. 13, figs. 6, 6a; pl. 28, fig. 8.

Maysville (Bellevue): Vevay, etc., Indiana; Cincinnati, Ohio, and vicinity.

Dekayia multispinosa Ulrich.

Dekayia multispinosa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 154, pl. 6, figs. 8, 8a.

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

Holotype.—Cat. No. 43656, U.S.N.M.

DEKAYIA OBSCURA Cumings. See Dekayella obscura.

DEKAYIA PAUPERA Ulrich. See Heterotrypa paupera.

Dekayia pelliculata Ulrich.

Dekayia pelliculata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 150, pl. 6, figs. 9, 9a.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 818, pl. 13, figs. 4, 4a; pl. 28, fig. 5.

Monticulipora (Dekayia) pelliculata J. F. James, Jour. Cincinnati Soc. Nat. Hist., 18, 1896, p. 117.

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

Section of *holotype*.—Cat. No. 43657, U.S.N.M.

DEKAYIA PERFRONDOSA Cumings. See Heterotrypa frondosa.

DEKAYIA PERFRONDOSA-SUBPULCHELLA Cumings. See Heterotrypa subpulchella.

DEKAYIA PROLIFICA Cumings. See Heterotrypa subramosa prolifica.

DEKAYIA SUBFRONDOSA Cumings. See Heterotrypa subfrondosa.

DEKAYIA SUBPULCHELLA Cumings. See Heterotrypa subpulchella.

DEKAYIA SUBRAMOSA Cumings. See Heterotrypa subramosa.

DEKAYIA TRENTONENSIS Ulrich. See Dekayella trentonensis.

DEKAYIA ULRICHI Cumings. See Dekayella ulrichi.

DEKAYIA ULRICHI-EXPANSA Cumings. See Heterotrypa lobata.

DEKAYIA ULRICHI-LOBATA Cumings. See Heterotrypa lobata.

DEKAYIA ULRICHI var. ROBUSTA Nickles and Bassler. See Dekayella ulrichi.

DELTACRINUS Ulrich. Genotype: Cheirocrinus clarus Hall.

Deltacrinus Ulrich, 14th Rep. Geol. Surv. Minnesota, 1886, p. 109, fig. 2.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 201 (Rev. Pal., 3, sec. 2, p. 277).—Miller, N. A. Geol. Pal., 1889, p. 237.—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 148.—Springer, Zittel-Eastman Textb. Pal., 2d. ed., 1913, p. 213.

Calceocrinus (part) Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875, footnote, pl. 9; ibid., Mus. ed., 1879, p. 146, figs. 1, 2; 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 281.

Deltacrinus alleni (Rowley).

Calceocrinus alleni Rowley, Amer. Geol., 34, 1904, p. 275, pl. 16, figs. 30–33.

Upper Medinan (Edgewood): Watson Station, Pike County, Missouri.

Deltacrinus contractus (Ringueberg).

Calceocrinus contractus Ringueberg, Annals New York Acad. Sci., 4, 1889, p. 404, pl. 10, fig. 12.

Deltacrinus contractus Kindle, U. S. Geol. Surv., Geol. Atlas, U. S., folio 190, 1913, pp. 1–25, pls.

Niagaran (Lockport-Gasport member): Lockport, New York.

Deltacrinus halli (Ringueberg).

Calceocrinus sp. Hall, Pal. New York, 2, 1847, p. 352, pl. 85, figs, 5, 6.

Calceocrinus halli Ringueberg, Annals New York Acad. Sci., 4, 1889, p. 403, pl. 10, fig. 9.

Clinton (Rochester): Middleport, New York.

Observation.—Hall based the genus Calceocrinus upon the specimen figured in 1847, but not named specifically.

Deltacrinus indianensis (Miller).

Calceocrinus indianensis Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 645, pl. 6, fig. 37. (Adv. sheets, 1891, p. 35.)

Niagaran (Laurel): St. Paul, Indiana.

Deltacrinus stigmatus (Hall).

Cheirocrinus stigmatus Hall, Trans. Albany Inst., 4, 1863, p. 225. (Abstract, p. 31.)

Calceocrinus stigmatus Shumard, Trans. Acad. Sci. St. Louis (Cat. Pal. Foss.), 2, 1866, p. 358.—Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875, 1877, pl. 19, figs. 9–11; mus. ed., 1879, p. 147, pl. 19, figs. 9–11; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 281, pl. 19, figs. 9–11.

Deltacrinus stigmatus Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Minnesota, 1886, p. 111, 113 (gen. ref.).

Niagaran (Waldron): Waldron, Indiana.

Deltacrinus tunicatus (Hall).
Calceocrinus tunicatus Hall, 28th Rep. New York State Mus. Nat. Hist., mus. ed., 1879, p. 147, fig. 1; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 281, fig. 1.
Niagaran (Waldron): Waldron, Indiana.

Deltacrinus typus (Ringueberg).
Calceocrinus typus Ringueberg, Annals New York Acad. Sci., 4, 1889, p. 402, pl. 10, fig. 8.
Clinton (Rochester): Lockport, New York.

DELTHYRIS ACUTILIRATA Conrad. See Platystrophia acutilirata.

DELTHYRIS BIALVEATA Conrad. See Spirifer (Eospirifer) radiatus.

DELTHYRIS BRACHYNOTA Hall. See Platystrophia biforata.

DELTHYRIS CRISPA Dalman. See Spirifer (Delthyris) crispus.

DELTHYRIS DECEMPLICATUS Hall. See Spirifer (Delthyris) sulcata.

DELTHYRIS EXPANSUS Emmons. See Pterotheca expansa.

DELTHYRIS LYNX Hall. See Platystrophia biforata and P. lynx.

DELTHYRIS NIAGARENSIS Owen. See Spirifer (Delthyris) niagarensis.

DELTHYRIS PLICATUS Owen. See Spirifer (Delthyris) vanuxemi.

DELTHYRIS RADIATA Billings. See Spirifer (Eospirifer) radiatus.

DELTHYRIS RUGATINA Conrad. See Spirifer (Eospirifer) sulcata.

DELTHYRIS? RUGICOSTA Schuchert. See Spirifer (Delthyris) rugicosta.

DELTHYRIS SINUATUS Hall. See Bilobites bilobus.

DELTHYRIS STAMINEA Hall. See Spirifer (Delthyris) crispus.

DELTHYRIS SULCATA Hisinger. See Spirifer (Delthyris) sulcata.

DELTOCERAS Hyatt. Genotype: D. planum Hyatt.
Deltoceras Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 449.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 772.—Ruedemann, Bull. New York State Mus., 90, 1906, p. 480.

Deltoceras planum Hyatt.
Deltoceras planum Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 450.
Canadian (Quebec): Port au Choix, Newfoundland.

Deltoceras vaningeni Ruedemann.
Deltoceras vaningeni Ruedemann, Bull. New York State Mus., 90, 1906, p. 480, pls. 25–28, figs. 39–41.
Chazyan (Crown Point): Valcour Island, New York.

DEMIRASTRITES URCEOLUS Eisel. See Monograptus urceolus.

DENDROCLONELLA Rauff. Genotype: D. rugosa Rauff.
Dendroclonella Rauff, Palæontographica, 41, 1895, p. 252.

Dendroclonella rugosa Rauff.
Dendroclonella rugosa Rauff, Palæontographica, 41, 1895, p. 252, pl. 18, figs. 8, 3–6; pl. 24, fig. 1.
Niagaran (Brownsport): Perry County, Tennessee.

DENDROCRINUS Hall. Genotype: D. longidactylus Hall.

Dendrocrinus Hall, Pal. New York, 2, 1852, p. 193.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 317.—Billings, Geol. Surv. Canada, Rep. Progr. for 1853–1856, 1857, p. 264; Geol. Surv. Canada, dec. 4, 1859, p. 35, fig. 14.—Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 208.—Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 20.—Zittel, Handb. Pal., 1, 1879, p. 361.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, pp. 285, 289, 298 (Rev. Pal., pt. 1, pp. 62, 66, 75); ibid., 1885, pp. 115, 116; ibid., 1890, pp. 380–384; Amer. Jour. Sci., 3d ser., 26, 1883, p. 376, fig. 5.—Miller, N. A. Geol. Pal., 1889, p. 238, fig. 282.—Bather, Ann. Mag. Nat. Hist., 6th ser., 5, 1890, p. 324, pl. 14, fig. 15; pl. 15, fig. 4; Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 179, fig. 96.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 155.—Zittel, Grundzuge Pal., 1, 1910, p. 132.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 711.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 504.—Springer, Geol. Surv. Canada, Mem. 15P, 1911, p. 29; Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 215.

Dendrocrinus acutidactylus Billings.

Dendrocrinus acutidactylus Billings, Geol. Surv. Canada, Rep. Progr., 1853–1856, 1857, p. 266; Geol. Surv. Canada, dec. 4, 1859, p. 37, pl. 3, figs. 2a, b.

Trenton (Curdsville): Montreal, Quebec; Mercer County, Kentucky.

Dendrocrinus alternatus (Hall).

Poteriocrinus alternatus Hall, Pal. New York, 1, 1847, pp. 83, 316, pl. 28, figs. 1a–f.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 224, fig. 77.

Cyathocrinus? alternatus Hall, Pal. New York, 1, 1847, p. 316.

Homocrinus alternatus Hall, Pal. New York, 2, 1852, p. 185.

Dendrocrinus alternatus Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 299 (Rev. Pal., pt. 1, p. 76).

Trenton: Turin, Lowville, Middleville, etc., New York.

DENDROCRINUS ANCILLA Hall. See Homocrinus ancilla.

DENDROCRINUS ANGULATUS Billings. See Palæocrinus angulatus.

Dendrocrinus angustatus (Meek and Worthen).

Homocrinus angustatus Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1870, p. 30; Geol. Surv. Illinois, 6, 1875, p. 492, pl. 23, fig. 8.

Dendrocrinus angustatus Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 299 (Rev. Pal., pt. 1, p. 76).

Richmond (Maquoketa): Mount Carroll, Illinois.

Dendrocrinus caduceus (Hall).

Poteriocrinus (Dendrocrinus) caduceus Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 208, pl. 5, figs. 7, 8 (adv. sheets 1866, p. 3; 1871, pl. 1, figs. 7, 8).

Poteriocrinites (Dendrocrinus) caduceus Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 26, pl. 3 bis, figs. 1a–d.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 738, figs.

Dendrocrinus caduceus Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 299 (Rev. Pal., pt. 1, p. 76); ibid., 1890, p. 392, pl. 10, fig. 11.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 505, fig. 1819.

Richmond (Waynesville-Liberty): Near Lebanon, etc., Ohio.

Dendrocrinus casei Meek.

Pentacrinite Christy, Letters on Geology, 1848, pl. 2.

Dendrocrinus Casei Meek, Amer. Jour. Sci., 3d ser., 2, 1871, p. 295.—Foerste, Amer. Geol., 12, 1893, pp. 270, 340.—Bather, Geol. Mag., dec. 4, 6, 1899, p. 35,

Dendrocrinus casei—Continued.

fig. 13; Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 120, fig. 26, 3.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res., Indiana, 1908, p. 717, pl. 4, figs. 2, 2b.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 505.

Poteriocrinites (Dendrocrinus) Casei Meek, Geol. Surv. Ohio, 1, pt. 2, 1873, p. 28, pl. 3 bis., figs. 2a–c.

Poteriocrinites (Dendrocrinus) caseyi Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 739, fig.

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

Dendrocrinus celsus Ringueberg.

Dendrocrinus celsus Ringueberg, Proc. Acad. Nat. Sci. Philadelphia, 1888, p. 132, pl. 7, fig. 3.

Clinton (Rochester): Lockport, New York.

Dendrocrinus cincinnatiensis (Meek).

Poteriocrinites (Dendrocrinus) Cincinnatiensis Meek, Proc. Acad. Nat. Sci. Philadelphia, 1871, p. 312; Geol. Surv. Ohio, Pal., 1, 1873, p. 20, pl. 3 bis, figs. 5a, b.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 739, figs.

Dendrocrinus Cincinnatiensis Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 299 (Rev. Pal., pt. 1, p. 76).—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 505, fig. 1818.

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

Dendrocrinus conjugans Billings. See Cupulocrinus conjugans.

Dendrocrinus curtus Ulrich. See Merocrinus curtus.

Dendrocrinus cylindricus Billings. See Cupulocrinus conjugans.

Dendrocrinus dyeri (Meek).

Poteriocrinites (Dendrocrinus) Dyeri, Meek, Proc. Acad. Nat. Sci. Philadelphia, 1872, p. 310; Geol. Surv. Ohio, Pal., 1, 1873, p. 24, pl. 3 bis, figs. 3a, b.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 739, figs.

Dendrocrinus Dyeri Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 299 (Rev. Pal., pt. 1, p. 76).

Trenton (Upper): River quarries, Covington, Kentucky.

Dendrocrinus erraticus Miller.

Dendrocrinus erraticus Miller, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 316, pl. 8, figs. 1, 1a.

Richmond: Drift at Cincinnati, Ohio.

Dendrocrinus gracilis (Hall).

Poteriocrinus gracilis Hall (not McCoy), Pal. New York, 1, 1847, p. 84, pl. 28, figs. 2a–f.

Poteriocrinus subgracilis D'Orbigny, Prodrome Pal., 1, 1849, p. 23.

Homocrinus gracilis Hall, Pal. New York, 2, 1852, p. 158.

Poteriocrinites gracilis Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 21, footnote.

Dendrocrinus gracilis Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 299 (Rev. Pal., pt. 1, p. 76).

Trenton: Middleville, New York.

Dendrocrinus gregarius Billings.

Dendrocrinus gregarius Billings, Geol. Surv. Canada, Rep. Progr. 1853–1856, 1857, p. 265; Geol. Surv. Canada, dec. 4, 1859, p. 36, pl. 3, figs. 1a–c.

Trenton: Ottawa, Ontario.

DENDROCRINUS HUMILIS Billings. See Cupulocrinus humilis.

DENDROCRINUS JEWETTII Billings. See Cupulocrinus jewetti.

DENDROCRINUS LATIBRACHIATUS Billings. See Cupulocrinus latibrachiatus.

Dendrocrinus longidactylus Hall.

Dendrocrinus longidactylus Hall, Pal. New York, 2, 1852, p. 193, pl. 43, figs. 1a–k; pl. 42, figs. 7a, b.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 317, pl. 100, fig. 14.—Bather, Geol. Mag., dec. 4, 6, 1899, p. 35, fig. 12; Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 120, figs. 26, 2.—Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 29, fig. 1.

Clinton (Rochester): Lockport, New York.

Dendrocrinus modestus Safford.

Dendrocrinus modestus Safford, Geol. Tennessee, 1869, p. 285 (not defined).

Stones River (Lebanon): Central basin of Tennessee.

Dendrocrinus navigiolum Miller.

Dendrocrinus navigiolum Miller, Jour. Cincinnati Soc. Nat. Hist., 3, 1880, p. 235, pl. 7, figs. 5, 5a (6, 6a).

Eden (Fulton): First Ward, Cincinnati, Ohio.

Dendrocrinus? nodobrachiatus Ringueberg.

Dendrocrinus? nodobrachiatus Ringueberg, Annals New York Acad. Sci., 5, 1890, p. 303, pl. 3, fig. 6.

Niagaran (Lockport-Gasport member): Lockport, New York.

DENDROCRINUS NUCLEUS Hall. See Botryocrinus nucleus.

Dendrocrinus oswegoensis Meek and Worthen.

Dendrocrinus Oswegoensis Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 333, pl. 4, fig. 4.—Miller, N. A. Geol. Pal., 1889, p. 238, fig. 284.

Richmond (Maquoketa): Oswego, Kendall County, Illinois.

DENDROCRINUS POLYDACTYLUS Wachsmuth and Springer. See Cupulocrinus polydactylus.

Dendrocrinus posticus (Hall).

Poteriocrinus posticus Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 209, pl. 5, figs. 5, 6 (extract 1871, pl. 1, figs. 5, 6.).

Poteriocrinites (Dendrocrinus) posticus Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 22, pl. 3 bis, figs. 4a–c.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 740, figs.

Dendrocrinus posticus Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 300 (Rev. Pal., pt. 1, p. 77).

Richmond (Waynesville-Liberty): Southwestern Ohio.

Dendrocrinus proboscidiatus Billings.

Dendrocrinus proboscidiatus Billings, Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, p. 267; Geol. Surv. Canada, dec. 4, 1859, p. 38, pl. 3, figs. 3a–c; Ottawa Nat., 1, 1887, p. 53, pl. figs.—Springer, Mem. Geol. Surv. Canada, 15 P, 1911, p. 37, (loc. occ.)

Trenton (Curdsville): Montreal, Quebec; Kirkfield, Ontario.

Dendrocrinus retractilis Walcott.

Dendrocrinus retractilis Walcott, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 211, pl. 17, fig. 4.

Trenton: Trenton Falls, New York.

Dendrocrinus rusticus Billings.

Dendrocrinus rusticus Billings, Geol. Surv. Canada, Rep. Prog. for 1853–56, 1857, p. 270; Geol. Surv. Canada, dec. 4, 1859, p. 41, pl. 3, figs. 7a, 7b.

Trenton: Ottawa, Ontario.

DENDROCRINUS (HOMOCRINUS) SCOPARIUS Wachsmuth and Springer. See Lasiocrinus scoparius.

Dendrocrinus similis Billings.

Dendrocrinus similis Billings, Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, p. 267; Geol. Surv. Canada, dec. 4, 1859, p. 40.

Trenton: Ottawa, Ontario.

Dendrocrinus tener Billings.

Dendrocrinus tener Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 9.

Richmond (Charleton): West End, Anticosti.

Observation.—Not recognized. Twenhofel reports the specimen as too poor for determination.

DENDROCYSTIS Haeckel. See Dendrocystites Barrande.

DENDROCYSTITES Barrande. Genotype: D. sedgwicki Barrande

?Syringocrinus Billings, Canadian Org. Rem., dec. 4, 1859, p. 65.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 411 (Rev. Pal., pt. 2, p. 237).—Miller, N. A. Geol. Pal., 1889, p. 285.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 203.—Zittel, Grundzuge Pal., 1, 1910, p. 156.

Dendrocystites Barrande, Extraits du Syst. Silur., 1887, p. 219; Syst. Silur. Boheme, 7, p. 142.—Jaekel, Zeitschr. deutsch. geol. Gesell., 52, 1901, p. 673.

Dendrocystis Haeckel, Amphor. und Cystoid., 1, 1900, p. 47.—Delage and Herouard, Zool. Concrete, 3, 1904, p. 408.—Bather, Roy. Soc. Edinburgh, 49, pt. 2, 1913, p. 371, text figs. 6–9.

Dendrocystites? paradoxica (Billings).

Syringocrinus paradoxicus Billings, Geol. Surv. Canada, dec. 4, 1859, p. 65, pl. 10, fig. 14.

Syringocrinus paradoxus Bather, Treatise on Zool., Echinoderma, 1900, p. 48.

Dendrocystis(?) paradoxica Bather, Trans. Roy. Soc. Edinburgh, 49, pt. 2, 1913, p. 397, fig. 13.

Trenton: Beauport, near Quebec, Canada.

Observation.—See Bather (op. cit., 1913) for discussion of Syringocrinus and S. paradoxica.

DENDROGRAPTUS Hall. Genotype: D. hallianus Prout.

Dendrograptus Hall, Geol. Surv. Canada for 1857, Rep. Progr., 1858, p. 143; Rep. Geol. Surv. Wisconsin, 1, 1862, p. 21; Geol. Surv. Canada, dec. 2, p. 126, 127, figs. a, b, c.—Nicholson, Quart. Jour. Geol. Soc. London, 24, 1868, p. 142.—Carruthers, Geol. Mag., 5, 1868, p. 73, 130.—Hall, 20th Rep. New York State Cab. Hist., 1868, p. 218; rev. ed., p. 252.—Nicholson, Mon. British Grapt., 1872, p. 127.—Zittel, Handb. Pal., 1, 1879, p. 289.—Spencer, Bull. Mus. Univ. State Missouri, 1, 1884, p. 16; Trans. Acad. Sci. St. Louis, 4, 1884, p. 262, 566.—Miller, N. A. Geol. Pal., 1889, p. 184.—James, Jour. Cincinnati Soc. Nat. Hist., 14, pt. 2, 1892, p. 151.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 165.—Roemer and Frech, Leth. geog., 1, Theil, Leth. Pal., 1, 3 Lief., 1897, p. 577.—Elles and Wood, Mon. British Grapt., Pal. Soc., 1903, p. xli.—Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 578, 579.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 26.—Ruedemann, Zittel-Eastman Textb., Pal., 2d. ed., 1913, p. 128.

DENDROGRAPTUS ARUNDINACEUS Gurley. See Mastigograptus arundinaceus.

DENDROGRAPTUS COMPACTUS Walcott. See Callograptus compactus.

Dendrograptus dawsoni Spencer.

Dendrograptus dawsoni Spencer, Canadian Nat., 10, 1882, p. 165; Trans. Acad. Sci. St. Louis, 4, 1884, p. 568, pl. 1, fig. 5; Bull. Mus. Univ. Missouri, 1, 1884, p. 18, pl. 1, fig. 5.—Gurley, Jour. Geol., 4, 1896, pp. 94, 308.—Bassler, Bull. U. S. Nat. Mus., 65, 1909, p. 6, fig. 1.

Niagaran dolomite: Hamilton, Ontario.

DENDROGRAPTUS? (CALLOGRAPTUS?) diffusus Hall. See Callograptus diffusus.

Dendrograptus divergens Hall.

Dendrograptus divergens Hall, Geol Surv. Canada, dec. 2, 1865, p. 129, pl. 17, figs. 3, 4.—Hopkinson, Quart. Jour. Geol. Soc. London, 31, 1875, p. 664, pl. 36, figs. 6a, b.

Canadian (Levis, Didymograptus zone): Point Levis, Quebec.

Dendrograptus dubius Miller.

Dendrograptus simplex Spencer, Canadian Nat., 10, 1882, p. 165 (nom. nud.); Trans. Acad. Sci. St. Louis, 4, 1884, p. 567, pl. 1, fig. 4; Bull. Mus. Univ. State Missouri, 1, 1884, p. 17, pl. 1, fig. 4.

Dendrograptus dubius Miller, N. A. Geol. Pal., 1889, p. 184.—Gurley, Jour. Geol., 4, 1898, pp. 94, 308.—Bassler. Bull. U. S. Nat. Mus., 65, 1909, pp. 7, 8, figs. 2, 8.

Niagaran dolomite: Hamilton, Ontario.

Dendrograptus erectus Hall.

Dendrograptus erectus Hall, Geol. Surv. Canada, dec. 2, 1865, p. 130, pl. 17, fig. 7.

Canadian (Levis, Didymograptus zone): Point Levis, Quebec.

Dendrograptus flexuosus Hall.

Dendrograptus flexuosus Hall, Geol Surv. Canada, Can. Org. Rem., dec. 2, 1865. p. 127, pl. 17, figs. 1, 2, p. 128, fig. 3; 20th Rep. New York State Cab. Nat. Hist., 1868, p. 177, fig. 9; rev. ed., 1870, p. 209, fig. 9, p. 224.—Hopkinson and Lapworth, Quar. Jour. Geol. Soc., 31, 1875, p. 662, pl. 36, figs. 3a–3d.—Roemer and Frech, Leth. Pal., 1, 1897, p. 578.—Ruedemann, Mem. New York State Mus., 7, 1904, p. 579, pl. 4, figs. 5, 6, 8–10.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 26, fig. 37.

Dendrograptus cf. gracilis Ruedemann, New York State Pal. Ann. Rep., 1902, p. 555.

Canadian: Point Levis, Quebec (Levis, Diplograptus dentatus zone); Deepkill, New York (Deepkill, D. dentatus zone). Lower and Middle Arenig of Wales.

Dendrograptus fluitans Ruedemann.

Dendrograptus n. sp. Ruedemann, New York State Pal. Ann. Rep., 1902, p. 555.

Dendrograptus fluitans Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 582–583, pl. 4, figs. 11, 12.

Canadian (Deepkill): Deepkill, Rensselaer County, New York (Tetragraptus zone).

Dendrograptus frondosus Spencer.

Dendrograptus frondosus Spencer, Canadian Nat., 10, 1882, p. 165 (nom. nud.); Trans. Acad. Sci. St. Louis, 4, 1884, p. 568, pl. 1, fig. 6; Bull. Mus. Univ. State Missouri, 1, p. 18, pl. 1, fig. 6, 6a.—Gurley, Jour. Geol., 4, 1896, pp. 64, 308.—Bassler, Bull. U. S. Nat. Mus., 65, 1909, p. 8, fig. 7.

Niagaran dolomite: Hamilton, Ontario.

Dendrograptus fruticosus Hall.

Dendrograptus fruticosus Hall, Geol. Surv. Canada, dec. 2, 1865, p. 131, pl. 17, figs. 8, 9.

Canadian (Levis, Didymograptus dentatus zone): Point Levis, Quebec.

Dendrograptus gracilis Hall.

Dendrograptus gracilis Hall, Geol. Surv. Canada, dec. 2, 1865, p. 132, pl. 18, figs. 5–6; 20th Rep. New York State Cab. Nat. Hist., 1868, p. 199, pl. 4, fig. 11; rev. ed., 1870, p. 230, pl. 4, fig. 11; p. 224.

Canadian (Levis, Didymograptus zone): Point Levis, Quebec.

Dendrograptus cf. gracilis Ruedemann. See Dendrograptus flexuosus.

Dendrograptus gracilis var. crassa James. See Buthotrephis gracilis crassa.

Dendrograptus (Psilophyton) gracillimus Walcott. See Mastigograptus gracillimus.

Dendrograptus gracillimus var. intermedia James. See Buthotrephis gracilis intermedia.

Dendrograptus linearis Carruthers. See Pleurograptus linearis.

Dendrograptus novellus Hall. See Chaunograptus novellus.

Dendrograptus ontarioensis Bassler.

Dendrograptus ontarioensis Bassler, Bull. U. S. Nat. Mus., 65, 1909, pp. 12, 13, pl. 1, fig. 4, fig. 12.

Niagaran dolomite: Hamilton, Ontario.

Dendrograptus phainotheca Gurley.

Dendrograptus phainotheca (Gurley MS.) Bassler, Bull. U. S. Nat. Mus., 65, 1909, pp. 11, 12, pl. 2, fig. 2; fig. 11.

Niagaran dolomite: Hamilton, Ontario.

Dendrograptus prægracilis Spencer.

Dendrograptus prægracilis Spencer, Canadian Nat., 10, 1882, p. 165 (nom. nud.); Trans. Acad. Sci. St. Louis, 4, 1884, p. 569, pl. 1, fig. 7; Bull. Mus. Univ. State Missouri, 1, 1884, p. 19, pl. 1, fig. 7.—Gurley, Jour. Geol., 4, 1896, pp. 95–308.—Bassler, Bull. U. S. Nat. Mus., 65, 1909, p. 9, pl. 2, fig. 3, text figs. 4, 10.

Niagaran dolomite: Hamilton, Ontario.

Dendrograptus? problematicus (Spencer).

Inocaulis(?) problematica Spencer, Canadian Nat., n. s., 8, 1878, p. 458; ibid., 10, 1882, p. 165; Bull. Mus. Univ. State Missouri, 1, 1884, pp. 14, 36, pl. 5, fig. 3; Trans. Acad. Sci. St. Louis, 4, 1884, p. 564, pl. 5, fig. 3.—Gurley, Jour. Geol., 4, 1896, pp. 99, 309.

Dendrograptus? problematicus Bassler, Bull. U. S. Nat. Mus., 65, 1909, p. 10, pl. 1, figs. 1, 2, text fig. 6.

Dendrograptus sp. Grant, Jour. Proc. Hamilton Assoc., 16, 1900, p. 102, fig.

Niagaran dolomite: Hamilton, Ontario.

Dendrograptus ramosus Spencer.

Dendrograptus ramosus Spencer, Canadian Nat., 10, 1882, p. 165 (nom. nud.); Trans. Acad. Sci. St. Louis, 4, 1884, p. 567, pl. 1, fig. 3; Bull. Mus. Univ. State Missouri, 1, 1884, pp. 14, 17, pl. 1, fig. 3, 3a.—Gurley, Jour. Geol. 4, 1896, pp. 95, 308.—Bassler, Bull. U. S. Nat. Mus., 65, 1909, p. 8, pl. 1, fig. 3; text figs. 3, 9.

Niagaran dolomite: Hamilton, Ontario.

Dendrograptus rectus Ruedemann.

Dendrograptus rectus Ruedemann, Mem. New York State Mus., 11, 1908, p. 145, pl. 8, fig. 2, text fig. 51.

Upper Clinton: Clinton, Oneida County, New York.

Dendrograptus serpens Hopkinson.

Dendrograptus serpens Hopkinson, Quart. Jour. Geol. Soc. London, 31, 1875, p. 665, pl. 37, fig. 3.

Dendrograptus cf. serpens Gurley, Jour. Geol., 4, 1896, p. 84.

Canadian: Europe; Summit, Nevada.

DENDROGRAPTUS SIMPLEX Spencer. See Dendrograptus dubius.

DENDROGRAPTUS SIMPLEX Walcott. See Mastigograptus simplex.

Dendrograptus spinosus Spencer.

Dendrograptus spinosus Spencer, Canadian Nat., 10, 1882, p. 165 (nom. nud.); Trans. Acad. Sci. St. Louis, 4, p. 569, pl. 1, fig. 8; Bull. Mus. Univ. State Missouri, 1, pp. 14, 19, pl. 1, fig. 8.—Gurley, Jour. Geol., 4, 1896, pp. 95, 308.—Bassler, Bull. U. S. Nat. Mus., 65, 1909, p. 10, fig. 5.

Niagaran dolomite: Hamilton, Ontario.

Dendrograptus striatus Hall.

Dendrograptus striatus Hall, Geol. Surv. Canada, dec. 2, 1865, p. 129, pl. 17, figs. 5–6.

Canadian (Levis, Didymograptus dentatus zone): Point Levis, Quebec.

Dendrograptus(?) succulentus Ruedemann.

Dendrograptus n. sp. Ruedemann, New York State Pal. Ann. Rep., 1902, p. 570.

Dendrograptus(?) succulentus Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 581–582, pl. 4, figs. 1–4, text figs. 16, 17.

Canadian: Deepkill, Rensselaer County, New York (Deepkill, Diplograptus dentatus zone); Point Levis, Quebec (Levis, D. dentatus zone).

DENDROGRAPTUS TENUIRAMOSUS Walcott. See Mastigograptus tenuiramosus.

Dendrograptus unilateralis Gurley.

Dendrograptus unilateralis Gurley, Jour. Geol., 4, 1896, p. 84.

Trenton (Magog): Magog, Quebec.

DEOCRINUS Hudson. Genotype: Rhodocrinus asperatus Billings.

Deocrinus Hudson, Bull. New York State Mus., 107, 1907, p. 121.

Deocrinus asperatus (Billings).

Rhodocrinus asperatus Billings, Geol. Surv. Canada, dec. 4, 1859, p. 27, pl. 1, figs. 4a–4c.

Archæocrinus asperatus Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 301.

Deocrinus asperatus Hudson, Bull. New York State Mus., 107, 1907, p. 122, fig. 5, pl. 8.

Chazyan (Aylmer): Near Montreal, Quebec.

DERMATOSTROMA Parks. Genotype: Stromatopora papillatum James.

Dermatostroma Parks, Univ. Toronto Studies, Geol. Series, 7, 1910, p. 29.

Dermatostroma canaliculatum Parks.

Dermatostroma canaliculatum Parks, Univ. Toronto Studies, Geol. Series, 7, 1910, p. 35, pl. 24, figs. 8, 9.

Richmond (Waynesville): Waynesville, Ohio.

Holotype.—Cat. No. 40082, U.S.N.M.

Dermatostroma cavernosum Parks.

Dermatostroma cavernosum Parks, Univ. Toronto Studies, Geol. Series, 7, 1910, p. 36, pl. 24, fig. 12–13.

Trenton (Catheys): Five miles east of Mount Pleasant, Tennessee.

Holotype.—Cat. No. 49508, U.S.N.M.

Dermatostroma corrugatum (Foerste).

Labechia(?) corrugata Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 86, pl. 1, fig. 11.

Dermatostroma corrugatum Parks, Univ. Toronto Studies, Geol. Series, 7, 1910, p. 34, pl. 24, figs. 7, 10, 11, 14.

Richmond (Whitewater): Near Wilmington, Ohio.

Dermatostroma glyptum (Foerste).

Labechia corrugata glypta Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 87.

Dermatostroma glyptum Parks, Univ. Toronto Studies, Geol. Series, 7, 1910, p. 33, pl. 24, figs. 4, 5, 6.

Richmond (Whitewater): Near Wilmington, Ohio.

Dermatostroma papillatum (James).

Stromatopora papillata James, Paleontologist, 1, 1878, p. 1.—Mickleborough and Wetherby, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 81.—James, ibid., 9, 1886, p. 251; ibid., 15, 1892, p. 91.

Dermatostroma papillatum Parks, Univ. Toronto Studies, Geol. Series, 7, 1910, p. 30, pl. 23, figs. 8–10.

Maysville and Richmond: Cincinnati, Ohio, and vicinity; Indiana; Kentucky Tennessee; Virginia.

Dermatostroma papillatum diversum Parks.

Dermatostroma papillatum diversum Parks, Univ. Toronto Studies, Geol. Series, 7, 1910, p. 31, pl. 23, fig. 12.

Maysville (Corryville): Cincinnati, Ohio.

Holotype.—Cat. No. 56844, U.S.N.M.

Dermatostroma scabrum (James).

Stromatopora scabra James, Paleontologist, 3, 1879, p. 18.—J. F. James, Jour. Cincinnati Soc. Nat. Hist., 9, 1886, p. 251; ibid., 1892, p. 91.

Labechia scabra Harper and Bassler, Cat. Fossils, Trenton and Cincinnati Periods Vicinity Cincinnati, 1896, p. 3.

Dermatostroma scabrum Parks, Univ. Toronto Studies, Geol. Series, 7, 1910, p. 31, pl. 24, figs. 1–3.

Eden-Richmond: Lebanon, Cincinnati, etc., Ohio; Indiana; Kentucky; Tennessee.

Plesiotype.—Cat. No. 40080, U.S.N.M.

Dermatostroma tyronense Foerste.

Dermatostroma tyronensis Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, p. 139, pl. 10, figs. 5a, b.

Black River (Lowville): High Bridge, Kentucky.

DESMOGRAPTUS Hopkinson. Genotype: D. cancellatus Hopkinson.

Desmograptus Hopkinson, Quart. Jour. Geol. Soc. London, 31, 1875, p. 668.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 185.—Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, p. 609.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 26.—Ruedemann, Zittel-Eastman Textb. Pal., 1913, p. 128.

Desmograptus cancellatus (Hopkinson).

Dictyograptus (Desmograptus) cancellatus Hopkinson, Quart. Jour. Geol. Soc. London, 31, 1875, p. 668, pl. 36, figs. 11a, 11b.

Dictyonema (Desmograptus) cancellatum Ruedemann, New York State Pal., Ann. Rep. 1902, p. 570.

Desmograptus cancellatus Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 610, 611, pl. 3, figs. 5–8, 31.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 26, fig. 36.

Desmograptus macrodictyum Gurley, Jour. Geol., 4, 1896, p. 83.

Lower Ordovician: St. Davids, Wales (Lower Arenig); Point Levis, Quebec (Levis); Deepkill, Rensselaer County, New York (Deepkill, Diplograptus dentatus zone).

Desmograptus intricatus Ruedemann.

Dictyonema (Desmograptus) n. sp. Ruedemann, New York State Pal., Ann. Rep. 1902, p. 570.

Desmograptus intricatus Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 611, 612, pl. 3, figs. 1–4, text figs. 32, 33; fig. 30, p. 609.

Canadian (Deepkill-Diplograptus dentatus zone): Deepkill, Rensselaer County, New York.

Desmograptus macrodictyum Gurley. See Desmograptus cancellatus.

Desmograptus pergracilis (Hall and Whitfield).

Dictyonema pergracilis Hall and Whitfield, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 181 (abstract, p. 1); 27th Rep. New York State Cab. Nat. Hist., 1875, pl. 9, fig. 38.—Spencer, Trans. Acad. Sci. St. Louis, 4, 1884, pp. 564, 577; Bull. Mus. Univ. State Missouri, 1, 1884, p. 27.—Foerste, Bull. Sci. Lab. Denison Univ., 2, pt. 1, 1887, p. 107.—Pocta, Syst. Sil. Boheme, 8, pt. 1, 1894, p. 193.—Gurley, Jour. Geol., 4, 1896, p. 308.

Desmograptus pergracilis Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 179.

Niagaran (Louisville): Louisville, Kentucky.

Desmograptus tenuiramosus Ruedemann.

Desmograptus tenuiramosus Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 177, 178, pl. 1, fig. 2, text figs. 84, 85.

Chazyan (Normanskill): Glenmont, Albany County, New York.

DIABOLOCRINUS Wachsmuth and Springer.

Genotype: D. perplexus Wachsmuth and Springer.

Diabolocrinus Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 20, 1897, pp. 211, 249.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 200.—Zittel, Grundzuge Pal., 1, 1910, p. 161.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 188.

Diabolocrinus asperatus (Miller and Gurley).

Archæocrinus asperatus Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 5, 1894, p. 19, pl. 2, figs. 7–9.—Miller, Sec. App., N. A. Geol. Pal., 1897, p. 734, figs. 1296, 1297.

Diabolocrinus hieroglyphicus Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 252 pl. 10, fig. 5a–c.

Chazyan (Ottosee): Near Knoxville, Tennessee.

Diabolocrinus hieroglyphicus Wachsmuth and Springer. See Diabolocrinus asperatus.

Diabolocrinus perplexus Wachsmuth and Springer.

Diabolocrinus perplexus Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 250, pl. 11, fig. 1a, b.

Chazyan (Ottosee): Near Knoxville, Tennessee.

Diabolocrinus vesperalis (White).

Rhodocrinus vesperalis White, Proc. U. S. Nat. Mus., 2, 1880, p. 259, pl. 1, figs. 11, 12; 12th Ann. Rep. U. S. Geol. Surv. Terr., 1883, p. 129, pl. 35, figs. 4a, b.

Diabolocrinus vesperalis Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, pp. 251, 262, pl. 11, figs. 1c–, d.—Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 104.

Gilbertsocrinites americanus Troost, Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 61 (nom. nud.).

Lyriocrinus sculptilus Miller (not Hall, 1851), Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 83, pl. 3, figs. 6a, b; p. 117 (corrected to L. sculptus on private edition).

Archæocrinus sculptus Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1885, p. 320 (Rev. Pal., pt. 3, sec. 1, 1885, p. 98).—Miller, N. A. Geol. Pal., 1889, p. 225, fig. 250.

Chazyan (Ottosee): Near Knoxville, Tennessee. Erroneously cited by White (1880) from the Coal Measares near Humboldt, Kansas, and by Miller (1882) from the Helderbergian of Tennessee.

Holotype and *plesiotype*.—Cat. Nos. 39970, 80321, U.S.N.M.

Diagoniella Rauff. See Protospongia Salter.

Diamesopora Ulrich (part). See Cœloclema Ulrich.

DIAMESOPORA Hall. Genotype: D. dichotoma Hall.

Diamesopora Hall, Pal. New York, 2, 1852, p. 158 (not defined).—Pictet, Traité de Pal., 2d ed., 4, 1857, p. 170.—Hall and Simpson, Pal. New York, 6, pp. 15, 19.—Miller, N. A. Geol. Pal., 1889, p. 300.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 566.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 54, 229.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 175; Bull. New York State Mus., 45, 1901, p. 175.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 62.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 165.

Diamesopora communis Ulrich. See Cœloclema commune.

Diamesopora dichotoma Hall.

Diamesopora dichotoma Hall, Pal. New York, 2, 1852, p. 158, pl. 40, figs. 3a–d.—Rominger, Proc. Acad. Nat. Sci. Philadelphia, 1866, p. 118.—Grabau, Bull. New York State Mus. 45, 1901, p. 175, fig. 78; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 175, fig. 78.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 62, pl. 21, figs. 12, 13; pl. 24, figs. 28–30.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 166, fig. 216a, b.

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

Plesiotype.—Cat. No. 35759, U.S.N.M.

Diamesopora infrequens (Hall).

Trematopora infrequens Hall, 28th Ann. Rep. New York State Mus., doc. ed., 1876, pl. 10, figs. 13, 14 (in error for 3, 4); ibid., Mus. ed., 1879, p. 111, pl. 10, fig. 3 (in part), 4; 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 232, pl. 9, figs. 3 (in part), 4.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890 p. 1200, figs.

Cœloclema infrequens Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 258.

Diamesopora infrequens Ulrich, Geol. Surv. Illinois, 8, 1890, p. 467.

Niagaran (Waldron): Waldron, etc., Indiana; Newsom, Tennessee.

Diamesopora osculum (Hall).

Trematopora osculum Hall, 28th Ann. Rep. New York State Mus., doc. ed., 1876, pl. 10, figs. 3–12 (3 and 4 in error); ibid., Mus. ed., 1879, p. 110, pl. 10, figs. 5–8, 11–14; 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 231, pl. 9, figs. 5–8, 11–14.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1201, fig.

Cœloclema osculum Ulrich. Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 258.

Diamesopora osculum Ulrich, Geol. Surv. Illinois, 8, 1890, p. 467.

Niagaran (Waldron): Waldron, etc., Indiana; Newsom, Tennessee.

DIAMESOPORA OWENI Ulrich. See Cœloclema oweni.

Diamesopora subimbricata (Hall).

Trematopora subimbricata Hall, 28th Ann. Rep. New York State Mus., Mus. ed., 1879, pl. 10, figs. 9, 10; Trans. Albany Inst., 10, 1883, p. 60 (abstract, 1879, p. 4); 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 234, pl. 9, figs. 9, 10.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1202, figs.

Cœloclema imbricata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1882, p. 258.

Diamesopora subimbricata Ulrich, Geol. Surv. Illinois, 8, 1890, p. 467.

Niagaran (Waldron): Waldron, Indiana.

DIAMESOPORA TRENTONENSIS Ulrich. See Cœloclema trentonense.

Diamesopora? tubulosa (Hall).

Trematopora tubulosa Hall, Pal. New York, 2, 1852, p. 151, pl. 40A, figs. 3a–c.

Diamespora tubulosa Rominger, Proc. Acad. Nat. Sci. Philadelphia, 1866, p. 119.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 467.

Lower Clinton: Wayne County, New York.

DIAMESOPORA VARIA Ulrich. See Chilotrypa varia.

DIAMESOPORA VAUPELI Ulrich. See Cœloclema alternatum.

DIANULITES Eichwald. Genotype: D. bicornis Eichwald.

Dianulites Eichwald, Zool. Spec., 1, 1829, p. 180; Leth. Rossica, 1, 1860, p. 487.—Dybowski, Die Chætetiden der Ostbaltischen Silur-form., 1877, p. 14.—Zittel, Handb. Pal., 1, 1880, p. 616.—Nicholson, Genus Monticulipora, 1881, pp. 20, 155.—Waagen and Wentzel, Pal. Indica, 13th ser., 1886, p. 874.—Simpson, 14th Ann. Rep. State Geol. New York for the year 1894, 1897, p. 587.—Miller, N. A. Geol. Pal., 2d App. 1897, p. 728.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 230.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 226–229; Zittel-Eastman Textb. Pal., 1913, p. 335.

Hexaporites Pander, Beitr. zur Geogn. d. russ. Reichs., 1830, p. 106, pl. 1, fig. 5; pl. 28, fig. 8.

DIANULITES DISCOIDEA Miller. See Mesotrypa discoidea.

DIANULITES DUBIA Miller. See Diplotrypa? dubia.

DIANULITES LIMITARIS Miller. See Diplotrypa limitaris.

DIANULITES NEGLECTA Miller. See Diplotrypa neglecta.

DIANULITES PATELLA Miller. See Mesotrypa patella.

Dianulites petropolitanus Dybowski.

Dianulites petropolitana Dybowski, Die Chætetiden der Ostbaltischen Silur-form., 1877, p. 24, pl. 1, figs. 4, 5.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 232–237, pl. 2, figs. 4–6a; pl. 10, figs. 7–11; text figs. 129–132.

Hexaporites Pander, Beitr. Geogn. russ. Reiches., 1830, p. 106, pl. 1, fig. 5; pl. 28, fig. 8.

Dianulites petropolitanus—Continued.

Hexaporites fungiformis Leuchtenberg in Eichwald Geog. Russ., 1846, p. 370.—Eichwald, Leth. Rossica, 1, 1860, p. 478.

Dianulites petropolitanus var. hexaporites Dybowski, Die Chætetiden der Ostbaltischen Silurform., 1877, p. 30, pl. 1, figs. 6, 6a.

Monotrypa (Chætetes?) cumulata Ulrich, Geol. Minnesota, 3, pt. 1, 1893, p. 307, pl. 27, figs. 26, 27.

Middle Ordovician: Esthonia, Russia; Goodhue County, Minnesota (Prosser); Ottawa, Ontario.

Plesiotypes.—Cat. Nos. 26906, 57339, 57340, U.S.N.M. (Holotype of M. cumulata).

Dianulites petropolitanus var. hexaporites Dybowski. See Dianulites petropolitanus.

Dianulites quebecensis Miller. See Mesotrypa quebecensis.

Dianulites rotunda Miller. See Mesotrypa rotunda.

Dianulites selkirkensis Miller. See Mesotrypa selkirkensis.

DIAPHOROSTOMA Fischer. Genotype: Platyostoma ventricosum Conrad.

Platyostoma Conrad (not Meigen, 1903), Jour. Acad. Nat. Sci. Philadelphia, 7, 1842, p. 275.—Hall, Pal. New York, 2, 1852, pp. 103, 286; ibid., 3, 1859, pp. 293, 299.—Nicholson, Rep. Pal. Prov. Ontario, pt. 1, 1874, p. 117.—Waagen, Mem. Geol. Surv. India, Pal. Indica, 13th ser., 1, 1880, p. 103.—Lindström, Kongl. Sven. Vet.-Akad. Handl., 19, No. 6, 1881, p. 61.—Zittel, Handb. Pal., 2, 1882, p. 217.—Koken, Neues Jahrb. Min., Geol., 6, 1889, pp. 349, 468, 470.—Miller, N. A. Geol. Pal., 1889, p. 418.—Nettelroth, Kentucky, Foss. Shells, Geol. Surv. Kentucky, 1889, p. 183.—Koken, Die Leitfossilien, Leipzig, 1896, p. 128.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 274.

Diaphorostoma Fischer, Man. Conch., 1885.—Grabau, Bull. New York State Mus., 45, 1, 1901, p. 211; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 211.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 679.—Dall, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 54.

Diaphorostoma auriforme (Hall).

Capulus auriformis Hall, Pal. New York, 1, 1847, p. 31, pl. 6, figs. 9a, b; 12th Rep. New York State Cab. Nat. Hist., 1859, p. 67.

Stomatia auriformis Emmons, Amer. Geology, 1, pt. 2, 1855, p. 157.

Platyostoma auriforme Raymond, Ann. Carnegie Mus., 4, 1908, p. 217.

Chazyan or Trenton: Galway, New York.

Diaphorostoma brownsportense (Foerste).

Platyceras brownsportensis Foerste, Jour. Geol., 11, 1903, p. 709.

Diaphorostoma brownsportensis Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 64, pl. 1, fig. 14.

Niagaran (Brownsport): Brownsport Furnace, Cerro Gordo, and Bath Springs, Tennessee.

Diaphorostoma campanulatum (Winchell and Marcy).

Platyceras campanulatum Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 99, pl. 2, fig. 16.

Niagaran (Racine): Chicago, Illinois.

Diaphorostoma cliftonense Foerste.

Diaphorostoma cliftonensis Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 63, pl. 3, figs. 41A, B; Cincinnati Soc. Nat. Hist. Jour., 21, 1909, p. 30.

Clinton: Clifton, Tennessee (Osgood); Martins, Lewis County, Kentucky (West Union).

Diaphorostoma hemisphericum (Hall).

Euomphalus hemisphericus Hall, Nat. Hist. New York, Geol., 4, 1843, p. 109, figs. 1, 2; p. 110, tab. 16, figs. 1, 2.

Straparollus hemisphericus D'Orbigny, Prodr. Pal., 1, 1849, p. 29 (gen. ref.)

Platyostoma hemispherica Hall, Pal. New York, 2, 1852, p. 288, pl. 60, fig. 2a, b.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 692, figs.

Clinton (Rochester): Rochester, Lockport, etc., New York.

Diaphorostoma humile (Billings).

Cyclonema humilis Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 56.

Gamachian (Ellis Bay) and Anticostian (Gun River-Chicotte): The Jumpers, etc., Anticosti.

Diaphorostoma illinoisense Savage.

Diaphorostoma illinoisensis Savage, Bull. Geol. Surv., Illinois, 23, 1913, p. 118, pl. 7, fig. 19.

Upper Medinan (Channahon): Will County, Illinois.

Diaphorostoma niagarense (Hall).

Platyostoma niagarensis Hall, Pal. New York, 2, 1852, p. 287, pl. 60, figs. 1a–v.—Roemer, Sil. Fauna West. Tennessee, Breslau, 1860, p. 75, pl. 5, fig. 15.—Hall, Trans. Albany Inst., 4, 1863, p. 227 (loc. occ.); 20th Rep. New York State Cab. Hist., 1868, p. 342, 393 (loc. occ.) (Extras, 1865), rev. ed., 1870, pp. 390, 432; 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1877, pl. 28, figs. 1–12; pl. 29, figs. 1–15; pl. 31, fig. 3; Mus. ed., 1879, p. 175, pl. 28, figs. 1–12; pl. 29, figs. 1–15.—White, 2d Ann. Rep. Indiana Dep. Stat. Geol., 1880, p. 497, pl. 3, figs. 7, 8.—Zittel, Handb. Pal., 2, 1882, p. 217, fig. 297.—Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1881, p. 318, pl. 29, figs. 1–12; 13?, pl. 30, figs. 1–15.—Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 97, pl. 13, figs. 3a, b; fig. 22.—Nettelroth, Kentucky Foss. Shells, Geol. Surv. Kentucky, 1889, p. 185, pl. 33, fig. 30.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 693, figs.—Miller, N. A. Geol. Pal., 1889, p. 418, fig. 697.—Rowley in Greene, Cont. Indiana Pal., pt. 8, 1901, p. 67, pl. 23, fig. 12.—Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 483, pl. 57, figs. 3, 4.

Platyostoma (Diaphorostoma) niagarense Grabau, Amer. Nat., 36, 1902, p. 939.

Diaphorostoma niagarense Grabau, Bull. Buffalo Soc. Nat. Sci., 8, 1901, p. 212, fig. 141; Bull. New York State Mus., 45, 1901, p. 212, fig. 141.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 59, pl. 10, figs. 14–16.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 679, fig. 951.—Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 102, pl. 6, fig. 1.

Platyceras (Platystoma) niagarensis Foerste, Geol. Surv. Ohio, 7, 1893, p. 553, pl. 25, figs. 3, 22.

Platyceras (Diaphorostoma) cornutum Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 453, pl. 13, figs. 9–16.

Strophostylus niagarensis Keyes, Amer. Nat., 24, 1890, pl. 33, fig. 2; Proc. Iowa Acad. Sci., 1, pt. 2, 1892, p. 25.

Silurian: Lockport, Rochester, etc., New York. As at present identified a widely distributed species in North America ranging from the Brassfield to the Keyser formation of the Helderbergian.

Plesiotype.—Cat. No. 53232, U.S.N.M. (Nettelroth).

Observation.—D. niagarensis Hall has been identified with Platyceras cornutum Hisinger, but until the two have been more closely compared it is preferred to leave them distinct.

Diaphorostoma niagarense clintonense (Foerste).

Platyceras Niagarense var. Clintonense Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 554, pl. 37a, fig. 8.

Clinton: Mifflintown, Juniata County, Pennsylvania.

Diaphorostoma niagarense immaturum Savage.

Diaphorostoma niagarensis var. immatura Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 55, pl. 2, fig. 3.

Upper Medinan (Girardeau): Near Thebes, Illinois.

Diaphorostoma niagarense multilineatum (Calvin).

Platystoma niagarense var. multilineatum Calvin, Bull. Lab. Nat. Hist. State Univ. Iowa, 1, 1890, p. 177, pl. 2, figs. 4a–c.

Niagaran (Waldron): Waldron, Indiana.

Diaphorostoma perforatum Whiteaves.

Diaphorostoma perforatum Whiteaves, Geol. Surv. Canada, Ann. Rep., n. s., 14, App. F, 1904, p. 52; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 261, pl. 29, figs. 7, 7a.

Niagaran: Ekwan River, Canada.

Diaphorostoma plebium (Hall).

Platyostoma plebia Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875, pl. 28, figs. 14, 15; rev. ed., 1879, p. 175, pl. 28, figs. 14, 15; 11th Ann. Rep. Dep. Geol. Nat. Hist., 1882, p. 319, pl. 29, figs. 14, 15.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 695, figs.

Niagaran (Waldron): Waldron, Indiana.

Diaphorostoma trigonostoma (Meek).

Platyostoma? trigonostoma Meek, Proc. Acad. Nat. Sci. Philadelphia, 1, 1871, 169.—Miller, N. A. Geol. Pal., 1889, p. 418, fig. 698.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 695, figs.

Platyostoma Niagarensis var. trigonostoma Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 185, pl. 16, figs. 3a–c, and text fig.

Xenophora trigonostoma Whitfield, Geol. Wisconsin, 4, 1882, p. 358 (gen. ref.).

Niagaran: Yellow Springs, Ohio.

DIASTOPORA D'Orbigny (part). See Berenicea Lamouroux.

DIASTOPORELLA Vine. See Berenicea Lamouroux.

DIASTOPORINA Ulrich. Genotype: D. flabellata Ulrich.

Diastoporina Ulrich, Jour. Cincinnati Soc. Nat. Hist., 12, 1890, p. 177.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 684.—Ulrich, Geol. Minnesota, 3, 1893, p. 121.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 17.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 595.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 20.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 119.

Diastoporina flabellata Ulrich.

Diastoporina flabellata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 12, 1890, p. 178, fig. 5; Geol. Minnesota, 3, 1893, p. 122, pl. 2, figs. 2, 3.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, figs. 199, 200 (p. 595).—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 120, fig. 178f.

Trenton (Prosser): Cannon Falls and St. Paul, Minnesota.

Holotype.—Cat. No. 43266, U.S.N.M.

DICELLOCEPHALUS AFFINIS Matthew. See Platycolpus affinis.

DICELLOCEPHALUS BARABUENSIS Whitfield. See Platycolpus barabuensis.

DICELLOCEPHALUS BELLI Matthew. See Anomocarella belli.

DICELLOCEPHALUS(?) CORAX Matthew. See Dikelocephalus(?) corax.

DICELLOCEPHALUS CRISTATUS Matthew. See Conokephalina? cristatus.

DICELLOCEPHALUS FINALIS Walcott. See Apatokephalus finalis.

DICELLOCEPHALUS HARTII Lesley. See Dikelocephalus hartii.

DICELLOCEPHALUS INEXPECTANS Walcott. See Conokephalina inexpectans.

DICELLOCEPHALUS MAGNIFICUS Matthew. See Hungaia magnifica.

DICELLOCEPHALUS MEGALOPS Matthew. See Conokephalina megalops.

DICELLOCEPHALUS OWENI Matthew. See Anomocarella? oweni.

DICELLOCEPHALUS PAUPER Matthew. See Ptychaspis? pauper.

DICELLOCEPHALUS PLANIFRONS Matthew. See Anomocarella? planifrons.

DICELLOCEPHALUS SESOSTRIS Matthew. See Ptychaspis sesostris.

DICELLOCEPHALUS TRIBULIS Walcott. See Dikelocephalus tribulis.

DICELLOGRAPSUS Hopkinson. See Dicellograptus Hopkinson.

DICELLOGRAPTUS Hopkinson. Genotype: Didymograptus elegans Carruthers.

Dicellograpsus Hopkinson, Geol. Mag., 8, 1871, p. 20.

Dicellograptus Zittel, Handb. Pal., 1, 1879, p. 300.—Tullberg, Sveriges Geol. Unders., Ser. C, No. 55, 1883, pp. 12, 14.—Herrman, Geol. Mag., dec. 3, 2, 1885, p. 451.—Koken, Die Leitfossilien, Leipzig, 1896, p. 329.—Wiman, Bull. Geol. Inst. Univ. Upsala, 2, pt. 2, 1896, p. 264.—Walther, Zeits. d. d. geol. Gesell., 49, 1897, p. 256.—Roemer and Frech, Leth. geog., Leth Pal., 1, 3 Lief, 1897, p. 617.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 32.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 291–293; Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 130.

Dicellograptus complanatus Lapworth.

Dicellograptus complanatus Lapworth, Ann. Mag. Nat. Hist., 5th ser., 5, 1880, p. 160, pl. 5, figs. 17a–e.—Tullberg, Sver. Geol. Unders., Afh. och Upps., Ser. C, 50, 1882, p. 18.—Roemer and Frech, Leth. Pal., 1, 1897, p. 618, fig. 183.—Elles and Wood, Mon. British Grapt., 1904, p. 139, pl. 20. figs. 1ad.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 32, figs. 53a, b.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 294, 295.

Ordovician: Scotland and Ireland (Upper Hartfell); Scania (Trinucleus beds); Arbuckle Mountains, Oklahoma (Sylvan).

Plesiotype.—Cat. No. 54267, U.S.N.M.

Dicellograptus divaricatus (Hall).

Graptolithus divaricatus Hall, Pal. New York, 3, 1859, p. 514, figs. 1–4; New York State Cab. Nat. Hist., 13th Ann. Rep., 1860, p. 58, figs. 1–4; Geol. Surv. Canada, Can. Org. Rem., dec. 2, 1865, p. 14, fig. 19.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 264, figs.

Graptolithus (Dicranograptus) divaricatus Hall, New York State Cab. Nat. Hist., 20th Ann. Rep., 1868, p. 180, fig. 20; rev. ed., 1870, p. 212, fig. 20.

Dicellograptus divaricatus—Continued.

Didymograptus divaricatus Nicholson, Ann. Mag. Nat. Hist., 5, 1868, p. 351, pl. 7, fig. 4; Mon. British Grapt., 1872, p. 55, text fig. 30.

Dicellograptus divaricatus Hopkinson, Geol. Mag., 8, 1871, p. 25, pl. 1, fig. 4.—Hopkinson and Lapworth, Quart. Jour. Geol. Soc., 31, 1875, p. 654, pl. 34, figs. 3a, b.—Lapworth, Roy. Soc. Can. Proc. and Trans., 5, sec. 4, 1886, p. 184.—Walcott, Geol. Soc. Am. Bull., 1, 1890, p. 339.—T. S. Hall, Rec. Geol. Surv. N. S. Wales, 7, pt. 2, 1902, p. 3, pl. 12, fig. 3; pl. 13, fig. 3.—Elles and Wood, Mon. British Grapt., pt. 4, 1904, p. 143, pl. 20, figs. 5a, 5b.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 32, fig. 53c.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 296–299, pl. 18, figs. 4, 212–214.

Dicellograptus moffatensis var. divaricatus Lapworth, Belfast Nat. Field Club, Rep. and Proc., 1, pt. 4, 1877; app., p. 141, pl. 7, fig. 10.—Ami, Can. Geol. Surv., Ann. Rep. 3, pt. 2, 1889, p. 60K, 116K.

Dicranograptus divaricatus Walcott, Alb. Inst. Trans., 10, 1883, (adv. sheets, 1879, p. 34).

Dicranograptus (Dicellograptus) divaricatus Roemer and Frech, Leth. Pal., 1, 3 Lief, p. 618.

Chazyan (Normanskill): Kenwood, Glenmont, Stockport, etc., New York; Nevada; Canada; Arkansas.

Middle Ordovician: Scotland and Wales (Glenkiln); New South Wales; Australia.

Dicellograptus divaricatus bicurvatus Ruedemann.

Dicellograptus elegans Gurley, Geol. Surv. Arkansas, Ann. Rep. for 1890, 3, 1892, p. 414; Jour. Geol., 4, 1896, pp. 71, 95.

Dicellograptus divaricatus var. bicurvatus Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 300, pl. 18, fig. 8, text fig. 216.

Chazyan (Normanskill): Kenwood and Glenwood, New York; Ouachita Mountains, Oklahoma (Talihina); Arkansas (Stringtown).

Observation.—The species listed by Gurley as D. elegans Carruthers in all probability refers to this variety. See Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 312.

Dicellograptus divaricatus Lapworth (1876). See Dicellograptus divaricatus rigidus.

Dicellograptus divaricatus rectus Ruedemann.

Dicellograptus divaricatus var. rectus Ruedemann, Bull. New York State Mus., 11, pt. 2, 1908, p. 299, pl. 18, fig. 7, text fig. 215.

Chazyan (Normanskill): Kenwood and Speigletown, New York.

Dicellograptus divaricatus rigidus Lapworth.

Dicellograptus divaricatus Lapworth, Cat. West. Scott. Foss., 1876, pl. 4, fig. 86.

Dicellograptus moffatensis var. divaricatus Lapworth, Belfast Nat. Field Club, Rep. and Proc., 1, pt. 4, app. 1877, p. 141, pl. 7, fig. 10.

Dicellograptus rigidus Gurley, Geol. Surv. Arkansas, 3d Ann. Rep., 1890, p. 416; Jour. Geol., 4, 1896, p. 297.

Dicellograptus divaricatus var. rigidus Lapworth, Ann. Mag. Nat. Hist., 5th ser., 5, 1880, p. 163, pl. 5, fig. 20.—Elles and Wood, Mon. British Grapt., 1904, p. 144, fig. 88a; pl. 20, figs. 6a–e.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 301.

Ordovician: Great Britain (Glenkiln); Arkansas and Oklahoma (Normanskill-Stringtown).

Plesiotype.—Cat. No. 54259, U.S.N.M.

Dicellograptus divaricatus salopiensis Elles and Wood.

Dicellograptus divaricatus var. salopiensis Elles and Wood, Mon. British Grapt., pt. 4, 1904, p. 145, pl. 20, figs. 7a–e.—Ruedemann, Bull. New York State Mus., 11, pt. 2, 1908, p. 300, pl. 18, fig. 5, text figs. 217–219.

Ordovician: Shropshire, England, and South Scotland (Glenkiln); Stockport and Kenwood, New York (Normanskill).

DICELLOGRAPTUS ELEGANS Gurley. See Dicellograptus divaricatus bicurvatus.

Dicellograptus gurleyi Lapworth.

Dicellograptus gurleyi (Lapworth MSS) Gurley, Jour. Geol., 4, 1896, p. 70.—Ruedemann, Bull. New York State Mus., 11, pt. 2, 1908, pp. 303–306, pl. 19, figs. 7–9, text figs. 223–228.

Chazyan (Normanskill): Stockport, Glenmont, and Mount Moreno, New York; Arkansas (Stringtown).

Plesiotype.—Cat. No. 54265, U.S.N.M.

Dicellograptus intortus Lapworth.

Dicellograptus intortus Lapworth, Ann. and Mag. Nat. Hist., 5th ser., 5, 1880, p. 161, pl. 5, fig. 19a.—Clark, Geol. Mag., 4th ser., 9, 1902, p. 498.—Elles and Wood, Mon. British Grapt., pt. 4, 1904, p. 146, figs. 90a, b, pl. 20, figs. a–f.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 302, 303, figs. 221, 222; pl. 18, figs. 9–10.

Dicellograpsus intortus Gurley, Jour. Geol., 4, 1896, p. 95.

Dicellograptus intortus polythecatus Gurley, Jour. Geol., 4, 1896, p. 70.

Ordovician: Great Britain (Glenkiln); Stockport and Speigletown, New York; Arkansas (Normanskill).

DICELLOGRAPTUS INTORTUS POLYTHECATUS Gurley. See Dicellograptus intortus.

Dicellograptus mensurans Ruedemann.

Dicellograptus mensurans Ruedemann, Mem. New York State Mus., 11, 1908, pt. 2, pp. 295, 296, pl. 18, fig. 2, text figs. 210, 211.

Chazyan: Kenwood, New York (Normanskill); Alabama (Athens).

Dicellograptus moffatensis alabamensis Ruedemann.

Dicellograptus moffatensis var. alabamensis Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 310–312, pl. 20, figs. 1, 2, text figs. 234–236.

Chazyan (Athens): Near Pratt's Ferry, Bibb County, Alabama.

DICELLOGRAPTUS MOFFATENSIS var. DIVARICATUS Ami. See Dicellograptus divaricatus.

DICELLOGRAPTUS MOFFATENSIS var. DIVARICATUS Lapworth. See Dicellograptus divaricatus rigidus.

DICELLOGRAPTUS RIGIDUS Gurley. See Dicellograptus divaricatus rigidus.

Dicellograptus sextans (Hall).

Graptolithus sextans Hall, Pal. New York, 1, 1847, p. 273, pl. 74, fig. 3.—Salter, Quar. Jour. Geol. Soc., 5, 1849, p. 17, pl. 1, fig. 10.—Chapman, Canadian Jour., n. s., 1, 1856, p. 389, fig. 2.—Carruthers, Siluria, 4th ed., 1867, p. 61, fig. 8.—Hall, 20th Rep. New York State Cab. Hist., 1868, pp. 180, 227; rev. ed., 1870, pp. 212, 224.—Nicholson, Quar. Jour. Geol. Soc., 24, 1868, p. 134.

Diplograptus? sextans McCoy, British Pal. Foss., 1855, p. 9.

Didymograptus sextans Nicholson, Ann. Mag. Nat. Hist., 4th ser., 5, 1870, p. 354, pl. 9, fig. 9.

Dicellograptus sextans—Continued.

Dicellograptus sextans Lapworth, Belfast Nat. Field Club, Rep. and Proc., 1, pt. 4, 1877, pl. 7, fig. 4.—Linnarsson, Sver. Geol. Unders., ser. C, no. 31, 1879, p. 18.—Lapworth, Ann. and Mag. Nat. Hist., 5th ser., 6, 1880, p. 19; Trans, Roy. Soc. Canada, 5, sec. 4, 1886, p. 178.—Ami, Canadian Geol. Surv. Rep., 2d ser., 3, pt. 2, 1889, p. 117.—Walcott, Geol. Soc. Amer. Bull., 1, 1890, p. 339.—Gurley, Jour. Geol., 4, 1896, p. 297.—T. S. Hall, Roy. Soc. Victoria Proc., 9, 1896, p. 184; Geol. Mag., n. s., dec. 4, 6, 1899, p. 445.—Ruedemann, Bull. New York State Mus., 42, 1901, p. 539.—Clark, Geol. Mag., 4th ser., 9, 1902, p. 498.—Elles and Wood, Mon. British Grapt., pt. 4, 1904, p. 153, pl. 21, figs. 1a–e.—Dale, Bull. U. S. Geol. Surv., 242, 1904, p. 33.—Ami, Geol. Surv. Canada, Sum. Rep., 1905, p. 12.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 33, fig. 53d, e.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 306–308, pl. 19, fig. 1, text figs. 229–230.

Dicellograptus cf. sextans Tullberg, Sver. Geol. Unders., ser. C, No. 50, 1882, p. 20.

Dicranograptus sextans Hopkinson, Geol. Mag., 7, 1870, p. 356, pl. 16, fig. 1.—Lapworth, Cat. West. Scott. Foss., 1876, p. 6, pl. 3, fig. 78.—Walcott, Trans. Albany Inst., 10, 1883, p. 34 (adv. sheets, 1879).—Richardson, Terranes of Orange County, Vermont, 1902, p. 63.

Dicranograptus (Dicellograptus) sextans Roemer and Frech, Leth. Pal., 1, 1897, p. 621.

Dicranograptus formosus Hopkinson, Geol. Mag., 7, 1870, p. 356.

Middle Ordovician: Glenmont, Mt. Moreno, etc., New York; Vermont; Arkansas (Normanskill); England; Wales; Scotland; Ireland; Sweden; and Australia.

Dicellograptus sextans exilis Elles and Wood.

Dicellograptus sextans var. exilis, Elles and Wood, Mon. British Grapt., pt. 4, 1904, p. 153.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 309, 310, fig. 231.

Graptolithus sextans (pars.) Hall, Pal. New York, 1, 1847, pl. 74, fig. 3a.

Middle Ordovician: Great Britain (Glenkiln); Glenmont and Mt. Moreno, New York (Normanskill).

Dicellograptus sextans perexilis Ruedemann.

Dicellograptus sextans var. perexilis Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 310, pl. 19, fig. 2, text fig. 233.

Chazyan (Normanskill): Mt. Moreno, near Hudson, New York.

Dicellograptus sextans tortus Ruedemann.

Dicellograptus sextans var. tortus Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 309, fig. 232.

Chazyan (Normanskill): Kenwood, New York.

Dicellograptus smithi Ruedemann.

Dicellograptus smithi Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 313–315, pl. 19, figs. 3–6, text figs. 237, 238.

Chazyan (Athens): Near Pratt's Ferry, Bibb County, Alabama.

DICELLOGRAPTUS TENUIS Lapworth. See Didymograptus subtenuis.

DICELLOMUS Hall. Genotype: Lingula polita Hall.

Dicellomus Hall, 23d Ann. Rep. New York State Cab. Nat. Hist., 1873, p. 246.—Walcott, Mon. U. S. Geol. Surv., 1889, 32, pt. 2, p. 446; Proc. U. S. Nat. Mus., 28, 1905, pp. 312–313.—Grabau and Shimer, N. A. Index Fossils, 1907, 1, p. 189.—Walcott, Smiths. Misc. Coll., 53, 1908, pl. 11, pp. 142, 144; Mon. U. S. Geol. Surv., 51, 1912, p. 571.

DICELLOMUS—Continued.

Schmidtia Zittel (part) (not Volborth), Handb. Pal., 1, 1880, p. 665.

Obolella Hall and Clarke (part), 11th Ann. Rep. State Geol. New York, 1892, pp. 240–241; 45th Ann. Rep. New York State Mus., 1892, pp. 556–557; Pal. New York, 8, pt. 1, 1892, pp. 66–73.

Dicellomus nanus (Meek and Hayden).

Obolella nana Meek and Hayden, Proc. Acad. Nat. Sci. Philadelphia, 13, 1862, p. 435; Amer. Jour. Sci., 2d ser., 33, 1862, p. 73, figs. 1a, b, 2a, b.—Billings, Geol. Surv. Canada, Pal. Foss., 1, 1862, pp. 67, 68.—Meek and Hayden, Smiths. Cont. Knowl., 172, Pal. Upper Missouri, pt. 1, 1865, p. 4, pl. 1, figs. 3a–3d.—Whitfield, U. S. Geogr. and Geol. Surv. Rocky Mountains Region, Rep. Geol. Res. Black Hills of Dakota, by Newton and Jenney, 1880, pp. 340–341, pl. 2, figs. 14–17.—Walcott, Bull. U. S. Geol. Surv., 30, 1886, p. 111.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 69, 70.

Dicellomus nanus Walcott (part), Mon. U. S. Geol. Surv., 32, pt. 2, 1899, p. 447, pl. 60, figs. 3a–d (not fig. 3); Proc. U. S. Nat. Mus., 28, 1905, pp. 314–315; Mon. U. S. Geol. Surv., 51, 1912, p. 573, pl. 53, figs. 1, 1a–l, 2, 2a, 3, 3a–d.

Lower Ordovician: Near Buffalo Fork Peak, Uinta County, Wyoming. Also Upper and Middle Cambrian of Montana, Missouri, etc.

Plesiotypes.—Cat. No. 31903, 51908, U.S.N.M.

DICHOGRAPSUS Salter. See Dichograptus Salter.

DICHOGRAPSUS ARANEA Salter. See Dichograptus octobrachiatus.

DICHOGRAPSUS FLEXILIS Hall. See Clonograptus flexilis.

DICHOGRAPSUS LOGANI Nicholson. See Loganograptus logani.

DICHOGRAPSUS MILESI Hall. See Clonograptus milesi.

DICHOGRAPSUS OCTOBRACHIATUS Nicholson. See Dichograptus octobrachiatus.

DICHOGRAPSUS OCTONARIUS Hall. See Dichograptus octonarius.

DICHOGRAPSUS RAMULUS Gurley. See Temnograptus? ramulus.

DICHOGRAPSUS REMOTUS Gurley. See Clonograptus remotus.

DICHOGRAPSUS RIGIDUS Hall. See Clonograptus rigidus.

DICHOGRAPTUS Salter.

Genotype: Dichograpsus aranea Salter=Graptolithus octobrachiatus Hall.

Dichograpsus Salter, Quart. Jour. Geol. Soc. London, 19, 1863, p. 139.—Nicholson, ibid., 24, 1868, p. 9, 127.—Carruthers, Geol. Mag., 5, 1868, p. 73, 129.—Nicholson, Mon. British Grapt., 1872, p. 106; Ann. Mag. Nat. Hist., 4th ser., 11, 1873, p. 138.

Dichograptus, Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 217; rev. ed., 1870, p. 251.—Zittel, Handb. Pal., 1, 1879, p. 299.—Tullberg, Sver. Geol. Unders., ser. C, No. 55, 1883, p. 12.—Hermann, Geol. Mag., dec. 3, 3, 1886, p. 21.—Barrois, Ann. Soc. Geol. du Nord, 21, Lille, p. 108.—Nicholson and Murie, Geol. Mag., dec. 4, 2, p. 532, fig.—Wiman, Bull. Geol. Inst. Univ. Upsala, 2, pt. 2, 1896, p. 265.—Koken, Die Leitfossilien, Leipzig, 1896, p. 328.—Roemer and Frech, Leth. geog., Leth. Pal., 1897, p. 594.—Elles, Quart. Jour. Geol. Soc. London, 54, 1898, p. 483.—Zittel-Eastman Textb. Pal., 1, 1900, p. 118.—Elles and Wood, Mon. British Grapt. Pal. Soc., 1902, p. 76.—Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, p. 634.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 28.—Ruedemann, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 129.

Dichograptus abnormis Hall. See Clonograptus abnormis.

Dichograptus divaricatus Whitfield. See Dicellograptus divaricatus.

Dichograptus flabelliformis Brögger. See Dictyonema flabelliforme.

Dichograptus furcatus Whitfield. See Dicranograptus furcatus.

Dichograptus logani Nicholson. See Loganograptus logani.

Dichograptus octobrachiatus (Hall).

Graptolithus octobrachiatus Hall, Geol. Surv. Canada, Rep. for 1857, 1858, p. 122; Geol. Surv. Canada, Can. Org. Rem., dec. 2, 1865, p. 96, pl. 7, figs. 1–7; pl. 8, figs. 1–4.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 226, fig. 232.

Dichograpsus aranea Salter, Quart. Jour. Geol. Soc., 19, 1863, p. 137, figs. 9, 10.

Graptolithus (Loganograptus) octobrachiatus Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 174, fig. 5; pl. 3, figs. 23–27; rev. ed., 1870, p. 207, fig. 5, pl. 3, fig. 23–27.

Graptolithes (Didymograptus) octobrachiatus McCoy, Geol. Surv. Victoria, Prod. Pal. Victoria, dec. 1, 1874, p. 17, pl. 2, fig. 4.

Dichograpsus octobrachiatus Nicholson, Quart. Jour. Geol. Soc., 24, 1868, p. 129, pl. 5, figs. 1, 2; Ann. Mag. Nat. Hist., 4th ser., 1, 1868, p. 56, pl. 3, fig. 6.

Dichograptus octobrachiatus Nicholson, Mon. British Grapt., 1872, p. 107, fig. 50.—Brögger, Die silurischen Etagen, 2, 3, 1882, p. 38.—Herrmann, Nyt. Mag. Naturv., 29, 1885, p. 124; Geol. Mag., dec. 3, 3, 1886, p. 22, fig. 7.—Lecrenier, Ann. Soc. Geol. Belg., 14, 1887, p. 182.—Ami, Geol. Surv. Canada Rep., 2d ser., 3, pt. 2, 1889, p. 117k.—Törnquist, Lunds Univ. Arsskrift., 26, 1891, p. 12, pl. 1, fig. 1.—Nicholson and Marr, Geol. Mag., dec. 4, 2, 1895, p. 534, fig.—Gurley, Jour. Geol., 4, 1896, p. 294.—Roemer and Frech, Leth. geog., Leth. Pal., 1, 1897, p. 595.—Elles, Quart. Jour. Geol. Soc., 54, 1898, p. 483.—Ruedemann, New York State Pal., Ann. Rep. 1902, pp. 554, 556.—Elles and Wood, Mon. British Grapt., pt. 1, 1902, p. 77, pl. 9; pl. 10, figs. 1a–e.—Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 634–637, pl. 8, figs. 1–7; pl. 9, figs. 1–2.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 28, fig. 41.

Canadian: Point Levis, Quebec (Levis, Didymograptus zone); Deepkill, Rensselaer County, New York (Deepkill, Tetragraptus, Didymograptus, and Diplograptus zones); England (Skiddaw); Wales (Arenig); Scandinavia; Belgium; Australia.

Dichograptus octonarius (Hall).

Graptolithus octonarius Hall, Canadian Nat. Geol., 3, 1858, p. 148; Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 124; Geol. Surv. Canada, dec. 2, 1865, p. 95, pl. 10, figs. 1, 2.

Graptolithus (Monoprion) octonarius Hall, 20th Rep. New York State Cab. Hist., 1868, p. 226, pl. 3, fig. 22; rev. ed., 1870, p. 260, pl. 3, fig. 22; p. 223.

Dichograpsus octonarius Gurley, Jour. Geol., 4, 1896, p. 95 (gen. ref.)

Dichograptus octonarius Hall (T. S.), Geol. Mag., dec. 4, 6, 1899, p. 449, pl. 22, fig. 7.

Canadian: Point Levis, Quebec (Levis); Australia.

Dichograptus thureaui Frech. See Goniograptus thureaui.

Dichotrypa grandis Ulrich.

Dichotrypa grandis Ulrich, Geol. Surv. Illinois, 8, 1890, p. 498, pl. 43, figs. 1–1e.

Niagara (?): Will County, near Wilmington, Illinois (?).

Observation.—This form is probably from the St. Louis group of Illinois and may be the same as Dichotrypa elegans Ulrich.

DICRANELLA Ulrich. Genotype: D. bicornis Ulrich.

Dicranella Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 664; Zittel-Eastman Textb. Pal., 1, 1900, p. 644.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 349.—Bassler, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 738.

Dicranella bicornis Ulrich.

Dicranella bicornis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 665, pl. 44, fig. 26; pl. 46, figs. 39, 40.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 349, fig. 1657, j, k.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 738, fig. 1425d.

Beyrichia bicornis Miller, N. A. Geol. Pal., 2d App., 1897, p. 787 (gen. ref.).

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

Cotypes.—Cat. No. 41366, U.S.N.M.

Dicranella? byrnesi (Miller).

Leperditia Byrnesi Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 123, fig. 10; N. A. Geol. Pal., 1889, p. 552, fig. 1020.

Æchmina Byrnesi Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 12, pl. 3, figs. 9–11.

Dicranella? byrnesi Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 664.

Eden (Fulton): Cincinnati, Ohio, and vicinity.

Dicranella marginata Ulrich.

Dicranella marginata Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 666, pl. 44, figs. 27, 28.

Beyrichia marginata Miller, N. A. Geol. Pal., 2d App., 1897, p. 786 (gen. ref.).

Black River (Decorah): Fountain, Minnesota.

Holotype.—Cat. No. 41368, U.S.N.M.

Dicranella? simplex Ulrich.

Dicranella? simplex Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 666, pl. 44, figs. 24, 25; pl. 46, fig. 42.

Beyrichia simplex Miller, N. A. Geol. Pal., 2d App., 1897, p. 787 (gen. ref.).

Black River (Decorah): Fountain, Minnesota.

Holotype.—Cat. No. 41367, U.S.N.M.

Dicranella spinosa Ulrich.

Dicranella spinosa Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 665, pl. 44, fig. 23; pl. 46, fig. 41.

Beyrichia spinosa Miller, N. A. Geol. Pal., 2d App., 1897, p. 787 (gen. ref.).

Black River (Decorah): Minneapolis, Minnesota.

Holotype.—Cat. No. 41369, U.S.N.M.

Dicraniscus Meek. See Triplecia Hall.

DICRANOGRAPTUS Hall. Genotype: Graptolithus ramosus Hall.

Dicranograptus Hall, Can. Org. Remains, dec. 2, 1865, p. 112; 20th Rep. New York State Cab. Hist., 1868, p. 218; rev. ed., 1870, p. 252.—Carruthers, Geol. Mag., 5, 1868, p. 73, 132.—Hopkinson, Geol. Mag., 7, 1870, p. 353.—Richter, Zeits. d. d. geol. Gesell, 27, 1875, p. 266.—Zittel, Handb. Pal., 1, 1879, p. 300.—Tullberg, Sveriges Geol. Unders., ser. C, No. 55, 1883, pp. 12, 14.—Spencer, Trans. Acad. Sci. St. Louis, 4, 1884, p. 562.—Miller, N. A. Geol. Pal., 1889, p. 185.—James, Jour. Cincinnati Soc. Nat. Hist., 14, pt. 2, 1892, p. 160.—Gurley, Jour. Geol., 4, 1896, p. 71.—Wiman, Bull. Geol. Inst. Univ. Upsala, 2, pt. 2, 1896, p. 264.—Koken, Die Leitfossilien, Leipzig, 1896, p. 329.—Roemer and Frech, Leth. geog., Leth. Pal., 1897, p. 615.; Zittel-Eastman

DICRANOGRAPTUS—Continued.

Textb. Pal., 1, 1900, p. 119.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 315–317; Zittel-Eastman Pal., 2d ed., 1913, p. 130.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 32.

Dicranograpsus Nicholson, Ann. Mag. Nat. Hist., 4th ser., 6, 1870, p. 371; Mon. British Grapt., 1872, p. 118.

DICRANOGRAPTUS ARKANSASENSIS Gurley. See Dicranograptus ramosus arkansasensis.

DICRANOGRAPTUS ARUNDINACEUS Hall. See Mastigograptus arundinaceus.

Dicranograptus contortus Ruedemann.

Dicranograptus contortus Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 337–338, pl. 23, fig. 9; figs. 275–278.

Chazyan (Normanskill): Kenwood and Troy, New York.

DICRANOGRAPTUS DISSIMILARIS Emmons. See Diplograptus foliaceus.

DICRANOGRAPTUS DIVARICATUS Walcott. See Dicellograptus divaricatus.

DICRANOGRAPTUS FORMOSUS Hopkinson. See Dicellograptus sextans.

Dicranograptus furcatus (Hall).

Graptolithus furcatus Hall, Pal. New York, 1, 1847, p. 237, pl. 74, figs. 4a–h.—Chapman, Can. Jour., 1, 1856, p. 390, fig. 10.

Dicranograptus furcatus Hall, Geol. Surv. Canada Can. Org. Rem., dec. 2, 1865, p. 15.—Lapworth, Ann. Mag. Nat. Hist., 5, 1880, p. 283.—Walcott, Alb. Inst. Trans., 10, 1883 (Adv. sheet, 1879), p 34.—Whitfield, Am. Jour. Sci., 3d ser., 26, 1883, p. 380.—Walcott, Geol. Soc. Bull., 1, 1890, p. 339.—Gurley, Jour. Geol., 4, 1896, p. 297.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 334–336, pl. 23, fig. 7; text fig. 272.

Dicranograptus nicholsoni Frech, Leth. Pal., 1, 1897, p. 617, fig. 181.

Chazyan (Normanskill): Glenmont, etc., New York; Silver Peak Quadrangle, Nevada.

Plesiotypes.—Cat. No. 54251, U.S.N.M.

Dicranograptus furcatus exilis Ruedemann.

Dicranograptus furcatus var. exilis Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 337, pl. 23, fig. 8; figs. 273–274.

Chazyan (Normanskill): Kenwood, New York.

DICRANOGRAPTUS INÆQUALIS (Emmons). See Cladograptus inæqualis.

Dicranograptus nicholsoni Hopkinson.

Dicranograptus nicholsoni Hopkinson, Geol. Mag., 7, 1870, p. 357, pl. 16, fig. 3.—Lapworth, Cat. West. Scott. Foss., 1876, p. 6, pl. 3, fig. 79; Belfast Nat. Field Club, Rep. and Proc., App., 1, pt. 4, 1877, p. 141, pl. 7, fig. 2.—Tullberg, Sver. Geol. Unders., ser. C, No. 50, 1882, p. 20.—Gurley, Jour. Geol., 4, 1896, p. 297.—Elles and Wood, Mon. British Grapt., pt. 4, 1904, p. 171, pl. 25, figs. 1a–h.—T. S. Hall, Proc. Roy. Soc. Victoria, 18, 1905, p. 24, pl. 6, fig. 7; Rec. Geol. Surv. Victoria, 1, pt. 4, 1906, p. 274.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 317–320, pl. 20, figs. 3, 5; pl. 21, fig. 1; figs. 241, 242.

Middle Ordovician: Great Britain (Glenkiln and Hartfell); Scania; Victoria; Saratoga County, etc., New York (Trenton-Utica); Ohio (Fulton).

Plesiotypes.—Cat. Nos. 54247, 54269, U.S.N.M.

DICRANOGRAPTUS NICHOLSONI Frech. See Dicranograptus furcatus.

DICRANOGRAPTUS NICHOLSONI ARKANSASENSIS Gurley. See Dicranograptus ramosus arkansasensis.

Dicranograptus nicholsoni diapason Gurley.

Dicranograptus nicholsoni var. diapason Gurley, Jour. Geol., 4, 1896, p. 73.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 322–324, pl. 21, figs. 3–5, figs. 249–254.

Chazyan (Normanskill): Glenmont, Stockport, etc., New York; Arkansas.

Cotype.—Cat. No. 54286, U.S.N.M.

Dicranograptus nicholsoni parvangulus Gurley.

Dicranograptus nicholsoni var. parvangulus Gurley, Ann. Rep. Geol. Surv. Arkansas, 3, 1892, p. 417; Jour. Geol., 4, 1896, p. 73.—Ruedemann, Bull. New York State Mus., 11, pt. 2, 1908, pp. 320–322, pl. 21, fig. 2, figs. 243–248.

Chazyan (Normanskill): Mount Moreno, Glenmont, Stockport, etc., New York; Arkansas.

Cotypes.—Cat. Nos. 54257, 54258, U.S.N.M.

Dicranograptus nicholsoni parvulus Ruedemann.

Dicranograptus nicholsoni var. parvulus Ruedemann, Bull. New York State Mus., 162, 1912, p. 78, figs. 17, 18.

Trenton (Canajoharie): Near Pattersonville, New York.

Dicranograptus nicholsoni whitianus (Miller).

Graptolithus (Climacograptus) ramulus White (preoccupied), Wheeler's Expl. Surv. West 100th Merid., 4, pt. 1, 1877, p. 62, pl. 4, figs. 3a–c.

Graptolithus whitianus Miller, Amer. Pal. Foss., 2d ed., 1883, p. 269.

Dicranograptus nicholsoni var. whitianus Gurley, Jour. Geol., 4, 1896, p. 72, 300.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 324.

Chazyan (Normanskill zone): Five miles north of Summit, Nevada.

Holotype.—Cat. No. 8555, U.S.N.M.

DICRANOGRAPTUS RAMOSUS Hopkinson. See Dicranograptus spinifer.

Dicranograptus ramosus (Hall).

Graptolithus ramosus Hall, Pal. New York, 1, 1847, p. 270, pl. 73, fig. 3a–h.—Salter, Geol. Soc. Quar. Jour., 5, 1848, p. 16, pl. 1, fig. 7; Geol. Surv. Canada, dec., 1865, p. 15, fig. 20.—Chapman, Canadian Jour., 8, 1863, p. 205, text fig. 203.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 200, fig. 194.

Graptolithus (Dicranograptus) ramosus Hall, New York State Cab. Nat. Hist., 20th Ann. Rep., 1868, p. 181, fig. 21; pl. 2, figs. 18–21, p. 227; rev. ed., 1870, p. 212.

Cladograpsus ramosus Geinitz, Die Graptolithen, 1852, p. 29.—McCoy, Geol. Surv. Victoria, dec. 2, 1875, pl. 20, fig. 2.

Cladograpsus sp. undet. Emmons, Amer. Geology, 1856, pl. 1, fig. 12.

Dicranograptus ramosus Salter, Mem. Geol. Surv. Great Britain, 3, 1866, p. 330, pl. 11A, fig. 1; Siluria, 4th ed., 1866, p. 541, fig. 4.—Nicholson, Mon. British Grapt., 1872, p. 119, fig. 60.—Lapworth, Cat. West. Scot. Foss., 1876, p. 6, pl. 4, fig. 80.—Whitfield, U. S. Geog. Surv. West 100th Merid., Wheeler's Rep., 1877.—Walcott, Alb. Inst. Trans., 10, 1883 (Advance sheet, 1879, p. 34).—Lapworth, Roy. Soc. Canada Trans., 5, sec. 4, 1886, p. 184.—Ami, Canadian Geol. Surv. Rep., 2d ser., 3, pt. 2, 1889, p. 117K.—Miller, N. A. Geol. Pal., 1889, p. 185, fig. 167.—Walcott, Bull. Geol. Soc., 1, 1890, 339.—Gurley, Geol. Surv. Arkansas Ann. Rep., 3, 1892, p. 411.—James, Jour. Cincinnati

Dicranograptus ramosus—Continued.

Soc. Nat. Hist., 14, 1892, p. 160.—Gurley, Jour. Geol., 4, 1896, p. 297.—T. S. Hall, Proc. Roy. Soc. Victoria, 9, 1896, pl. 1, p. 184.—Roemer and Frech, Leth. geog., Leth. Pal., 1, 1897, 616, fig. 180.—T. S. Hall, Geol. Mag., n. s., dec. 4, 6, 1899, 445.—Ruedemann, Bull. New York State Mus., 42, 1901, p. 496ff.—T. S. Hall, Geol. Surv. Victoria Rec., 1, pt. 1, 1902, p. 33.—Clark, Geol. Mag. (4), 9, 1902, p. 498.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 55, 213, pl. 16, figs. 10, 11.—Elles and Wood, Mon. British Grapt., 1904, p. 175, pl. 24, figs. 6a, b.—Dale, Bull. U. S. Geol. Surv., 242, 1904, p. 33.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 32, fig. 52.—Ruedemann, Mem. New York State Mus., 11, pt. 2, pp. 325–328, pl. 23, fig. 1, text figs. 255, 256, 411.

Middle Ordovician: Mount Moreno, Kenwood, Stockport, etc., New York; Canada; New Jersey; Arkansas; Oklahoma (Normanskill); Victoria and Australia. Hartfell and Glenkiln shales of Great Britain.

Dicranograptus ramosus arkansasensis (Gurley).

Dicranograptus arkansasensis Gurley, Geol. Surv. Arkansas, Ann. Rep., 3, 1892, p, 416, pl. 9, figs. 1, 2.

Dicranograptus nicholsoni arkansasensis Gurley, Jour. Geol., 4, 1896, p. 72.

Dicranograptus ramosus var. arkansasensis Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 329, figs. 257, 258.

Middle Ordovician: Arkansas (Normanskill); Great Britain (Glenkiln).

Cotype.—Cat. No. 54261, U.S.N.M.

DICRANOGRAPTUS RAMOSUS var. SPINIFER Elles and Wood. See Dicranograptus spinifer.

DICRANOGRAPTUS RAMULUS Herrman. See Dicranograptus nicholsoni whitianus.

Dicranograptus rectus Hopkinson.

Graptolithus ramosus Salter, Quart. Jour. Geol. Soc. London, 5, 1849, p. 16, pl. 1, fig. 7.

Dicranograptus rectus Hopkinson, Geol. Mag., 9, 1872, p. 508, pl. 12, fig. 10.—Elles and Wood, Mon. British Grapt., 4, 1904, p. 169, pl. 24, figs. 4a–c.

Ordovician: South Scotland (Glenkiln); Arkansas (Normanskill-Stringtown).

DICRANOGRAPTUS SEXTANS Hopkinson. See Dicellograptus sextans.

Dicranograptus spinifer (Lapworth) Elles and Wood.

Dicranograptus ramosus Hopkinson, Geol. Mag., 7, 1870, p. 358, pl. 16, fig. 5.—Lapworth, Belfast Nat. Field Club, Rep. and Proc., App., 1, pt. 4, 1877, p. 140, pl. 7, fig. 1.

Dicranograptus ramosus var. spinifer (Lapworth MS.) Elles and Wood, Mon. British Grapt., pt. 4, 1904, p. 176, pl. 24, figs. 8a–c.

Dicranograptus spinifer Lapworth, Geol. Soc. Quart. Jour. London, 38, 1882, p. 610.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 330–332, pl. 22; pl. 23, figs. 2, 3, figs. 259–263.

Middle Ordovician: Great Britain (Hartfell and Glenkiln); Glenmont, Stockport, and Mount Moreno, New York (Normanskill).

Dicranograptus spinifer geniculatus Ruedemann.

Dicranograptus spinifer var. geniculatus Ruedemann, Bull. New York State Mus., 11, pt. 2, 1908, pp. 333, 334, pl. 23, figs. 4–6, text figs. 265–267.

Chazyan (Normanskill): Glenmont, and Mount Moreno, New York.

DICRANOPELTIS Hawle and Corda. Genotype: Lichas scabra Beyrich.

Dicranopeltis Hawle and Corda, Abh. d. k. bohmischen Gesell. Wiss., 5, 1847 (extract), p. 141, pl. 7, fig. 75.—Gurich, Neues Jahrb. Min., Geol. Pal., 14, Beilage-Band, 1901, p. 525.—Reed, Quart. Jour. Geol. Soc. London, 58, 1902, pp. 63, 61; sec. B, pp. 71, 82.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 310.

Dicranopeltis arkansana (Van Ingen).

Arges arkansana Van Ingen, School of Mines Quart., 23, 1901, p. 61, fig. 19, pl. figs. 19–21.

Niagaran (St. Clair): St. Clair Springs, Independence County, Arkansas.

Dicranopeltis decipiens (Winchell and Marcy).

Lichas breviceps? Hall, Adv. sheets., 18th Rep. New York State Cab. Nat. Hist., 1865, p. 30 (not Hall, 1864); 20th Rep. New York State Cab. Nat. Hist., 1867, p. 334, p. 377, pl. 21, figs. 12–14; rev. ed., 1870, p. 424, pl. 21, figs. 12–14.

Lichas decipiens Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 104, pl. 3, fig. 11.

Lichas emarginatus Hall, 28th Rep. New York State Mus. Nat. Hist., mus. ed., 1879, p. 199.

Dicranopeltis decipiens Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 237, pl. 22, figs. 10, 11.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 311, fig. 1621f, g.

Niagaran (Racine): Bridgeport, Hawthorn, and Lemont, Illinois; Grafton, Wisconsin.

Dicranopeltis nasuta Weller.

Dicranopeltis nasuta Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 240, pl. 22, figs. 5–7.

Niagaran (Racine): Milwaukee, Wisconsin.

Dicranopeltis telleri Weller.

Dicranopeltis telleri Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 241, pl. 22, figs. 8–9.

Niagaran (Racine): Milwaukee, Wisconsin.

DICRANOPORA Ulrich. Genotype: Ptilodictya internodia Miller and Dyer.

Dicranopora Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, pp. 152, 166.—Miller, N. A. Geol. Pal., 1889, p. 300.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 389.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, p. 14.—Simpson, 14th Ann. Rep. State Geol. New York for the year 1894, 1897, p. 545.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 49.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 745.

Dicranopora emacerata (Nicholson).

Ptilodictya emacerata Nicholson, Ann. Mag. Nat. Hist., 4th ser., 15, 1875, p. 179, pl. 14, figs. 3–3b; Pal. Ohio, 2, 1875, p. 261, pl. 25, figs. 5–5b.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 826, figs.

Dicranopora emacerata Ulrich, Contr. Micro-Pal. Cambro-Sil., pt. 2, 1889, p. 40.—Whiteaves, Pal. Foss., 3, 1895, p. 118.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 827, pl. 32, figs. 13, 13b.

Maysville and Richmond: Cincinnati, Ohio, and vicinity; Stony Mountain, Manitoba; Anticosti.

Dicranopora fragilis (Billings).

Ptilodictya fragilis Billings, Catal. Sil. Foss. Anticosti, 1866, p. 9.

Stictopora fragilis Whitfield, Geol. Surv. Wisconsin, 4, 1882, p. 253, pl. 11, fig. 24.

Dicranopora fragilis—Continued.

Dicranopora fragilis Ulrich, Contr. Micro-Pal. Cambro-Sil., pt. 2, 1889, p. 40.—Whiteaves, Pal. Foss., 3, 1895, p. 118.

Richmond: Charleton Point, Anticosti (Charleton); Iron Ridge, Wisconsin (Maquoketa); Stony Mountain, Manitoba (Stony Mountain).

Dicranopora internodia (Miller and Dyer).

Ptilodictya internodia Miller and Dyer, Contr. to Pal., No. 2, 1878, p. 7, pl. 4, figs. 7, 7a.

Dicranopora internodia Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 166, pl. 7, figs. 9, 9a.—Miller, N. A. Geol. Pal., 1889, fig. 471 (p. 300).

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

DICRANOPORA LATA Ulrich. See Rhinidictya lata.

Dicranopora meeki (James).

Helopora meeki James, Paleontologist, No. 1, 1878, p. 3.

Dicranopora meeki Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 36, pl. 5, fig. 1.

Maysville (Mount Hope): Cincinnati, Ohio, and vicinity.

DICRANOPORA NITIDULA Miller. See Rhinidctya nitidula.

Dicranopora parva Ami. Not recognizable.

Dicranopora parva Ami, Canadian Rec. Sci., 5, 1892, p. 99.

Trenton: Gagnon's Beach, Quebec.

DICRANOPORA TRENTONENSIS Ulrich. See Rhinidictya trentonensis.

DICTUOCRINITES Conrad. See Receptaculites Defrance.

DICTUOLITES BECKII Hall. See Lithodictuon becki.

DICTYOCEPHALITES Bergeron. See Harpides Beyrich.

DICTYOCRINUS Hall. See Ischadites Murchison.

DICTYOCRINUS Conrad. See Receptaculites Defrance.

DICTYOGRAPTUS Moberg. See Dictyonema Hall.

DICTYOGRAPTUS (DESMOGRAPTUS) CANCELLATUS Hopkinson. See Desmograptus cancellatus.

DICTYOGRAPTUS RETICULATUS Ulrich. See Dictyonema arbusculum.

DICTYONELLA Hall. Genotype: Rhynchonella? reticulata Hall.

Dictyonella Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, p. 274.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, pp. 81, 99; Zittel-Eastman Textb. Pal., 1, 1896, p. 312; 2d ed., 1913, p. 396.—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. 209.

Eichwaldia Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, pp. 274–277, with figs.—Dall, Amer. Jour. Conch., 6, 1870, p. 98.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 307; 13th Ann. Rep. New York State Geol., 1895, p. 903.

Dictyonella anticostiensis (Billings).

Eichwaldia anticostiensis Billings, Cat. Sil. Foss. Anticosti, 1866, p. 10.

Dictyonella anticostiensis Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 211.

Richmond (Charleton): Near West End Lighthouse, Anticosti.

Dictyonella concinna (Hall).

Eichwaldia concinna Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, p. 278.—Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pl. 83, fig. 5.

Dictyonella concinna Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 211.—Foerste, Jour. Geol., 11, 1903, p. 709 (loc. occ.).

Niagaran (Brownsport): Perry and Decatur Counties, Tennessee.

Dictyonella corallifera (Hall).

Atrypa corallifera Hall, Pal. New York, 2, 1852, p. 281, pl. 58, fig. 5.

Eichwaldia corallifera Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, p. 278.

Dictyonella corallifera Schuchert, Bull. U. S. Geol., 87, 1897, p. 211.—Grabau, Bull. New York State Mus., 45, 1901, p. 179, fig. 83; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 179, fig. 83.

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

Dictyonella gibbosa (Hall).

Eichwaldia gibbosa Hall, 20th Rep. New York State Cab. Nat. Hist, 1867, p. 278.—Hall and Clarke, Pal. New York, 8, pt. 2, 1895, pl. 83, figs. 6, 7.

Dictyonella gibbosa Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 211.—Foerste, Jour. Geol., 11, 1903, p. 709.

Niagaran (Brownsport): Perry and Decatur Counties, Tennessee.

Dictyonella reticulata (Hall).

Rhynchonella? reticulata Hall, Trans. Albany Inst., 4, 1863, p. 217.

Eichwaldia reticulata Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, pp. 275–277, figs. 1–7; 28th Rep., ibid., 1879, p. 169, pl. 26, figs. 50–54; 11th Rep. State Geol. Indiana, 1882, p. 312, pl. 26, figs. 50–54.—Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 91, pl. 13, fig. 4.—Beecher and Clarke, Mem. New York State Mus., 1, 1889, p. 31, pl. 3, figs. 11–13.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 308, figs. 229–235; pl. 83, figs. 8–13.—Foerste, Geol. Ohio, 7, 1895, p. 594, pl. 25, fig. 4.

Dictyonella reticulata Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 211.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 210, fig. 247.

Silurian: Waldron, Indiana, and Newsom, Tennessee (Waldron); Dayton, Ohio (Brassfield); Wisconsin.

DICTYONEMA Hall. Genotype: Gorgonia? retiformis Hall;

Dictyonema Hall, Amer. Jour. Sci. Arts, 2d ser., 11, 1851, p. 401; Pal. New York, 2, p. 174.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 171.—Hall, Canadian Nat. Geol., 3, 1858, p. 174; Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 142; Pal. New York, 3, p. 15; Geol. Surv. Canada, dec. 2, 1865, p. 136; 20th Rep. New York State Cab. Hist., 1868, p. 218, rev. ed., p. 252.—Nicholson, Mon. British Grapt., 1872, p. 129.—Dames, Zeits. d. d. geol. Gesell., 25, 1873, p. 383.—Zittel, Handb. Pal., 1, 1879, p. 289.—Salter, Mem. Geol. Surv. Great Britain, 3, 1881, p. 331; 2d ed., p. 535.—Spencer, Bull. Mus. State Missouri, 1, 1884, p. 22; Trans. Acad. St. Louis, 4, 1884, pp. 262, 572.—Miller, N. A. Geol. Pal. 1889, p. 185.—Holm, Bihang till K. Sv. Vet.-Akad. Handl., 16, Afd. 4, No. 7, 1890, p. 4.—Moberg, Geol. Foren. Stockholm Forhandl., 13, 1891, p. 216; ibid, 16, 1894, p. 236.—Matthew, Trans. Royal Soc. Canada, 9, sec. 4, 1892, p. 33.—James, Jour. Cincinnati Soc. Nat. Hist., 16, 1892, p. 153.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 190.—Moberg, Geol. Foren. Stockholm Forhandl., 16, 1894, p. 236.—Tornquist, Geol. Foren. Stockholm Forhandl., 16, 1894, p. 380.—Gurley, Jour. Geol., 4, 1896, p. 81.—Koken, Die Leitfossilien, Leipzig, 1896, p. 327, fig. 239.—Wiman, Nat. Sci., 9, 1896, p. 243.—Frech, Leth. Geog., 1 Theil, Leth. Pal., 1, 3 Lief., 1897, p. 557.—Grabau, Bull.

DICTYONEMA—Continued.

Buffalo Soc. Nat. Sci., 6, 1899, p. 119; ibid, 7, 1901, p. 133; Bull. New York State Mus., 45, 1901, p. 133.—Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 591, 592.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 24.—Ruedemann, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 128.

Dictyograptus Hopkinson, Quart. Jour. Geol. Soc. London, 31, 1875, p. 667.—Moberg, Geol. Foren. Stockholm Forhandl., 16, 1894, p. 236.—Tornquist, ibid., 16, 1894, p. 380.

Dictyonema arbusculum (Ulrich).

Dictyonema irregularis James (not Hall), Paleontologist, 3, 1879, p. 22.

Dictyograptus reticulatus Ulrich, Cat. Foss. Cincinnati group, 1880, p. 61 (nom. nud.).

Inocaulis arbuscula Ulrich, Cincinnati Soc. Nat. Hist. Jour., 2, 1879, p. 28, pl. 7, figs. 27, 27a.—Gurley, Jour. Geol., 4, 1896, p. 300.

Calyptograptus? arbusculus Spencer, Acad. Sci. St. Louis Trans., 4, 1884, p. 563, footnote (gen. ref.).

Dictyonema arbusculum Gurley, in J. F. James, Cincinnati Soc. Nat. Hist. Jour., 1892, p. 153, 16, pt. 2.—Nickles, ibid., 20, 1902, p. 72.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 151–153, figs. 57, 58; Bull. New York State Mus., 162, 1912, p. 77, pl. 2, fig. 15.

Eden: Covington, Kentucky, and vicinity (Southgate); Indian Ladder, New York (Indian Ladder).

Holotype and *plesiotype*.—Cat. Nos. 54288, 54289, U.S.N.M.

Dictyonema areyi Gurley.

Dictyonema areyi (Gurley MS.) Ruedemann, Mem. New York State Mus., 11, 1908, p. 164, pl. 4, fig. 2; text fig. 73.

Clinton (Rochester): Rochester, New York.

Dictyonema canadense (Whiteaves).

Inocaulis Canadensis Whiteaves, Pal. Foss. Geol. Surv. Canada, 3, pt. 3, 1897, p. 149, pl. 17, fig. 4.

Dictyonema canadensis Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 131 (gen. ref.).

Black River or Richmond: Inmost Island, Lake Winnipeg, Canada.

DICTYONEMA (DESMOGRAPTUS) CANCELLATUM Ruedemann. See Desmograptus cancellatus.

Dictyonema crassibasale Gurley.

Dictyonema gracilis Spencer (not Hall), Canadian Nat., 8, 1878, p. 458; ibid., 10, 1882, p. 165; Trans. Acad. Sci. St. Louis, 4, 1884, pp. 573, 574, pl. 2, figs. 2, 3; Bull. Mus. Univ. State Missouri, 1, 1884, p. 24, pl. 2, figs. 2, 2a, 3.

Dictyonema crassibasale (Gurley MS.) Bassler, Bull. U. S. Nat. Mus., 65, 1909, pp. 19–24, pl. 3, fig. 1; text figs. 21–25.

Niagaran dolomite: Hamilton, Ontario.

DICTYONEMA DELICATULUM Dawson. See Dictyonema perexile.

Dictyonema desmoides Gurley.

Dictyonema desmoides (Gurley MS.) Bassler, Bull. U. S. Nat. Mus., 65, 1909, pp. 34, 35, pl. 4, fig. 3; text figs. 41–43.

Niagaran dolomite: Hamilton, Ontario.

Dictyonema expansum Spencer.

Dictyonema expansum Spencer, Trans. Acad. Sci. St. Louis, 4, 1884, pp. 464, 575, 576, pl. 2, fig. 1; Bull. Mus. Univ. State Missouri, 1, 1884, pp. 14, 25, 26, pl. 2, fig. 1.—Gurley, Jour. Geol., 4, 1896, pp. 96, 308.—Bassler, Bull. U. S. Nat. Mus., 65, 1909, pp. 31–33, figs. 36, 37.

Niagaran dolomite: Hamilton, Ontario.

Dictyonema filiramus Gurley.

Dictyonema filiramus (Gurley MS.) Bassler, Bull. U. S. Nat. Mus., 65, 1909, p. 34, figs. 38–40.

Niagaran dolomite: Hamilton, Ontario.

Dictyonema flabelliforme (Eichwald).

Gorgonia flabelliformis Eichwald, Sil. Schicht. in Estland, 1840, p. 207; Urwelt Russl., 1842, p. 45, tab. 1, fig. 6.

Fenestella flabelliformis Eichwald, Soc. Natur. Moscou, No. 1, 1854, p. 6; ibid., 1855, No. 4, p. 453.

Rhabdinopora flabelliformis Eichwald, Leth. Ross., 1860, p. 369.

Dictyograptus flabelliformis Brögger, Die sil Etagen 2 and 3, etc., 1882, p. 30, pl. 12, figs. 17–19.

Dictyonema flabelliformis Roemer, Zeits. d. d. geol. Gesell, 11, 1859, p. 558.—Tornquist, Lunds Univ. Arskrift, 2, 3, 1865, p. 22, pl. 1, fig. 14.—Tullberg, Bih. till K. Svenska Vet. -Akad. Handl., 6, No. 13, 1882.—Schmidt, Quart. Jour. Geol. Soc., 1862, p. 517.—Dawson, Rep., Peter Ridpath Mus., McGill, Univ., 1883, p. 16,—Moberg, Sver. Geol. Und. Afh. och. upps., ser. c, No. 109, 1890, p. 31.—Matthew, Trans. Roy. Soc. Canada, 9, 1892, p. 34, pl. 12, figs. 1–3b; Trans. Roy. Soc. Canada, 10, 1893, sec. 4, p. 10, footnote.—Wiman, Bull. Geol. Inst. Upsala, 2, pt. 2, 1895, p. 55, pl. 10, figs. 13, 14.—Matthew, Trans. New York Acad. Sci., 14, 1895, p. 262, 272, pl. 49, figs. 1, 2.—Wiman, Nat. Sci., 9, 1896, p. 245.—Roemer and Frech, Leth. Geog., 1 Theil, Pal. 1., 1897, p. 572, pl. 2, figs. 3a, b.—Dale, U. S. Geol. Surv., 19th Ann. Rep., pt. 3, 1899, p. 185.—Ruedemann, New York State Mus., 1903, p. 936; Mem. New York State Mus., 7, pt. 1, 1904, pp. 599–606, pl. 1, figs. 1–22, text figs. 26, 27.—Moberg, Lunds Univ., Arskrift, N. F. Afdeln, 2, vol. 2, No. 7, pl. 1, fig. 6, 1906.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 24, fig. 32.—Westergard, Lunds Univ. Arskrift, N. F., Afdeln, 2, vol. 5, No. 3, 1909, pl. 3, figs. 3–5.

Graptopora socialis Salter, Amer. Assoc. Proc., 11, 1857, p. 65.

Dictyonema sociale Salter, Mem. Geol. Surv., 3, 1866, p. 331, pl. 4, fig. 1.—Lapworth, Trans. Roy. Soc. Canada, 4, 1887, p. 168, sec. 4.

Dictyonema graptolithinum Kjerulf, Veiviser Christiania, 1865, pp. 1, 3, figs. 4, 5.

Bryograptus? multiramosus Gurley, Jour. Geol., 4, 1896, p. 64.

Dictyonema norvegicum Kjerulf, Veiviser Christiania, 1865, pp. 1, 2, figs. 1–3.

Dictyonema flabelliforme var. Norvegicum, Matthew, Trans. Roy. Soc. Canada, 9, sec. 4, 1892, p. 37.—Hahn, Ann. New York Acad. Sci., 22, 1912, p. 139.

Dictyonema flabelliforme var. Acadicum Matthew, Trans. Roy. Soc. Canada, 9, sec. 4, 1892, p. 36.—Hahn, Ann. New York Acad. Sci., 22, 1912, p. 137.

Dictyonema flabelliforme var. confertum Matthew, Trans. Roy. Soc. Canada, 9, sec. 4, 1892, p. 36.—Hahn, Ann. New York Acad. Sci., 22, 1912, p. 138.

Dictyonema flabelliforme ruedemanni Hahn, Ann. New York Acad. Sci., 22, 1912, p. 139.

Dictyonema flabelliforme desmograptus Hahn, Ann. New York Acad. Sci., 22, 1912, p. 139.

Dictyonema flabelliforme—Continued.

Canadian (Dictyonema flabelliforme bed): Esthonia, Russia, Sweden, Wales, Belgium, etc.; slate belt of Rensselaer and Washington Counties, New York; Vermont; St. John Basin, New Brunswick.

DICTYONEMA FLABELLIFORME var. ACADICUM Matthew. See Dictyonema flabelliforme.

DICTYONEMA FLABELLIFORME var. CONFERTUM Matthew. See Dictyonema flabelliforme.

DICTYONEMA FLABELLIFORME DESMOGRAPTUS Hahn. See Dictyonema flabelliforme.

DICTYONEMA FLABELLIFORME NORVEGICA Hahn. See Dictyonema flabelliforme.

DICTYONEMA FLABELLIFORME RUEDEMANNI Hahn. See Dictyonema flabelliforme.

Dictyonema furciferum Ruedemann.

Dictyonema n. sp. Ruedemann, New York State Pal., Ann. Rep., 1902, p. 570.

Dictyonema furciferum Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 606, 607, pl. 3, fig. 11, text fig. 28.

Callograptus grabaui Hahn, Annals New York Acad. Sci., 22, 1912, p. 142, figs.

Canadian: Deepkill, Rensselaer County, New York (Deepkill, Tetragraptus and D. bifidus zones); Bellefonte, Pennsylvania (base of Stonehenge); Point Levis, Quebec (Levis Diplograptus dentatus zone).

Dictyonema gracile Hall.

Gorgonia? Hall, Geol. New York, 4th Dist., 1843, p. 115, fig. 42.

Dictyonema gracilis Hall, Pal. New York, 2, 1852, p. 175, pl. 40G, fig. 1a-d.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 7, fig. 2.—Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 225.—Rominger, Geol. Surv. Michigan, 1, pt. 3, 1873, p. 44.—Lesquereux, Geol. Surv. Indiana, 13th Rep., 1883, p. 30.—Pocta, Syst. Sil. Centre Boheme, 8, 1894, p. 193.—Gurley, Jour. Geol., 4, 1896, p. 308.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 25, fig. 34.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 157, pl. 1, fig. 5, text figs. 65–68.

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

DICTYONEMA GRACILIS Spencer. See Dictyonema crassibasale.

Dictyonema grande Nicholson.

Dictyonema grandis Nicholson, Ann. Mag. Nat. Hist., 4th Ser., 11, 1873, p. 134, fig. 1.

Canadian (Levis): Point Levis, Quebec.

DICTYONEMA GRAPTOLITHINUM Kjerulf. See Dictyonema flabelliforme.

DICTYONEMA HISINGERI Göppert. See Dictyonema flabelliforme.

Dictyonema irregulare Hall.

Dictyonema irregularis Hall, Geol. Surv. Canada, dec. 2, 1865, p. 136, pl. 20, figs. 1, 2.—Hoek, Neues Jahrb. Min., Geol., Pal., 34, 1912, p. 225, pl. 2, figs. 3–5.

Canadian: Point Levis, Quebec (Levis, Diplograptus dentatus zone); Bolivia.

DICTYONEMA IRREGULARIS James. See Dictyonema arbusculum.

Dictyonema multiramosum Ruedemann.

Dictyonema multiramosum Ruedemann, Bull. New York State Mus., 162, 1912, p. 78, pl. 2, fig. 16.

Trenton (Schenectady): Rotterdam Junction, New York.

Dictyonema murrayi Hall.

Dictyonema murrayi Hall, Canadian Org. Rem., Geol., Surv. Canada, dec. 2, 1865, p. 138, pl. 20, figs. 6, 7.—Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, p. 606, pl. 3, fig. 12.

Canadian: Point Levis, Quebec (Levis, Clonograptus zone), Rensselaer County, New York (Deepkill).

Plesiotype.—Cat. No. 54287, U.S.N.M.

Dictyonema murrayi tarijense Hoek.

Dictyonema murrayi var. tarijense Hoek, Neues Jahrb. Min., Geol., Pal., 34, 1912, p. 224, pl. 12, figs. 1, 2.

Lowest Ordovician: Tarija, Bolivia.

Dictyonema neenah Hall.

Dictyonema neenah Hall, Rep. Geol. Surv. Wisconsin, 1861, p. 7; 20th Rep. New York State Cab. Nat. Hist., 1878, p. 225.—Pocta, Syst. Sil. Centre Boheme, 8, 1894, p. 193.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, pl. 5, fig. 13, p. 47.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 150.

Black River (Platteville): Fox River, near Appleton, Wisconsin.

Dictyonema norvegicum Kjerulf. See Dictyonema flabelliforme.

Dictyonema obovatum Gurley.

Dictyonema obovatum Gurley, Ann. Rep. Geol. Surv. Arkansas, 1890, 3, 1892, p. 418; Jour. Geol., 4, 1896, p. 300.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 151.

Chazyan (Normanskill-Stringtown): Near Crystal Springs, Arkansas.

Dictyonema parallelum Gurley.

Dictyonema parallelum (Gurley MS.) Bassler, Bull. U. S. Nat. Mus., 65, 1909, pp. 37, 38, pl. 4, fig. 2, text fig. 47.

Niagaran dolomite: Hamilton, Ontario.

Dictyonema percrassum Gurley.

Dictyonema percrassus (Gurley MS.) Bassler, Bull. U. S. Nat. Mus., 65, 1909, pp. 35, 36, figs. 44, 45.

Niagaran dolomite: Hamilton, Ontario.

Dictyonema perexile Gurley.

Dictyonema delicatulum Dawson (not Lapworth), Canadian Nat. Geol., 10, 1883, p. 461 (footnote).—Matthew, Trans. Royal Soc. Canada, 10, sec. 4, 1893, p. 96.

Canadian: Point Levis, Quebec (Levis); St. John, New Brunswick (Bretonian—Div. C3d).

Dictyonema pergracilis Hall. See Desmograptus pergracilis.

Dictyonema pertenue Foerste.

Dictyonema pertenue Foerste, Bull. Sci. Lab. Denison Univ., 2, pt. 1, 1887, p. 107, pl. 8, fig. 27a, b; Geol. Surv. Ohio, Pal., 7, 1893, p. 600, pl. 27, figs. 27a, b.—Gurley, Jour. Geol., 4, 1896, p. 308.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 153, figs. 59, 60.

Upper Medinan (Brassfield): Soldiers Home near Dayton, Ohio.

Dictyonema polymorphum Gurley.

Dictyonema tenellum Spencer, Trans. Acad. Sci. St. Louis, 4, 1884, pl. 1, fig. 13 (not description, p. 576); Bull. Mus. Univ. State Missouri, 1, 1884, pl. 1, fig. 13 (not description, p. 26).

Dictyonema polymorphum—Continued.

Calyptograptus subretiformis Spencer (part), Trans. Acad. Sci. St. Louis, 4, 1884, pl. 4, fig. 2; Bull. Mus. Univ. State Missouri, 1, 1884, pl. 4, fig. 2.

Dictyonema polymorphum (Gurley MS.) Ruedemann, Mem. New York State Mus., 11, 1908, p. 158, pl. 2, fig. 3; pl. 3, figs. 4, 5, 6; p. 160, figs. 60–72.—Bassler, Bull. U. S. Nat. Mus., No. 65, 1909, p. 24, pl. 4, fig.11.

Niagaran: Hamilton, Ontario; Middleport, New York (Rochester).

Holotype.—Cat. No. 54278, U.S.N.M.

Dictyonema quadrangulare (Hall).

Dictyonema quadrangularis Hall, Geol. Surv. Canada, dec. 2, 1865, p. 138, pl. 20, fig. 5.—Matthew, Trans. Royal Soc. Canada, 10, sec. 4, 1893, p. 96.

Canadian: Point Levis, Quebec (Levis, Clonograptus zone); St. John, New Brunswick (Bretonian—Div. C3d).

Dictyonema rectilineatum Ruedemann.

Dictyonema n. sp. Ruedemann, New York State Pal. Ann. Rep., 1902, p. 570.

Dictyonema rectilineatum Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 607–609, pl. 3, figs. 9, 10, text fig. 29.

Canadian: Deepkill, Rensselaer County, New York (Deepkill, Diplograptus dentatus zone); Point Levis, Quebec (Levis, dentatus zone).

Dictyonema retiforme (Hall).

Gorgonia? reteformis Hall, Rep. Surv. 4th Geol. Dist. New York, 1843, p. 115, fig. 1.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 260, figs.

Dictyonema retiformis Hall, Pal. New York, 2, 1852, p. 174, pl. 40F, fig. 1a, b.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, p. 55, pl. 7, fig. 1.—Hall, Geol. Surv. Canada, dec. 2, 1865, p. 12, fig. 10; 20th Rep. New York State Cab. Hist., 1868, p. 178, fig. 11; rev. ed., 1870, p. 210, fig. 11; p. 225.—Nicholson, Mon. British Grapt., 1872, p. 129, fig. 69.—Zittel, Handb. Pal., 1, 1879, p. 289, fig. 195.—Spencer, Bull. Mus. Univ. State Missouri, 1, 1884, p. 14, 23, 24, pl. 3, figs. 1, 1a, 2, 2a; Trans. Acad. Sci. St. Louis, 4, 1884, p. 573, pl. 3, fig. 1, 2.—Miller, N. A. Geol. Pal., 1889, p. 185, text fig. 168.—Pocta, Syst. Sil. Centre Boheme, 8, 1894, p. 192, 193.—Gurley, Jour. Geol., 4, 1896, pp. 96, 308.—Roemer and Frech, Leth. geog., 1 Theil, Leth. Pal., 1, 3 Lief., 1897, p. 575, fig. 145.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 133, fig. 27; Bull. New York State Mus., 45, 1901, pp. 133, 134, fig. 27.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 25, fig. 33.—Ruedemann, Mem. New York State Mus., 11, 1908, p. 155, fig. 64, pl. 3, fig. 1.—Bassler, Bull. U. S. Nat. Mus., 65, 1909, pp. 18, 19, figs. 19, 20.

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

Dictyonema robustum Hall.

Dictyonema robusta Hall, Geol. Surv. Canada, dec. 2, 1865, p. 137, pl. 20, figs. 3, 4.

Canadian (Levis, Clonograptus zone): Point Levis, Quebec.

Dictyonema scalariforme Foerste.

Dictyonema scalariforme Foerste, Bull. Sci. Lab. Denison Univ., 2, pt. 1, 1887, p. 108, pl. 8, figs. 28, 29; Geol. Surv. Ohio, Pal., 7, 1893, p. 600, pl. 27, figs. 28, 29.—Gurley, Jour. Geol., 4, 1896, p. 308.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 153, pl. 1, fig. 3, text figs. 61–63.

Upper Medinan (Brassfield): Soldiers Home, Dayton, Ohio.

Clinton shale: Near Clinton, New York.

Dictyonema sociale Salter. See Dictyonema flabelliforme.

Dictyonema spenceri Gurley.

Dictyonema spenceri (Gurley MS.) Bassler, Bull. U. S. Nat. Mus., 65, 1909, pp. 36, 37, pl. 4, fig. 1, text fig. 46.

Niagaran dolomite: Hamilton, Ontario.

Dictyonema spiniferum Ruedemann.

Dictyonema spiniferum Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 151, pl. 1, fig. 4, text figs. 55, 56.

Chazyan (Normanskill): Glenmont, Albany County, New York.

Dictyonema splendens Billings.

Dictyonema splendens Billings, Pal. Foss., Geol. Surv. Canada, 2, pt. 1, 1874, p. 12, fig. 2, 2a.—Spencer, Bull. Mus. Univ. State Missouri, 1, 1884, p. 27; Trans. Acad. Sci. St. Louis, 4, 1884, p. 577.—Foerste, Bull. Sci. Lab. Denison Univ., 2, pt. 1, 1887, p. 108.

Dictyonema cf. splendens Clarke, Mem. New York State Mus., 3, 1900, p. 64.

Silurian or Helderbergian: Between Cape Gaspe and Cape Rosier, Canada.

Dictyonema stenactinotum Gurley.

Dictyonema stenactinotum (Gurley MS.) Bassler, Bull. U. S. Nat. Mus., 65, 1909, pp. 30, 31, pl. 3, fig. 2, text fig. 34.

Niagaran dolomite: Hamilton, Ontario.

Dictyonema subretiforme (Spencer).

Calyptograptus subretiformis Spencer, Canadian Nat., n. s., 8, 1880, pp. 458, 460; ibid., 10, 1882, p. 165; Bull. Mus. Univ. State Missouri, 1, 1884, p. 28, pl. 4, fig. 1 (not fig. 2); Trans. Acad. Sci. St. Louis, 4, 1884, p. 578, pl. 4, fig. 1 (not fig. 2).—Gurley, Jour. Geol., 4, 1896, pp. 93, 308.

Dictyonema subretiforme Ruedemann, Mem. New York State Mus., 11, 1908, p. 162, pl. 2, figs. 1, 2.—Bassler, Bull. U. S. Nat. Mus., 65, 1909, pp. 26–28, figs. 30, 31.

Niagaran: Hamilton, Ontario; Middleport, New York (Rochester).

Dictyonema tenellum Spencer (part). See Dictyonema polymorphum.

Dictyonema tenellum Spencer.

Dictyonema tenellum Spencer, Canadian Nat., n. s., 8, 1878, pp. 458, 459; ibid., 10, 1882, p. 165; Trans. Acad. Sci. St. Louis, 4, 1884, pp. 564, 576 (not pl. 1, fig. 13); Bull. Mus. Univ. State Missouri, 1, 1884, pp. 14, 26 (not pl. 1, fig. 13).—Miller, N. A. Geol. Pal., 1889, p. 185.—Gurley, Jour. Geol., 4, 1896, pp. 96, 308.—Bassler, Bull. U. S. Nat. Mus., 65, 1909, pp. 28–30, pl. 2, fig. 4, text figs. 32, 33.

Niagaran dolomite: Hamilton, Ontario.

Dictyonema websteri Dawson.

Dictyonema websteri Dawson, Acadian Geol., Suppl. Chap., 1860, p. 60, fig. 46; ibid., 2d ed., 1868, p. 563, fig. 196; Canadian Nat. Geol., 5, 1860, p. 139, fig. 2—Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 225.—Spencer, Trans. Acad. Sci. St. Louis, 4, 1884, p. 576; Bull. Mus. Univ. State Missouri, 1, 1884, p. 26.—Ruedemann, Proc. and Trans. Nova Scotian Inst. Sci., 11, pt. 4, 1908, p. xlvii.

Silurian: Kings County, Nova Scotia.

Dictyophyton becki Miller. See Lithodictuon becki.

Dictyophytra Rauff. Not recognized.

Dictyophytra (? in place of Dictyophyton) Rauff, Palæontographica, 40, 1894, p. 249.

Observation.—Dictyophytra was proposed by Rauff probably to replace Dictyophyton, but its description was not given.

DICTYOPHYTRA? WALCOTTI Rauff. See Cyathophycus walcotti.

DICTYORHABDUS Walcott. Genotype: D. priscus Walcott.
Dictyorhabdus Walcott, Bull. Geol. Soc. Amer., 3, 1892, p. 165.

Dictyorhabdus priscus Walcott.
Dictyorhabdus priscus Walcott, Bull. Geol. Soc. Amer., 3, 1892, p. 165, pl. 3, figs. 1–5.
Black River (Harding): Canon City, Colorado.

DICTYOSTOMA Spencer. See Dictyostroma Nicholson.

DICTYOSTOMA RETICULATUM Spencer. See Ceramoporella reticulata.

DICTYOSTROMA Nicholson. Genotype: D. undulatum Nicholson.
Dictyostroma Nicholson, Pal. Ohio, 2, 1875, p. 254.—Nicholson and Murie, Jour. Linn. Soc. London, Zool., 14, p. 224.—Zittel, Handb. Pal., 1, 1879, p. 286.—Dawson, Quart. Jour. Geol. Soc. London, 35, 1879, p. 56.—Nicholson, Mon. British Strom., Pal. Soc., 1886, p. 85.—Waagen and Wentzel, Mem. Geol. Surv. Indica, Pal. Indica, 13th ser., 1, 1888, p. 944.—Miller, N. A. Geol. Pal., 1889, p. 158.—Parks, Univ. Toronto Studies, Geol. Ser., 5, 1908, p. 56.
Dictyostoma Spencer, Trans. Acad. Sci. St. Louis, 4, 1884, p. 601; Bull. Mus. Univ. State Missouri, 1, 1884, p. 51.
Milleria Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, expl. of pl. 46 (Genotype: M. laminata Davis).
Observation.—Dictyostroma is not a stromatoporoid, but is a coral closely allied if not identical with Cœnites.

DICTYOSTROMA RETICULATUM Whiteaves. See Ceramoporella reticulata.

Dictyostroma undulatum Nicholson.
Dictyostroma undulatum Nicholson, Pal. Ohio, 2, 1875, p. 254, pl. 24, figs. 6, 6c.—Nicholson and Murie, Jour. Linn. Soc. Zool., 14, 1878, p. 224.—Miller, N. A. Geol. Pal., 1889, p. 158, fig. 101.—Nicholson, Mon. British Strom., 1892, pp. 85, 232.—Parks, Univ. Toronto Studies, Geol. Ser., 5, 1908, p. 57, pl. 14, figs. 3, 4; pl. 15, figs. 3, 4, 7, 8.
Alveolites stromatoporoides Rominger, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 55.
Milleria laminata Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 46, fig. 9.
Niagaran (Louisville): Louisville, Kentucky.

DIDYMOGRAPSUS Pictet. See Didymograptus McCoy.

DIDYMOGRAPSUS CADUCEUS Salter. See Tetragraptus serra and T. similis.

DIDYMOGRAPSUS CONVEXUS Gurley. See Didymograptus sagittarius.

DIDYMOGRAPSUS DIVARICATUS. See Dicellograptus divaricatus.

DIDYMOGRAPSUS GEMINUS Nicholson. See Didymograptus nanus.

DIDYMOGRAPSUS MURCHISONI FURCILLATUS Gurley. See Didymograptus furcillatus.

DIDYMOGRAPTUS McCoy. Genotype: D. murchisoni McCoy.
Didymograpsus McCoy, British Pal. Fossils, pt. 2, 1851, p. 9.—Chapman, Canadian Jour., n. s., 1, 1856, p. 389.—Pictet, Traité de Pal., 2d ed., 4, 1857, p. 474.—Nicholson, Quart. Jour. Geol. Soc. London, 24, 1868, p. 9, 138.—Carruthers, Geol. Mag., 5, 1868, pp. 73, 128.—Nicholson, Ann. Mag. Nat. Hist., 4th ser., 5, 1870, p. 337; Mon. British Grapt., 1872, p. 103.

DIDYMOGRAPTUS—Continued.

Didymograptus Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, pp. 217, 234; 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. 14.—Miller, N. A. Geol. Pal., 1889, p. 185.—Tornquist, Lunds Univers. Arsskrift, 26, No. 4, 1890, p. 15.—Barrois, Ann. Soc. Geol. du Nord, 21, Lille, 1893, p. 108.—Holm, Sveriges Geol. Unders., ser. C, No. 150, 1895, p. 15; Geol. Foren. Stockholm Forhandl., 17, 1895, p. 331; Geol. Mag., dec. 4, 2, 1895, pp. 433, 439, pl. 14, figs. 1–3, 7, 8.—Nicholson and Murie, Geol. Mag., dec. 4, 2, 1895, pp. 530–535, figs.—Koken, Die Leitfossilien, Leipzig, 1896, p. 328.—Wiman, Bull. Geol. Inst. Univ. Upsala, 2, pt. 2, No. 4, 1896, p. 266; Nat. Sci., 9, 1896, p. 191.—Walther, Zeits. d. d. geol. Gesell., 49, 1897, p. 251.—Roemer and Frech, Leth. geog., 1 Theil, Leth. Pal., 1, 3 Lief., 1897, p. 587.—Ruedemann, Amer. Nat., 32, 1898, p. 5; Zittel-Eastman Textb. Pal., 1, 1900, p. 118.—Tornquist, Lunds Univers. Arsskrift, 37, No. 5, 1901, p. 10.—Elles and Wood, Mon. British Grapt., Pal. Soc., 1901, p. 5.—Ruedemann, Mem. New York State Mus., 7, 1904, p. 666, 668.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 30.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 247; Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 129.

Didymograptus acutidens Lapworth.

Didymograptus affinis Hopkinson, Quart. Jour. Geol. Soc., 31, 1875, pl. 33, figs. 6b, c.

Didymograptus acutidens (Lapworth MS.) Elles and Wood, Mon. British Grapt., pt. 1, Pal. Soc., 1901, p. 25, pl. 2, figs. 3a–d.—Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 683, 684, pl. 13, fig. 15, text figs. 77, 78.

Canadian: St. Davids District, Wales, and South Shropshire, England (Arenig); Deepkill, Rensselaer County, New York (Deepkill, Didymograptus bifidus zone).

DIDYMOGRAPTUS AFFINIS Hopkinson. See Didymograptus acutidens.

Didymograptus arcuatus (Hall).

Graptolithus arcuatus Hall, Geol. Surv. Canada, dec. 2, 1865, p. 79, pl. 2, figs. 6–10.

Graptolithus (Monoprion) arcuatus Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 226; rev. ed. (1870), p. 260; p. 223.

Didymograpsus arcuatus Gurley, Jour. Geol., 4, 1896, p. 96 (gen. ref.).

Didymograptus arcuatus Elles and Wood, Mon. British Grapt., Pal. Soc., 1903, p. li (gen. ref.).

Canadian (Levis, Didymograptus zone): Point Levis, Quebec.

Didymograptus bifidus (Hall).

Graptolithus bifidus Hall, Canadian Nat. and Geol., 3, 1858, p. 164; Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 130; Geol. Surv. Canada, dec. 2, 1865, p. 73, pl. 1, figs. 16–18; pl. 3, figs. 9, 10.

Graptolithus (Monoprion) bifidus Hall, 20th Rep. New York State Cab. Nat. Hist. 1869, p. 226, pl. 3, figs. 13, 14; rev. ed., 1870, p. 241; p. 223.

Didymograptus bifidus Nicholson, Quart. Jour. Geol. Soc. London, 24, 1868, p. 136; Ann. Mag. Nat. Hist., 4th ser., 5, p. 346, fig. 7.—Hopkinson, Quart. Jour. Geol. Soc., 31, 1875, p. 646, pl. 33, figs. 8a–e.—Brögger, Die sil. Etagen 2, 3, etc. Kristiania, 1882, p. 41.—Herrmann, Geol. Mag., 3d ser., 3, 1886, p. 15.—Ami, Geol. Surv. Canada Rep., 2d ser., 3, pt. 2, 1889, p. 116k.—Barrois, Ann. de la Soc. Geol. du Nord., 20, 1892, p. 92.—Elles, Quart. Jour. Geol. Soc. London, 54, 1898, p. 511.—Elles and Wood, Mon. British Grapt., pt. 1, Pal.

Didymograptus bifidus—Continued.

Soc., 1901, p. 42, figs. 26a–b, pl. 4, figs. 1a–f; p. 6, figs. 1, 2.—Ruedemann, New York State Pal. Ann. Rep., 1902, pp. 566, 567; Mem. New York State Mus., 7, pt. 1, 1904, pp. 689–692, pl. 15, figs. 1–3, text figs. 86, 87.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 31, fig. 47c, 48.

Canadian: Point Levis, Quebec (Levis, Didymograptus bifidus zone); Deepkill, Rensselaer County, New York (Deepkill, D. bifidus zone); Nevada; South Scotland and Wales (Arenig); England; Scandinavia; Bohemia; France.

Didymograptus bipunctatus (Gurley).

Didymograpsus bipunctatus Gurley, Jour. Geol., 4, 1896, p. 65, pl. 5, figs. 7, 7a.

Canadian (Levis): Near Point Levis, Quebec.

Didymograptus caduceus of authors. See Tetragraptus similis, Didymograptus (Isograptus) caduceus and T. similis.

Didymograptus (Isograptus) caduceus (Salter).

Didymograpsus caduceus Salter (part), Quart. Jour. Geol. Soc. London, 9, 1853, p. 87, fig. 1a; ibid., 19, 1863, p. 138, fig. 13a.

Graptolithus caduceus Chapman, Canadian Jour., n. s., 1, 1856, p. 390, fig. 3.

Graptolites (Didymograpsus) caduceus McCoy, Pal. Geol. Surv. Victoria, Prodr. Pal. Victoria, dec. 2, 1874, p. 30, pl. 20, figs. 3–5a.

Didymograptus caduceus T. S. Hall, Proc. Royal Soc. Victoria, n. s., 8, 1896, p. 69.

Didymograptus (Isograptus) caduceus Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 693–698, pl. 15, figs. 6, 7, text fig. 89.

Tetragraptus caduceus Brögger, Die Sil. Etagen 2, 3, Kristiania, 1882, p. 39.

Didymograptus gibberulus Nicholson, Ann. Mag. Nat. Hist., 4th ser., 16, 1875, p. 271, pl. 7, figs. 3, 3a, 3b.—Moberg, Geol. Foren. Stockh. Forh., 13, 1891, p. 221.—Holm, Sver. Geol. Und. Afh. och upps., ser. C, No. 150, 1895, p. 18.—Elles, Quart. Jour. Geol. Soc., 54, 1898, p. 496.—Elles and Wood, Mon. British Grapt., pt. 1, Pal. Soc., 1901, p. 52, figs. 33a, b; pl. 2, figs. 9a–e.

Didymograptus (Isograptus) gibberulus Roemer and Frech, Leth. Pal., 1, 1897, p. 93, fig. 161.

Isograptus gibberulus Moberg, Geol. Foren. Stockh. Forh., 14, 1892, p. 346, pl. 8, figs. 3–7.—Tornquist, Lunds Univ. Arsskrift, 37, Afd. 2, 1901, p. 23, pl. 3, figs. 16–19.

Tetragraptus bryonoides Etheridge, jr., Ann. Mag. Nat. Hist., 4th ser., 1874, 14, p. 2, pl. 3, figs. 3, 4.

Phyllograptus stella Hopkinson, Quart. Jour. Geol. Soc. London, 31, 1875, p. 658, pl. 34, fig. 6.

Lower Ordovician: England (Skiddaw); Wales (Arenig); Scandinavia; Australia; Deepkill, Rensselaer County, New York (Deepkill, Didymograptus bifidus zone); Point Levis, Quebec (Levis, Diplograptus dentatus zone); Arkansas.

Didymograptus caduceus nanus Ruedemann.

Didymograptus caduceus nanus Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, p. 698, pl. 15, figs. 8, 9, text fig. 90.

Canadian: Deepkill, Rensselaer County, New York (Deepkill, Diplograptus dentatus zone); Point Levis, Quebec (Levis, D. dentatus zone); Arkansas.

Didymograptus cuspidatus Ruedemann.

Didymograptus cuspidatus Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 684, 685, pl. 13, fig. 16, text figs. 79, 80.

Canadian (Deepkill, Diplograptus dentatus zone): Mt. Moreno, Columbia County, New York.

DIDYMOGRAPTUS DIVARICATUS Nicholson. See Dicellograptus divaricatus.

DIDYMOGRAPTUS? ELEGANS Ruedemann. See Monograptus elegans.

Didymograptus ellesæ Ruedemann.

Didymograptus (Leptograptus) (part.) Ruedemann, New York State Pal. Ann. Rep., 1902, p. 589.

Didymograptus ellesi Ruedemann, Mem. New York State Mus., 7, 1904, pt. 1, pp. 682, 683, pl. 14, figs. 22–24, text figs. 75, 76. (Corrected to ellesæ in 1908, Mem. 11, pt. 2, p. 134.)

Canadian (Deepkill, Didymograptus bifidus zone): Deepkill, Rensselaer County, New York.

Didymograptus euodus Lapworth.

Didymograptus euodus Lapworth, Quart. Jour. Geol. Soc. London, 31, 1875, p. 645, pl. 35, fig. 1a–c.—Elles and Wood, Mon. British Grapt., pt. 1, Pal. Soc., p. 21, pl. 1, figs. 10a, b.

Ordovician (Lower Llandeilo): Abereiddy Bay, St. David's District, Wales.

Canadian (Upper Tetragraptus zone): Twelve miles west of Little Rock, Arkansas.

Didymograptus extensus (Hall).

Graptolithus extensus Hall, Geol. Surv. Can. Rep., 1858, p. 132; Canadian Nat. Geol., 3, 1858, p. 166; Geol. Surv. Canada, dec. 2, p. 80, pl. 2, figs. 11–16.

Graptolithus (Monoprion) extensus Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 195, pl. 3, fig. 12; rev. ed., 1870, p. 225, pl. 3, fig. 12, p. 228.

Didymograptus extensus Nicholson, Ann. Mag. Nat. Hist., 4th ser., v. 1870, 5, 341, pl. 7, figs. 2, 2a.—Hopkinson, Quart. Jour. Geol. Soc., 31, 1875, p. 642, pl. 33, figs. 1a–1d.—Brögger, Die Sil. Etagen 2, 3, 1882, p. 40, Kristiania.—Herrmann, Geol. Mag., dec. 3, 3, 1886, p. 14.—Lapworth, Proc. and Trans. Roy. Soc. Can., 4, 1887, pp. 168, 184.—Ami, Geol. Sur. Can. Rep., 2d ser., 3, pt. 2, 1889, p. 116k.—Roemer and Frech, Leth. Pal., 1, 1897, p. 591.—Elles, Quart. Jour. Geol. Soc., London, 54, 1898, p. 504.—Tornquist, Lunds Univ. Arsskrift, 37, Af. 2, Nr. 5, 1901, p. 14, pl. 1, figs. 25–30.—Elles and Wood, Mon. British Grapt., pt. 1, Pal. Soc., 1901, p. 8, pl. 1, figs. 1a, b., text figs. 4a–d.—Ruedemann, New York State Pal., Ann. Rep., 1902, p. 556; Mem. New York State Mus., 7, pt. 1, 1904, pp. 668–671, pl. 13, figs. 17, 18; pl. 14, figs. 1–4; text figs. 62–65.

Didymograpsus extensus Gurley, Jour. Geol., 4, 1896, p. 96 (gen. ref.).

Graptolites (Didymograptus) extensus McCoy, Geol. Surv. Victoria, Prodr. Pal., dec. 2, 1875, p. 29, pl. 20, figs. 1, 1a.

Graptolithus constrictus Hall (part), Geol. Surv. Canada, Can. Org. Rem., dec. 2, 1865, p. 76, pl. 1, figs. 23–27.

Canadian: Point Levis, Quebec (Levis, Didymograptus zone); Deepkill, Rensselaer County, New York (Deepkill, Tetragraptus zone); Arkansas; South Scotland; Wales (Arenig); Wales (Skiddaw); Christiania; Scania; Australia.

Didymograptus extenuatus (Hall).

Graptolithus extenuatus Hall, Geol. Surv. Canada, dec. 2, 1865, p. 75, pl. 1, figs. 21, 22.

Graptolithus (Monoprion) extenuatus Hall, 20th Rep. New York State Cab. Hist., 1868, p. 226; rev. ed., 1870, p. 241.

Didymograpsus extenuatus Gurley, Jour. Geol., 4, 1896, p. 96 (gen. ref.).

Didymograptus extenuatus Elles and Wood, Mon. British Grapt., Pal. Soc., 1903, p. 1i (gen. ref.).

Canadian (Levis, Diplograptus dentatus zone): Point Levis, Quebec.

Didymograptus filiformis Tullberg.

Didymograptus filiformis Tullberg, Geol. Fören. Stockh. Forh., 5, 1880, 42, pl. 2, figs. 8–11.—Lapworth, Ann. Mag. Nat. Hist., 5th ser., 6, 1880, p. 20.—Brögger, Die sil. Etagen 2, 3, 1882, p. 39.—Tullberg, Sver. Geol. Und., Afh. och upps. ser. C, 50, 1882, p. 22.—Törnquist, Lunds Univ. Arsskrift, 37, Af. 2, nr. 5, 1901, pl. 3, figs. 6–9.—Elles and Wood, Mon. British Grapt., pt. 1, Pal. Soc., 1901, p. 32, fig. 20.—Ruedemann New York State Pal., Ann. Rep., 1902, p. 556; Mem. New York State Mus., 7, pt. 1, 1904, pp. 686, 687, pl. 14, figs. 8–14.

Lower Ordovician: Scania, Westrogothia; Norway; Scotland (Arenig); Deepkill, Rensselaer County, and Mount Moreno, near Hudson, New York (Deepkill, Tetragraptus and Diplograptus dentatus zones).

Didymograptus forcipiformis Ruedemann.

Didymograptus forcipiformis Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 699, 700, pl. 15, figs. 10–13; text fig. 91.

Canadian: Mount Moreno, Columbia County, New York (Deepkill, Diplograptus dentatus zone); Point Levis, Quebec (Levis, D. dentatus zone).

Didymograptus fruticosus Etheridge. See Tetragraptus fruticosus.

Didymograptus furcillatus Lapworth.

Didymograptus furcillatus Lapworth, Quar. Jour. Geol. Soc. London, 31, 1875, p. 649, pl. 35, figs. 3a–3d.

Didymograpsus murchisoni furcillatus Gurley, Jour. Geol., 4, 1897, p. 97.

Ordovician: Wales (Lower Llandeilo): Point Levis, Quebec (Levis).

Didymograptus gibberulus Nicholson. See Didymograptus (Isograptus) caduceus.

Didymograptus gracilis Törnquist.

Didymograptus gracilis Törnquist, Under. ofver. Siljans. Graptoliter 1 (Aftryck ur Lunds Univ. Arsskrift. 26), 1891, p. 17, pl. 1, figs. 9–12.—Holm, Geol. Fören. Stockh. Forh. 17, H 3, 1895, pl. 1, figs. 7, 8.—Elles, Quar. Jour. Geol. Soc., 54, 1895, p. 506.—Elles and Wood, Mon. British Grapt., pt. 1, 1901, p. 24, pl. 2, fig. 2.—Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 679–681, figs. 15–21, pl. 14.

Didymograptus (Leptograptus) gracilis Ruedemann, New York State Pal.. Ann. Rep., 1902, p. 589, fig. 17.

Lower Ordovician: Dalarne, Sweden (Phyllograptus shales); England (Skiddaw); Deepkill, Rensselaer County, etc., New York (Deepkill, Didymograptus bifidus zone).

Didymograptus incertus Ruedemann.

Didymograptus sp. nov. Ruedemann, New York State Pal., Ann. Rep., 1902, p. 570.

Didymograptus incertus Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 700, 701, pl. 15, fig. 14, text fig. 92.

Canadian (Deepkill, Diplograptus dentatus zone): Deepkill, Rensselaer County, New York.

Didymograptus indentus (Hall).

Graptolithus indentus Hall, Canadian Nat. Geol., 3, 1858, p. 163; Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 128; Geol. Surv. Canada, dec. 2, 1865, p. 74, pl. 1, fig. 20.

Graptolithus (Monoprion) indentus Hall, 20th Rep. New York State Cab. Hist., 1868, p. 226; rev. ed., 1870, p. 260; p. 223.

Didymograptus indentus—Continued.

Didymograptus indentus Hopkinson, Quart. Jour. Geol. Soc. London, 31, 1875, p. 647, pl. 33, figs. 7a–7c.—Barrois, Ann. Soc. Geol. du Nord, 20, 1892, p. 93.—Matthew, Trans. Royal Soc. Canada, 10, sec. 4, 1893, p. 99.—Elles, Quart. Jour. Geol. Soc. London, 54, 1898, p. 510.

Canadian: Point Levis, Quebec (Levis, Didymograptus zone); St. John, New Brunswick (Bretonian-Div. C3d); Wales (Skiddaw).

DIDYMOGRAPTUS INDENTUS var. NANUS Lapworth. See Didymograptus nanus.

Didymograptus nanus (Lapworth).

Didymograpsus geminus Nicholson, Quar. Jour. Geol. Soc., 24, 1868, p. 134, pl. 5, figs. 8, 9; Ann. and Mag. Nat. Hist., ser. 4, 5, 1870, p. 346, fig. 6b.

Didymograptus indentus var. nanus Lapworth, Quar. Jour. Geol. Soc., 31, 1875, p. 647, pl. 33, fig. 7d; pl. 35, figs. 4a–c.—Elles, Quar. Jour. Geol. Soc., 54, 1898, p. 511.

Didymograptus nanus Elles and Wood, Mon. British Grapt. pt. 1, Pal. Soc., 1901, p. 47, pl. 4, figs. 5a–h.—Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 692, 693, pl. 15, figs. 4, 5; text fig. 88.

Lower Ordovician: Wales (Arenig); England (Skiddaw); Deepkill, Rensselaer County, New York (Deepkill, Didymograptus bifidus zone).

Didymograptus nicholsoni planus Elles and Wood.

Didymograptus nicholsoni var. planus Elles and Wood, Mon. British Grapt., pt. 1, Pal. Soc., 1901, p. 29, pl. 2, figs. 5a, b.—Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 685, 686, pl. 13, figs. 10–14, text figs. 82, 83.

Lower Ordovician: England (Skiddaw); Deepkill, Rensselaer County, New York (Deepkill, Tetragraptus zone).

Didymograptus nitidus (Hall).

Graptolithus nitidus Hall, Geol. Surv. Canada Rep., 1857, 1858, p. 129; Can. Nat. and Geol., 3, 1858, p. 163; Canadian Org. Rem., dec. 2, 1865, p. 69, pl. 1, figs. 1–9.

Graptolithus (Monoprion) nitidus Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 226, pl. 3, figs. 8, 9; rev. ed., 1870, p. 234, pl. 3, figs. 8, 9, p. 223.

Didymograptus nitidus Nicholson (part.), Quar. Jour. Geol. Soc. London, 24, 1868, p. 135.—Etheridge, jr., Ann. Mag. Nat. Hist., 4th ser., 14, 1874, 6, pl. 3, fig. 20.—Herrmann, Geol. Mag., dec. 3, 3, 1886, p. 15.—Barrois, Ann. de la Soc. Geol. du Nord, 1892, 20, p. 91.—Matthew, Trans. Roy. Soc. Can., 10, sec. 4, 1893, p. 98.—Elles (part.), Quar. Jour. Geol. Soc., 54, 1896, 499–502; p. 500, fig. 19; p. 501, fig. 20.—Roemer and Frech, Leth Geog., 1, Theil, Leth Pal., 1, Lief., 3, 1897, p. 591, fig. 160.—Elles, Quart. Jour. Geol. Soc. London, 34, 1898, p. 499, figs. 19, 20, p. 500.—Elles and Wood, Mon. British Grapt., pt. 1, Pal. Soc., 1901, p. 10, pl. 1, figs. 2a–c, figs. 5a–d.—Ruedemann, New York State Pal. Ann. Rep., 1902, p. 554, 556; Mem. New York State Mus., 7, pt. 1, 1904, pp. 671–674, pl. 13, figs. 1–4; pl. 14, figs. 5, 6, text figs. 66–70.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 31, fig. 47a, 49a.—Hoek, Neues Jahrb. Min. Geol. Pal., 34, 1912, p. 220, pl. 13, figs. 8, 9.

Didymograpsus (Graptolithus) nitidus Nicholson, Mon. British Grapt., 1872, p. 80, fig. 45.

Canadian: Point Levis, Quebec (Levis, Didymograptus zone); St. John, New Brunswick (Bretonian—Div. C3d); Deepkill, Rensselaer County, New York (Deepkill, Tetragraptus zone); Arkansas; England (Skiddaw); France; Australia; Norway; Argentina.

Didymograptus nitidus grandis Ruedemann.

Didymograptus nitidus var. grandis Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, p. 674, pl. 13, fig. 5.

Canadian (Deepkill, Tetragraptus zone): Deepkill, Rensselaer County New York.

Didymograptus patulus (Hall).

Graptolithus patulus Hall, Geol. Surv. Can., Rep. for 1857, 1858, p. 131; Can. Nat. and Geol., 3, 1858, p. 165; Geol. Surv. Canada, Canadian Org. Rem., dec. 2, 1865, p. 71, pl. 1, figs. 10–15.

Didymograptus patulus Hopkinson, Quar. Jour. Geol. Soc., 31, 1875, 644, pl. 33, figs. 4a–e.—Linnarsson, Sver. Geol. Und. Afh. och Upps., ser. C, No. 31, 1879, p. 5.—Brögger, Die sil. Etagen 2, 3, Kristiania, 1882, p. 39.—Herrmann (part.), Geol. Mag., dec. 3, 3, 1886, p. 14.—Matthew, Proc. and Trans. Royal Soc. Can., 10, sec. 4, 1893, p. 98; ibid., 11, 1894, p. 114.—Elles and Wood, Mon. British Grapt., pt. 1, Pal. Soc., 1901, p. 13, pl. 1, figs. 8a–c; text figs. 8a–b.—Ruedemann, New York State Pal. Ann. Rep., 1902, p. 556; Mem. New York State Mus., 7, pt. 1, 1904, pp. 674–676, pl. 13, figs. 8, 9; pl. 14, fig. 7; text figs. 71–73 (73 on p. 677).—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 31, figs. 47b, 49b.

Canadian: Point Levis, Quebec (Levis); St. John, New Brunswick (Bretonian—Div. C3d); Deepkill, Rensselaer County, New York (Deepkill, Tetragraptus zone).

Didymograptus pennatulus (Hall).

Graptolithus pennatulus Hall, Geol. Surv. Canada, dec. 2, 1865, p. 7, fig. 1; p. 82, pl. 3, figs. 1–8; pl. 5, fig. 9.

Graptolithus (Didymograptus) pennatulus Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 173, fig. 2; rev. ed., 1870, p, 206. fig. 2.

Graptolithus ((Monoprion) pennatulus Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 223.

Didymograptus pennatulus Hopkinson, Quart. Jour. Geol. Soc. London, 31, 1875, p. 643, pl. 33, figs. 3a–3e.—Zittel, Handb. Pal., 1, 1879, p. 298, fig. 204.—Barrois, Ann. Soc. Geol. du Nord, 20, 1892, p. 90.—Elles and Wood, Mon. British Grapt., Pal. Soc., 1901, p. 18, pl. 1, fig. 7.

Didymograpsus pennatulus Gurley, Jour. Geol., 4, 1896, p. 97 (gen. ref.).

Canadian: Point Levis, Quebec (Levis, Didymograptus zone); England (Arenig).

Didymograptus perflexus Gurley.

Didymograpsus perflexus Gurley, Jour. Geol., 4, 1896, p. 66.

Canadian: Summit, Nevada.

Cotypes.—Cat. No. 54344, U.S.N.M.

Didymograptus rectus Ruedemann. See Monograpsus rectus.

Didymograptus sagittarius Dale. See Didymograptus sagitticaulis.

Didymograptus sagitticaulis Gurley.

Graptolithus sagittarius Hall (not Hisinger), Pal. New York, 1, 1847, p. 272, pl. 74, fig. 1.—Chapman, Canadian Jour., n. s., 1, 1856, p. 390, fig. 6.—Walcott, Trans. Albany Inst., 10, 1883 (adv. sheet, 1879, p. 34).

Monograptus sagittarius Whitfield, Am. Jour. Sci., 3d ser., 26, 1883, p. 380.

Didymograptus sagittarius Lapworth, Trans. Roy. Soc. Canada, 5, sec. 4, 1886, p. 180f, 183f; Geol. Surv. Canada Ann. Rep., 2d ser., 3, pt. 1, 1889, p. 95B.—Walcott, Bull. Geol. Soc. Amer., 1, 1890, p. 338.—Gurley, Geol. Surv. Arkansas, Ann. Rep., 3, p. 411.—Dale, Bull. U. S. Geol. Surv., 242, 1904, p. 33.

Didymograpsus sagitticaulis Gurley, Jour. Geol., 4, 1896, p. 68.

Didymograptus sagitticaulis—Continued.

Didymograpsus convexus Gurley, Jour. Geol., 4, 1896, p. 67, pl. 5, fig. 8.

Didymograptus sagitticaulis Ruedemann, Mem. New York State Mus., 11, pt. 2-1908, pp. 248–251, pl. 14, fig. 3, text figs. 151–155.

Chazyan (Normanskill): Kenwood, Stockport, and near Poughkeepsie, New York; Canada; Arkansas (Stringtown); Tennessee (Athens).

Plesiotypes.—Cat. No. 54255, U.S.N.M. (Gurley types of D. convexus.)

Didymograptus serratulus (Hall).

Graptolithus serratulus Hall, Pal. New York, 1, 1847, p. 274, pl. 74, fig. 5a, b.—Chapman, Canadian Jour., n. s., 1, 1856, p. 390, text fig. 8—Hall, New York State Cab. Nat. Hist., 20th Rep., 1867, p. 223f.—Walcott, Trans. Albany Inst., 10, 1883, p. 35 (adv. sheets, 1879).

?Graptolithus (Monograptus) serratulus Whitfield, U. S. Geog. Surv., 100th Mer., Lieut. Wheeler's Rep., 4, 1877, p. 19.

Graptolithus (Monoprion) serratulus Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 226; rev. ed., 1870, p. 260.

Didymograptus serratulus Walcott, Geol. Soc. Amer., Bull. 1, 1890, p. 338.—Gurley, Geol. Surv. Arkansas, Ann. Rep., 3, 1892, p. 411.—Roemer and Frech, Leth. Pal., 1, 1897, p. 589.—Ruedemann, Bull. New York State Mus., 42, 1901, pp. 497, 541.—Elles and Wood, Mon. British Grapt., pt. 1, 1901, p. 29, pl. 2, figs. 7a, b, text fig. 18a–b.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 251–253, pl. 14, fig. 4, text figs. 156–159.

Didymograpsus serratulus Pictet, Traite de Pal., 2d ed., 4, 1857, p. 474, pl. 108, fig. 23.

Middle Ordovician: Kenwood, Stockport, etc., New York; Arkansas (Normanskill); Great Britain (Glenkiln).

Didymograptus serratulus juvenalis Ruedemann.

Didymograptus serratulus juvenalis Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 252, fig. 156.

Chazyan (Normanskill): Kenwood, New York.

Didymograptus sextans Nicholson. See Dicellograptus sextans.

Didymograptus similis (Hall).

Graptolithus similis Hall, Geol. Surv. Canada, dec. 2, 1865, p. 78, pl. 2, figs. 1–5.

Didymograpsus similis Gurley, Jour. Geol., 4, 1896, p. 295 (gen. ref.).

Didymograptus similis Ruedemann, New York State Pal., Ann. Rep., 1902, pp. 566, 567; Mem. New York State Mus., 7, pt. 1, 1904, pp. 677–679, pl. 14, figs. 25–29, text figs. 73, 74 (73 on p. 678).

Canadian: Point Levis, Quebec (Levis, Didymograptus zone); Deepkill, Rensselaer County, New York (Deepkill, Didymograptus and Diplograptus zones); Wales (Arenig); Norway; Sweden.

Didymograptus spinosus Ruedemann.

Didymograptus spinosus Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 688, 689, pl. 14, figs. 30–32, text figs. 84, 85.

Canadian (Deepkill, Diplograptus dentatus zone): Mount Moreno, Columbia County, New York.

Didymograptus subtenuis (Hall).

Graptolithus tenuis (Portlock?) Hall, Pal. New York, 1, 1847, p. 272, pl. 74, figs. 2a–d.

Graptolithus subtenuis Hall, in Miller's Amer. Pal. Foss., 1st ed., 1877, p. 244.—Walcott, Trans. Albany Inst., 1883, 10 (adv. sheets, p. 35).—Gurley, Jour. Cincinnati Soc. Nat. Hist., 16, 1892, p. 156.

Didymograptus subtenuis—Continued.

Dicellograptus tenuis Lapworth, Roy. Soc. Canada Trans. 5, sec. 4, 1886, p. 178.

Leptograptus tenuis Lapworth, Roy. Soc. Canada Trans., 10, sec. 4, 1886, p. 183.

Leptograptus subtenuis Walcott, Bull. Geol. Soc. Amer., 1, 1890, p. 338.

Leptograpsus subtenuis Gurley, Jour. Geol., 4, 1896, p. 296 (gen. ref.).

Didymograptus tenuis Ruedemann, Bull. New York State Mus., 42, 1901, p. 540f.

Didymograptus subtenuis Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 253–255, pl. 14, figs. 1, 2, text figs. 160, 161.

Chazyan (Normanskill): Kenwood, Mount Moreno, and Stockport, New York; Canada.

Didymograptus superectes Lapworth.

Didymograptus superectes Lapworth, Cat. West. Scot. Foss., pl. 3, fig. 74, a, b; Proc. Belfast Field Club, 1877, p. 142, pl. 7, figs. 15a, b.—Elles and Wood, Mon. British. Grapt., Pal. Soc., pt. 1, 1901, p. 19, pl. 1, figs. 9a, b.

Middle Ordovician: South Scotland (Glenkiln); Oklahoma (Normanskill-Stringtown).

Didymograptus tenuis Ruedemann. See Didymograptus subtenuis.

Didymograptus (Goniograptus) thureaui McCoy. See Goniograptus thureaui.

Didymograptus tornquisti Ruedemann.

Didymograptus tornquisti Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, p. 688, pl. 13, figs. 6, 7.

Canadian (Deepkill, Didymograptus bifidus zone): Deepkill, Rensselaer County, New York.

Didymopora Ulrich. See Fistulipora McCoy.

DIKELOCEPHALUS Owen. Genotype: D. minnesotensis Owen.

Dikelocephalus Owen, Geol. Surv. Wisconsin, Iowa, Minnesota, 1852, p. 573.—Billings, Canadian Nat. Geol., 5, 1860, p. 306.—Hall, 16th Ann. Rep. New York State Cab. Nat. Hist., 1863, p. 137.—Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 399.—Chapman, Expos. Min., Geol. Canada, 1864, p. 137.—Salter, Mem. Geol. Surv. Great Britain, 3, 1866, p. 303.—Hall, Trans. Albany Inst., 5, 1867, p. 116.—Hall and Whitfield, U. S. Geol. Surv. Expl. 40th Parl., 4, 1877, p. 225.—Salter, Mem. Geol. Surv. Great Britain, 3, 2d ed., 1881, p. 497.—Whitfield, Geol. Wisconsin, 4, 1882, p. 200.—Zittel, Handb. Pal., 2, 1885, p. 596.—Beecher, Amer. Jour. Sci., 4th ser., 3, 1897, p. 192; Zittel-Eastman Textb. Pal., 1, 1900, p. 629.—Raymond, ibid., 2d ed., 1913, p. 720.

Dikellocephalus Dames, Richthofen's China, Berlin, 4, 1883, p. 5.—Koken, Die Leitfossilien, Leipzig, 1896, p. 17, fig. 10, fig. 8.

Dicelocephalus Barrande, N. Jahrb. f. Min., 1853, p. 336.

Dicellocephalus Whitfield, Ann. Rep. Wisconsin Geol. Surv., 1878, p. 63.—Miller, N. A. Geol. Pal., 1889, p. 543.—Matthew, Trans. Royal Soc. Canada, 10, sec. 4, 1893, p. 10.—Berkey, Amer. Geol., 21, 1898, p. 290.

Dikelocephalus affinis Billings. See Platycolpus affinis.

Dikelocephalus barabuensis Whitfield. See Platycolpus barabuensis.

Dikelocephalus Belli Billings. See Anomocarella belli.

Dikelocephalus corax Billings. See Apatokephalus corax.

Dikelocephalus cristatus Billings. See Conokephalina? cristatus.

Dikelocephalus Devinei Billings. See Ptychoparia? devinei.

DIKELOCEPHALUS EATONI Whitfield. See Platycolpus eatoni.

DIKELOCEPHALUS HARTII Walcott (1909). See Saukia stosei.

Dikelocephalus harttl (Walcott).

Conocephalites Hartti Walcott, 32d Rep. New York State Mus. Nat. Hist., 1880, p. 130.

Dicellocephalus hartti Walcott, Bull. U. S. Geol. Surv., 30, 1886, p. 21.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 199, figs.—Walcott, Smiths. Misc. Coll., 57, 1912, p. 273, pl. 44, figs. 1–7a.

Dikelocephalus hartti Walcott, Smiths. Misc. Coll., 57, No. 13, 1914, p. 368, pl. 63, figs. 1–7, 7a.

Ozarkian or Upper Cambrian: Near Saratoga Springs (Hoyt), and near Chateaugay, New York (top of Potsdam).

Cotypes.—Cat. Nos. 58571–58577, U.S.N.M.

DIKELOCEPHALUS HISINGERI Billings. See Lisania? hisingeri.

DIKELOCEPHALUS MAGNIFICUS Billings. See Hungaia magnifica.

DIKELOCEPHALUS MEGALOPS Billings. See Conokephalina megalops.

Dikelocephalus? mlssisquoi Billings.

Dikelocephalus Missisquoi Billings, Pal. Foss., Geol. Surv. Canada, 1865, p. 199.

Canadian (Beekmantown): Philipsburg, Quebec.

DIKELOCEPHALUS NEWTONENSIS Weller. See Calvinella newtonensis.

DIKELOCEPHALUS OWENI Billings. See Anomocarella? oweni.

DIKELOCEPHALUS PAUPER Billings. See Ptychoparia? pauper.

DIKELOCEPHALUS PLANIFRONS Billings. See Anomocarella? planifrons.

DIKELOCEPHALUS SELECTUS Billings. See Ptychaspis? selectus.

DIKELOCEPHALUS SESOSTRIS Billings. See Ptychaspis sesostris.

Dikelocephalus tribulis (Walcott).

Dicellocephalus tribulis Walcott, Smiths. Misc. Coll., 57, 1912, p. 274, pl. 44, figs. 8, 8a.

Dikelocephalus tribulis Walcott, Smiths. Misc. Coll., 57, 1914, p. 372, pl. 63, figs. 8–10, 10a.

Ozarkian or Upper Cambrian (Hoyt): Near Saratoga Springs, New York.

Holotype.—Cat. No. 58578, U.S.N.M.

DILOBELLA Ulrich. Genotype: D. typa Ulrich.

Dilobella Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 672.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 347.

Dilobella typa Ulrich.

Dilobella typa Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 673, pl. 46, figs. 30–34.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 348, fig. 1658s, s′, t.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 738, fig. 1425p.

Bollia typa Miller, N. A. Geol. Pal., 2d App., 1897, p. 787 (gen. ref.).

Black River (Decorah): St. Paul and Cannon Falls, Minnesota.

Cotypes.—Cat. No. 41641, U.S.N.M.

DIMEROCRINITES Phillips. See Dimerocrinus Phillips.

DIMEROCRINUS Phillips. Genotype: D. decadactylus Phillips.

Dimerocrinites Phillips, in Murchison's Sil. Syst., 1839, p. 674.—Muller, Monatsber. Berl. Akad., 1, 1841, p. 208.

Dimerocrinus D'Orbigny, Prodr. Pal., 1, 1850, p. 46; Cours elem. Pal., 2, p. 142.—Roemer, Leth. geog., 1855, p. 237.—Salter, Cat. Camb. Sil. Foss., 1873, p. 120.—Zittel, Handb. Pal., 1, 1879, p. 368.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, pp. 358, 371, 405 (Rev. Pal. pt. 2, pp. 184, 197, 231); ibid., 1885, p. 323.—Carpenter, Phil. Trans. Royal Soc. London, 174, 1884, p. 928.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 198.—Zittel, Grundzuge Pal., 1, 1910, p. 161.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 187.

Thysanocrinus Hall, Pal. New York, 2, 1852, pp. 188, 355.—Pictet, Traité de Pal., 2d ed., 4, 1857, p. 317.—Billings, Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, p. 262.—Hall, 15th Rep. New York State Cab. Nat. Hist. for 1861, 1862, p. 125.—Dujardin and Hupe, Hist. Nat. des Zoophytes, 1862, pp. 128, 131.—Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 398.—Zittel, Handb. Pal., 1, 1879, p. 377.—Carpenter, Phil. Trans. Royal Soc. London, 174, p. 928.—Miller, N. A. Geol. Pal., 1889, p. 286.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 190.—Wachsmuth, Zittel-Eastman Textb. Pal. 1, 1900, p. 145.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 70, fig. 36.—Grabau, Bull. New York State Mus., 45, 1901, p. 155; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 155.—Slocom, Field Columbia Mus., 2, No. 10, Geol. Ser., 1908, p. 299.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 547. (Genotype: T. liliiformis Hall.)

Eucrinus Angelin, Icon. Crin., 1878, p. 24, pl. 6, figs. 8, 8a.—Zittel, Handb. Pal., 1, 1879, p. 375.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, pp. 358, 370 (Rev. Pal., pt. 2, pp. 184, 196); ibid., 1885, p. 323.—Ringueberg, Ann. New York Acad. Sci., 5, 1890, p. 305—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 199.—Zittel, Grundzuge Pal., 1, 1910, p. 161. (Genotype: E. lævis Angelin.)

Glyptaster Hall, Pal. New York, 2, 1852, p. 187; Trans. Albany Inst., 4, 1863, p. 202.—Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 373.—Hall, 28th Rep. New York State Mus. Nat. Hist., Mus. ed., 1879, p. 131.—Zittel, Handb. Pal., 1, 1879, p. 375.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, pp. 358, 367 (Rev. Pal., pt. 3, pp. 184, 193).—Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 259.—Miller, N. A. Geol. Pal., 1889, p. 247.—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 198.—Zittel, Grundzuge Pal., 1910, p. 161. (Genotype: G. brachiatus Hall.)

Dimerocrinus aculeatus (Hall).

Thysanocrinus aculeatus Hall, Pal. New York, 2, 1852, p. 190, pl. 42, figs. 3a–d.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 317, pl. 100, fig. 13.

Rhodocrinus (Thysanocrinus) aculeatus Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 398.

Clinton (Rochester): Lockport, New York.

Dimerocrinus arborescens (Talbot).

Thysanocrinus arborescens Talbot, Amer. Jour. Sci., 20, 1905, p. 23, pl. 1, fig. 2; text fig. 1.

Helderbergian (Manlius transition beds, or Coeymans): North Litchfield, New York.

Dimerocrinus brachiatus (Hall).

Glyptaster brachiatus Hall, Pal. New York, 2, 1852, p. 187, pl. 41, figs. 4a, b.

Thysanocrinus brachiatus Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 195, pl. 18, fig. 7.

Clinton (Rochester): Lockport, New York.

Dimerocrinus campanulatus (Slocom).

Thysanocrinus campanulatus Slocom, Field Columbian Mus., Geol., ed. ser., 10, 1908, p. 299, pl. 85, figs. 20, 23.

Niagaran (Racine): Drainage Canal, near Lemont, Illinois.

Dimerocrinus canaliculatus (Hall).

Thysanocrinus canaliculatus Hall, Pal. New York, 2, 1852, p. 189, pl. 42, figs. 2a–d.

Rhodocrinus (Thysanocrinus) canaliculatus Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 398.

Clinton (Rochester): Lockport, New York.

Dimerocrinus egani (Miller).

Glyptaster egani Miller, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 261, pl. 6, figs. 4, 4a, 4b; N. A. Geol. Pal., 1889, p. 247, fig. 311.

Thysanocrinus egani Weller, Bull. Chicago Acad. Sci., 4, 1900, p. 74, pl. 1, fig. 5.

Niagaran (Racine): Bridgeport, Illinois.

Dimerocrinus halli (Lyon).

Rhodocrinus Halli Lyon, Proc. Acad. Nat. Sci. Philadelphia, 1861, p. 412, pl. 4, fig. 5a, b.

Thysanocrinus Halli Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 196, pl. 13, fig. 9a, b.

Niagaran (Louisville): Near Louisville, Kentucky.

Dimerocrinus immaturus Wachsmuth and Springer. See Gazacrinus immaturus.

Dimerocrinus inornatus (Hall).

Glyptaster inornatus Hall, Trans. Albany Inst., 4, 1863, p. 205; 24th Rep. New York State Cab. Nat. Hist., 1872, p. 207, fig. 3; 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1877, pl. 14, figs. 1–6; Mus. ed., 1879, p. 134, pl. 14, figs. 1–6; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 261, fig. 3; also p. 263, pl. 13, figs. 1–6.

Thysanocrinus inornatus Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 193, pl. 18, figs. 6a–d; pl. 19, fig. 5.—Grabau and Shimer, N. A. Index Fossils, 11, 1910, p. 547.

Niagaran: Waldron and Hartsville, Indiana; Newson, Tennessee (Waldron); ?Racine, Wisconsin (Racine).

Dimerocrinus liliiformis (Hall).

Thysanocrinus liliiformis Hall, Pal. New York, 2, 1852, p. 188, pl. 42, figs. 1a–f.—Grabau, Bull. New York State Mus., 45, 1901, p. 156, fig. 50; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 156, fig. 50.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 199, pl. 18, fig. 4.

Rhodocrinus (Thysanocrinus) lilliformis Shumard, Trans. Acad. Sci. St. Louis (Cat., Pal. Foss.) 2, 1866, p. 398.

Dimerocrinus lilliformis Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 373. (Rev. Pal., pt. 2, p. 199.)

Clinton (Rochester): Lockport, New York.

Dimerocrinus lockportensis (Ringueberg).

Glyptaster (Eucrinus) lockportensis Ringueberg, Annals New York Acad. Sci., 5, 1890, p. 304, pl. 3, fig. 4.

Niagaran (Lockport, Gasport member): Lockport, New York.

Dimerocrinus milliganæ (Miller and Gurley).

Glyptaster milliganæ Miller and Gurley, Bull., Illinois State Mus. Nat. Hist., 10, 1896, p. 87, pl. 5, figs. 7–9.

Niagaran (Brownsport): Decatur County, Tennessee.

Dimerocrinus occidentalis (Hall).

Glyptaster occidentalis Hall, Trans. Albany Inst., 4, 1863, p. 204 (abstract, p. 10); 20th Rep. New York State Cab. Nat. Hist., 1868 (extras, 1865), p. 326, pl. 10 (1), fig. 3; rev. ed., 1870, p. 369, pl. 10, fig. 3; 20th Rep. New York State Mus. Nat. Hist., doc. ed., 1877, pl. 13, figs. 7–11; Mus. ed., 1879, p. 133, pl. 13, figs. 7–11.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 370 (Rev. Pal. pt. 2, p. 196).—Hall, 11th Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 262, pl. 12, figs. 7–11.—Whitfield, Geol. Wisconsin, 4, 1882, p. 281, pl. 16, figs. 3, 4.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 191, fig.—Miller, N. A. Geol. Pal., 1889, p. 247, fig. 312.—Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 194, pl. 18, fig. 5a–c.

Thysanocrinus occidentalis Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 73, pl. 1, figs. 6, 7.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 547.

Glyptaster occidentalis var. crebescens Hall, 28th Rep. New York State Mus. Nat. Hist., Mus. ed., 1879, p. 133; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 263.

Niagaran: Waldron and Hartsville, Indiana (Waldron): Racine, Wisconsin; Bridgeport and Hawthorne, Illinois (Racine).

Dimerocrinus pentangularis (Hall).

Glyptaster pentangularis Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 326, pl. 10 (1), fig. 4 (extras, 1865); ibid., rev. ed., 1870, p. 369, pl. 10, fig. 4.

Thysanocrinus pentangularis Weller, Bull. Chicago Acad. Sci. Nat. Hist. Surv., 4, pt. 1, 1900, p. 70, pl. 1, figs. 8–11.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 547.

Niagaran (Racine): Racine, Wisconsin; Bridgeport and Hawthorne, Illinois.

Dimerocrinus roemeri (Troost).

Gilbertsocrinites roemeri Troost MS., 1850.

Dimerocrinus roemeri (Troost) Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 101, pl. 15, fig. 4.

Niagaran (Brownsport): Decatur and Perry Counties, Tennessee.

Holotype.—Cat. No. 39968, U.S.N.M.

Dimerocrinus waldronensis (Miller and Dyer).

Cyathocrinus waldronensis Miller and Dyer, Cont. to Pal., 2, 1878, p. 6, pl. 4, fig. 9.—Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 1896, p. 49, pl. 3, figs. 19, 20.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 741, fig. 1330.

Dimerocrinus waldronensis Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1885, p. 323 (Rev. Pal., pt. 3, sec. 1, p. 101).

Macrostylocrinus waldronensis Wachsmuth and Springer, ibid., 1886, p. 149 (Rev. Pal., pt. 3, sec. 2, p. 225).

Niagaran (Waldron): Waldron, Indiana.

DIMORPHOGRAPTUS Lapworth. Genotype: D. elongatus Lapworth.

Dimorphograptus Lapworth, Geol. Mag., dec. 2, 3, 1876, p. 545.—Elles and Wood, Mon. British Grapt., 8, 1911, p. 348.

Dimorphograptus decussatus Elles and Wood.

Dimorphograptus decussatus Elles and Wood, Mon. British Grapt., 8, 1911, p. 352, pl. 35, figs. 5a–e.

Silurian: Scotland (Llandovery-Birkhill); Blaylock Mountain, Montgomery County, Arkansas (Blaylock) [Ulrich].

DINOBOLUS Hall. Genotype: Obolus conradi Hall.

Dinobolus Hall, Notes on Some New or Imperfectly Known Forms among the Brach., (March) 1871, p. 4; ibid., 1872, p. 4.—Davidson and King, Geol. Mag., 9, p. 442; Ann. Mag. Nat. Hist., 4th ser., 10, p. 248.—Hall, 23d Rep. New York State Cab. Nat. Hist., 1873, p. 247.—Hall and Whitfield, Pal. Ohio, 2, 1873, p. 130.—Davidson and King, Quart. Jour. Geol. Soc. London, 30, 1874, p. 159.—Zittel, Handb. Pal., 1, 1880, p. 668.—Miller, N. A. Geol. Pal., 1889, p. 343.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 36, 46, 164; 11th Ann. Rep. New York State Geol., 1894, p. 237.—Koken, Die Leitfossilien, Leipzig, 1896, p. 231, fig. 190, 2.—Schuchert, Zittel-Eastman Pal., 1, 1900, p. 306, 2d ed., 1913, p. 373.—Grabau and Shimer, North Amer. Index Fossils, 1, 1907, p. 190.

Obolellina Billings, Canadian Nat. Geol., 6, 1871, p. 222; ibid., 6, 1872, p. 326, figs. 1, 2; Amer. Jour. Sci., 3d ser., 3, 1872, p. 270.

Conradia Hall (not Adams), 23d Rep. New York State Cab. Nat. Hist., 1873, p. 250.—Davidson and King, Quart. Jour. Geol. Soc. London, 30, 1874, p. 159.

Dinobolus canadensis (Billings).

Obolus canadensis Billings, Canadian Nat. Geol., 3, 1858, p. 441, fig. 20–23 (not fig. 19=D. magnificus); Geol. Surv. Canada; Rep. Prog. for 1857, 1858, p. 189, figs. 20–23 (not fig. 19); Geol. Canada, 1863, p. 142, figs. 75.

Obolellina canadensis Billings, Canadian Nat. Geol., 6, 1871, p. 222; ibid., 1872, p. 326, fig. 15; fig. 6, p. 329.

Dinobolus canadensis Davidson and King, Quart. Jour. Geol. Soc. London, 30, 1874, p. 162, pl. 19, fig. 7.

Black River (Leray): Pauquette's Rapids, etc., Canada.

Dinobolus conradi (Hall).

Obolus conradi Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 368, pl. 13, figs. 1, 2.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 192, fig.

Obolus (Trimerella?) conradi Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 351, pl. 5, fig. 7.

Trimerella conradi Dall, American Jour. Conch., 7, 1871, p. 83.

Dinobolus conradi Hall, 23d Rep. New York State Cab. Nat. Hist., 1873, p. 247 (also extracts 1871, 1872).—Davidson and King, Quart. Jour. Geol. Soc. London, 30, 1874, p. 160, pl. 18, figs. 1–5.—Hall and Whitfield, Pal. Ohio, 2, 1875, p. 130, pl. 7, figs. 3, 4.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 38, pl. 4B, figs. 13–24.—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 428, pl. 1, fig. 8.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 190, fig. 255a.

Niagaran: Port Byron, Illinois; Leclaire, Iowa; Racine and Grafton, Wisconsin (Racine); Crawford, Ohio; England; Gotland.

Plesiotype.—Cat. No. 52938, U.S.N.M.

Dinobolus magnificus (Billings).

Obolus canadensis Billings (part), Geol. Surv. Canada, Rep. Prog. for 1857, 1858, p. 189, fig. 19 (not 20–23); Canadian Nat. Geol., 3, 1858, p. 441, fig. 19 (not figs. 20–23=D. canadensis).

Obolellina magnificus Billings, ibid., n. ser., 6, 1872, p. 329, fig. 7.

Dinobolus magnificus Davidson and King, Quart. Jour. Geol. Soc. London, 30, 1874, p. 164, pl. 19, fig. 8.—Nicholson, Pal. Prov. Ontario, 1875, p. 17, fig. 6.

Black River (Leray): Pauquette's Rapids, etc., Canada.

Dinobolus(?) parvus Whitfield.

Dinobolus? parvus Whitfield, Geol. Wisconsin, 4, 1882, p. 347, pl. 27, figs. 8–10.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 356, fig. 27.—Whiteaves, Pal. Foss., 3, pt. 3, 1897, p. 166.

Trenton: Whitewater, Wisconsin; Wykoff, Minnesota (Prosser); Lake Winnipeg, Canada.

Plastotype.—Cat. No. 45548, U.S.N.M.

DINORTHIS Hall and Clarke. Genotype: Orthis pectinella Emmons.

Dinorthis Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 195–222.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 420—Hall and Clarke, 11th Ann. Rep. New York State Geol., 1894, p. 266.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 252.—Cumings, 32d Ann. Rep. Dep. Geol. and Nat. Res. Indiana, 1908, p. 888.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 382.

Plæsiomys Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 196; 11th Ann. Rep. New York State Geol., 1894, p. 266.—Schuchert, Zittel Textb. Pal., 1913, p. 382. (Genotype: Orthis subquadrata Hall.)

Valcourea (subgenus of Plæsiomys) Raymond, Ann. Carnegie Mus., 7, 1911, p. 239, (Genotype: Plæsiomys strophomenoides Raymond.)

Dinorthis carleyi (Hall).

Orthis retrorsa Billings (not Salter), Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 136, fig. 113 (adv. sheets, 1862) (not fig. 112=D. retrorsa).—Meek, Pal. Ohio, 1, 1873, p. 92, pl. 11, fig. 7.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 37.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 532, figs.—McCreery, Amer. Geol. 5, 1890, p. 102.

Plæsiomys retrorsa Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 197, 222; pl. 5A, figs. 14–16.

Dinorthis retrorsa Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 902, pl. 33, figs. 7–7d.—Foerste, Amer. Geol., 31, 1903, p. 335 (loc. occ.).

Orthis carleyi Hall, 13th Rep. New York State Cab. Nat. Hist., 1860, p. 120, fig.; 2d Ann. Rep. New York State Geol., 1883, pl. 34, figs. 28, 29.

Dinorthis carleyi Foerste, Ohio Nat., 12, No. 3, 1912, p. 453, pl. 22, fig. 8.

Orthis kennicotti McChesney, New Pal. Fossils, 1861, p. 78.

Richmond (Arnheim): Oxford, etc., Ohio; Indiana; Kentucky; Tennessee.

Dinorthis carleyi insolens Foerste.

Dinorthis carleyi-insolens Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 320, pl. 7, fig. 9.

Richmond (Waynesville): Miltonville, etc., Ohio; Indiana.

Dinorthis (Valcourea) deflecta (Conrad).

Strophomena deflecta Conrad, Proc. Acad. Nat. Sci. Philadelphia, 1, 1843, p. 332.—Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 70.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 198.

Dinorthis (Valcourea) deflecta—Continued.

Strophomena recta Conrad, Proc. Acad. Nat. Sci. Philadelphia, 1, 1843, p. 332.—Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 70.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 199.

Leptæna deflecta Hall, Pal. New York, 1, 1847, p. 113, pl. 31B, fig. 5.

Leptæna recta Hall, ibid., 1847, p. 113, pl. 31B, fig. 6.

Streptorhynchus rectus Miller, Amer. Pal. Foss., 1877, p. 134.

Streptorhynchus deflectum Miller, N. A. Geol. Pal., 1889, p. 378.

Plæsiomys deflecta Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 197, 222, pl. 5A, figs. 28–34.

Plæsiomys recta Hall and Clarke, ibid., 1892, pp. 197, 222.

Plæsiomys loricula Hall and Clarke, ibid., 1892, pp. 197, 341, pl. 5A, figs. 31–34.

Orthis (Dinorthis) deflecta Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 422, pl. 32, figs. 24–30.

Orthis (Plæsiomys) loricula Hall and Clarke, 48th Rep. New York State Mus., 2, for 1895, 1897, p. 339, pl. 4, figs. 7–9; 14th Rep. State Geol. New York for 1894, 1897, p. 339, pl. 4, figs. 7–9.

Dinorthis deflecta Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 252, fig. 303a–d.

Black River: Mineral Point, Beloit, Janesville, Wisconsin; Dixon, Illinois; Minneapolis, St. Paul, etc., Minnesota; McGregor, Iowa; central Tennessee; Highbridge, Kentucky.

Stone River: Central Tennessee.

Dinorthis fontinalis (White).

Strophomena fontinalis White, Wheeler's Expl. and Surv. West 100th Merid., 4, 1875, p. 54, pl. 3, fig. 4; Prelim. Rep., p. 10, 1874.

Dinorthis fontinalis Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 215.

Middle Ordovician: Fish Spring, House Range, Utah.

Cotypes.—Cat. No. 17223, U.S.N.M.

Dinorthis (Plæsiomys) iphigenia (Billings).

Orthis iphigenia Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 133, pl. 110 (adv. sheets, 1862).

Plæsiomys iphigenia Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 222.

Dinorthis iphigenia Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 215.

Trenton: Ottawa, Ontario.

Dinorthis meedsi (Winchell and Schuchert).

Orthis meedsi Winchell and Schuchert, Amer. Geol., 9, April 1, 1892, p. 289.

Orthis minnesotensis Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, April 9, 1892, p. 332, pl. 5, figs. 14–17.

Orthis (Dinorthis) meedsi Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 427, pl. 32, figs. 39–42.

Dinorthis meedsi Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 253, fig. 303e–h.

Trenton (Prosser): Cannon Falls, Kenyon, Preston, etc., Minnesota; Decorah and McGregor, Iowa; Neenah and Oshkosh, Wisconsin.

Dinorthis meedsi arctica (Schuchert).

Orthis (Dinorthis) meedsi var. arctica Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 157, pl. 12, figs. 7, 8.

Mohawkian: Head of Frobisher Bay, Baffin Land.

Cotypes.—Cat. No. 28152, U.S.N.M.

Dinorthis meedsi germana (Winchell and Schuchert).

Orthis meedsi var. germana Winchell and Schuchert, Amer. Geol., 9, 1892, p. 290.

Orthis (Dinorthis) meedsi var. germana Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 428, pl. 32, figs. 43–45.

Dinorthis meedsi germana Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 215.

Trenton (Prosser): Cannon Falls, Kenyon, and Fountain, Minnesota.

Dinorthis pectinella (Emmons).

Orthis pectinella Emmons, Geol. New York, Rep. 2d Dist., 1842, p. 394, fig. 2.—Owen, Amer. Jour. Sci. Arts, 47, 1844, p. 366, fig. 2.—Hall, Pal. New York, 1, 1847, p. 123, pl. 32, fig. 10.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 193, pl. 9, figs. 10, 11, a, b.—Billings, Can. Nat. Geol., 1, 1857, p. 205, fig. 5.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 818, fig. 602.—Emmons, Manual Geology, 1860, p. 99, fig. 88.—Billings, Geol. Canada, 1863, p. 165, fig. 147.—Hitchcock, Geol. Vermont, 1, 1862, p. 294, fig. 202.—Chapman, Canadian Jour., n. s., 7, 1862, p. 111, fig. 92; ibid., 8, 1863, p. 199, fig. 184; Expos. Min., Geol. Canada, 1864, p. 115, fig. 91; p. 171, fig. 183.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 155, fig.—Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 34, figs. 39, 40.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 527, figs.

Orthis pectinella var. semiovalis Hall, Pal. New York, 1, 1847, p. 124, pl. 32, fig. 11.—Miller, N. A. Geol. Pal., 1889, p. 359.

Dinorthis pectinella Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 195, 222, 228, pl. 5, figs. 27–33.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 154, pl. 9, figs. 29, 30.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 253, fig. 303i–l.—Bassler, Bull. Virginia Geol. Surv., 2a, 1909, pl. 24, fig. 2.

Orthis (Dinorthis) pectinella Winchell and Schuchert, Minnesota Geol. Survey, 3, 1893, p. 424, pl. 32, figs. 31–34.—Whiteaves, Pal. Fossils, 3, pt. 3, 1897, p. 175.

Orthis charlotte Winchell, 8th Rep. Geol. Nat. Hist. Surv. Minnesota, 1880, p. 67.

Upper Black River and Early Trenton: Middleville, Trenton Falls, etc., New York; Pennsylvania; Mercer County, Kentucky; Ontario; Decorah, Iowa; St. Paul, Minneapolis, and Cannon Falls, Minnesota; Lake Winnipeg, Canada; Tennessee; Virginia.

Dinorthis pectinella sweeneyi (N. H. Winchell).

Orthis sweeneyi N. H. Winchell, 9th Rep. Geol. Nat. Hist. Surv. Minnesota, 1881, p. 117.

Dinorthis sweeneyi Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 196, 222, 228, pl. 5, figs. 34–36.

Orthis (Dinorthis) pectinella var. sweeneyi Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 426, pl. 32, figs. 35–38.

Black River (Decorah): St. Paul, Cannon Falls, etc., Minnesota; Decorah and McGregor, Iowa.

Dinorthis (Plæsiomys) platys (Billings).

Orthis platys Billings, Canadian Nat. Geol., 4, 1859, p. 438, fig. 15; Geol. Canada, 1863, p. 129, fig. 54.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 218.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1893, p. 424.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 530, figs.

Dinorthis platys Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 216.

Plæsiomys platys Raymond, Ann. Carnegie Mus., 7, 1911, p. 238, pl. 35, figs. 13–14.

Chazyan: Montreal, Quebec; Crown Point, Valcour Island, and Chazy, New York (Crown Point); East Tennessee (Lenoir).

DINORTHIS PORCATA Schuchert (part). See Dinorthis (Plæsiomys) porcata anticostiensis.

Dinorthis (Plæsiomys) porcata anticostiensis (Shaler).

Orthis porcata Billings (not McCoy), Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 135, fig. 111 (adv. sheets); Geol. Canada, 1863, p. 312, fig. 319.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 531, figs.

Plæsiomys porcata Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 197, 22, pl. 5A, figs. 20, 21.

Dinorthis porcata Schuchert (part), Bull. U. S. Geol. Surv., 87, 1897, p. 216.

Orthis anticostiensis Shaler, Fossil Brach. of the Ohio Valley, 1887, p. 19, pl. 6.

Richmond: English Head, etc., Anticosti (Ellis Bay); Stony Mountain, Manitoba Stony Mountain).

Dinorthis proavita (Winchell and Schuchert).

Orthis proavita Winchell and Schuchert, Amer. Geol., 9, April 1, 1892, p. 290.

Orthis petrae Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, April 9, 1892, p. 332, pl. 5, figs. 18–21.

Orthis (Dinorthis) proavita Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 431, pl. 32, figs. 51–57.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 120.—?Whiteaves, Pal. Foss, 3, pt. 3, 1897, p. 176.

Dinorthis proavita Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 216.

Richmond: Spring Valley, Minnesota; Wilmington, Illinois; Lake Winnipeg, Manitoba; Texas; etc.

Dinorthis (Plæsiomys) retrorsa (Salter).

Orthis retrorsa Salter, Mem. Geol. Surv. Great Britain, 2, 1858, p. 373, pl. 27, figs. 3, 4.—Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 136, fig. 112 (not 113=D. carleyi) (adv. sheets, 1862).

Plæsiomys retrorsa Ruedemann, Bull. New York State Mus., 162, 1912, p. 93, pl. 4, figs. 9–12.

Middle Ordovician: Wales (Bala); Snake Hill, Saratoga County, New York, and Ottawa, Ontario (Trenton).

DINORTHIS RETRORSA Cumings. See Dinorthis carleyi.

DINORTHIS SCOVILLEI Foerste. See Plectorthis (Austinella) scovillei.

Dinorthis (Valcourea) strophomenoides (Raymond).

Plæsiomys strophomenoides Raymond, Amer. Jour. Sci., 4th ser., 20, p. 370.

Valcourea strophomenoides Raymond, Ann. Carnegie Mus., 7, 1911, p. 240, pl. 35, figs. 15–19; pl. 36, fig. 1, text fig. 12.

Chazyan: Valcour Island and Plattsburg, New York (Crown Point); East Tennessee (Lenoir).

Dinorthis (Plæsiomys) subquadrata (Hall).

Orthis subquadrata Hall, Pal. New York, 1, 1847, p. 126, pl. 32A, fig. 1; Geol. Wisconsin, 1, 1862, p. 54, figs. 1, 2.—Meek, Pal. Ohio, 1, 1873, p. 94, pl. 9, fig. 2.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 38.—White, 2d Ann. Rep. Indiana Bureau Stat. Geol., 1880, p. 484, pl. 1, figs. 3–5; 10th Rep. State Geol. Indiana, 1881, p. 116, pl. 1, figs. 3–5.—Shaler, Foss. Brach. of the Ohio Valley, 1876, p. 22, pl. 7.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 535, figs.—Keyes, Geol. Surv. Missouri, 5, 1895, p. 60.

?Orthis subquadrata Billings, Geol. Canada, 1863, p. 165, fig. 146.

Platystrophia subquadrata Hall, 36th Rep. New York State Mus. Nat. Hist., 1884, p. 75, pl. 3, fig. 4.

Dinorthis (Plæsiomys) subquadrata—Continued.

Plæsiomys subquadrata Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 194, 196, 222, pl. 5A, figs. 17–19.

Orthis (Dinorthis) subquadrata Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 428, pl. 32, figs. 46–50.—Whiteaves, Pal. Foss., 3, pt. 3, 1897, p. 176.

Dinorthis subquadrata Hayes and Ulrich, U. S. Geol. Surv., folio 95, 1903, illus. sheet, figs. 7, 8.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 254, fig. 303m–o.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1907, p. 904, pl. 34, figs. 1–1b.

Richmond: Ohio Valley; Spring Valley, Minnesota; Wilmington, Illinois; Warren and Jefferson Counties, Missouri; Lattners, Iowa; Iron Ridge, Wisconsin; Lake Winnipeg, Canada; Anticosti; Texas; etc.

Plesiotypes.—Cat. No. 35454, U.S.N.M. (Hayes and Ulrich).

Dinorthis sweeneyi Hall and Clarke. See Dinorthis pectinella sweeneyi.

Dinorthis (Plæsiomys) ulrichi Foerste.

Dinorthis ulrichi Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 320, pl. 7, fig. 7a–c.

Trenton (Flanagan): Near Becknerville, Clark County, Flanagan and Paris, Kentucky.

Dione Barrande. See Dionide Barrande.

DIONIDE Barrande. Genotype: Dione formosa Barrande.

Dione Barrande, Note Prelim. Sil. Syst. Boheme, 1846, p. 32.

Dionide Barrande, Neues Jahrb. f. Min., pt. 4, 1847, p. 391, footnote; Syst. Sil. du Centre Boheme, 1, 1852, p. 640.—Pictet, Traite de Pal., 2d ed., 2, 1854, p. 510.—Barrande, Syst. Sil. du Centre Boheme, 1, Suppl., 1872, p. 50.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1880, p. 289.—Zittel, Handb. Pal., 2, 1885, p. 594.—Miller, N. A. Geol. Pal., 1889, p. 544.—Koken, Die Leitfossilien, Leipzig, 1896, p. 15, text fig. 9, fig. 2.—Beecher, Amer. Jour. Sci., 4th ser., 3, 1897, pp. 184, 186.—Lindström, Kongl. Sven. Vet.-Akad. Handl., 34, No. 8, 1901, p. 32.—Pictet, Traite de Pal., 2d ed., 2, 1854, p. 510.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 711.

Polytomurus Hawle and Corda, Abh. d. k. bohmischen Gesell. d. Wiss., 5 (extract), 1847, p. 37, pl. 3, fig. 16.—Angelin, Pal. Scandinavica, 3d ed., Holmiae, 1878, p. 12.

Dionide(?) perplexa Billings.

Dionide? perplexa Billings, Cat. Sil. Foss. Anticosti, 1866, p. 67.

Anticostian (Jupiter River): The Jumpers, Anticosti.

DIORYCHOPORA Davis. Genotype: D. tenuis Davis.

Dirychopora Davis, Kentucky, Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, expl. of pl. 74.

Dirychopora tenuis Davis.

Dirychopora tenuis Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 74, fig. 6.

Niagaran (Louisville): Near Louisville, Kentucky.

DIPHYPHYLLUM Lonsdale. Genotype: D. concinnum Lonsdale.

Diphyphyllum Lonsdale, Murchison's Geol. Russia in Europe, 1, 1845, p. 622.—McCoy, British Pal. Rocks Foss., 1854, p. 87.—Billings, Canadian Jour., n. s., 4, 1859, p. 133.—Dybowski, Archiv. f. Naturf. Liv-, Ehst. und. Kurl., 5, 1874, p. 337.—Nicholson, Rep. Pal. Prov. Ontario, pt. 1, 1874, p. 31.—

DIPHYPHYLLUM—Continued.

Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 120.—Lindström, Ann. Mag. Nat. Hist., 4th ser., 18, 1876, p. 15.—Thomson and Nicholson, Ann. Mag. Nat. Hist., ser. 4, 17, 1876, p. 123.—Zittel, Handb. Pal., 1, 1879, p. 231.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 357.—Frech, Pal. Abhandl., Dames and Kayser, 3, Heft 3, 1886, p. 94.—Miller, N. A. Geol. Pal., 1889, p. 186.—Sherzer, Amer. Geol., 7, 1891, pp. 290–295.—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 157.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 25, 26.

Diplophyllum Hall, Amer. Jour. Sci. and Arts., 2d ser., 11, 1851, p. 399; Pal. New York, 2, 1852, p. 115; 12th Rep. New York State Cab. Nat. Hist., 1859, p. 80.—Grabau, Bull. New York State Mus., 45, 1901, p. 139; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 139.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, pp. 25, 26.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 73. (Genotype: D. cæspitosum Hall.)

Diphyphyllum billingsi Greene.

Diphyphyllum billingsi Greene, Cont. Indiana Pal., 11, 1903, p. 98, pl. 31, figs. 2, 3.

Niagaran (Louisville): Louisville, Kentucky.

Diphyphyllum cæspitosum (Hall).

Diplophyllum cæspitosum Hall, Pal. New York, 2, 1852, p. 116, pl. 33, figs. 1a–r, 2.—Grabau, Bull. New York State Mus., 45, 1901, pp. 139–140, fig. 33; Bull. Buffalo Soc. Nat. Hist., 7, 1901, p. 139, fig. 33.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 25.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 74, fig. 117.

Diphyphyllum cæspitosum Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 80 (gen. ref.).—Lambe, Ottawa Nat., 12, 1899, p. 240.—Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 343.—Lambe, Contr. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 158, pl. 13, figs. 3, 3a, 3b.

Cyathophyllum pelagicum Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 108 (adv. sheets, 1862); Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 34 (loc. ref.).

Silurian: Lockport, etc., New York; Ontario (Lockport); Wisconsin (Racine and Guelph); Island of Anticosti (Becsie River, Gun River); Ontario (Cataract).

Diphyphyllum coralliferum (Hall).

Diplophyllum coralliferum Hall, Pal. New York, 2, 1852, p. 322, pl. 72, figs. 1a–c.

Diphyphyllum coralliferum Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 80 (gen. ref.).—Schuchert, Amer. Geol., 31, 1903, p. 163. (loc. occ.)

Cayugan (Cobleskill): Schoharie, etc., New York.

Diphyphyllum huronicum Rominger.

Diphyphyllum Huronicum Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 121, pl. 45, fig. 1.

Eridophyllum huronicum Davis, Kentucky, Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 109, fig. 2; pl. 111.

Niagaran: Point Detour, Michigan; Drummond Island; Louisville, Kentucky.

Diphyphyllum integumentum (Barrett).

Diphyphyllum integumentum Barrett, Ann. New York Acad. Sci., 1, 1878, p. 123.—Weller, Geol. Surv. New Jersey, Rep. Pal., 3, 1903, p. 218, pl. 17, fig. 11.

Diphyphyllum integumentum—Continued.

Diplophyllum integumentum Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 106, pl. 10, fig. 1; pl. 15, fig. 9–10; pl. 16, figs. 15 and 17.

Helderbergian (Decker Ferry): Two miles south of Tristates, New York.

Upper Monroan (Anderdon and Amherstburg); Detroit River area.

Diphyphyllum? multicaule (Hall).

Syringopora? multicaulis Hall, Pal. New York, 2, 1852, p. 119, pl. 33, fig. 3a–g.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 493, footnote.

Diphyphyllum multicaule Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 122, pl. 45, figs. 3, 4.—Sherzer, Amer. Geol., 6, 1890, p. 61.—Lambe, Ottawa Nat., 12, 1899, p. 241; Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 159, pl. 13, figs. 4, 4a–c.

Synaptophyllum multicaule Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 105, pl., 12, fig. 6.

Eridophyllum vennori Billings, Canadian Nat. Geol., n. s., 2, 1865, p. 430.

Diphyphyllum vennori Miller, N. A. Geol. Pal., 1889, p. 186 (gen. ref.).

Silurian: Lockport, etc., New York (Lockport); Michigan; Manitoulin Island, Lake Huron (Cataract).

Upper Monroan (Amherstburg): Detroit River, opposite Amherstburg, Ontario.

Diphyphyllum proliferum Foerste.

Diphyphyllum proliferum Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 102, pl. 1, figs. 18A–d.

Niagaran (Brownsport): Near Linden; Brownsport Furnace and Savannah, Tennessee.

DIPHYPHYLLUM RUGOSUM Rominger. See Eridophyllum rugosum.

DIPHYPHYLLUM STOKESI Whiteaves. See Columnaria (Palæophyllum) stokesi.

DIPHYPHYLLUM VENNORI Miller. See Diphyphyllum multicaule.

DIPLASPIS Matthew. See Cyathaspis Lankester.

DIPLEURA Green. See Homalonotus Koenig.

DIPLOCERAS Conrad. See Endoceras Hall.

DIPLOCLEMA Ulrich. Genotype: D. trentonense Ulrich.

Diploclema Ulrich, Geol. Surv. Illinois, 8, 1890, p. 368; (Ulrich, in press), Miller, N. A. Geol. Pal., 1889, p. 300.—Ulrich, Zittel's Textb. Pal. (Engl. ed.), 1896, p. 262.—Pocta, Syst. Sil. du Centre Boheme, 8, pt. 1, 1894, p. 17.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 22.—Grabau, Bull. New York State Mus., 45, 1901, p. 162; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 162.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 17; Zittel-Eastman Textb. Pal., 1913, p. 321.

Diploclema sparsum (Hall).

Trematopora sparsa Hall, Pal. New York, 2, 1852, p. 155, pl. 40A, figs. 12a–d.—

Diploclema sparsum Ulrich, Geol. Surv. Illinois, 8, 1890, p. 369, pl. 53, fig. 10.—Grabau, Bull. New York State Mus., 45, 1901, p. 162, fig. 57; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 162, fig. 57.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 17, pl. 5, figs. 6, 7; pl. 23, figs. 4–6.

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

Anticostian (Gun River-Jupiter River): Anticosti.

Plesiotype.—Cat. No. 44071, U.S.N.M.

Diploclema sparsum argutum Bassler.
Diploclema sparsum var. argutum Bassler, Bull. U. S. Geol. Surv., 292, 1906, pp. 17, 18, pl. 5, figs. 8, 9.
Clinton (Rochester): Lockport, New York.
Holotype.—Cat. No. 35557, U.S.N.M.

Diploclema trentonense Ulrich.
Diploclema trentonense Ulrich, Geol. Surv. Illinois, 8, 1890, p. 369, pl. 53, figs. 9–9c.
Trenton: Trenton Falls, New York.
Cotypes.—Cat. No. 43251, U.S.N.M.

DIPLOGRAPSUS AMPLEXICAULE Emmons. See Diplograptus (Glyptograptus) amplexicaulis.

DIPLOGRAPSUS ANTENNARIUS Nicholson. See Cryptograptus antennarius.

DIPLOGRAPSUS CILIATUS Emmons. See Glossograptus arthracanthus.

Diplograpsus foliosus Emmons. Undeterminable.
Diplograpsus foliosus Emmons, Amer. Geology, 1, pt. 2, 1855, p. 106, pl. 1, fig. 13; Manual Geology, 1860, p. 87, fig. 68.
Mohawkian: Augusta County, Virginia.

DIPLOGRAPSUS HUDSONICUS Nicholson. See Diplograptus hudsonicus.

DIPLOGRAPSUS LACINIATA Emmons. See Diplograptus foliaceus.

DIPLOGRAPSUS MUCRONATUS McCoy. See Lasiograptus mucronatus.

DIPLOGRAPSUS OBLIQUIS Emmons. See Diplograptus foliaceus.

Diplograpsus stenosus Gurley. Not recognized.
Diplograpsus stenosus Gurley, Jour. Geol., 4, 1896, p. 78.
Trenton (Magog): Magog, Quebec.

DIPLOGRAPSUS WHITFIELDI Nicholson. See Glossograptus whitfieldi.

DIPLOGRAPTUS McCoy. Genotype: Graptolithus foliaceus Murchison.
Diplograpsus McCoy, Ann. Mag. Nat. Hist., 6, 1850, p. 270; British Pal. Rocks Foss., 1854, p. 3.—Geinitz, Amer. Jour. Sci. Arts, 2d ser., 14, 1852, p. 128; Bull. Soc. Geol. France, 2d ser., 9, 1852, p. 187; Zeits. d. d. geol. Gesell., 3, 1852, p. 389.—Richter, Zeits. d. d. geol. Gesell., 5, 1853, p. 455.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 104.—Chapman, Canadian Jour., n. s., 1, 1856, p. 389; 6, 1861, p. 506; Expos. Min. Geol. Canada, 1864, p. 100.—Nicholson, Quart. Jour. Geol. Soc. London, 24, 1868, pp. 9, 137; Mon. British Grapt., 1872, p. 115.
Diplograptus Dana, Amer. Jour. Sci. Arts, 2d ser., 14, 1852, p. 128.—Hall, Geol. Surv. Canada, dec. 2, 1865, p. 109; 20th Rep. New York State Cab. Nat. Hist., p. 217; rev. ed., 1868 (1870), p. 251.—Zittel, Handb. Pal., 1, 1879, p. 300.—Dairon, Trans. Geol. Soc. Glasgow, 7, 1883, p. 177.—Tullberg, Sveriges Geol. Unders., ser. C, no. 55, 1883, pp. 13, 14.—Spencer, Trans. Acad. Sci. St. Louis, 4, 1884, p. 561.—Miller, N. A. Geol. Pal., 1889, p. 186.—James, Jour. Cincinnati Soc. Nat. Hist., 14, pt. 2, p. 157.—Wiman, Jour. Geol., 2, 1894, p. 267.—Ruedemann, 48th Rep. New York State Mus., 2, 1897, p. 244; 14th Rep. State Geol. New York for 1894, 1897, p. 244.—Wiman, Bull. Geol. Inst. Univ. Upsala, 2, pt. 2, 1896, p. 264.—Koken, Die Leitfossilien, Leipzig, 1896, p. 329.—Wiman, Nat. Sci., 9, 1896, p. 188.—Roemer and Frech, Leth. geog.,

DIPLOGRAPTUS—Continued.

1 Theil, Leth. Pal., 1, 3 Lief., 1897, p. 624.—Walther, Zeits. d. d. geol. Gesell., 49, 1897, p. 250.—Ruedemann, Amer. Nat., 32, 1898, p. 3: Zittel-Eastman Textb. Pal., 1, 1900, p. 119.—Elles and Wood, Mon. British Grapt., Pal. Soc., 1903, p. xxxii.—Ruedemann, Mem. New York State Mus., 7, 1904, p. 718, 719.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 33.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 339–341; Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 130.

Glyptograptus Zittel, Handb. Pal., 1, 1879, p. 300.—Wiman, Bull. Geol. Inst. Univ. Upsala, 2, pt. 2, No. 4, 1896, p. 264.—Roemer and Frech, Leth. geog., 1 Theil, Leth. Pal., 1, 3 Lief., 1897, pp. 625, 632.

Diplograptus acutus (Elles and Wood).

Diplograptus vulgatus var. acutus, Elles and Wood, Mon. British Grapt., pt. 6, 1907, p. 242, pl. 30, figs. 3a–c.

Ordovician: South Scotland (Glenkiln); Arkansas (Stringtown).

DIPLOGRAPTUS AMPLEXICAULE Walcott (part). See Diplograptus peosta.

DIPLOGRAPTUS AMPLEXICAULE Whitfield. See Diplograptus amplexicaulis pertenuis.

Diplograptus (Glyptograptus) amplexicaulis (Hall).

Graptolithus amplexicaule Hall, Pal. New York, 1, 1847, pp. 79, 316, pl. 26, figs. 11a, b.—Hitchcock, Geol. Vermont, 1, 1861, p. 291, text fig.; New York State Cab. Nat. Hist., 20th Ann. Rep., 1868, pl. 3, figs. 6, 7, rev. ed., 1870, p. 223.

Diplograpsus amplexicaule Emmons, Amer. Geology, 1, pt. 2, 1855, p. 236, pl. 7, figs. 11a, b.

Diplograptus amplexicaulis Lapworth, Proc. and Trans. Roy. Soc. Can., 1886, 4, p. 184.—White Trans. New York Acad. Sci., 15, 1895, p. 93.—Ruedemann, Bull. New York State Mus., 39, 1901, p. 497ff.

Diplograptus foliaceus mut. amplexicaule Gurley, Jour. Geol., 4, 1896, p. 298.

Diplograptus (Glyptograptus) amplexicaulis Frech, Leth. geog., 1 Theil, Leth. Pal., 1, 3 Lief., 1897, p. 632 (gen. ref.).—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 361–365, pl. 25, figs. 10–13, text figs. 302–307.

Trenton: Trenton Falls, Middleville, and Washington County, New York.

Diplograptus amplexicaulis pertenuis Ruedemann.

Diplograptus amplexicaule Whitfield, U. S. Geol. Sur. West 100th Merid., Wheeler's Rep., 4, Pal., 1877, p. 19.—Ruedemann, Bull. New York State Mus., 8, 1901, p. 533, footnote.

Diplograptus amplexicaulis var. pertenuis Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 365, 366, pl. 25, figs. 14–16, text figs. 308–310.

Trenton (Snake Hill): Lansingburg and Troy, New York.

Diplograptus (Glyptograptus) angustifolius (Hall).

Graptolithus angustifolius Hall, Pal. New York, 3, 1859, p. 515, figs. 1, 2; New York State Cab. Nat. Hist., 13th Ann. Rep., 1860, p. 59, figs. 1, 2.

Diplograptus angustifolius Nicholson, Geol. Soc. Lond. Quar. Jour., 1868, p. 525, pl. 19, figs. 8, 9.—Lapworth, Cat. West. Scott. Foss., 1876, pl. 2, fig. 35; Belfast Nat. Field Club., Rep. and Proc., App., 1, pt. 4, 1877, p. 132, pl. 6, fig. 11; Ann. Mag. Nat. Hist., 5th ser., 5, 1880, p. 21.—Walcott, Alb. Inst. Trans., 10, 1881 (adv. sheets, 1879, p. 34).—Lapworth, Geol. Sur. Can. Rep., 2d ser., 2, 1886, p. 22D; Sci., 9, 1887, p. 320.–Ami, Geol. Sur. Can. Rep.'2d ser., 3, pt. 2, 1889, p. 116K.—Walcott, Bull. Geol. Soc. Amer. 1, 1890, p. 339.—Barrois, Ann. Soc. Geol. du Nord, 20, 1892, p. 145.—Gurley, Jour. Geol., 4, 1896, p.

Diplograptus (Glyptograptus) angustifollus—Continued.
298.—Ruedemann, Bull. New York State Mus. 42, 1901, p. 541ff.—Weller, Geol. Sur. New Jersey, Pal., 3, 1903, p. 212, pl. 16, figs. 8, 9.—Dale, Bull. U. S. Geol. Sur., 242, 1904, p. 33.

Diplograptus (Glyptograptus) angustifolius Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 366–369, pl. 25, figs. 19, 20, text figs. 311–314.

Diplograptus (Graptolithus) angustifolius Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 206, figs.

Chazyan (Normanskill): Glenmont, Stockport, Lansingburg, etc., New York; Kicking Horse Pass, Canada; Silver Peak Quadrangle, Nevada; Arkansas; Quebec; New Jersey; Great Britain.

DIPLOGRAPTUS BARBATULUS Salter. See Diplograptus foliaceus.

Diplograptus basillcus (Elles and Wood).

Orthograptus basilicus Lapworth, Geol. Mag., 10, 1873, p. 134 (nom. nud.).

Diplograptus vulgatus var. basilicus Elles and Wood, Mon. British Grapt., pt. 6, 1907, p. 243, pl. 30, figs. 2a–d.

Ordovician: South Scotland (Lower Hartfell); Arkansas (Normanskill-Stringtown).

DIPLOGRAPTUS BICORNIS Geinitz. See Climacograptus bicornis.

DIPLOGRAPTUS BIMUCRONATUS Nicholson. See Lasiograptus bimucronatus.

DIPLOGRAPTUS CILIATUS Walcott. See Glossograptus ciliatus.

Diplograptus crassitestus Ruedemann.

Diplograptus crassitestus Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 354, 355, pl. 25, fig. 6, text figs. 299–300.

Richmond (Sylvan): Arbuckle Mountains, Oklahoma.

Cotypes.—Cat. No. 54266, U.S.N.M.

DIPLOGRAPTUS DENTATUS Lapworth. See Diplograptus (Glyptograptus) euglyphus.

Diplograptus dentatus (Brongniart).

Fucoides dentatus Brongniart, Hist. Veget. Foss., 1, 1828, p. 70, pl. 6, figs. 9–12.

Graptolithus pristiniformis Hall, Geol. Sur. Can. Rep., 1857, p. 133; Canadian Nat. Geol., 3, 1858, p. 167.

Diplograptus pristiniformis Hall, Geol. Sur. Can., dec. 2, 1865, p. 110ff, pl. 13, figs. 15–17.—Nicholson, Quar. Jour. Geol. Soc., 24, 1868, p. 140, pl. 5, figs. 14, 15.

Diplograptus dentatus Hopkinson and Lapworth, Quart. Jour. Geol. Soc. London, 31. 1875, p. 656, pl. 34, figs. 5a–k.—Emerson, Narrative Hall's 2d Arctic Exped. U. S. Navy Dept., 1879, p. 576.—Ami, Geol. Sur. Can. Rep., 2d ser., 3, pt. 2, 1889, p. 117k.—Gurley, Jour. Geol., 4, 1896, p. 298.—Elles, Quar. Jour. Geol. Soc., 54, 1898, p. 517.—Ruedemann, New York State Pal., Ann. Rep., 1902, p. 570; Mem. New York State Mus., 7, pt. 1, 1904, pp. 719–721, pl. 17, figs. 10–13, text fig. 100.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 34.

Canadian: Point Levis, Quebec (Levis, Diplograptus dentatus zone); Deepkill, Rensselaer and Columbia Counties, New York (Deepkill, D. dentatus zone); Arkansas; England (Skiddaw); Wales (Arenig); Sweden.

DIPLOGRAPTUS DISSIMILARIS Emmons. See Diplograptus foliaceus.

DIPLOGRAPTUS ETHERIDGII Hopkinson. See Cryptograptus tricornis.

Diplograptus (Glyptograptus) euglyphus (Lapworth).

Diplograptus dentatus Lapworth, Ann. Mag. Nat. Hist., 5th ser., 4, 1870, p. 424; Belfast, Nat. Field Club Rep. and Proc., 1, pt. 4, App., 1877, p. 132, pl. 6, fig. 13; Geol. Soc. Quar. Jour., 34, 1878.

Diplograptus (Glyptograptus) euglyphus Lapworth, Ann. Mag. Nat. Hist., 5th ser., 5, 1880, p. 166, pl. 4, figs. 14a–e.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 369–370, pl. 25, figs. 22, 23, text figs. 315–316.—

Diplograptus euglyphus Lapworth, Ann. Mag. Nat. Hist., 5th ser., 6, 1880, p. 21; Proc. and Trans. Roy. Soc. Can., 4, 1887, p. 177; Canadian Rec. Sci., 3, 1888, p. 141 (loc. occ.); Can. Geol. Surv. Rep., 1887–88, 2d, ser., 3, pt. 1, p. 95B.

Middle Ordovician: Great Britain (Glenkiln); Dease River, British Columbia; Griffin Cove, etc., Quebec; Glenmont, Speigletown, etc., New York (Normanskill); Silver Peak Quadrangle, Nevada; Arkansas.

Plesiotype.—Cat. No. 54266, U.S.N.M.

Diplograptus euglyphus pygmæus Ruedemann.

Diplograptus euglyphus var. pygmæus Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 371, pl. 25, figs. 317, 318.

Trenton (Canajoharie): Near Lansingburg, New York.

Diplograptus foliaceus (Murchison).

?Fucoides dentatus Conrad, New York State Surv., 2d Ann. Rep., 1838, p. 114.—Vanuxem, ibid., p. 283.

Graptolithus foliaceus Murchison, Sil. Syst., 1839, p. 694, pl. 26, fig. 3.—Portlock, Geol. Rep., 1843, p. 320, pl. 19, fig. 9.

Diprion foliaceus Harkness, Geol. Soc. London Quart. Jour., 7, 1850, pl. 1, fig. 13b.

Diplograptus foliaceus Geinitz, Die Grapt., 1852, pl. 1, figs. 29, 30.—Lapworth, Cat. West. Scotland Foss., 1876, p. 6, pl. 2, fig. 29; Belfast Nat. Feld Club Rep. and Proc., 1, pt. 4, App., 1877, p. 133, pl. 6, fig. 18.—Linnarsson, Sver. Geol. Und., Ser. C., 31, 1879, p. 16ff.—Tullberg, Sver. Geol. Und., Ser. C, 41, 1880, p. 20; ibid., 50, 1882, p. 20.—Lapworth, Proc. and Trans. Roy. Soc. Canada, 4, 1887, pp. 177ff.—Ami, Can. Geol. Surv. Rep., 2d ser., 3, pt. 2, 1888, p. 117K.—Geinitz, Mitth. k. Min. geol. praeh. Mus. Dresden, 9, 1890, p. 37, pl. A.—Gurley, Geol. Surv. Arkansas, Ann. Rep., 1892, 3, p. 404.—Barrois, Ann. Soc. Geol. du Nord, 20, 1892, p. 145.—Gurley, Jour. Geol., 4, 1896, p. 298.—Hall, Roy. Soc. Proc., 9, 1896, p. 185; ibid., 10, 1897, p. 14; Geol. Mag., n. s., dec. 4, 6, 1899, p. 445.—Ruedemann, Bull. New State Mus., 42, 1901, p. 497ff.—Clark, Geol. Mag., 4th ser., 9, 1902, p. 498.—T. S. Hall, Geol. Surv. Victoria Rec., 1, pt. 1, 1902, p. 34f; Geol. Surv. New South Wales Rec., 7, pt. 2, 1902, p. 4, pl. 12, fig. 7.—Weller, Geol. Surv. New Jersey Pal., 3, 1902, p. 53.—Ami, Geol. Surv. Canada, Summ. Rep., 1905, p. 12.—Grabau and Shimer, N. A. Index Fossils 1, 1906, p. 33.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 341–346, pl. 24, figs. 1–8, pl. 25, figs. 1, 2, text figs. 279–282, pl. 25, figs. 7–9.

Fucoides simplex Emmons, Tac. Syst., 1844, p. 27, pl. 5, fig. 1; Agric. New York, 1, 1847, pl. 17, fig. 1.

Graptolithus pristis (part) Hall, Pal. New York, 1, 1847, p. 265, pl. 72, figs. 1-ac; Pal. New York, 3, 1859, p. 516, fig. 2; New York State Cab. Nat. Hist., 13th Ann. Rep., 1860, p. 60, fig. 2; Geol. Surv. Canada, Can. Org. Rem., dec. 2, 1865, p. 36, fig. 30; New York State Cab. Nat. Hist., 20th Ann. Rep., 1868, pp. 204, 205, fig. 2.

Graptolithus (Diplograptus) pristis White, Rep. Wheeler Surv., 4, 1875, p. 65, pl. 4, fig. 2.

Diplograptus foliaceus—Continued.

Diplograptus pristis Marcou, Geol. Map United States, 1853, p. 24, pl. 1, fig. 10.—Hopkinson, Micro. Club Jour., 1, 1869, pl. 8, fig. 11a.—Carruthers, Geol. Mag., 5, 1868, p. 130, pl. 5, figs. 13a–d.—Nicholson, Mon. British Grapt., 1872, fig. 22, p. 54; p. 58, fig. 26; p. 69, fig. 39A; p. 116, fig. 58.—Hopkinson and Lapworth, Geol. Soc. London Quart. Jour., 31, 1875, pp. 656–657, pl. 35, figs. 7a–g.—Walcott, Alb. Inst. Trans., 10, 1883 (adv. sheets, 1879, p. 34), p. 4 (loc. occ.).—Whitfield, Amer. Jour. Sci., 3d ser., 1883, 26, p. 380.—Tullberg, Zeittschr. d. deutsch. geol. Gesell., 35, 1883, p. 241.—Walcott, Bull. Geol. Soc. Amer., 1, 1890, p. 339.—Ruedemann (part), New York State Geol. Rep., 1897, p. 219, pl. 4.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 33, fig. 54.

Graptolithus folium et G. pristis Salter, Geol. Soc. London Quart. Jour., 5, 1849, p. 15, pl. 1, figs. 5, 6.

Diplograptus rugosus Emmons, Amer. Geol., 1, pt. 2, 1856, p. 105, pl. 1, fig. 26.—Lapworth, Ann. Mag. Nat. Hist., 5th ser., 5, 1880, p. 168.

Diplograptus dissimilaris Emmons, Amer. Geol., 1, pt. 2, 1855, p. 105, pl. 1, fig. 5.

Dicranograptus dissimilaris Gurley, Jour. Geol., 4, 1896, p. 95 (gen. ref.).

Diplograptus secalinus Hall, Pal. New York, 1, 1847, p. 267, pl. 72, figs. 2a–c.

Diplograptus barbatulus Salter, Mem. Geol. Surv. Great Britain, 3, 1866, pl. 2a, figs. 1c–d.

Graptolithus (Diplograptus) hypniformis White, Geogr. and Geol. Expl. West 100th Merid., Prel. Rep., 1874, p. 12; ibid., 4, War Dep., 1877, p. 63, pl. 4, fig. 4a, b.

Diplograpsus obliquis Emmons, Amer. Geol., 1, pt. 2, 1855, p. 106, pl. 1, fig. 22.

Diplograpsus laciniata Emmons, Amer. Geol., 1, pt. 2, 1855, p. 236, pl. 1, fig. 24.

Middle Ordovician: Great Britain (Glenkiln and Hartfell); Scandinavia, Australia, Nevada, Oklahoma, Arkansas, Canada, New York, etc. (Normanskill, etc.).

Plesiotype.—Cat. No. 8556, U.S.N.M. (Holotype of G. hypniformis).

DIPLOGRAPTUS FOLIACEUS Ruedemann (part). See Glossograptus (Orthograptus) quadrimucronatus.

Diplograptus foliaceus acutus Lapworth.

Graptolithus pristis Hall (?Hisinger), Pal. New York, 1, 1847, pl. 72, fig. 10, 1p.

Diplograptus foliaceus var. acutus (Lapworth MS.) Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 349–351, pl. 25, figs. 1, 2, text figs. 288–293.

Middle Ordovician: Stockport, etc., New York (Normanskill); Canada; Scotland (Glenkiln); Shropshire (Upper Llandeilo).

Diplograptus foliaceus alabamensis Ruedemann.

Diplograptus foliaceus var. alabamensis Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 352, pl. 25, fig. 3.

Chazyan (Athens): Pratts Ferry, Bibb County, Alabama.

DIPLOGRAPTUS FOLIACEUS mut. AMPLEXICAULE Gurley. See Diplograptus (Glyptograptus) amplexicaulis.

Diplograptus foliaceus incisus Lapworth.

Graptolithus pristis Hall (not Hisinger), Pal. New York, 1, 1847, pl. 72, fig. 11.

Diplograptus foliaceus var. incisus (Lapworth MS.) Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 347–349, pl. 24, figs. 198, text figs. 283–287.

Chazyan: One-half mile below Little Mechin Point, Quebec; Stockport and Glenmont, New York (Normanskill).

Diplograptus foliaceus trifidus (Gurley).

Diplograptus trifidus Gurley, Geol. Surv. Ark. Rep., 3, 1890, 417, pl. 9, figs, 3, 4; Jour. Geol., 4, 1896, pp. 298, 307.

Diplograptus foliaceus var. trifidus Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 351, 352, fig. 295.

Chazyan (Normanskill): Arkansas.

Cotypes.—Cat. No. 54260, U.S.N.M.

Diplograptus foliaceus vespertinus Ruedemann. See Diplograptus vespertinus.

Diplograptus hudsonicus Nicholson.

Diplograpsus Hudsonicus Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 38, fig. 15.

Cincinnatian (Pulaski): River Humber, Ontario.

Diplograptus inutilis Hall.

Diplograptus inutilis Hall, Geol. Surv. Canada, dec. 2, 1865, p. 111, pl. 13, fig. 14.—Gurley, Jour. Geol., 4, 1896, p. 298.—Ruedemann, New York State Pal. Ann. Rep., 1902, p. 570; Mem. New York State Mus., 7, pt. 1, 1904, p. 721, pl. 16, figs. 12, 13.

Canadian: Point Levis, Quebec (Levis, Diplograptus dentatus zone); Deepkill, Rensselaer County, New York (Deepkill, D. dentatus zone).

Diplograptus laxus Ruedemann. See Cryptograptus antennarius.

Diplograptus longicaudatus Ruedemann.

Diplograptus longicaudatus Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, p. 723, pl. 16, fig. 11.

Canadian (Deepkill, Diplograptus dentatus zone): Deepkill, Rensselaer County, New York.

Diplograptus (Amplexograptus) macer Ruedemann.

Diplograptus (Amplexograptus) macer Ruedemann, Mem. New York State Mus., 162, 1912, p. 82, pl. 2, figs. 20, 21.

Trenton (Canajoharie): Minaville, New York.

Diplograptus marcidus Walcott. See Cryptograptus tricornis.

Diplograptus (Mesograptus) mohawkensis Ruedemann.

Diplograptus (Mesograptus) mohawkensis Ruedemann, Bull. New York State Mus., 162, 1912, p. 80, pl. 2, figs. 18, 19.

Trenton (Canajoharie): Near Amsterdam and near Saratoga, New York.

Diplograptus mucronatus Geinitz. See Lasiograptus mucronatus.

Diplograptus peosta Hall.

Graptolithus pristis (part) Hall, Pal. New York, 1, 1847, p. 72, figs. 1f, 1g.

Graptolithus (Diplograptus) peosta Hall, Geol. Surv. Wisconsin Rep., 1861, p. 17.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 47, pl. 5, fig. 12.

Diplograptus peosta Hall, Geol. Wisconsin, 1, 1862, p. 430; 20th Rep. New York State Cab. Hist., 1868, p. 223.—Gurley, Jour. Geol., 4, 1896, p. 298.—James, Amer. Geol., 5, 1890, p. 354.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 372–374, pl. 25, fig. 17, text figs. 319–322; Bull. New York State Mus., 162, 1912, p. 83, fig. 23, pl. 2, fig. 17.

Diplograptus pristis Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1897, p. 81, fig. 2.

Diplograptus peosta—Continued.
Diplograptus amplexicaulis Whitfield and Hovey (part), Bull. Amer. Mus. Nat. Hist., 11, pt. 1, 1898, pp. 20–21.—Ruedemann, Bull. New York State Mus., 42, 1901, p. 561.
Richmond (Maquoketa): Graf, etc., Iowa; Wisconsin; Illinois; Minnesota; etc.

DIPLOGRAPTUS PRISTINIFORMIS Ruedemann. See Lasiograptus (Thysanograptus) eucharis.

DIPLOGRAPTUS PRISTINIFORMIS Hall (part). See Diplograptus dentatus.

DIPLOGRAPTUS PRISTIS Ruedemann (part). See Glossograptus (Orthograptus) quadrimucronatus.

DIPLOGRAPTUS PRISTIS Nicholson. See Diplograptus foliaceus.

DIPLOGRAPTUS PRISTIS Winchell and Schuchert. See Diplograptus peosta.

DIPLORGAPTUS PRISTIS Hall (part). See Diplograptus foliaceus vespertinus.

DIPLOGRAPTUS PUTILLUS Hall. See Climacograptus putillus.

DIPLOGRAPTUS QUADRIMUCRONATUS Nicholson. See Glossograptus (Orthograptus) quadrimucronatus.

DIPLOGRAPTUS RUEDEMANNI Gurley. See Lasiograptus (Thysanograptus) eucharis.

DIPLOGRAPTUS RUGOSUS Emmons. See Diplograptus foliaceus.

DIPLOGRAPTUS SECALINUS Eaton. See Diplograptus foliaceus.

DIPLOGRAPTUS? SEXTANS McCoy. See Dicellograptus sextans.

DIPLOGRAPTUS SPINULOSUS Walcott. See Glossograptus ciliatus.

DIPLOGRAPTUS TERETIUSCULUS var. PUTILLUS Frech. See Climacograptus putillus.

DIPLOGRAPTUS TRICORNIS Carruthers. See Cryptograptus tricornis.

DIPLOGRAPTUS TRIFIDUS Gurley. See Diplograptus foliaceus trifidus.

Diplograptus vespertinus (Ruedemann).
Diplograptus pristis (part) Hall, Pal. New York, 1, 1847, pl. 72, figs. 1, 1a, 1b, 1k, 1l.
Diplograptus foliaceus mut. vespertinus Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 352–354, pl. 25, figs. 4, 5, 18, text figs. 296–298.
Diplograptus vespertinus Ruedemann, Bull. New York State Mus., 162, 1912, p. 83.
Chazyan (Normanskill): Van Schaick Island, etc., New York.
Trenton (Canajoharie): Mohawk Valley, New York.

DIPLOGRAPTUS VULGATUS var. ACUTUS Elles and Wood. See Diplograptus acutus.

DIPLOGRAPTUS VULGATUS var. BASILICUS Elles and Wood. See Diplograptus basilicus.

DIPLOGRAPTUS WHITFIELDI Nicholson. See Glossograptus whitfieldi.

DIPLOPHYLLUM Hall. See Diphyphyllum Lonsdale.

DIPLOSTENOPORA Ulrich and Bassler. Genotype: Escharopora siluriana Weller.
Diplostenopora Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 276.

Diplostenopora siluriana (Weller).

Escharopora siluriana Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 225, pl. 18, figs. 6–7; pl. 19, figs. 8, 9.

Diplostenopora siluriana Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 277, pl. 45, figs. 3–6; pl. 48, figs. 1–3; pl. 52, figs. 3–4.

Helderbergian: Two miles south Tristates, New York (Decker Ferry); Cash Valley, etc., near Cumberland, Maryland (Keyser).

DIPLOTRYPA Nicholson (part). See Mesotrypa Ulrich.

DIPLOTRYPA Nicholson. Genotype: Favosites petropolitanus Pander.

Diplotrypa Nicholson, Pal. Tab. Corals, 1879, p. 292; 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.—Roemer, Leth. geog., 1, Leth. Pal., 1883, p. 472.—Miller, N. A. Geol. Pal., 1889, p. 187.—Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 378, 457.—Rominger, Amer. Geol., 6, 1890, pp. 116–119.—Ulrich, Geol. Minnesota, 3, 1893, p. 285; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 275; also (not Ulrich) p. 104 (in part).—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, p. 36.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 47; Zittel-Eastman Textb. Pal., 1913, p. 338; Bull. U. S. Nat. Mus., 77, 1911, pp. 312, 313.

Callopora (not Hall) Dybowski, Die Chætetiden d. Ostb. Silur-Form., 1877, p. 106.

Diplotrypa? dubia Ulrich.

Diplotrypa? dubia Ulrich, Geol. Surv. Illinois, 8, 1890, p. 459, pl. 33, figs. 3–3b.

Monticulipora dubia J. F. James, Jour. Cincinnati Soc. Nat. Hist., 16, 1894, p. 182.

Dianulites dubia Miller, N. A. Geol. Pal., 2d App., 1897, p. 728 (gen. ref.).

Richmond (Fernvale): Wilmington, Illinois.

Sections of *holotype*.—Cat. No. 43390, U.S.N.M.

DIPLOTRYPA INFIDA Ulrich. See Mesotrypa infida.

Diplotrypa limitaris Ulrich.

Diplotrypa limitaris Ulrich, Geol. Minnesota, 3, 1893, p. 286, fig. 18.—Sardeson, Jour. Geol., 9, 1901, p. 8, pl. A, figs. 3, 4.

Dianulites limitaris Miller, N. A. Geol. Pal., 2d App., 1897, p. 728 (gen. ref.).

Trenton (Prosser): Goodhue County, Minnesota.

Holotype.—Cat. No. 43534, U.S.N.M.

DIPLOTRYPA MILLERI Ulrich. See Mesotrypa nummiformis.

Diplotrypa neglecta Ulrich.

Diplotrypa neglecta Ulrich, Geol. Minnesota, 3, 1893, p. 287, fig. 19.

Dianulites neglecta Miller, N. A. Geol. Pal., 2d App., 1897, p. 728 (gen. ref.).

Trenton (Prosser): Hader, Minnesota.

Holotype.—Cat. No. 43533, U.S.N.M.

DIPLOTRYPA PATELLA Ulrich. See Mesotrypa patella.

DIPLOTRYPA QUEBECENSIS Ami. See Mesotrypa quebecensis.

DIPLOTRYPA REGULARIS Foord. See Mesotrypa regularis.

Diplotrypa walkeri Bassler.

Diplotrypa walkeri Bassler, Bull. U. S. Geol. Surv., 292, 1906, pp. 47–48, pl. 16, figs. 1–5; pl. 25, fig. 4.

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

Cotypes.—Cat. No. 35527, U.S.N.M.

Diplotrypa westoni Ulrich.

Diplotrypa westoni Ulrich, Contr. Micro-Pal. Cambro-Sil., pt. 2, 1889, p. 30, pl. 8, figs. 4–4b; Zittel's Textb. Pal. (Engl. ed.), 1896, fig. 457 (p. 274).—Whiteaves, Pal. Foss., 3, pt. 3, 1897, p. 163.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 323, fig. 201; Zittel-Eastman Textb. Pal., 1913, p. 338.

Black River or Richmond: Big Island, Lake Winnipeg, Manitoba.

Ordovician (Chasmops): Nittsjo Rätvik, Dalarne, Sweden, and south of Bödahamn, island of Œland, Baltic Sea.

Part of *holotype*.—Cat. No. 43810, U.S.N.M.

DIPRION FOLIACEUS Harkness. See Diplograptus foliaceus.

DISCINA Hall. See Orbiculoidea D'Orbigny.

DISCINA CIRCE Billings. See Orbiculoidea lamellosa.

DISCINA CLARA Spencer. See Schizotreta tenuilamellata.

DISCINA CONCORDENSIS Sardeson. See Schizotreta pelopea.

DISCINA DEFORMIS Lincklaen. See Archinacella deformata.

Discina?? fletcheri Ami.

Discina fletcheri Ami, Proc. and Trans. Nova Scotian Inst. Sci., 8, 1895, p. 412.

Silurian: Antigonish County, Nova Scotia.

DISCINA FORBESI Nicholson. See Schizotreta tenuilamellata.

DISCINA LAMELLOSA Hitchcock. See Orbiculoidea lamellosa.

Discina?? novascotica Ami.

Discina novascotica Ami, Proc. and Trans. Nova Scotian Inst. Sci., 8, 1895, p. 412.

Silurian: Antigonish County, Nova Scotia.

Discina?? orientalis Ami.

Discina orientalis Ami, Proc. and Trans. Nova Scotian Inst. Sci., 8, 1895, p. 413.

Silurian: Antigonish County, Nova Scotia.

DISCINA PARMULATA Lincklaen. See Orbiculoidea parmulata.

DISCINA PELOPEA Billings. See Schizotreta pelopea.

DISCINA SOLITARIA Ringueberg. See Schizotreta tenuilamellata.

Discina sublamellosa Ulrich.

Discina sublamellosa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 97, pl. 4, fig. 11.—Miller, N. A. Geol. Pal., 1889, p. 344.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 218.

Eden (Economy): Covington, Kentucky.

Observation.—Probably not a brachiopod; possibly a pelecypod.

DISCINA TENUILAMELLATA var. SUBPLANA Hall. See Orbiculoidea subplana.

DISCINA TENUISTRIATA Ulrich. See Orbiculoidea tenuistriata.

DISCINA TRUNCATA Emmons. See Orbiculoidea lamellosa.

DISCINA VANUXEMI Hall. See Orbiculoidea vanuxemi.

DISCOCERAS Barrande. Genotype: Clymenia antiquissima Eichwald.

Discoceras Barrande, Cephalopodes; Ext. Syst. Sil. du Centre Boheme, 1877, p. 95.—Angelin, Fragmenta Silurica, 1880, p. 9.—Zittel, Handb. Pal., 2, 1884, p. 377.—Remele, Zeits. d. d. geol. Gesell., 28, 1886, p. 468.—Schröder, Pal. Abhandl. von Dames u. Kayser, Neue Folge, 1, Heft. 4, Jena, 1891, p. 20.—Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 500.—Koken, Die Leitfossilien, Leipzig, 1896, p. 51.—Miller, N. A. Geol. Pal., 2d, App., 1897, p. 772.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 72.

Discoceras canadense Whiteaves.

Discoceras Canadense Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 227, pl. 22, figs. 3, 3a.

Black River or Richmond: Little Black Island; Lake Winnipeg, Canada.

DISCOCERAS EATONI Schroeder. See Schroederoceras eatoni.

Discoceras graftonense (Meek and Worthen).

Lituites Graftonensis Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1870, p. 51; Geol. Surv. Illinois, 6, 1875, p. 507, pl. 25, fig. 1.—Newell, Proc. Boston Soc. Nat. Hist., 1888, 23, p. 485 (loc. occ.).—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 105.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 72.

Lituites multicostatus Whitfield, Ann. Rep. for 1879, 1880, p. 67; Geol. Wisconsin, 4, 1882, p. 303, pl. 20, fig. 7.—Newell, Proc. Boston Soc. Nat. Hist., 23, 1888, p. 486 (loc. occ.).

Trocholites multicostatus Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 36, pl. 6, figs. 1, 1a.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1229, figs.

Niagaran: Grafton, Illinois; Waukesha, Wisconsin; Indiana; Elora and Hespeler, Ontario (Guelph).

DISCOCERAS INTERNISTRIATUM Schroeder. See Trocholites internistriatus.

Discoceras marshi (Hall).

Lituites marshii Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 362-pl. 16 (7), figs. 6, 7; rev. ed., 1870, p. 404, pl. 16, figs. 6, 7.—Nettelroth, Kentucky Foss. Shells, Geol. Surv. Kentucky, 1889, p. 195, pl. 30, fig. 1.—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 473, pl. 21, fig. 4.

Discoceras marshii Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 72, fig. 1284.

Niagaran: Kankakee, Illinois; Louisville, Kentucky; Wabash, Indiana.

Plesiotype.—Cat. No. 51378, U.S.N.M.

Discoceras ortoni (Meek).

Lituites? Ortoni Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 186, pl. 15, fig. 4 (Gyroceras? Ortoni at end of description).

Discoceras ortoni Miller, N. A. Geol. Pal., 2d App., 1897, p. 773 (gen. ref.).

Niagaran (Guelph): Greenville, Darke County, Ohio.

DISCOLITES Emmons. See Microceras Hall.

DISCOLITES MINUTUS Emmons. See Microceras inornatum.

DISCOPHYCUS Walcott. Genotype: D. typicale Walcott.

Discophycus Walcott, Trans. Albany Inst., 10, 1883, p. 19 (adv. sheets, 1879).—Miller, N. A. Geol. Pal., 1889, p. 117.

Discophycus typicale Walcott.

Discophycus typicalis Walcott, Trans, Albany Inst., 10, 1883, p. 19, pl. 2, figs. 18, 18a (adv. sheets, 1879).—James, Jour. Cincinnati Soc. Nat. Hist., 7, 1884, p. 128, pl. 5, fig. 4.

Utica: Trenton, Oneida County, New York.

DISCOPHYLLUM Hall. Genotype: D. peltatum Hall.

Discophyllum Hall, Pal. New York, 1, 1847, p. 277

Discophyllum peltatum Hall.

Discophyllum peltatum Hall, Pal. New York, 1, 1847, p. 277, pl. 75, fig. 3.

Chazyan (Normanskill) or Trenton (Snake Hill): Near Troy, New York.

DISCOSORUS Hall. Genotype: D. conoideus Hall

Discosorus Hall, Pal. New York, 2, 1852, p. 99, pl. 28.—Woodward, Man. Mollusca, pt. 3, 1856, p. 449.—Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 81.—Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1883, p. 272.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 194.—Miller, N. A. Geol. Pal., 1889, p. 436.

Discosorus conoideus Hall.

Columns of circular discs, etc., Bigsby, Trans. Geol. Soc. London, ser. 2, 1, 1824, p. 204, pl. 30, figs. 4, 6.

Discosorus conoideus Hall, Geol. Lake Sup. Land Dist., Foster and Whitney's Rep., 1851, p. 222, pl. 34, figs. 2, 3; Pal. New York, 2, 1852, p. 99, pl. 28, figs. 13a–c.—Whitfield, Geol. Wisconsin, 4, 1882, p. 209, pl. 20, fig. 6.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 196, fig. 25.

Orthoceras? (Discosorus) conoideus Barrande, Syst. Sil. du Centre Boheme, 2, pt. 3, 1864, p. 750, pl. 232, 437, 474.—Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 286; Geol. Surv. Ohio, Pal., 7, 1893, p. 546, pl. 36, fig. 8.

Gomphoceras conoideum Whitfield and Hovey, Bull. Amer. Mus. Nat. Hist., 11, pt. 2, 1899, p. 172. (Regarded as internal cast of siphon.)

Silurian: Ontario and Lockport, New York (Lower Clinton); Todds Fork, Clinton County, Ohio (Brassfield); Ashford, etc., Wisconsin; Drummond Island, Lake Huron (Niagaran).

Discosorus gracilis Foord.

Discosorus ——— Barrande, Syst. Sil. Boheme, 2, suppl. 1877, pl. 474, figs. 9, 10.

Discosorus gracilis Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 198, fig. 26.

Niagaran: Drummond Island, Lake Huron.

Discosorus remotus Foord.

Columns of circular discs, etc., Bigsby, Trans. Geol. Soc., 2d ser., 1, 1824, p. 204, pl. 30, fig. 7.

Discosorus remotus Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 197.

Niagaran: Drummond Island, Lake Huron.

DISCOTRYPA Ulrich. Genotype: Chætetes elegans Ulrich.

Discotrypa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 155.—Miller, N. A. Geol. Pal., 1889, p. 300.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 378.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 30.

Discotrypa elegans (Ulrich).

Chætetes elegans Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 130, pl. 12, figs. 12, 12a.

Discotrypa elegans Ulrich, ibid., 6, p. 163, pl. 7, fig. 1–1b.

Monticulipora elegans James and James, ibid., 10, 1888, p. 165.—J. F. James, ibid., 16, 1894, p. 180.

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

Holotype.—Cat. No. 43653, U.S.N.M.

DISTACODUS Hinde. Genotype: Machairodus incurvus Pander.

Machairodus Pander, Mon. Foss. Fische Sil. Syst., 1856, p. 23.

Distacodus Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 357. (Proposed for Machairodus Pander, preoccupied by Kaup.)—Miller, N. A. Geol. Pal., 1889, p. 518.

Distacodus incurvus (Pander).

Machairodus incurvus Pander, Mon. Foss. Fische Sil. Syst., 1856, p. 23, tab. 1, fig. 22.

Distacodus incurvus Hinde, Quart, Jour. Geol. Soc. London, 35, 1879, p. 357, pl. 15, fig. 9.

Middle Ordovician: Esthonia, Russia.

Maysville (Pulaski): Garrison Common, near Toronto, Ontario.

DITŒCHOLASMA Simpson. Genotype: Petraia fanningana Safford.

Ditœcholasma Simpson, Bull. New York State Mus., 39, 1900, p. 200.

Ditœcholasma fanninganum (Safford).

Petraia Fanningana Safford, Geol. Tennessee, 1869, p. 320, pl. 5, (H), figs. 3a–g.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 627, figs.

Duncanella fanningana Girty, 19th Ann. Rep. U. S. Geol. Surv., 1899, p. 552.

Ditœcholasma fanninganum Simpson, Bull. New York State Mus., 39, 1900, p. 201, figs. 5, 6.

Ditœcholasma (Petraia) fanningana Foerste, Jour. Geol., 11, 1903, p. 713 (loc. occ.).

Niagaran (Brownsport): Decatur, Perry, and Wayne Counties, Tennessee.

Dolabra carinata Meek. See Whitella carinata.

Dolabra sterlingensis Meek and Worthen. See Whitella sterlingensis.

DOLICHOMETOPUS Angelin. Genotype: D. suecicus Angelin.

Dolichometopus Angelin, Pal. Scandinavica, 3d ed., Holmiæ, 1878, p. 72.—Woodward, Geol. Mag., dec. 3, 1, 1884, p. 343.—Zittel, Handb. Pal., 2, 1885, p. 599.—Miller, N. A. Geol. Pal., 1889, p. 545.—Koken, Die Leitfossilien, Leipzig, 1896, p. 15.—Matthew, Trans. Royal Soc. Canada, 2d ser., 3, sec. 4, 1897, pp. 184, 195.—Walcott, Cam. Faunas China, Yearb.. Carnegie Inst., 3, 1913, p. 215.—Clarke, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 783.

Amphoton Lorenz, Zeit. deutsch. geol. Gesell., 58, 1906, p. 75. (Genotype: A. steinmanni Lorenz.)

Dolichometopus(?) convexus Billings.

Dolichometopus? convexus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 269, fig. 253.

Canadian (Quebec-G): Port aux Choix, Newfoundland.

Dolichometopus(?) gibberulus Billings.

Dolichometopus? gibberulus Billings, Pal. Foss., 1, 1865, Geol. Surv. Canada, p. 269, fig. 254.

Canadian (Quebec-G): Port aux Choix, Newfoundland.

Dolichometopus mccoyi (Walcott).
Barrandia? McCoyi Walcott, Mono. U. S. Geol. Surv., 8, 1884, p. 96, pl. 12, fig. 5.
Niobe Maccoyi Frech, Leth. geog., Leth. Pal., 2, 1897, pl. 1b, fig. 2.
Upper Pogonip: Ridge east of Hamburg Ridge, Eureka District, Nevada.
Cotype.—Cat. No. 24650, U.S.N.M.

Dolichometopus(?) rarus Billings.
Dolichometopus? rarus Billings, Pal. Foss., 1, 1865, p. 352, text fig. 338.
Canadian (Beekmantown): Township of Oxford, Canada.

DOLICHOPTERUS Hall. Genotype: D. macrocheirus Hall.
Dolichopterus Hall, Pal. New York, 3, 1859, p. 414.—Zittel, Handb. Pal., 2, 1885, p. 651.—Miller, N. A. Geol. Pal., 1889, p. 545.—Laurie, Nat. Sci., 3, 1893, p. 125.—Clarke, Zittel-Eastman Textb. Pal., 1, 1900, p. 676.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 230; Bull. New York State Mus., 45, 1901, p. 230.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 410.—Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 258.

Dolichopterus breviceps Clarke and Ruedemann.
Dolichopterus breviceps Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 414, fig. 98.
Chazyan (Normanskill): Catskill, New York.

Dolichopterus frankfortensis Clarke and Ruedemann.
Dolichopterus frankfortensis Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 268, pl. 83, figs. 9–14.
Trenton (Schenectady): Schenectady, Aqueduct, Rotterdam Junction, and Duanesburg, New York.

Dolichopterus latifrons Clarke and Ruedemann.
Dolichopterus latifrons Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 269, pl. 83, figs. 15–16.
Trenton (Schenectady): Schenectady, New York.

Dolichopterus macrocheirus Hall.
Dolichopterus macrocheirus Hall, Pal. New York, 3, 1859, p. 414, pl. 83, fig. 1, pl. 83a, fig. 1.—Pohlman, Bull. Buffalo Soc. Nat. Sci., 4, 1881, p. 20.—Grabau, Bull. New York State Mus., 45, 1901, p. 230; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 230.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 410, fig. 1711.—Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 262, pl. 35, fig. 1; pls. 40–45, text fig. 61.
Cayugan (Bertie): Williamsville, Litchfield, etc., New York.
Plesiotype.—Cat. No. 60052, U.S.N.M.

Dolichopterus otisius (Clarke).
Pterygotus? otisius Clarke, Bull. New York State Mus., 107, 1907, p. 308, pl. 6, figs. 6, 7.
Dolichopterus otisius Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 270, pl. 46, figs. 1–8.
Medinan (Shawangunk): Otisville, New York; Delaware Water Gap, Pennsylvania.

Dolichopterus siluriceps Clarke and Ruedemann.
Eusarcus scorpionis Pohlman, Bull. Buffalo Soc. Nat. Sci., 5, 1886, p. 30, pl. 3, fig. 3.
Dolichopterus siluriceps Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 273, pl. 26, fig. 3.
Cayugan (Bertie): Williamsville, New York.

Dolichopterus stylonuroides Clarke and Ruedemann.

Dolichopterus stylonuroides Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 276, pl. 46, figs. 9–14.

Medinan (Shawangunk): Otisville, New York.

Dolichopterus(?) testudineus Clarke and Ruedemann.

Dolichopterus(?) testudineus Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 274, pl. 57, figs. 1, 2.

Cayugan (Bertie): Near Crane's Corners, Litchfield, Herkimer County, New York.

DONACICRINITES BIPARTITUS Troost. See Erisocrinus? bipartitus.

DOUVILINA Hall and Clarke. See Stropheodonta Hall.

DREPANELLA Ulrich. Genotype: D. crassinoda Ulrich.

Drepanella Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, pp. 117, 118 (Depranella in error).—Miller, N. A. Geol. Pal., 1st, App., 1892, p. 707.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 670; Zittel-Eastman Textb. Pal., 1, 1900, p. 644.—Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 311.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 349.

Drepanella ampla Ulrich.

Drepanella ampla Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 120, pl. 8, fig. 2.—Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, pl. 41, fig. 9.

Stones River (?Ridley): Bottom of gorge, High Bridge, Kentucky.

Holotype.—Cat. No. 41375, U.S.N.M.

DREPANELLA AMPLA var. ELONGATA Ulrich (1894). See Drepanella crassinoda.

Drepanella bigeneris Ulrich.

Drepanella bigeneris Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 672, pl. 44, figs. 20–22.—Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, pl. 41, figs. 1–3.

Black River (Platteville): Minneapolis, Minnesota.

Cotypes.—Cat. No. 41379, U.S.N.M.

DREPANELLA BILATERALIS Ulrich. See Scofieldia bilateralis.

Drepanella crassinoda Ulrich.

Drepanella crassinoda Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 118, pl. 8, figs. 1a–c.—Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 291, fig. 18, pl. 41, figs. 4–6.—Grabau and Shimer, N. A. Index Fossils, 1910, p. 349, fig. 1657l–n.—Bassler, Bull. Virginia Geol. Surv., 2a, 1909, pl. 23, fig. 12; Zittel-Eastman Textb. Pal., 1913, p. 738, fig. 1425o.

Drepanella ampla var. elongata (in error for D. crassinoda) Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 670, fig. 48a–c.

Black River (Lowville): High Bridge, Kentucky; Virginia; Tennessee.

Holotype.—Cat. No. 41377, U.S.N.M.

DREPANELLA CRASSINODA NITIDA Ulrich. See Drepanella nitida.

Drepanella elongata Ulrich.

Drepanella elongata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 121, pl. 8, figs. 5a, b.—Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, pl. 41, figs. 10, 11.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 349, fig. 1657o.

Drepanella macra Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 670, fig. 48d (not 48c = D. crassinoda).

Stones River (?Ridley): Bottom of gorge, High Bridge, Kentucky.

Holotype.—Cat. No. 41376, U.S.N.M.

DREPANELLA MACRA Ulrich (1894). See Drepanella elongata.

Drepanella macra Ulrich.

Drepanella macer Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1894, p. 119, pl. 8, figs. 4a–c.

Drepanella macra Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 291, fig. 17, pl. 41, figs. 12–14.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 350, fig. 1664a–c.

Stones River (Lebanon): Lavergne, Lebanon, and Columbia, Tennessee.

Holotype.—Cat. No. 41373, U.S.N.M.

Drepanella nitida (Ulrich).

Drepanella crassinoda nitida Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 119, pl. 8, figs. 3a, b.

Drepanella nitida Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 291, fig. 19, pl. 41, figs. 7, 8.

Black River (Lowville): High Bridge, Kentucky.

Holotype.—Cat. No. 41378, U.S.N.M.

Drepanella richardsoni (Miller).

Beyrichia richardsoni Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 347, fig. 40; N. A. Geol. Pal., 1889, p. 535, fig. 978.

Drepanella richardsoni Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 117.—Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 292, fig. 23, pl. 41, fig. 15.

Richmond (Whitewater): Wilmington, Ohio.

Plesiotype.—Cat. No. 41407, U.S.N.M.

Drepanella richardsoni canadensis Ulrich.

Drepanella richardsoni var. canadensis Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 118.

Richmond: Oakville, Ontario.

Cotypes.—Cat. No. 41374, U.S.N.M.

Drepanella symmetrica (Emerson).

Beyrichia symmetrica Emerson, Narrative Hall's 2d Arctic Exped., U. S. Navy Dep., 1879, p. 581, fig. 9.

Richmond: Frobisher Bay, Baffin Land.

Plastotype.—Cat. No. 60729, U.S.N.M.

DREPANODUS Pander. Genotype: D. arcuatus Pander.

Drepanodus Pander, Mon. d. foss. Fische Sil. Syst., 1856, p. 20.—Miller, N. A. Geol. Pal., 1889, p. 518.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 245.

Drepanodus arcuatus Pander.

Drepanodus arcuatus Pander, Mon. foss. Fish. Sil. Syst., 1856, p. 20, tab. 1, figs. 2, 4, 5.—Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 357, pl. 15, figs. 7, 8.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 245, fig. 1537, d, e.

Middle Ordovician: Esthonia, Russia.

Maysville (Pulaski): Garrison Common, near Toronto, Ontario.

DREPANOPTERUS Laurie. See Stylonurus subgenus Drepanopterus.

DRYMOPORA Davis. See Syringopora subgenus Drymopora.

DRYMOTRYPA Ulrich. See Pseudohornera Roemer.

DUNCANELLA Nicholson. Genotype: D. borealis Nicholson.

Duncanella Nicholson, Ann. Mag. Nat. Hist., 4th ser., 13, 1874, p. 333.—Zittel, Handb. Pal., 1, 1879, p. 226.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 396.—Miller, N. A. Geol. Pal., 1889, p. 187.—Frech, Palæontographica, 37, 1890, p. 81.—Sherzer, Amer. Geol., 7, 1891, pp. 278–283.—Girty, 19th Ann. Rep. U. S. Geol. Surv., 1899, p. 556; Zittel-Eastman Textb. Pal., 1, 1900, p. 74; 2d ed., 1913, p. 82.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 76.

Duncanella borealis Nicholson.

Duncanella borealis Nicholson, Ann. Mag. Nat. Hist., 4th ser., 13, 1874, p. 334, fig.—Miller, N. A. Geol. Pal., 1889, p. 187, fig. 172.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 76.

Streptelasma (Duncanella) borealis Hall, 28th Rep. New York State Mus. Nat. Hist., mus. ed., 1879, p. 106, pl. 5, figs. 7, 8; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 226, pl. 1, figs. 7–10; pl. 4, figs. 7, 8.

Streptelasma borealis Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1084, figs.

Streptelasma minima Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875, pl. 5, figs. 7, 8.

Niagaran (Waldron): Waldron, Indiana; Newsom, Tennessee.

Clinton (Osgood): Osgood, Indiana.

DUNCANELLA FANNINGANA Girty. See Ditœcholasma fanninganum.

DYBOWSKIA Waagen and Pichl. See Fistulipora McCoy.

DYBOWSKIELLA Waagen and Wentzel. See Fistulipora McCoy.

DYERIA Ulrich. Genotype: Cyrtolites costatus James.

Dyeria Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1044.

Dyeria costata (James).

Cyrtolites costatus James, Amer. Jour. Sci., 3d ser., 3, 1872, p. 26.—Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 150, pl. 13, figs. 1a, b, c.

Bucania costatus Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 308.

Dyeria costata, Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1044. text fig. 8.—Grabau, Amer. Nat., 36, 1902, p. 939.

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

Plesiotypes.—Cat. No. 45796, U.S.N.M.

DYSTACTOPHYCUS Miller and Dyer.

Genotype: D. mammillanum Miller and Dyer.

Dystactophycus Miller and Dyer, Cont. to Pal., 2, 1878, p. 2.—James, Jour. Cincinnati Soc. Nat. Hist., 7, 1885, p. 163.—Miller, N. A. Geol. Pal., 1, 1889, p. 117.

Dystactophycus mammillanum Miller and Dyer.

Dystactophycus mammillanum Miller and Dyer, Cont. to Pal., 2, 1878, p. 3, pl. 3, fig. 4.—James, Jour. Cincinnati Soc. Nat. Hist., 18, 1895, p. 125.—Miller, N. A. Geol. Pal., 1889, p. 118, fig. 34.

Maysville (Corryville): Near Morrow, Ohio.

DYSTACTOSPONGIA Miller. Genotype: D. insolens Miller.

Dystactospongia Miller, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 42.—Miller, N. A. Geol. Pal., 1889, p. 158.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 14, pt. 1, 1891, p. 70.

Dystactospongia insolens Miller.

Dystactospongia insolens Miller, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 43, pl. 2, figs. 2a–b.—James, ibid., 14, 1891, p. 70.—Miller, N. A. Geol. Pal., 1889, p. 158, fig. 102.

Stromatopora insolens James, Jour. Cincinnati Soc. Nat. Hist., 9, 1886, p. 250.

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

Dystactospongia madisonensis Foerste.

Dystactospongia madisonensis Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 302, pl. 9, figs. 1, 5; ibid., 16, 1910, p. 20.

Richmond (Whitewater-Saluda): Madison, Osgood, and Versailles, Indiana.

Dystactospongia minima Ulrich.

Dystactospongia minima Ulrich, Amer. Geol., 3, 1889, p. 243.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 14, pt. 1, 1891, p. 70.

Richmond (Waynesville): Hanover, Butler County, Ohio.

Holotype.—Cat. No. 46553, U.S.N.M.

Dystactospongia minor Ulrich and Everett.

Dystactospongia minor Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 278, pl. 8, figs. 3a–b.—Hayes and Ulrich, U. S. Geol. Surv., folio 95, 1893, illust. sheet, figs. 48, 49.

Black River: Dixon, Illinois (Platteville); Columbia, etc., Tennessee (Carters).

Sections of *holotype* and *plesiotypes*.—Cat. Nos. 46554, 35404, U.S.N.M.

Dystactospongia rudis Ulrich and Everett.

Dystactospongia rudis Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 279, pl. 8, figs. 4, 4a.

Black River (Platteville): Dixon, Illinois.

Sections of *holotype*.—Cat. No. 46555, U.S.N.M.

EATONIA Hall. Genotype: Atrypa peculiaris Conrad.

Eatonia Hall, 10th Rep. New York State Cab. Nat. Hist., 1857, p. 90; 12th Rep., ibid., 1859, p. 35; Pal. New York, 3, 1859, p. 432.—Billings, Proc. Portland Soc. Nat. Hist., 1863, p. 111.—Zittel, Handb. Pal., 1, 1880, p. 691.—Waagen, Mem. Geol. Surv. India, Pal. Indica, 13th ser., 1883, p. 412.—Miller, N. A. Geol. Pal., 1889, p. 345.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 205; 13th Ann. Rep. New York State Geologist, 1895, p. 829.—Koken, Die Leitfossilien, Leipzig, 1896, p. 245.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 760.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 219.

Eatonia goodlandensis Kindle and Breger.

Eatonia goodlandensis Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 439, pl. 8, figs. 10–12.

Niagaran: Near Goodland, Indiana.

Eccoptochile? meekanus Slocom. See Ceraurinus icarus.

Ecculiomphalus of authors. See Eccyliomphalus Portlock.

Eccyliomphalus (part) of authors. See Eccyliopterus Remele.

ECCYLIOMPHALUS Portlock. Genotype: E. bucklandi Portlock.

Ecculiomphalus Portlock, Geol. Rep. Londonderry, 1843, p. 411.

Eccyliomphalus McCoy, British Pal. Rocks and Foss., 1854, p. 301.—Remele, Zeits. d. d. geol. Gesell., 40, 1888, p. 666.—Koken, Neues Jahrb. f. Min., Geol.,

ECCYLIOMPHALUS—Continued.

Pal., 6, Beilage-Band, 1889, p. 317.—Miller, N. A. Geol. Pal., 1889, p. 402.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, pp. 1024, 1029, 1036.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 276.—Grabau and Shimer, N. N. A. Index Fossils, 1, 1909, p. 662.

Orthostoma Conrad, 2d Ann. Rep. New York Geol. Surv., 1838, p. 119.—Miller, N. A. Geol. Pal., 1889, p. 414 (Genotype: O. commune Conrad).

Calaurops Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 314.—Miller, N. A. Geol. Pal., 1889, p. 399.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 662 (Genotype: C. lituiformis Whitfield).

Eccyliomphalus atlanticus (Billings).

Ecculiomphalus Atlanticus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 250.

Canadian (Quebec—F., G.): Bay of St. John and Keppel Island, Newfoundland.

Eccyliomphalus calciferus (Whitfield).

Euomphalus calciferus Whitfield, Bull. Amer. Mus. Nat. Hist., 2, 1889, p. 47, pl. 8, figs. 12, 13.

Canadian (Beekmantown): Beekmantown, New York.

Eccyliomphalus (Orthostoma) canadensis (Billings).

Ecculiomphalus Canadensis Billings, Canadian Nat. Geol., 6, 1861, p. 320, fig. 4; Geol. Canada, Geol. Surv. Canada, 1863, p. 232, fig. 248.

Calaurops Canadensis Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 315 (gen. ref.).

Canadian (Beekmantown): Ormstown, Phillipsburg, and Point Levis, Quebec.

Eccyliomphalus circinatus (Whiteaves).

Ecculiomphalus circinatus Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 35, pl. 5, figs. 4 a–b; pl. 8, fig. 5; ibid., pt. 2, 1895, p. 86.

Niagaran (Guelph): Galt, Hespeler, Elora, and Durham, Ontario.

Eccyliomphalus (Orthostoma) communis (Conrad).

Orthostoma communis Conrad, 2d Ann. Rep. New York Geol. Surv., 1838, p. 119.—Hall, 15th Rep. New York State Cab. Nat. Hist., 1861, pl. 11, fig. 16.—Miller, N. A. Geol. Pal., 1889, p. 414, fig. 691.

Mohawkian (Trenton?): New York.

Eccyliomphalus compressus (Whitfield).

Ecculiomphalus compressus Whitfield, Bull. Amer. Mus. Nat. Hist., 9, 1897, p. 180, pl. 4, fig. 13.—Seely, Vermont State Geol. Rep., 7, 1910, pl. 61, fig. 13.

Canadian (Beekmantown): Colchester, Vermont.

Eccyliomphalus contiguus Ulrich.

Eccyliomphalus contiguus Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1037, pl. 75, figs. 48–52.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 185, pl. 12, figs. 13–15.

Stones River (Murfreesboro): Murfreesboro, Tennessee.

?Trenton: Jacksonburg, New Jersey.

Cotypes.—Cat. No. 45797, U.S.N.M.

Eccyliomphalus distans (Billings).

Ecculiomphalus distans Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 249, fig. 235.

Eccyliomphalus distans Miller, N. A. Geol. Pal., 1889, p. 403, fig. 672.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 663, fig. 915.

Chazyan (Quebec—P.): Cow Head, Newfoundland.

Eccyliomphalus fredericus Raymond.
Eccyliomphalus fredericus Raymond, Bull. Amer. Pal., 3, 1902, p. 305, pl. 18, fig. 4; Ann. Carnegie Mus., 4, 1908, p. 202, pl. 53, figs. 1–3.
Chazyan: Crown Point, Valcour, etc., New York (Crown Point); Mingan Islands, Canada (Mingan).

Eccyliomphalus gyroceras (Roemer).
Euomphalus gyroceras Roemer, Kreide von Texas, 1852, pl. 11, figs. 6a, b, p. 91.
Eccyliomphalus gyroceras Miller, N. A. Geol. Pal., 1889, p. 403 (gen. ref.).
Canadian (Beekmantown): San Saba Valley, Texas.

Eccyliomphalus intortus (Billings).
Ecculiomphalus intortus Billings, Canadian Nat. Geol., 6, 1861, p. 320, fig. 5; Geol. Canada, Geol. Surv. Canada, 1863, p. 232, fig. 249.
Canadian (Beekmantown): Edwardstown, Phillipsburg, and Point Levis, Quebec.

Eccyliomphalus kalmi (Raymond).
Eccyliopterus kalmi Raymond, Ann. Carnegie Mus., 3, 1906, p. 576.
Eccyliomphalus kalmi Raymond, Ann. Carnegie Mus., 4, 1908, p. 202, pl. 53, fig. 4.
Chazyan (Crown Point): Sloop Bay, Valcour Island, New York.

Eccyliomphalus (Orthostoma) lituiformis (Whitfield).
Calaurops lituiformis Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 315, pl. 26, figs. 1–4.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 662, fig. 914.—Seely, Vermont State Geol., Rep., 7, 1910, pl. 60, fig. 4.
Eccyliomphalus (Calaurops) lituiformis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1023 (gen. ref.).
Canadian (Beekmantown): Fort Cassin, Vermont.

Eccyliomphalus multiseptarius (Cleland).
Ecculiomphalus multiseptarius Cleland, Bull. Amer. Pal., 3, 1900, p. 123 (251), pl. 15, figs. 1–4; Bull. Amer. Pal., 4, 1903, p. 17.
Canadian (Tribes Hill): Near Fort Hunter, New York.

Eccyliomphalus perkinsi (Whitfield).
Euomphalus Perkinsi Whitfield, Bull. Amer. Mus. Nat. Hist., 3, 1890, p. 30, pl. 1, figs. 10–14.—Seely, Vermont State Geol. Rep., 7, 1910, pl. 56, figs. 6, 7.
Eccyliomphalus perkinsi Miller, 1st App. N. A. Geol. Pal., 1892, p. 693 (gen. ref.).
Canadian (Beekmantown): Fort Cassin, Vermont.

Eccyliomphalus priscus (Whitfield).
Ecculiomphalus priscus Whitfield, Bull. Amer. Mus. Nat. Hist., 2, 1889, p. 46, pl. 8, figs. 19, 20.
Canadian (Beekmantown): Near Beekmantown, New York.

Eccyliomphalus proclivis (Raymond).
Eccyliopterus proclivis Raymond, Ann. Carnegie Mus., 3, 1906. p. 576.
Eccyliomphalus proclivis Raymond, Ann. Carnegie Mus., 4, 1908, p. 203, pl. 53, fig. 5.
Chazyan (Crown Point): Crown Point, New York.

Eccyliomphalus spiralis (Billings).
Ecculiomphalus spiralis Billings, Canadian Nat. Geol., 6, 1861, p. 321.
Canadian (Beekmantown): Phillipsburg, Quebec.

Eccyliomphalus subellipticus Weller.
Eccyliomphalus subelliptica Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 219, pl. 4, fig. 6.
Canadian (Beekmantown): Columbia, New Jersey.

Eccyliomphalus subrotundus Ulrich and Scofield.

Eccyliomphalus subrotundus Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1037, pl. 75, figs. 17, 18.

Trenton (Prosser): Wykoff, Minnesota.

Holotype.—Cat. No. 45798, U.S.N.M.

Eccyliomphalus superbus (Billings).

Ecculiomphalus superbus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 250.

Chazyan (Quebec—P): Portland Creek, Newfoundland.

Eccyliomphalus trentonensis (Conrad).

Cyrtolites Trentonensis Conrad, Jour. Acad. Nat. Sci., Philadelphia, 8, 1842, p. 270, pl. 17, fig. 4.—Hall, Pal. NewYork, 1, 1847, p. 189, pl. 40A, figs. 3a–d, pl. 41, figs. 1a–c.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 167, pl. 5, fig. 22; fig. 38.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 183, figs.

Ecculiomphalus (?) trentonensis Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 68 (gen. ref.).

Eccyliomphalus trentonensis Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 184, pl. 12, figs. 20, 21.

Trenton: Carlisle, Pennsylvania; Middleville, etc., New York; New Jersey.

Eccyliomphalus triangulus Grabau and Shimer. See Eccyliopterus triangulus.

Eccyliomphalus undulatus (Hall).

Ecculiomphalus undulatus Hall, Rep. Geol. Surv. Wisconsin, 1861, p. 37.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 63, pl. 8, figs. 1–3.

Eccyliomphalus undulatus Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1036, pl. 75, figs. 19–23.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 663, fig. 916.

Black River (Platteville): Minneapolis, Minnesota; Beloit, Wisconsin; La Salle, Illinois; ?Lebanon, Tennessee (Stones River).

Plesiotypes.—Cat. Nos. 46054, 47927, U.S.N.M.

ECCYLIOPTERUS Remele. Genotype: Eccyliomphalus alatus Roemer.

Eccyliopterus Remele, Zeitschr. deutsch. geol. Ges., Band, 40, 1888, p. 666.—Koken, Neues Jahrb. f. Min., Geol. Pal., 6, Beilage-Band, 1889, p. 318; Die Leitfossilien, Leipzig, 1896, p. 102; Bull. de l'Acad. Imp. Sci. St. Petersburg, 7, 1897, p. 174.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, pp. 1029, 1031.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 658.

Eccyliopterus beloitensis Ulrich and Scofield.

Eccyliopterus beloitensis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1032, pl. 62, fig. 70; pl. 74, figs. 1–4.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 658, fig. 906c–e.

Black River: Beloit, Wisconsin (Platteville); High Bridge, Kentucky (Lowville).

Holotypes.—Cat. No. 45799, U.S.N.M.

Eccyliopterus disjunctus (Billings).

Ophileta? disjuncta Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 344. fig. 331a, b.

Eccyliopterus disjuncta Koken, Neues Jahrb. Min. Geol. Pal., 6, Beilage-Band, 1889, p. 320 (gen. ref.).

Canadian (Beekmantown): Leeds and Grenville Counties, Canada.

Eccyliopterus kalmi Raymond. See Eccyliomphalus kalmi.

Eccyliopterus? michleranus (Hall).
Euomphalus michleranus Hall, Rep. U. S. Mexican Bound. Surv., Emory, 1857, pl. 20, fig. 4.
Canadian (Beekmantown): Near El Paso, Texas.
Holotype.—Cat. No. 9825, U.S.N.M.

Eccyliopterus ottawaensis (Billings).
Ophileta Ottawaensis Billings, Canadian Nat. Geol., 5, 1860, p. 166, figs. 9, 10; Geol. Canada, Geol. Surv. Canada, 1863, p. 180, fig. 173a., b.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 500, figs.
Eccyliopterus ottawaensis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 937 (gen. ref.).
Trenton: Ottawa, Ontario.

Eccyliopterus owenanus (Meek and Worthen).
Ophileta Owenana Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 313, pl. 3, fig. 6a, b.
Eccyliopterus owenanus Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1032, pl. 74, figs. 10–14.
Eccyliopterus owenensis Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 658, fig. 906f, g.
Trenton: Galena, Illinois (Galena); Wykoff, etc., Minnesota (Prosser).
Plesiotypes.—Cat. No. 45800, 45801, U.S.N.M.

Eccyliopterus proclivis Raymond. See Eccyliomphalus proclivis.

Eccyliopterus spiralis Ruedemann.
Eccyliopterus spiralis Ruedemann, Bull. New York State Mus., 49, 1901, p. 34, pl. 2, figs. 9, 10.
Mohawkian (Rysedorph): Rysedorph Hill, Rensselaer County, New York.

Eccyliopterus triangulus (Whitfield).
Ecculiomphalus triangulus Whitfield, Bull. Amer. Mus. Nat. Hist., 3, 1890, p. 29, pl. 1, figs. 5–9.—Sardeson, Jour. Geol., 11, 1903, p. 481, fig. 18.
Eccyliomphalus triangulus Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 663, fig. 917.
Eccyliopterus triangulus Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, pl. 74, figs. 5, 6; pl. 62, fig. 73.
Canadian (Beekmantown): Providence Island, Lake Champlain, Vermont.
Plesiotypes.—Cat. No. 45802, U.S.N.M.

Eccyliopterus vagrans (Raymond).
Helicotoma vagrans Raymond, Amer. Jour. Sci., 4th ser., 20, 1905, p. 376.
Eccyliopterus vagrans Raymond, Ann. Carnegie Mus., 4, 1908, p. 204, pl. 49, figs. 10–11.
Chazyan (Crown Point): Valcour Island, New York.

Eccyliopterus volutatus (Whitfield).
Ecculiomphalus volutatus Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 314, pl. 25, figs. 8–11.—Seely, Vermont State Geol., Rep. 7, 1910, pl. 59, figs. 8–10.
Eccyliopterus volutatus Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, pl. 62, figs. 71, 72; pl. 74, figs. 7–9.
Canadian (Beekmantown): Fort Cassin, Vermont.
Plesiotypes.—Cat. No. 45803, U.S.N.M.

Echinocrinus fenestratus Yandell. See Tetracystis fenestratus.

Echinocystis Hall. See Lysocystites Miller.

ECHINOCYSTITES Hall. See Lysocystites Miller.

ECHINOENCRINITES ANATIFORMIS Hall. See Chirocrinus anatiformis.

ECHINOENCRINITES FENESTRATUS Troost. See Tetracystis fenestratus.

ECHINOGNATHUS Walcott. Genotype: Eurypterus? clevelandi Walcott.

Echinognathus Walcott, Amer. Jour. Sci., 3d ser., 23, 1882, p. 213.—Zittel, Handb. Pal., 2, 1885, p. 651.—Miller, N. A. Geol. Pal., 1889, p. 546.—Vogdes, Annals New York Acad. Sci., 5, 1889, p. 18.—Clarke, Zittel-Eastman Textb. Pal., 1, 1900, p. 676; 2d ed., 1913, p. 783.—Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 321.

Echinorhynchus (in error for Echinognathus) Martin, Trans. New York Acad. Sci., 2, 1882, p. 8.

Echinognathus clevelandi (Walcott).

Eurypterus? clevelandi Walcott, Amer. Jour. Sci., 3d ser., 23, 1882, p. 153, figs. 1, 2.

Eurypterus (Echinognathus) clevelandi Laurie, Trans. Royal Soc. Edinburgh, 39, 1899, p. 587.

Echinognathus clevelandi Walcott, Amer. Jour. Sci., 3d ser., 23, 1882, p. 213, figs. 1, 2.—Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 322, pl. 58, figs. 1, 2.

Utica: Holland Patent, Oneida County, New York.

Cotypes.—Cat. No. 26785, U.S.N.M.

ECHINORHYNCHUS Martin. See Echinognathus Walcott.

ECHINOSPHÆRA Angelin. See Echinosphærites Eichwald.

ECHINOSPHÆRITES Wahlenberg. Genotype: Echinus aurantium Gyllenhal.

Echinosphærites Wahlenberg, Acta Soc. Sci. Upsala, 8, 1821, p. 52.—Eichwald, Zool. Specialis, pt. 1, Vilnae, 1829, p. 231.—Muller, Ann. Mag. Nat. Hist., 2d ser., 13, 1854, p. 248.—Chapman, Canadian Jour., new ser., 2, 1857, p. 303.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 302.—Hall, Pal. New York, 3, for 1859, 1861, p. 150.—Zittel, Handb. Pal., 1, 1879, p. 417.—Barrande and Waagen, Syst. Sil. Centre Boheme, 7, pt. 1, 1887, p. 150, pls. 16, 21–25, 39.—Jaekel, Stammes. Pelmat., 1, Thecoidea u. Cyst., Berlin, 1899, p. 331.—Zittel-Eastman Textb. Pal., 1, 1900, p. 183.

Echinosphæra Angelin, Icon. Criniod., 1878, p. 28.—Haeckel, Amph. Cyst. Leipzig, 1896, p. 66, pl. 1, figs. 3–3E.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 53, figs. 14, 15.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 152.

Echinosphærites aurantium (Gyllenhal).

Echinus aurantium Gyllenhal, Kong. Vet. Akad. Hand., 33, 1772, p. 245, pl. 8, figs. 4, 5; pl. 9, figs. 6–9.—Wahlenberg, Jour. de Physique, 91, 1820, p. 188.

Echinosphærites aurantium Wahlenberg, Acta Soc. Sci. Upsala, 8, 1821, p. 52.—Bassler, Bull. Virginia Geol. Surv., 2a, 1909, pl. 3, fig. 19; pl. 21, figs. 6–8.

Sphæronites aurantium Hisinger, Anteckninger, 4, 1828, pp. 195, 198.

Echinosphæra aurantium Angelin, Iconog. Crin. Soc., 1878, p. 28, pl. 14, figs. 1–21.

Crystallocystis aurantium Haeckel, Die Amph. und Cyst., 1896, p. 66, pl. 1, figs. 3–3e.

Middle Ordovician: Esthonia, Russia; Pennsylvania, Maryland, and Virginia (Chambersburg); Virginia and Tennessee (Ottosee); Tennessee (Carters); Missouri, etc. (Kimmswick).

Plesiotypes.—Cat. No. 56631, U.S.N.M.

ECHINUS AURANTIUM Wahlenberg. See Echinosphærites aurantium.

ECHINUS GYRACANTHUS Eaton. See Tentaculites gyracanthus.

ECTENOCRINUS Miller. Genotype: Heterocrinus simplex Hall.

Ectenocrinus Miller, N. A. Geol. Pal., 1889, p. 242.—Bather, Ann. Mag. Nat. Hist., 6th ser., 5, 1890, p. 324, pl. 14, fig. 7; pl. 15, fig. 7.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1890, pp. 380, 383, 385.—Bather, Kongl. Sv. Vet. Akad. Handl., 25, No. 2, 1893, p. 20; Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 146, fig. 58, 3.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 152.—Zittel, Grundzuge Pal., 1, 1910, p. 151.—Springer, Mem. Geol. Surv. Canada, 15 P, 1911, p. 27; Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 212.

Ectenocrinus canadensis (Billings).

Heterocrinus Canadensis Billings, Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, p. 273; Geol. Surv. Canada, dec. 4, 1859, p. 48, pl. 4, figs. 5a–5d.

Ectenocrinus canadensis Miller, N. A. Geol. Pal., 1889, p. 242 (gen. ref.).—Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 22, pl. 4, fig. 10.

Heterocrinites simplex Troost, Amer. Assoc. Adv. Sci., 1850, p. 60 (nom. nud.).

Trenton: Ottawa and Montreal, Canada; Frankfort, Kentucky.

Plesiotype.—Cat. No. 39921, U.S.N.M. (Troost's type of H. simplex.)

Ectenocrinus grandis (Meek).

Heterocrinus simplex var. grandis Meek, Geol. Surv. Ohio, Pal., 1843, p. 9, pl. 1, figs. 7a–c; Cincinnati Quart. Jour. Sci., 1, Jan., 1874, p. 13.

Ectenocrinus grandis Miller, N. A. Geol. Pal., 1889, p. 242, fig. 295.—Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 124, pl. 1, figs. 8a–d.

Heterocrinus simplex Hall (not Hall, 1847), 24th Rep. New York State Cab. Nat. Hist., 1872, pl. 5, fig. 11, 12.

Eden and Lower Maysville: Cincinnati, Ohio, and vicinity.

Trenton (Upper): Near Rogers Gap, Kentucky.

Ectenocrinus simplex (Hall).

Heterocrinus simplex Hall, Pal. New York, 1, 1847, p. 280, pl. 76, figs. 2a–d.—Billings, Geol. Surv. Canada, Rep. Prog., 1853–56, 1857, p. 271.—Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 7, pl. 1, figs. 4a, b, 5a, b.—Dyche, Science, 20, 1892, p. 66; Jour. Cincinnati Soc. Nat. Hist., 15, 1892, p. 101.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 502, fig. 1814.

Ectenocrinus simplex Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1880, p. 392, pl. 10, fig. 9.—Miller, N. A. Geol. Pal., 1889, p. 242, fig. 296.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 720, pl. 4, figs. 10, 10a.

Ectenocrinus (Heterocrinus) simplex Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 42, 1890, p. 379.

Eden and Lower Maysville: Cincinnati, Ohio, and vicinity.

ECTOMARIA Koken. Genotype: Murchisonia nieszkowskii Schmidt.

Eunema (part) of Salter, Billings, Bigsby and Miller.

Murchisonia (part) of Whitfield and other authors.

Solenospira Ulrich, Geol. Minnesota, 3, pt. 2, 1897, pp. 959, 1021.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 635 (Genotype: Eunema pagoda Salter).

Ectomaria Koken, Bull. Acad. Imp. Sci. St. Petersburg, 5th ser., 7, No. 2, 1897, p. 201; Koken, Die Leitfossilien, 1896, p. 395; Neues Jahrb. für Min., Geol. und Pal., 1, 1898, p. 21.—Donald, Quart. Jour. Geol. Soc. London, 55, 1899, p. 252.

Ectomaria adelina (Billings).

Murchisonia Adelina Billings, Pal. Foss., 1, Geol. Surv. Canada, p. 232, fig. 217.

Solenospira adelina Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1021 (gen. ref.).

Ectomaria adelina Donald, Quart. Jour. Geol. Soc. London, 55, 1899, p. 253 (gen. ref.).

Canadian (Quebec-G): Cape Norman, Newfoundland.

Ectomaria? extenuata (Hall).

Murchisonia extenuata Hall, Pal. New York, 3, 1859, p. 298, pl. 54, figs. 15, 16.

Solenospira? extenuatum Grabau, Michigan Geol. Surv., Geol. Ser. 1, 1909, p. 176, pl. 16, fig. 7.

Cayugan (Manlius): Schoharie and Onondaga Counties, New York.

Upper Monroan (Lucas): Salt shaft, Detroit, Michigan.

Ectomaria minuta (Hall).

Murchisonia minuta Hall, Pal. New York, 3, 1859, p. 298, pl. 54, fig. 17.

Solenospira minuta Grabau, Michigan Geol. Surv., Geol. Ser. 1, 1909, p. 175, pl. 16, fig. 8.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 653.

Cayugan (Manlius): Fayetteville, New York.

Monroan: Monroe County (Raisin River) and Detroit, Michigan (Lucas).

Ectomaria missisquoi (Billings).

Murchisonia missisquoi Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 307.

Solenospira missisquoi Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1021 (gen. ref.).

Ectomaria missisquoi Donald, Quart. Jour. Geol. Soc. London, 55, 1899, p. 253 (gen. ref.)

Canadian (Beekmantown): Stanbridge, Quebec.

Ectomaria pagoda (Salter).

Eunema? pagoda Salter, Geol. Surv. Canada, Canadian Org. Rem., dec. 1, 1859, p. 30, pl. 6, fig. 5.

Murchisonia pagoda Chamberlin, Geol. Wisconsin, 1, 1883, p. 157, fig.

Solenospira pagoda Ulrich and Scofield, Geol. Minnesota 3, pt. 2, 1897, p. 1022, pl. 70, figs. 56–60.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 653, fig. 893d, e.

Ectomaria pagoda Donald, Quart. Jour. Geol. Soc. London, 55, 1899, p. 253.

Black River: Pauquettes Rapids, Ottawa River, Canada, and near Watertown, New York (Leray); Cannon Falls, Minnesota (Decorah); Beloit, Wisconsin (Platteville).

Plesiotype.—Cat. No. 45997, U.S.N.M. (Ulrich and Scofield).

Ectomaria pagoda occidentalis (Whiteaves).

Solenospira pagoda var. occidentalis Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 193.

Ectomaria pagoda var. occidentalis Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1899, p. 344 (gen. ref.).

Black River or Richmond: Little Black Island, Lake Winnipeg.

Ectomaria prisca (Billings).

Eunema prisca Billings, Canadian Nat. and Geol., 4, 1859, p. 360, fig. 8, 1; Geol. Surv. Canada, 1863, p. 119, fig. 30.

Solenospira prisca Ulrich and Scofield, Geol. Minnesota, pt. 2, 1897, p. 1022, pl. 70, figs. 52–55.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 653, fig. 893c.

Ectomaria prisca Donald, Quart. Jour. Geol. Soc. London, 55, 1899, p. 253 (gen. ref.)

Ectomaria prisca—Continued.

Murchisonia (Eunema) pagoda Whitfield (not Salter), Geol. Wisconsin, 4, 1883, p. 218, pl. 5, fig. 20.

Chazyan (Mingan): Mingan Islands, Canada.

Black River: Beloit and Janesville, Wisconsin; Minneapolis, Minnesota; Dixon, Illinois.

Plesiotype.—Cat. Nos. 46072, 46073, U.S.N.M. (Ulrich and Scofield).

Ectomaria prisca extenuata Ulrich.

Solenospira prisca var. extenuata Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1022, pl. 70, figs. 52, 54.

Stones River (Murfreesboro): Murfreesboro, Tennessee.

Holotype.—Cat. No. 46074, U.S.N.M.

EDMONDIA Koninck. Genotype: Isocardia unioniformis Phillips.

Edmondia Koninck, Desc. Animaux Fossiles, Liege, 1842–1844, p. 66.—King, Mon. Permian Foss. England, Pal. Soc., 1850, p. 162.—Pictet, Traite de Pal., 2d ed., 3, 1855, p. 501.—Zittel, Handb. Pal., 2, 1881, p. 127.—Hall, Pal. New York, 5, pt. 1, Lam., 2, 1885, p. XXXII.—Koninck, Ann. d. Mus. Royal d'Hist. Nat. de Belgique, 11, 1885, p. 28.—Miller, N. A. Geol. Pal., 1889, p. 478.—Hind, Mon. British Carb. Lam., 1, Pal. Soc., 1898, p. 255.

Edmondia?? arcuata Cleland.

Edmondia(?) arcuata Cleland, Bull. Amer. Pal., 4, 1903, p. 18, pl. 4, figs. 5–7.

Canadian? (Beekmantown?): Three miles south Ingham Mills, New York.

Observation.—Probably a synonym for some species from the Stones River or higher formation.

Edmondia? deckerensis Weller.

Edmondia? deckerensis Weller, Geol. Surv. New Jersey, Rep. Pal., 3, 1903, p. 241, pl. 22, figs. 6–7.

Helderbergian (Decker Ferry): Two miles south of Tristates, New York.

Edmondia? nilesi Winchell and Marcy.

Edmondia Nilesi Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 97, pl. 2, fig. 13.

Modiolopsis nilesi Whitfield, Geol. Wisconsin, 4, 1882, p. 357 (gen. ref.).

Niagaran (Racine); Chicago, Illinois; Wisconsin.

EDMONDIA SUBANGULATA Hall. See Cyrtodonta subangulata.

EDMONDIA SUBTRUNCATA Hall. See Whitella subtruncata.

EDMONDIA VENTRICOSA Hall (part). See Whitella ventricosa.

Edmondia? vetusta Whiteaves.

Edmondia? vetusta Whiteaves, Geol Surv. Canada, Pal., Foss., 3, p, 187, pl. 20, fig. 8.

Black River or Richmond: Inmost Island, Kinwow Bay, Lake Winnipeg.

EDRIOASTER Billings. Genotype: Cyclaster bigsbyi Billings.

Cyclaster Billings (preoccupied), Geol. Surv. Canada, Rep. Progr. for 1853–1856, 1857, p. 292; Geol. Surv. Canada, Canadian Org. Rem., dec. 3, 1858, p. 82.—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 323.—Zittel, Grundzuge Pal., 1, 1910, p. 241.

EDRIOASTER—Continued.

Edrioaster Billings, Geol. Surv. Canada, dec. 3, 1858, p. 82.—Zittel, Handb. Pal., 1, 1879, p. 414.—Sturtz, Neues Jahrb. Min., Geol. Pal., 2, 1886, p. 144.—Miller, N. A. Geol. Pal., 1889, p. 242.—Jaekel, Stammes. d. Pelmat, 1, Thecoidea u. Cyst., Berlin, 1899, p. 44.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 209, fig. 6.—Zittel, Grundzuge Pal., 1, 1910, p. 181.

Edriocystis Haeckel, Amph. und Cyst., Leipzig, 1896, p. 117.

Edrioaster bigsbyi (Billings).

Cyclaster Bigsbyi Billings, Geol. Surv. Canada, Rep. Progr. for 1853–1856, 1857, p. 293.

Agelacrinites (Edrioaster) Bigsbyi Chapman, Expos. Min. Geol., Canada, 1864, p. 110.—Sladen, Quart. Jour. Geol. Soc., 35, 1879, p. 750.

Agelacrinus Bigsbyi Schmidt, Mem. Acad. St. Petersburg, 22, No. 11, 1874, 34.

Edriocystis Bigsbyi Haeckel, Amph. u. Cyst., 1896, p. 118, pl. 3, figs. 35, 36.

Edrioaster Bigsbyi Billings, Geol. Surv. Canada (Can. Org. Rem.), dec. 3, 1858, p. 85, pl. 8, figs. 1, 1a, 2, 2a.—Jaekel, Stammes. d. Pelmat., 1, Thecoidea u. Cyst., Berlin, 1899, p. 46, pl. 2, fig. 4.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 209, fig. 6.—Springer, Mem. Geol. Surv. Canada, 15 P, 1911, p. 44 (loc. occ.).

Trenton: Ottawa and Kirkfield, Ontario; High Bridge, Kentucky (Curdsville); Fillmore County, Minnesota (Prosser.).

Edrioaster saratogensis Ruedemann.

Edrioaster saratogensis Ruedemann, Bull. New York State Mus., 162, 1912, p. 86, pl. 3, figs. 2–4.

Trenton (Snake Hill): Snake Hill, Saratoga County, New York.

EDRIOCYSTIS Haeckel. See Edrioaster Billings.

EDRIOSPONGIA Ulrich and Everett. Genotype: E. basalis Ulrich and Everett.

Edriospongia Ulrich and Everett in Miller, N. A. Geol. Pal., 1889, p. 159.—Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 271.

Edriospongia basalis Ulrich and Everett.

Edriospongia basalis Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 272, pl. 6, figs. 1a–c.

Black River (Platteville): Near Dixon, Illinois.

Sections of *holotype*.—Cat. No. 46556, U.S.N.M.

EICHWALDIA of authors. See Dictyonella Hall.

EICHWALDIA Billings. Genotype: E. subtrigonalis Billings.

Eichwaldia Billings, Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 190; Canadian Nat. Geol., 3, 1858, p. 442.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 81; Zittel-Eastman Textb. Pal., 1, 1900, p. 312; ibid., 2d ed. 1913, p. 396.

Eichwaldia subtrigonalis Billings.

Eichwaldia subtrigonalis Billings, Geol. Surv. Canada; Rep. Progr. for 1857, 1858, p. 192, fig. 24; Canadian Nat. Geol., 3, 1858, p. 443, fig. 24; Geol. Canada, 1863, p. 142, fig. 76.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 310, figs. 241, 242; pl. 83, figs. 1–4.

Black River (Leray): Pauquette Rapids, Ottawa River, Canada.

ELKANIA Ford. Genotype: Obolella desiderata Billings.

Billingsia Ford (not Dekoninck, 1876), Amer. Jour. Sci., 3d ser., 31, 1885, p. 466.

Elkania Ford, Amer. Jour. Sci., 3d ser., 32, 1886, p. 325.—Miller, N. A. Geol. Pal., 1889, p. 346.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 75, 165; 11th Ann. Rep. New York State Geologist, 1894, p. 241.—Walcott, Proc. U. S. Nat. Mus., 28, 1905, p. 321.

Elkania ambigua (Walcott).

Obolella? ambigua Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 67, pl. 1, fig. 2.

Billingsia? ambigua Ford, Amer. Jour. Sci., 3d ser., 31, 1886, p. 467.

Elkania ambigua Ford, Amer. Jour. Sci., 32, 1886, p. 325.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 78.—Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 562, pl. 51, figs. 2, 2a–c.

Lower Pogonip: Northeast of Adams Hill and southeast of Jackson Mine, Eureka District, Eureka County, Nevada.

Holotype and *plesiotype*.—Cat. No. 24554, U.S.N.M.

Elkania desiderata (Billings).

Obolella desiderata Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1862, p. 69, fig. 62 on p. 68.—Davidson, Geol. Mag., 5, p. 309, figs. 1, 2.—Walcott, Bull. U. S. Geol. Surv., 30, p. 111.

Billingsia desiderata Ford, Amer. Jour. Sci., 3d ser., 31, 1886, p. 466, figs. 1, 2.

Elkania desiderata Ford, Amer. Jour. Sci., 32, 1886, p. 325.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 77, pl. 3, figs. 15–19; 11th Ann. Rep. State Geol. New York, 1892, pl. 3, figs. 13–14.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 221.—Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 562, pl. 51, figs. 1, 1a–d.

Canadian (Levis, Didymograptus zone): Point Levis, Quebec.

Elkania ida (Billings).

Obolella ida Billings, Pal. Fossils, Geol. Surv. Canada, 1, 1865, p. 71, fig. 63 (adv. sheets, 1862.)—Walcott, Bull. U. S. Geol. Surv., 30, 1886, p. 111.—Dawson, Canadian Rec.

Sci., 3, 1888, p. 55; Peter Redpath Mus., McGill Univ., 1888, p. 55.

Billingsia? ida Ford, Amer. Jour. Sci., 3d ser., 31, 1886, p. 467.

Elkania ida Ford, Amer. Jour. Sci., 32, 1886, p. 325 (gen. ref.).—Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 563, pl. 30, figs. 20, 20a; pl. 51, figs. 4, 4a–c.

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

ELKANIA PRETIOSA Ford. See Acrothete pretiosa.

ELLIPTOCEPHALA UNDULOSTRIATA Miller. See Proetus undulostriatus.

ELPE Barrande. Genotype: E. inchoata Barrande.

Elpe Barrande, Syst. Sil. du Centre Boheme, 1, Suppl., 1872, p. 510.—Zittel, Handb. Pal., 2, 1885, p. 554.—Ulrich, Zittel-Eastman Textb. Pal., 1, 1900, p. 646.—Bassler, ibid, 2d ed., 1913, p. 741.

Leioditia (Ulrich MS.) Jones, Geol. Surv. Canada, Cont. Micro-Pal., 3, 1891, p. 94.

Elpe cincinnatiensis (Meek).

Cythere Cincinnatiensis Meek, Proc. Acad. Nat. Sci. Philadelphia, 1872, p. 331; Geol. Surv. Ohio, Pal., 1, 1873, p. 158, pl. 14, figs. 1a–d.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 120.—Jones, Ann. Mag. Nat. Hist., 5th ser., 14, 1884, p. 395, footnote.

Cytheropsis cincinnatiensis Miller, N. A. Geol. Pal., 1889, p. 541, fig. 993.

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

Elpe irregularis (Miller).

Cythere irregularis Miller, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 106, pl. 3, figs. 7, 7a.

Cytheropsis irregularis Miller, N. A. Geol. Pal., 1889, p. 541 (gen. ref.).

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

Elpe radiata (Ulrich).

Leperditia radiata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 9, pl. 7, figs. 2–2b.

Eden (Fulton): First Ward, Cincinnati, Ohio.

Cotypes.—Cat. No. 41711, U.S.N.M.

Elpe ulrichi Foerste.

Elpe Ulrichi Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 532, pl. 37, figs. 14a–c.

Upper Medinan (Brassfield): Huffman's Quarry, near Dayton, Ohio.

EMMELEZOE Jones and Woodward. Genotype: Ceratiocaris elliptica Jones.

Emmelezoe Jones and Woodward, Mon. British Pal. Phyllopoda, Pal. Soc., 1888, pp. 3, 68.—Clarke, Zittel-Eastman Textb. Pal., 1, 1900, p. 657; 2d ed., 1913, p. 752.

Emmelezoe decora Clarke.

Emmelezoe decora Clarke, 54th Ann. Rep. New York State Mus., App. 1, 1902, p. 95, pl. 2, figs. 4–11; pl. 3, figs. 1–4.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 379, fig. 1683.

Cayugan (Pittsford): Erie Canal, Monroe County, New York.

EMMONSIA Edwards and Haime. See Favosites Lamarck.

EMPEROCRINUS Miller and Gurley.

Genotype: E. indianensis Miller and Gurley.

Emperocrinus Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 6, 1895, p. 42.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 744.—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 202.

Emperocrinus indianensis Miller and Gurley.

Emperocrinus indianensis Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 6, 1895, p. 43, pl. 4, figs. 16, 17.—Miller, N. A. Geol. Pal., 2d App., p. 744, figs. 1347, 1348.

Niagaran (Laurel): St. Paul, Indiana.

Enallopora D'Orbigny. Genotype: Gorgonia perantiqua Hall.

Enallopora D'Orbigny, Prod. de Pal., 1, 1850, p. 22.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 206.—Pictet, Traité de Pal., 2d ed., 4, 1857, p. 169.—Miller, N. A. Geol. Pal., 1889, p. 300.

Observations.—For objections to the use of this name, see Geol. Surv. Illinois, 8, p. 683.

ENALLOPORA CINCTOSA Miller. See Mitoclema cinctosum.

ENALLOPORA PERANTIQUA D'Orbigny. See Protocrisina perantiqua.

ENCRINASTER Haeckel (part). See Protaster Forbes.

ENCRINURUS Emmrich. Genotype: Trilobus punctatus Brunn.

Cryptonymus Eichwald, (not Eichwald, 1825), Sil. Schichten Syst., Esthland, 1840.—Salter, Mon. British Tril., Pal. Soc., 1866, pp. 147, 168.—Angelin, Pal. Scandinavica, 3d ed., Holmiæ, 1878, p. 2.

ENCRINURUS—Continued.

Encrinurus Emmrich, Zur. Natg. der Tril., 1844, p. 16; Neues Jahrb. f. Min., etc., 1845, p. 42.—Hawle and Corda, Abh. d. k. bohmischen Gesell. d. Wiss., 5 (ext.), 1847, p. 90, pl. 5, fig. 55.—Barrande, Neues Jahrb. f. Min., etc., 1850, p. 778.—Salter, Mem. Geol. Surv. United Kingdom, dec. 3, 1853, pl. 4.—McCoy, British Pal. Rocks Fossils, 1854, p. 158.—Pictet, Traité de Pal., 2d ed., 2, 1854, p. 523.—Nieszkowski, Archiv. f. Naturk. Liv-, Ehst- u. Kurl., 1, 1857; p. 602.—Steinhardt, Beit. z. Naturk. Preus. Phys.-Oekon Gesell. Konigsberg, 1874, p. 57.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 7th ser., 30, 1881, p. 222.—Zittel, Handb. Pal., 2, 1885, p. 621.—Novak, Sitz. d. k. bohm. Gesell. d. Wiss. Math. Naturw. Cl. for 1886, p. 429.—Miller, N. A. Geol. Pal., 1889, p. 547.—Koken, Die Leitfossilien, Leipzig, p. 36, 1896, fig. 24, figs. 5, 6.—Beecher, Amer. Jour. Sci., 4th ser., 3, 1897, p. 105, pl. 3, fig. 25.—Jaekel, Zeits. d. d. geol. Gesell., 53, 1901, p. 149.—Grabau, Bull. New York State Mus., 45, 1901, p. 225; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 225.—Lindstrom, Kongl. Sven. Vet. Akad. Handl., 34, No. 8, 1901, p. 26, 56.—Vogdes, San Diego Soc. Nat. Hist., 1907, p. 61.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 314.—Slocom, Field Mus. Nat. Hist., Geol. Ser., 4, 1913, p. 61.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 723.

Cromus Barrande, Syst. Sil. du Centre Boheme, 1, 1852, p. 821, pl. 43.—Zittel, Handb. Pal., 2, 1885, p. 621.—Koken, Die Leitfossilien, Leipzig, 1896, p. 36.—Jaekel, Zeits. d. d. geol. Gesell., 53, 1901, p. 156.—Lindstrom, Kongl. Sven. Vet. Akad. Handl., 34, No. 8, 1901, p. 11.—Pictet, Traité de Pal., 2d ed., 2, 1854, p. 523.—Barrande, Syst. Sil. du Centre Boheme, Suppl., 1, 1872, p. 20.

Encrinurus americanus Vogdes.

Encrinurus americanus Vogdes, Desc. New Crust. Clinton of Georgia, 1886, p. 1.—Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 102.

Clinton: Taylors Ridge, west of Catoosa Station, Georgia.

Encrinurus cristatus Clarke.

Encrinurus cristatus Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 741, fig. 58.

Richmond (Maquoketa): Spring Valley, Minnesota.

Holotype.—Cat. No. 41953, U.S.N.M.

Encrinurus deltoideus Shumard.

Encrinurus deltoideus Shumard, 1st and 2d Ann. Rep. Geol. Surv. Missouri, pt. 2, 1855, p. 198, pl. B, fig. 10.—Foerste, Bull. Sci. Lab. Denison Univ., 2, pt. 1, 1887, p. 102.—Keyes, Missouri Geol. Surv., 4, 1894, p. 229.—Savage, Bull. Geol. Surv., Illinois, 23, 1913, p. 60, pl. 2, fig. 10.

Cryptonymus deltoideus Vogdes, Mon. Genera Zethus, Cybele, Encrinurus and Cryptonymus, 1878, p. 21.

Upper Medinan (Girardeau): Near Thebes, Illinois.

Encrinurus egani Miller.

Encrinurus egani Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1880, p. 251, pl. 15, figs. 1, 1b; N. A. Geol. Pal., 1889, p. 547, figs. 1004–5.—Weller, Bull. Chicago, Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 257, pl. 24, figs. 8–11.

Niagaran (Racine): Joliet and near Lemont, Illinois.

Encrinurus elegantulus Billings.

Encrinurus elegantulus Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 62.—Foerste, Bull. Sci. Lab. Denison Univ., 2, pt. 1, 1887, p. 102.

Anticostian (Jupiter River): The Jumpers, Anticosti.

ENCRINURUS EXCEDRINUS Safford. See Encrinurus raricostatus.

Encrinurus indianensis Kindle and Breger.

Encrinurus indianensis Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res., Indiana, 1904, p. 482, pl. 24, figs. 14, 15.

Niagaran (Noblesville): Connors Mill, Huntington, Wabash, etc., Indiana.

Encrinurus laevis (Angelin).

Cryptonymus laevis Angelin, Pal. Scand., pt. 1, p. 4, pl. 4, fig. 10.

Encrinurus (Cryptonymus) laevis Salter, Sutherland's Jour. Voyage in Baffins Bay, etc., 2, App., 1852, p. 221, pl. 5, figs. 14, 14a.

Encrinurus laevis Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 592.

Cromus arcticus Houghton, Jour. Geol. Soc. Dublin, 1, 1857, p. 241, pl. 6, figs. 1–5.

Niagaran: Griffiths Island, etc., Arctic America.

ENCRINURUS MIRUS Billings. See Cybeloides mirus.

Encrinurus multisegmentatus (?Portlock) Billings.

Amphion multisegmentatus Portlock, Geol. Londonderry, 1843, p. 291, pl. 3, fig. 6.

Encrinurus multisegmentatus Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 61 (loc. ref.).—Salter, Mem. Geol. Surv. United Kingdom, decade 7, pl.4.

Cryptonymus multisegmentatus Vogdes, Mon. Genera Zethus, etc., 1878, p. 29.

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

Encrinurus nereus Hall.

Encrinurus sp. 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.

Encrinurus nereus Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, p. 375, pl. 21, fig. 15; rev. ed., 1870, p. 425, pl. 21, fig. 15.—Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 102.

Cryptonymus nereus Vogdes, Mon. Gen. Zethus, Cybele, etc., 1878, p. 24, pl. 3, fig. 17.

Niagaran (Racine): Racine, Wisconsin.

Encrinurus ornatus Hall and Whitfield.

Cybele punctata Hall (not Brünnich), Pal. New York, 2, 1852, p. 297, pl. 66A, figs. 1a–l.

Encrinurus punctatus Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 61 (loc. ref.).—Foerste, Bull. Sci. Lab. Denison Univ., 2, 1897, p. 103; Proc. Boston Soc. Nat. Hist., 24, 1890, p. 269.—Van Ingen, School of Mines Quart., 1901, p. 66, pl. fig. 27.

Encrinurus cfr. punctatus Norton, Proc. Iowa Acad. Sci., 3, 1896, p. 79.

Encrinurus ornatus Hall and Whitfield, Pal. Ohio, 2, 1875, p. 154, pl. 6, fig. 16.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 195, fig.—Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 102.—Grabau, Bull. New York State Mus., 45, 1901, p. 225, fig. 157; Bull. Buffalo Soc. Nat. Hist., 7, p. 225, fig. 157.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 314, fig. 1627.

Cryptonymus ornatus Vogdes, Mon. Gen. Zethus, Cybele, etc., 1878, p. 23.

Niagaran (Clinton-Guelph): Eaton and Yellow Springs, Ohio; New York; Canada; Arkansas; Tennessee; Alabama.

Encrinurus pernodosus Slocom.

Encrinurus pernodosus Slocom, Field Mus. Nat. Hist., Geol. Ser., 4, No. 3, 1913, p. 61, pl. 16, figs. 5–7.

Richmond (Maquoketa): Bloomfield, Clermont, and Elgin, Iowa.

ENCRINURUS PUNCTATUS Foerste. See Encrinurus thresheri and E. ornatus.

Encrinurus raricostatus Walcott.

Encrinurus excedrinus Safford, Geol. Tennessee, 1869, p. 290 (nom. nud.).

Encrinurus raricostatus Walcott, 31st Rep. New York State Mus. Nat. Hist., 1880 (adv. sheets, 1877), p. 69.—Safford and Vogdes, Proc. Acad. Nat. Sci. Philadelphia, 1889, p. 167, text fig.—Clarke, Geol. Minnesota, 3, pt. 2, 1890, p. 740.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 128.

Cryptonymus raricostatus Vogdes, Mon. Genera Zethus, etc., 1878, p. 27.

Black River: Mineral Point, Beloit, and Janesville, Wisconsin (Platteville); Manitoba.

Encrinurus rarus (Walcott).

Ceraurus rarus Walcott, 31st Rep. New York State Mus. Nat. Hist., 1880 (adv. sheets, 1877), p. 68.

Ceraurus (Cyrtometopus) rarus Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 738.

Encrinurus rarus Raymond and Barton, Bull. Mus. Comp. Zool., 54, 1913, p. 541, pl. 2, fig. 3.

Black River (Platteville): Beloit, Wisconsin.

Observation.—See E. vannulus Clarke.

Encrinurus thresheri Foerste.

Encrinurus thresheri Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 101, pl. 8, fig. 26.

Encrinurus punctatus Foerste, Geol. Surv. Ohio, 7, 1893, p. 531, pl. 27, fig. 26.

Upper Medinan (Brassfield): Dayton, Ohio; Hanover, Indiana.

Encrinurus trentonensis Walcott.

Encrinurus trentonensis Walcott, 31st Rep. New York State Mus. Nat. Hist., 1880 (adv. sheets, 1877), p. 68.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 202, pl. 15, figs. 26, 27.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 314.

Cryptonymus trentonensis Vogdes, Mon. Genera Zethus, etc., 1878, p. 28.

Black River: Clifton, Wisconsin; Dunleith, Illinois.

Trenton: Jacksonburg, New Jersey.

Encrinurus tuberculifrons Weller.

Encrinurus tuberculifrons Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 259, pl. 24, figs. 12–13.

Niagaran (Racine): Near Joliet, Illinois.

Encrinurus tuberculosus Collie.

Encrinurus tuberculosis Collie, Bull. Geol. Soc. Amer., 14, 1903, p. 418, pl. 59, fig. 3.

Trenton: Bellefonte, Pennsylvania.

Encrinurus vannulus Clarke.

Encrinurus vannulus Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 739, figs. 56, 57.

Black River (Platteville): Janesville and Beloit, Wisconsin.

Cotype.—Cat. No. 41954, U.S.N.M.

Observation.—Probably the same as E. rarus Walcott.

Encrinurus vigilans (Hall).

Ceraurus vigilans Hall, Pal. New York, 1, 1847, p. 245, pl. 65, figs. 2a–h.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 217, pl. 15, figs. 2a–c.

Cryptonymus vigilans Vogdes, Mon. Genera Zethus, etc., 1878, p. 29, pl. 2, figs. 2a–2h.

Encrinurus vigilans—Continued.

Encrinurus vigilans Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 952 (gen. ref.).—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 216, figs.

Cybele vigilans Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 67 (gen. ref.).

Trenton: Middleville, etc., New York.

Encrinus curvatus Eaton.

Encrinus curvatus Eaton, Geol. Textb., 2d ed., 1832, p. 128, pl. 1, fig. 4.

Ordovician: Glens Falls, New York.

Observation.—Species based on a crinoid column.

ENCRINUS GIGANTEUS Eaton. See Arthrophycus alleghaniensis.

ENCRINUS TRANSVERSUS Eaton. See Phytopsis tubulosa.

ENDOCERAS Hall. Accepted genotype: E. proteiforme Hall.

Endoceras Hall, Amer. Jour. Sci. Arts, 47, 1844, p. 109; Pal. New York, 1, 1847, p. 58, p. 207 footnote.—Roemer, Neues Jahrb. f. Min., etc., 1848, p. 178.—Woodward, Man. Mollusca, pt. 1, 1851, p. 89, fig. 50 on p. 90.—Saemann, Palæontographica, 3, 1852, pp. 147, 155, 157, 162.—Pictet, Traité de Pal., 2d ed., 2, 1854, p. 641.—Emmons, Amer. Geol., 1, pt. 2, 1855, pp. 148, 151.—Barrande, Bull. Soc. Geol. France, 2d, 12, 1855, p. 172; Neues Jahrb. f. Min., etc., 1855, p. 274, pl. 3, figs. 16, 71, p. 385.—Salter, Quart. Jour. Geol. Soc. London, 15, 1859, p. 376, fig. b.—Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 68.—Hitchcock, Geol. Vermont, 1, for 1861, 1862, p. 299.—Chapman, Canadian, Jour., n. s., 8, 1863, p. 21; Expos. Min. Geol. Canada, 1864, p. 129.—Barrande, Syst. Sil. du Centre Boheme, 2, pt. 3, 1874, p. 773.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 130.—Barrande, Cephalopodes, Ext. Syst. Sil. du Centre Boheme, p. 103.—Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1881, pp. 20, 23, fig. 1; Geol. Wisconsin, 4, 1882, p. 228.—Miller, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 85.—Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1883, p. 266.—Zittel, Handb. Pal., 2, 1884, p. 362.—Holm, Palæont. Abhandl., Dames and Kayser, Bd. 3, Heft 2, 1885, pp. 4, 11.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 129.—Miller, N. A. Geol. Pal., 1889, p. 436.—Hyatt, Amer. Geol., 16, 1895, July, p. 1.—Koken, Die Leitfossilien, Leipzig, 1896, p. 48, fig. 30.—Holm, Geol. Foren Stockholm Forhandl., 18, 1896, p. 395; Sveriges Geol. Unders., ser. C, No. 163, 1896, p. 3.—Hyatt, Zittel-Eastman Textb. Pal., 1, 1900, p. 514; 2d ed., 1913, p. 595.—Ruedemann, Amer. Geol., 31, 1903, p. 214; Bull. New York State Mus., 90, 1906, pp. 404, 418.—Cumings, 32d Ann Rep. Dep. Geol. Nat. Res., Indiana, 1908, p. 1026.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 41.

Diploceras Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1847, p. 267.—Whitfield, Geol. Wisconsin, 4, 1882, p. 228 (Genotype: D. vanuxemi Conrad).

Cyclendoceras Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 43.

Colpoceras Hall, 3d Rep. New York State Cab. Nat. Hist., rev. ed., 1850, p. 181; doc. ed., p. 174.—Barrande, Syst. Sil. du Centre Boheme, 2, pt. 3, 1874, p. 783.—Miller, N. A. Geol. Pal., 1889, p. 432 (Genotype: C. virgatum Hall).

Observation.—The generic relations of the species here referred to Endoceras and also to Cameroceras are in many cases still to be investigated.

Endoceras angusticameratum Hall.

Endoceras angusticameratum Hall, Pal. New York, 1847, p. 218, pl. 51, fig. 3.

Trenton: Middleville, New York.

Endoceras annulatum Hall.

Endoceras annulatum Hall, Pal. New York, 1, 1847, p. 207, pl. 44, figs. 1a, b; Amer. Geol., 1, pt. 2, 1855, p. 152.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 8, 1886, p. 243.

Endoceras annulatum var. Whiteaves, Trans. Royal Soc. Canada, 9, sec. 4, 1892, p. 77, pl. 5, figs. 1, 1a; Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 202.

Cyclendoceras annulatum Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 43, fig. 1241.

Trenton: Watertown, New York; Lake Winnepeg, Canada.

ENDOCERAS APPROXIMATUM Hall. See Cameroceras approximatum.

Endoceras arctiventrum Hall.

Endoceras arctiventrum Hall, Pal. New York, 1, 1847, p. 217, pl. 51, figs. 2a, b.

Trenton: Middleville, New York.

Endoceras arcuatum (J. F. James).

Colpoceras arcuatum James, J. F., Jour. Cincinnati Soc. Nat. Hist., 8, 1886, p. 242, pl. 4, figs. 1a, b.

Maysville: Cincinnati, Ohio.

Observation.—Recognizable? Refers merely to siphuncle of some Endoceras.

Endoceras atlanticum (Barrande).

Orthoceras atlanticum Barrande, Syst. Sil. du Boheme, ser. 4, 2, 1870, pl. 430, figs. 12, 13.

Ordovician: Newfoundland.

ENDOCERAS AULEMA Miller. See Nanno aulema.

Endoceras bristolense Miller.

Endoceras bristolense Miller, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 85, pl. 4, figs. 2, 2a.

Richmond (Maquoketa): Bristol, Illinois.

Endoceras(?) champlainense Ruedemann.

Endoceras(?) champlainense Ruedemann, Bull. New York State Mus., 90, 1906, p. 418, pl. 1, figs. 1–4, text fig. 5.

Canadian (Beekmantown): Near Beekmantown, New York.

Observation.—Compare Endoceras consuetum Sardeson.

Endoceras clarkei (Wetherby).

Colpoceras clarkei Wetherby, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 77, pl. 2, figs. 5, 5a.

Colpoceras clarkii Miller, N. A. Geol. Pal., 1889, p. 432, fig. 727.

Trenton (Curdsville): Mercer County, Kentucky.

Endoceras consuetum Sardeson.

Endoceras consuetum Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 103, pl. 6, fig. 11.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 42.

Canadian (Shakopee): Near Monroe and near Pickett Station, Wisconsin.

Observation—Compare Endoceras champlainense Ruedemann.

ENDOCERAS CRASSISIPHONATUM Whiteaves. See Narthecoceras crassisiphonatum.

ENDOCERAS DISTANS Hall. See Actinoceras distans.

ENDOCERAS DUPLICATUM Hall. See Cameroceras duplicatum.

Endoceras egani Miller.

Endoceras egani Miller, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 84, pl. 4, figs. 1, 1a, 1b.

Richmond (Maquoketa): Bristol, Illinois.

ENDOCERAS ELONGATUM Keyes. See Endoceras proteiforme elongatum.

Endoceras gemelliparum Hall.

Endoceras gemelliparum Hall, Pal. New York, 1, 1847, p. 60, pl. 19, figs. 1a, b.—Barrande, Neues Jahrb. f. Min., etc., 1855, p. 267; Bull. Soc. Geol. France, (2), 12, 1855, p. 166.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 152.

Black River: Hendersons Bay, Jefferson County, New York.

ENDOCERAS HENNEPINI Miller. See Cameroceras hennepini.

Endoceras(?) hudsoni Ruedemann.

Endoceras(?) hudsoni Ruedemann, Bull. New York State Mus., 90, 1906, p. 421, pl. 7, fig. 1, fig. 6.

Chazyan (Valcour): Valcour Island, New York.

Endoceras hudsonicum Parks.

Endoceras hudsonicum Parks in Tyrrell, 22d Rep. Ontario Bur. Mines, 1913, p. 37.

Niagaran (Guelph); Severn River, Ontario.

ENDOCERAS INÆQUABILE Miller. See Cameroceras inæquabile,

Endoceras insulare (Barrande).

Orthoceras insulare Barrande, Syst. Sil. du Boheme, 4th ser., 2, 1870, pl. 430, figs. 1–11; pl. 31, figs. 1–10.

Ordovician: Newfoundland.

ENDOCERAS LATIVENTRUM Hall. See Cameroceras lativentrum.

ENDOCERAS LONGISSIMUM Hall. See Vaginoceras longissimum.

Endoceras magister Ruedemann.

Endoceras magister Ruedemann, Bull. New York State Mus., 90, 1906, p. 423, pl. 8, fig. 1, fig. 7.

Chazyan (Valcour): Valcour, New York.

Endoceras magniventrum Hall.

Endoceras magniventrum Hall, Pal. New York, 1, 1847, p. 218, pl. 53, figs. 1a-e; pl. 54, fig. 2b.—Barrande, Neues Jahrb. f. Min., etc., 1855, p. 267; Bull. Soc. Geol. France, 2d ser., 1855, p. 166.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 8, 1886, p. 243.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 154.

Trenton: Middleville, New York.

ENDOCERAS MARCOUI Barrande. See Cameroceras marcoui.

Endoceras montrealense (Billings).

Orthoceras montrealensis Billings, Can. Nat. Geol., 4, 1859, pp. 361–363, figs. 11c–e; Geol. Canada, Geol. Surv. Canada, 1863, p. 121, figs. 37a–c.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 552, figs.—Whitfield, Bull. Amer. Mus. Nat. Hist., 3, 1890, p. 34.

Endoceras montrealense Hall, Pal. New York, 5, pt. 2, 1879, p. 221 (gen. ref.).—Ruedemann, Bull. New York State Mus., 90, 1906, p. 424, pl. 9, fig. 8, fig. 8.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 42, fig. 1238.

Orthoceras sordidum Whitfield, Bull. Amer. Mus. Nat. Hist., 3, p. 34, pl. 2, fig. 4.

Canadian (Beekmantown): Near St. Eustache, Quebec; Fort Cassin, Vermont.

ENDOCERAS MULTITUBULATUM (Hall). See Vaginoceras multitubulatum.

Endoceras? ommaneyi Salter.

Orthoceras Ommaneyi Salter, App. to Sutherland's Jour. Voyage in Baffin Bay, etc., 1852, p. 222, pl. 5, figs. 16, 17; in Sutherland, Quart. Jour. Geol. Soc., 9, p. 314.—Haughton, Jour. Roy. Dublin Soc., 1, 1858, p. 249; in McClintock's "Discovery of the Fate of Franklin and his Companions" App. 4, 1859, p. 381.

Endoceras? ommaneyi Foord, Cat. Foss. Ceph. British Mus., pt. 1, 1888, p. 155.

Niagaran: Assistance Bay, Cornwallis Island, Arctic America.

Endoceras proteiforme Hall.

Endoceras proteiforme Hall, Pal. New York, 1, 1847, p. 208, pls. 46, figs. 1a–b, 2; 48, figs. 1, 4; 49, figs. 1a–e; 50, figs. 1–3; 52, 1a–b; 53, figs. 1a–c; 55, fig. 1, p. 311, 85, figs. 1a–f.—Gebhard, 9th Rep. New York State Cab. Nat. Hist. 1856, p. 45.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 151, pl. 16, figs. 1–3a, pl. 12, figs. 1–5; Man. Geol. 1860, p. 96, fig. 85.—Hitchcock, Geol. Vermont, 1, 1862, p. 299; ibid., 2, pl. 12, fig. 1.—Chapman, Canadian Jour., n. s., 8, 1863, p. 21, fig. 131, p. 200, fig. 194; Expos. Min. Geol. Canada, 1864, p. 129, fig. 131, p. 172, fig. 194.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1876, p. 37, fig. 12c.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 130.—Emerson, Narrative Hall's Sec. Arctic Exped., U. S. Navy Dep., 1879, p. 579.—Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 86, pl. 12, figs. 1, 1a–c.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 153.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 8, 1886, p. 243.—Hyatt, Zittel-Eastman, Texb. Pal., 1900, p. 515, fig. 1056.—Ruedemann Bull. New York State Mus., 90, 1906, p. 413, fig. 3.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1029, pl. 50, figs. 1–1d.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 42, fig. 1239, 1240.

Cameroceras proteiforme Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 777, pl. 48, figs. 1, 2; pl. 49, fig. 2; pl. 50, figs. 1, 2 (?3); pl. 51, figs. 1–3; pl. 53, figs. 4–5.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 169.—Weller, Geol. Surv. New Jersey, Pal. 3, 1903, p. 190, pl. 13, fig. 5.—Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 580.

Trenton: Middleville, Lowville, Watertown, etc., New York. The species has been identified from almost all the Mohawkian and Cincinnatian formations of the United States and Canada.

Plesiotype.—Cat. No. 17401, U.S.N.M. (Walcott, 1884).

Observation.—The above references undoubtedly include a variety of forms.

Endoceras proteiforme elongatum Hall.

Endoceras proteiforme? var. elongatum Hall, Pal. New York, 1, 1847, p. 216, pl. 52, figs. 1a, b.

Endoceras elongatum Keyes, Missouri Geol. Surv., 5, 1894, p. 220.

Cameroceras proteiforme var. elongatum, Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 580 (gen. ref.)

Trenton: Middleville, New York.

ENDOCERAS PROTEIFORME var. LINEOLATUM Hall. See Orthoceras lineolatum.

Endoceras proteiforme strangulatum Hall.

Endoceras proteiforme var. strangulatum Hall, Pal. New York, 1, 1847, p. 212, pl. 46, figs. 4a–c.

Trenton: Middleville, New York.

ENDOCERAS PROTEIFORME var. TENUISTRIATUM Hall. See Orthoceras tenuistriatum.

ENDOCERAS PROTEIFORME var. TENUITEXTUM Hall. See Orthoceras tenuitextum.

Endoceras rapax Billings.

Orthoceras rapax Billings, Canadian Nat. Geol., 5, 1860, p. 176.

Endoceras rapax Miller, N. A. Geol. Pal., 1889, p. 437 (gen. ref.).

Black River: Kingston, Ontario.

Endoceras rottermundi (Barrande).

Orthoceras (Endoceras) rottermundi Barrande, Syst. Sil. du Boheme, 2d ser., 1866, pl. 220.

Endoceras rottermundi Barrande, Syst. Sil. du Centre Boheme, 2, pt. 3, 1874, p. 749, pl. 220, figs. 9–11.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 151.

Black River: Island in Lake Huron (?Thessalon Island).

ENDOCERAS (NARTHECOCERAS) SIMPSONI Whiteaves. See Narthecoceras simpsoni.

Endoceras subannulatum (Whitfield).

Endoceras (Cameroceras) subannulatum Whitfield, Ann. Rep. for 1879, Wisconsin, Geol. Surv., 1880, p. 56; Geol. Wisconsin, 4, 1882, p. 230, pl. 7, figs. 15, 16.

Endoceras subannulatum Chamberlin, Geol. Wisconsin, 1, 1883, p. 159, fig.—Whiteaves, Trans. Royal Soc. Canada, 9, sec. 4, 1892, p. 78, pl. 5, figs. 2, 2a; Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 202.

Black River: Beloit, Wisconsin; Valley of Red River, western shore of Lake Winnipeg, East Selkirk, etc., Canada.

Endoceras subcentrale Hall.

Endoceras subcentrale Hall, Pal. New York, 1, 1847, p. 59, pl. 17, fig. 4.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 152.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 8, 1886, p. 244.

Black River (Watertown): Watertown, New York.

Endoceras vanuxemi (Conrad).

Diploceras Vanuxemi Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1848, p. 267, pl. 16, fig. 2.

Endoceras vanuxemi Miller, N. A. Geol. Pal., 1899, p. 437 (gen. ref.).

Trenton: Trenton Falls, New York.

Observation.—Clarke (Geol. Minnesota, 3, 1897) says Diploceras is unquestionably a Cameroceras and the type D. vanuxemi probably the same as Endoceras proteiforme.

Endoceras virgatum (Hall).

Colpoceras virgatum Hall, 3d Rep. New York State Cab. Nat. Hist., rev. ed., 1850, p. 182, pl. 5, fig. 2 (doc. ed., p. 174).

Endoceras virgatum Hall, Pal. New York, 5, pt. 2, 1879, p. 220 (gen. ref.).

Black River: Lewis County, New York.

ENDODESMA Ulrich. Genotype: E. cuneatum Ulrich.

Endodesma Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 525.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 527.

Endodesma compressum Ulrich.

Endodesma compressum Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 529, pl. 36, figs. 35, 37.

Trenton (Prosser): Near Wykoff, Minnesota.

Holotype.—Cat. No. 46194, U.S.N.M.

Endodesma cuneatum Ulrich.

Endodesma cuneatum Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 526, pl. 36, figs. 33, 34.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 527, fig. 715d, e.

Trenton (Prosser): Near Wykoff, Minnesota.

Holotype.—Cat. No. 46195, U.S.N.M.

Endodesma gesneri (Billings).

Modiolopsis Gesneri Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 172, fig. 157a, b; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 43, figs. 45a, b (adv. sheets, 1862).—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 408, figs.

Endodesma gesneri Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 528, pl. 37, figs. 3, 4.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 527, fig. 715a.

Black River and Trenton: Ottawa, etc., Ontario.

Plesiotype.—Cat. No. 46196, U.S.N.M.

Endodesma orthonotum (Meek and Worthen).

Modiolopsis orthonota Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 295, pl. 1, fig. 7a.

Modiolopsis rectiformis Worthen, Bull. 1, Illinois State Mus. Nat. Hist., 1882, p. 38.

Endodesma orthonotum Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 527, pl. 37, figs. 1, 2.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 527, fig. 715b, c.

Black River (Platteville): Dunleith, Illinois.

Plastotype.—Cat. No. 46197, U.S.N.M.

Endodesma postlatum Ulrich.

Endodesma postlatum Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 527, pl. 37, figs. 5, 6.

Trenton (Galena): Dubuque, Iowa.

Endodesma tranceps (Raymond).

Cyrtodonta tranceps Raymond, Amer. Jour. Sci., 20, 1905, p. 372.

Chazyan (Crown Point): Valcour Island, New York.

Endodesma trentonense (Hall).

Modiolopsis? trentonensis Hall, Pal. New York, 1, 1847, p. 161, pl. 34, fig. 10.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 412, fig.

Lyonsia trentonensis Emmons, Amer. Geology, 1, pt. 2, 1855, p. 170, pl. 14, fig. 4.

Endodesma trentonensis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 504 (gen. ref.).

Trenton: New York.

Endodesma undosum Ulrich.

Endodesma undosum Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 529, pl. 36, fig. 38.

Black River (Platteville): Near Beloit, Wisconsin.

ENDYMINIA Vogdes. See Endymionia Billings.

ENDYMION Billings. See Endymionia Billings.

ENDYMIONIA Billings. Genotype: Endymion meeki Billings.

Endymion Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, pp. 93, 94 (adv. sheets, 1862).

Endymionia Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 281.—Zittel, Handb. Pal., 2, 1885, p. 594.—Miller, N. A. Geol. Pal., 1889, p. 547.—Beecher, Amer. Jour. Sci., 3d ser., 49, 1895, p. 307; ibid., 4th ser., 3, 1897, p. 187.

Endyminia Vogdes, Cal. Acad. Sci., Occ. Pap., 4, 1893, p. 253.

Endymionia meeki (Billings).

Endymion meeki Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 94, fig. 84 (adv. sheets, 1862).

Endymionia meeki Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 281.—Miller, N. A. Geol. Pal., 1889, p. 547, fig. 1006.

Canadian: Point Levis, Quebec (Levis, Diplograptus dentatus zone); Table Head, Pistolet Bay, etc., Newfoundland (Quebec-N, P).

ENOPLEURA Wetherby. See Ateleocystites Billings.

ENOPLEURA BALANOIDES Wetherby. See Ateleocystites balanoides.

ENOPLEURA CRUSTACEA Bather. See Ateleocystites balanoides.

ENTEROLASMA Simpson. Genotype: Streptelasma strictum Hall.

Enterolasma Simpson, Bull. New York State Mus., 39, 1900, p. 203.—Grabau, Bull. New York State Mus., 45, 1901, p. 136; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 136.

Enterolasma caliculum (Hall).

Streptelasma calicula Hall, Pal. New York, 2, 1852, p. 111, pl. 32, fig. 1a–k.—Lambe, Contr. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 113, pl. 7, figs. 4a–c.

Petraia calicula Billings, Geol. Surv. Canada, Geol. Canada, 1863, p. 308, fig. 310.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 627, fig.

Cyathophyllum? caliculum Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 601, pl. 34, fig. 8.

Enterolasma caliculus Grabau, Bull. New York State Mus., 45, 1901, p. 137, fig. 29; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 137, fig. 29.

Streptelasma (Enterolasma) caliculum Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 56, fig. 76g, 77.

Enterolasma cf. caliculus Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 24, pl. 1, fig. 1.

Silurian (Cataract-Guelph): Rochester, Lockport, etc., New York; Grimsby, etc., Ontario; Lake Temiscaming, Quebec; Wisconsin, Ohio, Tennessee, Alabama, etc.

Enterolasma geometricum (Foerste).

Streptelasma calicula var. geometricus Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 345, pl. 9, figs. 7, 12, 13.

Streptelasma? geometricum Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 601, pl. 34, figs. 7, 12, 13.

Upper Medinan (Brassfield): Near Dayton and Todds Fork; near Wilmington, Ohio.

Enterolasma waynense (Safford).

Petraia Waynensis Safford, Geol. Tennessee, 1869, pp. 314, 320, pl. 5 (II), figs. 2a–h.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, p. 628, figs.

Streptelasma waynense Miller, N. A. Geol. Pal., 1889, p. 205 (gen. ref.).

Enterolasma waynense Simpson, Bull. New York State Mus., 39, 1900, p. 204, figs. 13–15.

Enterolasma (Petraia) waynense Foerste, Jour. Geol., 11, 1903, p. 713 (loc. occ.).

Niagaran (Brownsport): Wayne, Decatur, and Perry Counties, Tennessee.

ENTOMIS Jones. Genotype: E. tuberosa Jones.

Entomis Jones, Mem. Geol. Surv. Great Britain, Expl. Map 32, Scotland, 1861, p. 137.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 707.—Ulrich, Zittel-

ENTOMIS—Continued.

Eastman Textb. Pal., 1, 1900, p. 646.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res., Indiana, 1908, p. 1040.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 362.—Bassler, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 741.

Entomis madisonensis Ulrich.

Entomis madisonensis Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 107, pl. 7, figs. 12a–b.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res., Indiana, 1908, p. 1046, pl. 53, figs. 8, 8b.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 362, fig. 1667, r, s.

Richmond (Whitewater-Saluda): Near Madison, Indiana.

Holotype.—Cat. No. 41565, U.S.N.M.

Entomis waldronensis Ulrich.

Entomis waldronensis Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, pt. 2, 1891, p. 183, pl. 12, figs. 3a, 3b.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 363, fig. 1668m, n.

Niagaran (Waldron): Waldron, Indiana.

Holotype.—Cat. No. 41566, U.S.N.M.

ENTOMOLITUS PARADOXUS PISIFORMIS Linnæus. See Agnostus pisiformis.

ENTOMOSTRACITES PISIFORMIS Wahlenberg. See Agnostus pisiformis.

ENTOMOSTRACITES SCARABÆOIDES Wahlenberg. See Peltura scarabæoides.

ENTOMOSTRACITES SPINULOSUS Wahlenberg. See Parabolina spinulosa.

EOHARPES Raymond. Genotype: Harpes primus Barrande.

Harpina Novak (not Burmeister, 1844) Sitz. d. k. bohm. Gesell. d. Wiss. Math.-Naturw. Cl. for 1884, 1885, p. 215.—Clarke, Geol. Minnesota, pt. 2, 1894, p. 756.—Beecher, Amer. Jour. Sci., 49, 1895, p. 307; ibid., 3, 1897, p. 185.

Eoharpes Raymond, Amer. Jour. Sci., 19, 1905, p. 378; Zittel-Eastman Textb. Pal., 1913, p. 711.

Eoharpes antiquatus (Billings).

Harpes antiquatus Billings, Canadian Nat. Geol., 4, 1859, p. 469, fig. 38; Geol. Canada, Geol. Surv. Canada, 1863, p. 133, fig. 67.

Harpina antiquatus Raymond, Annals Carnegie Mus., 3, 1905, p. 330, pl. 10, fig. 1.

Eoharpes antiquatus Raymond, 7th Rep. Vermont State Geol., 1910, p. 214, pl. 32, fig. 1; Ann. Carnegie Mus., 7, No. 1, 1910, p. 60.

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

Eoharpes cassinensis (Whitfield).

Harpes cassinensis Whitfield, Bull. Amer. Mus. Nat. Hist., 9, 1897, p. 182, pl. 5, figs. 3, 4.—Seely, Vermont State Geol., Rep. 7, 1910, pl. 55, figs. 3, 4.

Canadian (Beekmantown): Fort Cassin, Vermont.

Eoharpes consuetus (Billings).

Harpes consuetus Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 64.

Anticostian (Chicotte): Southwest Point, Anticosti.

Eoharpes dentoni (Billings).

Harpes Dentoni Billings, Canadian Nat. Geol., 8, 1863, p. 36, fig.; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 183, fig. 166.

Eoharpes dentoni Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 33, pl. 3, fig. 5.

Trenton (Curdsville): Ottawa, Ontario.

Eoharpes escanabiæ (Hall).

Harpes escanabiæ Hall, Geol. Lake Sup. Land Dist., Foster and Whitney's Rep., 1851, p. 211, pl. 27, fig. 2a.

Trenton: Escanaba River below Indian Creek, Michigan.

Eoharpes granti (Billings).

Harpes granti Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 326, fig. 314.

Canadian (Beekmantown): Stanbridge, Quebec.

Eoharpes minnesotensis (Clarke).

Harpina minnesotensis Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 755, fig. 76.

Trenton (Prosser): Hader, Minnesota.

Holotype.—Cat. No. 41889, U.S.N.M.

Eoharpes ottawaensis (Billings).

Harpes ottawaensis Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 182, fig. 165; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 28.—Miller, N. A. Geol. Pal., 1889, p. 549, fig. 1011.

Harpina ottawaensis Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 757, fig. 79.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 191, pl. 14, figs. 1, 2.—Raymond, Annals Carnegie Mus., 3, 1905, p. 331, pl. 10, fig. 2.

Harpes (Harpina) ottawaensis Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 258, fig. 1546.

Eoharpes ottawaensis Bassler, Bull. Virginia Geol. Surv., 29, 1909, p. 111, fig. 10.—Raymond, 7th Rep. Vermont State Geol., p. 215, pl. 32, fig. 2.—Ruedemann, Bull. New York State Mus., 162, p. 116, pl. 9, fig. 1.

Chazyan: Valcour, etc., New York (Day Point); Virginia (Liberty Hall.)

Trenton: Ottawa, Ontario; New Jersey, New York, Minnesota, etc.

Plastotype.—Cat. No. 41887, U.S.N.M.

Eoharpes pustulosus (Hall).

Ceraurus? pustulosus Hall, Pal. New York, 1, 1847, p. 246, pl. 61, figs. 2a, b.

Harpes pustulosus Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 67 (gen. ref.).

Eoharpes pustulosus Raymond and Barton, Bull. Mus. Comp. Zool., 54, 1913, p. 542.

Black River: Watertown, New York.

Eoharpes rutrellum (Clarke).

Harpina rutrellum Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 757, figs. 80, 81.

Trenton (Prosser): Cannon Falls, and Minneapolis, Minnesota.

Holotype.—Cat. No. 41888, U.S.N.M.

EOORTHIS Walcott. Genotype: Orthis remnicha Winchell.

Orthis (Plectorthis) Walcott (not Hall and Clarke), Proc. U. S. Nat. Mus., 28, 1905, pp. 257–259.

Plectorthis Grabau and Shimer (part) (not Hall and Clarke), N. A. Index Fossils, 1907, 1, p. 250.

Eoorthis Walcott, Smiths. Misc. Coll., 53, 1908, pp. 102–104; ibid., 53, No. 4, 1908, pl. 11, and pp. 142 and 148; Mon. U. S. Geol. Surv., 51, 1912, p. 772.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 381.

Orthis (Orusia) Walcott, Proc. U. S. Nat. Mus., 28, 1905, p. 273.

Orusia Walcott, Smiths. Misc. Coll., 53, 1908, pl. 11, pp. 142, 148; U. S. Geol. Surv., Mon., 51, 1912, p. 765 (Genotype: Anomites lenticularis Wahlenberg).

Eoorthis atava (Matthew).

Strophomena atava Matthew, Trans. Roy. Soc. Canada, 1st ser., 1893, 10, sec. 4, pp. 102–103, pl. 7, fig. 8a–f.—Moberg and Segerberg, Medd. fran. Lunds Geol. Faltklubb, ser. B., No. 2, 1906.

Rafinesquina? atava Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 338.

Orthis (Plectorthis) atava Walcott, Proc. U. S. Nat. Mus., 28, 1905, pp. 259–260.

Eoorthis atava Walcott, Mon. U. S. Geol. Surv., 51, pt. 1, 1912, p. 774, pl. 95, figs. 7, 7a–b.

Canadian (Bretonian—Div. C 3a): Navy Island, St. John Harbor, New Brunswick.

Eoorthis desmopleura (Meek).

Orthis coloradoensis Meek (not Shumard), Proc. American Phil. Soc., 2, 1870, p. 425.

Orthis desmopleura Meek, Hayden's U. S. Geol. Surv. Wyoming, 1872, p. 295.

Orthis (Plectorthis) desmopleura Walcott, Proc. U. S. Nat. Mus., 28, 1905, p. 261.

Eoorthis desmopleura Walcott, Mon. U. S. Geol. Surv., 1912, 51, p. 777, pl. 96, figs. 1, 1a–r.

Upper Cambrian: Utah, New Mexico, Pennsylvania, etc.

Lower Ordovician: Glen Eyre, Queens Canyon, near Manitou, and Colorado Springs, Colorado.

Holotype and *plesiotypes*.—Cat. Nos. 7859, 52317, 52320, U.S.N.M.

Eoorthis desmopleura nympha Walcott.

Orthis (Plectorthis) desmopleura nympha Walcott, Proc. U. S. Nat. Mus., 28, 1905, p. 262.

Eoorthis desmopleura nympha Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 778, pl. 96, fig. 2,

Lower Ordovician: Williams Canyon, Manitou, Colorado; also Upper Cambrian of Wyoming.

Holotype.—Cat. No. 52333, U.S.N.M.

Eoorthis johannensis (Matthew).

Orthisina(?) johannensis Matthew, Trans. Roy. Soc. Canada, 1st ser., 9, sec. 4, 1892, pp. 49–50, pl. 12, figs. 13a–c.

Clitambonites? johannensis Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 184.

Orthis (Plectorthis) johannensis Walcott, Proc. U. S. Nat. Mus., 28, 1905, pp. 265, 266.

Eoorthis johannensis Walcott, Mon. U. S. Geol. Surv., 51, pt. 1, 1912, p. 781, pl. 97, figs. 10, 10a.

Canadian (Bretonian—Div. C 3a): Germaine Street, St. John, New Brunswick.

Eoorthis (Orusia) lenticularis (Wahlenberg).

Anomites lenticularis Wahlenberg, Nova Acta Regiae Soc. Sci. Upsal., 8, Petrif. tell. Svecanae, 1821, pp. 66, 67.

Orthis lenticularis Davidson, British Foss. Brachiopoda, 3, pt. 7, 1869, pp. 230–232, pl. 33, figs. 22–28 —Roemer, Leth. geog., pt. 1, Leth. Pal., Atlas, 1876, pl. 2, figs. 4a–c.—Matthew, Trans. Roy. Soc. Canada, 9, sec. 4, 1892, pp. 46–48, pl. 12, figs. 9a–d; Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, pp. 213–116, pl. 17, figs. 1a–d.

Orthis (Orusia) lenticularis Walcott, Proc. U. S. Nat. Mus., 28, 1905, pp. 273–276.

Orusia lenticularis Walcott, Mon. U. S. Geol. Surv., 51, pt. 1, 1912, p. 98, figs. 1, 1a–p; 2, 2a–k; 3, 3a–b; 6, 6a–c. (See for complete bibliography.)

Orthis lenticularis strophomenoides Matthew, Trans. Roy. Soc. Canada, 9, sec. 4, 1892, p. 49, pl. 12, figs. 12–b; Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, p. 217, pl. 17, figs. 4a–b.

Eoorthis (Orusia) lenticularis—Continued.

Olenus limestone and shale of Norway and Sweden; Lingula flags of North Wales, etc.

Canadian (Bretonian—Div. C 3a–c): St. John, New Brunswick and Cape Breton, Nova Scotia.

Eoorthis (Orusia) lenticularis atrypoides (Matthew).

Orthis lenticularis var. atrypoides Matthew, Trans. Royal Soc. Canada, 9, 1892, p. 48, pl. 12, figs. 11a, 11b; Geol. Surv. Canada, Rept. Cambrian Rocks Cape Breton, 1903, p. 217, pl. 17, figs. 3a–b.

Orthis (Orusia) lenticularis atrypoides Walcott, Proc. U. S. Nat. Mus., 28, 1905 p. 276.

Orusia lenticularis atrypoides Walcott, Mon. U. S. Geol. Surv., 51, pt. 1, 1912, p. 769, pl. 98, fig. 5.

Canadian (Bretonian—Div. C 3a): Germaine Street, St. John, New Brunswick.

Eoorthis (Orusia) lenticularis lyncioides (Matthew).

Orthis lenticularis var. lyncioides Matthew, Trans. Royal Soc. Canada, 9, 1892, p. 49, pl. 12, figs. 10a–10c; Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, p. 216, pl. 17, figs. 2a–c.

Orthis (Orusia) lenticularis lyncioides Walcott, Proc. U. S. Nat. Mus., 28, 1905, p. 277.

Orusia lenticularis lyncioides Walcott, Mon. U. S. Geol. Surv., 51, pt. 1, 1912, p. 769, pl. 98, fig. 4.

Canadian (Bretonian—Div. C 3a): Germaine Street, St. John, New Brunswick.

Eoorthis newtonensis (Weller).

Orthis newtonensis Weller, Geol. Surv. New Jersey, Pal., 3, 1903, pp. 113, 114, pl. 1, figs. 3–5.

Orthis (Plectorthis) newtonensis Walcott, Proc. U. S. Nat. Mus., 28, 1905, p. 267,

Eoorthis newtonensis Walcott, Mon. U. S. Geol. Surv., 51, 1912, p. 784, pl. 97. figs. 9, 9a.

Upper Cambrian or Ozarkian (Kittatinny): Newton, Sussex County, New Jersey.

Eoorthis wichitaensis Walcott.

Orthis (Plectorthis) wichitaensis Walcott, Proc. U. S. Nat. Mus., 28, 1905, pp. 271–272.

Eoorthis wichitaensis Walcott, Mon. U. S. Geol. Surv. 51, 1912, p. 790, pl. 94, figs. 1a–o, u.

Lower Ordovician: Near Manitou, El Paso County, Colorado. Also Upper and Middle Cambrian of Oklahoma, Missouri, etc.

Holotype and *paratypes*.—Cat. Nos. 52381, 52384, U.S.N.M.

Eophyton (Scolithus) dispar James. See Scolithus dispar.

EOPOLYCHÆTUS Ruedemann. Genotype: E. albaniensis Ruedemann.

Eopolychætus Ruedemann, Bull. New York State Mus., 42, 1901, p. 573.

Eopolychætus albaniensis Ruedemann.

Eopolychætus albaniensis Ruedemann, Bull. New York State Mus., 42, 1901, p. 573, pl. 1, fig. 13.

Trenton (Snake Hill): Rural Cemetery, near Albany, New York.

EOPTERIA Billings. Genotype: E. typica Billings.

Eopteria Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 221.—Zittel, Handb. Pal., 2, 1881, p. 36.—Miller, N. A. Geol. Pal., 1889, p. 480.

Eopteria? ornata Billings.
Eopteria ornata Billings, Pal. Foss. 1, Geol. Surv. Canada, 1865, p. 307, fig. 299, Ozarkian? (Levis- erratic): Point Levis, Quebec.

Eopteria richardsoni Billings.
Eopteria Richardsoni Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 306. text fig. 298.—Miller, N. A. Geol. Pal., 1889, p. 480, fig. 821.
Canadian (Beekmantown): Near St. Antoine, above Quebec, Canada.

Eopteria typica Billings.
Eopteria typica Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 221.
Canadian (Quebec—G.): Port aux Choix, Newfoundland.

EOSPONGIA Billings. Genotype: E. roemeri Billings.
Eospongia Billings, Geol. Vermont, 2, 1861, p. 955; Rep. Econ. Geol., etc., Vermont, 1862, p. 227.; Pal. Fossils, 1, Geol. Surv. Canada, 1865, pp. 18, 19 (adv. sheets, 1861).—Miller, N. A. Geol. Pal., 1889, p. 159.—Seely, Rep. State Geol. Vermont, 3, 1902, p. 153.

Eospongia roemeri Billings.
Eospongia roemeri Billings, Geol. Vermont, 2, 1862, p. 956; Rep. Econ. Geol., etc., Vermont, 1862, p. 228. Billings, Pal. Foss., 1, Geol., Surv. Canada, 1865, p. 19 (adv. sheets, 1861).
Chazyan (Mingan): Mingan Islands, Canada.

EOSPONGIA VARIANS Billings. See Zittelella varians.

EOTOMARIA Ulrich and Scofield. Genotype: E. canalifera Ulrich.
Pleurotomaria and Raphistoma (part)-of American authors.
Eotomaria, Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, pp. 954, 1000.—Koken, Neues Jahrb. Min., Geol. and Pal., 1, 1898, p. 19.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 642.

Eotomaria arcyi Clarke and Ruedemann.
Eotomaria arcyi Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 68, pl. 8, fig. 2.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 643.—Grabau, Michigan Geol. Surv., Geol. Ser. 1, 1909, p. 187, pl. 23, fig. 5.
Niagaran (Guelph): Rochester, New York.
Upper Monroan (Lucas and Amherstburg): Detroit River region, Michigan.

Eotomaria canalifera Ulrich.
Eotomaria canalifera Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1002, pl. 69, figs. 9–14. (E. sublævis, p. 954, in error.)
Pleurotomaria canalifera Miller, N. A. Geol. Pal., 1897, p. 769 (gen. ref.).
Stones River (Murfreesboro): Near Murfreesboro, Tennessee.
Cotypes.—Cat. No. 46055, U.S.N.M.

Eotomaria? cassina (Whitfield).
Lophospira Cassina Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 312, pl. 25, figs. 1–4.—Seely, Vermont State Geol., Rep. 7, 1910, pl. 59, figs. 1–4.
Eotomaria? cassina Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 991 (gen. ref.)
Murchisonia cassina Miller, N. A. Geol. Pal., 1899, p. 411 (gen. ref.).
Canadian (Beekmantown): Fort Cassin, Vermont.

Eotomaria dryope (Billings).
Pleurotomaria Dryope Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 170, fig. 154a, b.

Eotomaria dryope—Continued.

Eotomaria dryope Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1003, pl. 69, figs. 21–25.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 642, fig. 875c–e.

Black River: Pauquettes Rapids, Ottawa River, Canada; Minneapolis and Cannon Falls, Minnesota (Platteville); Lincoln County, Missouri (Auburn); Maury County, Tennessee.

Plesiotypes.—Cat. Nos. 45804, 45805, U.S.N.M.

Eotomaria durhamensis (Whiteaves).

Pleurotomaria Durhamensis Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 24, pl. 4, fig. 2; ibid., pt. 2, 1895, p. 77.

Eotomaria durhamensis Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 68, pl. 10, fig. 17.

Niagaran (Guelph): Durham, Ontario; Rochester, New York.

Eotomaria elevata Ulrich.

Eotomaria elevata Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1005, pl. 70, figs. 68–69.

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

Trenton (Catheys): Hartsville, Tennessee.

Holotype.—Cat. No. 45806, U.S.N.M.

Eotomaria galtensis (Billings).

Pleurotomaria Galtensis Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 343, fig. 349; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 154, fig. 136 (adv. sheets, 1862).—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 709, fig.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 75, pl. 11, fig. 7.

Eotomaria galtensis Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 70, pl. 10, figs. 10–12.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 643, fig. 877.—Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 189, pl. 25, fig. 1, 2.

Niagaran (Guelph): Galt, etc., Ontario; Oak Orchard Creek, New York; Wisconsin.

Upper Monroan (Lucas and Amherstburg): Detroit River region, Michigan.

EOTOMARIA HALEI Clarke and Ruedemann. See Euomphalopterus halei.

Eotomaria kayseri Clarke and Ruedemann.

Eotomaria kayseri Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 70, pl. 7, fig. 1; pl. 8, fig. 1.

Niagaran (Guelph): Rochester, New York.

Eotomaria labiosa Ulrich.

Eotomaria labiosa Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1003, pl. 69, figs. 15–17.

Stones River (Murfreesboro): Murfreesboro, Tennessee.

Holotype.—Cat. No. 46056, U.S.N.M.

Eotomaria laphami (Whitfield).

Pleurotomaria Laphami Whitfield, Ann. Rep. for 1877, Wisconsin Geol. Surv., 1878, p. 84; Geol. Wisconsin, 4, 1882, p. 296, pl. 18, fig. 9.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 193, fig.—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 455, pl. 11, fig. 4.

Pleurotomaria (Eotomaria) laphami Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 70 (gen. ref.).

Eotomaria laphami—Continued.

Eotomaria laphami Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 70 (gen. ref.).

Niagaran: Ashford, Wisconsin (Racine); Delphi, Indiana.

Eotomaria obsoleta Raymond.

Eotomaria obsoletum Raymond, Amer. Jour. Sci., 4th ser., 20, 1905, p. 376; Ann. Carnegie Mus., 4, 1908, p. 192, pl. 49, figs. 12–14.

Chazyan (Day Point, Crown Point): Crown Point and Valcour Island, New York.

Eotomaria supracingulata (Billings).

Pleurotomaria supracingulata Billings, Rep. Progr., Geol. Surv. Canada, 1857, p. 302; Geol. Canada, Geol. Surv. Canada, 1863, p. 181, fig. 175.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 717, fig.

Eotomaria supracingulata Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1894, p. 1004, pl. 69, figs. 26–29.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 643, fig. 876.

Raphistoma (Pleurotomaria) nasoni Hall, Rep. Geol. Surv. Wisconsin, 1862, p. 39, fig. 2.

Raphistoma Nasoni Whitfield, Geol. Wisconsin, 4, 1882, p. 215, pl. 6, figs. 2, 3.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 157, fig.—Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 78, pl. 11, figs. 21, 21a.

Pleurotomaria nasoni Hall, Rep. Supt. Geol. Surv. Wisconsin, 1861, p. 34.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 61, pl. 8, figs. 4–7.

Black River: St. Joseph's Island, Lake Huron; Dixon, etc., Illinois; Minneapolis, etc., Minnesota; Janesville and Beloit, Wisconsin; Eureka District, Nevada (Pogonip).

Plesiotypes.—Cat. Nos. 45807, 45808, U.S.N.M.

Eotomaria vicina Ulrich and Scofield.

Eotomaria vicina Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1003, pl. 69, figs. 18–20.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 643, fig. 875f.

Black River (Platteville): Minneapolis, Minnesota; Mineral Point, Wisconsin.

Cotype.—Cat. No. 45809, U.S.N.M.

EOTROPHONIA Ulrich. Genotype: E. setigera Ulrich.

Eotrophonia Ulrich, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 91.

Eotrophonia setigera Ulrich.

Eotrophonia setigera Ulrich, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 91, pl. 4, fig. 5.

Eden (Economy): Covington, Kentucky.

Cotypes.—Cat. No. 46535, U.S.N.M.

EREMOCERAS Hyatt. Genotype: Cyrtoceras syphax Billings.

Eremoceras Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 282; Zittel-Eastman Textb. Pal., 1900, p. 530; ibid., 2d ed., 1913, p. 611.

Eremoceras syphax (Billings).

Cyrtoceras Syphax Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 194, text fig. 178.

Eremoceras syphax Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 282 (gen. ref.).

Canadian (Levis-limestone): Point Levis, Quebec.

ERIDONYCHIA Ulrich. Genotype: E. apicalis Ulrich.

Eridonychia Ulrich, Geol. Surv. Ohio, 7, 1893, p. 639.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 980.

Eridonychia apicalis Ulrich.

Eridonychia apicalis Ulrich, Geol. Surv. Ohio, 7, 1893, p. 639, pl. 47, fig. 1.
Maysville (Fairmount): Cincinnati, Ohio, and vicinity.
Holotype.—Cat. No. 46198, U.S.N.M.

Eridonychia crenata Ulrich.

Eridonychia crenata Ulrich, Geol. Surv. Ohio, 7, 1893, p. 640, pl. 47, fig. 3.
Richmond (Waynesville): Waynesville, Ohio.
Holotype.—Cat. No. 46199, U.S.N.M.

Eridonychia paucicostata Ulrich.

Eridonychia paucicostata Ulrich, Geol. Surv. Ohio, 7, 1893, p. 640, pl. 47, fig. 2.
Maysville (Fairmount): Covington, Kentucky.
Holotype.—Cat. No. 46200, U.S.N.M.

ERIDOPHYLLUM Edwards and Haime.

Genotype: E. verneuilanum Edwards and Haime.

Eridophyllum Edwards and Haime, Mon. d. Polyp. Foss. d. Terr Pal., 1851 (Arch. du Mus. d'Hist. Nat., 5), pp. 171–423.—Pictet, Traité de Pal., 2d ed., 4, 1857, p. 459.—Billings, Canadian Jour., n. s., 4, 1859, p. 130.—Milne-Edwards, Hist. Nat. Corall., 3, 1860, p. 414.—Dybowski, Archiv. Naturf. Liv-, Ehst- und Kurl., 5, 1873, p. 337.—Nicholson, Rep. Pal. Prov. Ontario, pt. 1, 1874, p. 34.—Zittel, Handb. Pal., 1, 1879, p. 233.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 356.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 728.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, pp. 25, 26.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 71.

Eridophyllum dividuum Davis.

Eridophyllum dividuum Davis, Kentucky Foss. Corals, Geol. Surv. Kentucky, 1885, pl. 109, figs. 3–12.
Niagaran (Louisville): Louisville, Kentucky.
Cotype.—Cat. No. 52776, U.S.N.M.

Eridophyllum eruciforme Davis.

Eridophyllum eruciforme Davis, Kentucky Foss. Corals, Geol., Surv. Kentucky, pt. 2, 1885, pl. 107.
Niagaran (Louisville): Louisville, Kentucky.

ERIDOPHYLLUM HURONICUM Davis. See Diphyphyllum huronicum.

Eridophyllum louisvillense Greene.

Eridophyllum Louisvillensis Greene, Cont. Indiana Pal., 1, pt. 11, 1903, p. 98, pl. 31, fig. 1.
Niagaran (Louisville): Louisville, Kentucky.

Eridophyllum proliferum Foerste.

Eridophyllum proliferum Foerste, Jour. Geol., 11, 1903, p. 713.
Niagaran (Brownsport): Near Brownsport Furnace, near Linden, and near Savannah, Tennessee.

Eridophyllum rugosum Edwards and Haime.

Eridophyllum? rugosum Edwards and Haime, Pol. Foss. des Terr. Pal., 1851, p. 424, pl. 10, figs. 4–4b.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 357.—Hall, 12th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1883, p. 255, pl. 3, fig. 6.—Davis, Kentucky, Foss. Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 109, fig. 1; pl. 110.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 223, figs.—Simpson, Bull. New York State Mus., 8, 1900, p. 123, fig. 38.—Grabau and Shimer, N. A. Index Fossils 1, 1906, p. 72, fig. 111; 113 a.

Eridophyllum rugosum—Continued.

Diphyphyllum rugosum Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 122, pl. 45, fig. 2.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 2, 1901, p. 157.

Middle Silurian: Gotland; Louisville, Kentucky; Cabots Head, Georgian Bay, etc., Ontario (Niagaran).

Eridophyllum sentum Davis.

Eridophyllum sentum Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 51, fig. 4; pl. 108, fig. 1.

Niagaran (Louisville): Louisville, Kentucky.

Eridophyllum Vennori Billings. See Synaptophyllum multicaule.

Eridorthis Foerste. See Hebertella subgenus Eridorthis.

ERIDOTRYPA Ulrich. Genotype: E. mutabilis Ulrich.

Batostomella (in part) Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 375, 432.

Eridotrypa Ulrich, Geol. Minnesota, 3, 1893, p. 264.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 756.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, p. 32.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 29.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, p. 745.—Hennig, Archiv. für Zool., 4, 21, p. 36.—Grabau and Shimer, N. A. Index Fossils, 1, 1908, p. 134.—Bassler, Bull. U. S. Nat. Mus., 77, p. 242.

Eridotrypa ædilis (Eichwald).

Cladopora ædilis Eichwald, Bull. Soc. Nat. Moscou, No. 4, 1855, p. 457; Leth. Rossica, 1, 1860, p. 404, pl. 24, figs. 12, 13.

Monticulipora ædilis Dybowski, Die Chætetiden Ostbaltischen Silur-Formation, 1877, p. 98, pl. 3, figs. 5, 5a.

Eridotrypa ædilis Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 242, 244, pl. 4, figs. 5, 5a; figs. 137, 138.

Eridotrypa mutabilis Ulrich, Geol. Minnesota, 3, 1893, p. 265, pl. 26, figs. 20–32.—Sardeson, Jour. Geol., 9, 1901, p. 13, pl. A, fig. 11.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 134, fig. 188f, 190f.

Middle Ordovician: Various localities in Esthonia, Russia; Goodhue, Ramsey, and Dakota Counties, Minnesota; Wisconsin, Tennessee, Kentucky, Ontario, etc. (Black River and Trenton).

Plesiotypes.—Cat. No. 43536, U.S.N.M. *Cotypes* of E. mutabilis.

Eridotrypa ædilis minor (Ulrich).

Eridotrypa mutabilis var. minor Ulrich, Geol. Minnesota, 3, 1893, p. 266, pl. 26, figs. 20, 21, 29, 30.

Eridotrypa ædilis minor Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 245, fig. 139.

Middle Ordovician: Cannon Falls, etc., Minnesota (Trenton-Prosser); Wesenberg, Esthonia, Russia (Wesenberg).

Cotypes.—Cat. No. 43537, U.S.N.M.

Eridotrypa briareus (Nicholson).

Chætetes briareus Nicholson, Pal. Ohio, 2, 1875, p. 202, pl. 21, 13–13b.

Monticulipora (Monotrypa) briareus Nicholson, Genus Monticulipora, 1881, p. 198, pl. 2, figs. 5–5c.

Monticulipora briarea James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 172.—J. F. James, ibid., 16, 1894, p. 191.

Monticulipora (Chætetes) briareus Chamberlin, Geol. Wisconsin, 1, 1883, p. 172, fig.

Eridotrypa briareus—Continued.

Monotrypella briarea Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, pp. 248, 256 (gen. ref.).

Eridotrypa briareus Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 237.—Nickles, Bull. Kentucky Geol. Surv. No. 5, 1905, p. 43, pl. 1, figs. 4, 5.

Trenton: Covington, Kentucky. An abundant species in central Kentucky (Cynthiana) and central Tennessee (Bigby, Cathey).

Eridotrypa echinata (Hall).

Trematopora echinata Hall, 28th Ann. Rep. New York State Mus., doc. ed., 1876, pl. 11, figs. 1–5; ibid., Mus. ed., 1879, p. 112, pl. 11, figs. 1–5; 11th Ann. Rep., Indiana Geol. Nat. Hist., 1882, p. 233, pl. 10, figs. 1–5.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, p. 1200, figs.

Eridotrypa echinata Ulrich, Geol. Minnesota, 3, 1893, p. 265.

Niagaran (Waldron): Waldron, Indiana.

Eridotrypa exigua Ulrich.

Eridotrypa exigua Ulrich, Geol. Minnesota, 3, 1893, p. 266, pl. 26, figs. 17–19.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 245, 246, fig. 140.

Trenton: Cannon Falls, Minnesota (Prosser); Trenton Falls, New York; Chimney Point, Vermont.

Middle Ordovician (Jewe): Near Jewe, Esthonia, Russia.

Cotypes.—Cat. No. 43535, U.S.N.M.

Eridotrypa mutabilis Ulrich. See Eridotrypa ædilis.

Eridotrypa mutabilis var. minor Ulrich. See Eridotrypa ædilis minor.

Eridotrypa nodulosa Bassler.

Eridotrypa nodulosa Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 30, pl. 11, figs. 14, 15; pl. 25, figs. 1–3.

Clinton (Rochester): Lockport and Rochester, New York.

Cotypes.—Cat. No. 35524, U.S.N.M.

Eridotrypa parvulipora Ulrich and Bassler.

Eridotrypa parvulipora Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 272, pl. 43, figs. 5–8; pl. 44, figs. 7, 8.

Helderbergian (Keyser): Keyser and Cherry Run, West Virginia; Cumberland, Maryland.

Cotypes.—Cat. No. 53643, U.S.N.M.

Eridotrypa similis Bassler.

Eridotrypa similis Bassler, Bull. U. S. Geol. Surv., 292, 1906, pp. 31, 32, pl. 12, figs. 10–14; pl. 26, figs. 1, 2.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 134.

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

Cotypes.—Cat. No. 35519, U.S.N.M.

Eridotrypa simulatrix (Ulrich).

Batostomella simulatrix Ulrich, Geol. Surv. Illinois, 8, 1890, p. 432, pl. 35, figs. 1–1g.

Eridotrypa simulatrix Ulrich, Geol. Minnesota, 3, 1893, p. 265.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 828, pl. 16, figs. 4, 4b; pl. 29, figs. 5, 5a.

Monticulipora simulatrix J. F. James, Jour. Cincinnati Soc. Nat. Hist., 16, 1894, p. 194.

Richmond: Clarksville, Waynesville, and other localities in Ohio; Weisberg and Versailles, Indiana; Savannah, Illinois; Anticosti.

Cotypes.—Cat. No. 43744, U.S.N.M.

Eridotrypa solida (Hall).

Trematopora solida Hall, Pal. New York, 2, 1852, p. 153, pl. 40a, figs. 6a–c.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 258.

Homotrypa? solida Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 293.

Eridotrypa solida Bassler, Bull. U. S. Geol. Surv., 292, 1906, pp. 30, 31, pl. 12, figs. 7–9; pl. 24, figs. 20–23; pl. 25, fig. 16.

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

Plesiotypes.—Cat. No. 35525, U.S.N.M.

Eridotrypa spinosa Bassler.

Eridotrypa spinosa Bassler, Bull. U. S. Geol. Surv., 292, 1906, pp. 29, 30, pl. 12, figs. 1–3; pl. 25, fig. 15.

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

Cotypes.—Cat. Nos. 35521, 35739, U.S.N.M.

Eridotrypa striata (Hall).

Trematopora striata Hall, Pal. New York, 2, 1852, p. 153, pl. 40, fig. 7a–d.—Grabau, Bull. New York State Mus., 45, 1901, p. 167, fig. 66.

Eridotrypa striata Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 32, pl. 12, figs. 4–6; pl. 24, figs. 3–6; pl. 25, fig. 14.

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

Cotypes.—Cat. No. 35545, U.S.N.M.

Eridotrypa trentonensis (Nicholson).

Monticulipora (Heterotrypa) Trentonensis Nicholson, Genus Monticulipora, 1881, p. 149, fig. 28.

Monotrypella Trentonensis Foord, Contr. Micro-Pal. Cambro-Sil., 1883, p. 15.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 83.

Eridotrypa trentonensis Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1890, p. 238.

Trenton: Peterboro, Ontario; Mercer County, Kentucky.

ERIDOTRYPA VEVAYENSIS Cumings. See Batostoma jamesi.

ERIPTYCHIUS Walcott. Genotype: E. americanus Walcott.

Eriptychius Walcott, Bull. Geol. Soc. Amer., 3, 1892, p. 167.

Eriptychius americanus Walcott.

Eriptychius americanus Walcott, Bull. Geol. Soc. Amer., 3, 1892, p. 167, pl. 4, figs. 5–11.

Black River (Harding): Canyon City, Colorado.

Erisocrinus? bipartitus (Troost).

Donacicrinites bipartitus Troost MS., 1850.

Erisocrinus? bipartitus (Troost) Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 98, pl. 6, figs. 8, 9.

?Niagaran (Brownsport): Decatur County, Tennessee.

Observation.—Probably a Graphiocrinus from the Carboniferous of the Mississippi Valley and not from Decatur County, Tennessee [Frank Springer.]

ESCHARA BIFURCATA Van Cleve. See Pachydictya bifurcata.

ESCHARA BIPUNCTATA Van Cleve. See Phænopora expansa.

ESCHARA COMPRESSA Van Cleve. See Phænopora magna.

ESCHARA MULTIFIDA Van Cleve. See Phænopora multifida.

Eschara ovatopora Troost. Not recognizable.
Escharia ovatopora Troost, 5th Geol. Rep. Tennessee, 1840, p. 75.
Ordovician: Near Nashville, Tennessee.

ESCHARA RAMOSA Van Cleve. See Phænopora fimbriata.

Eschara reticulata Troost. Not recognizable.
Escharia reticulata Troost, 5th Geol. Rep. Tennessee, 1840, p. 75.
Ordovician: Near Nashville, Tennessee.

ESCHARINA DISTORTA James. See Rhinopora verrucosa.

ESCHAROPORA Hall. Genotype: E. recta Hall.
Escharopora Hall, Pal. New York, 1, 1847, p. 72.—Eichwald, Lethæa Rossica, 1, 1860, p. 435.—Miller, N. A. Geol. Pal., 1889, p. 301.—Ulrich, Geol. Minnesota, 3, 1893, p. 167; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 279.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 45.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 156.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 745.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 115; Zittel-Eastman Textb. Pal., 1913, p. 345.
Nicholsonia Waagen and Wentzel, Pal. Indica, 13th ser., 1886, p. 874.
Ptilodictya (in part) of various authors.

Escharopora acuminata (James).
Ptilodictya acuminata James, Catal. Foss. Cincinnati Group, p. 3.
Escharopora acuminata Ulrich, Geol. Minnesota, 3, 1893, p. 167.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 36.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 829.
Sagenella striata James, Paleontologist, No. 3, 1899, p. 22.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 53.
Eden: Cincinnati, Ohio, and vicinity.
Observation.—Sagenella striata was founded upon the expanded base of this species.

Escharopora angularis Ulrich.
Escharopora angularis Ulrich, Geol. Minnesota, 3, 1893, p. 168, pl. 12, figs. 1–4, 30, 31.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 344, fig. 504a.
Black River (Platteville and Decorah): Minneapolis, etc., Minnesota; High Bridge, Kentucky.
Cotypes.—Cat. No. 43538, U.S.N.M.

ESCHAROPORA (PTILODICTYA) ANGUSTA Hall. See Ptilodictya angusta.

Escharopora briareus (Ulrich).
Ptilodictya briareus Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 165, pl. 7, figs. 6–6b.
Escharopora briareus Ulrich, Geol. Minnesota, 3, 1893, p. 167.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 239.
Stones River (Lebanon): Lebanon, Shelbyville, and Columbia, Tennessee.
Holotype.—Cat. No. 43728, U.S.N.M.
Observation.—The form called by Safford Ptilodictya multiramis (not defined) is probably referable to this species.

Escharopora confluens Ulrich.
Escharopora confluens Ulrich, Geol. Minnesota, 3, 1893, p. 171, pl. 13, figs. 1–11.
Black River (Decorah): Minneapolis, etc., Minnesota.
Cotypes.—Cat. No. 43539, U.S.N.M.

Escharopora falciformis (Nicholson).

Ptilodictya cruciformis D'Orbigny, Prodr. de Pal., 1, 1849, p. 21 (not defined).—Boule and Thevenin, Ann. de Pal., 1, fasc. 1, 1906, p. 4, pl. 1, figs. 7–9.

Ptilodictya falciformis Nicholson, Ann. Mag. Nat. Hist., 4th ser., 15, 1875, p. 177, pl. 14, figs. 1–1b; Pal. Ohio, 2, 1875, p. 259, pl. 25, figs. 7, 7b; Pal. Province Ontario, 1875, p. 13, fig. 2.—Zittel, Handb. Pal., 1, 1880, p. 604, fig. 431.—Hall, 12th Ann. Rep. Indiana Geol. Nat. Hist., 1883, p. 265, pl. 12, fig. 1.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 827, figs.

Escharopora falciformis Ulrich, Geol. Minnesota, 3, 1893, p. 167.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 156.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 830, pl. 16, figs. 5, 5a.

Escharopora recta Quenstedt, Roehren- und Sternkorallen, 1881, p. 94, pl. 146, pp. 69, 70.

Crateripora lineata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 30, pl. 7, figs. 28, 28a.

Crateripora lineata var. expansa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 30.

Maysville: Cincinnati, Ohio, and vicinity (Mt. Hope, Fairmount); Nashville and Columbia, Tennessee (Leipers); Appalachians of Tennessee and Virginia.

Plesiotypes.—Cat. Nos. 43729, 43730, U.S.N.M. *Holotype* of C. lineata and var. expansa.

Observation.—Crateripora lineata and var. expansa were applied to the articulating basal sockets of this species before their true nature was known.

Escharopora hilli (James).

Ptilodictya Hilli James, Paleontologist, No. 1, 1878, p. 4.—Ulrich, Jour. Cincinnati Nat. Hist., 5, 1882, pl. 7, figs. 7, 7a.—Nettleroth, Kentucky Fossil Shells, 1885, p. 30, pl. 33, figs. 1, 2, 4, 5.—Ulrich, Geol. Minnesota, 3, 1893, p. 167.—Nickles, Bull. Kentucky Geol. Surv., No. 5, 1905, p. 53, pl. 3, figs. 2, 3.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 37.

Maysville (Fairmount): Bank of the Ohio River at Cincinnati, Ohio (drift); Boyle and Lincoln Counties, Kentucky.

Plesiotypes.—Cat. Nos. 43724, 51377, U.S.N.M.

Escharopora libana (Safford).

Ptilodictya? libana Safford, Geol. Tennessee, 1869, p. 286.

Escharopora libana Ulrich, Geol. Minnesota, 3, 1893, p. 167.

Stones River (Lebanon): Lebanon, Tennessee.

Cotypes.—Cat. No. 43477, U.S.N.M.

Escharopora? limitaris Ulrich.

Escharopora? limitaris Ulrich, Geol. Minnesota, 3, 1893, p. 172, figs. 9a–b, pl. 13, figs. 12, 13.

Black River (Decorah): Minneapolis and Preston, Minnesota; Lake Nipissing, Ontario.

Cotypes.—Cat. No. 43807, U.S.N.M.

Escharopora maculata (Ulrich).

Ptilodictya maculata Ulrich Jour., Cincinnati Soc. Nat. Hist., 5, 1882, p. 163, pl. 6, 17, pl. 7, figs. 4, 4a; Geol. Surv. Illinois, 8, 1890, fig. 6b (p. 317).

Escharopora maculata Ulrich, Geol. Minnesota, 3, 1893, p. 167.

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

Cotypes.—Cat. No. 43726, U.S.N.M.

Escharopora pavonia (D'Orbigny).

Ptilodictya pavonia D'Orbigny, Prodr. de Pal., 1, 1849, p. 22.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 163, pl. 7, figs. 3, 3d.

Chætetes pavonia Milne-Edwards and Haime, Pol. Foss. Terr. Pal., 1851, p. 267, pl. 19, figs. 4, 4a.—Rominger, Proc. Acad. Nat. Sci. Philadelphia, 1866, p. 116.—Quenstedt, Rœhren- und Sternkorallen, 1881, p. 79, pl. 146, figs. 21–25.

Monticulipora pavonia Milne-Edwards, Hist. Nat. des. Corall., 3, 1860, p. 276.—James and James, Jour. Cincinnati Soc. Nat. Hist., 11, 1888, p. 18.—James, ibid., 18, 1895, p. 70.

Monticulipora (Monotrypa) pavonia Nicholson, Genus Monticulipora, 1881, p. 195, fig. 41, pl. 6, figs. 3, 3a.

Monotrypa pavonia Nicholson in Steinmann, Neues Jahrb. Min., Geol. Pal., 1, 1882, pl. 4, fig. 7.

Nicholsonia pavonia Waagen and Wenzel, Pal. Indica, 13th ser., 1886, p. 874.

Heterodictya pavonia Ulrich, Catal. Foss. Cincinnati Group, 1880, p. 10.

Escharopora pavonia Ulrich, Geol. Minnesota, 3, 1893, p. 167.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 240.—Bassler, Proc. U. S. Nat. Mus., 26, 1903, p. 571, pl. 20, figs. 3, 4; ibid., 30, 1906, p. 37.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 156.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 832, pl. 16, fig. 6; pl. 29, fig. 6.

Cyclopora Jamesi Prout, Trans. St. Louis, Acad. Sci., 1, 1859, p. 578.

Stictopora clathratula James, Catal. Foss. Cincinnati Group (not defined).

Chætetes? clathratulus Nicholson, Quart. Jour. Geol. Soc. London, 30, 1874, p. 509, pl. 30, figs. 1, 1b; Pal. Ohio, 2, 1875, p. 209, pl. 22, figs. 2, 2b; Ann. Mag. Nat. Hist., 4th ser., 18, 1876, p. 91, pl. 5, figs. 9, 9a.

Maysville: Cincinnati, Ohio, and vicinity (Fairmount); Central Tennessee (Leipers).

Plesiotype.—Cat. No. 43725, U.S.N.M. (Ulrich).

Observation.—Boule and Thevenin have refigured D'Orbigny's so-called types of this species, but unfortunately chose a specimen of Peronopora decipiens for this purpose. D'Orbigny's original description and Edwards and Haime's figures leave no doubt that the author of this species had this abundant Escharopora in mind.

Escharopora ponderosa (Ulrich).

Ptilodictya ponderosa Ulrich, Amer. Geol., 1, 1888, p. 308.

Trenton (Upper): Covington, Kentucky.

Escharopora ramosa (Ulrich).

Ptilodictya ramosa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1888, p. 164, pl. 7, figs. 5, 5a.

Escharopora ramosa Ulrich, Geol. Minnesota, 3, 1893, p. 167.

Stones River (Lebanon): Lebanon, Tennessee.

Holotype.—Cat. No. 43727, U.S.N.M.

Escharopora recta Hall.

Escharopora recta Hall, Pal. New York, 1, 1847, p. 73, pl. 26, figs. 1a–g.—Hitchcock, Geol. Vermont, 1, 1861, p. 290, fig. 188.

Ptilodictya recta Emmons, Amer. Geology, 1, pt. 2, 1855, p. 205, pl. 7, figs. 1a–d.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 158, fig. 120a.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 153, fig.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, p. 828, figs.

Trenton: Middleville and Jacksonburg, New York; Canada and Minnesota.

Escharopora recta Quenstedt. See Escharopora falciformis.

Escharopora recta nodosa Hall.

Escharopora recta var. nodosa Hall, Pal. New York, 1, 1847, p. 73, pl. 26, fig. 2.
Trenton: Middleville and Jacksonburg, New York.

ESCHAROPORA SILURIANA Weller. See Diplostenopora siluriana.

Escharopora subrecta (Ulrich).

Ptilodictya subrecta Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 63.

Escharopora subrecta Ulrich, Geol. Minnesota, 3, 1893, p. 168, pl. 12, figs. 5–29.—Grabau and Shimer, N. A. Index Fossils, 1, p. 156, fig. 208f.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 116, 117, fig. 44; Zittel-Eastman Textb. Pal., 1913, p. 344, fig. 504b.

Ptilodictya (Escharopora) subrecta Sardeson, Jour. Geol., 9, 1901, p. 159, pl. B, fig. 10.

Black River (Decorah): Minneapolis, etc., Minnesota; Decorah, Iowa; and Beloit, Wisconsin; Lake Nipissing, Ontario.

Ordovician (Wassalem): Uxnorm, Esthonia, Russia.

Cotypes.—Cat. Nos. 43818, 43819, U.S.N.M.

ETAGRAPTUS Ruedemann. See Tetragraptus subgenus Etagraptus.

ETHMOPHYLLUM MINGANENSIS Walcott. See Archæoscyphia minganensis.

EUCALYPTOCRINITES Goldfuss. See Eucalyptocrinus Goldfuss.

EUCALYPTOCRINITES CONICUS Troost. See Eucalyptocrinus milliganæ.

EUCALYPTOCRINITES CRENATUS Troost. See Eucalyptocrinus ventricosus.

EUCALYPTOCRINITES FLORIDUS Troost. See Eucalyptocrinus milliganæ.

EUCALYPTOCRINITES LÆVIS Troost. See Eucalyptocrinus phillipsi.

EUCALYPTOCRINITES TENNESSEÆ Troost. See Eucalyptocrinus ovalis.

EUCALYPTOCRINUS Goldfuss. Genotype: E. rosaceus Goldfuss.

Eucalyptocrinites Goldfuss, Petrefacta, 1826, p. 214, 2d ed., pt. 1, 1862, p. 199; Agg. Mem. Soc. Sci. Nat. Neuch., 1, 1835, p. 197; Nova Acta Physico Med., Acad. Caes. Leop.-Carol., 19, 1839, p. 335.—Müller, Berlin Acad. Wiss., 1841, p. 210.—Roemer, Rhein. Ubergangsgeb., 1843, p. 64.—D'Orbigny, Prodrome Pal., 1, 1850, p. 45.

Eucalyptocrinus Agassiz, Ann. Nat. Hist., 1, 1838, p. 447.—Hall, Pal. New York, 2, 1852, p. 207.—Quenstedt, Handb. Petref., 1852, p. 624.—McCoy, British Pal. Rocks and Fossils, 1854, p. 57.—Roemer, Leth. Geog. (Ausg. 3), 1855, p. 257.—Pictet, Traité de Pal., 2d ed., 4, 1857, p. 306.—Bronn, Klass. Thierr. (Actin.), 1860, pl. 27.—Dujardin and Hupe, Hist. Nat. Zooph. Echin., 1862, p. 115.—Allman, Trans. Royal Soc. Edinburgh, 23, 1864, p. 249, text. fig. 5.—Hall, 15th Rep. New York State Cab. Nat. Hist., 1865, p. 32.—Schultze, Mon. Echin. Eifel. Kalk., 1866, p. 90.—Hall, 20th Rep. New York State Cab. Nat. Hist. (extras, 1865), 1868, p. 321, fig. 2; rev. ed. for 1868, 1870, p. 363, figs. 1–2.—Angelin, Icon. Crinoid., 1878, p. 16.—Hall, 28th Rep. New York State Cab. Nat. Hist., 2d ed., 1879, pls. 16–19.—Wetherby, Jour. Cincinnati Soc. Nat. Hist., 1879 (Apr.), No. 5, p. 7.—Zittel, Handb. Pal., 1, 1879, p. 379.—Etheridge and Carpenter, Ann. Mag. Nat. Hist., 5th ser., 7, 1881, p. 296.—Quenstedt, Handb. Petrefact., 1885, p. 963.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, p. 349 (Rev. Pal., pt. 3, sec. 1, p. 127).—Miller, N. A. Geol. Pal., 1889, p. 243; Amer. Geol., 6, 1890, p.

EUCALYPTOCRINUS—Continued.

347.—Bather, Treatise on Zool., 3, Echinoderma, London, 1900, p. 164.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 102, fig. 46.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 148.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 157; Bull. New York State Mus., 45, 1901, p. 157.—Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 45.—Zittel, Grundzüge Pal., 1, 1910, p. 164.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 557.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 192.

Hypanthocrinites Phillips, in Murchison's Sil. Syst., 1839, p. 672, pl. 17, fig. 3.

Hypanthocrinus Hall, Pal. New York, 2, 1852, p. 178.—Salter, Cat. Camb. Sil. Foss., 1873, p. 119.—Angelin, Icon. Crin., 1878, p. 17.—Zittel, Handb. Pal., 1, 1879, p. 380.—Miller, Jour. Cincinnati Soc. Nat. Hist., 3, 1880, p. 141.

EUCALYPTOCRINUS ARMOSUS McChesney. See Siphonocrinus armosus.

Eucalyptocrinus asper Weller.

Eucalyptocrinus asper Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 110, pl. 5, figs. 4–7.

Niagaran (Racine): Bridgeport and Hawthorne, Illinois.

Eucalyptocrinus cælatus (Hall).

Hypanthocrinites cælatus Hall, Geol. New York, 4, 1843, p. 113, fig. 1; tab. 18, fig. 1.

Eucalyptocrinus cælatus D'Orbigny, Prodr. de Pal., 1, 1849, p. 45 (gen. ref.).—Hall, Pal. New York, 2, 1852, p. 210, pl. 47, figs. 4a–e.—Roemer, Leth. geog., 1, Leth. Pal., Atlas, 1876, pl. 11, fig. 12.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 228, fig.—Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 336, pl. 83, figs. 5–7.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 559.

Eucalyptocrinus papulosus Hall, Pal. New York, 2, 1852, p. 211, pl. 47, figs. 5a, b.

Clinton (Rochester): Lockport, Rochester, etc., New York.

EUCALYPTOCRINUS CÆLATUS Hall (1882). See Eucalyptocrinus elrodi and E. ventricosus.

Eucalyptocrinus cælatus levis Grabau and Shimer.

Hypanthocrinites decorus Hall (not Phillips), Nat. Hist. New York, Geol., 4, 1843, p. 133, fig. 2, 3; p. 144; tab. ill. 18, fig. 2.

Hypanthocrinus decorus Marcou, Geol. Map United States and British Prov., etc., 1853, p. 27, pl. 2, fig. 8.

Eucalyptocrinus decorus Hall, Pal. New York, 2, 1852, p. 207, pl. 47, fig. 1, 2a–h, 3a–d; p. 352, pl. 85, fig. 7.—Jones, Geol. Surv. Canada, dec. 3, 1858, p. 23, fig. 3.—Emmons, Manual Geol., 1860, p. 110, fig. 100.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 7, fig. 6.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 229, figs.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 157, fig. 53; Bull. New York State Mus., 45, 1901, pp. 157, 158, fig. 53.

Eucalyptocrinus cœlatus var. levis Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 559, figs. 1893 and 1894.

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

EUCALYPTOCRINUS CHICAGOENSIS Winchell and Marcy. See Eucalyptocrinus crassus.

EUCALYPTOCRINUS CONICUS Shumard. See Eucalyptocrinus milliganæ.

EUCALYPTOCRINUS CONSTRICTUS Hall. See Eucalyptocrinus crassus.

EUCALYPTOCRINUS CORNUTUS Wachsmuth and Springer. See Callicrinus cornutus.

EUCALYPTOCRINUS CORNUTUS var. EXCAVATUS Hall. See Callicrinus cornutus.

Eucalyptocrinus crassus Hall.

Eucalyptocrinus crassus Hall, Trans. Albany Inst., 4, 1863, p. 197.—Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 129, pl. 6, fig. 11.—Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed. for 1875, 1877, pl. 17, figs. 1–11; pl. 18, figs. 1–9; pl. 19, figs. 2, 4, 5; pl. 21, fig. 6; pl. 31, fig. 5; mus. ed., 1879, p. 141, pl. 17, figs. 1–11; pl. 18, figs. 1–9; pl. 19, figs. 2, 4, 5.—Wetherby, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, pl. 8, figs. 5–8; p. 7 footnote.—White, 2d Ann. Rep. Indiana Dep. Stat. Geol., 1880, p. 495, pl. 3, fig. 1.—Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 272, pl. 17, figs. 1–11; pl. 18, figs. 1–9; pl. 19, figs. 2, 4, 5.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 189, fig.—Miller, N. A. Geol. Pal., 1889, p. 244, fig. 302.—Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 342, pl. 81, figs. 1–6, 14, 15.—Weller, Bull. Chicago Acad. of Sci., 4, 1900, p. 105, pl. 5, figs. 1, 2; p. 25, text fig. 6.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 559, fig. 1895.

Eucalyptocrinus constrictus Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 273, pl. 15, fig. 1; Trans. Albany Inst., 10, 1883, p. 66.

Eucalyptocrinus chicagoensis Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 90, fig.

Eucalyptocrinus sp. undet. Worthen, Geol. Surv. Illinois, 6, 1875, pl. 24, figs. 2, 2a.

Niagaran: Waldron, etc., Indiana; Newsom, Tennessee (Waldron); Chicago, Illinois (Racine).

EUCALYPTOCRINUS CRASSUS Hall, 1867. See Eucalyptocrinus nodulosus.

EUCALYPTOCRINUS DECORUS of American authors. See Eucalytocrinus cælatus lævis.

Eucalyptocrinus depressus Miller.

Eucalyptocrinus depressus Miller, Jour. Cincinnati Soc. Nat. Hist., 3, 1880, p. 232, pl. 7, figs. 1–1b.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 114, pl. 7, figs. 5–7.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 349, pl. 83, figs. 3, 4a, 4b.

Niagaran (Racine): Cicero and Bridgeport, near Chicago, Illinois.

Eucalyptocrinus egani (Miller).

Eucalyptocrinus (Hypanthocrinus) egani Miller, Jour. Cincinnati Soc. Nat. Hist., 3, 1880, p. 140, pl. 4, figs. 1–1c.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 108, pl. 7, fig. 4.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 352, pl. 82, figs. 11, 12.

Niagaran (Racine): Near Chicago, Illinois.

Eucalyptocrinus ellipticus Miller.

Eucalyptocrinus ellipticus Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 648, pl. 7, fig. 4 (adv. sheets, 1891, p. 38).

Niagaran (Waldron): Hartsville, Indiana.

Eucalyptocrinus elrodi Miller.

Eucalyptocrinus elrodi Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 650, pl. 7, figs. 9, 10 (adv. sheets, 1891, p. 40); N. A. Geol. Pal., 2d App., 1897, p. 745, figs. 1351, 1352.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 339, pl. 81, fig. 7a, 8–13.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 559, fig. 1896.

Eucalyptocrinus elrodi—Continued.

Eucalyptocrinus cælatus Hall, Trans. Alb. Inst., 4, 1863, p. 226; 20th Rep. New York State Cab. Nat. Hist. (extras, 1865), 1868, p. 321, fig. 1; p. 329; rev. ed., 1870, p. 366; 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1877, pl. 16, figs. 1–10; pl. 19, figs. 1, 3, 6, 7; mus. ed., 1879, p. 142, pl. 16, figs. 1–10; pl. 19, figs. 1, 3; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 274, pl. 15, fig. 2; pl. 16, figs. 1–10; pl. 19, figs. 1, 3.

Eucalyptocrinus subglobosus Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 647, pl. 7, fig. 3 (adv. sheets, 1891, p. 37); N. A. Geol. Pal., 2d App., 1897, p. 745, fig. 1354.

Niagaran (Waldron): Hartsville and Waldron, Indiana; Newsom, Tennessee.

Eucalyptocrinus extensus (Troost).

Eucalyptocrinites extensus Troost, Amer. Jour. Sci. Arts, 2d ser., 8, 1849, p. 419; Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 60 (nom. nud.).

Eucalyptocrinus extensus Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 370.—Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 49, pl. 13, figs. 9, 10.

Niagaran (Brownsport): Decatur County, Tennessee.

Holotype.—Cat. No. 39961, U.S.N.M.

Eucalyptocrinus gibbosus (Troost).

Eucalyptocrinites gibbosus Troost, Amer. Jour. Sci. Arts, 2d ser., 8, 1849, p. 419; Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 61 (nom. nud.).

Eucalyptocrinus gibbosus Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 370.—Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 54, pl. 10, figs. 3, 4.

Niagaran (Brownsport): Decatur County, Tennessee.

Holotype.—Cat. No. 39959, U.S.N.M.

Eucalyptocrinus goldfussi (Troost).

Eucalyptocrinites Goldfussi Troost, Amer. Jour. Sci. Arts, 2d ser., 8, 1849, p. 419; Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 60 (nom. nud.).

Eucalyptocrinus goldfussi Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 370.—Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 52, pl. 15, figs. 5, 6.

Niagaran (Brownsport): Decatur County, Tennessee.

Holotype.—Cat. No. 39953, U.S.N.M.

Eucalyptocrinus gorbyi Miller. See Eucalyptocrinus magnus.

Eucalyptocrinus inconspectus Ringueberg.

Eucalyptocrinus inconspectus Ringueberg, Proc. Acad. Nat. Sci. Philadelphia, 1884, p. 148, pl. 3, fig. 5.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 346, pl. 83, fig. 1, 2.

Niagaran (Lockport): Lockport, New York.

Eucalyptocrinus inornatus Weller.

Eucalyptocrinus inornatus Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 15, pl. 6, figs. 3, 4.

Niagaran (Racine): Bridgeport and Hawthorne, Illinois.

Eucalyptocrinus laevis Shumard. See Eucalyptocrinus phillipsi.

Eucalyptocrinus lindahli Wachsmuth and Springer.

Eucalyptocrinus lindahli Wachsmuth and Springer, Amer Geol., 10, 1892, p. 139; Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 347, pl. 82, fig. 9.—Foerste, Jour. Geol., 11, 1903, p. 712.—Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 47, pl. 12, figs. 5, 6.

Eucalyptocrinus lindahli—Continued.

Eucalyptocrinus wortheni Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 3, 1893, p. 53, pl. 4, fig. 2.

Eucalyptocrinites splendidus Troost (not Hall and Whitfield), Amer. Jour. Sci. Arts, 2d ser., 8, 1849, p. 419 (nom. nud.); Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 60 (nom. nud.).

Niagaran (Brownsport): Wayne County, Tennessee.

Plesiotype.—Cat. No. 39962, U.S.N.M. (Troost's type of E. splendidus).

Eucalyptocrinus magnus Worthen.

Eucalyptocrinus magnus Worthen, Geol. Surv. Illinois, 6, 1875, p. 501, pl. 25, fig. 3.—Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 348, pl. 82, figs. 7, 8.—Weller, Bull. Chicago Acad. Sci., 4, 1900, p. 116, pl. 6, fig. 7.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 560.

Eucalyptocrinus gorbyi Miller, 17th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1892, p. 649, pl. 7, figs. 5, 6 (adv. sheets, 1891, p. 39); N. A. Geol. Pal., 2d App., 1897, p. 745, fig. 1353.

Niagaran: Wayne County and Newsom, Tennessee (Waldron); Hawthorne, Illinois (Racine).

Eucalyptocrinus milliganæ Miller and Gurley.

Eucalyptocrinites conicus Troost, Amer. Jour. Sci. Arts, 2d ser., 8, 1849, p. 419; Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 61 (nom. nud.).

Eucalyptocrinus conicus Shumard, Trans. Acad. Sci. St. Louis, 2, No. 2, 1866, p. 370.

Eucalyptocrinites floridus Troost, MS., 1850.

Eucalyptocrinus milliganæ Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 10, 1896, p. 88, pl. 5, figs. 4–6.

Eucalyptocrinus milligani Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 558, fig. 1892.—Wood, Bull., U. S. Nat. Mus., 64, 1909, p. 50, pl. 5, fig. 13.

Niagaran (Brownsport): Decatur County, Tennessee.

Plesiotypes.—Cat. Nos. 39957, 39958, U.S.N.M. (Troost's type of E. conicus and E. floridus).

Eucalyptocrinus muralis Ringueberg.

Eucalyptocrinus muralis Ringueberg, Annals New York Acad. Sci., 5, 1890, p. 305, pl. 3, fig. 3.

Niagaran (Lockport-Gasport member): Lockport, New York.

Eucalyptocrinus nashvillæ (Troost).

Eucalyptocrinites Nashvillæ Troost, Amer. Jour. Sci Arts, 2d ser., 8, 1849, p. 419; Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 60 (nom. nud.).

Eucalyptocrinus nashvillæ Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 370.—Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 53, pl. 15, figs. 7, 8.

Niagaran (Brownsport): Decatur County, Tennessee.

Holotype.—Cat. No. 39955, U.S.N.M.

Eucalyptocrinus nodulosus Weller.

Eucalyptocrinus nodulosus Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 109, pl. 7, figs. 1–3.

Eucalyptocrinus crassus Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, p. 323, pl. 11, fig. 2; rev. ed., 1870, p. 365, pl. 11, fig. 2.

Niagaran (Racine): Bridgeport and Romeo, Illinois.

Eucalyptocrinus obconicus Hall.

Eucalyptocrinus obconicus Hall, 20th Rep. New York State Cab. Nat. Hist., 1867 (extras, 1865), p. 323, pl. 11 (2), fig. 1; rev. ed. 1870, p. 365, pl. 11, fig. 1.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 191, fig.—Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 353, pl. 83, fig. 13.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 109, pl. 7, fig. 8.—Slocom, Field Col. Mus., 2, Geol. Series, 1908, p. 301, pl. 86, figs. 1, 2.

Niagaran (Racine): Racine, Wisconsin; Chicago, Illinois.

Eucalyptocrinus ornatus Hall.

Eucalyptocrinus ornatus Hall, Rep. Geol. Surv. Wisconsin, 1861, p. 20.—Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 91.—Hall, 20th Rep. New York State Cab. Nat. Hist., 1868 (extras, 1865), p. 329, pl. 11, figs. 4. 5; rev. ed., 1870, p. 366, pl. 11, figs. 4, 5.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 191, fig.—Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 340, pl. 82, fig. 10.—Weller, Bull. Chicago Acad. Sci., 4, 1900, p. 111, pl. 6, figs. 5, 6.

Niagaran (Racine): Racine, Wisconsin; Bridgeport and Romeo, Illinois.

Eucalyptocrinus ovalis Hall.

Eucalyptocrinites ovalis Troost, Amer. Jour. Sci. Arts, 2d ser., 8, 1849, p. 419; Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 60 (nom. nud.).

Eucalyptocrinus ovatus Hall (in error for E. ovalis), 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875, 1877, pl. 17, figs. 11, 12; mus. ed., 1879, p. 143, pl. 17, figs. 12, 13.

Eucalyptocrinus ovalis Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1882, p. 275, pl. 17, figs. 12, 13.—Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 344, pl. 82, figs. 1–6.—Grabau, Amer. Jour. Sci., 16, 1903, p. 299.—Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 48, pl. 11, fig. 3.

Eucalyptocrinites Tennesseæ Troost, Amer. Jour. Sci. Arts., 2d ser., 8, 1849, p. 419; Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 61 (nom. nud.).—Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 370.

Niagaran: Decatur and Perry Counties, Tennessee (Brownsport); Waldron and Hartsville, Indiana; Newsom, Tennessee (Waldron).

Plesiotypes.—Cat. No. 39952, U.S.N.M (Troost's type of E. ovalis).

EUCALYPTOCRINUS OVATUS Hall. See Eucalyptocrinus ovalis.

EUCALYPTOCRINUS PAPULOSUS Hall. See Eucalyptocrinus cælatus.

Eucalyptocrinus phillipsi (Troost).

Eucalyptocrinites lævis Troost, Amer. Jour. Sci. Arts, 2d ser., 8, 1849, p. 419; Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 60 (nom. nud.)

Eucalyptocrinus lævis Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 370.

Eucalyptocrinites Phillipsii Troost, Amer. Jour. Sci. Arts, 2d ser., 8, 1849, p. 419; Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 60 (nom. nud.).

Eucalyptocrinus phillipsi Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 370.—Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 51, pl. 10, figs. 9, 10; pl. 13, figs. 2, 3, 4.

Niagaran (Brownsport): Decatur County, Tennessee.

Holotype and *plesiotype.*—Cat. Nos. 39964, 39966, U.S.N.M. (Troost's types of E. lævis and E. phillipsi).

Eucalyptocrinus proboscidalis Miller.

Eucalyptocrinus proboscidalis Miller, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 224, pl. 9, fig. 2.—Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 352, pl. 82, fig. 14.

Niagaran (Guelph): Pontiac, Ohio.

EUCALYPTOCRINUS RAMIFER Roemer. See Callicrinus ramifer.

Eucalyptocrinus rotundus Miller.

Eucalyptocrinus rotundus Miller, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 82, pl. 3, figs. 4, 4b.—Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 350.—Weller, Bull. Chicago Acad. Sci. Nat. Hist. Surv., 4, pt. 1, 1900, p, 113, pl. 5, fig. 3.

Niagaran (Racine): Near Chicago, Illinois.

Eucalyptocrinus splendidus Hall and Whitfield.

Eucalyptocrinus splendidus Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 128, pl. 6, fig. 12.—Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 350.

Niagaran (Guelph): Springfield, Ohio.

EUCALYPTOCRINUS SPLENDIDUS Troost. See Eucalyptocrinus lindahli.

Eucalyptocrinus springeri Foerste.

Eucalyptocrinus springeri Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 99, pl. 4, fig. 73.

Niagaran (Waldron): Newsom, Tennessee.

EUCALYPTOCRINUS SUBGLOBOSUS Miller. See Eucalyptocrinus elrodi.

EUCALYPTOCRINUS TENNESSEÆ Shumard. See Eucalyptocrinus ovalis.

Eucalyptocrinus tuberculatus Miller and Dyer.

Eucalyptocrinus tuberculatus Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 36, pl. 2, figs. 9, 9a.—Miller, N. A. Geol. Pal., 1889, p. 244, fig. 303.—Wachsmuth and Springer, Mem. Mus. Zool. Harvard, 20, 1897, p. 337, pl. 83, figs. 8–10.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 560.

Niagaran (Waldron): Waldron and Hartsville, Indiana; Newsom, Tennessee.

Eucalyptocrinus turbinatus Miller.

Eucalyptocrinus turbinatus Miller, Cincinnati Soc. Nat. Hist., 5, 1882, p. 82, pl. 3, figs. 5, 5a.—Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 351, pl. 82, fig. 13.—Weller, Bull. Chicago Acad. Sci. Nat. Hist. Surv., 4, pt. 1, 1900, p. 107, pl. 6, figs. 1, 2.

Niagaran (Racine): Near Chicago, Illinois.

Eucalyptocrinus ventricosus Wachsmuth and Springer.

Eucalyptocrinus ventricosus Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 341, pl. 83, figs. 11, 12.—Foerste, Jour. Geol., 11, 1903, p. 712.—Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 54.

Eucalyptocrinus cælatus Roemer (not Hall, 1843), Sil. Fauna West. Tennessee, Breslau, 1860, p. 48, pl. 4, figs. 3a–c.

Eucalyptocrinites crenatus Troost MS., 1850.

Niagaran (Brownsport): Decatur County, Tennessee.

Plesiotype.—Cat. No. 39956 U.S.N.M. (Troost's type of E. crenatus).

EUCALYPTOCRINUS WORTHENI Miller and Gurley. See Eucalyptocrinus lindahli.

EUCHASMA Billings. Genotype: Conocardium blumenbachi Billings.

Euchasma Billings, Geol. Surv. Canada, Pal. Foss., 1, 1865, p. 360.

Euchasma blumenbachi (Billings).

Conocardium Blumenbachii Billings, Canadian Nat. Geol., 4, 1859, p. 350; Geol. Canada, Geol. Surv. Canada, 1863, p. 113, fig. 22a, b.

Euchasma blumenbachi—Continued.

Euchasma Blumenbachia Billings, Geol. Surv. Canada, Pal. Foss., 1, 1865, pp. 220, 361, fig. 348.

Canadian: Mingan Islands, Canada; Port aux Choix, Table Head, and Cape Norman, Newfoundland (Quebec—G. H.).

EUCHEIROCRINUS Meek and Worthen. Genotype: Cheirocrinus chrysalis Hall.

Eucheirocrinus Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1869, p. 73; Geol. Surv. Illinois, 5, 1873, pp. 443, 502.—Bather, Kongl. Sv. Vet. Akad. Handl., 25, No. 2, 1893, pp. 21, 61, fig. 13b; Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 148, figs. 61, 62.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 154.—Springer, ibid., 2d ed., 1913, p. 213.

Cheirocrinus Hall (not Eichwald), 13th Rep. New York State Cab. Nat. Hist., 1860, p. 122.—Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 358.—Meek and Worthen, Geol. Surv. Illinois, 5, 1873, p. 443.

Calceocrinus Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 562.—Miller, N. A. Geol. Pal., 1889, p. 230; 2d App., 1897, p. 740.

Proclivocrinus Ringueberg, Ann. New York Acad. Sci., 4, 1889, p. 396, pl. 11, figs. 2, 4.—Bather, Ann. Mag. Nat. Hist., 6th Ser., 5, 1890, p. 332, pl. 14, fig. 10; Treatise on Zool. (Lankester), pt. 3, 1900, p. 148. (Genotype: Calceocrinus radiculus Ringueberg.)

Eucheirocrinus chrysalis (Hall).

Cheirocrinus chrysalis Hall, 13th Rep. New York State Cab. Nat. Hist., 1860, p. 123, figs. 1–5.

Calceocrinus chrysalis Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 358.—Hall, 28th Rep. New York State Mus. Nat. Hist., Mus. ed., 1879, p. 147, fig. 2; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 281, fig. 2.

Proclivocrinus chrysalis Ringueberg, Annals New York Acad. Sci., 4, 1889, p. 399, pl. 10, figs. 7, 13.

Cremacrinus chrysalis Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, pp. 111, 113 (gen. ref.).

Clinton (Rochester): Lockport, New York.

Eucheirocrinus radiculus (Ringueberg).

Calceocrinus radiculus Ringueberg, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 120, pl. 5, figs. 3, 3a.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 503.

Cremacrinus radiculus Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, pp. 111, 113 (gen. ref.).

Proclivocrinus radiculus Ringueberg, Annals New York Acad. Sci., 4, 1889, p. 397, pl. 10, fig. 6.

Clinton (Rochester): Lockport, New York.

Observation.—Probably the same as E. chrysalis (Hall).

EUCONIA Ulrich. Genotypes: Pleurotomaria etna and P. ramsayi Billings.

Euconia Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 953.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 642.

Euconia amphitrite (Billings).

Pleurotomaria Amphitrite Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 32. (Adv. sheets, 1862.)

Euconia amphitrite Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 954 (gen. ref.).—Raymond, Ann. Carnegie Mus., 4, 1908, p. 216.

Chazyan (Mingan): South Point of Large Island, Mingan Islands, Canada.

Euconia beekmanensis (Whitfield).

Pleurotomaria Beekmanensis Whitfield, Bull. Amer. Mus. Nat. Hist., 2, 1889, p. 53, pl. 8, figs. 8–11.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 704, figs.—Koken, Neues Jahrb. Min., Geol. Pal., 6, Beilage-Band, 1889, p. 478.

Euconia beekmanensis Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 954 (gen. ref.).

Canadian (Beekmantown): Beekmantown, New York.

Euconia etna (Billings).

Pleurotomaria Etna Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 226, figs. 210, a, b.—Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 316, pl. 24, figs. 12, 13.—Seely, Vermont State Geol., Rep. 7, 1910, pl. 62, figs. 12, 13.

Euconia etna Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 954 (gen. ref.).—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 642, fig. 873.

Canadian (Quebec—G, H): Cape Norman and Table Head, Newfoundland.

Euconia? pervetusta (Conrad).

Cyclostoma? pervetusta Conrad, Ann. Rep. New York State Geol. Surv., 1838, p. 113; ibid., 1839, p. 65.

Pleurotomaria pervetusta Hall, Rep. Geol. 4th Dist., New York, 1843, p. 48, figs. 1, 2.—Owen, Amer. Jour. Sci. Arts, 48, 1845, p. 300, figs. 1, 2.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 5, figs. 1, 2.—Hall, Pal. New York, 2, 1852, p. 12, pl. 4 (bis), figs. 3a–d.—Grabau, Bull New York State Mus., 45, 1901, p. 213, fig. 143; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 213, fig. 143.

Euomphalus pervetustus Hall, Geol. New York, 4, 1843, p. 48, figs. 1, 2; tab. ill. 2, figs. 1, 2.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 231.

Straparollus pervetustus D'Orbigny, Prodr. de Pal., 1, 1849, p. 30 (gen. ref.).

Cyclonema pervetusta Whitfield and Hovey, Bull. Amer. Mus. Nat. Hist., 11, pt. 2, 1899, p. 162 (gen. ref.).

Euconia(?) pervetusta Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 642, fig. 874.

Upper Medinan: Medina and Lockport, New York.

Euconia ramsayi (Billings).

Pleurotomaria Ramsayi Billings, Canadian Nat. Geol., 4, 1859, p. 351, figs. 3, 4; Geol. Canada, Geol. Surv. Canada, 1863, p. 117, figs. 26a, b.—Miller, N. A. Geol. Pal., 1889, p. 422, fig. 701.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 714, figs.

Euconia ramsayi Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 954 (gen. ref.).—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 642.

Canadian (Romaine): Mingan Islands, Canada.

EUCRINUS Angelin. See Dimerocrinus Phillips.

EUGASTER Hall. See Eugasterella Schuchert.

EUGASTERELLA Schuchert. Genotype: Eugaster logani Hall.

Eugaster Hall (not Seville, 1839), 20th Rep. New York State Cab. Hist., 1868, p. 290; rev. ed., 1870, p. 332.—Zittel, Handb. Pal., 1, 1879, p. 444.—Stürtz, Neues Jahrb. Min., Geol. Pal., 2, 1886, p. 151; Palæontographica, 32, 1886, pp. 78, 83.—Miller, N. A. Geol. Pal., 1889, p. 244.—Stürtz, Verh. naturh. Ver. preuss. Rheinl., etc., 1893, p. 20.—Gregory, Proc. Zool. Soc. London, 1897, p. 1035.

Eugasterella Schuchert, in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 19; Bull U. S. Nat. Mus., 88, 1915, p. 237.

Eugasterella concinna (Ringueberg).
Eugaster concinnus Ringueberg, Bull. Buffalo Soc. Nat. Hist., 5, 1886, p. 8, pl. 1, fig. 3.
Eugasterella(??) concinna Schuchert, in Frech, Foss. Cat. 1, Anim., pt. 3, 1914, p. 19; Bull. U. S. Nat. Mus., 88, 1915. p. 239.
Clinton (Rochester): Lockport, New York.

EUGYRICHNITES Ami. Genotype: E. minutus Ami.
Eugyrichnites Ami, Summary Rep. Geol. Surv. Canada, for 1904, 1905, p. 291.

Eugyrichnites minutus Ami.
Eugyrichnites minutus Ami, Summary Rep. Geol. Surv. Canada for 1904, 1905, p. 291.
Horizon uncertain: Tapley's Mill, near Woodstock, New Brunswick.

EUNEMA Salter. See Trochonema subgenus Eunema.

EUNEMA HISTORICUM Hudson. See Gyronema historicum.

EUNEMA LEPTONOTUM Raymond. See Gyronema leptonotum.

EUNEMA? PAGODA Salter. See Ectomaria pagoda.

EUNEMA PRISCA Billings. See Ectomaria prisca.

EUNICITES Ehlers. Genotype: E. avitus Ehlers.
Eunicites Ehlers, Palæontographica, 17, 1868, p. 147.—Zittel, Handb. Pal., 1, 1880, p. 565.—Miller, N. A. Geol. Pal., 1889, p. 518.—Grabau and Shimer, N. A. Index Fossils, 1910, 2, p. 241.

Eunicites chiromorphus Hinde.
Eunicites chiromorphus Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 381, pl. 20, fig. 10.
Upper Medinan (Cataract): Toronto, Ontario.

Eunicites clintonensis Hinde.
Eunicites clintonensis Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 381, pl. 19, fig. 21.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 242, fig. 1532a.
Upper Medinan (Cataract): Toronto, Ontario.

Eunicites confinis Foerste.
Eunicites confinis Foerste, Amer. Geol., 2, 1888, p. 418, fig. 6; Geol. Surv. Ohio, Pal., 7, 1893, p. 517, fig. 6.
Richmond (Elkhorn): Todds Fork, Clinton County, Ohio.

Eunicites contortus Hinde.
Eunicites contortus Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 375, pl. 18, fig. 4.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 241, fig. 1530d.
Cincinnatian (Pulaski): Toronto, Ontario.

Eunicites coronatus Hinde.
Eunicites coronatus Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 381, pl. 20, fig. 9.
Upper Medinan (Cataract): Toronto, Ontario.

EUNICITES CRISTATUS Miller. See Arabellites cristatus.

Eunicites? digitatus Hinde.
Eunicites? digitatus Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 376, pl. 19, fig. 3.
Cincinnatian (Pulaski): Toronto, Ontario.

Eunicites falcatus Foerste.
Eunicites falcatus Foerste, Amer. Geol., 2, 1888, p. 418, fig. 5; Geol. Surv. Ohio, Pal., 7, 1893, p. 517, fig. 5.
Richmond (Elkhorn): Todds Fork, Clinton County, Ohio.

Eunicites gracilis Hinde.
Eunicites gracilis Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 376, pl. 19, fig. 3.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 242, fig. 1528c.
Cincinnatian (Pulaski): Toronto, Ontario.

Eunicites paululus Foerste.
Eunicites paululus Foerste, Amer. Geol., 2, 1888, p. 418, fig. 7; Geol. Surv. Ohio, Pal., 7, 1893, p. 517, fig. 7.
Richmond (Elkhorn): Todds Fork, Clinton County, Ohio.

Eunicites major Hinde.
Eunicites major Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 374, pl. 18, fig. 1.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 241, fig. 1530a.
Œnonites major Miller, N. A. Geol. Pal., 1889, p. 519 (gen. ref.).
Cincinnatian (Pulaski): Toronto, Ontario.

Eunicites perdentatus Hinde.
Eunicites perdentatus Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 375, pl. 18, fig. 6.
Lumbriconereites perdentatus Miller, N. A. Geol. Pal., 1889, p. 519 (gen. ref.).
Cincinnatian (Pulaski): Toronto, Ontario.

Eunicites simplex Hinde.
Eunicites simplex Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 376, pl. 19, fig. 2.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 242, fig. 1528b.
Cincinnatian (Pulaski): Toronto, Ontario.

EUNICITES (NEREIDAVUS) VARIANS Hinde. See Nereidavus varians.

EUNOA Clarke. Genotype: E. accola Clarke.
Eunoa Clarke, Bull. New York State Mus., 52, 1902, p. 606.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 377.

Eunoa accola Clarke.
Eunoa accola Clarke, Bull. New York State Mus., 52, 1902, p. 607, pls. 5, 6.
Canadian (Deepkill): Deepkill, Rensselaer County, New York.

EUOMPHALOPTERUS Roemer. Genotype: Euomphalus alatus Hisinger.
Euomphalopterus Roemer, Leth. geog. 1, Leth. Pal., 1876, Atlas, Expl., pl. 14, fig. 9a.—Zittel, Handb. Pal., 2, 1882, p. 206.—Koken, Neues Jahrb. f. Min., Geol., Pal., 6 Beilage-Band, 1889, p. 438; Neues Jahrb. f. Min., Geol., Pal., 1, 1893, p. 15; Die Leitfossilien, Leipzig, 1896, p. 102, text fig. 80.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 932.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 629.—Dall, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 527,

Euomphalopterus alatus americanus Kindle and Breger.

Euomphalopterus alatus var. americanus Kindle and Breger, 28th Ann. Rep. Dept. Geol. Nat. Res. Indiana, 1904, p. 459, pl. 13, fig. 6.

Euomphalopterus alatus var. Kindle and Breger, ibid., 1904, p. 461.

Niagaran: Little Deer Creek, Carroll County, Indiana.

Euomphalopterus alatus limatoideus Kindle and Breger.

Euomphalopterus alatus var. limatoidea Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 461, pl. 14, fig. 4.

Niagaran: Delphi, Indiana.

Euomphalopterus alatus obsoletus Ulrich.

Euomphalopterus alatus-obsoletus Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 934, figs. 5g–i.

Niagaran (Waldron): Waldron, Indiana.

Euomphalopterus elora (Billings).

Pleurotomaria Elora Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 343, fig. 348; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 154, fig. 135 (adv. sheets 1861).—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 708, fig.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, p. 74, pl. 11, figs. 5, 6.

Euomphalopterus Elora Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 331.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 630, fig. 853.

Niagaran (Guelph): Elora, Ontario.

Euomphalopterus halei (Hall).

Pleurotomaria halei Hall, Rep. Sup. Geol. Surv. Wisconsin, 1861, p. 34.—Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 109.—Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, pp. 344, 364, pl. 15 (6), figs. 13, 14 (extras, 1865); rev. ed., 1870, p. 392, pl. 15, figs. 13, 14, p. 432.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 73, pl. 10, figs. 2, 2a.

Eotomaria halei Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 69 (gen. ref.).

Trochonema halei Miller, N. A. Geol. Pal., 1889, p. 428 (gen. ref.).

Euomphalopterus Halei Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 330 (gen. ref.).

Niagaran: Racine, Wisconsin; Bridgeport, Illinois (Racine); Durham, Ontario; and Wisconsin (Guelph).

Euomphalopterus tyrrelli Parks.

Euomphalopterus tyrrelli Parks in Tyrrell, 22d Rep. Ontario Bur. Mines, 1913, p. 36.

Niagaran (Guelph): Severn River, Ontario.

Euomphalopterus valeria (Billings).

Pleurotomaria Valeria Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 169.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 23, pl. 4, figs. 1, 1a; ibid., pt. 2, 1895, p. 71, pl. 11, figs. 2, 3.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 721, figs.

Euomphalopterus Valeria Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 4, 1906, p. 330 (gen. ref.).—Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 191, pl. 28.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 630, figs. 851h, j, 852.

Niagaran (Guelph): Gault, etc., Ontario; Ohio.

Upper Monroan (Lucas): Salt shaft, Detroit, Michigan.

Euomphalopterus velaris Whiteaves.

Pleurotomaria velaris Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 72, pl. 11, figs. 4, 4a.

Euomphalopterus velaris Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 330 (gen. ref.).

Pleurotomaria cf. velaris Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 193, pl. 23, figs. 1–2.

Niagaran (Guelph): Elora, Ontario.

?Upper Monroan (Anderdon): Near Amherstburg, Ontario.

EUOMPHALUS McCoy. Genotype: E. pentagonalis McCoy.

Euomphalus McCoy, Syn. Char. Carb. Foss. Ireland, 1844, p. 34.—Brown, Illust. Foss. Conch. Great Britain and Ireland, 1849, p. 81.—King, Mon. Permian Foss. England, Pal. Soc., 1850, p. 211.—Woodward, Man. Mollusca, pt. 1, 1851, p. 145.—McCoy, British Pal. Rocks Foss., 1854, p. 297.—Pictet, Traite de Pal., 2d ed., 3, 1855, p. 153.—Goldfuss, Petrefacta Germ., 2d ed., pt. 3, 1863, p. 75.—Meek and Worthen, Geol. Surv. Illinois, 2, p. 158.—Waagen, Mem. Geol. Surv. India, Pal. Indica, ser. 13, 1, p. 86.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 19, No. 6, 1881, p. 136.—Koninck, Ann. d. Mus., Royal d'Hist. Nat. de Belgique, 6, 1881, p. 136.—Zittel, Handb. Pal., 2, 1882, p. 206.—Nettelroth, Kentucky Foss. Shells, Geol. Surv. Kentucky, 1889, p. 181.—Koken, Neues Jahrb. f. Min., Geol. Pal., 6 Beilage-Band, 1889, p. 317.—Whidborne, Mon. Dev. Fauna South England, 1, Pal. Soc., 1891, p. p. 244.—Koken, Die Leitfossilien, Leipzig, 1896, p. 104, fig. 86, p. 106.—Pilsbry, Zittel-Eastman Textb. Pal., 1900, p. 446.—Dall, ibid., 2d ed., 1913, p. 527.

EUOMPHALUS (part) of authors. See Eccyliopterus Remele and Oxydiscus Koken, and Poleumita Clarke and Ruedemann.

EUOMPHALUS ALATUS var. LIMATOIDEA Kindle and Breger. See Euomphalopterus alatus limatoideus.

EUOMPHALUS CALCIFERUS Whitfield. See Eccyliomphalus calciferus.

EUOMPHALUS CIRCINATUS Whiteaves. See Eccyliomphalus circinatus.

Euomphalus?? circumliratus Whitfield.

Euomphalus circumliratus Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 308, pl. 24, figs. 18–21.—Seely, Vermont State Geol., Rep., 7, 1910, pl. 62, figs. 18–21.

Canadian (Beekmantown): Fort Cassin, Vermont.

Euomphalus expansus Conrad. Not recognized.

Euomphalus expansus Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1842, p. 273.

Niagaran: Near Rome, New York, and Pendleton, Indiana.

Euomphalus fairchildi Clarke and Ruedemann.

Euomphalus fairchildi Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 75, pl. 8, figs. 3, 4.

Euomphalus cf. fairchildi Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 186, pl. 16, fig. 28.

Niagaran (Guelph): Rochester, New York.

?Upper Monroan (Lucas): Detroit, Michigan.

Euomphalus galtensis Whiteaves.
Euomphalus galtensis Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 21, pl. 3, figs. 9, 9a; ibid., pt. 2, 1895, p. 85.
Niagaran (Guelph): Galt, Hespeler, and Durham, Ontario.

EUOMPHALUS GYROCERAS Roemer. See Eccyliomphalus gyroceras.

EUOMPHALUS HEMISPHERICUS Hall. See Diaphorostoma hemisphericum.

Euomphalus inornatus (Whiteaves).
Trochonema inornatum Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 19, pl. 3, fig. 7.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1230, fig.
Euomphalus inornatus Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 85, pl. 13, fig. 1.
Niagaran (Guelph): Elora and Durham, Ontario.

EUOMPHALUS MACLURII Troost. See Maclurites magnus.

EUOMPHALUS MACROLINEATUS Whitfield. See Poleumita macrolineata.

EUOMPHALUS MICHLERANUS Hall. See Eccyliopterus? michleranus.

EUOMPHALUS MINNESOTENSIS Miller. See Raphistoma minnesotense.

Euomphalus? minutissimus Castelnau.
Euomphalus? minutissimus Castelnau, Essai Syst. Sil. l'Amerique Septent, 1843, p. 35, pl. 11, fig. 9.
Ordovician?: Trenton, New York.
Observation.—Not recognized. Probably internal cast of some small shell.

EUOMPHALUS (STRAPAROLLUS?) MOPSUS Whitfield. See Straparollus mopsus.

EUOMPHALUS PEPINENSIS Meek. See Raphistoma pepinensis.

EUOMPHALUS PERKINSI Whitfield. See Eccyliomphalus perkinsi.

Euomphalus pervetus (Conrad). Not recognized.
Inachus pervetus Conrad, Proc. Acad. Nat. Sci., Philadelphia, 1843, p. 334.
Euomphalus pervetus Miller, N. A. Geol. Pal., 1889, p. 404.
Lead-bearing limestone: Mineral Point, Wisconsin.

EUOMPHALUS PERVETUSTUS Hall. See Euconia? pervetusta.

EUOMPHALUS POLYGYRATUS Roemer. See Polygyrata polygyratus.

EUOMPHALUS (RAPHISTOMA) ROTULIFORMIS Meek. See Polygyrata rotuliformis.

EUOMPHALUS (CYCLONEMA) RUGÆLINEATA Hall and Whitfield. See Poleumita rugilineata.

EUOMPHALUS SANCTISABÆ Roemer. See Straparollus sanctisabæ.

EUOMPHALUS SINUATUS Hall. See Straparollus sinuatus.

EUOMPHALUS STRONGI Whitfield. See Sinuopea strongi.

EUOMPHALUS SULCATUS Hall. See Poleumita? sulcata.

Euomphalus triliratus Conrad. Not recognized.
Euomphalus triliratus Conrad, Proc. Acad. Nat. Sci. Philadelphia, 1, 1843, p. 333.
Trenton: Mineral Point, Wisconsin.

EUOMPHALUS (RAPHISTOMA?) TROCHISCUS Meek. See Polygyrata trochiscus.

EUOMPHALUS UNIANGULATUS Hall. See Helicotoma uniangulata.

EUOMPHALUS? VATICINUS Hall. See Raphistoma minnesotense.

Euomphalus verneuili Castelnau.
Euomphalus Verneuili Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 34, pl. 11, figs. 1a, b.
Silurian: Northern shore of Lake Huron.

Euomphalus winonensis Sardeson.
Euomphalus winonensis Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 96, pl. 6, fig. 1.
Ozarkian (Oneota): Near Dresbach, Winona County, and near Red Wing, Goodhue County, Minnesota; Blanchardville, Wisconsin.

EURYCHILINA Ulrich. Genotype: E. reticulata Ulrich.
Eurychilina Ulrich, Cont. Micro-Pal., Geol. Surv. Canada, pt. 2, 1889, p. 52.—Vogdes, Annals New York Acad. Sci., 5, 1889, facing p. 36.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, pt. 1, 1890, pp. 125, 126.—Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 538.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 707.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 658; Zittel-Eastman Textb. Pal., 1, 1900, p. 644.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1040.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 348.—Bassler, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 738.

Eurychilina æqualis Ulrich.
Eurychilina æqualis Ulrich. Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 129, pl. 9, figs. 5–8.
Eurychilina equalis Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 348 figs. 1657q–s.
Stones River (Ridley?): Bottom of gorge at High Bridge, Kentucky; Lebanon, Tennessee.
Cotypes.—Cat. No. 41639, U.S.N.M.

Eurychilina billingsi (Jones).
Primitia billingsi Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 547, pl. 21, fig. 10.
Anticostian (Gun River and Jupiter River): West of Jupiter River, Anticosti.

Eurychilina bulbifera Ruedemann.
Eurychilina bulbifera Ruedemann, Bull. New York State Mus., 49, 1901, p. 76, pl. 5, figs. 14–17.
Mohawkian (Rysedorph): Rysedorph Hill, Rennselaer County, New York.

Eurychilina dianthus Ruedemann.
Eurychilina dianthus Ruedemann, Bull. New York State Mus., 49, 1901, p. 78, pl. 5, figs. 1, 2, 8, 9.
Mohawkian (Rysedorph): Rysedorph Hill, Rennselaer County, New York.

Eurychilina frobisheri (Emerson).
Primitia frobisheri Emerson, Narrative Hall's Sec. Arctic Exped., U. S. Navy Dep., 1879, p. 581, fig. 8.
Richmond: Frobisher Bay, Baffin Land.
Plastotype.—Cat. No. 60728, U.S.N.M.

Eurychilina granosa Ulrich.

Eurychilina granosa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, pt. 1, 1890, p. 128, pl. 9, figs. 9–12.

Stones River (Ridley?): Bottom of gorge at High Bridge, Kentucky.

Cotypes.—Cat. No. 41616, U.S.N.M.

Eurychilina jerseyensis Weller.

Eurychilina jerseyensis Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 210, pl. 13, fig. 17.

Trenton: Near Iliffs Pond, New Jersey.

Eurychilina latimarginata (Raymond).

Primitia latimarginata Raymond, Amer. Jour. Sci., 20, 1905, p. 380.

Eurychilina latimarginata Raymond, Ann. Carnegie Mus., 7, No. 2, 1911, p. 255, fig. 26.

Chazyan: Chazy, Valcour Island, Crown Point, etc., New York (Day Point, Valcour); East Tennessee (Lenoir).

Eurychilina longula Ulrich.

Eurychilina longula Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, pt. 1, 1890, p. 127, pl. 9, figs. 3a, b, 4.

Black River (Lowville): High Bridge, Kentucky.

Cotypes.—Cat. No. 41623, U.S.N.M.

Eurychilina manitobensis Ulrich.

Eurychilina manitobensis Ulrich, Geol. Surv. Canada, Cont. Micro-Pal., pt. 2, 1889, p. 53, pl. 9, figs. 10, 10a.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 127 (loc. occ.)

Richmond (Stony Mountain): Stony Mountain, Manitoba; Wyoming.

Eurychilina obesa Ulrich.

Eurychilina obesa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, pt. 1, 1890, p. 129, pl. 9, fig. 13.

Black River (Lowville): High Bridge, Kentucky.

Holotype.—Cat. No. 41624, U.S.N.M.

Eurychilina obliqua Ruedemann.

Eurychilina obliqua Ruedemann, Bull. New York State Mus., 49, 1901, p. 79, pl. 5, figs. 10–12.

Mohawkian (Rysedorph): Rysedorph Hill, Rensselaer County, New York.

Eurychilina oculifera Weller.

Eurychilina oculifera Weller, Geol. Surv. New Jersey, 3, 1903, p. 210, pl. 13, fig. 16.

Trenton: Near Iliffs Pond, New Jersey.

Eurychilina reticulata Ulrich.

Eurychilina reticulata Ulrich, Cont. Micro-Pal., Geol. Surv. Canada, pt. 2, 1889, p. 52, pl. 9, figs. 9, 9a; Geol. Minnesota, 3, pt. 2, 1894, p. 660, pl. 44, fig. 1.—Ruedemann, Bull. New York State Mus., 49, 1901, p. 76, pl. 5, fig. 3.—Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 298, fig. 46.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 348, fig. 1657p.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 738, fig. 1425g.

Mohawkian: Minneapolis, St. Paul, etc., Minnesota (Black River–Decorah); Rysedorph Hill, New York (Rysedorph).

Cotypes and *plesiotypes.*—Cat. Nos. 44600, 44601, U.S.N.M.

Eurychilina reticulata incurva Ulrich.

Eurychilina reticulata incurva Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 661, pl. 44, fig. 2.

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

Holotype.—Cat. No. 41599, U.S.N.M.

Eurychilina? solida Ruedemann.

Eurychilina? solida Reudemann, Bull. New York State Mus., 49, 1901, p. 77, pl. 5, fig. 18.

Mohawkian (Rysedorph): Rysedorph Hill, Rensselaer County, New York.

Eurychilina? striatomarginata (Miller).

Beyrichia striato-marginatus Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 233, fig. 26; N. A. Geol. Pal., 1889, p. 535, fig. 979.

Eurychilina striatomarginata Ulrich, Cont. Micro-Pal., Geol. Surv. Canada, pt. 2, 1889, p. 52; Jour. Cincinnati Soc. Nat. Hist., 13, pt. 1, 1890, p. 130, pl. 9, fig. 14; Geol. Minnesota, 3, pt. 2, 1894, p. 659.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1046, pl. 13, fig. 9.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 348, fig. 1657t.

Richmond (Whitewater-Saluda): Osgood, etc., Indiana.

Plesiotype.—Cat. No. 41615, U.S.N.M.

Eurychilina? subæquata Ulrich.

Eurychilina? subæquata Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 663, pl. 45, figs. 7–9.

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

Holotype.—Cat. No. 41628, U.S.N.M.

Eurychilina subradiata Ulrich.

Eurychilina subradiata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, pt. 1,1890, p. 126, pl. 9, figs. 1a–c, 2a–c; Geol. Minnesota, 3, pt. 2, 1894, p. 661, pl. 4, figs. 3, 4, 4a.—Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 299, fig. 49.—Ruedemann, Bull. New York State Mus., 162, 1912, pl. 9, fig. 16.

Stones River: Lebanon, Tennessee.

Black River: Dixon, Illinois, etc. (Platteville); Minneapolis, Minnesota (Decorah).

Trenton (Canajoharie): Canajoharie, New York.

Cotypes and *plesiotypes*.—Cat. Nos. 41611, 41613, 41614, U.S.N.M.

Eurychilina subradiata rensselærica Ruedemann.

Eurychilina subradiata rensselærica Ruedemann, Bull. New York State Mus., 49, 1901, p. 77, pl. 5, figs. 4–7, 13.

Mohawkian (Rysedorph): Rysedorph Hill, Rensselaer County, New York.

Eurychilina symmetrica Ulrich.

Eurychilina symmetrica Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 663, pl. 44, figs. 5–7; pl. 45, figs. 4–6.

Black River (Decorah): St. Paul and near Cannon Falls, Minnesota.

Cotypes.—Cat. No. 41386, U.S.N.M.

Eurychilina ventrosa Ulrich.

Eurychilina ventrosa Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 662, pl. 45, figs. 1–3.

Trenton (Prosser): Near Cannon Falls and Kenyon, Minnesota.

Cotype.—Cat. No. 41625, U.S.N.M.

EURYDICTYA Ulrich. Genotype: E. montifera Ulrich.

Eurydicta Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 389, 520.—(Ulrich in press), Miller, N. A. Geol. Pal., 1889, p. 301.—Ulrich, Geol. Minnesota, 3, 1893, p. 138.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 17.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 527.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 48.

Eurydictya calhounensis Ulrich.

Eurydictya calhounensis Ulrich, Geol. Surv. Illinois, 8, 1890, p. 520, pl. 30, figs. 4–4c.

Black River (Kimmswick): Three miles north of Cap au Gres, Calhoun County, Illinois.

Sections of *holotype*.—Cat. No. 43754, U.S.N.M.

Eurydictya montifera Ulrich.

Eurydictya montifera Ulrich, Geol. Surv. Illinois, 8, 1890, p. 521, pl. 30, figs. 3–3d.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, figs. 80–82 (p. 528).

Richmond (Fernvale): Wilmington, Illinois.

Fragment of *holotype*.—Cat. No. 43753, U.S.N.M.

Eurydictya multipora (Hall).

Phænopora multipora Hall, Foster and Whitney's Rep. Geol. Lake Superior Land District, pt. 2, 1851, p. 206, pl. 24, figs. 1a, b.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 171, pl. 8, figs. 7–7b.

Eurydictya multipora Ulrich, Geol. Surv. Illinois, 8, 1890, p. 520; Geol. Minnesota, 3, 1893, p. 139, pl. 6, 9–11; pl. 14, 9–11 (not pl. 7, 24, 29–31=Rhinidictya fidelis Ulrich).—Nickles and Bassler, U. S. Geol. Surv., 173, 1900, p. 241.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 38, pl. 1, figs. 11, 12.

Ptilodictya antiqua James, Paleontologist, 5, 1881, p. 37.

Black River and Trenton: Escanaba River, Michigan; Burgin, Kentucky; Nashville, Tennessee; St. Paul, Minnesota.

Plesiotypes.—Cat. No. 43604, U.S.N.M.

EURYDICTYA MULTIPORA (in part) Ulrich. See Rhinidictya fidelis.

Eurydictya sterlingensis Ulrich.

Eurydictya sterlingensis Ulrich, Geol. Surv. Illinois, 8, 1890, p. 522, pl. 30, figs. 2, 2a.

Richmond (Maquoketa): Sterling and South Elgin, Illinois.

EURYMYA Ulrich. Genotype: Modiolopsis plana Hall.

Eurymya Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 512.—Sardeson, Amer. Geol., 30, 1902, p. 39.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 517.

Eurymya alata (Ulrich).

Modiolopsis alata Ulrich, Amer. Geol., 5, 5, 1890, p. 280, figs. 8a–c.

Eurymya alata Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 512 (gen. ref.).

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

Cotypes.—Cat. No. 46201, U.S.N.M.

Eurymya plana (Hall).

Modiolopsis plana Hall, Rep. Supt. Geol. Surv. Wisconsin, 1861, p. 30; Geol. Wisconsin, 1, 1862, pp. 38 and 438, fig. 6.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 156, fig.—Ulrich, 19th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1892, p. 224, fig.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 56, pl. 7, figs. 12, 13 (?14, 15).—Sardeson, Amer. Geol., 30, 1902, p. 40, figs. 1–9.

Eurymya plana—Continued.
Eurymya plana Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 512, pl. 36, figs. 27, 28.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 518, figs. 696a, b.
Black River (Platteville): Beloit, Janesville, Mineral Point, etc., Wisconsin; Minneapolis, St. Paul, etc., Minnesota.
Plesiotypes.—Cat. No. 46202, U.S.N.M.

Eurymya subplana Ulrich.
Eurymya subplana Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 513.
Trenton (Hermitage): Central Tennessee and Mercer County, Kentucky.
Cotypes.—Cat. No. 46203, U.S.N.M.

EURYMYA? TRUNCATA Ulrich. See Modiolodon truncata.

EURYMYELLA Williams. Genotype: E. shaleri Williams.
Eurymyella Williams, Proc. U. S. Nat. Mus., 42, 1912, p. 382.

Eurymyella angularis Williams.
Eurymyella angularis Williams, Proc. U. S. Nat. Mus., 1912, p. 387, pl. 49, figs. 10, 11.
Silurian (Eastport): East side Seward Neck, Washington County, Maine.
Holotype and *paratype*.—Cat. No. 58437, U.S.N.M.

Eurymyella convexa Williams.
Eurymyella convexa Williams, Proc. U. S. Nat. Mus., 42, 1912, p. 389, pl. 50, fig. 10.
Silurian (Eastport): Salt works, Eastport, Maine.
Holotype.—Cat. No. 58448, U.S.N.M.

Eurymyella denbowensis Williams.
Eurymyella denbowensis Williams, Proc. U. S. Nat. Mus., 42, 1912, p. 390, pl. 50, figs. 11–14.
Silurian (Pembroke): Denbow Point, Washington County, Maine.
Holotype and *paratype*.—Cat. No. 58449, U.S.N.M.

Eurymyella plana Williams.
Eurymyella plana Williams, Proc. U. S. Nat. Mus., 42, 1912, p. 388, pl. 49, fig. 14.
Silurian (Eastport): East side of Seward Neck, Washington County, Maine.
Holotype.—Cat. No. 58439, U.S.N.M.

Eurymyella recta Williams.
Eurymyella recta Williams, Proc. U. S. Nat. Mus., 42, 1912, p. 389, pl. 49, fig. 15.
Silurian (Eastport): East side of Seward Neck, Washington County, Maine.
Holotype.—Cat. No. 58440, U.S.N.M.

Eurymyella shaleri Williams.
Eurymyella shaleri Williams, Proc. U. S. Nat. Mus., 42, 1912, p. 385, pl. 49, figs. 1–4.
Silurian (Eastport): Moose Island, etc., Washington County, Maine.
Cotypes.—Cat. Nos. 58431–58433, U.S.N.M.

Eurymyella shaleri breva Williams.
Eurymyella shaleri var. breva Williams, Proc. U. S. Nat. Mus., 42, 1912, p. 386, pl. 49, figs. 5–7.
Silurian (Eastport): Moose Island, etc., Washington County, Maine.
Cotypes.—Cat. No. 58434, U.S.N.M.

Eurymyella shaleri longa Williams.

Eurymyella shaleri var. longa Williams, Proc. U. S. Nat. Mus., 42, 1912, p. 397, pl. 49, fig. 8.

Silurian (Eastport): Moose Island, etc., Washington County, Maine.

Holotype.—Cat. No. 58435, U.S.N.M.

Eurymyella shaleri minor Williams.

Eurymyella shaleri var. minor Williams, Proc. U. S. Nat. Mus., 42, 1912, p. 387, pl. 49, fig. 9; ibid., 45, 1913, p. 346, pl. 31, fig. 5.

Silurian (Eastport): Sipps Bay, south of highway bridge, Washington County, Maine.

Holotype and *plesiotype.*—Cat. Nos. 58436, 58972, U.S.N.M.

Eurymyella? simulans Williams.

Eurymyella? simulans Williams, Proc. U. S. Nat. Mus., 1912, p. 388, pl. 49, figs. 12, 13.

Silurian (Eastport): East side of Seward Neck, Washington County, Maine.

Cotypes.—Cat. No. 58438, U.S.N.M.

EURYPTERUS Dekay. Genotype: E. remipes Dekay.

Eurypterus Dekay, Annals Lyceum Pal. New York, 1, 1825, p. 375.—Harlan, Medical, Physical Res., 1835, p. 297.—Hibbert, Trans. Royal Soc. Edinburgh, 13, 1836, p. 281.—Conrad, 1st Ann. Rep. New York Geol. Surv., 1837, p. 182.—Fischer de Waldheim, Bull. Soc. geol. France, 11, 1840, p. 368.—Edwards, Hist. Nat. d. Crustaces, 3, 1840, p. 422.—Conrad, 5th Ann. Rep. New York Geol. Surv., 1841, p. 38.—Roemer, Palæontographica, 1, 1848, pp. 192–193.—McCoy, British Pal. Rocks Fossils, 1854, p. 175.—Pictet, Traité de Pal., 2d ed., 2, 1854, p. 529.—Salter, Quart. Jour. Geol. Soc. London, 12, 1856, p. 27.—Nieszkowski, Archiv. f. Naturk. Liv.-Ehst-u. Kurl., 1858, 2, p. 308.—Hall, Pal. New York, 3, 1859, 1861, pp. 382; 385; 392; 395; 397, figs. 1, 2; 398, fig. 3; 400, fig. 5; 403, figs. 6, 7.—Woodward, Mon. British Foss. Crust., Pal. Soc., 1872, p. 132.—Barrande, Syst. Sil. du Centre Boheme, 1, Suppl., 1872, p. 563.—Alth, Abhandl. der K.-K. Geol. Reichsanstalt, 7, Heft 1, 1874, p. 54.—Hall and Clarke, Pal. New York, 7, 1888, p. 49.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersb., 7 ser., 31, 5, 1883, p. 48.—Zittel, Handb. Pal., 2, 1885, p. 647.—Miller, N. A. Geol. Pal., 1889, p. 548.—Vogdes, Annals New York Acad. Sci., 1889, p. 20, pl. 1, fig. 7.—Laurie, Trans. Royal Soc. Edinburgh, 37, 1893, p. 517; Nat. Sci., 2, 1893, p. 125; ibid., 3, 1893, p. 125.—Clarke, Zittel-Eastman Textb. Pal. 1, 1900, p. 674.—Grabau, Bull. New York State Mus., 45, 1901, p. 228.—Clarke, 54th Rep. New York State Mus., 1901, p. 83.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 228.—Clarke, Bull. New York State Mus., 107, 1907, p. 304.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 405.—Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 155.—Clarke, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 782.

Onychopterus (subgenus of Eurypterus) Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 212.—Clarke, Zittel-Eastman Textb. Pal., 1913, p. 782. (Genotype: Eurypterus kokomoensis Miller and Gurley).

Tylopterus (subgenus of Eurypterus) Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 216.—Clarke, Zittel-Eastman Textb. Pal., 1913, p. 783. (Genotype: Eurypterus boylei Whiteaves).

Eurypterus (Tylopterus) boylei (Whiteaves).

Eurypterus Boylei Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 42, pl. 7, fig. 3; ibid., pt. 2, 1895, p. 109 (loc. occ.)

Eurypterus (Tylopterus) boylei—Continued.

Tylopterus boylei Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 218, fig. 42.

Niagaran (Guelph): Elora, Ontario.

EURYPTERUS? CESTROTUS Clarke. See Stylonurus (Ctenopterus) cestrotus.

Eurypterus chadwicki Clarke and Ruedemann.

Eurypterus chadwicki Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 413, fig. 95.

Chazyan (Normanskill): Catskill, New York.

EURYPTERUS CICEROPS Clarke. See Eusarcus(?) cicerops.

EURYPTERUS? CLEVELANDI Walcott. See Echinognathus clevelandi.

Eurypterus dekayi Hall.

Eurypterus dekayi Hall, Pal. New York, 3, 1859, p. 411, pl. 82, fig. 1.—Grabau. Bull. New York State Mus., 45, 1901, p. 230; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 230.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 409.—Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 181, pl. 19, fig. 2; pl. 20, fig. 1.

Cayugan (Bertie): Buffalo, New York.

EURYPTERUS ERIENSIS Whitfield. See Eurypterus microphthalmus.

EURYPTERUS GIGANTEUS Pohlman. See Eurypterus pustulosus.

Eurypterus (Onychopterus) kokomoensis (Miller and Gurley).

Eurypterus kokomoensis Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 10, 1896, p. 90, pl. 5, fig. 1.

Eurypterus (Onychopterus) kokomoensis Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 212, pl. 25, figs. 1, 2; pl. 26, fig. 2.

Cayugan (Kokomo): Kokomo, Indiana.

Eurypterus lacustris Harlan.

Eurypterus lacustris Harlan, Trans. Geol. Soc. Pennsylvania, 1, 1834, p. 98, pl. 5, fig. 2; Medical, Physical Res., 1835, p. 298, pl. 5, fig. 2.—Hibbert, Trans. Royal Soc. Edinburgh, 13, 1836, p. 281, pl. 12, fig. 6.—Edwards, Hist. Nat. d. Crustaces, 3, 1840, p. 422.—Fischer de Waldheim, Bull. Soc. Geol. France, 11, 1840, p. 368.—Hall, Pal. New York, 3, 1859, p. 400, text fig. 5; p. 407, pl. 81, figs. 1–11; pl. 81A, fig. 1; pl. 81B, figs. 1–5; pl. 83B, fig. 3.—Grabau, Bull. New York State Mus., 45, 1901, p. 229; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 229.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 408, fig. 1708.—Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 173, pls. 9–12; pl. 13, fig. 3; figs. 35, 36.

Eurypterus robustus Hall, Pal. New York, 3, 1859, p. 410, pl. 81C, fig. 1; also see corrigenda, p. 533.—Grabau, Bull. New York State Mus., 45, 1901, p. 229; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 229.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 408, fig. 1710.

Eurypterus remipes Bronn and Roemer, Leth., 3d ed., 2, 1854, p. 666, pl. 9, fig. 1.

Cayugan (Bertie): Williamsville, Buffalo, Black Rock, Erie County, and Union Springs, Cayuga County, New York; Bertie, Ontario.

Eurypterus lacustris pachycheirus (Hall).

Eurypterus pachycheirus Hall, Pal. New York, 3, 1859, p. 412, pl. 82, figs. 1–3.—Pohlman, Bull. Buffalo Soc. Nat. Sci., 4, 1881, p. 19, fig. 7.—Grabau, Bull. New York State Mus., 45, 1901, p. 230; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 230.

Eurypterus lacustris pachycheirus—Continued.

Eurypterus lacustris var. pachychirus Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 179, pl. 12, fig. 3; pl. 19, fig. 1.

Cayugan (Bertie): Buffalo and Black Rock, New York.

Eurypterus maria Clarke.

Eurypterus maria Clarke (part) Bull. New York State Mus., 107, 1907, p. 305, pl. 1, figs. 1, 2, 4; pl. 2, figs. 2, 4, 7; pl. 3, figs. 1–5, 7.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 406, figs. 1705a–c, 1713d–e.—Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 184, pls. 21, 22, fig. 37.

Medinan (Shawangunk): Otisville, New York, and Delaware Water Gap, Pennsylvania.

EURYPTERUS MARIA (part) Clarke. See Pterygotus (Erettopterus) globiceps and Stylonurus myops.

Eurypterus megalops Clarke and Ruedemann.

Eurypterus megalops Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 191, pl. 83, fig. 7.

Trenton (Schenectady): Near Rotterdam Junction, Schenectady County, New York.

Eurypterus microphthalmus Hall.

Eurypterus microphthalmus Hall, Pal. New York, 3, 1859, p. 407, pl. 80A, fig. 7.—Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 192, pl. 20, figs. 2–10.

Eurypterus Eriensis Whitfield, Annals New York Acad. Sci., 2, 1882, p. 196.—Claypole, Proc. Amer. Phil. Soc., 21, 1883, p. 239.—Whitfield, Geol. Surv. Ohio, Pal., 7, 1893, p. 416, pl. 1, figs. 31, 32; Ann. New York Acad. Sci., 5, 1891, p. 515, pl. 5, figs. 31, 32.—Grabau and Shimer, N. A. Index Fossils, 1, 1910, p. 407, fig. 1707.—Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 208, pl. 30, figs. 31–32.

Cayugan: Drift bowlder near Cazenovia; also Onondaga, Litchfield, Cherry Valley, and Manlius village, New York (top of Manlius); Put-in-Bay, Lake Erie (Put-in-Bay).

EURYPTERUS MYOPS Clarke. See Stylonurus myops.

EURYPTERUS PACHYCHEIRUS Hall. See Eurypterus lacustris pachycheirus.

Eurypterus pittsfordensis Sarle.

Eurypterus pittsfordensis Sarle, Bull. New York State Mus., 69, 1902, p. 1098, pl. 10, fig. 7; pl. 15, figs. 1–3; pls. 16–23; pl. 24, figs. 2–5; pl. 25, figs. 2, 5, 6.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 407, fig. 1706.—Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 196, pl. 13, figs. 4–6; pls. 14–16; pl. 17, figs. 1–6; pl. 18, figs. 3–8.

Cayugan (Pittsford): Pittsford, Monroe County, New York.

Eurypterus pristinus Clarke and Ruedemann.

Eurypterus pristinus Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 207, pl. 83, figs. 5, 6.

Trenton (Schenectady): Dettbarn quarry, Schenectady, New York.

Eurypterus? (Dolichopterus?) prominens Hall.

Eurypterus prominens Hall, Proc. Amer. Assoc. Adv. Sci., 33, 1884, p. 420.—Hall and Clarke, Pal. New York, 7, 1888, p. 157, pl. 27, figs. 3, 4.

Eurypterus(?) (Dolichopterus?) prominens Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 200, fig. 38.

Clinton sandstone: Northern part of Cayuga County, New York.

Eurypterus pustulosus Hall.

Eurypterus pustulosus Hall, Pal. New York, 3, 1859, p. 413, pl. 83B, fig. 1.—Grabau, Bull. New York State Mus., 45, 1901, p. 229; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 229.—Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 201, pls. 23, 24, figs. 39–41.

Eurypterus giganteus Pohlman, Bull. Buffalo Soc. Nat. Sci., 4, 1883, p. 41, pl. 2, fig. 1.

Pterygotus globicaudatus Pohlman, Bull. Buffalo Soc. Nat. Sci., 4, 1883, p. 42, pl. 2, fig. 2.—Laurie, Trans. Royal Soc. Edinburgh, 37, 1893, p. 515.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 231; Bull. New York State Mus., 45, 1901, p. 231.

Cayugan (Bertie): Buffalo, New York.

Plesiotype.—Cat. No. 60051, U.S.N.M.

Eurypterus ranilarva Clarke and Ruedemann.

Eurypterus ranilarva Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 208, pl. 17, fig. 7; pl. 18, figs. 1, 2.

Cayugan (Kokomo): Kokomo, Indiana.

Eurypterus remipes Dekay.

Eurypterus remipes Dekay, Annals Lyceum Nat. Hist. New York, 1, 1825, p. 375, pl. 29; ibid., 2, 1828, p. 273.—Harlan, Trans. Geol. Soc. Pennsylvania, 1, 1832, p. 96, pl. 5, fig. 1; Amer. Mo. Mag., 3, 1834, p. 291; Medical, Physical Res., 1835, p. 297, fig. 1.—Bronn, Leth. Geol., 1, 1835–1837, p. 109, fig. 1.—Hibbert, Trans. Roy. Soc. Edinburgh, 13, 1836, pl. 12, fig. 7, p. 281.—Edwards, Hist. Nat. d. Crustaces, 3, 1840, p. 422.—Fischer de Waldheim, Bull. Soc. Geol. France, 11, 1840, p. 368.—Vanuxem, Nat. Hist. New York, Geol., 3, 1842, pp. 99, 100, fig.—Roemer, Palæontographica, 1, 1848, p. 190, pl. 27.—Pictet, Traite de Pal., 2d ed., 2, 1854, p. 529, pl. 46, fig. 14.—Hall, Pal. New York, 3, 1859, p. 382; p. 403, figs. 6, 7; p. 404, pl. 80, figs. 1–12; pl. 80A, figs. 1–6; 11–17; pl. 83B, fig. 2; pl. 84A, figs. 1, 2.—Emmons, Man. Geol., 1860, p. 41, fig. 34; p. 122, fig. 4.—Chapman, Canadian Jour., n. s., 8, 1863, p. 440, fig. 227; Expos. Min. Geol. Canada, 1864, p. 191, fig. 227.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, pp. 958, 959, figs. 463a, b, 464.—Woodward, Quart. Jour. Geol. Soc. London, 23, 1867, pl. 1, fig. 7.—Meek and Worthen, Amer. Jour. Sci. Arts, 2d ser., 46, 1868, footnote p. 20, p. 546.—Woodward, Mon. British Foss. Crust., Palaeontographical Soc., 1872, p. 132, fig. 40.—Walcott, Bull. Mus. Comp. Zool., 8, 1881, pl. 5, fig. 7.—Peach, Proc. Royal Soc. Edinburgh, 9, 1888, pl. 20, figs. 2, 2a.—Miller, N. A. Geol. Pal., 1889, p. 548, fig. 1008.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 236, fig.—Clarke, Zittel-Eastman Textb. Pal., 1900, 1, pt. 2, p. 676, figs. 1420, 1421.—Grabau, Bull. New York State Mus., 45, 1901, p. 229, pl. 18; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 229, pl. 18.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 408, fig. 1709, Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 161, pls. 2–8, figs. 33, 34.

Cayugan: Waterville, Litchfield, Seneca Falls, North Buffalo, etc. (Bertie), and Seneca Falls (Rondout), New York.

EURYPTERUS REMIPES Bronn and Roemer. See Eurypterus lacustris.

EURYPTERUS ROBUSTUS Grabau. See Eurypterus lacustris.

Eurypterus? (Dolichopterus?) stellatus Clarke and Ruedemann.

Eurypterus? (Dolichopterus?) stellatus Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 211, pl. 83, figs. 1–4.

Trenton (Schenectady): Schenectady, New York.

EURYSOMA Claypole. See Eusarcus Grote and Pitt.

EURYSTOMITES Schröder. Genotype: Nautilus kelloggi Whitfield.

Eurystomites Schröder, Pal. Abhandl. von Dames u. Kayser, Neue Folge, 1, Heft 4, Jena, 1891, p. 26.—Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 441.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 773.—Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 811.—Ruedemann, Bull. New York State Mus., 90, Pal., 14, 1906, pp. 451, 456.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 68.

Eurystomites accelerans Ruedemann.

Eurystomites accelerans Ruedemann, Bull. New York State Mus., 90, 1906, p. 460, pl. 18, figs. 2, 3; fig. 23.

Canadian (Beekmantown): Valcour, New York.

Eurystomites amplectens Ruedemann.

Eurystomites amplectens Ruedemann, Bull. New York State Mus., 90, 1906, p. 461, pl. 18, figs. 4–7; fig. 24.

Canadian (Beekmantown): Valcour, New York.

Eurystomites apollo (Billings).

Lituites Apollo Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 25 (adv. sheets 1862).

Eurystomites apollo Miller, N. A. Geol. Pal., 2d App., 1897, p. 773 (gen ref.).

Canadian (Romaine): Mingan Islands, Canada.

EURYSTOMITES CHAMPLAINENSIS Schröder. See Tarphyceras champlainense.

Eurystomites gibbosus Hyatt.

Eurystomites gibbosum Hyatt, Proc. Amer. Phil. Soc., 32, 1894, p. 443.

Canadian (Quebec): Port aux Choix, Schooner Island, Newfoundland.

Eurystomites imperator (Billings).

Lituites imperator Billings, Geol. Vermont, 2, for 1861, 1862, p. 957; Rep. Econ. Geol., etc., Vermont, 1862, p. 229; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 23 (adv. sheets 1861).

Eurystomites imperator Miller, N. A. Geol. Pal., 2d App., 1897, p. 773 (gen. ref.).

Canadian (Beekmantown): Phillipsburg, Quebec.

Eurystomites kelloggi (Whitfield).

Nautilus kelloggi Whitfield (part), Bull. Amer. Mus. Nat. Hist., 1, 1886, 8, p. 328, pl. 30, fig. 1 (not pl. 31, figs. 4, 5=E. rotundus Hyatt).

Eurystomites kelloggi Schröder, Pal. Abh. herausg. von Dames und Kayser, 5, Heft 4, 1891, p. 27.—Hyatt, Amer. Phil. Soc. Proc., 32, 1894, p. 442, pl. 5, figs. 4, 5; figs. 21, 22.—Ruedemann, Bull. New York State Mus., 90, 1906, pp. 451, 456, figs. 21, 22; pl. 17, fig. 1; pl. 18, fig. 1.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 69, fig. 1278.

Canadian: Fort Cassin, Vermont; Valcour, New York (Beekmantown); Picketts Station, Wisconsin (Shakopee).

Plesiotype.—Cat. No. 25647, U.S.N.M.

Eurystomites plicatus Whiteaves.

Eurystomites plicatus Whiteaves, Canadian Rec. Sci., 6, 1895, p. 396; Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 225, figs. 15, 16; pl. 22, fig. 2.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 173.

Black River or Richmond: Little Black Island, Lake Winnipeg, and Baffin Land, Canada.

Eurystomites robertsoni (Hall).
Lituites robertsoni Hall, Rep. Geol. Surv. Wisconsin, 1861, p. 38.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 64, pl. 10, figs. 4–6.
Eurystomites robertsoni Miller, N. A. Geol. Pal., 2d App., 1897, p. 773 (gen. ref.).
Black River (Platteville): Beloit, Wisconsin; Rockford, Illinois.

Eurystomites rotundus Hyatt.
Nautilus kelloggi Whitfield (part), Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 328, pl. 31, figs. 4, 5.—Seely, Vermont State Geol. Rep., 7, 1910, pl. 53, figs. 4, 5.
Eurystomites rotundus Hyatt, Amer. Phil. Soc. Proc., 32, 1894, p. 443, pl. 5, figs. 21–25.—Ruedemann, Bull. New York State Mus., 90 1906, p. 463.
Canadian (Beekmantown): Fort Cassin, Vermont.
Cotypes.—Cat. No. 25655, U.S.N.M.

EURYSTOMITES UNDATUS Hyatt. See Plectoceras? undatum.

EURYSTOMITES UNDATUS var. OCCIDENTALIS Clarke. See Plectoceras undatum occidentale.

Eurystomites virginianus Hyatt.
Eurystomites virginiana Hyatt, Amer. Phil. Soc. Proc., 32, 1894, p. 444.—Ruedemann, Bull. New York State Mus., 90, 1906, p. 463.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 69.
Canadian (Beekmantown): Near Lexington, Virginia; Fort Cassin, Vermont.
Holotype.—Cat. No. 9611, U.S.N.M.

EUSARCUS Grote and Pitt. Genotype: E. scorpionis Grote and Pitt.
Eusarcus Grote and Pitt, Bull. Buffalo Soc. Nat. Sci., 3, 1875, pp. 1, 2.—Pohlman, Bull. Buffalo Soc. Nat. Sci., 5, 1886, p. 29.—Claypole, Amer. Geol., 13, 1894, p. 78, footnote.—Clarke, Zittel-Eastman Textb. Pal., 1, 1900, p. 676; ibid., 2d ed., 1913, p. 783.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 230; Bull. New York State Mus., 45, p. 230.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 409.—Clarke and Ruedemann, Mem. New York State Mus. 14, 1912, p. 226.
Eurysoma Claypole, Amer. Geol., 6, p. 258. (Genotype, E. newlini Claypole.)
Carcinosoma (Eurysoma preoccupied) Claypole, Amer. Geol., 13, 1894, p. 78.—Miller, N. A. Geol. Pal., 1st App. 1892, p. 706.

Eusarcus(?) cicerops (Clarke).
Eurypterus? cicerops Clarke, Bull. New York State Mus., 107, 1907, p. 307, pl. 5, fig. 10; pl. 5, fig. 7.
Eusarcus(?) cicerops Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 253, pl. 36, figs. 2–10.
Medinan (Shawangunk): Otisville, New York.

EUSARCUS GRANDIS Grote and Pitt. See Eusarcus scorpionis.

Eusarcus lingulatus Clarke and Ruedemann.
Eusarcus lingulatus Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 413, figs. 96, 97.
Chazyan (Normanskill): Catskill, New York.

Eusarcus longiceps Clarke and Ruedemann.
Eusarcus longiceps Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 257, pl. 84, figs. 1–6.
Trenton (Schenectady): Schenectady, New York.

Eusarcus newlini (Claypole).

Eurysoma newlini Claypole, Amer. Geol., 6, 1890, pp. 258, 260, fig. 3.

Carcinosoma newlini Claypole, Amer. Geol., 6, 1890, p. 400; ibid., 13, 1894, p. 78.

Eusarcus newlini Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 245, pl. 36, fig. 11; pls. 37–39, figs. 59, 60.

Carcinosoma ingens Claypole, Amer. Geol., 13, 1894, p. 77, pl. 4.

Cayugan (Kokomo): Kokomo, Indiana.

Plesiotype.—Cat. No. 42559, U.S.N.M.

Eusarcus scorpionis Grote and Pitt.

Eusarcus scorpionis Grote and Pitt, Bull. Buffalo Soc. Nat. Sci., 3, 1875, p. 1.—Pohlman, ibid., 4, 1881, p. 21.—Grabau, Bull. New York State Mus., 45, 1901, p. 231; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 231.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 410.—Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 233, pls. 27–34; pl. 35, figs. 2–5; pl. 36, fig. 1; figs. 54–58.

Eusarcus grandis Grote and Pitt, Bull. Buffalo Soc. Nat. Sci., 3, 1875, p. 17.—Pohlman, ibid., 5, 1886, p. 31.—Grabau, Bull. New York State Mus., 45, 1901, p. 230; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 230.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 410.

Cayugan (Bertie): Williamsville and Buffalo, New York.

EUSARCUS SCORPIONIS Pohlman. See Dolichopterus siluriceps.

Eusarcus triangulatus Clarke and Ruedemann.

Eusarcus triangulatus Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 258, pl. 84, figs. 7–9.

Trenton (Schenectady): Schenectady, Duanesburg, and Rotterdam Junction, New York.

Eusarcus vaningeni Clarke and Ruedemann.

Eusarcus vaningeni Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 420, figs. 108–115.

Cuyagan (Pittsford): Oriskany Creek, near Clinton, New York.

EUSPIROCRINUS Angelin. Genotype: E. spiralis Angelin.

Euspirocrinus Angelin, Icon. Crin. Suec., 24, 1878.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 366 (Rev. Pal., pt. 1, p. 143); ibid., 1886, pp. 112, 143 (Rev. Pal., pt. 3, sec. 2, pp. 188, 219).—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 173.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 157.—Springer, ibid., 2d ed., 1913, p. 218.—Zittel, Grundzuge Pal., 1, 1910, pp. 135, 154.

Euspirocrinus obconicus W. R. Billings.

Euspirocrinus obconicus W. R. Billings, Trans. Ottawa Field Nat. Club, 2, 1885, p. 248, pl. fig.— Miller, N. A. Geol. Pal., 1889, p. 246, figs. 306, 307.

Trenton: Ottawa, Ontario; Hull, Quebec.

EUTHYRIS Quenstedt. See Athyris McCoy.

FABERIA Miller. Genotype: F. anomala Miller.

Faberia Miller, N. A. Geol. Pal., 1889, p. 549.

Faberia anomala Miller.

Faberia anomala Miller, N. A. Geol. Pal., 1889, p. 549, fig. 1009.

Maysville or Richmond: Butler County, Ohio.

FAVASTRÆA STRIATA D'Orbigny. See Strombodes striatus.

FAVISTELLA Dana. See Columnaria Goldfuss.

FAVISTELLA FAVOSIDEA Hall. See Favosites favosidea.

Favistella? franklini Salter.

Favistella Franklini Salter, Sutherland's Jour. Voyage in Baffins Bay, etc., 2, 1852, p. 229, pl. 6, figs. 3, 3a.—Haughton, Jour. Geol. Soc. Dublin, 1, 1859, p. 247, pl. 11, fig. 1.—Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 586.

Silurian: Cape Riley, Dobbin Bay, and Cape Hilgard, Arctic America.

Favistella? reticulata Salter.

Favistella reticulata Salter, Sutherland's Jour. Voyage in Baffins Bay, etc., 2, App., 1852, p. 229, pl. 6, figs. 2, 2a.—Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 586.

Silurian: Cape Riley, Franklin Pierce Bay, and Cape Hilgard, Arctic America.

FAVOSITELLA Etheridge and Foord.

Genotype: Favosites interpuncta Quenstedt.

Bythotrypa Ulrich, Geol. Minnesota, 3, 1893, p. 324; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 268.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 24.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 123. (Genotype: Fistulipora? laxata Ulrich.)

Favositella Etheridge and Foord, Ann. Mag. Nat. Hist., 5th ser., 13, 1884, p. 472.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 100-102; Zittel-Eastman Textb. Pal., 1913, p. 328.

Favositella epidermata (Ulrich).

Crepipora epidermata Ulrich, Geol. Surv. Illinois, 8, 1890, p. 471, pl. 40, figs. 1–1e.

Bythotrypa epidermata Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 186 (gen. ref.).

Richmond (Fernvale): Wilmington and Savannah, Illinois; Tennessee.

Cotypes.—Cat. No. 43229, U.S.N.M.

Favositella laxata (Ulrich).

Fistulipora? laxata Ulrich, Contr. Micro-Pal. Cambro-Sil., pt. 2, 1889, p. 37, pl. 8, figs. 2, 2a.

Bythotrypa laxata Ulrich, Geol. Minnesota, 3, 1893, p. 325, pl. 28, figs. 21–25; Zittel's Textb. Pal. (Engl. ed.), 1896, fig. 440 (p. 268).—Whiteaves, Pal. Foss., 3, pt. 3, 1897, p. 163.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 124, fig. 182c.

Favositella laxata Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 101 (gen. ref.); Zittel-Eastman Textb. Pal., 1913, p. 329, fig. 467.

Black River and Trenton: St. Andrews, Manitoba; Minneapolis, St. Paul, Kenyon, Berne, and Cannon Falls, Minnesota; Rockton, Illinois; Decorah, Iowa.

Fragment of *holotype* and *plesiotypes*.—Cat. Nos. 43220, 43241, U.S.N.M.

FAVOSITES Lamarck. Genotype: F. alveolatus Lamarck.

Favosites Lamarck, Cours. de Zool. du Mus. Hist. Nat., Hist. An. Sans Vert., 1812, p. 204.—Eichwald, Zool. Specialis, pt. 1, Vilnae, 1829, p. 193.—Koninck, Desc. Animaux Fossiles, Leige, p. 9.—McCoy, Syn. Char. Carb. Foss. Ireland, 1844, p. 191.—Dana, Wilkes U. S. Expl. Exped., 7, Zoophytes, 1838, p. 430.—Edwards and Haime, Compt. Rend. de l'Acad. Sci., 29, 1849, p. 260; Mon. d. Polyp. Foss. d. Terr. Pal. (Arch. du Mus. d'Hist. Nat., 5), 1851, pp. 152, 230.—Hall, Pal. New York, 2, 1852, p. 124.—McCoy, British Pal. Rocks, Fossils, 1854, p. 19.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 440.—Billings, Canadian Jour., n. s., 4, 1859, p. 99.—Milne-Edwards, Hist. Nat. d. Corall., 3, 1860, p. 246.—Verrill, Amer. Jour. Sci., 3d ser., 3, 1872, p. 191; Ann. Mag. Nat. Hist., 4th ser., 9, 1872, p. 360.—Duncan, Rep. 41st Meeting

FAVOSITES—Continued.

British Assoc. Adv. Sci., 1872, p. 132.—Koninck, Animaux Foss. Terr. Carb. Belgique, 1872 (Mem. l'Acad. Royale Sci. Belgique), 39, p. 136.—Nicholson, Canadian Jour., n. s., 14, 1873, p. 38.—Salter, Cat. Camb. Sil. Foss., 1873, p. 104.—Nicholson, Geol. Mag., 10, 1873, p. 567; Rep. Pal. Prov. Ontario, pt. 1, 1874, p. 44.—Moseley, Proc. Royal Soc. London, 25, 1875, p. 66.—Nicholson, Geol. Surv. Ohio, Pal., 2, 1875, p. 183.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 19.—Zittel, Handb. Pal., 1, 1879, p. 236.—Nicholson, Tab. Corals Pal. Period, 1879, p. 37.—Thomson, Proc. Phil. Soc. Glasgow, 13, 1881, pp. 201, 202, fig. 1A.; Proc. Phil. Soc. Glasgow, 14, 1883, p. 349; ibid., 20, 1889, p. 121, fig.—Roemer, Leth. Geog., pt. 1, Leth. Pal., 1883, p. 419.—Frech, Zeits. d. Deutschen geol. Gesell., 37, 1885, p. 100.—Hall and Simpson, Pal. New York, 6, 1887, p. 13.—Nicholson, Geol. Mag., dec. 3, 5, 1888, p. 107.—Miller, N. A. Geol. Pal., 1889, p. 188.—Beecher, Trans. Connecticut Acad. Arts Sci., 8, 1891, pp. 209, 210, 215.—Girty, Amer. Geol., 15, 1895, pp. 131–146.—Sardeson, Neues Jahrb. f. Min., Geol., Pal., Beilage-Bd., 10, 1896, pp. 251, 284.—Girty, Amer. Geol., 18, 1896, p. 41.—Say (reprint), Bull. Amer. Pal., 1, 1896, p. 278.—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 2.—Lindstrom, Kongl. Sven. Vet. Akad. Handl., 32, 1899, p. 49.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 130; Zittel-Eastman Textb. Pal., 1, 1900, p. 99; Bull. New York State Mus., 9, 1901, p. 140; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 140.—Pocta, Syst. Sil. du Centre Boheme, 8, pt. 2, 1902, p. 213.—Beecher, Amer. Jour. Sci., 16, 1903, p. 9.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 84; Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 113.

Calamopora Goldfuss, Petrefacta, 1826, pp. 77, 245; 2d ed., pt. 1, 1862, p. 72.

Emmonsia Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal., 1851 (Arch. du Mus. d'Hist. Nat., 5), pp. 152–246.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 441.—Milne-Edwards, Hist. Nat. d. Corall., 3, 1860, p. 257.—Rominger, Jour. Sci. Arts, 2d ser., 34, 1862, p. 391.—Nicholson, Canadian Jour., n. s., 14, 1873, p. 38.—Zittel, Handb. Pal., 1, 1879, p. 237.—Nicholson, Tab. Corals Pal. Period, 1879, p. 41.—Roemer, Leth. Geog., pt. 1, Leth. Pal., 1883, p. 422.—Miller, N. A. Geol. Pal., 1889, p. 187.

Astrocerium Hall, Amer. Jour. Sci. Arts, 2d ser., 11, 1851, pp. 399–400; Pal. New York, 2, 1852, p. 120.—Rominger, Amer. Jour. Sci. Arts, 2d ser., 34, 1862, p. 391.—Nicholson, Canadian Jour., n. s., 14, 1873, p. 39; Tab. Corals Pal. Period, 1879, p. 40.

FAVOSITES ALVEOLARIS Lonsdale. See Paleofavosites asper.

FAVOSITES ASPERA D'Orbigny. See Paleofavosites aspera.

Favosites basalticus nanus Grabau.

Favosites basaltica Goldfuss var. nana Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 110, pl. 10, figs. 5, 6.

Upper Monroan (Anderdon): Salt shaft, Detroit, Michigan.

FAVOSITES? CAPAX Billings. See Paleofavosites asper.

Favosites concavus Grabau.

Favosites concava Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 114, pl. 15, figs. 2, 3.

Upper Monroan (Anderdon): Amherstburg, Ontario.

Favosites constrictus (Hall).

Astrocerium constrictum Hall, Pal. New York, 2, 1852, p. 123, pl. 34A, figs. 2a–c, 3a–e.

Favosites constrictus—Continued.
Favosites constrictus Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 142, fig. 37; Bull. New York State Mus., 45, 1901, p. 142, fig. 37.
Clinton (Rochester): Lockport, etc., New York; Ontario.

Favosites corrugatus Weller.
Favosites corrugatus Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 220, pl. 17, figs. 1, 2.
Helderbergian (Decker Ferry): Flatbrookville, New Jersey.

Favosites cristatus Edwards and Haime.
Favosites cristatus Edwards and Haime, Pal. Foss. Terr. Paleozoic, 1851, p. 242.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 9, figs. 1–5.
Silurian: Gotland, England, etc.; Indiana, Kentucky, and Tennessee (Osgood and Louisville-Brownsport).

Favosites cristatus major Davis.
Favosites cristatus var. major Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 24, fig. 3.
Niagaran: Louisville, Kentucky (Louisville); Perry and Decatur Counties, Tennessee (Brownsport).

Favosites declinatus Foerste.
Favosites declinata Foerste, Bull. Kentucky Geol. Surv., 7, 1906, p. 300, pl. 2, figs. 4a, b, and pl. 4, fig. 4.
Clinton (Waco): Near Irvine, Panola, Waco, etc., Kentucky.

Favosites discoideus (Roemer).
Calamopora forbesi var. discoidea Roemer, Sil. Fauna West. Tennessee, Breslau, 1860, p. 19, pl. 2, fig. 10a, b; Leth. geog., pt. 1, Leth. Pal., 1883, p. 454.
Favosites forbesi var. discoidea Miller, N. A. Geol. Pal., 1889, p. 188 (gen. ref.).
Favosites discoidea Foerste, Jour. Geol., 11, 1903, p. 713.
Niagaran (Brownsport): Perry, Wayne, and Decatur Counties, Tennessee.

Favosites discus Davis.
Favosites discus Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 9, figs. 8, 9.
Niagaran: Louisville, Kentucky (Louisville); West Tennessee (Brownsport).

Favosites excretus Hall. See Favosites spinigerus.

Favosites favosideus (Hall).
Favistella favosidea Hall, Pal. New York, 2, 1852, p. 41, pl. 17, figs. 2a–f.
Favosites favosideus Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 333.
Clinton: Rochester, Sodus, etc., New York.
Upper Medinan (Brassfield): Dayton, Ohio.

Favosites favosus (Goldfuss).
Calamopora favosa Goldfuss, Petrefacta, 1826, p. 77, pl. 26, fig. 2a–c; ibid., 2d ed., pt. 1, 1862, p. 73.—Troost, 5th Geol. Rep. Tennessee, 1840, p. 70.—Roemer, Sil. Fauna West. Tennessee, Breslau, 1860, p. 18, pl. 2, fig. 8.—Rominger, Amer. Jour. Sci. Arts, 2d ser., 34, 1862, p. 392.
Favosites favosa Edwards and Haime Mon. d. Polyp. Foss. d. Terr. Pal. 1851 (Arch. du Mus. d'Hist. Nat., 5), p. 233.—Hall, Pal. New York, 2, 1852, p. 126, pl. 34a (bis), fig. 5a–g.—Milne-Edwards, Hist. Nat. d. Corall., 3, 1860, p. 248.—

Favosites favosus—Continued.

Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 32 (loc. ref.).—Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 147; Geol. Surv. Ohio, Pal. 2, 1875, p. 229; Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 52.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 21, pl. 4, figs. 1–4; pl. 5, fig. 2.—White, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 383, pl. 52, figs. 1, 2.—Hall, 12th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1883, p. 253, pl. 3, figs. 1–4.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 8, figs. 1, 2.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 239, figs.—Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 333.—Keyes, Missouri Geol. Surv., 4, 1894, p. 120, pl. 14, fig. 2.—Hayes and Ulrich, U. S. Geol. Surv., Folio 95, illus. sheet, 1903, fig. 5.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 84, fig. 137.

Favosites gothlandicus Foerste, Bull. Kentucky Geol. Surv., 7, 1906, p. 298, pl. 2, figs. 1a, b.

Silurian (Brassfield-Guelph): Drummonds Island, Lake Huron; Anticosti; Ontario; Michigan; Missouri; Iowa; Ohio; Kentucky; etc.

Plesiotypes.—Cat. No. 52654, U.S.N.M. (Davis).

Favosites favosus integritabulatus Swartz.

Favosites favosus var. integritabulatus Swartz, Maryland Geol. Surv., Low. Dev., 1913, p. 214, pl. 24, figs. 1, 2.

Helderbergian (Keyser): Warrior Mountain, east of Flintstone, Maryland.

Favosites forbesi Edwards and Haime.

Favosites forbesi Edwards and Haime, British Foss. Corals, 1854, p. 258.—Lindstrom, Ofvers K. Vet. Akad. Forhandl., 30, 4, 1873, p. 22.—Nicholson, Geol. Mag., 10, 1873, p. 569; Canadian Jour., n. s., 14, 1873, p. 40, 45; Rep. Pal. Prov. Ontario, pt. 1, 1874, p. 48, pl. 7, fig. 8; pl. 8, fig. 4; Trans. Royal Soc. Edinburgh, 27, 1876, p. 247; Tab. Corals Pal. Period, p. 56, pl. 1, fig. 7; pl. 2, figs. 1–3; pl. 3, figs. 1, 2.—Roemer, Leth. Geog., pt. 1, Leth. Pal., 1883, p. 421, pl. 9, fig. 5a–c.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 8, figs. 5, 6.—Weissermel, Zeits. d. d. geol. Gesell., 46, 1894, p. 648, pl. 52, fig. 1.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 50.—Pocta, Syst. Sil. du Centre Boheme, 8, pt. 2, 1902, p. 339, fig. 16, pl. 87, 100.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 31.

Silurian: Europe; Rochester, etc., New York; Ontario; Kentucky; Tennessee (Niagaran); Anticosti.

Plesiotype.—Cat. No. 52658, U.S.N.M. (Davis).

Favosites forbesi var. discoidea Roemer. See Favosites discoideus.

Favosites forbesi var. eifelensis Holtedahl. See Favosites pyriformis.

Favosites forbesi occidentalis Hall.

Favosites Forbesi var. occidentalis Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875, pl. 4, figs. 6–15; ibid., mus. ed., 1879, p. 109, pl. 4, figs. 6–15; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 229, pl. 1, figs. 11–14; pl. 3, figs. 6–15.—Miller, N. A. Geol. Pal., 1889, p. 188, fig. 175.—Girty, Amer. Geol., 15, 1895, pp. 134–136, pl. 7, figs. 1–26; pl. 8, figs. 20–25, figs. 1–5.—Weissermel, Zeits. Geol. Gesell., 49, 1897, p. 377, fig. 2.

Favosites Forbesi var. Waldronensis Nicholson, Tab. Corals Pal. Period, 1879, p. 60, pl. 2, figs. 2–2b.

Niagaran (Waldron): Waldron, Indiana; Newsom, etc., Tennessee.

FAVOSITES FORBESI var. WALDRONENSIS Nicholson. See Favosites forbesi occidentalis.

Favosites gaspensis Lambe.

Favosites Gaspensis Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 8.

Silurian(?): L'Anse au Gascon, Baie des Chaleurs, Quebec

Favosites goldfussi (Castelnau). Not recognized.

Calamopora goldfussi Castelnau, Syst. Sil., 1843, p. 47.

?Favosites goldfussi Miller, N. A. Geol. Pal., 1889, p. 188, fig. 176.

Silurian: Manitoulin Islands, Lake Huron, and Sturgeon Bay, Wisconsin.

FAVOSITES GOTHLANDICA Foerste. See Favosites favosus.

Favosites gothlandicus (Fought).

Corallium gothlandicum Fought, Amoen. Acad., 1, 1749, p. 106, pl. 4, fig. 27.

Calamopora gothlandica Goldfuss, Petrefacta, 1826, p. 78, pl. 26, figs. 3a–e; ibid., 2d ed., 1862, p. 73.—Troost, 5th Geol. Rep. Tennessee, 1840, p. 69.—Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, pl. 16, fig. 3.—Roemer, Sil. Fauna West Tennessee, Breslau, 1860, p. 18, pl. 2, figs. 9, 9a, 9b.

Favosites gothlandica Lam., Syst., 2, 1816, p. 206.—Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal. (Arch. du Mus. d'Hist. Nat., 5), 1851, p. 232.—Salter, Sutherland's Jour. Voyage in Baffin's Bay, etc., 2, App., 1852, p. 228.—Edwards and Haime, Mon. British Foss. Corals, Pal. Soc., 1854, p. 256, pl. 60, figs. 1, 1a.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 305, fig. 302; Proc. Portland Soc. Nat. Hist., 1, 1863, p. 106.—Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 83.—Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 32.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 50.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 3, pl. 1, fig. 1.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 30.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 244.—Lambe, Cruise of the "Neptune," App. 4, 1906, p. 325.

Silurian: Europe and (?)America.

Observation.—Typical F. gothlandicus is probably not represented in American strata. The above references to American Silurian forms have not been accurately determined. F. favosus and F. niagarensis are the principal American species usually identified as F. gothlandicus.

FAVOSITES HALLIANA Nicholson. See Cladopora multipora.

Favosites helderbergiae præcedens Schuchert.

Favosites niagarensis? Hall, Pal. New York, 2, 1852, p. 324, pl. 73, figs. 1a–1c.

Favosites helderbergiae præcedens Schuchert, Am. Geol., 31, 1903, p. 164.—Grabau, Bull. New York State Mus., 92, 1906, p. 108, fig. 7.—Swartz, Maryland Geol. Surv., Low. Dev., 1913, p. 209, pl. 22, figs. 2–7.

Helderbergian: Schoharie, Litchfield, etc., New York (Coeymans); Cash Valley, Pinto, etc., Maryland; West Virginia; Pennsylvania (Keyser).

Cotypes.—Cat. No. 10533, U.S.N.M.

Favosites hisingeri Edwards and Haime.

Favosites hisingeri Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal. (Arch. du Mus. d'Hist. Nat., 5), 1851, p. 240, pl. 17, figs. 2–2b; Mon. British Foss. Corals, Pal. Soc., 1854, p. 259, pl. 61, figs. 1a, 1b.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 51.—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 6.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 29.

Favosites hisingeri—Continued.

Astrocerium parasiticum Hall, Pal. New York, 2, 1852, p. 122, pl. 34, fig. 2a–i.

Favosites parasiticum Grabau, Bull. New York State Mus., 45, 1901, p. 141, fig. 35; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 141, fig. 35.

Astrocerium venustum Hall, Pal. New York, 2, 1852, p. 120, fig.; p. 121, pl. 34, figs. 1a–j; Rep. Geol. Surv. Wisconsin, 1862, p. 66, fig. 1.—Whitfield, Geol. Wisconsin, 4, 1882, p. 270, pl. 13, figs. 8–10.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 188, fig.

Calamopora venusta Rominger, Amer. Jour. Sci. Arts, 2d ser., 34, 1862, p. 394.

Favosites venustus Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 83.—Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 390.—Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 147.—Nicholson, Geol. Surv. Ohio, Pal., 2, 1875, p. 226; Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 52.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 23, pl. 5, fig. 3.—Hall, 12th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1883, p. 253, pl. 2, figs. 7, 8.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 9, figs. 7, 10.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 243, figs.—Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 335.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 140, fig. 34; Bull. New York State Mus., 45, 1901, p. 140, fig. 34.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 84, fig. 136a, b.

Silurian: England, etc. Various localities in the Cataract and Niagaran of the United States and Canada.

Favosites hisingeri aplata Foerste.

Favosites hisingeri-aplata Foerste, Bull. Kentucky Geol. Surv., 7, 1906, p. 299, pl. 2, fig. 2; pl. 4, fig. 5.

Clinton (Waco): Near Estill Springs, north of Irvine, etc., Kentucky.

Favosites hispidus Rominger.

Favosites hispidus Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 23, pl. 5, fig. 4.

Niagaran: Drummond's Island, Lake Huron; Point Detour, Michigan.

Observation.—Probably the same as F. hisingeri.

Favosites louisvillensis Davis.

Favosites louisvillensis Davis, Kentucky Foss. Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 9, fig. 6.

Niagaran (Louisville): Near Louisville, Kentucky.

Favosites louisvillensis Greene.

Favosites louisvillensis Greene, Cont. Indiana Pal., 1, pt. 19, 1904, p. 186, pl. 56, fig. 2.

Niagaran (Louisville): Near Louisville, Kentucky.

Observation.—On account of the synonymy that undoubtedly exists among the Louisville corals, it is useless to propose a new name for this preoccupied term. Moreover it is possible that both names refer to the same species.

FAVOSITES LYCOPERDON Owen. See Chætetes lycoperdon.

Favosites lycopodites Vanuxem. Not recognizable.

Favosites lycopodites Vanuxem, Geol. Rep. 3d District New York, 1842, p. 46, fig. 3.—Emmons, Nat. Hist. New York, Geol., 2, 1842, p. 389, fig. 3; p. 395.—Mather, Nat. Hist. New York, Geol., 1, 1843, p. 397, fig. 3.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 242, fig.

Trenton: New York, etc.

Favosites maximus (Troost). Not recognized.

Calamopora maximus Troost, 5th Rep. Geol. Tennessee, 1840, p. 73.

Favosites maxima Owen, Geol. Expl. Iowa, Wisconsin, Illinois, 2d ed., 1844, p. 76, fig. 7, pl. 13.—Yandell and Shumard, Contr. Geol. Kentucky, 1847, p. 7.

Favosites cf. maximus Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 115, pl. 15, figs. 4, 5.

"Mountain limestone": Near Nashville, Tennessee.

Observation.—Troost's description probably refers to a large-celled variety of Columnaria alveolata, abundant in the Richmond group north of Nashville. Owen's figures are of a true Favosites, probably F. favosus. Grabau's reference is also to a true Favosites.

Favosites multipora Nicholson. See Cladopora multipora.

Favosites niagarensis Hall.

Favosites niagarensis Hall, Pal. New York, 2, 1852, p. 125, pl. 34a (bis), fig. 4a–i.—Billings, Canadian Nat. Geol., 1, 1856, p. 60, pl. fig. 1; ibid., 4, 1859, p. 103.—Nicholson, Canadian Jour., n. s., 14, 1873, p. 40.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 190, fig.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1895, pl. 8, figs. 3, 4.—Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 334; Geol. Surv. Ohio, Pal., 7, 1893, p. 601.—Lambe, Cont. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 7.—Grabau, Bull. New York State Mus., 45, 1901, pp. 142, 143, fig. 38; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 142, fig. 38.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 28; Bull. New York State Mus., 65, 1903, p. 48.—Shimer, Bull. New York State Mus., 80, 1905, p. 236.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 85.

Niagaran: Niagara Falls, Lockport, etc., New York (Rochester); Ontario; Michigan; Iowa; Kentucky; Tennessee; etc.

Favosites niagarensis? Hall (part). See Favosites helderbergiæ præcedens.

Favosites niagarensis Rominger. See Paleofavosites asper.

Favosites niagarensis var. spinigera Hall. See Favosites spinigerus.

Favosites obliquus Rominger.

Favosites obliquus Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 24, pl. 28, fig. 2.

Niagaran: Point Detour, Michigan; Drummonds Island, Lake Huron; Masonville, Iowa.

Favosites obpyriformis Foerste.

Favosites obpyriformis Foerste, Jour. Geol., 11, 1903, p. 713; Bull. Sci. Lab. Denison Univ., 14, 1909, p. 100, pl. 4, fig. 74.

Niagaran (Brownsport): Near Vice, Decatur County, Tennessee.

Favosites occidens Whitfield.

Favosites occidens Whitfield, Ann. Rep. for 1877, Wisconsin Geol. Surv., 1878, p. 78; Geol. Wisconsin, 4, 1882, p. 313, pl. 23, figs. 6, 7.

Niagaran (Guelph): Ozaukee, etc., Wisconsin.

Favosites parasiticus Hall. See Favosites hisingeri.

Favosites prolificus Billings. See Paleofavosites asper.

Favosites pyriformis (Hall).

Asterocerium pyriforme Hall, Pal. New York, 2, 1852, p. 123, pl. 34A, fig. 1a–e.

Favosites pyriformis—Continued.

Favosites pyriformis Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 25.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 141, fig. 36; Bull. New York State Mus., 45, 1901, p. 141, fig. 36.—Weller, Geol. Surv. New Jersey, 3, 1903, p. 220, pl. 17, figs. 3–5.—Swartz, Maryland Geol. Surv., Low. Dev., 1913, p. 211, pl. 23, figs. 1–4.

Favosites forbesi eifelensis Holtedahl, 2d Arct. Exp. Fram, 1898–1902, No. 32, 1914, p. 11, pl. 4, figs. 5, 6.

Clinton (Rochester) and Niagaran (Lockport): Lockport, etc., New York.

Helderbergian: Two miles south of Tristates, New York (Decker Ferry); Cookerly, etc., Maryland (Keyser); southwestern Ellesmereland, Arctic America.

Observation.—The Helderbergian specimens described by Weller, Swartz, and Holtedahl probably belong to a distinct species or variety as noted by the last author.

Favosites pyriformis kokomoensis Foerste.

Favosites pyriforme-kokomoensis Foerste, Cincinnati Soc. Nat. Hist., Jour., 21, 1909, p. 9, pl. 1, figs. 17a–d, pl. 2, fig. 15.

Cayugan (Kokomo): Kokomo, Indiana.

Favosites rectangularis Grabau.

Favosites rectangularis Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 111, pl. 14, figs. 3, 4.

Upper Monroan (Anderdon): Salt shaft, Detroit, Michigan; Amherstburg, Ontario.

Favosites seriata Nicholson. See Cladopora seriata.

Favosites spinigerus Hall.

Favosites Niagarensis? var. spinigera Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875, pl. 4, fig. 1–5.

Favosites spinigerus Hall, 28th Rep. New York State Mus. Nat. Hist., mus. ed., 1879, p. 108, pl. 4. figs. 1–5; 11th Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 228, pl. 3, figs. 1–5; pl. 8, figs. 1, 2.—Girty, Amer. Geol., 15, 1895, p. 136, pl. 8, figs. 6–15.

Favosites excretus Hall, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875, pl. 9, figs. 1, 2.

Favosites spongilla Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 25.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 8, figs. 7–9.

Niagaran (Waldron-Brownsport): Waldron, St. Paul, etc., Indiana; Newsom, etc., Tennessee; Louisville, Kentucky.

Plesiotype.—Cat. No. 52645, U.S.N.M.

Favosites spongilla Rominger. See Favosites spinigera.

Favosites striatus Say. Not recognized.

Favosites striatus Say, Amer. Jour. Sci., 1, 1818, p. 384.

Silurian: Falls of the Ohio, etc.

Favosites subelongus Savage.

Favosites subelongus Savage, Bull. Geol. Surv., Illinois, 23, 1913, p. 64, pl. 3, figs. 9, 10.

Upper Medinan (Edgewood): Near Edgewood, Louisiana, and south of Clarksville, Pike County, Missouri.

Favosites troosti Edwards and Haime.

Favosites troosti Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal., 1851(Arch. du Mus. d'Hist. Nat., 5), p. 238, pl. 18, figs. 1, 1a.—Billings, Canadian Jour., n. s., 4, 1859, p. 103.—Nicholson, Canadian Jour., n. s., 14, 1873, p. 40.

Favosites troosti—Continued.

Silurian: Iowa.

Observation.—Although recorded from the Silurian of Iowa, this species is undoubtedly a Devonian form like F. hemisphericus.

Favosites tuberoides Grabau.

Favosites tuberoides Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 112, pl. 14, fig. 2.

Upper Monroan (Amherstburg): Detroit River, opposite Amherstburg, Ontario.

FAVOSITES VENUSTUS Hall. See Favosites hisingeri.

FENESTELLA Lonsdale. (Not Fenestella Bolten 1798.) Genotype: Gorgonia antiqua Goldfuss. Accepted genotype: Fenestella plebeia McCoy.

Fenestella Lonsdale, Murchison's Sil. Syst., 1839, p. 677.—Phillips, Pal. Foss., 1841, p. 22.—McCoy, Synopsis Carb. Foss. Ireland, 1844, p. 200.—Lonsdale, Russia and the Ural Mountains, 1, Appendix A, 1845, p. 629.—King, Mon. Perm. Foss., 1850, p. 34.—McCoy, British Pal. Foss., 1854, p. 49.—Hall, Amer. Jour. Sci. Arts, 2d ser., 23, 1857, pp. 203–204.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 165.—Eichwald, Leth. Rossica, 1, 1860, p. 356.—Nicholson, Pal. Province Ontario, 1874, p. 104.—Zittel, Handb. Pal., 1, Munich, 1880, p. 600.—Vine, Geol. Mag., dec. 2, 7, 1880, p. 511.—Shrubsole, Quart. Jour. Geol. Soc. London, 37, 1881, p. 179.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 150.—Claypole, Quart. Jour. Geol. Soc. London, 39, 1883, p. 31.—Vine, Proc. Yorkshire Geol. Polyt. Soc., n. s., 8, 1884, p. 164; Rep. 53d Meeting British Assoc. Adv. Sci., 1884, p. 190 (restricted).—Hall, Rep. State Geol. New York for 1884, 1885, p. 35.—Waagen and Pichl, Pal. Indica, ser. 13, 1885, pp. 773, 776.—Ulrich, Contr. Amer. Pal., 1, 1886, p. 4.—Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 83.—Hall and Simpson, Pal. New York, 6, 1887, p. 22.—Miller, N. A. Geol. Pal., 1889, p. 302.—Girty, Mon. U. S. Geol. Surv., 32, pt. 2, 1889, pp. 5, 18.—Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 395, 534.—Pocta, Syst. Sil. Boheme, 8, pt. 1, 1890, p. 40.—Whidborne, Devon. Fauna England (Pal. Soc. Publ.), 2, pt. 4, 1895, p. 165.—Simpson, 13th Ann. Rep. State Geol. New York for 1893, 1895, pp. 687, 724; 47th Ann. Rep. New York State Mus., pp. 881, 918.—Ulrich, Zittel's Textb. Pal. (Engl. ed.), 1896, p. 281.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 500.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 159.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, pp. 37, 244.—Grabau, Bull. New York State Mus., 45, 1901, p. 170; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 170.—Condra, Nebraska Geol. Surv., 2, pt. 1, 1903, p. 49.—Cumings, Amer. Jour. Sci., 17, 1904, pp. 49, 58; ibid., 20, 1905, p. 169, pls. 5–7.—Hennig, Archiv. fur Zool., K. Sven. Vet.-Akad. Stockholm, 3, 1906, p. 1.—Cumings, 30th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1906, p. 1276.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 50.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 142.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 746.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 175; Zittel-Eastman Textb. Pal., 1913, p. 341.

Fenestrella (in error for Fenestella) D'Orbigny, Prodr. de Pal., 1, 1850, p. 44.

Actinostoma Young and Young, Quart. Jour. Geol. Soc. London, 30, 1874, p. 681.—Vine, Proc. Yorkshire Geol. Polyt. Soc., 9, 1885, p. 84.

Flabelliporina Simpson, 13th Ann. Rep. State Geol. New York for 1893, 1895, pp. 703, 724; 47th Ann. Rep. New York State Mus., pp. 897, 918; 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 521.

FENESTELLA ACMEA Hall. See Semicoscinium acmeum.

Fenestella acuticosta Roemer.

Fenestella acuticosta Roemer, Sil. Fauna West. Tennessee, 1860, p. 30, pl. 2, figs. 15, 15a.

Niagaran (Brownsport): Perry County, Tennessee.

Fenestella (Cycloporina) altidorsata Ulrich and Bassler.

Fenestella (Cycloporina) altidorsata Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 282, pl. 45, fig. 15; pl. 49, figs. 1–3.

Helderbergian (Keyser): Devils Backbone, near Cumberland, Maryland.

Cotypes.—Cat. No. 60749, U.S.N.M.

Fenestella ambigua Hall. See Loculipora ambigua.

Fenestella aspera Hall. See Chasmatopora aspera.

Fenestella bellistriata Hall.

Fenestella bellastriata Hall, Trans. Albany Inst., 10, 1883, p. 63 (abstract, 1879, p. 7); 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 252.—Ulrich, Geol. Surv. Illinois, 8, 1890, pl. 54, fig. 2.

Niagaran (Waldron): Waldron, Indiana.

Plesiotype.—Cat. No. 44081, U.S.N.M.

Fenestella bicornis Spencer. Not recognizable.

Fenestella bicornis Spencer, Trans. St. Louis Acad. Sci., 4, 1884, p. 604, pl. 7, fig. 2; Bull. Mus. Univ. State Missouri, 1, 1884, p. 55, pl. 7, 2.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 247.

Clinton: Hamilton, Ontario.

Fenestella conferta Hall. See Polypora conferta.

Fenestella cribrosa Hall.

Fenestella cribrosa Hall, Pal. New York, 2, 1852, p. 166, pl. 40D, figs. 3a, b.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, pp. 50, 51, pl. 19, figs. 3–5.

Clinton (Rochester): Lockport and Middleport, New York.

Plesiotype.—Cat. No. 35553, U.S.N.M.

Fenestella cumberlandica Ulrich and Bassler.

Fenestella cumberlandica Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 280, pl. 47, figs. 1, 2.

Helderbergian (Keyser): Cash Valley, etc., near Cumberland, Maryland.

Cotypes.—Cat. No. 60745, U.S.N.M.

Fenestella elegans Hall.

Fenestella elegans Hall, Pal. New York, 2, 1852, p. 164, pl. 40D, figs. 1a–g.—Chapman, Canadian Jour., n. s., 7, 1862, p. 109, fig. 87; ibid., 8, 1863, p. 212, fig. 217; Expos. Min., Geol. Canada, 1864, p. 112, fig. 87; p. 184, fig. 217.—Grabau, Bull. New York State Mus., 45, 1901, p. 170, fig. 70; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 170, fig. 70.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 51, pl. 19, figs. 1, 2.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 142, fig. 198.

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

Fenestella flabelliformis Eichwald. See Dictyonema flabelliforme.

Fenestella gracilis Hall. See Chasmatopora gracilis.

Fenestella granulosa Whitfield.

Fenestella granulosa Whitfield, Ann. Rep. Geol. Surv. Wisconsin for 1877, 1878, p. 68; Geol. Surv. Wisconsin, 4, 1882, p. 252, pl. 12, figs. 1, 2.—Buel, Trans. Wisconsin Acad. Sci., 5, 1882, p. 187.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 173, fig.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 835, pl. 29, figs. 7, 7a.

Fenestella oxfordensis Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 159, pl. 6, fig. 13.

Richmond: Delafield, etc., Wisconsin (Maquoketa); Oxford, etc., Ohio (Waynesville-Whitewater).

Plesiotype.—Cat. No. 43635, U.S.N.M. (Holotype of F. oxfordensis.)

FENESTELLA INCEPTA Hall. See Chasmatopora incepta.

FENESTELLA NERVATA Nicholson. See Ptiloporella nervata.

FENESTELLA OXFORDENSIS Ulrich. See Fenestella granulosa.

Fenestella parvulipora Hall.

Fenestella parvulipora Hall, 28th Ann. Rep. New York State Mus., doc. ed., 1876, pl. 12, figs. 1–9; ibid., Mus. ed., 1879, p. 123, pl. 12, figs. 1–9; 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 249, pl. 11, figs. 1–9.

Niagaran (Waldron): Waldron, Indiana.

Fenestella pertenuis Hall.

Fenestella pertenuis Hall, Trans. Albany Inst., 10, 1883, p. 62 (abstract, 1879, p. 6); 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 251.

Niagaran (Waldron): Waldron, Indiana.

FENESTELLA PRISCA? Hall. See Semicoscinium tenuiceps.

Fenestella prolixa Hall.

Fenestella prolixa Hall, Trans. Albany Inst., 10, 1883, p. 64 (abstract, 1879, p. 8); 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 253.

Niagaran (Waldron): Waldron, Indiana.

FENESTELLA PUNCTOSTRIATA Hall. See Polypora punctostriata.

Fenestella subarctica Whiteaves.

Fenestella subarctica Whiteaves, Geol. Surv. Canada, Ann. Rep., n. s., 14, App. F, 1904, p. 39; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 249, pl. 23.

Niagaran: Ekwan River, Canada.

FENESTELLA TANTULUS Hall. See Polypora tantula.

FENESTELLA TENUICEPS Hall. See Semicoscinium tenuiceps.

Fenestella tenuis Hall.

Fenestella tenuis Hall, Pal. New York, 2, 1852, p. 51, pl. 19, figs. 5a–c.

Clinton: Wolcott Furnace, Whiting's Mill, Wayne County, New York.

FISTULIPORA McCoy.

Genotype: Fistulipora minor McCoy = Calamopora incrustans Phillips.

Fistulipora McCoy, Ann. Mag. Nat. Hist, 2d ser., 3, 1850, p. 131, figs. a, b.—Milne-Edwards and Haime, Pol. Foss. Terr. Pal., 1851, p. 219.—McCoy, British Pal. Foss., 1854, p. 11; Contr. British Pal., 1854, p. 99.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 438.—Billings, Canadian Nat. Geol., 3, 1858, p. 419; Geol. Surv. Canada, Rep. Progr. for 1857, 1858, p. 165; Canadian Jour., n. s., 4,

FISTULIPORA—Continued.

1859, p 97.—Milne-Edwards, Hist. Nat. des Corall., 3, 1860, p. 238.—Nicholson, Pal. Prov. Ontario, 1874, p. 63.—Dybowski, Verh. Mineral. Gesell. St. Petersburg (2), 10, 1876, p. 180.—Lindstrom, Ann. Mag. Nat. Hist., ser. 4, 18, 1876, p. 6.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1878, p. 38.—Nicholson, Pal. Tabulate Corals, 1879, p. 292.—Zittel, Handb. d. Pal., 1, 1880, p. 616; Genus Monticulipora, 1881, p. 91.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 156.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 477; Jour. Cincinnati Soc. Nat. Hist., 7, 1884, p. 43.—Thompson, Proc. Phil. Soc. Glasgow, 14, 1883, p. 351.—Nicholson and Foord, Ann. Mag. Nat. Hist., 5th ser., 16, 1885, p. 500.—Waagen and Wentzel, Pal. Indica, 13th ser., 1886, pp. 909, 922.—Hall and Simpson, Pal. New York, 6, 1887, p. 18.—James and James, Jour. Cincinnati Soc. Nat. Hist., 11, 1888, p. 32.—Miller, N. A. Geol. Pal., 1889, p. 305.—Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 382, 474.—J. F. James, Jour. Cincinnati Soc. Nat. Hist., 18, 1896, p. 119.—Ulrich, Zittel's Textb. Pal. (Engl. ed.), 1896, p. 269; p. 105 (not Ulrich).—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 559.—Lindstrom, Kongl. Sven. Vet. Akad. Handl., 32, 1899, pp. 48, 52.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, pp. 25, 266.—Condra, Nebraska, Geol. Surv., 2, pt. 1, 1903, p. 29.—Cumings, 30th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1906, p. 1292.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 22.—Grabau and Shimer, N. A. Index Fossils, 1, p. 124.—Hennig, Archiv. für Zool., 4, pt. 21, 1908, p. 16.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 329.—Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 262.

Didymopora Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 156.

Dybowskia Waagen and Pichl, Pal. Indica, ser. 13, p. 717.

Dybowskiella Waagen and Wentzel, Pal. Indica, 13th ser., 1886, pp. 910, 916.—Stuckenberg, Mem. du Comite Geologique Russia, 10, 3, 1895, p. 22.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 32, 1899, pp. 52, 53.

Lichenalia (not Hall, 1852) Hall and Simpson, Pal. New York, 6, 1887, p. xvi.—Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 168.—Miller, N. A. Geol. Pal., 1889, p. 311.—Simpson, 14th Ann. Rep. State Geologist New York for 1894, 1897, p. 559.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1889, p. 171.

Fistulipora crustula Bassler.

Ceramopora incrustans Hall, Pal. New York, 2, 1852, p. 169, pl. 40E, figs. 2a–d.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 198.—Grabau, Bull. New York State Mus., 45, 1901, p. 163, fig. 59; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 163, fig. 59.

Fistulipora crustula Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 24, pl. 7, figs. 7–10; pl. 8, figs. 16, 17; pl. 23, fig. 15.

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

Cotypes.—Cat. No. 35481, U.S.N.M.

FISTULIPORA FLABELLATA Ulrich. See Chiloporella flabellata.

Fistulipora halli Rominger.

Fistulipora Halli Rominger, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 119.

Lichenalia concentrica var. parvula Hall, 28th Ann. Rep. New York State Mus., doc. ed., 1876, pl. 7, figs. 1, 2; ibid., mus. ed., 1879, p. 117, pl. 7, figs. 1, 2; 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 241, pl. 6, figs. 1, 2.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 340, figs.

Niagaran (Waldron): Waldron, Indiana; Newsom, Tennessee.

Fistulipora hemispherica (Roemer).

Thecostegites hemisphericus Roemer, Sil. Fauna West. Tennessee, 1860, p. 25, pl. 2, figs. 3, 3a.—Miller, N. A. Geol. Pal., 1889, fig. 228 (p. 207).

Fistulipora hemispherica Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 270.

Fistulipora (Thecostegites) hemispherica Foerste, Jour. Geol., 11, 1903, p. 712 (loc. occ.).

Niagaran (Brownsport): Perry and Wayne Counties, Tennessee.

Fistulipora laminata (Hall).

Callopora laminata Hall, Pal. New York, 2, 1852, p. 146, pl. 40, figs. 3a–e.

Leioclema? laminatum Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 416, 425.

Lioclema (?Nicholsonella) laminatum Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 304.

Fistulipora laminata Bassler, Bull. U. S. Geol. Surv., 292, 1906, pp. 22, 23, pl. 7, figs. 4–6; pl. 8, figs. 9, 10.

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

Plesiotype.—Cat. No. 35467, U.S.N.M.

Fistulipora? laxata Ulrich. See Favositella laxata.

Fistulipora lens Whitfield. See Calloporella? lens.

Fistulipora lockportensis Bassler.

Fistulipora lockportensis Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 23, pl. 7, figs. 1–3.

Clinton (Rochester): Lockport and Rochester, New York.

Cotypes.—Cat. No. 35489, U.S.N.M.

Fistulipora? multipora James.

Fistulipora? multipora James, Paleontologist, 1, 1878, p. 2.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 38.

Cincinnatian: Cincinnati, Ohio, and vicinity.

Observation.—Not a valid species. Insufficiently described and types include a variety of forms.

Fistulipora neglecta Rominger.

Fistulipora neglecta Rominger, Proc. Acad. Nat. Sci. Philadelphia, 1866, p. 119.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p 272.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 125.

Lichenalia concentrica Hall, 28th Ann. Rep. New York State Mus., doc. ed., 1876, pl. 5, figs. 9–16; pl. 6, figs. 1, 2, 4, 7–10; pl. 7, figs. 3–11; ibid., mus. ed., 1879, p. 116, pl. 5, figs. 9–16; pl. 6, figs. 1, 2, 4, 7–10; pl. 7, figs. 3–11.—Quenstedt, Rochren- und Sternkorallen, 1881, p. 95, pl. 146, 71, 72.—Hall, 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 240, pl. 4, figs. 9–16; pl. 5, figs. 1, 2, 4, 7–10; pl. 6, figs. 3–11.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 7, 1884, pl. 3, fig. 5.—Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 168, pl. 17, 10.

Niagaran (Waldron): Waldron, Indiana; Newsom, Tennessee.

Fistulipora neglecta maculata (Hall).

Lichenalia concentrica var. maculata Hall, 28th Ann. Rep. New York State Mus., doc. ed., 1876, pl. 6, figs. 3, 5, 6; ibid., mus. ed., 1879, p. 117, pl. 6, figs. 3, 5, 6; 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 241, pl. 5, figs. 3, 5, 6.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 340, fig.

Fistulipora neglecta-maculata Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 272.

Niagaran (Waldron): Waldron, Indiana; Newsom, Tennessee.

FISTULIPORA OWENI James. See Cœloclema oweni.

FISTULIPORA RUGOSA Whitfield. See Batostoma? rugosum.

Fistulipora siluriana James.

Fistulipora siluriana James, Paleontologist, No. 3, 1879, p. 19.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 39.

Cincinnatian: Cincinnati, Ohio, and vicinity.

Observation.—Not a valid species. The types are not figured, are insufficiently described, and proved upon examination to include several distinct species.

FISTULIPORA SOLIDISSIMA Whitfield. See Lioclemella solidissima.

Fistulipora tuberculosa (Hall).

Rhinopora tuberculosa Hall, Pal. New York, 2, 1852, p. 170, pl. 40E, figs. 4a–c.—Grabau, Bull. New York State Mus., 45, 1901, p. 175, fig. 77; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 175, fig. 77.

Fistulipora tuberculosa Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 23, pl. 7, figs. 11–15; pl. 8, figs. 7, 8; pl. 23, fig. 14.

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

Thin sections of *holotype* and *plesiotype*.—Cat. Nos. 35485, 35486, U.S.N.M.

FISTULIPORELLA Simpson. Genotype: F. constricta Hall and Simpson.

Fistuliporella Simpson, 14th Ann. Rep. State Geol. New York, 1897, p. 560.—Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 262.

Fistuliporella cumulata Ulrich and Bassler.

Fistuliporella cumulata Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 263, pl. 41, figs. 1–5.

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

Cotypes.—Cat. No. 53661, U.S.N.M.

Fistuliporella marylandica Ulrich and Bassler.

Fistuliporella marylandica Ulrich and Bassler, Maryland Geol. Surv., Low, Dev., 1913, p. 266, pl. 45, figs. 8–11; pl. 48, fig. 4.

Helderbergian (Keyser): Cash Valley, Maryland.

Cotypes.—Cat. No. 60756, U.S.N.M.

Fistuliporella maynardi Ulrich and Bassler.

Fistuliporella maynardi Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, pl. 46, figs. 3–7.

Helderbergian (Keyser): Cash Valley, Maryland.

Cotypes.—Cat. No. 60755, U.S.N.M.

Fistuliporella minima Ulrich and Bassler.

Fistuliporella minima Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 265, pl. 43, figs. 13–16.

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

Holotype.—Cat. No. 53659, U.S.N.M.

Fistuliporella quinquedentata Ulrich and Bassler.

Fistuliporella quinquedentata Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 264, pl. 41, figs. 6–8.

Helderbergian (Keyser): Keyser, West Virginia.

Holotype.—Cat. No. 53660, U.S.N.M.

FLABELLIPORELLA Simpson. See Polypora McCoy.

FLABELLIPORINA Simpson. See Fenestella Lonsdale.

FLETCHERIA Edwards and Haime. Genotype: F. tubifera Edwards and Haime.
Fletcheria Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal., 1851 (Arch. du Mus. d'Hist. Nat., 5), p. 156, 300.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 446.—Milne-Edwards, Hist. Nat. d. Corall, 3, 1860, p. 300.—Duncan, Rep. 41st Meeting British Assoc. Adv. Sci., 1872, p. 130.—Lindstrom, Ann. Mag. Nat. Hist., 4th ser., 18, 1876, p. 13.—Zittel, Handb. Pal., 1, 1879, p. 235.—Nicholson, Tab. Corals Pal. Period, 1879, p. 206.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 488.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1889, p. 47.—Sherzer, Amer. Geol., 7, 1891, pp. 296–301.

Fletcheria incerta (Billings).
Columnaria incerta Billings, Canadian Nat. Geol., 4, 1859, p. 428, fig. 1, 2; Geol. Canada, Geol. Surv. Canada, 1863, p. 124, fig. 44, a, b.
Fletcheria incerta Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 48, pl. 1, figs. 8, 8a, 9.
Chazyan: Mingan Islands, Island of Montreal, etc., Quebec; Ottawa, Ontario.

FRAMMIA Holtedahl. Genotype: F. dissimilis Holtedahl.
Frammia Holtedahl, 2d Arct. Exp. Fram, 1898–1902, No. 32, 1914, p. 35.

Frammia dissimilis Holtedahl.
Frammia dissimilis Holtedahl, 2d Arct. Exp. "Fram," 1898–1902, No. 32, 1914, p. 35, pl. 8, figs. 17, 18, ?19.
Helderbergian (Lower beds): Southwestern Ellesmereland, Arctic America.

FUCOIDES ALLEGHANIENSIS Taylor. See Arthrophycus alleghaniensis.

Fucoides auriformis Hall.
Fucoides auriformis Hall, Nat. Hist. New York, Geol., 4, 1843, p. 47, pl. 1, fig. 2; Pal. New York, 2, 1852, p. 7, pl. 3, fig. 3.
Upper Medinan: Medina, etc., New York.
Observation.—Probably a burrow.

FUCOIDES BILOBA Vanuxem. See Rusophycus biloba.

FUCOIDES BRONGNIARTII Harlan. See Arthrophycus alleghaniensis.

FUCOIDES DEMISSUS Vanuxem. See Phytopsis tubulosa.

FUCOIDES DENTATUS Brongniart. See Diplograptus dentatus and Diplograptus foliaceus.

FUCOIDES HARLANI Vanuxem. See Arthrophycus alleghaniensis.

Fucoides heterophyllus Hall.
Fucoides heterophyllus Hall, Nat. Hist. New York, Geol., 4, 1843, p. 47, pl. 1, fig. 3; Pal. New York, 2, 1852, p. 7, pl. 3, fig. 4.
Upper Medinan: Medina, etc., New York.
Observation.—Probably a burrow.

FUCOIDES LINEARIS Haldemann. See Scolithus linearis.

FUCOIDES SERRA Brongniart. See Tetragraptus serra.

FUCOIDES SIMPLEX Emmons. See Diplograptus foliaceus.

FUNGISPONGIA Ringueberg. Genotype: F. irregularis Ringueberg.
Fungispongia Ringueberg, Proc. Acad. Nat. Sci. Philadelphia, 1884, p. 147.

Fungispongia irregularis Ringueberg.

Fungispongia irregularis Ringueberg, Proc. Acad. Nat. Sci. Philadelphia, 1884, p. 147, pl. 3, fig. 3.

Lower Clinton: Lockport, New York.

FUSISPIRA Hall. Genotype: F. ventricosa Hall.

Fusispira Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 229 (Extract, 1871, p. 5).—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, pp. 315, 316.—Zittel, Handb. Pal., 2, 1882, p. 239.—Miller, N. A. Geol. Pal., 1889, p. 404.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1075.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 697.

Fusispira angusta Ulrich and Scofield.

Fusispira angusta Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1079, pl. 81, figs. 28–31.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 697, fig. 1002e.

Trenton: Near Cannon Falls and near Fonntain, Minnesota (Prosser); near Burgin, Kentucky.

Cotypes.—Cat. No. 45811, U.S.N.M.

Fusispira angusta subplana Ulrich and Scofield.

Fusispira angusta var. subplana, Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1079, pl. 81, fig. 32.

Trenton (Prosser): Near Cannon Falls, Minnesota.

Cotypes.—Cat. No. 43812, U.S.N.M.

Fusispira calcifera (Billings).

Subulites calcifera Billings, Canadian Nat. Geol., 4, 1859, p. 360, fig. 10; Geol. Canada, Geol. Surv. Canada, 1863, p. 120, fig. 34.—Miller, N. A. Geol. Pal., 1889, p. 428, fig. 717.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1142, fig.

Fusispira calcifera Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1070 (gen. ref.).

Canadian (Romaine): Mingan Islands, Quebec.

Fusispira compacta Hall and Whitfield.

Fusispira compacta Hall and Whitfield, U. S. Geol. Expl. 40th Paral., 4, 1877, p. 236, pl. 1, fig. 25.

Pogonip: Pogonip Mountain, White Pine District, Nevada.

Holotype.—Cat. No. 17365, U.S.N.M.

Fusispira convexa Ulrich and Scofield.

Fusispira convexa Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1077, pl. 80, figs. 8–10.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 697, fig. 1002d.

Trenton: Trenton Falls, New York; near Cannon Falls, Minnesota (Prosser).

Cotypes.—Cat. Nos. 45813, 45814, U.S.N.M.

Fusispira daphne (Billings).

Subulites Daphne Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 223, fig. 206.

Fusispira daphne Ulrich and Scofield, Geol. Minnesota, 1897, p. 1070 (gen. ref.).

Chazyan (Quebec—L): Point Rich, Newfoundland.

Fusispira elongata Hall.

Fusispira elongata Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, pl. 8, fig. 5, p. 229 (Extract, 1871, p. 6).—Whitfield, Geol. Wisconsin, 4, 1882, p. 245, pl. 9, fig. 3.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 167, fig.—Whiteaves, Pal. Fossils, Geol. Surv. Canada, 3, pt. 3, 1897, p. 200 (loc. occ.).

Trenton: Elkader, Iowa (Prosser); Lower Fort Garry, Manitoba.

Fusispira inflata (Meek and Worthen).

Subulites inflatus Meek and Worthen, Proc. Acad. Nat. Sci., Philadelphia, 1870, p. 47; Geol. Surv. Illinois, 6, 1875, p. 495, pl. 23, fig. 5.

Fusispira inflata Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1075, pl. 80, figs. 17 and 18.—Whiteaves, Pal. Fossils, 1, Geol. Surv. Canada, 3, pt. 3, 1897, p. 199.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 168.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 697, fig. 1002a.

Trenton: Carroll County, Illinois (Galena); Hader, Wykoff, etc., Minnesota (Prosser and Stewartville); Lake Winnipeg, Canada; Baffin Land.

Plesiotypes.—Cat. Nos. 45815, 45816, U.S.N.M.

Fusispira inflata ventricosa (Hall).

Fusispira ventricosa Hall, 24th Rep. New York State Mus. Nat. Hist., 1872, p. 229, pl. 8, fig. 6 (extract, 1871, p. 5).—Whitfield, Geol. Wisconsin, 4, 1882, p. 245, pl. 9, fig. 2.—Miller, N. A. Geol. Pal., 1889, p. 405, fig. 676.—Whiteaves, Canadian Rec. Sci., 5, 1893, p. 328 (loc. occ.).

Fusispira inflata var. ventricosa Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1075, pl. 80, figs. 17, 18.

Trenton: Depere, West Jefferson, etc., Wisconsin; Stewartville, Wykoff, etc., Minnesota.

Fusispira intermedia Ulrich and Scofield.

Fusispira intermedia Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1076, pl. 80, figs. 19–21.

Trenton (Prosser and Stewartville): Stewartville and south of Cannon Falls, Minnesota.

Cotype.—Cat. No. 45817, U.S.N.M.

Fusispira nobilis Ulrich and Scofield.

Fusispira nobilis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1078, pl. 80, figs. 2–4.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 168.

Trenton: Wykoff, Pleasant Grove, and Fountain, Minnesota (Prosser); Baffin Land.

Cotypes.—Cat. No. 45818, U.S.N.M.

Fusispira obesa (Whitfield).

Subulites obesus Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 318, pl. 26, fig. 7.

Fusispira obesa Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1070, (gen. ref.).

Canadian (Beekmantown): Fort Cassin, Vermont.

Fusispira planulata Ulrich and Scofield.

Fusispira planulata Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1078, pl. 81, figs. 26, 27.

Trenton (Prosser): Wykoff, Minnesota; Eagle Point, Iowa.

Holotype.—Cat. No. 45819, U.S.N.M.

Fusispira psyche (Billings).

Subulites psyche Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 188, fig. 169.

Fusispira psyche Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1070 (gen. ref.).

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

Fusispira schucherti Ulrich and Scofield.

Fusispira schucherti Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1076, pl. 80, fig. 1.

Black River (Platteville): Beloit, Wisconsin.

Fusispira(?) spicula Sardeson.

Fusispira(?) spicula Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, 1892, p. 336, pl. 6, figs. 10, 11.

Black River (Decorah): Minneapolis, Minnesota.

Fusispira subbrevis Ulrich and Scofield.

Fusispira subbrevis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1076, pl. 80, figs. 11–16.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 697, fig. 1002b.

Trenton (Prosser and Stewartville): South of Cannon Falls and Stewartville, Minnesota; Decorah, Iowa.

Cotype.—Cat. No. 45820, U.S.N.M.

Fusispira subfusiformis (Hall).

Murchisonia subfusiformis Hall, Pal. New York, 1, 1847, p. 180, pl. 39, figs. 2a, b; 3d Rep. New York State Cab. Nat. Hist., 1850, p. 179, pl. 4, fig. 2 (doc. ed., p. 171).—Chapman, Canadian Jour., n. s., 7, 1862, p. 121, fig. 123; ibid., 8, 1863, p. 199, fig. 190; Expos. Min., Geol. Canada, 1864, p. 124, fig. 123; p. 171, fig. 190.—Nicholson, Rep. Pal. Proc. Ontario, pt. 2, 1875, p. 18, fig. 7b.

Loxonema subfusiformis D'Orbigny, Prodr. de Pal., 1, 1849, p. 5 (gen. ref.).—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 163.

Subulites subfusiformis Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 946 (gen. ref.).

Fusispira subfusiformis Hall, 24th Rep. New York State Cab. Nat. Hist., 1871, p. 229 (gen. ref.).—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 316.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1077, pl. 81, figs. 38, 39.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 697, fig. 1002c.

Trenton: Jefferson and Lewis Counties, New York; Goodhue and Fillmore Counties, Minnesota; Burgin, Kentucky; Canada.

Plesiotype.—Cat. No. 45821, U.S.N.M.

Fusispira sulcata Ulrich.

Fusispira sulcata Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1077, pl. 81, figs. 5–7.

Fusispira cf. sulcata Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 137, pl. 3, figs. 4, 5.

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

Holotype.—Cat. No. 45822, U.S.N.M.

Fusispira terebriformis Hall.

Fusispira terebriformis Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 230, pl. 8, fig. 4 (Extract, 1871, p. 6).—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 316.

Eden (Economy): Cincinnati, Ohio.

Fusispira ventricosa Hall. See Fusispira inflata ventricosa.

Fusispira vittata (Hall).

Murchisonia vittata Hall, Pal. New York, 1, 1847, p. 181, pl. 39, figs. 3a, b.

Loxonema vittata D'Orbigny, Prodr. de Pal., 1, 1849, p. 5 (gen. ref.).—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 163.

Fusispira vittata Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 229 (Extract, 1871, p. 5).

Trenton: Adams, Jefferson County, New York.

GAUROCRINUS Miller. See Reteocrinus Billings.

GAUROCRINUS ANGULARIS Miller. See Ptychocrinus parvus.

GAUROCRINUS COGNATUS Miller. See Reteocrinus nealli.

GAUROCRINUS SPLENDENS Miller. See Ptychocrinus splendens.

GAZACRINUS Miller. Genotype: G. inornatus Miller.

Gazacrinus Miller, 18th Rep. Geol. Surv. Indiana, 1894, p. 305 (adv. sheets, 1892, p. 49); N. A. Geol. Pal., 1st App., 1892, p. 679; ibid., 2d App., 1897, p. 746.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 78, fig. 38 (includes notes on synonymy).—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 188, fig. 119.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 187.

Idiocrinus Wachsmuth and Springer, Amer. Geol., 10, 1892, p. 135; Mem. Mus. Comp. Zool. Harvard (N. A. Crin. Camerata), 20, 1897, p. 202.—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 188.—Zittel, Grundzuge Pal., 1, 1910, p. 161. (Genotype: I. elongatus Wachsmuth and Springer.)

Gazacrinus immaturus (Hall).

Thysanocrinus immaturus Hall, Pal. New York, 2, 1852, p. 191, pl. 42, figs. 4a–f.

Rhodocrinus (Thysanocrinus) immaturus Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 398.

Dimerocrinus immaturus Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 373 (Rev. Pal., pt. 2, p. 199).

Idiocrinus immaturus Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 206, pl. 18, figs. 10a–c.

Clinton (Rochester): Lockport, New York.

Gazacrinus inornatus Miller.

Gazacrinus inornatus Miller, 18th Rep. Indiana Dept. Geol. Nat. Res., 1894, p. 303, pl. 5, figs. 9, 10, 15–17 (adv. sheets, 1892, p. 49, pl. 5, figs. 9, 10, 15–17); N. A. Geol. Pal., 1st App., 1892, p. 679, figs. 1232–33.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 188, fig. 119, 1.

Idiocrinus elongatus Wachsmuth and Springer, Amer. Geol., 10, 1892, p. 136; Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 203, pl. 18, figs. 8a–c.—Bather, Geol. Mag., dec. 4, 6, 1899, p. 126.

Niagaran (Laurel): St. Paul, Shelby County, Indiana.

Gazacrinus major Weller.

Gazacrinus major Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 78, pl. 3, figs. 1, 2.

Niagaran (Racine): Hawthorne, Illinois.

Gazacrinus milliganæ (Miller and Gurley).

Thysanocrinus milliganæ Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 8, 1896, p. 51, pl. 3, figs. 23–25.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 754, fig. 1403.

Niagaran (Brownsport): Decatur County, Tennessee.

Gazacrinus minor Weller.

Gazacrinus minor Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 80, pl. 3, figs. 3, 4.

Niagaran (Racine): Bridgeport, Illinois.

Gazacrinus ventricosus (Wachsmuth and Springer).

Idiocrinus ventricosus Wachsmuth and Springer, Amer. Geol., 10, 1892, p. 137; Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 205, pl. 18, fig. 9a, b.

Gazacrinus ventricosus Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 188, fig.

Niagaran (Laurel): St. Paul, Shelby County, Indiana.

GEINITZELLA Waagen and Wentzel. See Batostomella Ulrich.

GEISONOCERAS Hyatt. Genotype: Orthoceras rivale Barrande.

Geisonoceras Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 275; Zittel-Eastman Textb. Pal., 1, 1900, p. 518; ibid., 2d ed., 1913, p. 598.

Geisonoceras shumardi (Billings).

Orthoceras shumardi Billings, Can. Nat. Geol., 4, 1859, p. 460, fig. 36.

Geisonoceras shumardi Ruedemann, Bull. New York State Mus., 90, 1906, p. 437, pl. 12, fig. 4.

Orthoceras (Geisonoceras) shumardi Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 48.

Chazyan: Mingan Islands, Canada (Mingan); Chazy, New York (Day Point, Crown Point).

GEOCRINUS D'Orbigny. See Periechocrinus Austin.

GERASAPHES Clarke. Genotype: G. ulrichana Clarke.

Gerasaphes Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 710.

Gerasaphes ulrichana Clarke.

Gerasaphes ulrichana Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 710, figs. 14–16.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 788.—Ruedemann, Bull. New York State Mus., 49, 1906, p. 60.

Trenton (Upper): Mouth of Licking River, Covington, Kentucky.

Holotype.—Cat. No. 41951, U.S.N.M.

GILBERTSOCRINITES AMERICANUS Troost. See Diabolocrinus vesperalis.

GILBERTSOCRINITES(?) DUBIUS Troost. See Periechocrinus dubius.

GILBERTSOCRINITES ROEMERI Troost. See Dimerocrinus roemeri.

GIRVANELLA Nicholson and Etheridge.

Genotype: G. problematica Nicholson and Etheridge.

Girvanella Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1878, p. 23, pl. 9, fig. 24.—Nicholson, Geol. Mag., dec. 3, 4, 1888, p. 22.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 14, pt. 1, 1891, pp. 50, 51.—Dawson, Canadian Rec. Sci., 7, 1896, p. 212.

Strephochetus Seely, Amer. Jour. Sci. Arts, 3d ser., 30, 1885, p. 357; ibid., 32, 1886, p. 31.—Walcott, Bull. U. S. Geol. Surv., 30, 1886, p. 91.—Hinde, Geol. Mag., dec. 3, 4, 1887, p. 227.—Miller, N. A. Geol. Pal., 1889, p. 165.—Seely, Rep. State Geol. Vermont, 3, 1902, p. 156. (Genotype: S. ocellatus Seely.)

Girvanella antiqua Dawson.

Girvanella antiqua Dawson, Canadian Rec. Sci., 7, 1896, p. 214.

Cambrian or Lower Ordovician bowlder: Little Metis, Quebec.

Girvanella atrata (Seely).

Strephochetus atratus Seely, Amer. Jour. Sci. Arts, 3d ser., 32, 1886, p. 32; Rep. State Geol. Vermont, 3, 1902, p. 157, pl. 57, fig. 1, pl. 58, fig. 9.

Chazyan (Crown Point): McBrides Bay, South Hero, Vermont; Chazy, New York.

Girvanella brainerdi (Seely).

Strephochetus Brainerdi Seely, Amer. Jour. Sci. Arts, 3d ser., 32, 1886, p. 32; Rep. State Geol. Vermont, 3, 1902, p. 156, pl. 57, figs. 2, 58, figs. 7, 8.

Chazyan (Crown Point): Chazy, New York.

Observation.—See G. ocellata (Seely).

GIRVANELLA LABYRINTHICA Ulrich. See Streptospongia labyrinthica.

Girvanella ocellata (Seely).

Strephochetus ocellatus Seely, Amer. Jour. Sci. Arts, 3d ser., 30, 1885, p. 357, figs. 1–3; Amer. Jour. Sci., 3d ser., 32, 1886, p. 31.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1083.—Dawson, Canadian Rec. Sci., 7, 1896, p. 213.—Seely, Rep. State Geol. Vermont, 3, 1902, p. 156, pls. 56, 57, figs. 3, 4, 59.

Chazyan: Addison County, Vermont; Crown Point, New York (Crown Point); East Tennessee (Lenoir).

Observation.—Girvanella brainerdi and G. prunus Seely are probably synonyms of this species.

Girvanella prunus (Seely).

Strephochetus prunus Seely, Rep. State Geol. Vermont, 3, 1902, p. 160, pl. 57, fig. 5; pl. 58, fig. 6.

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

Observation.—See G. ocellata (Seely).

Girvanella richmondensis (Miller).

Stromatocerium richmondense Miller, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 41, pl. 2, figs. 1, 1a, 1b.—James, J. F., ibid., 9, p. 252.

Girvanella richmondense James, J. F., ibid., 14, pt. 1, 1891, p. 51.

Strephochetus Richmondense Seely, Amer. Jour. Sci. Arts, 3d ser., 32, 1886, p. 33.—Miller, N. A. Geol. Pal., 1889, p. 165, fig. 122.—Seely, Rep. State Geol. Vermont, 3, 1902, p. 157.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 706, pl. 2, figs. 3–3b.

Richmond (Whitewater): Richmond, Indiana.

GISSOCRINUS Angelin. Genotype: Actinocrinus arthriticus Phillips.

Gissocrinus Angelin, Icon. Crinoid., 1878, p. 10, pl. 3, figs. 1–3, 5b; pl. 29, fig. 75.—Zittel, Handb. Pal., 1, 1879, p. 353.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 312 (Rev. Pal., pt. 1, p. 89); ibid., 1886, pp. 115, 151; ibid., 1889, pp. 285, 312.—Bather, Ann. Mag. Nat. Hist., 6th ser., 5, 1890, p. 332, pl. 14, fig. 21; Kongl. Sv. Vet. Akad. Handl., 25, No. 2, 1893, p. 152; Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 175, fig. 90; Amer. Geol., 26, 1900, p. 308.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 156.—Zittel, Grundzüge Pal., 1, 1910, p. 154.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 220.

Gissocrinus? problematicus Rowley.

Gissocrinus? problematicus Rowley, Amer. Geol., 34, 1904, p. 277, pl. 16, figs. 37–41.

Upper Medinan (Edgewood): Three miles west of Louisiana, Missouri.

GLADIOLITES VENOSUS Gurley. See Retiolites geinitzianus venosus.

GLAPHURUS Raymond. Genotype: Arionellus pustulatus Walcott.

Glaphurus Raymond, Annals Carnegie Mus., 3, 1905, p. 357.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 313.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 723.

GLAPHURUS PRIMUS Raymond. See Cybeloides primus.

Glaphurus pustulatus (Walcott).

Arionellus pustulatus Walcott, 31st Ann. Rep. New York State Mus. Nat. Hist., 1879 (1880), (adv. sheets, 1877, p. 15), p. 68.

Sao(?) Lamottensis Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1881, p. 334, pl. 33, figs. 9–11.—Brainerd and Seely, Bull. Amer. Mus. Nat. Hist., 3, 1890, p. 22.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 925, figs.

Agraulos (Arionellus) pustulatus Vogdes, Bull. U. S. Geol. Surv., No. 63, 1890, p. 90.

Glaphurus pustulatus Raymond, Ann. Carnegie Mus., 3, 1905, p. 357, pl. 14, figs. 4–6, fig. 3; ibid., 7, 1910, p. 74, pl. 18, figs. 9–11; 7th Rep. Vermont State Geol., 1910, p. 234, pl. 36, figs. 4–6; pl. 38, figs. 9–11.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 313, figs. 1625, 1626.—Perkins, Rep. Vermont State Geol., 8th ser., 1912, pl. 18, figs. 9–11.

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

GLASSIA Davidson. Genotype: Atrypa obovata Sowerby

Glassia Davidson, Geol. Mag., n. s., 8, 1881, p. 11; Sup. British Dev. and Sil. Brach., Pal. Soc., 1882, p. 38.—Davidson, Mon. British Foss. Brach., 5, Sil. Suppl., Pal. Soc., 1882, pp. 86, 116.—Miller, N. A. Geol. Pal., 1889, p. 346.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 152, figs. 142–145; 13th Ann. Rep. New York State Geol., 1895, p. 811.—Koken, Die Leitfossilien, Leipzig, 1896, p. 238.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 409.

GLASSIA HEADI Miller. See Catazyga headi.

Glassia romingeri Hall and Clarke.

Glassia romingeri Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 153, pl. 83, figs. 32–35; 48th Rep. New York State Mus., 2, for 1895, 1897, p. 363, pl. 8, figs. 33–36; 14th Rep. State Geol. New York for 1894, 1877, p. 363, pl. 9, figs. 33–36.

Trenton: Drift near Ann Arbor, Michigan.

GLASSIA SCHUCHERTANA Ulrich. See Catazya headi schuchertana.

Glassia variabilis Whiteaves.

Glassia variabilis Whiteaves, Geol. Surv. Canada, Ann. Rep., n. s., 14, App. F. 1894, p. 42; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 252, pl. 26, figs, 6–6b; p. 273; pl. 26, figs. 3–5; p. 277, pl. 26, figs. 7–9.

Niagaran: Winisk, Ekwan, and Fawn rivers, Canada.

GLAUCOCRINUS Parks and Alcock. Genotype: G. falconeri Parks and Alcock.

Glaucocrinus Parks and Alcock, The Ottawa Nat., 26, 1912, p. 43.

Observation.—Probably a synonym for Anomalocrinus.

Glaucocrinus falconeri Parks and Alcock.

Glaucocrinus falconeri Parks and Alcock, The Ottawa Nat., 26, 1912, p. 43, pl. 4, figs. 1, 4.

Trenton (Curdsville): Kirkfield, Ontario.

GLAUCONOME Goldfuss. Genotype: G. disticha Goldfuss.

Glauconome Goldfuss, Petrefacta Germaniæ, 1826, p. 100.—Lonsdale, Murchison's Sil. Syst., 1839, p. 677.—Phillips, Pal. Foss. Cornwall, Devon, and W. Somerset, 1841, p. 21.—Etheridge, Ann. Mag. Nat. Hist., 4th ser., 20, 1877, p. 32.—McCoy, Syn. Char. Carb. Foss. Ireland, 1844, p. 198.—Vine, Rep. 53d Meeting British Assoc. Adv. Sci., 1884, p. 204.—Shrubsole and Vine, Quart. Jour. Geol. Soc. London, 1884, 40, p. 329.—Goldfuss, Petrefacta, 2d ed., pt. 1, 1862, p. 94.—Vine, Rep. 50th Meeting British Assoc. Adv. Sci., 1880, p. 82; Geol. Mag., dec. 2, 7, 1880, p. 507; Rep. 51st Meeting British Assoc. Adv. Sci., 1882, p. 170.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 159, 160; Zittel-Eastman Textb. Pal., 1913, p. 343.

Penniretepora D'Orbigny, Prodr. de Pal., 1, 1850, p. 45.—Zittel, Handb. Pal., 1, 1880, p. 603.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 150.

Glauconome strigosa (Billings).

Helopora strigosa Billings, Catal. Sil. Foss. Anticosti, 1866, p. 37.

Nematopora(?) strigosa Ulrich, Amer. Geol., 1, 1888, p. 232, footnote; Geol. Surv. Illinois, 8, 1890, p. 645.

Glauconome strigosa Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 161, 162, fig. 81.

Species No. 1.—Wiman, Bull., Geol. Inst. Univ. Upsala, 5, pt. 2, 1902, p. 181, pl. 6, figs. 29–33.

Silurian: Island of Anticosti, Canada (Charleton, Ellis Bay); Borkholm, Esthonia, Russia (Borkholm).

GLOSSINA Phillips. See Lingula subgenus Palæoglossa Cockerell.

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

GLOSSINA CYANE Schuchert. See Obolus cyane.

GLOSSOCERAS Barrande. Genotype: G. gracile Barrande.

Glossoceras Barrande, Syst. Sil. du Centre Boheme, 2, pt. 1, 1867, p. 372; Cephalopodes: Ext. Syst. Sil. du Centre Boheme, 1877, p. 118.—Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 279.—Zittel, Handb. Pal., 2, 1884, p. 373.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 253.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 23, No. 12, 1890, p. 33.—Koken, Die Leitfossilien, Leipzig, 1896, p. 49, fig. 32, fig. 2.—Hyatt, Zittel-Eastman Textb. Pal., 1, 1900, p. 516; ibid., 2d ed., 1913, p. 597.

Glossoceras desideratum Billings.

Glossoceras desideratum Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 60.

Anticostian (Jupiter River): Southwest Point, Anticosti.

GLOSSOGRAPSUS Emmons. See Glossograptus Emmons.

GLOSSOGRAPTUS Emmons. Genotype: G. ciliatus Emmons.

Glossograpsus Emmons, Amer. Geology, 1, pt. 2, 1855, p. 108.

Glossograptus Zittel, Handb. Pal., 1, 1879, p. 302.—Miller, N. A. Geol. Pal., 1889, p. 189.—Koken, Die Leitfossilien, Leipzig, 1896, p. 329.—Roemer and Frech, Leth. geog., 1 Theil, Leth. Pal., 1, 3 Lief. 1897, p. 631.—Elles and Wood, Mon. British Grapt., Pal. Soc., 1903, p. 38.—Ruedemann, Mem. New York State Mus., 7, 1904, p. 724; ibid., 11, pt. 2, 1908, pp. 375–379; Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 130.

Glossograptus arthracanthus Gurley.

Diplograpsus ciliatus Emmons, Amer. Geology, 1, pt. 2, 1855, p. 105, pl. 1, fig. 19; Man. Geol., 1860, p. 87, fig. 65.

Glossograpsus arthracanthus Gurley, Jour. Geol., 4, 1896, p. 78.

Normanskill or Early Trenton: Augusta County, Virginia.

Glossograptus ciliatus Emmons.

Glossograptus ciliatus Emmons, Amer. Geology, 1, pt. 2, 1856, p. 108, pl. 1, fig. 25.—Lapworth, Quart. Jour. Geol. Soc. London, 31, 1875, p. 659, pl. 34, fig. 7; Roy. Soc. Canada Trans., 5, 4th sec., 1887, p. 184; Canadian Geol. Surv. Rep., 2d ser., 3, pt. 1, 1889, p. 95B.—Ami, Geol. Surv. Canada Rep., 2d ser., 3, pt. 2, 1889, p. 117K.—Gurley, Geol. Surv. Ark., Ann. Rep., 3, 1892, p. 404f.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 379–383, pl. 26, figs. 1–5; pl. 27, figs. 1–4, figs. 324–335.

Diplograptus ciliatus Walcott, Alb. Inst. Trans., 10, 1881 (adv. sheets, 1879, p. 34).

Glossograptus setaceus Emmons, Amer. Geology, 1, 1856, p. 236, pl. 1, fig. 20.

Graptolithus spinulosus Hall, Pal. New York, 3, 1859, p. 517, fig.; New York State Cab. Nat. Hist., 13th Ann. Rep., 1860, p. 60, fig.

Glossograptus spinulosus Lapworth, Ann. Mag. Nat. Hist., 5, 1880, p. 283.—Dodge, Amer. Jour. Sci., 3d ser., 40, 1890, p. 153.

Diplograptus spinulosus Walcott, Trans. Alb. Inst., 10, 1881, p. 35; Bull. Geol. Soc., 1, 1890, p. 339.

Chazyan (Normanskill): Glenmont and other localities in slate belt of New York; Alabama; Long Point, St. Anne River, Quebec; Kicking Horse Pass and Dease River, British Columbia; Arkansas; Maine; North Wales.

Glossograptus ciliatus debilis Ruedemann.

Glossograptus ciliatus var. debilis Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 384, pl. 26, figs. 6, 7.

Chazyan (Normanskill): Mount Moreno, near Hudson, New York.

Glossograptus ciliatus horridus Ruedemann.

Glossograptus ciliatus Emmons mut. horridus Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 383, 384, pl. 26, figs. 8, 9; pl. 27, fig. 5.

Canadian: Summit, Nevada.

Holotype and *paratype*.—Cat. No. 54254, U.S.N.M.

Glossograptus echinatus Ruedemann. See Glossograptus hystrix.

Glossograptus? eucharis Ruedemann. See Lasiograptus (Thysanograptus) eucharis.

Glossograptus hystrix Ruedemann.

Glossograptus sp. Ruedemann, New York State Pal., Ann. Rep., 1902, p. 571.

Glossograptus hystrix Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 724, 725, pl. 16, figs. 27–29, text fig. 101.

Glossograptus echinatus Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 725–726, pl. 16, figs. 30–32, fig. 102.

Canadian: Deepkill, Rensselaer County, and Mount Moreno, near Hudson, New York (Deepkill, Diplograptus dentatus zone); Arkansas.

Glossograptus (Orthograptus) quadrimucronatus (Hall).

Graptolites dentatus Vanuxem, Geol. New York, 3d Dist., 1842, p. 57, fig. 2.—Emmons, Geology New York, 2d Dist., 1842, p. 279, fig. 2.—Hall, ibid., 4th Dist., 1843, p. 29.

Glossograptus (Orthograptus) quadrimucronatus—Continued.

Graptolithus pristis (in part) Hall, Pal. New York, 1, 1847, p. 265, pl. 57, figs. 1a–k.

Diplograptus pristis Ruedemann, Amer. Jour. Sci., 3d ser., 49, 1895, p. 453.—Wiman, Bull. Geol. Inst. Upsala, 5, 1895, p. 69.—Törnquist, Zool. Centralbl. 4, 1897, p. 4.

Graptolithus quadrimucronatus Hall, Geol. Surv. Canada, Can. Org. Rem., dec. 2, 1865, p. 144, pl. 13, figs. 1–10; New York State Cab. Nat. Hist., 20th Ann. Rep. 1868, pl. 3, figs. 1–5; rev. ed., 1870, p. 230; p. 224.—White, U. S. Geog. Surv. West 100th Merid., Wheeler's Rep., 4, Pal., 1877, p. 65, pl. 4, figs. 1a–b.—Walcott, Trans. Alb. Inst., 10 (adv. sheets, 1879, p. 35), 1881, p. 4 (loc. occ.).

Diplograptus quadrimucronatus Nicholson, Geol. Mag., 4, 1867, p. 111, pl. 7, figs. 1–8.—Lapworth, Geol. Mag., 6, 1877, p. 133, pl. 6, fig. 20; Belfast Nat. Field Club, Rep. and Proc., 1, 1876, App. 1877, p. 133, pl. 6, fig. 20.—Linnarsson, Sver. Geol. Und., ser. C, No. 41, 1879, p. 18.—Lapworth, Ann. Mag. Nat. Hist., 5th ser., 5, 1880, p. 359.—Tullberg, Sver. Geol. Und., ser. C, No. 41, 1880, p. 18; ibid., No. 50, 1882, p. 18.—Ruedemann, Bull. New York State Mus., 42, 1901, p. 528.

Diplograptus (Orthograptus) quadrimucronatus T. S. Hall, Geol. Surv. Victoria Rec., 1, pt. 4, 1906, p. 275, pl. 34, figs. 10, 11.

Orthograptus quadrimucronatus Ami, Can. Rec. Sci., 1893, 5, pp. 180, 234; Geol. Surv. Canada, Summ. Rep., 1904, 1905, p. 12.—Roemer and Frech, Leth. geog., 1 Theil, Leth Pal., 1, 3 Lief., 1897, p. 633.

Glossograptus (Orthograptus) quadrimucronatus Ruedemann, Mem. New York State Mus., 2, pt. 2, 1908, pp. 385–392, fig. 336 (see pl. 26, figs. 10–15; pl. 27, figs. 6, 7).

Orthograptus amii Lapworth, Can. Surv. Ann. Rep., 1887, pp. 15K, 24K.

Diplograptus foliaceus (in part) Ruedemann, New York State Geol. Ann. Rep. for 1894, 1895, pl. 1, figs. 1, 5, 8, 9; pl. 2, fig. 6; pl. 3, figs. 1–26; Amer. Nat., 32, 1898, p. 6; Mem. New York State Mus., 7, 1904, p. 528, fig. 9.

Diplograptus aff. whitfieldi Roemer and Frech, Leth. Pal., 1, 1897, pl. A, figs. 1b, 1c.

Trenton: Lake St. John, Quebec, Montreal, north shore Lake Huron and Ottawa (Collingwood), and in belt girdling the Adirondacks; Great Britain (Hartfell); Scandinavia; Australia.

Plesiotype.—Cat. No. 8557, U.S.N.M.

Glossograptus (Orthograptus) quadrimucronatus approximatus Ruedemann.

Glossograptus quadrimucronatus var. approximatus Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 392, 393, pl. 26, figs. 10–15; pl. 27, figs. 6, 7, fig. 337.

Trenton (Canajoharie): Dolgeville, Mechanicsville, etc., New York.

Glossograptus (Orthograptus) quadrimucronatus cornutus Ruedemann.

Glossograptus quadrimucronatus var. cornutus Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 393, 394, pl. 27, figs. 8–10, figs. 338–342.

Trenton (Canajoharie): Rural cemetery, Albany, New York.

Glossograptus (Orthograptus) quadrimucronatus postremus Ruedemann.

Glossograptus quadrimucronatus mut. postremus Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 394, pl. 26, fig. 16, fig. 343.

Trenton (Canajoharie): Waterford, Frankfort, etc., New York.

Glossograptus setaceus Emmons. See Glossograptus ciliatus.

Glossograptus spinulosus Lapworth. See Glossograptus ciliatus.

Glossograptus whitfieldi (Hall).

Graptolithus whitfieldi Hall, Pal. New York, 3, 1859, p. 516, fig. 1; New York State Cab. Nat. Hist., 13th Rep., 1860, p. 60, fig. 1; Geol. Surv. Canada, Can. Org. Rem., dec. 2, 1865, p. 31, fig. 29; p. 36, fig. 31; non pl. B, figs. 6–11; New York State Cab. Nat. Hist., 20th Rep., 1868, p. 199, fig. 31; p. 205, fig. 33; pl. 1, figs. 6–11; pp. 230, 236, 224.

Diplograpsus whitfieldi Nicholson, Geol. Mag., 4, 1867, 111, pl. 7, figs. 4, 4a.

Diplograptus whitfieldi Nicholson, Mon. British Grapt., 1872, p. 54, fig. 23; p. 69, fig. 30b.—Lapworth, Cat. West. Scott. Foss., 1876, pl. 2, fig. 45; Belfast Field Club Ann. Rep. Proc., 2d ser., App., 1, pt. 4, p. 134, pl. 6, fig. 21.—Zittel, Handb. Pal., 1, 1879, p. 294, fig. 200.—Lapworth, Ann. Mag. Nat. Hist., 5th ser., 6, 1880, p. 21.—Walcott, Trans. Alb. Inst., 1883, 10 (adv. sheet, 1879, p. 35).—Lapworth, Roy. Soc. Can. Proc., Trans., 4, 1886, 184.—Ami, Geol. Sur. Can. Rep., ser. 2, 3, pt. 2, 1889, p. 117K.—Geinitz, Mitth. K. Min. Geol. praeh., Mus. Dresden, 9, 1890, 35, pl. A, fig. 52.—Gurley, Geol. Surv. Arkansas, Rep., 3, 1890, p. 411.—Walcott, Geol. Soc. Am. Bull., 1, 1890, 339.—James, Jour. Cincinnati Soc. Nat. Hist., 14, pt. 2, 1892, p. 158.—Frech, Leth. Geog., 1, Theil. Leth. Pal., 1, 1897, p. 631, not fig. 192.—Ruedemann, Bull. New York State Mus., 42, 1901, pp. 497, 541.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 34.—Hoek, Neues Jahrb. Min. Geol. Pal., 14, 1912, p. 233, pl. 13, figs. 2, 3.

Diplograptus (Graptolithus) whitfieldi Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 208, figs.

Glossograptus whitfieldi Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 394–397, pl. 26, fig. 17, figs. 344, 345.

Chazyan: Normanskill, Glenmont, Stockport, etc., New York; Canada; Arkansas (Normanskill); Great Britain (Glenkiln); Bolivia.

GLYCERITES Hinde. Genotype: G. sulcatus Hinde.

Glycerites Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 380.—Miller, N. A. Geol. Pal., 1889, p. 518.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 243.

Glycerites calceolus Hinde.

Glycerites calceolus Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 384, pl. 20, fig. 11.

Upper Medinan (Cataract): Toronto, Ontario.

Glycerites sulcatus Hinde.

Glycerites sulcatus Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 380, pl. 19, fig. 1.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 243, fig. 1528a.

Cincinnatian (Pulaski): Toronto, Ontario.

Glycerites sulcatus excavatus Hinde.

Glycerites sulcatus var. excavatus, Hinde, Quart. Jour. Geol. Soc. London, 35, 1879, p. 380, pl. 19, fig. 10.

Cincinnatian (Pulaski): Toronto, Ontario.

GLYPTASTER Hall. See Dimerocrinus Phillips.

GLYPTASTER (EUCRINUS) ANGULARIS Wachsmuth and Springer. See Ptychocrinus parvus.

GLYPTASTER ARMOSUS Wachsmuth and Springer. See Siphonocrinus armosus.

GLYPTASTER OCCIDENTALLIS var. CREBESCENS Hall. See Dimerocrinus occidentalis.

GLYPTOCERAS Foerste. See Cyrtoceras Goldfuss.

GLYPTOCRINITES Carpenter. See Glyptocrinus Hall.

GLYPTOCRINUS Hall. Genotype: G. decadactylus Hall.

Glyptocrinus Hall, Pal. New York, 1, 1847, p. 281.—McCoy, British Pal. Rocks, Foss., 1854, p. 56.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 223.—Billings, Canadian Nat. Geol., 1, 1856, p. 53; Geol. Surv. Canada, Rep. Progr., 1853–1856, 1857, p. 256; Geol. Surv. Canada, dec. 4, 1859, p. 55, fig. 18.—Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 372.—Zittel, Handb. Pal., 1, 1879, p. 374.—Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 30.—Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1880, p. 246.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 356 (Rev. Pal., pt. 2, p. 182); ibid., 1885, p. 324; ibid., 1887, p. 105; ibid., 1890, p. 353.—Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 259.—Miller, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 217–219, 226.—Wachsmuth and Springer, Amer. Jour. Sci., 3d ser., 25, 1883, p. 255.—Carpenter, Phil. Trans. Royal Soc. London, 174, 1884, p. 929.—Miller, N. A. Geol. Pal., 1889, p. 247.—Dyche, Science, 20, 1892, p. 66.—James, Jour. Cincinnati Soc. Nat. Hist., 19, 1897, pp. 110, 111.—Bather, Treatise on Zool., 1897, p. 161.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 147.—Zittel, Grundzuge Pal., 1, 1910, p. 162.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 712.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 552.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 189.

Reteocrinus (part) Wachsmuth and Springer, Amer. Jour. Sci., 25, 1883, p. 266.

Canistrocrinus Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1885, pp. 310, 316 (Rev. Pal., 3, sec. 1, pp. 88, 94).—James, Jour. Cincinnati Soc. Nat. Hist., 19, 1897, pp. 104, 105.—Zittel, Grundzuge Pal., 1, 1910, p. 161.

Glyptocrinites Carpenter, Phil, Trans. Royal Soc. London, 174, 1884, p. 929.

GLYPTOCRINUS ANGULARIS Miller and Dyer. See Ptychocrinus parvus.

GLYPTOCRINUS ARGUTUS Walcott. See Stelidiocrinus argutus.

GLYPTOCRINUS ARMOSA Hall. See Siphonocrinus armosus.

GLYPTOCRINUS (EUCALYPTOCRINUS) ARMOSUS McChesney. See Siphonocrinus armosus.

GLYPTOCRINUS BAERI Meek. See Xenocrinus baeri.

GLYPTOCRINUS BILLINGSI Miller. See Periglyptocrinus billingsi.

GLYPTOCRINUS CARLEYI Hall. See Mariacrinus carleyi.

Glyptocrinus circumcarinatus Parks and Alcock.

Glyptocrinus circumcarinatus Parks and Alcock, The Ottawa Nat., 26, 1912, p. 45, pl. 4, figs. 2, 3.

Trenton (Curdsville): Kirkfield, Ontario.

GLYPTOCRINUS COGNATUS Miller. See Reteocrinus nealli.

Glyptocrinus decadactylus Hall.

Glyptocrinus decadactylus Hall, Pal. New York, 1, 1847, p. 281, pl. 77, figs. 1a–f; pl. 78, figs. 1a–u.—Christy, Letters on Geol., 1848, pl. 1, fig. 10.—Yandell, Proc. Amer. Assoc. Adv. Sci., 5, 1851, p. 234.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 821, fig. 622.—Hall, 12th Rep. New York State Cab. Nat. Hist., 1860, p. 69.—Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, p.

Glyptocrinus decadactylus—Continued.

207, fig. 2.—Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 30, pl. 2, figs. 5a, b.—Zittel, Handb. Pal., 1, 1879, p. 375, fig. 262.—Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 260, fig. 2.—Miller, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 220, pl. 11, figs. 1a–c.—Roemer, Leth. Geog., 1 Theil, Leth. Pal., Atlas, 1883, pl. 3, fig. 19.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 254, fig.—Miller, N. A. Geol. Pal., 1889, p. 247, figs. 313–315.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 270, pl. 20, figs. 4a–e; pl. 21, figs. 4a–b.—James, Jour. Cincinnati Soc. Nat. Hist., 19, 1897, p. 111.—Bather, Geol. Mag., dec. 4, 6, 1899, p. 32, fig. 1; Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 119, fig. 25.—Hayes and Ulrich, U. S. Geol. Surv., folio 95, illus. sheet, 1903, fig. 16.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 720, pl. 4, fig. 9.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 552, figs. 1882, 1883.

Heterocrinus decadactylus Emmons, Amer. Geology, 1, pt. 2, 1855, p. 223.

Apiocrinite(?) Anthony, Amer. Jour. Sci. Arts, 35, 1839, p. 360, text fig.

Maysville (Fairmount): Cincinnati, Ohio, and vicinity; Indiana; Kentucky.

Plesiotypes.—Cat. Nos. 35409, 40768, etc., U.S.N.M.

Glyptocrinus dyeri Meek.

Glyptocrinus dyeri Meek, Proc. Acad. Nat. Sci. Philadelphia, 1872, p. 314; Geol. Surv. Ohio, Pal., 1, 1873, p. 32, pl. 2, figs. 2a, b.—Miller, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 222.—Dyche, ibid., 15, 1892, p. 101; Science, 20, 1892, p. 66; Amer. Geol., 10, 1892, p. 130.—James, Jour. Cincinnati Soc. Nat. Hist., 19, 1897, p. 112.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 271, pl. 20, figs. 1a–c; pl. 21, figs. 3a–c, fig. 6.—Springer, Mem. Mus. Comp. Zool., Harvard, 25, No. 2, 1905, pl. 1, fig. 13.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 722, pl. 4, fig. 8.

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

Plesiotypes.—Cat. No. 40762, 40767, U.S.N.M.

Glyptocrinus dyeri sublævis Miller.

Glyptocrinus dyeri var. sublævis Miller, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 103, pl. 3, fig. 2; ibid., 1883, 7, p. 217.

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

Glyptocrinus Dyeri var. subglobosus Meek. See Glyptocrinus subglobosus.

Glyptocrinus? fimbriatus Shumard.

Glyptocrinus fimbriatus Shumard, 1st-2d Ann. Rep. Geol. Surv. Missouri, pt. 2, 1855, p. 194, pl. A, fig. 10a, b.—Miller, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 227.

Upper Medinan (Girardeau): Cape Girardeau County, Missouri.

Glyptocrinus? fornshelli Miller.

Glyptocrinus fornshelli Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 348, fig. 41; ibid., 6, 1883, p. 227; N. A. Geol., Pal., 1889, p. 248, fig. 316.—Keyes, Missouri Geol. Surv., 4, 1894, p. 162.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 276, pl. 20, fig. 3; pl. 21, fig. 5.—James, Jour. Cincinnati Soc. Nat. Hist., 19, 1897, p. 114.

Richmond (Waynesville): Near Morrow, Ohio.

Plesiotype.—Cat. No. 40771, U.S.N.M.

Glyptocrinus harrisi Miller. See Compsocrinus harrisi.

Glyptocrinus insperatus Rowley.

Glyptocrinus insperatus Rowley, Amer. Geol., 34, 1904, p. 275, pl. 16, figs. 34, 42, 43.

Upper Medinan (Edgewood): Near Edgewood, Pike County, Missouri.

Glyptocrinus insperatus carinatus Rowley.

Glyptocrinus insperatus? var. carinatus Rowley, Amer. Geol., 34, 1904, p. 278, pl. 16, fig. 56.

Upper Medinan (Edgewood): Near Edgewood, Pike County, Missouri.

Glyptocrinus insperatus pentagonus Rowley.

Glyptocrinus insperatus var. pentagonus Rowley, Amer. Geol., 34, 1904, p. 276, pl. 16, figs. 35, 36.

Upper Medinan (Edgewood): Near Edgewood, Pike County, Missouri.

GLYPTOCRINUS LACUNOSUS Billings. See Archæocrinus lacunosus.

Glyptocrinus libanus Safford.

Glyptocrinus Libanus Safford, Geol. Tennessee, 1869, p. 286 (nom. nud.).

Stones River: Lebanon, Tennessee.

GLYPTOCRINUS MARGINATUS Billings. See Archæocrinus marginatus.

Glyptocrinus mercerensis Miller and Gurley.

Glyptocrinus mercerensis Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 5, 1894, p. 28, pl. 2, fig. 23.

Trenton (Curdsville): Mercer County, Kentucky.

GLYPTOCRINUS MIAMIENSIS Miller. See Compsocrinus miamiensis.

GLYPTOCRINUS NEALLI Hall. See Reteocrinus nealli.

GLYPTOCRINUS NOBILIS Hall. See Siphonocrinus nobilis.

Glyptocrinus ornatus Billings.

Glyptocrinus ornatus Billings, Geol. Surv. Canada, Rep. Progress for 1853–56, 1857, p. 260; Geol. Surv. Canada, dec. 4, 1859, p. 60, pl. 9, fig. 2a,b.—Miller, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 225.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 274, pl. 20, fig. 6a, b.—Springer, Geol. Surv. Canada, Mem. 15P, 1911, p. 11 (loc. occ.).

Trenton (Curdsville): Ottawa and Kirkfield, Ontario.

GLYPTOCRINUS PARVUS Hall. See Ptychocrinus parvus.

Glyptocrinus? pattersoni Miller.

Glyptocrinus pattersoni Miller, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 80, pl. 3, fig. 2, 2a; ibid., 6, 1883, p. 226.

Reteocrinus Pattersoni Wachsmuth and Springer, Amer. Jour. Sci. Arts, 25, 1883, p. 266.

Canistrocrinus Pattersoni Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1885, p. 317 (Rev. Pal., pt. 3, sec. 1, p. 95.).—James, Jour. Cincinnati Soc. Nat. Hist., 19, 1897, p. 105.

Eden (Economy): Ohio River bank opposite Cincinnati, Ohio.

Glyptocrinus plumosus (Hall).

Actinocrinus? plumosus Hall, Nat. Hist. New York Geol., 4, 1843, p. 72.—Owen, Amer. Jour. Sci. Arts, 48, 1845, p. 303, fig. 5.

Glyptocrinus plumosus—Continued.

Glyptocrinus plumosus Hall, Pal. New York, 2, 1852, p. 180, pl. 41A, figs. 3a–g.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 157, fig. 52; Bull. New York State Mus., 45, p. 157, fig. 52.

Lower Clinton: Near Medina, Reynale's Basin, and Lockport, New York.

Glyptocrinus priscus Billings. See Periglyptocrinus priscus.

Glyptocrinus quinquepartitus Billings.

Glyptocrinus quinquepartitus Billings, Geol. Surv. Canada, dec. 4, 1859, pl. 8, fig. 4a, 4b.—Miller, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 217.

Trenton: Ottawa, Ontario.

Glyptocrinus ramulosus Billings.

Glyptocrinus ramulosus Billings, Canadian Nat. Geol., 1, 1857, p. 49, fig. 1; p. 54, fig. 3; p. 55, fig. 4–8; Canadian Jour., n. s., 1, 1856, p. 165; Geol. Surv. Canada, Rep. Progr. for 1853–1856, p. 258; Geol. Surv. Canada, dec. 4, p. 57, pl. 7, figs. 2a–f; pl. 8, figs. 1a–e.—Miller, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 224.—Wachsmuth and Springer, Mem. Mus. Comp. Zool. Harvard, 20, 1897, p. 273, pl. 20, fig. 5a–b.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 552.—Springer, Mem. Geol. Surv. Canada, 15 P, 1911, p. 11 (loc. occ.).

Archæocrinus? ramulosus Wachsmuth and Springer, Amer. Jour. Sci., 3d ser., 25, 1883, p. 265.

Trenton (Curdsville): Ottawa and Kirkfield, Ontario; Mercer County, Kentucky.

Glyptocrinus? richardsoni Wetherby.

Glyptocrinus richardsoni Wetherby, Jour. Cincinnati Soc. Nat. Hist., 2, 1880, p. 245, pl. 16, fig. 1, 1a.—Miller, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 227.

Reteocrinus Richardsoni Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 367 (Rev. Pal., pt. 2, p. 193).

Canistrocrinus Richardsoni Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1885, p. 317 (Rev. Pal., pt. 3, sec. 1, p. 95).—James, Jour. Cincinnati Soc. Nat. Hist., 19, 1897, p. 106.

Richmond: Wilmington, Ohio.

Glyptocrinus sculptus James. See Rhaphanocrinus sculptus.

Glyptocrinus Shafferi Miller. See Pycnocrinus shafferi.

Glyptocrinus shafferi var. germanus Miller. See Pycnocrinus germanus.

Glyptocrinus siphonatus Hall. See Siphonocrinus armosus.

Glyptocrinus subglobosus (Meek).

Glyptocrinus Dyeri var. subglobosus Meek, Proc. Acad. Nat. Sci. Philadelphia, 1872, p. 316; Geol. Surv. Ohio, Pal., 1, 1873, p. 34, pl. 2, fig. 2c.

Glyptocrinus subglobosus Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 7.—Miller, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 223.—James, Jour. Cincinnati Soc. Nat. Hist., 19, 1897, p. 114.

Reteocrinus subglobosus Wachsmuth and Springer, Amer. Jour. Sci., 3d ser., 25, 1883, p. 265.

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

Glyptocrinus? subnodosus Walcott. See Rhaphanocrinus subnodosus.

Glyptocrinus typus Miller. See Tanaocrinus typus.

GLYPTOCYSTIS Angelin. See Cheirocrinus Eichwald.

GLYPTOCYSTIS Bather (part). See Glyptocystites Billings.

GLYPTOCYSTIS LOGANI Springer. See Cheirocrinus logani.

GLYPTOCYSTIS MULTIPORUS Bather. See Glyptocystites multiporus.

GLYPTOCYSTITES Billings. Genotype: G. multiporus Billings.

Glyptocystites (part) Billings, Canadian Jour., 2, 1854, p. 215; Geol. Surv. Canada, Rep. Progr. for 1853–1856, 1857, p. 280.—Chapman, Canadian Jour., n. s., 2, 1857, p. 303.—Billings, Geol. Surv. Canada, dec. 3, 1858, p. 53.—Hall, Pal. New York, 3, 1859, p. 151.—Chapman, Expos. Min. Geol. Canada, 1864, p. 109.—Miller, N. A., Geol. Pal., 1889, p. 248.—Jaekel, Stammes. Pelmat. 1, Thecoidea u. Cystoidea, Berlin, 1899, p. 275.—Grabau and Shimer (part), N. A. Index Fossils, 2, 1910, p. 463.

Glyptocystis Bather (part), Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 64, fig. 33; Trans. Roy. Soc. Edinburgh, 49, pt. 2, 1913, p. 430.

GLYPTOCYSTITES Billings (part). See Cheirocrinus Eichwald.

GLYPTOCYSTITES GRACILIS Shumard. See Cheirocrinus logani gracilis.

Glyptocystites multiporus Billings.

Glyptocystites multipora Billings, Canadian Jour., 2, 1854, p. 216, figs. 1–8; Geol. Surv. Canada, Rep. Progr. for 1853–1856, 1857, p. 281; ibid., dec. 3, 1858, p. 54, pl. 3, fig. 1a, 1c.—Chapman, Expos. Min. Geol. Canada, 1864, p. 109.—Miller, N. A. Geol. Pal., 1889, p. 249, fig. 317.—Jaekel, Stammes. d. Pelmat., 1, Thecoidea u. Cystoidea, Berlin, 1899, p. 275, fig. 57, p. 277, pl. 15, fig. 4.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 463, fig. 1770.

Callocystis multipora Haeckel, Amphor. u. Cystoideen, 1896, p. 132, pl. 3, figs. 18–20.

Glyptocystis multiporus Bather, Treatise on Zool., pt. 3, Echinoderma, 1900, p. 64, fig. 33.—Springer, Mem. Geol. Surv. Canada, 15 P, 1911, p. 45 (loc. occ.).—Bather, Trans. Roy. Soc. Edinburgh, 49, pt. 2, 1913, p. 430, fig.

Trenton (Curdsville): Ottawa and Kirkfield, Ontario.

GLYPTODENDRON Claypole. See Cyrtoceras Goldfuss.

GLYPTOGRAPTUS Lapworth. See Diplograptus McCoy.

GLYPTORTHIS Foerste. See Hebertella subgenus Glyptorthis.

GNORIMOCRINUS Wachsmuth and Springer.
Genotype: Taxocrinus expansus Angelin.

Gnorimocrinus Wachsmuth and Springer, Proc. Nat. Acad. Philadelphia, Rev. Pal., 1, 1879, p. 50.—Bather, Rep. British Assoc. Adv. Sci., 1899, p. 922; Lankester's Treatise on Zool., 3, 1900, p. 189.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 163.—Springer, Jour. Geol., 14, 1906, p. 515; Mono. Crin. Flex., Smiths. Inst. (in press); Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 205.

Gnorimocrinus cirrifer Springer.

Gnorimocrinus cirrifer Springer, Mono. Crin. Flex., Smiths. Inst. (in press).

Niagaran (Brownsport): Decaturville, Tennessee.

Gnorimocrinus varians Springer.

Gnorimocrinus varians Springer, Mono. Crin. Flex., Smiths. Inst. (in press).

Niagaran (Brownsport): Decatur County, Tennessee.

GOLDIUS Dekoninck. Genotype: Brontes flabellifer Goldfuss.

Brontes Goldfuss (not Fabricius), Beit. Petrefact., Nova Acta Physico-Med., 19, 1839, p. 360.—Portlock, Rep. Geol. Londonderry, 1843, p. 268.

Goldius Dekoninck, Mem. Acad. Sci. Bruxelles, 14, 1841, p. 5.—Oehlert, Bull. Soc. d'Etudes Sci. d'Angers, 1885, p. 1.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 720.

Bronteus Goldfuss, Neues Jahrb. f. Min., etc., 1843, pp. 540, 548.—Burmeister, Org. der Tril., Berlin, 1843, p. 75.—Emmrich, Neues Jahrb. f. Min., etc., 1845, p. 42.—Beyrich, Ueber einige bohmische Trilobiten, 1845, p. 33.—Hawle and Corda, Abh. d. k. bohmischen Gesell. d. Wiss., 5 (extract), 1847, p. 56, pl. 4, figs. 33, 34.—Barrande, Neues Jahrb. f. Min., etc., 1850, p. 777; Syst. Sil. du Centre Boheme, 1, 1852, p. 829.—McCoy, British Pal. Rocks Fossils, 1854, p. 179.—Pictet, Traite de Pal., 2d ed., 2, 1854, p. 524.—Nieszkowski, Archiv. f. Naturk. Liv-, Ehst-u. Kurl., 1, 1857, p. 586.—Angelin, Pal. Scandinavica, 3d ed., Holmiae, 1878, p. 56.—Kayser, Zeits. d. d. geol. Gesell., 31, 1879, p. 413.—Zittel, Handb. Pal., 2, 1885, p. 613.—Hall and Clarke, Pal. New York, 7, 1888, p. 25, text fig. p. 26.—Miller, N. A. Geol. Pal., 1889, p. 535.—Whidborne, Mon. Dev. Fauna South England, 1, Pal. Soc., 1889, p. 32.—Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 726.—Koken, Die Leitfossilien, Leipzig, 1896, p. 28, fig. 18.—Beecher, Amer. Jour. Sci., 4th ser., 3, 1897, p. 104, pl. 3, fig. 21.—Clarke, 15th Ann. Rep. New York State Geol., 1898, p. 736.—Grabau, Bull. New York State Mus., 45, 1901, p. 226; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 226.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 34, 1901, pp. 26, 43.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 306.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 720.

Goldius acamas (Hall).

Bronteus acamas Hall, Adv. Sheets, 18th Rep. New York State Cab. Nat. Hist., 1865, p. 28; 20th Rep. New York State Cab. Nat. Hist., 1867, p. 322, pl. 21, figs. 19–20, p. 393; rev. ed., 1870, p. 422, pl. 21, figs. 19–20, pl. 25, fig. 21.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 232, pl. 20, fig. 1.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 306.

Niagaran (Racine): Racine, Wisconsin; Bridgeport and Romeo, Illinois.

Goldius aquilonaris (Whiteaves).

Bronteus aquilonaris Whiteaves, Geol. Surv. Canada, Ann. Rep., n. s., 14, App. F, 1904, p. 58; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 267, pl. 42, fig. 2.

Niagaran: Ekwan River, Canada.

Goldius ekwanensis (Whiteaves).

Bronteus Ekwanensis Whiteaves, Geol. Surv. Canada, Ann. Rep., n. s., 14, App. F, 1904, p. 58; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 266, pl. 42, fig. 1.

Niagaran: Ekwan River, Canada.

Goldius flabellifer (Goldfuss).

Brontes flabellifer Goldfuss, Nova Acta Acad. Caes. Leop. Nat.-Cur., 19, pt. 1, 1839, p. 361, pl. 33, fig. 3.

Bronteus flabellifer Phiips, Pal. Foss. Dev. and Cornw., 1841, p. 131, pl. 57, fig. 254.—Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 590.

Niagaran: Bessels Bay, Arctic America.

Goldius insularis (Billings).

Bronteus insularis Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 66.

Anticostian (Chicotte): Southwest Point, Anticosti.

Goldius laphami (Whitfield).

Bronteus laphami Whitfield, Ann. Rep. Wisconsin Geol. Surv. for 1877, 1878, p. 88; Geol. Surv. Wisconsin, 4, 1882, p. 310, pl. 22, figs. 1–4.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 195, fig.

Niagaran (Racine): Kewaunee, Wisconsin.

Goldius lunatus (Billings).

Bronteus lunatus Billings, Geol. Surv. Canada, Rep. Progr. for 1853–1856, 1857, p. 338; Geol. Canada, Geol. Surv. Canada, 1863, p. 188, fig. 187.—Miller, N. A. Geol. Pal., 1889, p. 535, fig. 980.—Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 725, fig. 43.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 235.—Ruedemann, Bull. New York State Mus., 49, p. 65, pl. 4, figs. 10, 11.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 198, pl. 15, figs. 14–16.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 306, fig. 1017.

Trenton: Ottawa, Canada; Wykoff, Minnesota; Lake Winnipeg; Jacksonburg, New Jersey.

Goldius niagarensis (Hall).

Bronteus? niagarensis Hall, Pal. New York, 2, 1852, p. 314, pl. 70, fig. 3.—Grabau, Bull. New York State Mus., 45, 1901, p. 226, fig. 158.

Clinton (Irondequoit—Rochester): Niagara Falls, Ontario.

Goldius occasus (Winchell and Marcy).

Bronteus occasus Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 104, pl. 3, fig. 12.

Niagaran (Racine): Bridgeport, Illinois.

GOMPHOCERAS Sowerby. Genotype: Orthoceras pyriforme Sowerby.

Gomphoceras Sowerby in Murchison's Sil. Syst., 1839, p. 621.—Portlock, Rep. Geol. Londonderry, 1843, p. 381.—D'Orbigny, Prodr. de Pal., 1, 1849, pp. 3, 27.—Woodward, Man. Mollusca, pt. 1, 1851, p. 89, fig. 51 on p. 90.—Barrande, Neues Jahrb. f. Min., etc., 1854, p. 10, pl. 1, fig. 9a.—Pictet, Traite de Pal., 2d ed., 2, 1854, p. 644.—Emmons, Amer. Geology, 1, pt. 2, 1855, pp. 148, 151.—Barrande, Neues Jahrb. f. Min., etc., 1855, p. 258, pl. 3, fig. 14; Bull. Soc. Geol. France, 2d ser., 12, 1855, p. 158.—Billings, Canadian Nat. Geol., 2, 1857, p. 136, pl. 2, fig. 1.—Barrande, Neues Jahrb. f. Min., etc., 1860, p. 653; Syst. Sil. du Centre Boheme, 2, pt. 1, 1867, p. 243.—Hall, Pal. New York, 5, pt. 2, 1879, p. 318.—Koninck, Ann. d. Mus. Royal d'Hist. Nat. de Belgique, 5, 1880, p. 40.—Blake, Mon. British Foss. Cephalopoda, 1882, p. 58.—Zittel, Handb. Pal., 2, 1884, p. 370.—Hyatt, Proc. Boston, Soc. Nat. Hist., 22, 1884, p. 277.—Newell, Proc. Boston Soc. Nat. Hist., 23, 1888, p. 470.—Miller, N. A. Geol. Pal., 1889, p. 437.—Whidborne, Mon. Dev. Fauna South England, 1, Pal. Soc., 1890, p. 117.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 211.—Koken, Die Leitfossilien, Leipzig, 1896, p. 47, text fig. 31.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 291.—Hyatt, Zittel-Eastman Textb. Pal., 1, 1900, p. 532; ibid., 2d ed., 1913, p. 612.—Grabau, Bull. New York State Mus., 45, 1901, p. 216; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 216.—Jaekel, Zeits. d. d. geol. Gesell., 44, 1902, Protok., pp. 8, 68, 80.—Jaekel in Ruedemann, Amer. Geol., 31, 1903, p. 200.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1026.

GOMPHOCERAS ANGUSTUM Newell. See Phragmoceras angustum.

GOMPHOCERAS CASSINENSE Whitfield. See Cyclostomiceras cassinense.

Gomphoceras cincinnatiense Miller.
Gomphoceras cincinnatiense Miller, Jour. Cincinnati Soc. Nat. Hist., 7, 1884, p. 19, pl. 4, figs. 1, 1a.
Maysville (Corryville): Cincinnati, Ohio.

GOMPHOCERAS CONOIDEUM Whitfield and Hovey. See Discosorus conoideus.

Gomphoceras eos Hall and Whitfield.
Gomphoceras eos Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 100, pl. 3, fig. 5.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 8, 1886, p. 244.
Richmond: Near Dayton, Ohio.

Gomphoceras faberi Miller.
Gomphoceras faberi Miller, Jour. Cincinnati Soc. Nat. Hist., 7, 1884, p. 19, pl. 4, figs. 2, 2a.—James, J. F., ibid., 8, 1886, p. 244.
Maysville (Corryville): Cincinnati, Ohio.

GOMPHOCERAS HALLI D'Orbigny. See Orthoceras fusiforme.

GOMPHOCERAS HERTZERI Miller. See Hexameroceras hertzeri.

Gomphoceras indianense Miller and Faber.
Gomphoceras indianense Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 17, 1894, p. 137, pl. 7, figs. 3–5.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1030, pl. 49, figs. 4–4b.
Richmond: Near Versailles, and Madison, Indiana.

Gomphoceras lineare Newell.
Gomphoceras linearis Newell, Proc. Boston Soc. Nat. Hist., 23, 1888, pp. 473, 474, fig.
Niagaran: Bridges quarry, Wabash, Indiana.

GOMPHOCERAS MARCYÆ Winchell and Marcy. See Gomphoceras scrinium.

GOMPHOCERAS MINIMUM Whitfield. See Cyclostomiceras minimum.

GOMPHOCERAS MIRUM Barrande. See Pentameroceras mirum.

GOMPHOCERAS NESTOR Foord. See Phragmoceras nestor.

GOMPHOCERAS OBESUM Billings. See Poterioceras obesum.

Gomphoceras ortoni Foerste.
Gomphoceras Ortoni Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 533, pl. 33, figs. 8a, b; pl. 36, figs. 7a–c.
Upper Medinan (Brassfield): Browns quarry, near Dayton, Ohio.

Gomphoceras parvulum Whiteaves.
Gomphoceras parvulum Whiteaves, Canadian Rec. Sci., 4, 1891, p. 298, pl. 3, figs. 5, 5a, b; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 296, pl. 35, figs. 2, 2a, 2b.
Niagaran: Grand Rapids of Saskatchewan, Canada.

Gomphoceras powersi J. F. James.
Gomphoceras powersi James, J. F., Jour. Cincinnati Soc. Nat. Hist., 8, 1886, p. 255, pl. 4, fig. 2.—Ulrich, Amer. Geol., 1, 1898, p. 325.
Black River (Platteville): Beloit, Wisconsin.

Gomphoceras projectum Newell.
Gomphoceras projectum Newell, Proc. Boston Soc. Nat. Hist., 23, 1888, pp. 476, 477, figs.
Niagaran: Delphi, Indiana.

Gomphoceras scrinium Hall.

Gomphoceras scrinium Hall, 20th Rep. New York State Cab. Nat. Hist. (extras, 1865), 1868, p. 350, pl. 18(9), figs. 1–3; pp. 389, 393; rev. ed., 1868, 1870, p. 410, pl. 18, figs. 1–3.—Foord Cat. Foss. Ceph. British Mus., 1, 1888, p. 224.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 194, fig.

Gomphoceras Marcyae Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 101, pl. 3, fig. 8; p. 109; p. 112.

Niagaran (Racine): Chicago, Illinois.

GOMPHOCERAS SEPTORIS Hall. See Septameroceras septore.

Gomphoceras subgracile Billings.

Gomphoceras subgracile Billings, Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, p. 311.

Silurian: Port Daniel, Gaspe, Canada.

Observation.—Possibly a species of Septameroceras.

Gomphoceras wabashense Newell.

Gomphoceras wabashensis Newell, Proc. Boston Soc. Nat. Hist., 23, 1888, p. 470–472, figs.—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 476, pl. 20, figs. 3, 4.

Niagaran: Delphi and Georgetown, Indiana.

Plesiotype.—Cat. No. 52947, U.S.N.M.

GOMPHOCYSTIS Angelin. See Gomphocystites Hall.

GOMPHOCYSTITES Hall. Genotype: G. glans Hall.

Gomphocystites Hall, 20th Rep. New York State Cab. Nat. Hist. (extras, 1864), 1868, p. 309; rev. ed., 1870, p. 351.—Zittel, Handb. Pal., 1, 1879, p. 415.—Miller, N. A. Geol. Pal., 1889, p. 249.—Jaekel, Stammes. Pelmat., 1, Thecoidea u. Cystoidea, Berlin, 1899, p. 419.—Zittel, Grundzuge Pal., 1910, p. 189.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 461.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 156.

Gomphocystis Angelin, Icon. Crinoid, 1878, p. 31.—Haeckel, Amphorideen u. Cystoideen, Leipzig, 1896, p. 115.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 77.

Gomphocystites clavus Hall.

Gomphocystites clavus Hall, 20th Rep. New York State Cab. Nat. Hist. (extras, 1864), 1868, p. 310, pl. 12a (1), fig. 3; rev. ed., 1870, p. 353, pl. 12a, fig. 3.

Niagaran (Racine): Racine, Wisconsin.

Gomphocystites glans Hall.

Gomphocystites glans Hall, 20th Rep. New York State Cab. Nat. Hist. (extras, Dec. 1864), 1868, p. 310, pl. 12(3), fig. 14; pl. 12a(1), figs. 4, 5; rev. ed. 1870, p. 352, pl. 12, fig. 14; pl. 12a, figs. 4, 5.—Roemer, Leth. geog., 1, Leth. Pal., Atlas, 1876, pl. 11, fig. 2a.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 191, fig.—Jaekel, Stammes. Pelmat., 1, Thecoidea u. Cystoidea, Berlin, 1899, p. 421, pl. 2, figs. 8, 9.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 462, fig. 1768.

Niagaran (Racine): Racine, Wisconsin.

Gomphocystites indianensis Miller.

Gomphocystites indianensis Miller, N. A. Geol. Pal., 1889, p. 249, fig. 319.—Jaekel, Stammes. Pelmat., 1, Thecoidea u. Cystoidea, Berlin, 1899, p. 421.

Niagaran (Osgood): Jefferson County, Indiana.

Gomphocystites tenax Hall.

Gomphocystites tenax Hall, 20th Rep. New York State Cab. Nat. Hist. (extras, 1864), 1868, p. 310, pl. 12(3), fig. 15; pl. 12a(1), figs. 1, 2; rev. ed., 1870, p. 352, pl. 12, fig. 15; pl. 12a, figs. 1, 2.—Roemer, Leth. geog., 1, Leth. Pal., Atlas, 1876, pl. 11, fig. 3.—Haeckel, Amphorideen u. Cystoideen, Leipzig, 1896, p. 115, pl. 3, fig. 37.—Jaekel, Stammes. Pelmat., 1, Thecoidea u. Cystoidea, Berlin, 1899, p. 421. Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 77, fig. 48.

Niagaran (Lockport): Lockport, New York.

GONAMBONITES PLANA var. RETROFLEXA Verneuil. See Clitambonites planus retroflexus.

Goniatites canadensis Castelnau. Not recognized.

Goniatites canadensis Castelnau, Syst. Sil., 1843, p. 34, pl. 11, fig. 7.

Ordovician?: Falls of Montmorency River, near Quebec, Canada.

Observation.—Probably the same as Sinuites cancellatus.

GONIOCERAS Hall. Genotype: G. anceps Hall.

Gonioceras Hall, Pal. New York, 1, 1847, p. 54.—D'Orbigny, Prodr. de Pal., 1, 1849, p. 2.—Pictet, Traité de Pal., 2d ed., 2, 1854, p. 638.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 148.—Barrande, Syst. Sil. du Centre Boheme, 2, pt. 3, 1874, p. 678; p. 786.—Hyatt, Science, 3, 1884, p. 124.—Zittel, Handb. Pal., 2, 1884, p. 370.—Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 288.—Miller, N. A. Geol. Pal., 1889, p. 441.—Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 794.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 322.—Ruedemann, Bull. New York State Mus., 90, 1906, p. 492.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 117.

Gonioceras anceps Hall.

Gonioceras anceps Hall, Pal. New York, 1, 1847, p. 54, pl. 14, figs. 1a-d.—Chapman, Canadian Jour., n. s., 8, 1863, p. 20, fig. 130.—Roemer, Leth. geog., 1, Leth. pal., Atlas, 1876, pl. 6, fig. 5a.—Miller, N. A. Geol. Pal., 1889, p. 441, fig. 742.—Keyes, Missouri Geol. Surv., 5, 1894, p. 220.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 117, fig. 1353.—Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 794, pl. 47, fig. 5.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 324, fig. 49.

Orthoceras anceps Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 150, fig. 108a, b.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 541, figs.

Ormoceras anceps Chapman, Canadian Jour., n. s., 8, 1863, p. 198, fig. 172; Expos. Min., Geol. Canada, 1864, p. 128, fig. 130; p. 170, fig. 172.

Gonioceras hallii Emmons, Amer. Geology, 1, pt. 2, 1855, p. 152, fig. 31; Man. Geol., 1860, p. 96, fig. 85.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 258, fig.

Black River: Watertown, etc., New York (Watertown); Ontario; Wisconsin; Minnesota; Kentucky; Tennessee.

Gonioceras chaziense Ruedemann.

Gonioceras chaziense Ruedemann, Bull. New York State Mus., 90, 1906, p. 494, pl. 36, figs. 3, 4.

Chazyan (Crown Point): Near Chazy, New York.

GONIOCERAS HALLII Emmons. See Gonioceras anceps.

GONIOCERAS LAMBI Whiteaves. See Tripteroceras lambi.

Gonioceras occidentale Hall.

Gonioceras occidentalis Hall, Rep. Supt. Geol. Surv. Wisconsin, 1861, p. 47.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 74, pl. 12, figs. 1, 2.—Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 795, pl. 47, fig. 6.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 117, fig. 1354.—Holtedahl, Vidensk. Skrifter, 1, 1912, p. 9, pl. 3, fig. 1.

Black River (Platteville): Wisconsin; Dixon, Illinois; Arctic America.

Plesiotype.—Cat. No. 46527, U.S.N.M.

GONIOGRAPTUS McCoy.

Genotype: Didymograptus (Goniograptus) thureaui McCoy.

Goniograptus McCoy, Ann. Mag. Nat. Hist., 4th ser., 18, 1876, p. 128.—Wiman, Bull. Geol. Inst. Univ. Upsala, 2, pt. 2, p. 265.—Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 620, 621.

Goniograptus geometricus Ruedemann.

Gonigraptus n. sp. Ruedemann, New York State Pal., Ann. Rep., 1902, p. 566.

Goniograptus geometricus Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 627–630, pl. 7, figs. 5, 10–20, figs. 43–45.

Canadian (Deepkill, Didymograptus trifidus zone): Deepkill, Rensselaer County, New York.

Observation.—Compare Thamnograptus anna.

Goniograptus perflexilis Ruedemann.

Goniograptus n. sp. Ruedemann New York State Pal., Ann. Rep., 1902, p. 556.

Goniograptus perflexilis Ruedemann, Mem. New York State Mus., 7, pt. 1, 1904, pp. 625–627, pl. 6, figs. 16–18; pl. 7, figs. 1–4, 6–9, figs. 39–42.

Canadian: Deepkill and Mount Moreno, New York (Deepkill, Tetragraptus and Didymograptus zones); Point Levis, Quebec (Levis, Didymograptus and Diplograptus dentatus zones).

Goniograptus thureaui (McCoy).

Didymograptus (Goniograptus) thureaui McCoy, Ann. Mag. Nat. Hist., 4th ser., 18, 1876, pp. 128–130.

Graptolites (Didymograptus) thureaui McCoy, Geol. Surv. Victoria, Prodr. Pal., Victoria, dec. 5, 1877, p. 39.

Goniograptus thureaui Ami, Geol. Surv. Canada, Rep., 2d ser., 3, pt. 2, 1889, p. 116k.—Ruedemann, Bull. New York State Mus., Pal. Ann. Rep., 1902, pp. 556, 565, 576–92, figs. 1–11; ibid., Mem. 7, pt. 1, 1904, pp. 621–624, pl. 6, figs. 1–15, figs. 37, 38.

Dichograptus (Clonograptus, Goniograptus) thureaui Frech, Leth. Pal., 1, Lief. 3, 1897, p. 600, fig. 165.

Dichograptus (Goniograptus) thureaui Grabau and Shimer, N. A. Index Fossils 1, 1906, p. 29, fig. 41d, 42.

Goniograptus thureau var. selwyni Ami, Can. Rec. Sci., 3, 1889, p. 422–428, p. 502, 503, figs. 1, 2.

Goniograptus thureaui var. postremus Ruedemann, Bull. New York State Mus., 52, 1902, p. 587, fig. 14.

Lower Ordovician: Sandhurst, Victoria; Point Levis, Quebec (Levis, Clonograptus zone); Deepkill, Rensselaer County, New York (Deepkill, Tetragraptus and D. bifidus zones).

GONIOGRAPTUS THUREAUI var. POSTREMUS Ruedemann. See Goniograptus thureaui.

GONIOGRAPTUS THUREAUI var. SELWYNI Ami. See Goniograptus thureaui.

GONIOPHORA Phillips. Genotype: G. cymbiformis Sowerby.

Goniophora Hall, Pal. New York, 5, pt. 1, Lam., 2, 1885, p. 13.—Nettelroth, Kentucky Foss. Shells, Geol. Surv. Kentucky, 1889, p. 213.—Miller, N. A. Geol. Pal., 1889, p. 481.—Whidborne, Mon. Dev. Fauna South England, 2, Pal. Soc., 1892, p. 16,—Koken, Die Leitfossilien, Leipzig, 1896, p. 525.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 251.—Hind, Mon. British Carb. Lamell., 1, Pal. Soc., 1899, p. 339.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 518.

Goniophora bellula Billings.

Goniophora bellula Billings, Pal. Foss. Geol. Surv. Canada, 2, pt. 1, 1874, p. 136, pl. 8, fig. 9.

Silurian: Arisaig, Nova Scotia.

Goniophora carinata (Hall).

Modiolopsis carinatus Hall, Pal. New York, 1, 1847, p. 160, pl. 35, figs. 11a–c.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 173, fig. 159.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 407, fig.

Goniophora carinata Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 504 (gen. ref.).—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 173, pl. 11, fig. 23.

Cypricardia americana D'Orbigny, Prodr. Pal., 1, 1850, p. 121.—Emmons, Amer. Geol., 1, pt. 2, 1855, p. 174, pl. 14, fig. 11.

Trenton: Middleville, etc., New York; New Jersey; etc.

Goniophora consimilis Billings.

Goniophora consimilis Billings, Pal. Foss., Geol. Surv. Canada, 2, pt. 1, 1874, p. 135, pl. 8, fig. 8.

Silurian: Arisaig, Nova Scotia.

Goniophora crassa Whiteaves.

Goniophora crassa Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 9, pl. 2, figs. 3, 3a–c; ibid., pt. 2, 1895, p. 67 (loc. occ.).

Niagaran (Guelph): Durham, Ontario.

Goniophora dubia (Hall).

Modiolopsis? dubius Hall, Pal. New York, 3, 1859, p. 264, pl. 49, figs. 2a–e.

Goniophora dubia Whitfield, Ann. New York Acad. Sci., 5, 1891, p. 514, pl. 5, figs. 24–26; Geol. Surv. Ohio, Pal., 7, 1893, p. 415, pl. 1, figs. 24–26.—Sherzer, Michigan Geol. Surv., 7, pt. 1, 1900, p. 224, pl. 17, figs. 24–26.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 519, fig. 697.—Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 168, pl. 30, figs. 24–26.

Cayugan (Manlius): Winfield, Herkimer County, New York.

Lower Monroan: Monroe County, Michigan; Put-in-Bay, Lake Erie.

Goniophora mediocris Billings.

Goniophora mediocris Billings, Pal. Foss., Geol. Surv. Canada, 2, pt. 1, 1874, p. 137, pl. 9, fig. 1.

Silurian: Arisaig, Nova Scotia.

Goniophora speciosa Hall.

Goniophora speciosa Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 317, pl. 27, figs. 26, 27; Trans. Albany Inst., 10, 1883, p. 73.

Niagaran (Waldron): Waldron, Indiana.

Goniophora transiens Billings.

Goniophora transiens Billings, Pal. Foss., Geol. Surv. Canada, 2, pt. 1, 1874, p. 134, pl. 8, fig. 7.

Silurian (Stonehouse): Arisaig, Nova Scotia.

GONIOPHYLLUM Edwards and Haime.

Genotype: Turbinolia pyramidalis Hisinger.

Goniophyllum Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal., 1851 (Arch. Mus. Hist. Nat., 5), pp. 169, 404.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 456.—Milne-Edwards, Hist. Nat. d. Corall., 3, 1860, p. 397.—Lindstrom, Geol. Mag., 3, 1866, pp. 357, 411.—Salter, Cat. Camb. Sil. Foss., 1873, p. 114.—Dybowski, Archiv. f. Natur. Liv.-Ehst-und Kurl., 5, 1873, p. 340.—Zittel, Handb. Pal., 1, 1879, p. 235.—Lindstrom, Bihang till K. Sv. Vet.-Akad. Handl., 7, 1882, p. 42.—Roemer, Leth. Geog., pt. 1, Leth. Pal., 1883, p. 406.—Sherzer, Amer. Geol., 7, 1891, pp. 296-301.—Koken, Die Leitfossilien, Leipzig, 1896, p. 313.—Weller, Jour. Geol., 6, 1898, p. 700; Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 20; Zittel-Eastman Textb. Pal., 1, 1900, p. 79; ibid., 2d ed., 1913, p. 87.

Goniophyllum pyramidale (Hisinger).

Turbinolia turbinata var. pyramidalis Hisinger, Tableau des petrif. de Suede, 1st ed., 1829, p. 22.

Turbinolia pyramidalis Hisinger, Tableau des petrif. de Suede, 2d ed., 1831, p. 26; Lethæa, 1838, p. 101, pl. 28, fig. 12.

Goniophyllum pyramidale Milne-Edwards and Haime, Polypiers fossiles, 1851, p. 404, pl. 2, figs. 4, 4a.—Lindstrom, Öfvers. Vet.-Akad. Forhandl., 1865, p. 271, pl. 30, figs. 1-9; Bihang till K. Sv. Vet.-Akad., Handl., 7, 1882, p. 43, pls. 1, 5, 6, 7, 8, 9 (see for complete bibliography).—Winchell, Amer. Geol., 6, 1890, p. 326.—Weller and Davidson, Jour. Geol., 4, 1896, p. 170, pl. 6, figs. 6-8.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 19, fig. 5.

Cyathophyllum tetragonum Quenstedt, Handb. der Petrefaktenkunde, Ab. 1, 6, 1879, p. 407, pl. 156, figs. 82-85.

Silurian: Island of Gotland; England; La Motte, Dubuque County, Iowa (Niagaran).

Goniostropha (part) Œhlert. See Hormotoma Salter.

GONIOTRYPA Ulrich. Genotype: G. bilateralis Ulrich.

Goniotrypa Ulrich, Contr. Micro-Pal. Cambro-Sil., pt. 2, 1889, p. 40.—Miller, N. A. Geol. Pal., 1889, p. 307.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 389.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 545.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 49.

Goniotrypa bilateralis Ulrich.

Goniotrypa bilateralis Ulrich, Contr. Micro-Pal. Cambro-Sil., pt. 2, 1889, p. 41, figs. 1-3, pl. 9, fig. 1.—Miller, N. A. Geol. Pal., 1889, fig. 481 (p. 307).—Whiteaves, Pal. Foss., 3, 1895, p. 118.

Richmond: Stony Mountain, Manitoba (Stony Mountain); Island of Anticosti (Charleton).

Cotypes.—Cat. No. 43475, U.S.N.M.

GONIURUS Raymond. Genotype: Bathyurus perspicator Billings.

Goniurus Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 65.

Goniurus caudatus (Billings).

Bathyurus caudatus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 261, fig. 245.

Goniurus caudatus Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 66.

Canadian: Port aux Choix, Newfoundland (Quebec—G., H.); Fort Cassin, Vermont; and Ticonderoga, New York (Beekmantown).

Goniurus elongatus Raymond.

Goniurus elongatus Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 66, pl. 7, figs. 11, 12.

Canadian: Beekmantown): Philipsburg and St. Armond, Missisquoi County, Quebec.

Goniurus perspicator (Billings).

Bathyurus perspicator Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 205, fig. 191.

Goniurus perspicator Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 65, pl. 7, fig. 10.

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

GORGONIA Hall. See Chasmatopora Eichwald.

Gorgonia anticorum Castelnau. Not recognized.

Gorgonia anticorum Castelnau, Syst. Sil., 1843, p. 50, pl. 24, fig. 1.

Silurian: Lake Huron.

GORGONIA ASPERA Hall. See Chasmatopora aspera.

GORGONIA FLABELLIFORMIS Eichwald. See Dictyonema flabelliforme.

Gorgonia infundibuliformis Eaton. Not recognized.

Gorgonia infundibuliformis Eaton, Geol. Textbook, ed. 2, 1832, p. 43, pl. 4, fig. 46.

GORGONIA PERANTIQUA Hall. See Protocrisina perantiqua.

GORGONIA PROAVUS Eichwald. See Graptodictya proava.

GORGONIA? RETEFORMIS Hall. See Dictyonema retiforme.

Gorgonia siluriana Castelnau. Not recognized.

Gorgonia siluriana Castelnau, Syst. Sil., 1843, p. 50.

Silurian: Lake Huron.

GOTLANDIA Dall. See Trimerella Billings.

GRAMMYSIA Verneuil. Genotype: G. hamiltonensis Verneuil.

Grammysia Verneuil, Bull. Geol. Soc. France (2) 4, 1847, p. 696.—Pictet, Traite de Pal., 2d ed., 3, 1855, p. 530.—Barrande, Syst. Sil. du Centre Boheme, 6, 1881, p. 85; Acephales: Ext. Syst. Sil. du Centre Boheme, 1881, p. 135.—Zittel, Handb. Pal., 2, 1881, p. 128.—Hall, Pal. New York, 5, pt. 1, Lam. 2, 1885, p. 30.—Miller, N. A. Geol. Pal., 1889, p. 482.—Nettelroth, Kentucky Foss. Shells, Geol. Surv. Kentucky, 1889, p. 207.—Koken, Die Leitfossilien, Leipzig, 1896, p. 525.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 260.—Dall, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 439.

Grammysia acadica Billings.

Grammysia Acadica Billings, Pal. Foss., Geol. Surv. Canada, 2, pt. 1, 1874, p. 140, pl. 9, fig. 4, 4a.

Silurian (Moydart, Stonehouse): Arisaig, Nova Scotia.

Grammysia? arctica Bassler (new name).

Grammysia? triangulata Holtedahl (not Williams, 1913), 2d Arct. Exp. Fram, 1898–1902, No. 32, 1914, p. 28, pl. 8, fig. 8.

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

GRAMMYSIA CASWELLI Foerste. See Cuneamya? caswelli.

GRAMMYSIA CINGULATA TRIANGULATA McCoy. See Grammysia triangulata.

GRAMMYSIA NEGLECTA Hall and Whitfield. See Cuneamya neglecta.

Grammysia pembrokensis Williams.

Grammysia pembrokensis Williams, Proc. U. S. Nat. Mus., 45, 1913, p. 344, pl. 31, fig. 2.

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

Holotype.—Cat. No. 58968, U.S.N.M.

Grammysia remota Billings.

Grammysia remota Billings, Pal. Foss., Geol. Surv. Canada, 2, pt. 50, 1874, p. 139, pl. 9, fig. 2.

Silurian: Arisaig, Nova Scotia.

Grammysia rustica Billings.

Grammysia rustica Billings, Pal. Foss., Geol. Surv. Canada, 2, pt. 1, 1874, p. 139, pl. 9, fig. 3.

Silurian (Stonehouse): Arisaig, Nova Scotia.

Grammysia triangulata (Salter).

Orthonota triangulata Salter, Mem. Geol. Surv. Great Britain, 1848, 2, pt. 1, Pal. app., p. 361, pl. 18, fig. 7.

Grammysia cingulata var. triangulata McCoy, British Pal. Foss., 1855, p. 280, pl. 1k, fig. 28.

Grammysia triangulata Williams, Proc. U. S. Nat. Mus., 45, 1913, p. 345, pl. 31, fig. 17.

Silurian: Great Britain; Long Cove, Washington County, Maine (Pembroke).

Plesiotype.—Cat. No. 58970, U.S.N.M.

GRAMMYSIA? TRIANGULATA Holtedahl. See Grammysia arctica.

GRAPTODICTYA Ulrich. Genotype: Ptilodictya perelegans Ulrich.

Graptodictya Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, pp. 151, 165.—Miller, N. A. Geol. Pal., 1889, p. 307.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 393.—Pocta, Syst. Sil. Centre Boheme, 8, pt. 1, 1894, p. 14.—Simpson, 14th Ann. Rep. New York State Geol. for 1894, 1897, p. 541.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 46.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 747.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 121.

GRAPTODICTYA NITIDA Ulrich. See Graptodictya perelegans.

Graptodictya perelegans (Ulrich).

Ptilodictya perelegans Ulrich, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 94, pl. 4, figs. 16, 16a.

Graptodictya perelegans Ulrich, ibid., 5, 1882, p. 165, pl. 8, fig. 5.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 122, fig., p. 121.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 280.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 836, pl. 29, fig. 8.

Graptodictya nitida Ulrich, Jour. Cincinnati Soc. Nat. Hist, 5, p. 166, pl. 7, figs. 8, 8a.

Richmond (Waynesville, Liberty): Clarkesville, etc., Ohio; Indiana.

Holotypes.—Cat. Nos. 43274, 43661, U.S.N.M.

Graptodictya proava (Eichwald).

Gorgonia proavus Eichwald, Urwelt Russlands, 2, 1840, p. 44, pl. 1, fig. 5.

Coscinium proavus Eichwald, Leth. Rossica, 1, 1860, p. 398.

Coscinium proavium Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 158, fig. 122.

Graptodictya proava—Continued.

Graptodictya proava Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 123–126, figs. 49, 50; pl. 8, fig. 2; pl. 9, figs. 1–6.

Clathropora flabellata Hall, Foster and Whitney's Rep. Geol. Lake Superior Land Dist., pt. 2, 1851, p. 207, pl. 24, figs. 2a, b.

Stictoporella flabellata Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 416.

Stictoporella cribrosa Sardeson (not Ulrich), Jour. Geol., 9, 1901, p. 157, pl. B, figs. 7–9.

Middle Ordovician: Uxnorm, Esthonia, Russia (Wassalem); Kenyon, Minnesota, and Escanaba River, Michigan (Trenton).

Plesiotype.—Cat. No. 57216, U.S.N.M.

Graptolites (Didymograpsus) bryonoides McCoy. See Tetragraptus serra.

Graptolites (Didymograpsus) caduceus McCoy. See Didymograptus (Isograptus) caduceus.

Graptolites dentatus Vanuxem. See Glossograptus (Orthograptus) quadrimucronatus.

Graptolites (Didymograptus) extensus McCoy. See Didymograptus extensus.

Graptolites (Didymograptus) fruticosus McCoy. See Tetragraptus fruticosus.

Graptolites (Didymograptus) logani McCoy. See Loganograptus logani.

Graptolites nilssoni Harkness. See Monograptus gregarius.

Graptolites (Didymograptus) octobrachiatus McCoy. See Dichograptus octobrachiatus.

Graptolites priodon of authors. See Monograptus priodon.

Graptolites pristis (part) of authors. See Diplograptus foliaceus.

Graptolites (Didymograpsus) quadribrachiatus McCoy. See Tetragraptus quadribrachiatus.

Graptolites (Didymograptus) thureaui McCoy. See Goniograptus thureaui.

Graptolites venosus Hall. See Retiolites geinitzianus venosus.

Graptolithus abnormis Hall. See Clonograptus abnormis.

Graptolithus acutus Hopkinson. See Monograptus intermedius.

Graptolithus alatus Hall. See Tetragraptus alatus.

Graptolithus amplexicaule Hall. See Diplograptus (Glyptograptus) amplexicaule.

Graptolithus angustifolius Hall. See Diplograptus (Glyptograptus) angustifolius.

Graptolithus annectans Walcott. See Leptograptus annectans.

Graptolithus arcuatus Hall. See Didymograptus arcuatus.

Graptolithus arundinaceus Hall. See Mastigograptus arundinaceus.

Graptolithus bicornis Hall. See Climacograptus bicornis.

Graptolithus bifidus Hall. See Didymograptus bifidus.

GRAPTOLITHUS BIGSBYI Hall. See Tetragraptus similis.

GRAPTOLITHUS BRYONOIDES Hall. See Tetragraptus amii and T. serra.

GRAPTOLITHUS CADUCEUS Chapman. See Didymograptus (Isograptus) caduceus.

GRAPTOLITHUS CLINTONENSIS Hall. See Monograptus clintonensis.

GRAPTOLITHUS CONSTRICTUS Hall (part). See Didymograptus extensus and D. hirundo.

GRAPTOLITHUS CONVOLUTUS Carruthers. See Monograptus convolutus.

GRAPTOLITHUS CRUCIFER Hall. See Tetragraptus crucifer.

GRAPTOLITHUS DENTATUS D'Orbigny. See Diplograptus foliaceus.

GRAPTOLITHUS DENTICULATUS Hall. See Tetragraptus denticulatus.

GRAPTOLITHUS DIVARICATUS Hall. See Dicellograptus divaricatus.

GRAPTOLITHUS DIVERGENS Hall. See Amphigraptus divergens.

GRAPTOLITHUS ENSIFORMIS Hall. See Trigonograptus ensiformis.

GRAPTOLITHUS EXTENSUS Hall. See Didymograptus extensus.

GRAPTOLITHUS EXTENUATUS Hall. See Didymograptus extenuatus.

GRAPTOLITHUS FLACCIDUS Hall. See Leptograptus flaccidus.

GRAPTOLITHUS FLEMINGII Salter. See Monograptus flemingii.

GRAPTOLITHUS (DICHOGRAPTUS) FLEXILIS Hall. See Clonograptus flexilis.

GRAPTOLITHUS FOLIACEUS Murchison. See Diplograptus foliaceus.

GRAPTOLITHUS FOLIUM Salter. See Diplograptus foliaceus.

GRAPTOLITHUS FRUTICOSUS Hall. See Tetragraptus fruticosus.

GRAPTOLITHUS FURCATUS Hall. See Dicranograptus furcatus.

GRAPTOLITHUS GRACILIS Hall. See Nemagraptus gracilis and N. gracilis surcularis.

GRAPTOLITHUS HEADI Hall. See Tetragraptus headi.

GRAPTOLITHUS (DIPLOGRAPTUS) HYPNIFORMIS White. See Diplograptus foliaceus.

GRAPTOLITHUS INDENTUS Hall. See Didymograptus indentus.

GRAPTOLITHUS INTERMEDIUS Carruthers. See Monograptus intermedius.

GRAPTOLITHUS LAEVIS Hall. See Phycograptus laevis.

GRAPTOLITHUS LOGANI Hall. See Loganograptus logani.

GRAPTOLITHUS MARCIDUS Hall. See Cryptograptus tricornis.

GRAPTOLITHUS MILESI Hall. See Clonograptus milesi.

GRAPTOLITHUS MUCRONATUS Hall. See Lasiograptus mucronatus.

GRAPTOLITHUS MULTIFASCIATUS Hall. See Amphigraptus multifasciatus.

GRAPTOLITHUS MULTIFASCICULATUS Lesley. See Amphigraptus multifasciatus.

GRAPTOLITHUS NITIDUS Hall. See Didymograptus nitidus.

GRAPTOLITHUS OCTOBRACHIATUS Hall. See Dichograptus octobrachiatus.

GRAPTOLITHUS OCTONARIUS Hall. See Dichograptus octonarius.

GRAPTOLITHUS PATULUS Hall. See Didymograptus patulus.

GRAPTOLITHUS PENNATULUS Hall. See Didymograptus pennatulus.

GRAPTOLITHUS (DIPLOGRAPTUS) PEOSTA Hall. See Diplograptus peosta.

GRAPTOLITHUS PRIODON Barrande. See Monograptus priodon.

GRAPTOLITHUS PRIODON Chapman. See Monograptus clintonensis.

GRAPTOLITHUS PRISTINIFORMIS Hall. See Diplograptus dentatus.

GRAPTOLITHUS PRISTIS Hall (part). See Diplograptus foliaceus, D. foliaceus acutus, D. foliaceus incisus, Glossograptus (Orthograptus) quadrimucronatus, and Diplograptus peosta.

GRAPTOLITHUS PUTILLUS Hall. See Climacograptus (Mesograptus) putillus.

GRAPTOLITHUS QUADRIBRACHIATUS Hall. See Tetragraptus quadribrachiatus.

GRAPTOLITHUS QUADRIMUCRONATUS Hall. See Glossograptus (Orthograptus) quadrimucronatus.

GRAPTOLITHUS RAMOSUS Salter. See Dicranograptus rectus.

GRAPTOLITHUS (DIPLOGRAPSUS) RAMOSUS Chapman. See Dicranograptus ramosus.

GRAPTOLITHUS RAMULUS Hall. See Temnograptus? ramulus.

GRAPTOLITHUS (CLIMACOGRAPTUS) RAMULUS White. See Dicranograptus nicholsoni whitianus.

GRAPTOLITHUS RICHARDSONI Hall. See Hologratpus? richardsoni.

GRAPTOLITHUS RIGIDUS Hall. See Clonograptus rigidus.

GRAPTOLITHUS SAGITTARIUS Hisinger. See Didymograptus sagitticaulis.

GRAPTOLITHUS (PRIONODUS) SEDGWICKII DISTANS. See Monograptus distans.

GRAPTOLITHUS (MONOPRION) SERRATULUS Hall. See Didymograptus serratulus.

GRAPTOLITHUS SEXTANS Hall. See Dicellograptus sextans and D. sextans exilis.

GRAPTOLITHUS SIMILIS HALL. See Didymograptus similis.

GRAPTOLITHUS SPINULOSUS Lapworth. See Glossograptus ciliatus.

GRAPTOLITHUS SUBTENUIS Hall. See Didymograptus subtenuis.

GRAPTOLITHUS TENTACULATUS Hall. See Retiograptus tentaculatus.

GRAPTOLITHUS TENUIS Portlock (part). See Leptograptus annectans and Didymograptus subtenuis.

GRAPTOLITHUS WHITFIELDI Hall. See Glossograptus whitfieldi and Lasiograptus bimucronatus.

GRAPTOLITHUS WHITIANUS Miller. See Dicranograptus nicholsoni whitianus.

GRAPTOPORA SOCIALIS Salter. See Dictyonema flabelliforme.

GRAPTOSPONGIA Ruedemann. Genotype: G. pusilla Ruedemann.
Graptospongia Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 485.

Graptospongia pusilla Ruedemann.
Graptospongia pusilla Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 485, figs. 467, 468.
Chazyan (Normanskill): Schuylerville, Saratoga County, New York.

GREENFIELDIA Grabau. See Hindella subgenus Greenfieldia.

GYPIDIA UNGUIFORMIS Ulrich. See Conchidium unguiforme.

GYPIDULA Dalman. See Conchidium Linnæus.

GYPIDULA Hall. Genotype: Pentamerus occidentalis Hall.
Gypidula Hall, 20th Rep. New York State Cab. Nat. Hist., 1867, p. 163; Pal. New York, 4, 1867, pp. 373, 380.—Zittel, Handb. Pal., 1, 1880, p. 694.—Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 161.—Miller, N. A. Geol. Pal., 1889, p. 346.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 322.
Sieberella Œhlert, Fischer's Man. Conch., 1887, p. 1311.
Gypidula and Sieberella Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 245; 13th Ann. Rep. New York State Geol., 1895, pp. 845, 846.

Gypidula (Sieberella) coeymanensis corriganensis Maynard.
Gypidula (Sieberella) coeymanensis var. corriganensis Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 345, pl. 62, figs. 12–18.
Helderbergian (Keyser): Devils Backbone, near Cumberland, Maryland; Keyser, West Virginia.

Gypidula (Sieberella) coeymanensis prognostica Maynard.
Gypidula (Sieberella) coeymanensis var. prognostica Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 344, pl. 62, figs. 9–11.—Holtedahl, Second Arct. Exped. "Fram," 1898–1902, No. 32, 1914, p. 21, pl. 7, fig. 5.
Helderbergian (Keyser): Pinto, Cumberland, Hancock, etc., Maryland; Keyser, West Virginia; Hyndman, Pennsylvania; Southwestern Ellesmereland, Arctic America.

Gypidula coppingeri (Etheridge).
Pentamerus coppingeri Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 594, pl. 25, figs. 2, 3.
Gypidula coppingeri Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 226.
Niagaran: Offley Island, Arctic America.

Gypidula (Sieberella) galeata (Dalman).
Atrypa galeata Dalman, Kongl. Svenska, Vet.-Akad. Handl., för 1827, 1828, p. 46, pl. 5, fig. 4.—Troost, 6th Geol. Rep. Tennessee, 1841, p. 15.—Vanuxem, Geol. New York, Rep. 3d Dist., 1842, p. 117, fig. 1.—Castelnau, Essai Syst. Sil. l'Amérique Septentrionale, 1843, p. 39, pl. 14, fig. 4.
Pentamerus galeatus Hall, 10th Rep. New York State Cab. Nat. Hist., 1857, p. 105, figs. 1–3.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 825, fig. 646.—Hall, Pal. New York, 3, 1859, p. 257, pl. 46, fig. 1; pl. 47, fig. 1.—Billings, Geol. Canada, 1863, p. 957, fig. 454.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 616, fig.—Sherzer, Michigan Geol. Surv., 7, 1900, pt. 1, p. 224.
Pentamerus galeatus var. Whiteaves, Cont. to Canadian Pal., 1, 1891, p. 234.
Sieberella galeatus Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 246, fig. 175; pl. 72, figs. 7–13.

Gypidula (Sieberella) galeata—Continued.

Gypidula (Sieberella) galeatus Kindle and Breger, 28th Ann. Rep. Dep., Geol. Nat. Res. Indiana, 1904, p. 437, pl. 2, figs. 20, 21, 23–29.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 278, fig. 388.

Devonian: Europe; New York; Maryland; Pennsylvania; New Brunswick; etc. Identified in Niagaran at Delphi, Indiana, and in the Monroan of Michigan, both probably erroneously.

Gypidula globulosa (Nettelroth).

Pentamerus globulosus Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 54.

Gypidula globulosa Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 226.

Niagaran (Louisville): Louisville, Kentucky.

Cotypes.—Cat. No. 51339, U.S.N.M.

Gypidula knotti (Nettelroth).

Pentamerus knotti Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 56, pl. 32, figs. 9–12.

Gypidula knotti Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 226.

Niagaran (Louisville): Louisville, Kentucky.

Holotype.—Cat. No. 51354, U.S.N.M.

Gypidula (Sieberella) nucleus (Hall and Whitfield).

Pentamerus galeatus Hall and Whitfield, 24th Rep. New York State Cab. Nat. Hist., 1872, pp. 197, 200a.

Pentamerus nucleus Hall and Whitfield, 27th Rep. New York State Cab. Nat. Hist., 1875, pl. 9, figs. 30–32.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 59, pl. 27, figs. 25–27; pl. 33, figs. 27–33.

Sieberella nucleus Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 247, pl. 72, figs. 1–3.

Gypidula nucleus Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 226.

Gypidula (Sieberella) nucleus, Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 438, pl. 2, figs. 18, 19.

Niagaran: Louisville, Kentucky (Louisville); Georgetown, Indiana.

Plesiotypes.—Cat. No. 51328, U.S.N.M.

Gypidula (Sieberella) rœmeri (Hall and Clarke).

Pentamerus galeatus Roemer (not Dalman), Sil. Fauna West. Tennessee, 1860, p. 73, pl. 5, fig. 14.

Sieberella rœmeri Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 247, pl. 72, fig. 6; 48th Rep. New York State Mus., 2, 1897, p. 370, pl. 13, fig. 4; 14th Rep. State Geol. New York for 1894, 1897, p. 370, pl. 13, fig. 4.

Gypidula rœmeri Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 227.—Foerste, Jour. Geol., 11, 1903, p. 711 (loc. occ.); Bull. Sci. Lab. Denison Univ., 14, 1909, p. 70, pl. 3, fig. 51C.

Niagaran: Decatur County, Tennessee (Brownsport); ?Newsom, Tennessee (Waldron).

Gypidula simplex Foerste.

Gypidula simplex Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 70, pl. 3, figs. 51A, B.

Niagaran (Waldron): Newsom, Tennessee.

Gypidula subglobosa Maynard.

Gypidula subglobosa Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 346, pl. 62, figs. 20–22.

Helderbergian (Keyser): Cash Valley, near Cumberland, Maryland.

Gypidula (Sieberella) uniplicata (Nettelroth).

Pentamerus uniplicatus Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 63, pl. 33, figs. 25, 26.

Sieberella uniplicata Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 247.

Gypidula uniplicata Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 226.

Niagaran (Louisville): Louisville, Kentucky.

Holotype.—Cat. No. 51337, U.S.N.M.

GYROCERAS Dekoninck. Genotype: G. paradoxicum Dekoninck.

Gyroceras Dekoninck, Desc. Animaux Fossiles, Liege, 1842, p. 530.—D'Orbigny, Prodr. de Pal., 1, 1849, p. 27.—Woodward, Man. Mollusca, pt. 1, 1851, p. 91, fig. 52.—Saemann, Palaeontographica, 3, 1852, pp. 139, 159.—Barrande, Neues Jahrb. f. Min., 1854, etc., p. 7, pl. 1, figs. 4a, b.—Pictet, Traite de Pal., 2d ed., 2, 1854, p. 651.—Barrande, Neues Jahrb. f. Min., etc., 1855, p. 259; Bull. Soc. Geol. France, 2d ser., 12, 1855, p. 159, pl. 5, fig. 7.—Billings, Canadian Nat. Geol., 2, 1857, p. 136, pl. 2, fig. 5.—Chapman, Canadian Jour., n. s., 2, 1857, p. 266.—Salter, Geol. Surv. Canada, dec. 1, 1859, pp. 31, 32.—Barrande, Syst. Sil. du Centre Boheme, 2, pt. 1, 1867, p. 156.—Waagen, Mem. Geol. Surv. India, Pal. Indica, 13th Ser., 1, 1879, p. 64.—Hall, Pal. New York, 5, pt. 2, 1879, pp. 358, 368, 389.—Koninck, Ann. d. Mus. Royal d'Hist. Nat. de Belgique, 5, 1880, p. 1.—Blake, Mon. British Foss. Ceph., 1882, p. 65.—Zittel, Handb. Pal., 2, 1884, p. 376.—Miller, N. A. Geol. Pal., 1889, p. 441.—Whidborne, Mon. Dev. Fauna South England, 1, Pal. Soc., 1890, p. 90.—Foord, Cat. Foss. Ceph. British Mus., 2, 1891, p. 53.—Koken, Die Leitfossilien, Leipzig, 1896, p. 50, fig. 34.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res., Indiana, 1908, p. 1027.

Gyroceras abruptum Hall.

Gyroceras abruptum Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 325; Trans. Albany Inst., 10, 1883, p. 75

Niagaran (Waldron): Waldron, Indiana.

Gyroceras americanum Billings.

Gyroceras (Lituites) americanum Billings, Geol. Surv. Canada, Rep. Progr. for 1853–1856, 1857, p. 309.

Trochoceras americanum? Foord, Cat. Foss. Ceph. British Mus., 2, 1891, p. 40.

Silurian: Port Daniel, Gaspe, Canada.

Gyroceras baeri (Meek and Worthen).

Trochoceras? Baeri Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1865, p. 263.—Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 157, pl. 13, fig. 9.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 133.

Lituites baeri James, J. F., Jour. Cincinnati Soc. Nat. Hist., 8, 1886, p. 248.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1228, figs.

Gyroceras baeri Miller, N. A. Geol. Pal., 1889, p. 441 (gen. ref.).—Cumings, 32d Ann. Rep. Dep. Geol. and Nat. Res. Indiana, 1908, p. 1032, pl. 51, fig. 1.

Richmond (Liberty): Richmond, etc., Indiana; Warren and Clinton Counties, Ohio.

Gyroceras bannisteri Winchell and Marcy.

Gyroceras bannisteri Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 102.

Trochoceras (Gyroceras) bannisteri Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, pp. 261, 393; rev. ed., 1870, p. 403, pl. 25, fig. 17.

Niagaran (Racine): Chicago, Illinois; Wisconsin.

Gyroceras duplicostatum Whitfield.

Gyroceras duplicostatum Whitfield, Ann. Rep. Geol. Surv. Wisconsin for 1877, 1878, p. 78; Geol. Wisconsin, 4, 1882, p. 235, pl. 7, fig. 1.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 159, fig.—Clarke, Geol. Minnesota, 3, pt. 2, 1897, p. 811.

Black River (Platteville): Beloit, Janesville, etc., Wisconsin.

Gyroceras elrodi White.

Gyroceras elrodi White, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 356, pl. 37, fig. 1; pl. 38, figs. 2–4.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4. 1889, p. 268, figs.

Barrandeoceras elrodi Miller, N. A. Geol. Pal., 2d App., 1897, p. 771 (gen. ref.).

Niagaran (Laurel): Hartsville, Indiana.

Gyroceras farcimen Clarke and Ruedemann.

Gyroceras farcimen Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 92, pl. 18, figs. 1–4.

Niagaran (Guelph): Shelby, New York.

GYROCERAS HERCULES Chamberlin. See Protophragmoceras hercules.

GYROCERAS (LITUITES) MAGNIFICUM Billings. See Apsidoceras magnificum.

GYROCERAS PARADOXICUM Hall. See Orthoceras paradoxicum.

Gyroceras rhombolineare Owen. Not recognized.

Gyroceras rhombolinearis Owen, Geol. Surv. Indiana, 1862, p. 362, fig. 4.

Silurian: Locality not given.

GYROCERAS (LITUITES) VAGRANS Billings. See Barrandeoceras vagrans.

GYRONEMA Ulrich. Genotype: G. pulchellum Ulrich and Scofield.

Gyronema (subgenus of Trochonema) Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1054.—Koken, Neues Jahrb. f. Min., Geol. Pal., 1, 1898, p. 24.

Gyronema brevispira Whiteaves.

Gyronema brevispira Whiteaves, Geol. Surv. Canada, Ann. Rep., n. s., 14, 1904, App. F, p. 51; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 259, pl. 29, fig. 4.

Niagaran: Ekwan River, Canada.

Gyronema dowlingi Whiteaves.

Gyronema Dowlingii Whiteaves, Geol. Surv. Canada, Ann. Rep., n. s., 14, App. F, 1904, p. 50; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 259, pl. 29, fig. 3.

Niagaran: Ekwan River, Canada.

Gyronema duplicatum Ulrich and Scofield.

Gyronema duplicatum Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1055, pl. 78, figs. 22–25.

Trochonema (Gyronema) duplicatum Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 671, fig. 928g, h.

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

Cotype.—Cat. No. 45823, U.S.N.M.

Gyronema historicum (Hudson).

Eunema historicum Hudson, Bull. New York State Mus., 80, 1905, p. 288, pl. 4, fig. 5.

Gyronema historicum Raymond, Ann. Carnegie Mus., 4, 1908, p. 208, pl. 54, figs. 5, 6.

Cyclonema? normaliana Raymond, Amer. Jour. Sci., 4th Ser., 20, 1905, p. 377.

Chazyan (Valcour): Valcour Island and Plattsburg, New York.

Gyronema leptonotum (Raymond).

Eunema leptonotum Raymond, Amer. Jour. Sci., 4th ser., 20, 1905, p. 378.

Gyronema leptonotum Raymond, Ann. Carnegie Mus., 4, 1908, p. 209, pl. 55, fig. 15.

Chazyan (Day Point): Chazy, New York.

Gyronema liratum Ulrich and Scofield.

Gyronema liratum Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1056, pl. 78, fig. 14–16.

Trochonema (Gyronema) liratum Grabau, Amer. Nat., 36, 1902, p. 925.

Black River (Platteville): Beloit, Wisconsin.

Holotype.—Cat. No. 45824, U.S.N.M.

Gyronema microclathratum (Hudson).

Holopea microclathrata Hudson, Bull. New York State Mus., 80, 1905, p. 294, pl. 4, figs. 3, 4.

Gyronema microclathratum Raymond, Ann. Carnegie Mus., 4, 1908, p. 210.

Chazyan (Valcour): Valcour Island, New York.

Gyronema percarinatum (Hall).

Pleurotomaria percarinata Hall, Pal. New York, 1, 1847, p. 177, pl. 38, fig. 4; 12th Rept. New York State Cab. Nat. Hist., 1855, p. 74.—Emmons, Amer. Geol., 1, pt. 2, 1855, p. 160, pl. 5, fig. 7.

Cyclonema percarinata Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 321.—Whitfield, Geol. Wisconsin, 4, 1882, p. 211, pl. 5, fig. 15.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 157, fig.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 172, fig.

Trenton: Middleville, New York.

Gyronema pulchellum Ulrich and Scofield.

Gyronema pulchellum Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1054, pl. 78, figs 19–21.

Trochonema (Gyronema) pulchellum Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 671, fig. 928e, f.

Black River: Minneapolis, Chatfield, etc., Minnesota (Decorah); Mercer County, Kentucky.

Cotypes.—Cat. No. 45825, U.S.N.M.

Gyronema? rotalineum Raymond.

Gyronema? rotalineum Raymond, Ann. Carnegie Mus., 3, 1906, p. 577; ibid., 4, 1908, p. 210, pl. 54, fig. 4.

Chazyan (Crown Point): Sloop Bay, Valcour Island, New York.

Gyronema semicarinatum (Salter).

Cyclonema semicarinata Salter, Geol. Surv. Canada, Can. Org. Rem., dec. 1, 1859, p. 27, pl. 6, figs. 2, 2a (not 2b).—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 145, fig. 90.—Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, 1892, p. 343.

Gyronema semicarinatum Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1055, pl. 78, figs. 17, 18.

Black River: Allumette Island, Ottawa River, Canada (Leray); near Cannon Falls, Minnesota (Decorah).

Plesiotypes.—Cat. No. 45826, U.S.N.M.

Gyronema speciosum Whiteaves.

Gyronema speciosum Whiteaves, Geol. Surv. Canada, Ann. Rep., n. s., 14, App. F, 1904, p. 50; Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 258, pl. 29, fig. 2.

Niagaran: Ekwan River, Canada.

HABROCRINUS D'Orbigny. Genotype: H. pusillus D'Orbigny.

Abrocrinus D'Orbigny, Prodrome Pal. Strat., 1, 1844, pp. 47–146; Cours Elementaire de Pal., Geol., 2, 1851, p. 144.

Habrocrinus Angelin, Icon. Crin. Suec., 1878, p. 3.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 279 (Rev. Pal., pt. 2, p. 105).

Habrocrinus benedicti (Miller).

Saccocrinus benedicti Miller, 18th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1894, p. 283, pl. 5, fig. 1, 2 (adv. sheets, 1892).

Habrocrinus benedicti Slocom, Field Columbian Mus., 2, Geol. Ser., 1908, p. 295, pl. 87, figs. 6, 7.

Periechocrinus chicagoensis Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, 1902, p. 131, pl. 13, figs. 7, 8.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 536.

Niagaran: St. Paul, Indiana (Laurel); Bridgeport and Joliet, Illinois (Racine).

Habrocrinus farringtoni Slocom.

Habrocrinus farringtoni Slocom, Field Columbian Mus. Geol., 2d ser., 2, 1908, p. 298, pl. 87, figs. 1–5.

Niagaran (Racine): Drainage Canal near Lemont, Illinois.

Habrocrinus howardi (Miller).

Saccocrinus howardi Miller, 18th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1894, p. 284, pl. 5, fig. 3–5 (adv. sheets, 1892); N. A. Geol. Pal., 1st App., 1892, p. 681, fig. 1244.

Periechocrinus Howardi Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 21, 1897, p. 529.

Habrocrinus howardi Slocom, Field Columbian Mus., 2, Geol. Ser., 1908, p. 295.

Niagaran (Laurel): St. Paul, Indiana.

Habrocrinus lemontensis Slocom.

Habrocrinus lemontensis Slocom, Field Columbian Mus., Geol. Ser., 2, 1908, p. 297, pl. 87, figs. 8–10.

Niagaran (Racine): Drainage Canal near Lemont, Illinois.

HABROCRINUS ORNATUS Wachsmuth and Springer. See Periechocrinus ornatus.

HALICHONDRITES Dawson and Hinde.

Genotype: H. confusus Dawson and Hinde.

Halichondrites Dawson and Hinde, Canadian Rec. Sci., 3, 1888, p. 68.—Dawson, Trans. Roy. Soc. Canada, 7, sec. 4, 1890, p. 52.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 667.—Rauff, Neues Jahrb. Min., Geol. Pal., 2, 1893, p. 58.

Halichondrites confusus Dawson and Hinde.

Halichondrites confusus Dawson and Hinde, Trans. Roy. Soc. Canada, 7, sec. 4, 1890, p. 52, fig. 23.—Dawson, ibid., 2d ser., 2, sec. 4, 1896, p. 116, fig. 26.

Canadian? (Levis?): Metis, Quebec.

HALLIA Edwards and Haime. Genotype: H. insignis Edwards and Haime.

Hallia Edwards and Haime, Mon. Polyp. Foss. Terr. Pal., 1851 (Arch. du Mus. d'Hist. Nat., 5), pp. 165–353.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 453.—

HALLIA—Continued.

Milne-Edwards, Hist. Nat. d. Corall., 3, 1860, p. 356.—Ludwig, Palæontographica, 14, 1865, p. 143, pl. 31, fig. 5.—Lindstrom, Geol. Mag., 3, 1866, p. 412.—Dybowski, Archiv. f. Naturf. Liv-, Ehst-und Kurl, 5, 1873, p. 337.—Zittel, Handb. Pal., 1, 1879, p. 230.—Hall, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 411 (Ext., 1882, p. 7).—Frech, Zeits. d. Deutschen geol. Gesell., 37, 1885, p. 81; Pal. Anhandl., Dames and Kayser, 3, Heft 3, 1886, p. 81.—Miller, N. A. Geol. Pal., 1889, p. 191.—Sherzer, Amer. Geol., 7, 1891, pp. 290–295.—Koken, Die Leitfossilien, Leipzig, 1896, p. 472.

Hallia divergens Hall.

Hallia divergens Hall, 35th Rep. New York State Mus. Nat. Hist., 1884 p. 412 (Ext., 1882, p. 8).

Niagaran (Racine): Racine, Wisconsin.

Hallia divisa Hall.

Hallia divisa Hall, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 412 (Ext., 1882, p. 8).

Niagaran: Louisville, Kentucky.

Hallia pluma Hall.

Hallia pluma Hall, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 412 (Ext., 1882, p. 8).

Niagaran (Racine): Racine, Wisconsin.

Hallia scitula Hall.

Hallia scitula Hall, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 411 (Ext., 1882, p. 7).

Niagaran: Louisville, Kentucky.

HALLICYSTIS Jaekel. Genotype: Apiocystites imago Hall.

Apiocystites Hall (not Forbes nor Hall, 1852), 20th Rep. New York State Cab. Nat. Hist., rev. ed., 1868, p. 358.

Hallicystis Jaekel, Stammes. Pelmat., Berlin, 1, 1899, p. 287.—Schuchert, Smith. Misc. Coll., 47, pt. 2, 1904, p. 216.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 154.

Hallicystis elongatus (Jaekel).

Hallicystis elongata Jaekel, Stammesg. d. Pelmat., 1, Thecoidea u. Cystoidea, Berlin, 1899, p. 288.—Schuchert, Smiths. Misc. Coll., 47, pt. 2, 1904, p. 217.

Niagaran (Racine): Near Chicago, Illinois.

Hallicystis imago (Hall).

Apiocystites imago Hall, 18th Rep. New York State Cab. Nat. Hist., 1864, p. 10, pl. 3, fig. 12; pl. 1, fig. 9; 20th Rep. New York State Cab. Nat. Hist. (extras, 1864), 1868, p. 314, pl. 12 (3), fig. 12; pl. 12a (1) fig. 9; rev. ed., 1870, p. 358, pl. 12, fig. 12; pl. 12a, fig. 9.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 191, fig.

Hallicystis imago Jaekel, Stammes. Pelmat., 1, Thecoidea u. Cystoidea, Berlin, 1899, p. 288, pl. 15, fig. 3.—Schuchert, Smiths. Misc. Coll., 47, pt. 2, 1904, p. 216, fig. 24.

Niagaran (Racine): Racine, Wisconsin; Chicago, Illinois.

Plesiotype.—Cat. No. 35060, U.S.N.M.

HALLIELLA Ulrich. Genotype: H. sculptilis Ulrich.

Halliella Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, pt. 2, 1891, p. 184.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 707.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 656.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 346.

Halliella labiosa Ulrich.

Halliella labiosa Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 656, pl. 46, figs. 43–46.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 346, fig. 1658r, r′.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 738, fig. 1425h.

Trenton (Prosser): Near Cannon Falls, Minnesota.

Cotypes.—Cat. No. 41361, U.S.N.M.

Halliella sculptilis (Ulrich).

Primitia? sculptilis Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, pt. 1, 1890, p. 136, pl. 8, fig. 6.

Halliella sculptilis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 656.

Trenton (Perryville): Perryville, Boyle County, Kentucky.

Holotype.—Cat. No. 41362, U.S.N.M.

Halliella? seminulum longa Ulrich and Bassler.

Halliella? seminulum var. longa Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 520, pl. 95, fig. 16.

Helderbergian (Keyser): Cumberland, Maryland.

Holotype.—Cat. No. 53309, U.S.N.M.

Halliella? triplicata Ulrich and Bassler.

Halliella? triplicata Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 521, pl. 95, figs. 17, 18.

Helderbergian (Keyser): Cumberland, Maryland.

Holotype.—Cat. No. 53310, U.S.N.M.

HALLINA Winchell and Schuchert. See Zygospira Hall.

HALLOCERAS? HERCULES Grabau and Shimer. See Protophragmoceras hercules.

HALLOGRAPTUS BIMUCRONATUS Lapworth. See Lasiograptus bimucronatus.

HALLOPORA Bassler. Genotype: Callopora elegantula Hall.

Callopora Hall (not Callopora Gray, 1848), Pal. New York, 2, 1852, p. 144.—Nicholson, Pal. Province Ontario, 1874, p. 61; Geol. Mag., n. s., 1, 1874, p. 13.—Hall, 28th Ann. Rep. New York State Mus., 1879, p. 114.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, pp. 154, 251.—Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 172.—Hall and Simpson, Pal. New York, 6, 1887, p. 15.—Miller, N. A. Geol. Pal., 1889, p. 295.—Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 372, 416; Geol. Minnesota, 1893, 3, p. 275; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 275.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 588.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, pp. 36, 186.—Grabau, Bull. Buffalo Nat. Sci., 7, 1901, p. 167; Bull. New York State Mus., 9, 1901, p. 167.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 741.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, pp. 40.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 139.—Hennig, Archiv fur Zool., 4, 1908, p. 48.

Hallopora Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 325, 326; Zittel-Eastman Textb. Pal., 1913, p. 337.

Hallopora ampla (Ulrich).

Callopora ampla Ulrich, Geol. Minnesota, 3, 1893, p. 281, pl. 23, figs. 13–15, 18–20, 22, 23, 27, 28.

Black River (Decorah) and Trenton (Prosser): Ramsey, Goodhue, and Fillmore Counties, Minnesota; Decorah, Iowa.

Cotypes.—Cat. Nos. 43518, 45519, U.S.N.M.

Hallopora andrewsi (Nicholson).

Chætetes pulchellus (not of Milne-Edwards and Haime) Nicholson, Quart. Jour. Geol. Soc. London, 30, 1874, p. 503, pl. 29, figs. 5–5b.—Nicholson, Pal. Ohio, 2, 1875, p. 195, pl. 21, figs. 5, 5a.

Monticulipora (Heterotrypa) Andrewsii Nicholson, Genus Monticulipora, 1881, p. 128, fig. 21, pl. 5, figs. 1, 1a.

Callopora andrewsi Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 252.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 187.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 785, pl. 8, figs. 9, 9a; pl. 27, fig. 7.

Monticulipora andrewsi (Van Cleve) Hall, 12th Ann. Rep. Indiana Geol. Nat. Hist., 1883, p. 249, pl. 11, fig. 9.—James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 178.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 419, figs.—J. F. James, Jour. Cincinnati Soc. Nat. Hist., 16, 1894, p. 200.

Maysville (Bellevue and Corryville): Cincinnati, Ohio, and vicinity; southeastern Indiana.

Hallopora angularis (Ulrich).

Callopora angularis Ulrich, Geol. Minnesota, 3, 1893, p. 277, pl. 22, figs. 37–41.

Black River (Decorah): Minneapolis, Chatfield, and near Fountain, Minnesota.

Cotypes.—Cat. No. 43520, U.S.N.M.

Hallopora clausa (Bassler).

Callopora clausa Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 42, pl. 15, figs. 9–12.

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

Cotypes.—Cat. No. 35530, U.S.N.M

Hallopora dalei (Milne-Edwards and Haime).

Chætetes Dalii Milne-Edwards and Haime, Pol. Foss. Terr. Pal., 1851, p. 266, pl. 19, figs. 6, 6a.

Monticulipora Dalii Milne-Edwards and Haime, British Foss. Corals, 1854, p. 265.—Milne-Edwards, Hist. Nat. des Corall., 3, 1860, p. 277.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 419, fig.

Monticulipora (Heterotrypa) ramosa var. dalei Nicholson, Genus Monticulipora, 1881, p. 115, fig. 19, C, D, pl. 2, 4.

Monticulipora ramosa var. dalei James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 182.—J. F. James, ibid., 16, 1894, p. 205.

Chætetes approximatus Nicholson, Quart. Jour. Geol. Soc. London, 30, 1874, p. 502, pl. 29, fig. 3, 3a.—Nicholson, Pal. Ohio, 2, 1875, p. 193, pl. 21, fig. 3.

Monticulipora approximatus (Van Cleve) Hall, 12th Ann. Rep. Indiana Geol. Nat. Hist., 1883, p. 250, pl. 11, fig. 6.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4,1 889, p. 419.

Callopora dalei Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 252.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 188.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 139, fig. 194.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 792, pl. 8, fig. 11; pl. 27, fig. 12; Bull. Geol. Soc. Amer., 23, 1912, p. 367, pl. 19, figs. 7, 8.

Maysville: Cincinnati, Ohio, and vicinity (Mount Hopo and Fairmount); Central Tennessee (Leipers).

Hallopora dumalis (Ulrich).

Callopora dumalis Ulrich, Geol. Minnesota, 3, 1893, p. 282, pl. 23, figs. 1–8.

Hallopora dumalis Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 331, fig. 207.

Hallopora dumalis—Continued.

Black River (Decorah) and Trenton (Prosser): St. Paul and Cannon Falls, Minnesota.

Ordovician (Kuckers): Reval, Esthonia, Russia.

Cotypes.—Cat. No. 43517, U.S.N.M.

Hallopora elegantula (Hall).

Callopora elegantula Hall, Pal. New York, 2, 1852, p. 144, pl. 40, figs. a–m; 28th Ann. Rep. New York State Mus., 1879, p. 115; 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 237.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 250, pl. 11, figs. 6–6b; Zittel's Texb. Pal. (Engl. ed.), 1896, figs. 456, A, B (p. 274).—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, pl. 18, figs. 1–7.—Grabau, Bull. New York State Mus., 45, 1901, p. 167, fig. 67; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 167, fig. 67.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 41, pl. 17, figs. 11–15; pl. 26, fig. 12.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 140, figs. 195a–b.

Hallopora elegantula Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 334, 335, fig. 210.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 337, figs. 491a, b.

Callopora nana Nicholson, Ann. Mag. Nat. Hist., 5th ser., 13, 1884, p. 120.

Niagaran: Lockport, Rochester, etc., New York; Ontario (Rochester); Waldron, Indiana; Newsom, Tennessee (Waldron); Osgood, Indiana (Osgood); Sterling, Illinois; Louisville, Kentucky; West Tennessee, etc. Wenlock shale of England and Gotland.

Plesiotypes.—Cat. Nos. 35528, 43648, U.S.N.M.

Hallopora frondosa (Cumings).

Callopora frondosa Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 785, pl. 9, figs. 1, 1a.

Richmond (Whitewater): Richmond, Indiana.

Hallopora goodhuensis (Ulrich).

Callopora goodhuensis Ulrich, Geol. Minnesota, 3, 1893, p. 282, pl. 23, figs. 9, 10, 21, 29.

Hallopora goodhuensis Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 327, figs. 203, 204.

Trenton (Prosser): St. Paul, Cannon Falls, etc., Minnesota.

Ordovician (Wassalem and Wesenberg): Esthonia, Russia.

Cotypes and *plesiotype*.—Cat. Nos. 43524, 57460, U.S.N.M.

Hallopora incontroversa (Ulrich).

Callopora incontroversa Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 96; Geol. Minnesota, 3, 1893, p. 278, pl. 22, figs. 33–36.

Black River (Decorah): Minneapolis, St. Paul, and Preston, Minnesota.

Holotype.—Cat. No. 43521, U.S.N.M.

Hallopora magnopora (Foerste).

Callopora magnopora Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 173; 3, pl. 16, fig. 5; Geol. Surv. Ohio, 7, 1895, p. 600, pl. 29, fig. 5.—Bassler, Bull. U. S. Geol. Surv., 292, 1906, pp. 42, 43, pl. 15, figs. 1–8; pl. 26, fig. 3.

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

Clinton (Rochester): Grimsby, Ontario.

Plesiotypes.—Cat. Nos. 35532, 44131, U.S.N.M.

Hallopora multitabulata (Ulrich).

Monotrypella multitabulata Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 100.

Hallopora multitabulata—Continued.

Callopora multitabulata Ulrich, Geol. Minnesota, 3, 1893, p. 280, pl. 23, figs. 11, 12, 16, 17, 24–26, 30, 31; Zittel's Textb. Pal. (Engl. ed.), 1896, fig. 456, C, D (p. 274).—Sardeson, Jour. Geol., 9, 1901, p. 9, pl. A, figs. 5–6d.—Ruedemann, Bull. New York State Mus., 49, for 1901, 1902, p. 13.—Nickles, Bull. Kentucky Geol. Surv., 5, 1905, p. 42, pl. 1, fig. 2.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 22, pl. 1, figs. 5–7.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 139, figs. 188n, 190n.

Hallopora multitabulata Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 326, 327, fig. 202; Zittel-Eastman Textb. Pal., 1913, p. 337, fig. 491.

Monticulipora kentuckensis James, Paleontologist, No. 7, 1883, p. 57, pl. 2, figs. 1, 1b.—James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 180, pl. 2, figs. 6a–d.—J. F. James, ibid., 16, 1904, p. 203.

Black River and Lower Trenton: Burgin, etc., Kentucky; Minneapolis, etc, Minnesota; Tennessee; Ontario; New York; Iowa; etc.

Cotypes.—Cat. Nos. 43522, 43523, U.S.N.M.

Hallopora nodulosa (Nicholson).

Chætetes? nodulosus Nicholson, Quar. Jour. Geol. Soc. London, 30, 1874, p. 506, pl. 29, figs. 9, 9a.; Pal. Ohio, 2, 1875, p. 200, pl. 21, figs. 10, 10a; Ann. Mag. Nat. Hist., ser. 4, 18, 1876, p. 87, pl. v. 3.

Monticulipora (Heterotrypa) nodulosa Nicholson, Genus Monticulipora, 1881, p. 116, pl. 1, figs. 4–4d.

Monticulipora nodulosa James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 182.—J. F. James, ibid., 16, 1894, p. 206.

Callopora nodulosa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 252; ibid., 6, 1883, p. 83.—Nickles, Kentucky Geol. Surv. Bull. No. 5, 1905, p. 50, pl. 2, figs. 8, 9.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 786, pl. 9, figs. 2–2c; pl. 27, fig. 8.

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

Hallopora onealli (James).

Chætetes? O'Nealli James, Introd. Catal. Low. Sil. Foss., 1875, p. 2.

Monticulipora o'uealli James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 174.—J. F. James, ibid., 16, 1894, p. 194.

Callopora onealli Miller, N. A. Geol. Pal., 1889, p. 296.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 23, pl. 6, figs. 1, 2.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 786, pl. 9, figs. 3–3b; pl. 27, figs. 9, 10.

Eden: Cincinnati, Ohio, and vicinity (Economy); New York (Indian Ladder).

Hallopora onealli communis (James).

Monticulipora (Heterotrypa) o'nealli? var. communis James, Paleontologist, No. 6, 1882, p. 47; ibid., No. 7. 1888, pl. 1, 8.

Monticulipora communis James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 175, pl. 2, figs. 5a, b.—J. F. James, ibid., 16, 1894, p. 195.

Callopora onealli-communis Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 190.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 24, pl. 1, fig. 13; pl. 4, figs. 8, 9.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 788, pl. 8, fig. 10; pl. 27, fig. 11.

Eden (Economy—McMicken): Cincinnati, Ohio, and vicinity.

Plesiotypes.—Cat. No. 35394, U.S.N.M.

Hallopora onealli sigillarioides (Nicholson).

Chætetes sigillarioides Nicholson, Pal. Ohio, 2, 1875, p. 203, pl. 22, figs. 9, 9a; Ann. Mag. Nat. Hist., 4th ser., 18, 1876, p. 87, pl. 5, fig. 2.

Hallopora onealli sigillarioides—Continued.

Callopora sigillaroidea Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 252; 6, 1883, p. 83.

Callopora sigillarioides Miller, N. A. Geol. Pal., 1889, p. 296, fig. 464.—Nickles, Bull. Kentucky Geol. Surv., 5, 1905, p. 50, pl. 2, figs. 10, 11.—Bassler, Virginia Geol. Surv., Bull. 2a, 1909, pl. 14, fig. 3.

Callopora onealli-sigillaroides Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 191.—Cumings, Amer. Geol., 28, 1901, p. 374.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, pl. 6, figs. 3, 4.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 789, pl. 9, fig. 4.

Monticulipora (Heterotrypa) O'Nealli (not James) Nicholson, Genus Monticulipora, 1881, p. 118, pl. 3, figs. 3–3f.

Eden (Economy—McMicken): Cincinnati, Ohio, and vicinity.

Plesiotypes.—Cat. No. 35395, U.S.N.M.

Hallopora pulchella (Ulrich).

Callopora pulchella Ulrich, Geol. Minnesota, 3, 1893, p. 283, pl. 22, figs. 1–12.

Black River (Decorah): St. Paul and Cannon Falls, Minnesota.

Cotypes.—Cat. No. 43525, U.S.N.M.

Hallopora pulchella persimilis (Ulrich).

Callopora pulchella var. persimilis Ulrich, Geol. Minnesota, 3, 1893, p. 284, pl. 22, figs. 13–17.

Black River (Decorah): Near Cannon Falls, Minnesota.

Cotypes.—Cat. No. 43526, U.S.N.M.

Hallopora ramosa (D'Orbigny).

Monticulipora ramosa 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. 277.—Nicholson, Tab. Corals Pal. Period, 1879, p. 274, fig. 35b.—Zittel, Handb. Pal., 1, 1880, p. 614, fig. 446b.—James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 181; ibid., 16, 1894, p. 204.—Miller, N. A. Geol. Pal., 1889, p. 197, fig. 198.—Boule and Thevenin, Ann. de Pal., 1, 1906, p. 6, pl. 2, figs. 6–8.

Chætetes ramosus Milne-Edwards and Haime, Pal. Foss. Terr. Pal., 1851, p. 266, pl. 19, figs. 2, 2a.—Nicholson, Ann. Mag. Nat. Hist., ser. 4, 18, 1876, p. 88.—Quenstedt, Roehren- und Sternkorallen, 1881, p. 77, pl. 146, figs. 13–18.

Monticulipora (Heterotrypa) ramosa Nicholson, Pal. Tab. Corals, 1879, p. 296, pl. 13, figs. 2, 2a; Genus Monticulipora, 1881, p. 110, fig. 18, pl. 2, figs. 2, 2a.—Zittel, Handb. Pal., 1, 1880, p. 615, fig. 447; Textb. Pal., English ed., 1896, fig. 185, p. 103, fig. 186B, p. 103.

Heterotrypa ramosa Nicholson in Steinmann, Neues Jahrb. Min., Geol. Pal., 1, 1882, pl. 4, fig. 1.

Callopora ramosa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 252; 6, 1883, p. 83; Geol. Surv. Illinois, 8, 1890, p. 315, fig. 5b.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 139, fig. 194, 1.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 790, pl. 9, figs. 5, 5a; pl. 10, fig. 1; pl. 27, fig. 13, 13a; Bull. Geol. Soc. Amer., 23, 1912, p. 368, pl. 20, fig. 16.

Hallopora ramosa Bassler, Zittel-Eastman Textb. Pal., 1913, p. 337, fig. 490.

Chætetes Dalei (not of Milne-Edwards and Haime) Nicholson, Quart. Jour. Geol. Soc. London, 30, 1874, p. 501, pl. 29, figs. 1, 1a; Pal. Ohio, 2, 1875, p. 192, pl. 21, figs. 1, 1a.—Hall, 12th Ann. Rep. Indiana Geol. Nat. Hist., 1883, p. 249, pl. 11, fig. 2.

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

Hallopora rugosa (Milne-Edwards and Haime).

Chætetes rugosus Milne-Edwards and Haime, Pal. Foss. Terr. Pal., 1851, p. 268, pl. 20, figs. 6, 6a.—Nicholson, Quart. Jour. Geol. Soc. London, 30, 1874, p. 502, pl. 29, fig. 2; Pal. Ohio, 2, 1875, p. 193, pl. 21, fig. 2; Ann. Mag. Nat. Hist., 4th ser., 18, 1876, p. 87, pl. 5, fig. 4.—Quenstedt, Roehren-und Sternkorallen, 1881, p. 78, pl. 146, figs. 19, 20.

Monticulipora rugosa Milne-Edwards and Haime, British Foss. Corals, 1854, p. 265.—Milne-Edwards, Hist. Nat. des Corall., 3, 1860, p. 277.—Dybowski, Die Chætetiden d. Ost. Silur-Form., 1877, p. 92, pl. 3, fig. 1.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 172, fig.

Monticulipora (Heterotrypa) ramosa var. rugosa Nicholson, Genus Monticulipora, 1881, p. 113, fig. 19A, B, pl. 2, fig. 3.

Monticulipora ramosa var. rugosa James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 182.—James, ibid., 16, 1894, p. 205.

Callopora ramosa var. rugosa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 252.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 793, pl. 10, fig. 2, pl. 27, figs. 14, 14a.

Callopora rugosa Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 192.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 140, fig. 194, 2.

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

Hallopora subnodosa (Ulrich).

Callopora subnodosa Ulrich, Geol. Surv. Illinois, 8, 1890, p. 417, pl. 33, figs. 5, 5c, fig. 3d (p. 308).—Miller, N. A. Geol. Pal., 1889, fig. 465 (p. 296).—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 796, pl. 10, figs. 5, 5a.

Richmond: Blanchester, Waynesville, Hanover, and other localities in Ohio; Richmond and Versailles, Indiana; Wilmington and Savannah, Illinois; Iron Ridge, Wisconsin.

Cotypes.—Cat. No. 43393, U.S.N.M.

Hallopora subplana (Ulrich).

Callopora subplana Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 253, pl. 11, figs. 7, 7b.—J. F. James, ibid., 16, 1894, p. 196.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 795, pl. 10, figs. 4, 4a; pl. 27, fig. 15.

Maysville (Mount Hope and Fairmount): Covington, Kentucky, and vicinity.

Cotypes.—Cat. No. 43649, U.S.N.M.

Hallopora undulata (Ulrich).

Callopora undulata Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 95; Geol. Minnesota, 3, 1893, p. 279, pl. 22, figs. 24–31.

Hallopora undulata Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 332, fig. 208.

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

Ordovician (Wassalem): Uxnorm, Esthonia, Russia.

Cotypes.—Cat. No. 43816, U.S.N.M.

HALLOPORINA Bassler. Genotype: Callopora crenulata Ulrich.

Calloporina Ulrich and Bassler (not Neviani, 1895), Smiths. Misc. Coll., Quart., 47, 1904, p. 47.

Callopora Ulrich (part), Geol. Minnesota, 3, 1893, p. 275.

Halloporina Bassler, Zittel-Eastman Textb. Pal., 1913, p. 337.

Halloporina crenulata (Ulrich).

Callopora crenulata Ulrich, Geol. Minnesota, 3, 1893, p. 284, pl. 22, figs. 18–23.

Calloporina crenulata Ulrich and Bassler, Smiths. Misc. Coll., Quart., 47, 1904, p. 47, pl. 14, figs. 17–19.

Black River (Decorah) and Trenton (Prosser): St. Paul and Cannon Falls, Minnesota; Decorah, Iowa; Neenah, Wisconsin.

Cotypes.—Cat. No. 43515, U.S.N.M.

Halloporina parva (Ulrich and Bassler).

Calloporina parva Ulrich and Bassler, Smiths. Misc. Coll., Quart., 47, 1904, p. 48, pl. 14, figs. 13–16.

Black River: Near Belfast, Marshall County, Tennessee.

Cotypes.—Cat. No. 43217, U.S.N.M.

HALYSITES Fischer. Genotype: H. catenularia Linnæus.

Halysites Fischer, Zoognosia, 3d ed., 1, 1813, p. 387; Notice sur les Polypiers Tubipores Fossiles, 1828, p. 15.—Fischer de Waldheim, Oryct. Gouv. Moscou, 1830, p. 163.—Edwards and Haime, Compt. Rend. de l'Acad. Sci., 29, 1849, p. 261; Mon. d. Polyp. Foss. d. Terr. Pal., 1851 (Arch. du Mus. d'Hist. Nat., 5, 1851), pp. 155, 281.—McCoy, British Pal. Rocks and Foss., 1854, p. 26.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 445.—Milne-Edwards, Hist. Nat. d. Corall., 3, 1860, p. 286.—Duncan, Rep. 41st Meeting British Assoc. Adv. Sci., 1872, p. 130.—Salter, Cat. Camb. and Sil. Foss., 1873, p. 110.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 77.—Lindstrom, Ann. Mag. Nat. Hist., 4th ser., 18, 1876, p. 13.—Nicholson, Tab. Corals Pal. Period, 1879, p. 226.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1880, p. 274.—Roemer, Leth. Geog., pt. 1, Leth. Pal., 1883, p. 483.—Miller, N. A. Geol. Pal., 1889, p. 191.—Sardeson, Neues Jahrb. f. Min., Geol. and Pal., Beilage-Band, 10, 1896, p. 272.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 64.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 32, No. 1, 1899, p. 25.—Grabau, Bull. New York State Mus., 45, 1901, p. 143; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 143.—Pocta, Syst. Sil. du Centre Boheme, 8, pt. 2, 1902, p. 268.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 96.

Catenipora Lamarck, Hist. des Amer. sane Vert., 2, 1816, p. 206.—Say, Amer. Jour. Sci. Arts, 2, 1820, p. 34.—Eichwald, Zool. Specialis, pt. 1, Vilnae, p. 192.—Eaton, Geol. Textb., 2d ed., 1832, p. 41.—Steininger, Mem. Soc. Geol. France, 1, 1834, p. 342.—Dana, Wilkes U. S. Expl. Exped., 7, Zoophytes, 1838, pp. 430, 538.—Goldfuss, Petrefacta, 1826, pp. 74, 245; 2d ed., pt. 1, 1862, p. 70.—Say, Bull. Amer. Pal., 1, 1896, p. 282 (reprint).

Halysites agglomeratiformis Whitfield.

Halysites agglomeratiformis Whitfield, Amer. Mus. Nat. Hist., 13, 1900, p. 20, pl. 2, figs. 1, 2.

Niagaran: Cape Harrison, Princess Marie Bay, Arctic America.

Halysites agglomeratus Hall.

Catenipora agglomerata Hall, Nat. Hist. New York, Geol., 4, tab. ill., 22, 1843, fig. 2; Pal. New York, 2, 1852, p. 129, pl. 35 (bis), fig. 2a–g.

Halysites agglomerata Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 79 (gen. ref.).—Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 146.—Nicholson, Geol. Surv. Ohio, Pal., 2, 1875, p. 227; Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 51, fig. 24; Tab. Corals Pal. Foss., 1879, p. 22, fig. 9.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 270, figs.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 48.—Whitfield, Bull. Amer. Mus. Nat. Hist., 19, 1903, p. 490, pl. 42, figs. 3, 4.—Clarke and Ruedemann Mem. New York State Mus., 5, 1903, p. 34.

Niagaran: Sweden, Ogden, etc., New York (Lockport-Guelph); Milwaukee, etc., Wisconsin.

HALYSITES AGGLOMERATUS var. COMPACTUS Whiteaves. See Halysites compactus.

Halysites catenularia (Linnæus).

Tubipora catenularia Linnæus, Syst. Nat., 12th ed., 1767, p. 1270.

Halysites catenularia Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal. (Arch. du Mus. d'Hist. Nat., 5), 1851, p. 28.1 (Gives a long list of European

Halysites catenularia—Continued.

references). Mon. British Foss. Corals, Pal. Soc., 1854, p. 270, pl. 64, figs. 1-1c.—Emmons, Man. Geol., 1860, p. 111, fig. 101.—Roemer, Sil. Fauna West. Tennessee, Breslau, 1860, p. 25, pl. 2, fig. 7.—Milne-Edwards, Hist. Nat. Corall., 3, 1860, p. 287.—Hall, Rep. Geol. Surv. Wisconsin, 1862, p. 66, fig. 2.—Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 85.—Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 146.—Nicholson, Geol. Surv. Ohio, Pal., 2, 1875, p. 227; Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 51, figs. 24a, b; Tab. Corals Pal. Period, 1879, p. 22, figs. 9a, b, pl. 10, figs. 7, 7a; pl. 11, figs. 1, 1a.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 486, pl. 9, figs. 6a, 6b.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 47.—Sardeson, Neues Jahrb. f. Min., Geol. and Pal., Beilage-Bd., 10, 1896, p. 272.—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 68, pl. 3, figs. 1, 1a, b, 2, 2a, 3, 3a.—Schuchert, Amer. Geol., 31, 1903, p. 164.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 222, pl. 17, figs. 6–8.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 33.—Foerste, Cincinnati Soc. Nat. Hist., Jour. 21, 1909, p. 10.—Lambe, Cruise of the "Neptune," App., 4, 1906, p. 326.

Tubipora catenulatus Linnæus, Syst. Nat., 13th ed., 1789, p. 3753.

Halysites catenulatus Salter, Sutherland's Jour. Voyage in Baffin's Bay, etc., 2, App., 1852, p. 228, pl. 6, fig. 11.—Billings, Canadian Nat. Geol., 1, 1856, p. 319, fig. 9.—Chapman, Canadian Jour., n. s., 6, 1861, p. 509, fig. 76; ibid., 8, 1863, p. 211, fig. 216.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 305, fig. 303.—Chapman, Expos. Min. Geol. Canada, 1864, p. 103, fig. 76; p. 183, fig. 216.—Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 7, 52.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 78, pl. 29, figs. 1, 2, 4.—Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 582.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1878, p. 49.—Emerson, Narrative Hall's 2d Arctic Exped., U. S. Navy Dep., 1879, p. 577.—Whitfield, Geol. Wisconsin, 4, 1882, p. 271, pl. 13, figs. 5–7; p. 241, pl. 10, fig. 6.—White, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 382, pl. 46, figs. 4–7.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 190, fig.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 67, figs. 1–3.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 270, figs.—Miller, N. A. Geol. Pal., 1889, p. 191, fig. 180.—Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 337.—Grabau, Bull. New York State Mus., 45, 1901, p. 143, fig. 39; Bull. Buffalo Soc. Nat. Sci., 8, 1901, p. 143, fig. 39.—Whitfield, Bull. Amer. Mus. Nat. Hist., 19, 1903, p. 489, pls. 41, 42, fig. 5.—Hayes and Ulrich, U. S. Geol. Surv., Folio 95, ill. sheet, 1903, fig. 6.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 96, fig. 153.—Swartz, Maryland Geol. Surv., Low. Dev., 1913, p. 220, pl. 26, fig. 8.

Catenipora escharoides Lamarck, Anim. sans. vertebres, 1st ed., 2, 1816, p. 207.—Say, Amer. Jour. Sci., 2, 1819, p. 34.—Goldfuss, Petrefacta, 1826, p. 74, pl. 25, figs. 4a–c; p. 245.—Eaton, Geol. Textb., 2d ed., 1832, p. 42, pl. 5, fig. 53.—Troost, 5th Geol. Rep. Tennessee, 1840, p. 68.—Castelnau, Essai Syst. Sil. L'Amerique Septent., 1843, p. 45, pl. 17, fig. 3.—Hall, Geol. New York, 4, tab. ill., 22, 1843, fig. 1.—Owen, Geol. Expl. Iowa, Wisconsin, and Illinois, 2d ed., 1844, p. 33, pl. 7, fig. 2.—Hall, Amer. Jour. Sci. Arts, 2d ser., 7, March, p. 228.—Edwards and Haime, Mon. Polyp. Foss. d. Terr. Pal., 1851 (Arch. du Mus. d. Hist. Nat., 5), p. 284; Pal. New York, 2, 1852, p. 44, pl. 18, fig. 2; p. 127, pl. 35, figs. 1a–c; p. 325.—Marcou, Geol. Map. United States and British Prov., etc., 1853, p. 28, pl. 2, fig. 10.—Edwards and Haime, Mon. British Foss. Corals, Pal. Soc., 1854, p. 272, pl. 64, figs. 2, 2a.—Milne-Edwards, Hist.

Halysites catenularia—Continued.

Nat. d. Corall., 3, 1860, p. 289.—Goldfuss, Petrefacta, 2d ed., pt. 1, 1862, p. 70.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 271, fig.—Sardeson, Neues Jahrb. Min., Geol. Pal., Beilage-Band, 10, 1896, p. 273.—Say, Bull. Amer. Pal., 1, 1896, p. 282 (reprint).

Silurian: A widely distributed species in all divisions of the Silurian in Europe and North America.

Halysites catenularia amplitubulatus Lambe.

Halysites catenularia var. amplitubulata Lambe, Contr. Canadian Pal., Geol. Surv. Canada, 1899, p. 71, pl. 4, figs. 4, 4a.

Silurian or Helderbergian: L'Anse a la Barbe and L'Anse au Gascon, Quebec.

Halysites catenularia feildeni (Etheridge).

Halysites catenulatus var. Feildeni Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 582, pl. 28, fig. 1.

Niagaran: Cape Hilgard, Arctic America.

Halysites catenularia var. gracilis Whiteaves. See Halysites gracilis.

Halysites catenularia harti (Etheridge).

Halysites catenulatus var. Harti Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 583, pl. 23, fig. 2.

Niagaran: Cape Frazer, Arctic America.

Halysites catenularia microporus (Whitfield).

Halysites catenulatus var. microporus Whitfield, Geol. Wisconsin, 4, 1882, p. 272. pl. 13, fig. 6.

Halysites catenularia var. micropora Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 70, pl. 3, fig. 4.

Silurian (Racine, Guelph, and Cataract): Bailey's Harbor, etc., Wisconsin; Ontario.

Halysites catenularia nitidus Lambe.

Halysites catenularia var. nitida Lambe, Contr. Canadian Pal., Geol. Surv. Canada, 1899, p. 71, pl. 4, figs. 2a, 2b.

Silurian or Helderbergian: L'Anse a la Barbe, Baie des Chaleurs, and Neigette Falls, near Rimouski, Quebec.

Halysites catenularia quebecensis Lambe.

Halysites catenularia var. Quebecensis Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 69, pl. 4, figs. 1, 1a, b.

Black River or Richmond: Lake St. John, Quebec.

Halysites catenulatus of authors. See Halysites catenularia.

Halysites catenulatus var. gracilis Schuchert. See Halysites gracilis.

Halysites catenulatus var. labyrinthicus Whitfield. See Halysites labyrinthicus.

Halysites catenulatus nexus Foerste. See Halysites labyrinthicus.

Halysites compactus Rominger.

Halysites compactus Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 79, pl. 29, fig. 3.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 2 (loc. occ.).—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 71, pl. 4, figs. 5, 5a, 6–8a.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 292.

Halysites compactus—Continued.

Halysites agglomeratus var. compactus Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 48.

Niagaran: Epoufette Point, Michigan; Elora, Galt, and Lake Temiscaming, Ontario; near Donald, British Columbia.

HALYSITES ESCHAROIDES Edwards and Haime. See Halysites catenularia.

Halysites gracilis (Hall).

Catenipora gracilis Hall, Geol. Lake Sup. Land Dist., Foster and Whitney's Rep., 1851, p. 212, pl. 29, figs. 1a, b; Rep. Geol. Surv. Wisconsin, 1862, p. 430.

Halysites catenularia var. gracilis Whiteaves, Pal. Foss., Geol. Surv. Canada., 3, pt. 3, 1897, p. 150.—Lambe, Cont. Canadian Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 69, pl. 3, figs. 5, 5a, b, 6, 7.

Halysites catenulatus var. gracilis Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 153.

Richmond: Green Bay, Wisconsin; Lake Winnipeg; Anticosti; Ontario; Baffin Land.

Halysites labyrinthicus (Goldfuss).

Catenipora labyrinthica Goldfuss, Petrefacta Germania, 1826, p. 75, pl. 25, figs. 5a, b; see also p. 245.—Troost, 5th Geol. Rep. Tennessee, 1840, p. 63.—Vanuxem, Nat. Hist New York Geol., 3, 1842, p. 112.—Castelnau, Essai Syst. Sil. l'Amer. Sept., 1843, p. 45, pl. 17, fig. 2.—Goldfuss, Petrefacta, 2d ed., pt. 1, 1862, p. 71.

Halysites catenulatus var. labyrinthicus Whitfield, Geol. Wisconsin, 4, 1882, p. 273, pl. 13, fig. 7.

Halysites nexus Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 67, figs. 4, 5.—Foerste, Cincinnati Soc. Nat. Hist., Jour., 21, 1909, p. 10.

Halysites catenulatus nexus Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 338.

Catenipora Michelini Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 45, pl. 17, fig. 1.

Catenipora meandrina Troost, 5th Geol. Rept. Tennessee, 1840, p. 68.

Halysites meandrina Miller, N. A. Geol. Pal., 1889, p. 191 (gen. ref.).

Niagaran: Drummond Island, Lake Huron; Louisville, Kentucky (Louisville); Decatur and Perry Counties, Tennessee (Brownsport); Wisconsin.

HALYSITES NEXUS Davis. See Halysites labyrinthicus.

Halysites parryi (König).

Catenipora Parryi König, Supplement to App. of Captain Parry's Voyage for the Discovery of a Northwest Passage, in the years 1819-20, 1824, p. 251.

Halysites parryi Miller, N. A. Geol. Pal., 1889, p. 191 (gen. ref.).

Niagaran: Prince Regents Inlet, Arctic America.

Halysites radiatus Whitfield.

Halysites radiatus Whitfield, Bull. Amer. Mus. Nat. Hist., 19, 1903, p. 490, pl. 42, figs. 1, 2.

Niagaran: Jackson County, Iowa.

Halysites sexto-catenatus Owen.

Halysites sexto-catenatus Owen, Geol. Surv. Indiana, 1862, p. 362.

Niagaran: Huntington County, Indiana.

Observation.—Not recognized. Probably the same as H. catenularia.

HAPLOCONUS Raymond. Genotype: Bathyurus smithi Billings.

Haploconus Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 61; Zittel-Eastman Textb. Pal., 1913, p. 721.

Haploconus brevimarginatus (Walcott).

Cyphaspis? brevimarginatus Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 93, pl. 12, fig. 10.

Haploconus brevimarginatus Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 61 (gen. ref.).

Upper Pogonip: Ridge east of Hamburg Ridge, Eureka District, Nevada.

Holotype.—Cat. No. 24646, U.S.N.M.

Haploconus galenensis (Clarke).

Cyphaspis(?) galenensis Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 759, fig. 82.

Haploconus galenensis Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 61 (gen. ref.).

Trenton (Prosser): Cannon Falls, Minnesota.

Holotype.—Cat. No. 41956, U.S.N.M.

Haploconus smithi (Billings).

Bathyurus Smithi Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 153, fig. 114a; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 56 (advance sheets, 1862).—Miller, N. A. Geol. Pal., 1889, p. 534, fig. 973.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 288, fig. 1595.

Haploconus smithi Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 62, pl. 7, figs. 13, 14.

Trenton: Peterborough, Ontario.

HAPLOCRINITES GRANULATUS Troost. See Haplocrinus granulatus.

HAPLOCRINITES HEMISPHERICUS Troost. See Pisocrinus quinquelobus.

HAPLOCRINITES MAXIMUS Troost. See Haplocrinus maximus.

HAPLOCRINITES OVALIS Troost. See Haplocrinus ovalis.

HAPLOCRINUS Steininger. Genotype: H. sphæroideus Steininger.

Haplocrinus Steininger, Mem. Geol. Soc. France, 1, 1834, p. 232; Bull. Soc. Geol. France (Ser.), 8, 1837, p. 231.—Roemer, Rhein. Uebergangs., 1844, p. 63.—Steininger, Verstein. Eifel, 1849, p. 20.—Quenstedt, Handb. Petref., 1852, p. 624.—Steininger, Geogn. Beschr. Eifel, 1853, p. 36.—Muller, Verh. Nat. Verein, Jahrb., 12, 1855, p. 21.—Roemer, Leth. Geog. (Ausg. 3), 1855, p. 260.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 309.—Hall, 15th Rep. New York State Cab. Nat. Hist. for 1861, 1862, p. 143.—Dujardin and Hupe, Hist. Nat. Des. Zooph. Ech., 1862, p. 105.—Allman, Trans. Royal Soc. Edinburgh, 23, 1864, p. 247, fig. 2.—Schultze, Echin. Eifelk., 1866, p. 103; Denk. d. Kais. Akad der Wiss., Math.-Naturw. Cl., 24, Abth. 2, 1866, p. 215, fig. 21.—DeKoninck, Bull. l'Acad. Roy. Belg., ser. 2, 3 (Extr. 63), 1868.—Zittel, Handb. Pal., 1, 1879, p. 347.—Quenstedt, Handb. Petref. (Ausg. 3), 1882, p. 964.—Carpenter, Challenger Rep. Crin., 1885, p. 158, etc.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, pp. 79, 83 (Rev. Pal., pt. 3, pp. 155, 159); ibid., 1887, pp. 97–113; ibid., 1888, pp. 339–363.—Miller, N. A. Geol. Pal., 1889, p. 252.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1890, pp. 354–390.—Bather, Kongl. Sv. Vet. Akad. Handl., 25, No. 2, 1893, pp. 20, 25, fig. 5.—Whidborne, Mon. Dev. Fauna South England, 2, Pal. Soc., 1895, p. 204.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 151, figs. 35, 64.—Zittel, Grundzuge Pal., 1, 1910, p. 196.

Aplocrinus D'Orbigny, Prodr. Pal. Strat., 1, 1849, p. 102.

Haplocrinus granulatus (Troost).

Haplocrinites granulatus Troost, Amer. Jour. Sci. Arts, 2d ser., 8, 1849, p. 420; Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 61 (nom. nud.).

Haplocrinus granulatus Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 376.—Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 25, pl. 4, figs. 4, 5.

Niagaran (Brownsport): Decatur County, Tennessee.

Haplocrinus maximus (Troost).

Haplocrinites maximus Troost, Amer. Jour. Sci. Arts., 2d ser., 8, 1849, p. 420; Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 61 (nom. nud.).

Haplocrinus maximus Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 376.—Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 26, pl. 4, figs. 6, 7, 8.

Niagaran (Brownsport): Decatur County, Tennessee.

Haplocrinus ovalis (Troost).

Haplocrinites ovalis Troost, Amer. Jour. Sci. Arts, 2d ser., 8, 1849, p. 420; Proc. Amer. Assoc. Adv. Sci., 2, p. 61 (nom. nud.).

Haplocrinus ovalis Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 376; Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 25, pl. 4, fig. 3.

Niagaran (Brownsport): Decatur County, Tennessee.

HARLANIA Goeppert. See Arthrophycus Hall.

HARLANIA HALLI Goeppert. See Arthrophycus alleghaniensis.

Harmodites rugosa D'Orbigny.

Harmodites rugosa D'Orbigny, Prodr. Pal., 1, 1849, p. 50.—Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal. (Arch. du Mus. d'Hist. Nat., 5), 1851, p. 296.—Boule and Thevenin, Ann. de Pal., 1, 1906, p. 7, pl. 9, fig. 5.

Silurian(?): Falls of the Ohio.

Observation.—The figures of Bonle and Thevenin refer to a Devonian species of Syringopora.

HARPES Goldfuss. Genotype: Trilobites ungula Sternberg.

Harpes Goldfuss, Nova Acta Physico-Med., 19, 1839, p. 358; Neues Jahrb. f. Min., etc., 1843, pp. 540, 548.—Portlock, Rep. Geol. Londonderry, 1843, p. 265.—Burmeister, Org. der Tril., Berlin, 1843, p. 87.—Emmrich, Neues Jahrb. f. Min., etc., 1845, p. 45.—Beyrich, Untersuchung uber Tril., 1846, p. 32.—Hawle and Corda, Abh. bohm. Gesell. d. Wiss., 5 (extract), 1847, p. 162, pl. 7, fig. 83.—Barrande, Neues Jahrb. f. Min., etc., 1850, p. 777; Syst. Sil. du Centre Boheme, 1, 1852, p. 343, pl. 8, 9.—Angelin, Pal. Scandinavica, 3d ed., Holmiae, 1854, p. 86.—Pictet, Traité de Pal., 2d ed., 2, 1854, p. 487.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 7th ser., 1881, p. 65.—Clarke, Jour. Morph., 2, 1888, pp. 265, 266.—Whidborne, Mon. Dev. Fauna South England, 1, Pal. Soc., 1889, p. 29.—Miller, N. A. Geol. Pal., 1889, p. 549.—Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 756.—Koken, Die Leitfossilien, Leipzig, 1896, p. 15, fig. 9, fig. 3.—Beecher, Amer. Jour. Sci., 4th ser., 3, 1897, pp. 105, 184, 185, pl. 3, fig. 11.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 34, no. 8, 1901, pp. 27, 31.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 258.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 711.

HARPES (part) of American authors. See Eoharpes Raymond.

Harpes telleri Weller.

Harpes telleri Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 213, pl. 20, fig. 2.

Niagaran (Racine): Milwaukee, Wisconsin.

HARPIDES Beyrich. Genotype: Harpides hospes Beyrich.

Harpides Beyrich, Unters. Tril., 1846, p. 34.—Hawle and Corda, Abh. d. k. bohmischen Gesell. d. Wiss., 5 (extract), 1847, pp. 161, 166, pl. 7, fig. 84.—Barrande, Neues Jahrb. f. Min., etc., 1850, p. 780.—Pictet, Traité de Pal., 2d ed., 2, 1854, p. 498.—Angelin, Pal. Scandinavica, 3d ed., Holmiae, 1878, p. 86.—Zittel, Handb. Pal., 2, 1885, p. 625.—Miller, N. A. Geol. Pal., 1889, p. 549.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 7th ser., 42, 1894, p. 63.—Koken, Die Leitfossilien, Leipzig, 1896, p. 24.—Frech, Leth. geog., 1 Th., Leth. Pal., 2, 1897, p. 44, footnote.—Beecher, Amer. Jour. Sci., 4th ser., 3, 1897, p. 185.—Lindstrom, Kongl. Sven. Vet. Akad. Handl., 34, no. 8, 1901, pp. 27, 31, 32.

Dictyocephalites Bergeron, Bull. Soc. Geol. de France, 3d ser., 23, p. 469, pl. 4, figs. 4, 5.—Pompeckj, Ein neuentdecktes Vorkommen von Tremadoc-Fossilien bei hof, 1896, p. 12; Neues Jahrb. f. Min., 1, 1897, p. 548.—Reed, Geol. Mag., dec. 4, 5, 1898, p. 496.

HARPIDES? AMERICANUS Frech. See Arethusina americana.

Harpides atlanticus Billings.

Harpides Atlanticus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 281, fig. 267.

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

Harpides concentricus Billings.

Harpides concentricus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 282, fig. 268.

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

Harpides(?) desertus Billings.

Harpides? desertus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 333, fig. 321.

Canadian (Beekmantown): Bed of Pike River, Bedford, Canada.

HARPINA Novak. See Eoharpes Raymond.

HARRISIA Cleland. See Clelandia Cossman.

HEBERTELLA Hall and Clarke. Genotype: Orthis sinuata Hall.

Group of Orthis occidentalis Hall, Bull. Geol. Soc. America, 1, 1889, p. 20.

Hebertella Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 198, 222.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 432.—Hall and Clarke, 11th Ann. Rep. New York State Geol., 1894, p. 266.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 254.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 888.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 381.

Eridorthis (subgenus of Plectorthis) Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 223.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 381. (Genotype, Plectorthis (Eridorthis) nicklesi Foerste.)

Glyptorthis Foerste, Bull. Sci. Lab. Denison Univ. 17, 1914, p. 257. (Genotype: Hebertella insculpta Hall.)

Hebertella alveata Foerste.

Orthis occidentalis Safford (not Hall, 1847), Geol. Tennessee, 1869, p. 275, fig. 11.—Meek, Pal. Ohio, 1, 1873, p. 96, pl. 9, fig. 3.—White, Wheeler's Expl. Survey West 100th Merid., 4, 1875, p. 70, pl. 4, fig. 11.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 34.—Shaler, Mem. Geol. Surv. Kentucky, 1, 1876, pp. 37–39.—White, 2d Ann. Rep. Indiana Bur. Stat. and Geol., 1880, p. 485, pl. 2, figs. 10–12; 10th Rep. State Geol. Indiana, 1881, p. 117, pl. 2, figs. 10–12.—

Hebertella alveata—Continued.

Whitfield, Geol. Wisconsin, 4, 1882, p. 260, pl. 12, figs. 17, 18.—Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 34, figs. 31–34; pl. 35, figs. 16–21.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 174, fig., p. 155.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 525, figs.—Dennis, Proc. Indiana Acad. Sci. for 1898, 1899, p. 289.

Hebertella occidentalis Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 222, pl. 5A, figs. 11, 12.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 255, figs. 304f–h.—Cumings, 32d Ann. Dep. Geol. Nat. Res. Indiana, 1908, p. 906, pl. 34, fig. 4.

Platystrophia occidentalis Hall, 36th Rep. New York State Mus. Nat. Hist., 1884, p. 75, pl. 3, fig. 3.

Hebertella alveata Feorste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 224, pl. 4, figs. 8a–b.

Richmond (Liberty, Whitewater): Ohio, Indiana, Kentucky.

Hebertella alveata richmondensis Foerste.

Hebertella alveata-richmondensis Foerste, Bull. Sci. Lab. Denison. Univ., 14, 1909, p. 224, pl. 4, fig. 8c; 1910, 14, p. 55, pl. 5, figs. 10, 17.

Richmond (Whitewater): Richmond, Indiana.

Hebertella battis (Billings).

Orthis Battis Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 185.

Hebertella battis Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 222.

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

Hebertella (Glyptorthis) bellarugosa (Conrad).

Orthis bellarugosa Conrad, Proc. Acad. Nat. Sci. Philadelphia, 1, 1843, p. 333.—Hall, Pal. New York, 1, 1847, p. 118, pl. 32, fig. 3.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 197, pl. 9, figs. 3a–d.—Shaler, Mem. Geol. Surv. Kentucky, 1, 1876, p. 35.—Lesley, Geol. Surv. Pennsylvania, Rep. P. 4, 1889, p. 507, figs.

Hebertella bellarugosa Hall and Clarke, Pal. New York, 7, pt. 1, 1892, p. 222.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 255, figs. 304d–e.—Raymond, Ann. Carnegie Mus., 7, 1911, p. 245, pl. 36, figs. 8, 9, figs. 19, 20.

Orthis (Hebertella?) bellarugosa Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 434, pl. 33, figs. 1–4.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 157.

Glyptorthis bellarugosa Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 258 (gen. ref.).

Black River: Mineral Point, Janesville, Neenah, etc., Wisconsin; Minneapolis, St. Paul, Cannon Falls, etc., Minnesota; Decorah and McGregor, Iowa; Curdsville, Kentucky; Baffin Land.

Chazyan (Valcour): Valcour Island, New York.

Hebertella borealis (Billings).

Orthis borealis Billings, Canadian Nat. Geol., 4, 1859, p. 436, fig. 14; Geol. Canada, 1863, p. 129, fig. 56; p. 167, fig. 148.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 510, figs.

Hebertella borealis Raymond, Ann. Carnegie Mus., 7, 1911, p. 241, figs. 13, 14.

Chazyan: St. Martins Junction, near Montreal, Caughnawaga, etc., Canada (Aylmer); Valcour Island, New York (Valcour); East Tennessee (Lenoir).

HEBERTELLA BOREALIS Hall and Clarke. See Hebertella frankfortensis.

Hebertella (Glyptorthis) crispata (Emmons).

Orthis crispata Emmons, Geol. New York, Rep. 2d Dist., 1842, p. 404, fig. 5.—Owen, Amer. Jour. Sci. Arts, 47, 1844, p. 379, fig. 5.—Emmons, Amer. Geology, 1, pt. 2, 1855, pl. 17, fig. 5; Man. Geol., 1860, p. 102, fig. 5.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 512, figs.

Hebertella (Glyptorthis) crispata—Continued.

Dalmanella crispata Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 224.—Glyptorthis crispata Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 258.

Cincinnatian (Pulaski): Lorraine, etc., New York.

Hebertella daytonensis (Foerste).

Orthis daytonensis Foerste, Bull. Sci. Lab. Denison Univ., 1885, p. 87, pl. 13, figs. 13, 20, 21.

Hebertella daytonensis Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 222.

Orthis (Hebertella) daytonensis Foerste, Geol. Ohio, 7, 1895, p. 575, pl. 25, figs. 13, 20, 21.

Upper Medinan (Brassfield): Dayton, etc., Ohio.

HEBERTELLA EXFOLIATA Raymond. See Plectorthis exfoliata.

HEBERTELLA (SCHIZONEMA) FASCIATA Foerste. See Orthostrophia (Schizoramma) fasciata.

Hebertella fausta (Foerste).

Orthis fausta Foerste, Bull. Denison Univ., 1, 1885, p. 85, pl. 13, figs. 15, 16.

Hebertella fausta Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 222.

Orthis (Hebertella) fausta and var. squamosa Foerste, Geol. Ohio, 7, 1895, pp. 573, 574, pl. 25, figs. 15a–15d, 16a, 16b; pl. 37A, figs. 19a, 19b.

Upper Medinan: Dayton, Ohio (Brassfield); Ontario (Cataract).

HEBERTELLA (SCHIZONEMA) FISSIPLICA Foerste. See Orthostrophia (Schiroramma) fissiplica.

HEBERTELLA (SCHIZONEMA) FISSISTRIATA Foerste. See Orthostrophia (Schizoramma) fissistriata.

Hebertella frankfortensis Foerste.

Orthis frankfortensis James, Cat. Lower Sil. Foss. Cincinnati Group, 1871, p. 10 (nom. nud.).

Hebertella frankfortensis Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 318, pl. 7, figs. 11a, b.

Orthis borealis Meek, Pal. Ohio, 1, 1873, p. 101, pl. 8, fig. 4.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 28.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 155, fig.—Lesley (part), Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 510, figs.—Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 36, pl. 34, figs. 14–20.

Orthis (Hebertella) borealis Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 433, fig. 33.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 157.

Hebertella borealis Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 222.—Hayes and Ulrich, U. S. Geol. Surv. Folio 95, ill. sheet, 1903, figs. 36, 37.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 254, fig. 304a–c.—Bassler, Bull. Virginia Geol. Surv., 2a, 1909, p. 183, figs. 11, 12, 20.

Trenton: Frankfort, etc., Kentucky (Wilmore); Columbia, etc., Tennessee; Virginia (Bigby); Wykoff, Minnesota (Prosser); Baffin Land.

Plesiotypes.—Cat. Nos. 48572, 51189, U.S.N.M.

Hebertella imperator (Billings).

Orthis imperator Billings, Canadian Nat. Geol., 4, 1859, p. 435, figs. 11–13; Geol. Canada, 1863, p. 129, fig. 55.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 518, figs.

Hebertella imperator Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 222.—Raymond, Annals Carnegie Mus., 7, 1911, p. 243, pl. 36, figs. 6, 7.

Chazyan (Aylmer): Hawkesbury and Cornwall, Canada.

Hebertella (Glyptorthis) insculpta (Hall).

Orthis insculpta Hall, Pal. New York, 1, 1847, p. 125, pl. 32, fig. 12.—Billings, Geol. Canada, 1863, p. 167, fig. 150.—Meek, Pal. Ohio, 1, 1873, p. 99, pl. 9, fig. 1.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 40.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 195, pl. 9, fig. 12.—Shaler, Mem. Geol. Surv. Kentucky, 1, 1876, p. 30.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 520, figs.

Orthis (Hebertella) insculpta Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 435.

Hebertella insculpta Hall and Clarke, Pal., New York, 8, pt. 1, 1892, p. 222, pl. 5A, fig. 13.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 255, fig. 305.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 905, pl. 34, figs. 2–2d.

Glyptorthis insculpta Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 258 (gen. ref.).

Orthis bellarugosa (not Conrad) Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 35, fig. 22.

Richmond: Oxford, etc., Ohio; Indiana; Wilmington, Illinois; Wisconsin; Iowa; Minnesota; Tennessee; etc.

Hebertella latasulcata Foerste.

Hebertella latasulcata Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 131, pl. 3, figs. 7a, b.

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

Hebertella lonensis (Walcott).

Orthis lonensis Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 74, pl. 11, fig. 6.

Hebertella lonensis Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 222.

Upper Pogonip: Lone Mountain, Nevada.

Holotype.—Cat. No. 17232, U.S.N.M.

Hebertella maria (Billings).

Orthis maria Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 137, fig. 114. (Adv. sheets, 1862.)

Hebertella sinuata or maria? Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 222, pl. 5A, figs. 9, 10.

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

Hebertella maria parkensis Foerste.

Hebertella maria-parkensis Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 319, pl. 7, figs. 6a–b.

Trenton: Between Pleasant Valley and Millersburg, etc. (Cynthiana), and Madison and Woodford Counties, Kentucky (Perryville).

Hebertella (Eridorthis) nicklesi Foerste.

Plectorthis (Eridorthis) nicklesi Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 222, pl. 4, figs. 3a–d.

Eridorthis nicklesi Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 132, pl. 1, figs. 5a–c.

Trenton (Upper): Rogers Gap, Brent, Ivor, etc., Kentucky; Point Pleasant, Ohio.

HEBERTELLA (SCHIZONEMA) NISIS Foerste. See Orthostrophia (Schizoramma) nisis.

Hebertella occidentalis Hall.

Orthis occidentalis Hall, Pal. New York, 1, 1847, p. 127, pl. 32A, fig. 2; pl. 32B, fig. 1; 12th Rep. New York State Cab. Nat. Hist., 1859, p. 72.—Billings, Geol. Canada, 1863, p. 210, fig. 210.

Hebertella occidentalis Foerste, Bull. Sci. Lab. Denison Univ., 14, 1910, p. 53, pl. 2, figs. 1, 2.

Maysville and Richmond: Maysville, etc., Kentucky; Cincinnati, Ohio, and vicinity; Oxford, etc., Ohio; Indiana.

Observation.—See also H. alveata Foerste.

Hebertella occidentalis sinuata Hall.

Orthis sinuata Hall, Pal. New York, 1, 1847, p. 128, pl. 32B, fig. 2.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 36.—Shaler, Fossil Brach. Ohio Valley, 1876, pl. 8.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 533, figs.

Orthis occidentalis var. sinuata Meek, Pal. Ohio, 1, 1873, p. 98.

Hebertella sinuata Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 222, pl. 5A, figs. 1–8.—Hayes and Ulrich, U. S. Geol. Surv., Folio 95, ill. sheet, 1903, fig. 17.—Cumings, Amer. Jour. Sci. (4), 15, 1903, p. 34, footnote.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 256, fig. 306.—Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 52, pl. 2, fig. 5.

Hebertella occidentalis sinuata Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 229.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 908, pl. 34, figs. 3–3e.

Maysville and Richmond: Cincinnati, Ohio, and vicinity; Kentucky; Tennessee; Indiana; etc.

Plesiotype.—Cat. No. 35398, U.S.N.M. (Hayes and Ulrich).

Hebertella (Eridorthis) rogersensis (Foerste).

Plectorthis (Eridorthis) rogersensis Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 223, pl. 14, figs. 4a–b.

Trenton (Upper): Rogers Gap, Kentucky.

Observation.—Probably only a variety of H. nicklesi.

Hebertella scovilli Hall and Clarke. See Plectorthis (Austinella) scovilli.

Hebertella sinuata Hall and Clarke. See Hebertella occidentalis sinuata.

Hebertella subjugata (Hall).

Orthis subjugata Hall, Pal. New York, 1, 1847, p. 129, pl. 32C, fig. 1.—Owen(?), Geol. Surv. Wisconsin, Iowa, Minnesota, 1852, pl. 2B, figs. 4, 5.—Emmons, Amer. Geol., 1, pt. 2, 1855, p. 196.

Hebertella subjugata Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 54, pl. 2, fig. 8; ibid., 17, 1912, p. 129, pl. 8, fig. 6.

Trenton-Richmond: Cincinnati, Ohio, and vicinity; Indiana; Kentucky; Tennessee; Virginia, etc.

Plesiotypes.—Cat. Nos. 17885, 17891, U.S.N.M.

Hebertella vulgaris Raymond.

Orthis perveta Billings (not Conrad), Canadian Nat. Geol., 4, 1859, p. 434.

Orthis subæquata Billings (not Billings, 1856), Canadian Nat. Geol., 1859, p. 434.

Orthis gibbosa Billings, Canadian Nat. Geol., 4, 1859, p. 434.

Hebertella vulgaris, Raymond, Ann. Carnegie Mus., 3, 1906, p. 501; ibid., 7, no. 2, 1911, p. 242, pl. 36, figs. 2–5, figs. 15–18, 22.

Chazyan: Chazy, Valcour Island, etc., New York (Day Point—Valcour); Canada (Aylmer); East Tennessee (Lenoir).

HELCION ORBICULATUS D'Orbigny. See Archinacella orbiculatus.

HELCION PATELLIFORMIS D'Orbigny. See Archinacella patelliformis.

HELCIONOPSIS Ulrich and Scofield. Genotype: H. striata Ulrich.
Helcionopsis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, pp. 821, 826.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 604.

Helcionopsis striata Ulrich.
Helcionopsis striata Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 827, pl. 61, figs. 29 and 30. (H. fissicostata in error, p. 821.)—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 604, fig. 805a, b.—Foerste, Jour. Geol., 11, 1903, p. 37.
Triblidium striatum Miller, N. A. Geol. Pal., 2d App., 1897, p. 771 (gen. ref.).
Richmond: Marion County, Kentucky.
Maysville: Cincinnati, Ohio.
Holotype.—Cat. No. 45827, U.S.N.M.

Helcionopsis subcarinata Ulrich and Scofield.
Helcionopsis subcarinata Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 827, pl. 61, fig. 28.
Trenton (Prosser): Goodhue County, Minnesota.
Cotypes.—Cat. No. 45828, U.S.N.M.

HELENTEROPHYLLUM Grabau. Genotype: H. caliculoides Grabau.
Helenterophyllum Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 95.

Helenterophyllum caliculoides Grabau.
Helenterophyllum caliculoides Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 95, pl. 11, figs. 2–3.
Upper Monroan (Anderdon): Anderdon quarry near Amherstburg, Ontario.
Cayugan (Manlius): Manlius, New York.

HELICOGRAPSUS Nicholson. See Nemagraptus Emmons.

HELICOPORA Claypole. Genotype: H. latispiralis Claypole.
Helicopora Claypole, Proc. Amer. Assoc. Adv. Sci., 30, 1881, p. 191; Quar. Jour. Geol. Soc. London, 39, 1883, p. 32.—Waagen and Pichl, Pal. Indica, ser. 13, 1885, p. 774.—Ulrich, Contr. Amer. Pal., 1, 1886, p. 5.—Miller, N. A. Geol. Pal., 1889, p. 308.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 396.—Simpson, 13th Ann. Rep. State Geol. New York for 1893, 1895, pp. 722, 726; 47th Ann. Rep. New York State Mus., pp. 916, 920.—Ulrich, Zittel's Textb. Pal. (Engl. ed.), 1896, p. 282.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, pp. 517, 522.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 39.

Helicopora latispiralis Claypole.
Helicopora latispiralis Claypole, Proc. Amer. Assoc. Adv. Sci., 30, 1881, p. 191; Quar. Jour. Geol. Soc. London, 39, 1883, p. 32, pl. 4, figs. 1, 1a.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, fig. 70, 1 (p. 518).
Niagaran: Cedarville, Greene County, Ohio.

HELICOTOMA Salter. Genotype: H. planulata Salter.
Helicotoma Salter, Canadian Org. Rem., Geol. Surv. Canada, dec. 1, 1859, p. 13.—Nicholson, Rep. Pal. Prov. Ontario, pt. 1, 1874, p. 120.—Miller, N. A. Geol. Pal., 1889, p. 405.—Koken, Neues Jahrb. f. Min., Pal., 1, 1898, p. 24; Bull. de l'Acad. Imp. Sci. St. Petersburg, 7, 1897, p. 159.—Ulrich and Scofield, Geol. Minnesota, 3, 1897, p. 1032.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 658.

Helicotoma brocki Foerste.

Helicotoma brocki Foerste, Bull. Sci. Lab. Denison Univ., 17, 1912, p. 137, pl. 10, fig. 11; pl. 11, fig. 3.

Richmond: Kagawong, Manitoulin Island, Lake Huron.

Helicotoma declivis Ulrich.

Helicotoma declivis Safford, Geol. Tennessee, 1869, p. 288 (nom. nud.).—Ulrich Geol. Minnesota, 3, pt. 2, 1897, p. 1036, pl. 74, figs. 34–38.

Stones River (Murfreesboro): Murfreesboro, Tennessee.

Cotypes.—Cat. No. 46057, U.S.N.M

Helicotoma eucharis Billings.

Helicotoma Eucharis Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 249, fig. 234a, b.—Miller, N. A. Geol. Pal., 1889, p. 405, fig. 677.

Chazyan (Quebec-L, M): Table Head, Newfoundland.

Helicotoma gorgonea Billings.

Helicotoma Gorgonea Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 248.

Canadian (Quebec—H): Table Head, Newfoundland.

Helicotoma granosa Ulrich.

Helicotoma granosa Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1035, pl. 82, figs. 32–34.

Black River (Lowville): High Bridge, Kentucky.

Holotype.—Cat. No. 45829, U.S.N.M.

Helicotoma larvata Salter. See Liospira larvata.

Helicotoma marginata Ulrich.

Helicotoma marginata Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1036, pl. 74, fig. 39.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 963, pl. 40, fig. 10.

Richmond (Elkhorn): Near Richmond, Indiana.

Holotype.—Cat. No. 45830, U.S.N.M.

Helicotoma misera Billings.

Helicotoma miser Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 309.

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

Helicotoma missouriensis Branson.

Helicotoma missouriensis Branson, Trans. Acad. Sci. St. Louis, 18, no. 4, 1909, p. 44, pl. 7, figs. 11–12.

Black River (Auburn-Decorah): Lincoln County, Missouri.

Helicotoma muricata (Salter).

Helicotoma planulata var. muricata Salter, Geol. Surv. Canada, dec. 1, 1859, p. 14, pl. 2, fig. 8.

Helicotoma muricata Miller, N. A. Geol. Pal., 1889, p. 405.

Black River (Leray): Allumette Island, Ottawa River, Canada.

Helicotoma naresii Etheridge.

Helicotama naresii Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 602, pl. 27, fig. 3.

Niagaran: Offley Island, Arctic America.

Helicotoma(?) peccatonica Sardeson.

Helicotoma(?) peccatonica Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 97, pl. 5, figs. 1, 2.

Canadian (Shakopee): Near Argyle, Wisconsin.

Helicotoma perstriata Billings.

Helicotoma perstriata Billings, Canadian Nat. Geol., 4, 1859, p. 356.

Chazyan (Mingan): Mingan Islands, Quebec.

Helicotoma planulata Salter.

Helicotoma planulata Salter, Can. Org. Rem., Geol. Surv. Canada, dec. 1, 1859, p. 14, pl. 2, figs. 5–7.—Hall, Rep. Geol. Surv. Wisconsin, 1862, p. 39, fig. 3; p. 439.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 157.—Whiteaves, Canadian Rec. Sci., 5, 1893, p. 323 (loc. occ.).—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1033, pl. 74, figs. 16–17.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 658, figs. 906h, i.

Black River: Allumette Island, Ottawa River, etc. (Leray), Canada; Lincoln County, Missouri; Wisconsin; New York.

Plesiotypes.—Cat. No. 45831, U.S.N.M.

HELICOTOMA PLANULATA var. MURICATA Salter. See Helicotoma muricata.

Helicotoma planulata robusta Ulrich and Scofield.

Helicotoma planulata var. robusta Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1033, pl. 74, fig. 15.

Black River (Platteville): Jo Daviess County, Illinois.

Holotype.—Cat. No. 45832, U.S.N.M.

Helicotoma planulatoides Ulrich.

Helicotoma planulatoides Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1034, pl. 74, figs. 28–30.

Black River (Lowville): High Bridge, Kentucky; Tennessee.

Holotype.—Cat. No. 45833, U.S.N.M.

Helicotoma proserpina Billings.

Helicotoma Proserpina Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 247, fig. 233.

Canadian (Quebec—G): Cape Norman, Newfoundland.

Helicotoma similis Whitfield.

Helicotoma similis Whitfield, Bull. Amer. Mus. Nat. Hist., 3, 1890, p. 31, pl. 1, figs. 1, 2.—Sardeson, Jour. Geol., 11, 1903, p. 481, fig. 19.—Seely, Vermont State Geol., Rep. 7, 1910, pl. 56, fig. 2.

Canadian (Beekmantown): Providence Island, Lake Champlain, Vermont.

Helicotoma? spinosa Salter.

Helicotoma? spinosa Salter, Geol. Surv. Canada, dec. 1, 1859, p. 15, pl. 2, figs. 9, 10.

Black River (Leray): Allumette Island, Ottawa River, Canada.

Helicotoma subquadrata Ulrich.

Helicotoma subquadrata Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1034, pl. 70, figs. 31–33.

Stones River (Murfreesboro): Murfreesboro, Tennessee.

Cotypes.—Cat. No. 46058, U.S.N.M.

Helicotoma tennesseensis Ulrich and Scofield.

Helicotoma tennesseensis Safford, Geol. Tennessee, 1869, p. 288 (nom. nud.).—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1034, pl. 74, figs. 20–24.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 659, figs. 906j, k.

Stones River (Murfreesboro): Murfreesboro, Tennessee.

Cotypes.—Cat. No. 46059, U.S.N.M.

Helicotoma tritonia Billings.

Helicotoma Tritonia Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 247.
Canadian (Quebec—G): Cape Norman, Newfoundland.

Helicotoma umbilicata Ulrich and Scofield.

Helicotoma umbilicata Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1034, pl. 62, fig. 68; pl. 74, figs. 25–27.
Black River (Platteville): Minneapolis and St. Paul, Minnesota; Beloit, Mineral Point, etc., Wisconsin; Dixon, etc., Illinois.
Cotypes.—Cat. Nos. 45834, 45835, U.S.N.M.

HELICOTOMA UNIANGULATA Salter. See Ophileta uniangulata.

Helicotoma uniangulata (Hall).

Euomphalus uniangulatus Hall, Pal. New York, 1, 1847, p. 9, pl. 13, figs. 1, 1a.
Straparollus uniangulatus Emmons, Amer. Geology, 1, pt. 2, 1855, p. 157.
Helicotoma uniangulata Salter, Geol. Surv. Canada, dec. 1, 1859, p. 13 (gen. ref.).
Ozarkian (Little Falls): Saratoga County, New York.

HELICOTOMA VAGRANS Raymond. See Eccyliopterus vagrans.

Helicotoma verticalis Ulrich.

Helicotoma verticalis Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1035, pl. 62, fig. 69; pl. 74, figs. 18, 19.
Black River (Lowville): High Bridge, Kentucky.
Holotype.—Cat. No. 45836, U.S.N.M.

Helicotoma whiteavesiana Raymond.

Helicotoma whiteavesiana Raymond, Ann. Carnegie Mus., 4, 1908, p. 204, pl. 48, figs. 11, 12.
Stones River (Pamelia): Aylmer, Quebec, and Hog Back, near Ottawa, Ontario.

HELIOLITES Guettard. Genotype: H. interstinctus Linnæus.

Heliolites Guettard, Mem. 3, 1770, p. 454.—Dana, Wilkes' U. S. Expl. Exped., 7, Zoophytes, 1840, pp. 430, 541.—Edwards and Haime, Compt. Rend. l'Acad. Sci., 29, 1849, p. 262; Mon. d. Polyp. Foss. d. Terr. Pal. (Arch. du Mus. d'Hist. Nat., 5), 1850, pp. 149, 212.—Hall, Pal. New York, 2, 1852, p. 130.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 438.—Milne-Edwards, Hist. Nat. d. Corall., 3, 1860, p. 234.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 10.—Nicholson, Trans. Royal Soc. Edinburgh, 27, 1876, pp. 247–248.—Lindstrom, Ann. Mag. Nat. Hist., 4th ser., 18, 1876, p. 13.—Zittel, Handb. Pal., 1, 1879, p. 212.—Nicholson, Tab. Corals Pal. Period, 1879, p. 243.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1880, p. 241.—Roemer, Leth. Geog., pt. 1, Leth. Pal., 1883, p. 503.—Koch, Palaeontographica, 29, 1883, pp. 333, 343.—Miller, N. A. Geol. Pal., 1889, p. 191.—James, Jour. Cincinnati Soc. Nat. Hist., 15, pt. 4, 1893, p. 152.—Koken, Die Leitfossilien, Leipzig, 1896, p. 314.—Sardeson, Neues Jahrb. f. Min., Geol. Pal., Beilage-Band, 10, 1896, pp. 252, 263.—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1909, p. 79.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 32, no. 1, 1909, pp. 35, 38.—Kiaer, Palaeontographica, 46, 1899, p. 39; Zittel-Eastman, Pal., 1, 1900, p. 108.—Grabau, Bull. New York State Mus., 45, 1901, p. 144; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 144.—Pocta, Syst. Sil. du Centre Boheme, 8, pt. 2, 1902, p. 280.—Kiaer, Vid-Selsk. Skrifter, Math.-naturw., 10, 1903, pp. 42, 56.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 97; Zittel-Eastman, Textb. Pal., 2d ed., 1913, p. 112.

HELIOLITES AFFINIS Billings. See Lyellia affinis (Billings).

Heliolites elegans Hall.

Heliolites elegans Hall, Pal. New York, 2, 1852, p. 130, pl. 36, figs. 1a–g.—White, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 383, pl. 48, fig. 4.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 273, fig.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 145, fig. 40; Bull. New York State Mus., 45, p. 145, fig. 40.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 98, fig. 157.

Plasmopora elegans Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 15, pl. 3, fig. 2.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 1, figs. 11–13.

Niagaran: Lockport, etc., New York (Lockport); Michigan; Indiana; Kentucky.

Heliolites exiguus Billings. See Lyellia exigua.

Heliolites inordinatus (Lonsdale).

Porites inordinata Lonsdale, In Murchison, Sil. Syst., 1839, p. 687, pl. 16 bis, figs. 12a–c.

Heliolites inordinata Milne-Edwards and Haime, Polyp. Foss. des Terr. Paleoz., 1851, p. 217; British Foss. Corals, 1855, p. 253, pl. 57, figs. 7, 7a.—Lambe, Contr. Canadian Pal., Geol. Surv. Canada, 1889, 4, pt. 1, p. 81.

Silurian: England and Ireland.

Helderbergian (?Silurian): West of l'Anse a la Barbe and l'Anse a la Vieille, Baie des Chaleurs, Canada.

Heliolites interstinctus (Linnæus).

Madrepora interstincta Linnæus, Syst. Nat., 12th ed., 1767, p. 1267.

Heliolites interstincta Edwards and Haime, Mon. British Foss. Corals, Pal. Soc., 1854, p. 249, pl. 57, figs. 9–9d; Polyp. Foss. Terr. Pal., 1851, p. 214.—Roemer, Sil. Fauna West. Tennesee, 1860, p. 23, pl. 2, fig. 5, 5a.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 305, fig. 301.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 12, pl. 1, fig. 1.—Hall, 12th Ann, Rep. Indiana Dep. Geol. Nat. Hist., 1883, p. 252, pl. 2, figs. 1–3.—Nicholson, Sil. Foss. Girvan Dist., 1880, pp. 57, 254, pl. 16, figs. 1–4.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 506, pl. 9, figs. 3a–3c.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 1, figs. 3, 4.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 273, figs.—Miller, N. A. Geol. Pal., 1889, p. 192, fig. 181.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 47 (loc. occ.).—Lambe, Cont. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 79, pl. 2, figs. 6, 6a —Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 32, No. 1, 1899, p. 41, pl. 1, figs. 1–36; pl. 2, figs. 1, 2; pl. 3, figs. 1, 2.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 97, fig. 156, 158a, b.

Silurian: Europe. Numerous localities in the Upper Medinan and Niagaran of North America.

Heliolites? macrostylus Hall.

Heliolites macrostylus Hall, Pal. New York, 2, 1852, p. 135, pl. 36A, figs. 2a–c.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1880, p. 252.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 32, No. 1, 1899, p. 67.

Niagaran (Racine): Milwaukee, Wisconsin.

Heliolites megastoma (McCoy).

Porites megastoma McCoy, Sil. Foss. Ireland, 1846, p. 62, pl. 4, fig. 9f.

Palæopora megastoma McCoy, British Pal. Foss., 1854, p. 16, pl. 1c, fig. 4.

Heliolites megastoma Edwards and Haime, Mon. British Foss. Corals, Pal. Soc., 1854, p. 251, pl. 58, figs. 2–2d.—Rominger, Geol. Surv. Michigan, 3, pt. 2,

Heliolites megastoma—Continued.

1876, p. 11, pl. 1, fig. 3.—Etheridge, Quart. Jour. Geol. Soc. London, 34, 1878, p. 581.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 1, figs. 1, 2.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 97.

Silurian: Great Britain; New York; Canada; Michigan; Iowa; Wisconsin; Arctic America (Niagaran).

Heliolites microporus Eichwald. See Heliolites subtubulatus.

Heliolites Murchisoni Milne-Edwards. See Heliolites subtubulatus.

Heliolites perelegans Whitfield.

Heliolites perelegans Whitfield, Amer. Mus. Nat. Hist., 13, 1900, p. 21, pl. 1, fig. 2.

Niagaran: Cape Harrison, Princess Marie Bay, Greenland.

Heliolites pyriformis Guettard.

Heliolites pyriformis Guettard, Mem. 3, 1870, p. 454.—Hall, Pal. New York, 2, 1852, p. 133, pl. 36A, fig. 1a-m.—Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 11, pl. 1, fig. 2.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1880, p. 246.—Davis, Kentucky Fossil Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 1, figs. 5, 6.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 32, No. 1, 1899, p. 67.—Grabau, Bull. New York State Mus., 45, 1901, p. 146, fig. 42.

Niagaran: Lockport, etc., New York (Lockport); Drummonds Island, Lake Huron; Iowa; Wisconsin; Kentucky.

Heliolites shepardi James. Not recognized.

Heliolites shepardi James, Paleontologist, No. 1, 1878, p. 2; Jour. Cincinnati Soc. Nat. Hist., 15, pt. 4, 1893, p. 152.

Richmond?: Brush Creek, Adams County, Ohio.

Heliolites sparsus Billings. See Plasmopora petaliformis.

Heliolites speciosus Billings. See Lyellia speciosus.

Heliolites spiniporus Hall.

Heliolites spinipora Hall, Pal. New York, 2, 1852, p. 131, pl. 36, fig. 2a-n.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 190, fig.—Grabau, Bull. New York State Mus., 45, 1901, p. 145, fig. 41; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 145, fig. 41.

Niagaran: Lockport, New York (Lockport); Wisconsin (Racine).

Heliolites spongiosus Foerste.

Heliolites spongiosa Foerste, Bull. Kentucky Geol. Surv., 7, 1906, p. 303, pl. 3, fig. 3; pl. 4, fig. 6; and pl. 5, fig. 5.

Clinton (Waco): Near Irvine, Kentucky.

Heliolites subtubulatus (McCoy).

Palæopora interstincta var. subtubulata McCoy, British Pal. Foss., 1851, p. 16, pl. 1, 1c, figs. 2a-b.

Heliolites subtubulatus Rominger, Geol. Surv. Michigan, 3, pt. 2, 1876, p. 13, pl. 1, fig. 4.—Davis, Kentucky Foss. Corals, Geol. Surv. Kentucky, pt. 2, 1885, pl. 1, figs. 7, 8.—Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 332; Geol. Surv. Ohio, Pal. 7, 1893, p. 601.—Lambe, Contr. Can. Pal., Geol. Surv. Canada, 4, pt. 1, 1899, p. 80, pl. 2, figs. 7, 7a.—Foerste, Bull. Kentucky Geol. Surv., 7, 1906, p. 304, pl. 3, figs. 5a, b.

Heliolites subtubulatus—Continued.

Heliolites Murchisoni Milne-Edwards and Haime, British Foss. Corals, 1855, p. 250, pl. 57, figs. 6a–c; Polyp. Foss. des Palaeoz., 1851, p. 215.

Heliolites microporus Eichwald, Leth. Rossica, 1860, p. 454, pl. 25, figs. 7a–c.

Silurian: Europe, Canada, Michigan, Iowa, Kentucky, Tennessee, Ohio, etc. (Niagaran).

Heliolites subtubulatus distans Foerste.

Heliolites subtubulata-distans Foerste, Bull. Kentucky Geol. Surv., 7, 1906, p. 3–5, pl. 3, fig. 5B.

Clinton (Waco): Near Waco and near Irvine, Kentucky.

Heliolites subtubulatus nucella Foerste.

Heliolites subtubulata-nucella Foerste, Bull. Kentucky Geol. Surv., 7, 1906, p. 305, pl. 3, fig. 5A.

Clinton (Waco): North of Estill Springs, Kentucky.

HELIOLITES TENUIS Billings. See Protarea tenuis.

HELIOLITES VETUSTA Hall. See Protarea vetusta.

HELIOMERA Raymond. Genotype: Cheirurus sol Billings.

Heliomera Raymond, Amer. Jour. Sci., 20, 1905, p. 381.

Heliomera sol (Billings).

Cheirurus sol Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 288, fig. 276.

Heliomera sol Raymond, Amer. Jour. Sci., 20, 1905, p. 381; Ann. Carnegie Mus., 7, no. 1, 1910, p. 77, pl. 18, fig. 12, fig. 9; 7th Rep., Vermont State Geol., 1910, p. 245, pl. 38, fig. 12.—Perkins, Rep. Vermont State Geol., 8th ser., 1912, pl. 18, fig. 12.

Chazyan: Table Head and four miles northeast Portland Creek, Newfoundland (Quebec-N., P.); Chazy, New York (Day Point).

HELIOPHRENTIS Grabau. Genotype: H. alternata Grabau.

Heliophrentis Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 98.

Heliophrentis alternata Grabau.

Heliophrentis alternatum Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 99, pl. 12, figs. 2, 3.

Upper Monroan (Amherstburg): Detroit River, near Amherstburg, Ontario.

Heliophrentis alternata compressa Grabau.

Heliophrentis alternatum mutation compressa Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 100, pl. 13, figs. 4, 5.

Upper Monroan (Amherstburg): Detroit River bed, opposite Amherstburg, Ontario.

Heliophrentis alternata magna Grabau.

Heliophrentis alternatum mut. magna Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 101, pl. 13, fig. 6.

Upper Monroan (Amherstburg): Detroit River bed, opposite Amherstburg, Ontario.

Heliophrentis carinata Grabau.

Heliophrentis carinatum Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 101, pl. 12, fig. 2; pl. 13, fig. 7.

Upper Monroan: Near Amherstburg, Ontario, and Wayne County, Michigan (Amherstburg); Monroe County, Michigan (?Lucas).

HELIOPHYCUS Miller and Dyer. Genotype: H. stelliforme Miller and Dyer.

Heliophycus Miller and Dyer, Cont. to Pal., no. 2, 1878, p. 2.—James, Jour. Cincinnati Soc. Nat. Hist., 7, 1885, p. 163.—Miller, N. A. Geol. Pal., 1889, p. 119.

Heliophycus stelliforme Miller and Dyer.

Heliophycus stelliforme Miller and Dyer, Contr. to Pal., no. 2, 1878, p. 2, pl. 3, fig. 3.—Miller, N. A. Geol. Pal., 1889, p. 120, fig. 39.

Maysville (Fairmount): Cincinnati, Ohio.

HELIOPHYLLUM Dana. Genotype: H. halli Edwards and Haime.

Heliophyllum Dana, Wilkes' U. S. Expl. Exped. 1838–42, 7, Zoophytes, 1846, p. 356, pl. 26, figs. 3, 4; Amer. Jour. Sci. and Arts, 2d ser., 1, 1846, p. 183.—Edwards and Haime, Mon. d. Polyp. Foss. d. Terr. Pal. (Arch. du Mus. d'Hist. Nat., 5), 1851, p. 170; p. 408.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 457.—Billings, Canadian Jour., n. s., 4, 1859, p. 124.—Milne-Edwards, Hist. Nat. d. Corall., 3, 1860, p. 401.—Ludwig, Palæontographica, 10, 1862, p. 183; p. 192.—Dybowski, Archiv. f. Naturf. Liv-, Ehst- und Kurl., 5, 1873, p. 339.—Nicholson, Canadian Nat., n. s., 7, 1874, p. 141; Rep. Pal. Prov. Ontario, pt. 1, 1874, p. 24; Geol. Mag., dec. 2, 1, 1874, p. 58.—Nicholson and Thomson, Proc. Roy. Soc. Edinburgh, 9, 1876, p. 140.—Nicholson, Ann. Mag. Nat. Hist., ser. 5, 1, 1878, p. 44.—Zittel, Handb. Pal., 1, 1879, p. 231.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 342.—Frech, Pal. Abhandl. Dames and Kayser, 3, Heft 3, 1886, p. 53.—Miller, N. A. Geol. Pal., 1889, p. 192.—Sherzer, Amer. Geol., 6, 1890, p. 60; 7, 1891, pp. 290–295.—Koken, Die Leitfossilien, Leipzig, 1896, p. 310.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 124.

Hellophyllum dentilineatum Hall.

Heliophyllum dentilineatum Hall, 35th Rep. New York State Mus. Nat. Hist. (ext. 1882, p. 13), 1884, p. 417.

Niagaran (?Louisville): Louisville, Kentucky.

Hellophyllum flos Greene.

Heliophyllum flos Greene, Cont. Indiana Pal., pt. 3, 1899, p. 18, pl. 7, figs. 6–8.

Niagaran (Louisville): Louisville, Kentucky.

Hellophyllum gemmiferum Hall.

Heliophyllum gemmiferum Hall, 35th Rep. New York State Mus. Nat. Hist. (ext. 1882, p. 13), 1884, p. 417.

Niagaran (?Louisville): Near Louisville, Kentucky.

Hellophyllum mitellum Hall.

Heliophyllum mitellum Hall, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 418. (Ext. 1882).

Niagaran (?Louisville): Louisville, Kentucky.

Hellophyllum pegramense Foerste.

Heliophyllum pegramensis Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 100, pl. 3, fig. 58a, b.

Niagaran (Brownsport): Pegram, Tennessee.

Hellophyllum pravum Hall.

Heliophyllum pravum Hall, 12th Ann. Rep. Indiana, Dep. Geol. Nat. Hist., 1883, p. 274, pl. 15, fig. 12; pl. 25, fig. 4; 35th Rep. New York State Mus. Nat. Hist. (ext. 1882, p. 13) p. 417.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 280, figs.

Niagaran (Louisville): Louisville, Kentucky.

Heliophyllum puteatum Hall.

Heliophyllum puteatum Hall, 35th Rep. New York State Mus. Nat. Hist. (ext. 1882, p. 14), 1884, p. 418.

Niagaran (?Louisville): Louisville, Kentucky.

HELLIPORA (CONSTELLARIA) ANTHELOIDEA Rominger. See Constellaria florida.

HELMINTHOLITUS Linnæus. See Conchidium Linnæus.

HELOCERAS Barrande. See Cycloceras McCoy.

HELOPORA Hall. Genotype: H. fragilis Hall.

Helopora Hall, Amer. Jour. Sci., 2d ser., 11, 1851, pp. 388, 389; Pal. New York, 2, 1852, p. 44.—Billings, Cat. Sil. Foss. Anticosti, p. 36.—Ulrich, Amer. Geol., 1, 1888, p. 231—Miller, N. A. Geol. Pal., 1889, p. 308.—Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 401, 642; Jour. Cincinnati Soc. Nat. Hist., 12, 1890, p. 191; Geol. Minnesota, 3, 1893, p. 189.—Pocta, Syst. Sil. Centre Boheme., 8, pt. 1, 1894, p. 8.—Zittel's Textb. Pal. (Engl. ed.), 1896, p. 280.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 548.—Nickles and Bassler, Bull. U. S. Geol. Surv., no. 173, 1900, p. 42.—Grabau, Bull. New York State Mus., 45, 1901, p. 172; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 172.—Hennig, Archiv. fur Zool., K. Sven. Vet.-Akad. Stockholm, 3, 1906, p. 18.—Grabau and Shimer, N. A. Index Fossils, 1, p. 152.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 747.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 149; Zittel-Eastman Textb. Pal., 1913, p. 342.

Helopora alternata Ulrich.

Helopora alternata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 12, 1890, p. 192, fig. 16f; Geol. Minnesota, 3, 1893, p. 192, pl. 3, fig. 9.

Black River (Decorah): Minneapolis, Minnesota.

Holotype.—Cat. No. 43566, U.S.N.M.

Helopora approximata James. Not recognized.

Helopora approximata James, Paleontologist, no. 1, 1875, p. 3.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 39.

Eden: Cincinnati, Ohio.

Observation.—Founded on some Bythopora (probably B. arctipora) with a bulbous extremity due to irregular growth.

Helopora armata Billings.

Helopora armata Billings, Cat. Sil. Foss. Anticosti, 1866, p. 38.

Anticostian (Jupiter River): East Point, Anticosti.

Helopora bellula Billings.

Helopora bellula Billings, Catal. Sil. Foss. Anticosti, 1866, p. 38.

Anticostian (Gun River and Jupiter River): East Point, etc., Anticosti.

HELOPORA CIRCE Billings. See Chilotrypa circe.

Helopora concava Billings.

Helopora concava Billings, Catal. Sil. Foss. Anticosti, 1866, p. 37.

Anticostian (Becsie River—Jupiter River): East Jupiter River, East Point, etc., Anticosti.

HELOPORA DENDRINA James. See Bythopora dendrina.

Helopora divaricata Ulrich.

Helopora divaricata Ulrich, 14th Ann. Rep. Geol. Minnesota, 1886, p. 59; Geol. Minnesota, 3, 1893, p. 191, pl. 3, figs. 1–3.—Bassler, Bull. U. S Nat. Mus., 77, 1911, pp. 149, 150, fig. 72.

Helopora divaricata—Continued.

Black River (Decorah): Minneapolis, etc., Minnesota.

Middle Ordovician (Kuckers): Esthonia, Russia.

Cotypes.—Cat. No. 43568, U.S.N.M.

Helopora elegans Ulrich.

Helopora elegans Ulrich, Geol. Minnesota, 3, 1893, p. 194, fig. 11.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 837, pl. 29, fig. 9.

Richmond (Whitewater): Blanchester, Oxford, etc., Ohio; Richmond and Versailles, Indiana.

Holotype.—Cat. No. 43566, U.S.N.M.

Helopora formosa Billings.

Helopora formosa Billings, Catal. Sil. Foss. Anticosti, 1866, p. 37.

Helopora nodosa Billings, Catal. Sil. Foss. Anticosti, 1866, p. 38.

Nematopora formosa Ulrich, Geol. Surv. Illinois, 8, 1890, p. 645.

Gamachian (Ellis Bay) and Anticostian (Becsie River-Jupiter River): East Point, East Jupiter River, East River, etc., Anticosti.

Helopora fragilis Hall.

Helopora fragilis Hall, Pal. New York, 2, 1852, p. 44, pl. 18, figs. 3a–f.—Nicholson and Hinde, Canadian Jour., n. s., 14, 1874, p. 141.—Nicholson, Pal. Province Ontario, 1875, p. 44, fig. 19, figs. 3, 3a.—Ulrich, American Geol., 1, 1888, p. 233, fig. 2a–c.—Miller, N. A. Geol. Pal., figs. 485a–c, 486 (p. 308).—Ulrich, Geol. Surv. Illinois, 8, p. 642, figs. 18a–c (p. 643), pl. 29, fig. 5a.—Grabau, Bull. New York State Mus., 45, 1901, p. 173, fig. 74; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 173, fig. 74.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 152, fig. 207.

Upper Medinan (Cataract): Western New York; Flamborough Head, etc., Ontario.

Lower Clinton: Wayne County, etc., New York.

Plesiotype.—Cat. No. 43369, U.S.N.M.

Helopora fragilis acadiensis Hall. Not defined.

Helopora fragilis var. acadiensis Hall, Canadian Nat. Geol., 5, 1860, p. 159.

Silurian: Nova Scotia.

Helopora harrisi James.

Helopora harrisi James, Paleontologist, No. 7, 1883, p. 58, pl. 2, figs. 2–2b.—Ulrich, Contr. Micro-Pal. Cambro-Sil., pt. 2, 1889, p. 45; Geol. Minnesota, 3, 1893, p. 195, pl. 3, figs. 11b, c, 12.—Whiteaves, Pal. Foss., 3, pt. 2, 1895, p. 117.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, figs. 113–115 (p. 548).—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 40, pl. 7, fig. 8.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 837, pl. 29, figs. 10–10b.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 343, fig. 501f.

Richmond: Waynesville, etc., Ohio; Indiana (Waynesville, Liberty); ?Stony Mountain, Manitoba.

Plesiotypes.—Cat. No. 43569, U.S.N.M.

Helopora imbricata Ulrich.

Helopora imbricata Ulrich, Geol. Surv. Illinois, 8, 1890, p. 644, pl. 29, fig. 5.

Richmond: Wilmington, Illinois (Fernvale); Charleton Point, etc., Anticosti (Charleton).

Observation.—This form may be the tertiary segments of Arthroclema angulare Ulrich.

Helopora irregularis Billings. See Trematopora irregularis.

HELOPORA LINEATA Billings. See Nematopora lineata.

Helopora lineopora Billings.
Helopora lineopora Billings, Catal. Sil. Foss. Anticosti, 1866, p. 38.
Nematopora? lineopora Ulrich, Geol. Surv. Illinois, 8, 1890, p. 645.
Gamachian (Ellis Bay) and Anticostian (Gun River): East of Jupiter River, etc., Anticosti.

HELOPORA MEEKI James. See Dicranopora meeki.

Helopora mucronata Ulrich.
Helopora mucronata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 12, 1890, p. 192, figs., fig. 16e; Geol. Minnesota, 3, 1893, p. 193, pl. 3, 10.
Trenton (Prosser): Cannon Falls and St. Paul, Minnesota.
Cotypes.—Cat. No. 43677, U.S.N.M.

HELOPORA NODOSA Billings. See Helopora formosa.

HELOPORA PARVULA James. See Bythopora parvula.

Helopora quadrata Ulrich.
Helopora quadrata Ulrich, Geol. Minnesota, 3, 1893, p. 193, fig. 10.
Trenton (Prosser): Cannon Falls, Minnesota.
Cotypes.—Cat. No. 43567, U.S.N.M.

Helopora spiniformis (Ulrich).
Arthroclema spiniformis Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 161, pl. 6, figs. 10, 10a.
Helopora spiniformis Ulrich, Geol. Minnesota, 3, 1893, pl. 3, figs. 4, 5, 6; Zittel's Textb. Pal. (Engl. ed.), 1896, fig. 469 (p. 283).—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 152, fig. 205j.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 343, fig. 502.
Stones River (Lebanon): Lebanon, Lavergne, etc., Tennesee.
Cotypes.—Cat. No. 43665, U.S.N.M.

HELOPORA STRIATOPORA Billings. See Thamniscus striatopora.

HELOPORA STRIGOSA Billings. See Glauconome strigosa.

HELOPORA TENUIS James. See Arthrostylus tenuis.

HELOPORA VARIPORA Billings. See Lioclema variporum.

HEMICOSMITES Hall. See Cœlocystis Schuchert.

HEMICRYPTURUS Green. See Asaphus Brongniart.

HEMICRYPTURUS CLINTONI Van Ingen. See Calymene clintoni.

HEMICYSTIS Haeckel. See Hemicystites Hall.

HEMICYSTITES Hall. Genotype: H. parasiticus Hall.
Hemicystites Hall, Pal. New York, 2, 1852, pp. 245, 355.—Chapman, Canadian Jour., n. s., 2, 1857, p. 304.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 305.—Hall, Pal. New York, 3, 1859, p. 152; 12th Rep. New York State Cab. Nat. Hist., 1859, p. 81.—Zittel, Handb. Pal., 1, 1879, p. 414.—Miller, N. A. Geol. Pal., 1889, p. 252.—Jaekel, Stammes. Pelmat., 1, 1899, p. 49.—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 207.—Zittel, Grundzuge Pal., 1, 1910, p. 182.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 473.
Hemicystis Haeckel, Amphorideen u. Cystoideen, Leipzig, 1896, p. 111.

HEMICYSTITES—Continued.

Cystaster Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, footnote, pl. 6 (adv. sheets 1871).—Jaekel, Stammes. Pelmat., 1, Thecoidea u. Cystoidea, Berlin, 1899, p. 43.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 207, fig. 2. (Genotype: Hemicystites granulatus Hall.)

Thecocystis Jaekel, Stammes. Pelmat., 1, Thecoidea u. Cystoidea, Berlin, 1899, p. 43. (Genotype: T. sacculus Jaekel.)

Hemicystites billingsi (Chapman).

Agelacrinus billingsi Chapman, Canadian Jour., 5, 1860, pp. 358, 204.

Hemicystites (Agelacrinites) Billingsii Sladen, Q. art. Jour. Geol. Soc., 35, 1879, p. 750.

Agelacrinites Billingsi Chapman, Ann. Mag. Nat. Hist., 3d ser., 6, 1860, p. 157, fig.—Billings, Canadian Jour., n. s., 6, 1861, p. 516, fig. 86.—Chapman, ibid., n. s., 8, 1863, p. 199, fig. 180; Expos. Min Geol. Canada, 1864, p. 110, fig. 86; p. 171, fig. 180.

Hemicystites Billingsi Jaekel, Stammes. Pelmat., 1, Thecoidea u. Cystoidea, Berlin, 1899, p. 49 (gen. ref.).

Trenton (?Curdsville): Peterboro, Ontario.

Hemicystites carnensis Foerste.

Hemicystites carnensis Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 455, pl. 3, fig. 2.

Trenton (Upper): Carntown, Kentucky.

Hemicystites (Cystaster) granulatus Hall.

Hemicystites (Cystaster) granulatus Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, pl. 6, figs. 1–4 (adv. sheets 1871).—Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 54, pl. 3, figs. 9a, b.

Hemicystites granulatus Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 473, fig. 1784c.

Hemicystis granulata Haeckel, Amphorideen u. Cystoideen, Leipzig, 1896, p. p. 112, pl. 3, figs. 27, 28.

Thecocystis sacculus Jaekel, Stammesges. Pelmat., 1, 1899, p. 43, pl. 1, figs. 1a, b.

Cystaster granulatus Jaekel, ibid., p. 44, pl. 1, fig. 2.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 206, fig. 2.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, pl. 6, fig. 5.

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

Hemicystites parasiticus Hall.

Hemicystites parasitica Hall, Pal. New York, 2, 1852, p. 246, pl. 51, figs. 18–20.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 305, pl. 99, fig. 25.—Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1868, footnote, p. 357.—Jaekel, Stammes. Pelmat., 1, Thecoidea u. Cystoidea, 1899, Berlin, p. 49.

Agelacrinus parasitica Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 81 (gen. ref.).

Clinton (Rochester): Lockport, New York.

Hemicystites stellatus Hall.

Hemicystites stellatus Hall, 24th Rep. New York State Cab. Nat. Hist., 1871, pl. 2, fig. 5, 6.—Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 52, pl. 3, figs. 8a, b.—Miller, N. A. Geol. Pal., 1889, p. 252, fig. 328.—Jaekel, Stammes. Pelmat., 1, Thecoidea u. Cystoidea, Berlin, 1899, p. 49.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 473, fig. 1784a.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, pl. 6, fig. 6.

Hemicystites stellatus—Continued.

Agelacrinus (Hemicystites) stellatus Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 215, pl. 6, figs. 5, 6 (adv. sheets, 1866).

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

HEMIGYRASPIS Raymond. Genotype: Asaphus affinis McCoy.

Hemigyraspis Raymond, Ann. Carnegie Mus., 7, no. 1, 1910, p. 41; Trans. and Proc. Roy. Soc. Canada, 5, 3d ser., sec. 4, 1912, p. 117; Zittel-Eastman Textb. Pal., 1913, p. 719.

Hemigyraspis collieana Raymond.

Asaphus marginalis Collie (not Hall), Bull. Geol. Soc. Amer., 14, 1903, p. 413.

Hemigyraspis collieana Raymond, Ann. Carnegie Mus., 7, 1910, p. 41, pl. 14, figs. 9–13.

Canadian (Beekmantown): Bellefonte, Pennsylvania.

Hemigyraspis liquensis (Hoek).

Ogygia liquensis Hoek, Neues Jahrb. Min., Geol. Pal., 34, 1912, p. 230, pl. 14.

Lowest Ordovician: Near Camargo, Bolivia.

Hemigyraspis mcconnelli Raymond.

Hemigyraspis mcconnelli Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 40, pl. 4, fig. 4.

Hemigyraspis sp. Raymond, Trans. Roy. Soc. Canada, 5, 1912, pl. 3, fig. 7.

Lower Ordovician (Ceratopyge beds): Three miles east of Golden, British Columbia.

Hemigyraspis plana (Matthew).

Asaphellus(?) planus Matthew, Bull. Nat. Hist. Soc. New Brunswick, no. 20, 1902, p. 419, pl. 18, fig. 11; Geol. Surv. Canada, Rep. Cambrian Rocks Cape Breton, 1903, p. 237, pl. 18, fig. 11.

Canadian (Bretonian. Div. C 3c2): McLeod Brook, Boisdale, Cape Breton, Nova Scotia.

HEMIPHRAGMA Ulrich. Genotype: Batostoma irrasum Ulrich.

Batostoma (in part) Ulrich, Geol. Surv. Illinois, 8, 1890, p. 379.

Hemiphragma Ulrich, Geol. Minnesota, 3, 1893, p. 299; Zittel's Textb. Pal. (Engl. ed.), 1896, p. 275.—Simpson, 14th Ann. Rep. State Geol. New York, 1894, 1897, p. 592.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 35.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 281, 282; Zittel-Eastman Textb. Pal., 1913, p. 338.

Hemiphragma imperfectum (Ulrich).

Batostoma imperfectum Ulrich, Geol. Surv. Illinois, 8, 1890, p. 460, pl. 25, figs. 3–3d

Hemiphragma imperfectum Ulrich, Geol. Minnesota, 3, 1893, p. 301.

Monticulipora imperfectum J. F. James, Jour. Cincinnati Soc. Nat. Hist., 16, 1894, p. 196.

Richmond (Fernvale): Wilmington, Illinois; Tennessee; Texas.

Sections of *cotypes*.—Cat. No. 44061, U.S.N.M.

Hemiphragma irrasum (Ulrich).

Batostoma irrasa Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 94.

Hemiphragma irrasum Ulrich, Geol. Minnesota, 3, 1893, p. 299, pl. 24, figs. 5–19; Zittel's Textb. Pal. (Engl. ed.), 1896, fig. 460 (p. 275).—Simpson, 14th Ann. Rep. State Geol. New York for the year 1894, 1897, figs. 190–193 (p. 592).—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 284–286, figs. 172, 173; Zittel-Eastman Textb. Pal., 1913, p. 338, fig. 493.

Hemiphragma irrasum—Continued.

Black River (Decorah) and Trenton (Prosser): Minneapolis, etc., Minnesota; Decorah, Iowa; Wisconsin; etc.

Middle Ordovician (Orthoceras limestone): Baltischport, Russia.

Cotypes and *plesiotype*.—Cat. Nos. 43564, 57417, U.S.N.M.

Hemiphragma ottawaense (Foord).

Batostoma Ottawaense Foord, Contr. Micro-Pal. Cambro-Sil., 1883, p. 18, pl. 2, figs. 1–1f.

Hemiphragma ottawaense Ulrich, Geol. Minnesota, 3, 1893, p. 300, pl. 24, figs. 1–1.

Batostoma (Hemiphragma) ottawaense Sardeson, Jour. Geol., 9, 1901, p. 13.

Black River and Trenton: Ottawa and Paquettes Rapids, Ottawa River, Canada; Kenyon, Berne, and Mantorville, Minnesota.

Hemiphragma tenuimurale Ulrich.

Hemiphragma tenuimurale Ulrich, Geol. Minnesota, 3, 1893, p. 301, pl. 24, figs. 20–23.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 282, 283, figs. 170, 171.

Batostoma (Hemiphragma) tenuimurale Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 137, fig. 190l.

Trenton (Prosser): Goodhue County, Minnesota; Iowa.

Middle Ordovician (Wassalem): Uxnorm, near Reval, Esthonia, Russia.

Cotypes and *plesiotype*.—Cat. Nos. 43563, 57416, U.S.N.M.

Hemiphragma whitfieldi (James).

Monticulipora (Chætetes) whitfieldi James, Paleontologist, no. 5, 1881, p. 34.

Monticulipora whitfieldi James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 178.—J. F. James, ibid., 16, 1894, p. 200.

Batostoma (Hemiphragma) whitfieldi Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 137.

Hemiphragma whitfieldi Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 286.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 40, p. 8, figs. 15, 16; pl. 4, figs. 1–4; pl. 5, fig. 5.

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

Plesiotypes.—Cat. No. 35393, U.S.N.M.

Hemipronites Meek and Hayden. See Strophomena Rafinesque.

Hemipronites americanus Whitfield. See Clitambonites diversus.

Hemipronites apicalis Whitfield. See Polytœchia apicalis.

Hemipronites filitextus Miller. See Strophomena neglecta.

Hemipronites propinquus Meek and Worthen. See Schuchertella proprinqua.

Hemipronites subplanus Meek and Worthen. See Schuchertella propinqua.

Hemipronites subtenta Miller. See Strophomena planumbona subtenta.

Hemisterias Rafinesque. Not recognized.

Hemisterias Rafinesque, Bull. Soc. Geol. France, 10, 1839, p. 381.—Binney and Tryon's Complete Writings of Constantine Smaltz Rafinesque on Recent and Fossil Conch., 1864, p. 90.

Hemisterias quadriloba Rafinesque.

Hemisterias quadriloba Rafinesque, Binney and Tryon's Complete Writings of Constantine Smaltz Rafinesque on Recent and Fossil Conch., 1864, p. 90, fig. 1.

Silurian??: Pennsylvania.

Hemithiris increbescens D'Orbigny. See Rhynchotrema inæquivalve.

Hemithiris subtrigonalis D'Orbigny. See Rhynchotrema subtrigonale.

HEMITRYPA Phillips. Genotype: H. oculata Phillips.

Hemitrypa Phillips, Pal. Foss., 1841, p. 27,—McCoy, Synop. Carb. Foss. Ireland, 1844, p. 204.—Pictet, Traité de Paleontologie, 2d ed., 4, 1857, p. 166.—Hall, 26th Ann. Rep. New York State Mus., 1874, p. 97; Rep. State Geol. New York for the year 1884, 1885, p. 36.—Ulrich, Contr. Amer. Pal., 1, 1886, p. 4.—Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 152.—Hall and Simpson, Pal. New York, 6, 1887, p. xxiii.—Miller, N. A. Geol. Pal., 1889, p. 309.—Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 396, 559.—Cole, Sci. Proc. Roy. Dublin Soc., n. s., 8, 1893, p. 132.—Pocta, Syst. Sil. Boheme, 8, pt. 1, 1894, p. 92.—Whidborne, Devon Fauna England (Pal. Soc. Publ.), 2, pt. 4, 1895, p. 177.—Simpson, 13th Ann. Rep. State Geol. New York for 1893, 1895, pp. 710, 726; 47th Ann. Rep. New York State Mus., 1895, pp. 904, 920.—Ulrich, Zittel's Textb. Pal. (Engl. ed.), 1896, p. 282.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, pp. 507, 520.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 39.—Cumings, Amer. Jour. Sci., 17, 1904, p. 49; 30th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1906, p. 1281.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 341.

HEMITRYPA DUBIA Hall. See Loculipora ambigua Hall.

Hemitrypa ulrichi Foerste.

Hemitrypa ulrichi Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 152; ibid., 3, 1888, pl. 15, fig. 2; Geol. Surv. Ohio, 7, 1895, p. 599, pl. 28, fig. 2.

Upper Medinan (Brassfield): Near New Carlisle, Ohio.

HERCOCRINUS Hudson. Genotype: H. elegans Hudson.

Hercocrinus Hudson, Bull. New York State Mus., 107, 1907, p. 125.—Zittel, Grundzuge Pal., 1, 1910, p. 191.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 549.

Hercocrinus elegans Hudson.

Hercocrinus elegans Hudson, Bull. New York State Mus. Nat. Hist., 1907, 107, p. 125, pl. 9, and text fig. 6.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 549.

Chazyan (Valcour): Valcour Island, Lake Champlain, New York.

Hercocrinus ornatus Hudson.

Hercocrinus ornatus Hudson, Bull. 107, New York State Mus., 1907, p. 127, pl. 10, and text fig. 7.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 549.

Chazyan (Valcour): Valcour Island, Lake Champlain, New York.

HERCYNELLA Kayser. Genotype: H. beyrichi Kayser.

Hercynella Kayser, Abhand. Geol. Specialk. Preus. Thur. Staaten, 2, 1878, p. 101.—Barrande, Syst. Sil., 4, pt. 3, 1911, p. 270.

Hercynella buffaloensis O'Connell.

Hercynella buffaloensis O'Connell, Bull. Buffalo Soc. Nat. Sci., 11, No. 1, 1914, p. 96, pl., figs. 1–3.

Cayugan (Bertie): North Buffalo, New York.

Hercynella canadensis Grabau.

Hercynella canadensis Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 195, pl. 25, figs. 5, 6.

Upper Monroan (Amherstburg): Detroit River region of Michigan and Ontario.

Hercynella patelliformis O'Connell.

Hercynella patelliformis O'Connell, Bull. Buffalo Soc. Nat. Sci., 11, No. 1, 1914, p. 97, pl., figs. 4–6.

Cayugan (Bertie): North Buffalo, New York.

HERMATOSTROMA Nicholson. Genotype: H. schluteri Nicholson.

Hermatostroma Nicholson, Mon. British Strom., Pal., Soc., 1886, p. 105; ibid., 1892, pp. 218, 219.—Parks, Univ. Toronto Studies, Geol. Ser., no. 4, 1907, p. 34.—Zittel-Eastman Pal., 2d ed., 1913, p. 123.

Hermatostroma guelphica Parks.

Hermatostroma guelphica Parks, Univ. Toronto Studies, Geol. Series, no. 4, 1907, p. 34, pl. 4, figs. 1, 2; pl. 6, fig. 4, 3.

Niagaran (Guelph): Elora, Ontario.

HERPETOCRINUS Salter. See Myelodactylus Hall.

HETEROCRINITES SIMPLEX Troost. See Ectenocrinus canadensis.

HETEROCRINUS Hall. Genotype: H. heterodactylus Hall.

Heterocrinus Hall, Pal. New York, 1, 1847, p. 278.—D'Orbigny, Prodr. de Pal., 1, 1849, p. 24.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 223.—Billings, Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, p. 271.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 329.—Billings, Geol. Surv. Canada, dec. 4, 1859, p. 48, fig. 16.—Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 376.—Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1865, p. 147.—Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 210 (adv. sheets 1866).—Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 1.—Zittel, Handb. Pal., 1, 1879, p. 358.—Carpenter, Phil. Trans. Royal Soc. London, 174, 1884, p. 933.—Wachsmuth and Springer (part), Proc. Acad. Nat. Sci. Philadelphia, 3, 1886, pp. 127, 129 (Rev. Pal., pt. 3, sec. 2, pp. 187, 203, 205); ibid., 1890, pp. 355–390.—Miller, N. A. Geol. Pal., 1889, p. 252.—Bather, Ann. Mag. Nat. Hist., 6th ser., 5, 1890, p. 324, pl. 14, fig. 6; pl. 15, figs. 5a, b.—Bather, Kongl. Sv. Vet. Akad. Handl., 25, 1893, p. 25, fig. 6; Nat. Sci., 12, 1898, p. 343; Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 146, fig. 58, 2.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 152.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 713.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 501.—Springer, Geol. Surv. Canada, Mem. 15P, 1911, p. 27; Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 212.

Stenocrinus Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, pp. 111, 127, 130, 131 (Rev. Pal., 3, sec. 2, pp. 187, 203, 206, 207).—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 146.—Zittel, Grundzuge Pal., 1, 1910, p. 151. (Genotype: Heterocrinus heterodactylus Hall.)

HETEROCRINUS ARTICULOSUS Billings. See Cremacrinus articulosus.

HETEROCRINUS BELLEVILLENSIS W. R. Billings. See Ohiocrinus bellevillensis.

HETEROCRINUS CANADENSIS Billings. See Ectenocrinus canadensis.

HETEROCRINUS CONSTRICTUS Hall. See Ohiocrinus constrictus.

HETEROCRINUS CONSTRICTUS var. COMPACTUS Meek. See Ohiocrinus compactus.

HETEROCRINUS CONSTRICTUS var. CONTRACTUS Wachsmuth and Springer. See Ohiocrinus compactus.

HETEROCRINUS CRASSUS Meek and Worthen. See Iocrinus crassus.

HETEROCRINUS DECADACTYLUS Emmons. See Glyptocrinus decadactylus.

HETEROCRINUS EXIGUUS Meek. See Heterocrinus exilis exiguus.

Heterocrinus exilis Hall.

Heterocrinus exilis Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 213, pl. 5, fig. 16 (adv. sheets 1866 and 1871).—Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 5, pl. 1, fig. 12.

Stenocrinus exilis Wachmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 132 (Rev. Pal., pt. 3, sec. 2, p. 208).

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

Heterocrinus exilis exiguus (Meek).

Heterocrinus exiguus Meek, Proc. Acad. Nat. Sci. Philadelphia, 23, 1, 1871, p. 308; ibid., 1872, p. 308.

Heterocrinus exilis var. exiguus Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 293 (Rev. Pal., pt. 1, p. 70).

Eden: Cincinnati, Ohio, and vicinity.

Heterocrinus? geniculatus Ulrich.

Heterocrinus geniculatus Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 16, pl. 7, figs. 13, 13a, 13b, 13c.

Stenocrinus geniculatus Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 132 (Rev. Pal., 3, sec. 2, p. 208).

Eden (Fulton): Cincinnati, Ohio, and vicinity.

Natural mold of *cotype*.—Cat. No. 42219, U.S.N.M.

Heterocrinus? gracilis Hall.

Heterocrinus? gracilis Hall, Pal. New York, 1, 1847, p. 280, pl. 76, figs. 3a, b; 12th Ann. Rep. Regents Univ. State New York, 1860, p.69. —Ruedemann, Bull. New York State Mus., 162, 1912, p. 86, pl. 3, fig. 5.

Trenton (Snake Hill): Snake Hill, New York.

Heterocrinus heterodactylus Hall.

Heterocrinus heterodactylus Hall, Pal. New York, 1, 1847, p. 279, pl. 76, figs. 1a-o.—Emmons, Amer. Geology, 1, pt. 2, 1855, pl. 17, fig. 20.—Hall, 12th Ann. Rep. Regents Univ. State New York, 1860, p. 69.—Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 12, pl. 1, figs. 1a, b.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, pp. 2, 3.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 724, pl. 3, figs. 5, 5a.

Stenocrinus heterodactylus Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, pp. 130, 132 (Rev. Pal., pt. 3, sec. 2, pp. 206, 208).

Eden: Lewis, Jefferson, and Oneida Counties, New York; Cincinnati, Ohio, and vicinity.

Heterocrinus heterodactylus propinquus Meek.

Heterocrinus heterodactylus propinquus Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 14, pl. 1, figs. 2a, b.

Stenocrinus heterodactylus var. propinquus Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 132 (Rev. Pal., 3, pt. 2, p. 208), (gen. ref.).

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

Heterocrinus inæqualis Billings. See Cremacrinus inæqualis.

Heterocrinus (Anomalocrinus) incurvus Meek and Worthen. See Anomalocrinus incurvus.

Heterocrinus isodactylus Miller. See Ohiocrinus compactus.

Heterocrinus juvenis Hall.

Heterocrinus juvenis Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 212, pl. 5, figs. 9, 10 (adv. sheets 1866, p. 4, and 1871, pl 1, figs. 9, 10).—Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 10, pl. 1, figs. 3a-c.—Miller, N. A. Geol. Pal., 1889, p. 252, fig. 329.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 283, fig.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 725, pl. 3, figs. 3, 3b.

Stenocrinus juvenis Wachsmuth and Springer, Proc. Acad. Nat. Sci., Philadelphia 1886, p. 132 (Rev. Pal., pt. 3, sec. 2, p. 208).

Maysville (Corryville): Lebanon, Ohio.

HETEROCRINUS LAXUS Hall. See Ohiocrinus laxus.

Heterocrinus milleri Wetherby.

Heterocrinus Milleri Wetherby, Jour. Cincinnati Soc. Nat. Hist., 3, 1880, p. 153, pl. 5, fig. 3.

Stenocrinus Milleri Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 132 (Rev. Pal., pt. 3, sec. 2, p. 208).

Trenton (Curdsville): Mercer County, Kentucky; Kirkfield, Ontario.

HETEROCRINUS ŒHANUS Miller. See Ohiocrinus laxus.

Heterocrinus pentagonus Ulrich.

Heterocrinus pentagonus Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 176, pl. 5, figs. 10 and 10a.

Stenocrinus pentagonus Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 132 (Rev. Pal., pt. 3, sec. 2, p. 208).

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

HETEROCRINUS? (IOCRINUS) POLYXO Hall. See Iocrinus subcrassus.

HETEROCRINUS SIMPLEX Hall. See Ectenocrinus simplex.

HETEROCRINUS SIMPLEX var. GRANDIS Meek. See Ectenocrinus grandis.

HETEROCRINUS SUBCRASSUS Meek and Worthen. See Iocrinus subcrassus.

Heterocrinus tenuis Billings.

Heterocrinus tenuis Billings, Geol. Surv. Canada, Rep. Progress, 1853–56, 1857, p. 273; Geol. Surv. Canada, dec. 4, 1859, p. 50, pl. 4, fig. 6a–b; pl. 10, figs. 1a–c.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 502.—Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 25.

Stenocrinus tenuis Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 132 (Rev. Pal., pt. 3, sec. 2, p. 208).

Trenton (Curdsville): Ottawa and Kirkfield, Ontario; Montreal, Quebec.

HETEROCRINUS VAUPELI Wetherby. See Ohiocrinus constrictus.

HETEROCYSTITES Hall. Genotype: H. armatus Hall.

Heterocystites Hall, Pal. New York, 2, 1852, p. 229.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 303.—Hall, Pal. New York, 3, for 1859, 1861, p. 152.—Miller, N. A. Geol. Pal., 1889, p. 253.—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 67, fig. 36, 7.

Heterocystites armatus Hall.

Heterocystites armatus Hall, Pal. New York, 2, 1852, p. 229, pl. 49A, figs. 3a–c.—Jaekel, Stammes. Pelmat., 1, Thecoidea u. Cystoidea, Berlin, 1899, p. 345.

Niagaran (Lockport): Lockport, New York.

HETERODICTYA Zittel. See Ptilodictya Lonsdale.

HETERODICTYA PAVONIA Ulrich. See Escharopora pavonia.

HETERONEMA Ulrich and Bassler. Genotype: H. capillare Ulrich and Bassler.

Heteronema Ulrich and Bassler, Smith. Misc. Coll., 45, 1904, p. 278.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 57; Zittel-Eastman Textb. Pal., 1913, p. 318.

Heteronema? contextum Ulrich and Bassler.

Heteronema? contextum Ulrich and Bassler, Smiths. Misc. Coll., Quart., 45, 1904, p. 279, pl. 65, fig. 12.

Maysville (Corryville): Morrow, Ohio.

Holotype.—Cat. No. 43132, U.S.N.M.

HETERORTHIS Hall and Clarke. Genotype: Orthis clytie Hall.

Heterorthis Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 207, 223; 11th Ann. Rep. New York State Geol., 1891, p. 268.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 382.

Heterorthis clytie Hall.

Orthis clytie Hall, 14th Rep. New York State Cab. Nat. Hist., 1861, p. 90; 15th Rep., ibid., 18–62, pl. 2, figs. 4, 5.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 34.—Hall and Whitfield, Pal. Ohio, 2, 1875, p. 75, pl. 1, figs. 18, 19.—Hall, 36th Rep. New York State Mus. Nat. Hist., 1884, p. 75, pl. 3, fig. 7.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 512, figs.

Heterorthis clytie Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 202, 223, pl. 5B, figs. 20–24.—Bassler, Bull. Virginia Geol. Surv., 2a, pl. 24, fig. 1.

Trenton (Hermitage): Frankfort, Paris, etc., Kentucky; Virginia; Tennessee.

HETEROSPONGIA Ulrich. Genotype: H. subramosa Ulrich.

Heterospongia Ulrich, Amer. Geol., 3, 1889, pp. 234, 239.—Miller, N. A. Geol. Pal., 1889, p. 160.—James, Jour. Cincinnati Soc. Nat. Hist., 14, 1891, p. 71.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 78 (Ext., 1893).

Heterospongia aspera Ulrich.

Heterospongia aspera Ulrich, Amer. Geol., 3, 1889, p. 241.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 14, pt. 1, 1891, p. 72.

Richmond (Arnheim): Marion and Lincoln Counties, Kentucky.

Heterospongia knotti Ulrich.

Heterospongia knotti Ulrich, Amer. Geol., 3, 1889, p. 241, fig. 5.

Heterospongia cfr. knotti Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 303, pl. 9, fig. 2.

Heterospongia subramosa-knotti Foerste, Ohio Nat., 12, 1912, p. 453, pl. 22, fig. 2.

Richmond (Arnheim): Near Lebanon, Kentucky.

Holotype.—Cat. No. 46557, U.S.N.M.

Heterospongia subramosa Ulrich.

Heterospongia subramosa Ulrich, Amer. Geol., 3, 1889, p. 240, fig. 6, p. 236.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 14, pt. 1, 1891, p. 71.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895 (ext. 1893), p. 79, pl. G, figs. 4–6.

Richmond (Arnheim): Marion and Lincoln Counties, Kentucky.

Cotypes.—Cat. Nos. 46558–46560, U.S.N.M.

HETEROSPONGIA SUBRAMOSA KNOTTI Foerste. See Heterospongia knotti.

HETEROTRYPA Nicholson. Genotype: Monticulipora frondosa D'Orbigny.

Heterotrypa (in part) Nicholson, Pal. Tabulate Corals, 1879, p. 291; Genus Monticulipora, 1881, pp. 101, 103.—Zittel, Handb. Pal., 1, p. 615.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 155; ibid., 6, 1883, p. 83.—Foord, Contr. Micro-Pal. Cambro-Sil., 1883, p. 20.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, pp. 83–85.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 471.—Rominger, Amer. Geol., 6, 1890, pp. 114, 119.—Ulrich, Geol. Sur. Illinois, 8, 1890, pp. 371, 413; Geol. Minnesota, 3, 1893, p. 267.—Zittel's

HETEROTRYPA—Continued.

Textb. Pal. (Engl. ed.), 1896, p. 104.—Ulrich, Zittel's Textb. Pal. (Engl. ed.), 1896, p. 273.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 578.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 31.—Cumings, Amer. Geol., 29, 1902, p. 199.—Ulrich and Bassler, Smith. Misc. Coll., Quart., 47, 1904, pp. 24, 25.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 333.

Heterotrypa affinis (Ulrich).

Amplexopora affinis Ulrich, Geol. Sur. Illinois, 8, 1890, p. 450, pl. 36, figs. 2, 2a.
Monticulipora affinis James, Jour. Cincinnati Soc. Nat. Hist., 16, pt. 5, 1894, p. 193.
Heterotrypa affinis Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 289.
Richmond (Fernvale): Wilmington, Illinois.
Sections of *holotype*.—Cat. No. 43769, U.S.N.M.

Heterotrypa andrewsi Nicholson. See Hallopora andrewsi.

Heterotrypa foerstei Nickles.

Heterotrypa foerstei Nickles, Bull. Kentucky Geol. Surv., 5, 1905, p. 48, pl. 2, fig. 5.—Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 126.
Trenton (Upper): Near Rogers Gap, Scott County, Kentucky.

Heterotrypa frondosa (D'Orbigny).

Monticulipora frondosa 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.—White, 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 380, pl. 48, figs. 2, 3.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 420, figs.—Boule and Thevenin, Ann. de Pal., 1, 1906, p. 6, pl. 2, figs. 9, 10; pl. 3, figs. 1, 2.
Chætetes frondosus Milne-Edwards and Haime, Pol. Foss. Terr. Pal., 1851, p. 267, pl. 19, figs. 5, 5a.—Quenstedt, Rœhren- und Sternkorallen, 1881, p. 73, pl. 146, fig. 8 (not 3–5).
Chætetes frondosus limatus Quenstedt, Rochren- und Sternkorallen, 74, 1881, pl. 146, fig. 9.
Heterotrypa frondosa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 23; ibid., 6, 1883, p. 83.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 289.—Ulrich and Bassler, Smiths. Misc. Coll., Quart., 47, 1904, p. 25, pl. 11, figs. 1–3.
Chætetes mammulatus (not D'Orbigny) Nicholson, Quart. Jour. Geol. Soc. London, 30, 1874, p. 508, pl. 30, figs. 2, 2b; Pal. Ohio, 2, 1875, p. 207.
Monticulipora (Heterotrypa) mammulata (not D'Orbigny), Nicholson, Pal. Tabulate Corals, 1879, p. 294, pl. 13, figs. 1, 1b; Genus Monticulipora, 1881, p. 104, pl. 6, figs. 1, 1g.
Monticulipora mammulata (not D'Orbigny) James and James, Jour. Cincinnati Soc. Nat. Hist., 11, 1888, p. 16.—James, ibid., 18, 1895, p. 69.
Dekayia frondosa Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 812, pl. 15, figs. 1–1e; pl. 28, fig. 9; pl. 29, fig. 1.
Dekayella cystata Cumings, Amer. Geol., 28, 1901, p. 375, pl. 35, figs. 1–6a.
Dekayia frondosa var. cystata Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 813, pl. 14, figs. 1, 1a; pl. 28, fig. 3.
Dekayia perfrondosa Cumings, Amer. Geol., 29, 1902, p. 207, 210, 212, pl. 9, figs. 9, 11–13, 15, 16; pl. 10, figs. 1, 6; pl. 11, fig. 6; pl. 12, fig. 2.
Maysville (McMillan): Cincinnati, Ohio, and vicinity.
Fragment of Edwards and Haime's *plesiotype*.—Cat. No. 35113, U.S.N.M.

Heterotrypa inflecta Ulrich.

Heterotrypa inflecta Ulrich, Geol. Surv. Illinois, 8, 1890, p. 414, pl. 37, figs. 2–2d.

Monticulipora inflecta J. F. James, Jour. Cincinnati Soc. Nat. Hist., 18, 1895, p. 77.

Heterotrypa ulrichi-inflecta Cumings, Amer. Geol., 29, 1902, p. 212, pl. 9, fig. 3.

Dekayia inflecta Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 814, pl. 15, figs. 2, 2a.

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

Cotypes.—Cat. No. 43367, U.S.N.M.

Heterotrypa lobata (Cumings).

Dekayia ulrichi-lobata Cumings, Amer. Geol., 29, 1902, p. 203, pl. 9, fig. 2; pl. 10, fig. 5; pl. 11, figs. 3, 4; 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 815, pl. 27, fig. 21.

Dekayia ulrichi-expansa Cumings, Amer. Geol., 29, 1902, p. 212, pl. 9, figs. 5, 6; pl. 11, fig. 7.

Maysville (Fairmount): Manchester Station, etc., Indiana; Cincinnati, Ohio, and vicinity.

Heterotrypa microstigma Cumings and Galloway.

Heterotrypa microstigma Cumings and Galloway, 37th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1913, p. 76, pl. 8, figs. 1–1c.

Richmond (Waynesville): Big Four Railroad, near Weisburg, Indiana.

Heterotrypa parvulipora Ulrich and Bassler.

Heterotrypa parvulipora Hayes and Ulrich, U. S. Geol. Surv., Folio 95, ill. sheet, 1903, fig. 26.—Ulrich and Bassler, Smiths. Misc. Coll., Quart., 47, 1904, p. 26, pl. 11, figs. 4–6.—Nickles, Bull. Kentucky Geol. Surv. 5, 1905, p. 45, pl. 1, fig. 12.

Trenton (Catheys): Maury County, etc., Tennessee; Kentucky.

Cotypes.—Cat. No. 43186, U.S.N.M.

Heterotrypa paupera (Ulrich).

Dekayia paupera Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 153, pl. 6, figs. 10, 10a.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 817, pl. 15, fig. 3, 3a; pl. 28, fig. 6.

Heterotrypa paupera Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 290.

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

Holotype.—Cat. No. 43656, U.S.N.M.

Heterotrypa prolifica Ulrich. See Heterotrypa subramosa-prolifica.

Heterotrypa ramosa Nicholson. See Hallopora ramosa.

Heterotrypa singularis Ulrich. See Dekayella singularis.

Heterotrypa solitaria Ulrich.

Heterotrypa solitaria Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 88, pl. 1, figs. 3–3b.

Maysville (Fairmount): Covington, Kentucky; Maury County, Tennessee.

Holotype.—Cat. No. 43664, U.S.N.M.

Heterotrypa subfrondosa (Cumings).

Dekayia subfrondosa Cumings, Amer. Geol., 29, 1902, p. 204, pl. 9, figs. 7, 8 (as D. subramosa); pl. 10, figs. 3, 7, 8; pl. 11, fig. 1; pl. 12, fig. 4; 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 821, pl. 14, figs. 6, 6c; pl. 28, fig. 10.

Maysville (Fairmount): Manchester Station, Indiana; Cincinnati, Ohio, and vicinity.

Heterotrypa subpulchella (Nicholson).

Chætetes subpulchellus Nicholson, Pal. Ohio, 2, 1875, p. 196, pl. 21, figs. 6, 6a.

Monticulipora (Heterotrypa) subpulchella Nicholson, Genus Monticulipora, 1881, p. 134, fig. 23, pl. 5, figs. 2, 2a.

Monticulipora subpulchella James and James, Jour. Cincinnati Soc. Nat. Hist., 10, 1888, p. 181.—J. F. James, Jour. Cincinnati Soc. Nat. Hist., 16, 1894, p. 204.

Heterotrypa subpulchella Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 83.—Nickles, Bull. Kentucky Geol. Surv., no. 5, 1905, p. 51, pl. 2, fig. 12.

Dekayia perfrondosa-subpulchella Cumings, Amer. Geol., 29, 1902, p. 211, 212, pl. 9, fig. 14; pl. 10, fig. 4.

Dekayia subpulchella Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 822, pl. 16, figs. 1, 1a; pl. 28, fig. 11.

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

Heterotrypa subramosa (Ulrich).

Atactopora subramosa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 124, pl. 12, figs. 6–6c.

Heterotrypa subramosa Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 290.

Dekayia subramosa Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 823, pl. 15, figs. 5, 5b; pl. 29, fig. 2.

Richmond (Waynesville): Jacksonburg, Hanover, etc., Ohio; Indiana.

Holotype.—Cat. No. 43663, U.S.N.M.

Heterotrypa subramosa prolifica Ulrich.

Heterotrypa prolifica Ulrich, Geol. Surv. Illinois, 8, 1890, p. 413, pl. 37, figs. 1–1d; Geol. Minnesota, 3, 1893, p. 268.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, figs. 145, 146 (p. 579).

Monticulipora prolifica J. F. James, Jour. Cincinnati Soc. Nat. Hist., 18, 1895, p. 75.

Heterotrypa subramosa-prolifica Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 290.

Dekayella perfrondosa-prolifica Cumings, Amer. Geol., 29, 1902, p. 212 (gen. ref.).

Dekayia prolifica Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 820, pl. 15, figs. 4–4b; pl. 29, fig. 3.

Richmond: Blanchester, Waynesville, etc., Ohio; Richmond, etc., Indiana; Illinois; Wisconsin; etc.

Cotypes.—Cat. No. 43368, U.S.N.M.

Heterotrypa ulrichi-inflecta Cumings. See Heterotrypa inflecta.

Heterotrypa vaupeli Ulrich. See Nicholsonella vaupeli.

Hexameres Barrande. See Hexameroceras Hyatt.

HEXAMEROCERAS Hyatt. Genotype: Phragmoceras pandæri Barrande.

Hexamorion (Hexameres) Barrande, Syst. Sil. Boheme 2, pt. 1, 1867, pp. 203, 265.

Hexameroceras Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 278.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 242.—Newell, Proc. Boston Soc. Nat. Hist., 23, 1888, p. 478.—Jaekel, Zeits. d. d. geol. Gesell., 54, Protok., 1902, pp. 8, 68, 80.—Jaekel in Ruedemann, Amer. Geol., 31, 1903, p. 200.

Hexamoceras Miller, N. A. Geol. Pal., 1st App., 1892, p. 696.

Hexameroceras cacabiforme Newell.

Hexameroceras cacabiformis Newell, Proc. Boston Soc. Nat. Hist., 23, 1888, p. 481, figs.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 131, fig.

Hexamoceras cacabiforme Miller, N. A. Geol. Pal., 1st App., 1892, p. 696 (gen. ref.).

Niagaran: Delphi, Indiana.

Hexameroceras delphicolum Newell.

Hexameroceras delphicolum Newell, Proc. Boston Soc. Nat. Hist., 23, 1888, p. 479, figs.—Kindle and Breger, 28th Ann. Rep. Dept. Geol. Nat. Res. Indiana, 1904, p. 475.

Hexamoceras delphicolum Miller, N. A. Geol. Pal., 1st App., 1892, p. 696 .

Niagaran: Delphi and Huntington, Indiana.

Hexameroceras hertzeri (Hall and Whitfield).

Crytoceras Hertzeri Hall and Whitfield, Geol. Surv. Ohio Pal., 2, 1875, p. 150, pl. 8, figs. 7, 8.

Hexameroceras herzeri Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 130, fig. 1378.

Gomphoceras hertzeri Miller, N. A. Geol. Pal., 1889, p. 437 (gen. ref.).

Hexamoceras hertzeri Miller, N. A. Geol. Pal., 1892, p. 696 (gen. ref.).

Niagaran (Guelph): Cedarville, Ohio.

HEXAMOCERAS Miller. See Hexameroceras Hyatt.

HEXAMORION Barrande. See Hexameroceras Hyatt.

HEXAPORITES Pander. See Dianulites Eichwald.

HEXAPORITES FUNGIFORMIS Leuchtenberg. See Dianulites petropolitana.

HINDELLA Davidson. Genotype: Athyris umbonata Billings.

Hindella Davidson, Suppl. British Sil. Brach., Pal. Soc., 1882, p. 130.—Miller, N. A. Geol. Pal., 1889, p. 346.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 63, figs. 46–51; 13th Ann. Rep. New York State Geol., 1895, p. 769.—Grabau, Michigan Geol. Sur., Geol. Ser., 1, 1909, p. 148.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 415.

Greenfieldia Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 148. (Genotype: Hindella whitfieldi Grabau.)

Hindella? ambigua Savage.

Hindella? ambigua Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 89, pl. 4, figs. 17 and 18.

Upper Medinan (Edgewood): Near Edgewood, Pike County, Missouri; Alexander County, Illinois.

HINDELLA PHOCA Ami. See Lissatrypa phoca.

Hindella prinstana (Billings).

Athyris Prinstana Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 145, fig. 122 (advance sheets, 1862).

Meristella prinstana Miller, N. A. Geol. Pal., 1889, p. 354.

Hindella prinstana Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 64, pl. 41, fig. 28; pl. 49, fig. 1.

Athyris turgida Shaler, Bull. Mus. Comp. Zool., 4, 1865, p. 69.

Gamachian (Ellis Bay) and Anticostian (Becsie River): Prinsta Bay, Ellis Bay, etc., Anticosti.

Hindella? (Greenfieldia) rostralis Grabau.

Hindella? (Greenfieldia) rostralis Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 150, pl. 21, figs. 1, 2, 7.

Lower Monroan (Greenfield): Greenfield, Ohio.

Hindella umbonata (Billings).

Athyris umbonata Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 144, fig. 121 (adv. sheets, 1862); Geol. Canada, 1863, p. 317, fig. 331.

Hindella umbonata Davidson, Suppl. British Sil. Brach., Pal. Soc., 1882, p. 130, fig.—Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 64, figs. 46–51; pl. 41, figs. 26, 27, 29, 30.

Meristella umbonata Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 88, pl. 13, fig. 2; Geol. Ohio, 7, 1895, p. 590, pl. 25, fig. 2.

Alexandrian (Ellis Bay) and Anticostian (Becsie River-Gun River): Island of Anticosti.

Upper Medinan (Brassfield): Dayton, Ohio.

Hindella? (Greenfieldia) whitfieldi Grabau.

Hindella? (Greenfieldia) whitfieldi Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 149, pl. 19, fig. 4; pl. 21, figs. 11, 17–19; pl. 30, figs. 8–10.

Meristella bella Whitfield (not Hall), Ann. New York Acad. Sci., 5, 1891, p. 510, pl. 5, figs. 8–10; Pal. Ohio, 7, 1893, p. 412, pl. 1, figs. 8–10.—Sherzer, Geol. Surv. Michigan, 7, pt. 1, 1900, p. 223, pl. 17, figs. 8–10.

Lower Monroan (Greenfield): Greenfield, Ohio.

HINDIA Duncan. Genotype: H. sphæroidalis Duncan.

Hindia Duncan, Ann. Mag. Nat. Hist. (5), 4, 1879, p. 84.—Hinde, Catalogue Fossil Sponges, British Mus., 1883, p. 57.—Zittel, Neues Jahrb. Min., Geol. Pal., 2, 1884, p. 79.—Rauff, Ann. Mag. Nat. Hist., 5th ser., 18, 1886, p. 169.—Hinde, Ann. Mag. Nat. Hist., 5th ser., 19, 1887, p. 67.—Mon. British Foss. Sponges, Palæontographical Soc., 1888, p. 115.—Miller, N. A. Geol. Pal., 1889, p. 160.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 226.—James, Jour. Cincinnati Soc. Nat. Hist., 14, 1891, p. 56.—Rauff, Palæontographica, 40, 1894, p. 327.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 79.—Koken, Die Leitfossilien, Leipzig, 1896, p. 337; Zittel-Eastman Textb. Pal., 1, 1900, p. 51.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 14.—Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 56.

Microspongia, Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 37.—Ulrich, Amer. Geol., 1, 1888, p. 325.—Miller, N. A. Geol. Pal., 1889, p. 161.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 228.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 14, pt. 1, 1891, p. 54. (Genotype: M. gregaria Miller and Dyer.)

Observation.—Although Microspongia has priority it was so poorly defined that its identity with Hindia would not be suspected without study of the types.

Hindia fibrosa of authors. See Hindia sphæroidalis.

Hindia gregaria (Miller and Dyer).

Microspongia gregaria Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 37, pl. 2, fig. 2.—Miller, N. A. Geol. Pal., 1889, p. 161, fig. 108.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 14, pt. 1, 1891, p. 54.

Astylospongia gregaria James, J. F., Jour. Cincinnati Soc. Nat. Hist., 9, 1886, p. 247.

Maysville: Cincinnati, Ohio, and vicinity.

Hindia inæqualis Ulrich and Everett.

Hindia inæqualis Ulrich and Everett, Geol. Surv. Illinois, 8, 1890, p. 275, pl. 2, figs. 4, 4a–b.

Black River (Platteville): Near Dixon, Illinois.

Section of *holotype*.—Cat. No. 46561, U.S.N.M.

Hindia parva Ulrich.

Hindia parva Ulrich, Amer. Geol., 3, 1889, p. 244.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 79, pl. G, figs. 7–9.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 135, pl. 6, fig. 1.

Hindia sphæroidalis var. parva Rauff, Palæontographica, 40, 1894, p. 338, pl. 15, fig. 2.

Microspongia parva Miller, N. A. Geol. Pal., 1889, p. 161 (gen. ref.).

Microspongia gregaria (part) James, Jour. Cincinnati Soc. Nat. Hist., 14, 1891, p. 54.

Trenton: Danville, Frankfort, etc., Kentucky; Tennessee; New Jersey; Wisconsin; Minnesota; etc.

Black River (Decorah): Minneapolis, etc., Minnesota.

Cotypes.—Cat. No. 46562, U.S.N.M.

Hindia sphæroidalis Duncan.

Calamopora fibrosa Roemer (not Goldfuss), Sil. Fauna West Tennessee, 1860, p. 20, pl. 2, fig. 9.

Hindia fibrosa Hinde, Cat. Foss. Sponges British Mus., 1883, p. 57, pl. 13, figs. 1, 1a–b.—Roemer, Lith. Errat. in Pal. Abhandl. Dames u. Kayser, 2, 1885, p. 63 (310), pl. 4 (27), fig. 17.—Rauff, Sitzungsber. d. Niederrh. Gesell. fur Nat. und Heilk zu Bonn, Sitz., 1886, pp. 166–172.—Hinde, Ann. Mag. Nat. Hist., 5th ser., 19, 1887, p. 76, figs. 1, 2; Mon. British Foss. Sponges, Pal. Soc., 1888, p. 116.—Girty, 48th Rep. New York State Mus., 2, 1895 (1897), p. 263; 14th Rep. State Geol. New York for 1894, 1897, p. 263, pl. 2, fig. 2.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 297, pl. 33, figs. 1, 2.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 14.

Hindia sphæroidalis Duncan, Ann. Mag. Nat. Hist., 5th ser., 4, 1879, p. 91, pl. 9, figs. 1–6.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 224, figs. 9, 10, pp. 225, 227—Rauff, Palæontographica, 40, 1894, p. 335, pl. 15; pl. 16; pl. 17; figs. 1–4.—Girty, 48th Rep. New York State Mus., 2, 1895 (1897), pl. 2, fig. 2; 14th Rep. State. Geol. New York for 1894, 1897, pl. 2, fig. 2; 19th Ann. Rep. U. S. Geol. Surv., 1899, p. 552.—Foerste, Jour. Geol., 11, 1903, p. 714.—Swartz, Maryland Geol. Surv., Low. Dev., 1913, p. 195, pl. 17, figs. 1–4.

Hyalostelia solivaga Ulrich, Geol. Surv. Illinois, 8, 1890, p. 232, pl. 2, fig. 4c.

Astylospongia inornata Hall, 16th Rep. New York State Cab. Nat. Hist., 1863, p. 70.

Sphærolithes nicholsoni Hinde, Abstract Proc. Geol. Soc., No. 305, 1875, p. 88, in Quart. Jour. Geol. Soc., 31.

Silurian and Early Devonian: Many localities in the United States and Canada.

Plesiotype.—Cat. No. 46563, U.S.N.M. (*holotype* of Hyalostelia solivaga).

Hindia sphæroidalis var. parva Rauff. See Hindia parva.

Hindia subrotunda (James).

Chætetes subrotundus James, Paleontologist, No. 2, 1878, p. 11.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 31.

Astylospongia subrotundus James, Paleontologist, 5, 1881, p. 34.

Microspongia? subrotundus J. F. James, Jour. Cincinnati Soc. Nat. Hist., 14, 1891, p. 55, fig. 1.

Richmond: Clinton County, Ohio.

HIPPARIONYX CONSIMILARIS Vanuxem. See Atrypa reticularis.

HIPPOTHOA DELICATULA James. See Corynotrypa delicatula.

HIPPOTHOA INFLATA Nicholson. See Corynotrypa inflata.

HOLASAPHUS Matthew. Genotype: H. centropyge Matthew.

Holasaphus Matthew, Trans. Roy. Soc. Canada, 2d ser., 1, sec. 4, 1895, p. 268; Geol. Surv. Canada, Rep. Cambrian Rocks, Cape Breton, 1903, p. 174.

Holasaphus congeneris (Walcott).

Bathyurus? congeneris Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 92, pl. 12, fig. 8.

Upper Pogonip: Ridge southwest of Wood Cove, Eureka District, Nevada.

Cotype.—Cat. No. 24654, U.S.N.M.

Holasaphus moorei Raymond.

Holasaphus moorei Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 35, pl. 3, figs. 7–11.

Canadian (Beekmantown): St. Anne de Bellevue, Island of Montreal, Quebec.

HOLOCYSTIS Haeckel. See Holocystites Hall.

HOLOCYSTITES Hall. Genotype: Caryocystites cylindricus Hall.

Holocystites Hall, 20th Rep. New York State Cab. Nat. Hist., 1868 (extras, 1864), p. 311, 380; rev. ed., pp. 353, 429.—Miller, Jour. Cincinnati Soc. Nat. Hist., 1, Oct., 1878, p. 129.—Zittel, Handb. Pal., 1, 1879, p. 416.—Miller, N. A. Geol. Pal., 1889, p. 253.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 72; Zittel-Eastman Textb. Pal., 1, 1900, p. 183.—Zittel, Grundzuge Pal., 1, 1910, p. 91.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 460.

Holocystis (not Lonsdale, 1855) Haeckel, Amphorideen u. Cystoideen, Leipzig, 1896, p. 60.

Megacystites Hall, Addenda 20th Rep. New York State Cab. Nat. Hist., 1867, p. 380. (New name, in case Holocystites be thought to be too much like Holocystis.)—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 47.

Megacystis Angelin, Icon. Crinoid., 1878, p. 29.

Holocystites abnormis Hall.

Holocystites abnormis Hall, 20th Rep. New York State Cab. Nat. Hist. (extras, 1864), 1868, p. 312, pl. 12(3), figs. 7, 8; rev. ed., p. 355, pl. 12, figs. 7, 8.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 191, fig.

Niagaran (Racine): Racine, Wisconsin.

Holocystites adipatus Miller.

Holocystites adipatus Miller, 17th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1898, p. 623, pl. 2, figs. 1, 2. (Adv. sheets, 1891, p. 13.)

Clinton (Osgood): Jefferson County, Indiana.

Holocystites affinis Miller and Faber.

Holocystites affinis Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 15, 1892, p. 87, pl. 1, figs. 16–18.

Clinton (Osgood): Near Madison, Indiana.

Holocystites alternatus (Hall).

Caryocystites alternatum Hall, Rep. Supt. Geol. Surv. Wisconsin, 1861, p. 23; Geol. Wisconsin, 1, 1862, p. 69.

Holocystites alternatus—Continued.

Holocystites alternatus Hall, 20th Rep. New York State Cab. Nat. Hist., 1868 (extras, 1864), p. 312, pl. 12(3), fig. 9; pl. 12a(1), fig. 6; rev. ed., 1870, p. 355, pl. 12, fig. 9, pl. 12a, fig. 6.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 461, fig. 1767.

Holocystis alternata Haeckel, Amphorideen u. Cystoideen, Leipzig, 1896, pl. 2, fig. 28.

Niagaran (Racine): Racine, Wisconsin.

Holocystites amplus Miller.

Holocystites amplus Miller, 18th Rep. Dep. Geol. Nat. Res., Indiana, 1894, p. 262, pl. 2, fig. 1. (Adv. sheets, 1892, p. 8, pl. 2, fig. 1.)

Clinton (Osgood): Near Madison, Indiana.

Holocystites asper Miller and Gurley.

Holocystites asper Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 7, 1895, p. 84, pl. 5, figs. 1, 2.

Clinton (Osgood): Near Madison, Indiana.

Holocystites baculus Miller.

Holocystites baculus Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 105, pl. 10, figs. 5, 5a.

Clinton (Osgood): Ripley County, Indiana.

Holocystites benedicti Miller.

Holocystites benedicti Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 627, pl. 5, fig. 3. (Adv. sheets, 1891.)

Clinton (Osgood): Jefferson County, Indiana.

Holocystites brauni Miller.

Holocystites brauni Miller, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 130.

Clinton (Osgood): Jefferson County, Indiana.

Holocystites canneus Miller.

Holocystites canneus Miller, N. A. Geol. Pal., 1889, p. 253, figs. 332, 333.

Clinton (Osgood): Jefferson County, Indiana.

Holocystites collettl Miller.

Holocystites colletti Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 626, pl. 4, fig. 3. (Adv. sheets, 1891, p. 16.)

Clinton (Osgood): Jefferson County, Indiana.

Holocystites commodus Miller.

Holocystites commodus Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 624, pl. 3, figs. 1, 2, 5, 6. (Adv. sheets, 1891, p. 14.)

Clinton (Osgood): Jefferson County, Indiana.

Holocystites cylindricus (Hall).

Caryocystites cylindricum Hall, Geol. Surv. Wisconsin, Rep. Progr., 1861, p. 23; Geol. Wisconsin, 1, 1862, p. 69.—Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 91.

Holocystites cylindricus Hall, Adv. Pub., 18th Rep. New York State Cab. Nat. Hist., 1864, p. 7, pl. 1, fig. 7, 8; pl. 3, figs. 4–6; 20th Rep. New York State Cab. Nat. Hist., Doc. Ed., 1868, p. 311, pl. 12, figs. 4–6; pl. 12a, figs. 7–8; rev. ed., 1870, p. 354.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 191, fig.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 461, fig. 1766.

Holocystis cylindrica Haeckel, Amphorideen u. Cystoideen, Leipzig, 1896, p. 60.

Niagaran (Racine): Racine, Wisconsin.

Holocystites dyeri Miller.

Holocystites dyeri Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 108, pl. 10, fig. 3.

Clinton (Osgood): Ripley County, Indiana.

Holocystites elegans Miller.

Holocystites elegans Miller, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 136, pl. 6, figs. 2, 3a.

Clinton (Osgood): Jefferson County, Indiana.

Holocystites faberi Miller.

Holocystites faberi Miller, N. A. Geol. Pal., 1889, p. 254, figs. 334, 335.

Clinton (Osgood): Jefferson County, Indiana.

Holocystites globosus Miller.

Holocystites globosus Miller, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 134, pl. 5, figs. 5, 5a, 5b.

Clinton (Osgood): Jefferson County, Indiana.

Holocystites gorbyi Miller.

Holocystites gorbyi Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 624, pl. 2, figs. 3, 4. (Adv. sheets, 1891, p. 14.)

Clinton (Osgood): Jefferson County, Indiana.

Holocystites gyrinus Miller and Gurley.

Holocystites gyrinus Miller and Gurley, Bull. Illinois State Mus. Nat Hist., 5, 1894, p. 5, pl. 1, figs. 1-3.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 747, fig. 1361.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 72, fig. 42.

Clinton (Osgood): Jefferson County, Indiana.

Holocystites hammelli Miller. See Trematocystis hammelli.

Holocystites indianensis Miller.

Holocystites indianensis Miller, 17th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1892, p. 625, pl. 3, fig. 7. (Adv. sheets, 1891, p. 15.)

Clinton (Osgood): Jefferson County, Indiana.

Holocystites jolietensis Miller.

Holocystites jolietensis Miller, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 223, pl. 9, figs. 1, 1a.

Niagaran (Racine): Joliet, Illinois.

Holocystites madisonensis Miller.

Holocystites madisonensis Miller, 17th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1892, p. 625, pl. 3, figs. 3, 4. (Adv. sheets, 1891, p. 15.)

Clinton (Osgood): Jefferson County, Indiana.

Holocystites ornatissimus Miller.

Holocystites ornatissimus Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 627, pl. 5, figs. 1, 2. (Adv. sheets, 1891, p. 15.)

Clinton (Osgood): Jefferson County, Indiana.

Holocystites ornatus Miller.

Holocystites ornatus Miller, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 132, pl. 5, figs. 3, 3a, 3b.

Clinton (Osgood): Jefferson County, Indiana.

Holocystites ovatus Hall.

Holocystites ovatus Hall, 20th Rep. New York State Cab. Nat. Hist. (extras, 1864), 1868, p. 313, pl. 12 (3), fig. 3; rev. ed., 1870, p. 357, pl. 12, fig. 2.—Chamberlin, Geol. Wisconsin, 1883, 1, p. 191, fig.

Niagaran (Racine): Waukesha, Wisconsin.

Holocystites papulosus Miller.

Holocystites papulosus Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 628, pl. 5, figs. 7, 8 (adv. sheets 1891, p. 18.—Rowley in Greene's Cont. Indiana Pal., 16, 1903, p. 166, pl. 48, figs. 16–18.

Clinton (Osgood): Jefferson County, Indiana.

Holocystites parvulus Miller.

Holocystites parvulus Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 628, pl. 5, fig. 6 (adv. sheets 1891, p. 18).

Clinton (Osgood): Jefferson County, Indiana.

Holocystites parvus Miller.

Holocystites parvus Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 626, pl. 4, figs. 4, 5 (adv. sheets 1891, p. 16).

Clinton (Osgood): Jefferson County, Indiana.

Holocystites perlongus Miller.

Holocystites perlongus Miller, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 132, pl. 5, figs. 4, 4a.

Clinton (Osgood): Ripley County, Indiana.

Holocystites plenus Miller.

Holocystites plenus Miller, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 135, pl. 6, figs. 2, 2a.

Clinton (Osgood): Jefferson County, Indiana.

Holocystites pustulosus Miller.

Holocystites pustulosus Miller, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 134, pl. 6, figs. 1, 1a.

Niagaran (Laurel): Near Waldron, Indiana.

Holocystites rotundus Miller.

Holocystites rotundus Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 107, pl. 9, figs. 3, 3a, 3b.

Clinton (Osgood): Ripley County, Indiana.

Holocystites scitulus Miller.

Holocystites scitulus Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 624, pl. 2, figs. 5, 6 (adv. sheets 1891, p. 14); N. A. Geol. Pal., 2d. App., 1897, p. 747, fig. 1359.

Clinton (Osgood): Jefferson County, Indiana.

Holocystites scutellatus Hall.

Holocystites scutellatus Hall, 20th Rep. New York State Cab. Nat. Hist., 1868 (extras Dec. 1864), p. 314, pl. 12 (3), fig. 1; rev. ed. 1870, p. 357, pl. 12, fig. 1.

Niagaran (Racine): Waukesha, Wisconsin.

Holocystites spangleri Miller.

Holocystites spangleri Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 626, pl. 4, fig. 6 (adv. sheets 1891, p. 16).

Clinton (Osgood): Jefferson County, Indiana.

Holocystites sphæricus Winchell and Marcy.
Holocystites sphæricus Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 111.
Niagaran (Racine): Chicago, Illinois.

Holocystites sphæroidalis Miller and Gurley.
Holocystites sphæroidalis Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 7, 1895, p. 85, pl. 5, figs. 3, 4.
Clinton (Osgood): Near Madison, Indiana.

Holocystites splendens Miller and Gurley.
Holocystites splendens Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 5, 1894, p. 7, pl. 1, figs. 7, 9.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 747, fig. 1360.
Clinton (Osgood): Near Madison, Indiana.

Holocystites subglobosus Miller. See Trematocystis subglobosus.

Holocystites subovatus Miller.
Holocystites subovatus Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 627, pl. 5, figs. 4, 5 (adv. sheets 1891, p. 17); N. A. Geol. Pal., 1st App., 1892, p. 680, fig. 1237.
Clinton (Osgood): Jefferson County, Indiana.

Holocystites subrotundus Miller.
Holocystites subrotundus Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 107, pl. 9, figs. 2, 2a.
Clinton (Osgood): Ripley, Indiana.

Holocystites tumidus Miller.
Holocystites tumidus Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 104, pl. 9, figs. 1, 1a.
Clinton (Osgood): Ripley, Indiana.

Holocystites turbinatus Miller.
Holocystites turbinatus Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1880, p. 259, pl. 15, figs. 7, 7a; N. A. Geol. Pal., 1889, p. 255, fig. 339.
Clinton (Osgood): Ripley County, Indiana.

Holocystites ventricosus Miller.
Holocystites ventricosus Miller, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 108, pl. 10, fig. 4.
Clinton (Osgood): Ripley County, Indiana.

Holocystites wetherbyi Miller.
Holocystites wetherbyi Miller, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 131, pl. 5, figs. 2, 2a, 2b.
Clinton (Osgood): Ripley County, Indiana.

Holocystites winchelli Hall.
Holocystites winchelli Hall, 20th Rep. New York State Cab. Nat. Hist., 1868 (extras, 1864), p. 313, pl. 12 (3), fig. 3; rev. ed., 1870, p. 356, pl. 12, fig. 3.
Niagaran (Racine): Waukesha, Wisconsin.

Holocystites wykoffi Miller.
Holocystites wykoffi Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 625, pl. 4, figs. 1, 2 (Adv. sheets, 1891, p. 15).
Clinton (Osgood): Jefferson County, Indiana.

HOLOGRAPTUS Holm. Genotype: H. expansum Holm.

Holograptus Holm, Ofver. K. Vet. Akad. Forhandl. 38, No. 9, 1881, p. 45.—Hermann, Geol. Mag., dec. 3, 3, 1886, p. 20.—Wiman, Bull. Geol. Inst. Univ. Upsala, 2, pt. 2, No. 4, 1896, p. 265.—Elles and Wood, Mon. British Grapt., Pal. Soc., 1902, p. 74.

Rouvilligraptus Barrois, Ann. Soc. Geol. du Nord, 21, Lille, 1893, p. 109.

Holograptus richardsoni (Hall).

Graptolithus Richardsoni Hall, Geol. Surv. Canada, dec. 2, 1865, p. 107, pl. 12, figs. 1–8.

Graptolithus (Monoprion) richardsoni Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 226, pl. 3, fig. 30; rev. ed. (1870), p. 261, pl. 3, fig. 30; p. 223.

Holograptus? richardsoni Gurley, Jour. Geol., 4, 1896, p. 99 (gen. ref.).

Rouvilligraptus Richardsoni Barrois, Ann. Soc. Geol. du Nord., 21, Lille, 1893, p. 109, pls. 3, 4.

Clonograptus Richardsoni Elles and Wood, Mon. British Grapt., Pal. Soc., 1903, p. 51 (gen. ref.).

Canadian (Levis, Clonograptus zone): Three miles above River Ste. Anne, Quebec.

HOLOMETOPUS Angelin. Genotype: H. limbatus Angelin.

Holometopus Angelin, Pal. Scandinavica, 3d ed., Holmiae, 1878, p. 58.—Zittel, Handb. Pal., 2, 1885, p. 602.—Miller, N. A. Geol. Pal., 1889, p. 550.—Pompeckj, Beit. Phys.-Oekon. Gesell., Konigsberg, 1890, p. 86.—Beecher, Amer. Jour. Sci., 4th ser., 3, 1897, p. 182.

Holometopus angelini Billings.

Holometopus Angelini Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 95, fig. 85a, b; p. 281.—Miller, N. A. Geol. Pal., 1889, p. 550, fig. 1013.

Canadian: Point Levis, Quebec (Levis, Diplograptus dentatus zone); Table Head, Pistolet Bay, four miles north Portland Creek and Cow Head, Newfoundland (Quebec, N. P.).

HOLOPEA Hall. Genotype: H. symmetrica Hall

Holopea Hall, Pal. New York, 1, 1847, p. 169.—Salter, Mem. Geol. Surv. Great Britain, 3, 1866, p. 346; ibid., 2d ed., 1881, p. 553; Cat. Camb. and Sil. Foss., 1873, p. 69.—Nicholson, Rep. Pal. Prov. Ontario, pt. 1, 1874, p. 119.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 19, No. 6, 1881, p. 187.—Zittel, Handb. Pal., 2, 1882, p. 188.—Miller, N. A. Geol. Pal., 1889, p. 405.—Koken, Neues Jahrb. f. Min., Geol. Pal., 6, Beilage-Band, 1889, p. 423; Die Leitfossilien, Leipzig, 1896, p. 400; Bull. de l'Acad. Imp. Sci. St. Petersburg, 7, 1897, p. 193.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1064.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 949.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 676.

HOLOPEA Whitfield (part). See Plethospira Ulrich.

Holopea ampla Ulrich and Scofield.

Holopea ampla Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1065, pl. 79, figs. 22–25.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 676, fig. 941.

Black River (Platteville): Cannon Falls, Minnesota; Mineral Point and Beloit, Wisconsin.

Cotype.—Cat. No. 45837, U.S.N.M.

Holopea antiqua (Vanuxem).

Littorina antiqua Vanuxem, Nat. Hist. New York, Geol., 3, 1842, p. 112, fig. 4.—Hall, ibid., 4, 1843, p. 142, fig. 4; tab. ill. 26, fig. 4.—Mather, ibid., 1, 1843, p. 349, fig. 4.—Owen, Amer. Jour. Sci. Arts, 2d ser., 1, 1846, p. 47, fig. 4.—Emmons, Man. Geol., 1860, p. 133, fig. 102.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, p. 58, pl. 9, fig. 4.

Holopea antiqua Hall, Pal. New York, 3, 1859, p. 294, pl. 54, figs. 2a–b, 3a–b.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 283, fig.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 264, pl. 24, figs. 15, 16.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 677, fig. 944.

Manlius or Keyser: Schoharie, Litchfield, etc., New York; New Jersey.

Holopea antiqua pervetusta Hall.

Holopea antiqua var. pervetusta Hall, Pal. New York, 3, 1859, p. 295, pl. 54, figs. 4, 5.—Grabau, Michigan, Geol. Surv., Geol. Ser., 1, 1909, p. 178, pl. 28, figs. 4–5.

Holopea pervetusta Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 677, fig. 945.

Helderbergian (Manlius or Keyser): New York.

Upper Monroan (Amherstburg): Detroit River region, Michigan.

Holopea appressa Ulrich and Scofield.

Holopea appressa Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1065, pl. 79, figs. 7–10.

Trenton: Goodhue County, Minnesota (Prosser); Burgin, Kentucky.

Cotypes.—Cat. No. 45838, U.S.N.M.

Holopea arctica Schuchert.

Holopea arctica Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 168, pl. 12, figs. 14–16.

Mohawkian: Head of Frobisher Bay, Baffin Land.

Cotypes.—Cat. No. 28190, U.S.N.M.

HOLOPEA ARENARIA Whitfield. See Plethospira arenaria.

HOLOPEA CASSINA Whitfield. See Plethospira cassina.

Holopea chicagoensis Winchell and Marcy.

Holopea chicagoensis Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 99, pl. 2, fig. 18.

Niagaran (Racine): Chicago, Illinois.

Holopea concinnula Ulrich and Scofield.

Holopea concinnula Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1066, pl. 79, fig. 6.

Black River (Platteville): Beloit, Wisconsin.

Plastotype.—Cat. No. 46531, U.S.N.M.

Holopea conoidea (Hall).

Murchisonia? conoidea Hall, Pal. New York, 2, 1852, p. 13, pl. 4, fig. 7.

Holopea conoidea Whitfield and Hovey, Bull. Amer. Mus. Nat. Hist., 11, pt. 2, 1899, p. 164 (gen ref.).

Upper Medinan: Lockport, New York.

Holopea dilucula (Hall).

Turbo dilucula Hall, Pal. New York, 1, 1847, p. 12, pl. 3, fig. 7.—Cleland, Bull. Amer. Pal., 4, 1903, p. 14.

Holopea dilucula Miller, N. A. Geol. Pal., 1889, p. 405, fig. 678.

Ozarkian (Little Falls): Little Falls, etc., New York.

Holopea? elongata Hall.

Holopea? elongata Hall, Pal. New York, 3, 1859, p. 295, pl. 54, figs. 6, 7.

Cayugan (Manlius): Schoharie, Manlius, etc., New York.

Holopea excelsa Ulrich and Scofield.

Holopea excelsa Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1067, pl. 79, figs. 11 and 12.

Trenton (Prosser): Wykoff, Sumner, and Hader, Minnesota.

Cotypes.—Cat. No. 45839, U.S.N.M.

Holopea gracia Billings.

Holopea Gracia Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 159 (adv. sheets, 1862).—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 72, pl. 3, fig. 17; Quart. Jour. Geol. Soc. London, 31, 1875, p. 549, pl. 26, fig. 17.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 18, pl. 3, fig. 4; ibid., 3, pt. 2, 1895, p. 95, pl. 14, fig. 3.

Niagaran (Guelph): Galt, Ontario.

Holopea grandis Calvin.

Holopea grandis Calvin, Bull. Lab. Nat. Hist. State Univ. Iowa, 1, 1890, p. 177, pl. 3, figs. 1a–b.

Niagaran: Monmouth, Iowa.

Holopea guelphensis Billings.

Holopea Guelphensis Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 343, fig. 351; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 159 (adv. sheets, 1862), fig. 143.—Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 343, pl. 15 (6), fig. 18 (extras, 1865); rev. ed., 1870, p. 391, pl. 15, fig. 18.—Nicholson, Quart. Jour. Geol. Soc. London, 31, 1875, p. 549, pl. 26, fig. 18; Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 72, pl. 3, fig. 18.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 193, fig.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 95.

Niagaran (Guelph): Galt, etc., Ontario; Wisconsin.

Holopea harmonia Billings.

Holopea harmonia Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 168, fig. 142 (adv. sheets, 1862).—Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 342, rev. ed., 1868 (1870), p. 391.—Koken, Neues Jahrb. Min., Geol. Pal., 6, Beilage-Band, 1889, p. 423.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 94.

Niagaran (Guelph): Galt, etc., Ontario; Wisconsin.

Holopea harpa (Hudson).

Straparollina harpa Hudson, Bull. New York State Mus., 80, 1905, p. 292, pl. 5, figs. 4, 5.

Holopea harpa Raymond, Ann. Carnegie Mus., 4, 1908, p. 212, pl. 53, fig. 13; pl. 55, figs. 16, 17.

Chazyan (Valcour): Valcour Island, New York.

Holopea hubbardi Miller.

Holopea hubbardi Miller, N. A. Geol. Pal., 1st App., 1892, p. 694, fig. 1255; 18th Ann. Rep. Indiana Dep. Geol. Nat. Res., p. 318, pl. 9, figs. 39, 40 (adv. sheets 1892).—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res., Indiana, 1908, p. 964, pl. 40, figs. 11, 11a.

Richmond (Whitewater-Saluda): Madison, Indiana.

Holopea hudsoni Raymond. See Trochonema hudsoni.

Holopea incerta Foerste.

Holopea incerta Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 139, pl. 1, fig. 4.

Trenton (Upper): Near Rogers Gap, Kentucky.

Holopea insignis Ulrich and Scofield.

Holopea insignis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1065, pl. 79, figs. 1–5.

Black River: Minneapolis, Cannon Falls, and Faribault, Minnesota (Platteville); Lincoln County, Missouri (Auburn).

Cotypes.—Cat. Nos. 45840, 45841, U.S.N.M.

Holopea lavinia Billings.

Holopea Lavinia Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 28 (adv. sheets 1862).

Trenton: Township of Admaston, Canada.

Holopea leiosoma Billings.

Holopea leiosoma Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 187, fig. 168.

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

Holopea magniventra Whitfield.

Holopea magniventra Whitfield, Ann. Rep. for 1877, Wisconsin Geol. Surv., 1878, p. 83; Geol. Wisconsin, 4, 1882, p. 316, pl. 24, figs. 2, 3.

Niagaran (Guelph): Carlton, Wisconsin.

Holopea mediocris (Billings).

Cyclonema mediocris Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 56.

Anticostian (Jupiter River): Four miles west of Southwest Point, Anticosti.

Holopea microclathrata Hudson. See Gyronema microclathratum.

Holopea minuta Savage.

Holopea minuta Savage, Bull. Geol. Surv., Illinois, 23, 1913, p. 102, pl. 5, fig. 30.

Upper Mediñan (Edgewood): Near Edgewood, Missouri.

Holopea nana Meek. See Cyclora minuta.

Holopea nashvillensis Ulrich.

Holopea nashvillensis Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1068.

Trenton (Catheys): Nashville, Tennessee.

Holotype.—Cat. No. 45842, U.S.N.M.

Holopea nereis Billings.

Holopea Nereis Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 27 (adv. sheets 1862).

Black River (Leray): Pauquettes Rapids, Ottawa River, near L'Original, Ottawa, and Island of Montreal, Canada.

Holopea niagarensis Winchell and Marcy.

Holopea niagarensis Winchell and Marcy, Mem. Boston, Soc. Nat. Hist., 1, 1865, p. 99, pl. 2, fig. 17.

Niagaran (Racine): Chicago, Illinois.

Holopea obesa Whitfield. See Sinuopea obesa.

Holopea obliqua Hall.

Holopea obliqua Hall, Pal. New York, 1, 1847, p. 170, pl. 37, figs. 2a–d.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 283, fig.

Holopea obliqua—Continued.

Holopea cf. obliqua Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 74, pl. 3, fig. 5.

Turbo obliquus Emmons, Amer. Geology, 1, pt. 2, 1855, p. 158, pl. 5, fig. 8; Man. Geol., 1860, p. 98, fig. 87.

Trenton: Middleville and Watertown, New York.

?St. Peter sandstone; Minnesota.

Holopea obscura (Hall).

Turbo? obscura Hall, Pal. New York, 1, 1847, p. 12, pl. 3, fig. 8 (sup. 315).

Holopea obscura Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 537 (gen. ref.).

Canadian (Beekmantown): Fort Plain, New York.

Holopea obsoleta (Hall).

Cyclonema? obsoleta Hall, Pal. New York, 2, 1852, p. 90, pl. 28, figs. 3a, b.

Holopea obsoleta Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 348 (gen. ref.).

Lower Clinton: Medina and Lockport, New York.

Holopea obsoleta elevata Foerste.

Holopea obsoleta var. elevata Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 290, pl. 6, fig. 17.

Clinton: Cumberland Gap, Tennessee.

Holopea? occidentalis Nicholson.

Holopea? occidentalis Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 85, fig.; Quart. Jour. Geol. Soc. London, 31, 1875, p. 550, 551, fig.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 95.

Niagaran (Guelph): Elora, Ontario.

Holopea ophelia Billings.

Holopea Ophelia Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 222, fig. 204.

Chazyan (Quebec-L): Point Rich, Newfoundland.

Holopea ovalis Billings.

Holopea ovalis Billings, Canadian Nat. Geol., 4, 1859, p. 351, fig. 2.

Canadian (Beekmantown): Second Concession of Godmanchester, Canada.

Holopea oxfordensis Ulrich.

Holopea oxfordensis Ulrich, Geol. Minnesota, 3, 1897, pt. 2, p. 1068.

Richmond (Whitewater): Oxford, Ohio.

Cotypes.—Cat. Nos. 45843, 45844, U.S.N.M.

Holopea paludiniformis Hall.

Holopea paludiniformis Hall, Pal. New York, 1, 1847, p. 171, pl. 37, figs. 3a, 3b.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 3, fig. 2.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 284, figs.—Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 75.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1067.—Ruedemann, Bull. New York State Mus., 49, 1901, p. 35.

Turbo americanus D'Orbigny, Prodr. de Pal., 1, 1849, p. 6.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 158, pl. 6, fig. 20.

Trenton: Watertown, New York; near Cannon Falls, Minnesota (Prosser).

?St. Peter sandstone; Minnesota.

Holopea parvula Ulrich.

Holopea parvula Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1067, pl. 79, fig. 19.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 187, pl. 12, fig. 30.

Trenton: Near Burgin, Kentucky (Flanagan); Jacksonburg, New Jersey.

Holotype.—Cat. No. 45845, U.S.N.M.

Holopea perundosa Sardeson. See Holopea pyrene.

Holopea pervetusta Grabau and Shimer. See Holopea antiqua pervetusta.

Holopea? plauta Raymond.

Holopea? plauta Raymond, Ann. Carnegie Mus., 3, 1906, p. 577; ibid., 4, 1908, p. 214, pl. 54, fig. 9.

Chazyan (Crown Point): Valcour Island and Chazy, New York.

Holopea proserpina Billings.

Holopea Proserpina Billings, Pal. Foss., 1 Geol. Surv. Canada, 1865, p. 28. (Adv. sheets, 1862.)

Canadian (Beekmantown): Phillipsburg, Quebec.

Holopea pyrene Billings.

Holopea Pyrene Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 145, fig. 91; Pal. Foss., 1, Geol. Surv. Canada, p. 27, fig. 26. (Adv. sheets, 1862.)—Koken, Neues Jahrb. f. Min., Geol. Pal., 6, Beilage-Band, 1889, p. 423.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1067, pl. 79, figs. 13–18.—Grabau, Amer. Nat., 36, 1902, p. 925.

Holopea(?) perundosa Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, 1892, p. 336, pl. 6, figs. 12, 13; p. 343.

Black River (Leray): Pauquettes Rapids, Ottawa River, Canada.

Trenton (Prosser): Near Cannon Falls, Minnesota.

Plesiotypes.—Cat. No. 45846, U.S.N.M.

Holopea? raymondia Cleland.

Holopea(?) raymondia Cleland, Bull. Amer. Pal., 4, 1903, p. 15, pl. 3, figs. 13, 14.

Ozarkian (Little Falls): Little Falls, New York.

Holopea reversa Hall.

Holopea reversa Hall, Canadian Nat. Geol., 5, 1860, p. 154, fig. 14.

Silurian: Arisaig, Nova Scotia.

Holopea rotunda Ulrich and Scofield.

Holopea rotunda Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1066, pl. 79, figs. 20, 21.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 676, fig. 942.

Black River (Platteville): Dixon, Illinois.

Trenton: Hartsville, Tennessee.

Cotypes.—Cat. Nos. 45847, 45848, U.S.N.M.

Holopea scrutator Raymond.

Holopea scrutator Raymond, Amer. Jour. Sci., 4th ser., 20, 1905, p. 379; Ann. Carnegie Mus., 4, 1908, p. 212, pl. 54, figs. 7, 8.

Chazyan: Valcour Island and Chazy, New York (Day Point, Crown Point); East Tennessee (Lenoir).

Holopea similis Ulrich and Scofield.

Holopea similis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1066, pl. 79, fig. 26.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 676, fig. 942.

Holopea similis—Continued.
Black River (Decorah): Minneapolis and St. Paul, and Goodhue and Fillmore Counties, Minnesota.
Trenton (Prosser): Near Cannon Falls, Minnesota.
?Maysville: Covington, Kentucky.

Holopea subconica Hall.
Holopea subconica Hall, Pal. New York, 3, 1859, p. 294, pl. 54, figs. 1a, 1b.—Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 177.
Cayugan (Manlius): Near Auburn, Cayuga County, New York.
Upper Monroan (Lucas): Salt shaft, Detroit, Michigan.

Holopea supraplana Ulrich and Scofield.
Holopea supraplana Ulrich and Scofield, Geol. Minnesota, 3, 1897, pt. 2, p. 1068, pl. 79, figs. 27, 28.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 187, pl. 12, figs. 31, 32.
Trenton: Kenyon, Minnesota (Prosser); Jacksonburg, New Jersey.
Cotypes.—Cat. No. 45849, U.S.N.M.

Holopea symmetrica Hall.
Holopea symmetrica Hall, Pal. New York, 1, 1847, p. 170, pl. 37, fig. 1.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 186, pl. 12, figs. 26, 27.
Turbo symmetricus Emmons, Amer. Geology, 1, pt. 2, 1855, p. 158, pl. 5, fig. 17.
Trenton: Middleville, New York; Jacksonburg, New Jersey.

HOLOPEA TEXTILIS Grabau and Shimer. See Strophostylus textilis.

HOLOPEA TURGIDA Billings. See Sinuopea turgida.

Holopea ventricosa Hall.
Holopea ventricosa Hall, Pal. New York, 1, 1847, p. 171, pl. 37, figs. 4a, b.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 284, figs.
Turbo ventricosus Emmons, Amer. Geology, 1, pt. 2, 1855, p. 158, pl. 6, fig. 19a, b.
Trenton: Middleville, New York.

Holopea? voluta Cleland.
Holopea(?) voluta Cleland, Bull. Amer. Pal., 4, 1903, p. 14, pl. 3, fig. 12.
Ozarkian (Little Falls): Little Falls, New York.

HOLOPELLA? SUBULATA Foerste. See Hormotoma subulata.

HOMALONOTUS Koenig. Genotype: H. knighti Koenig.
Homalonotus Koenig, Icones Foss. Sectiles, 1825, p. 7.—Murchison, Sil. Syst., 1839, p. 651.—Edwards, Hist. Nat. d. Crust., 3, 1840, p. 314.—Bronn. Neues Jahrb. f. Min., etc., 1840, pp. 445, 451.—Goldfuss, ibid., 1843, pp. 541, 559.—Castelnau, Essai Syst. Sil. l'Amerique Septent, 1843, p. 20.—Burmeister, Org. der. Tril., Berlin, 1843, p. 99.—Emmrich, Neues Jahrb. f. Min., etc., 1845, p. 43.—Hawle and Corda, Abh. d. k. bohmischen Gesell. d. Wiss., 5 (Extract), 1847, p. 89, pl. 5, fig. 51.—McCoy, Ann. Mag. Nat. Hist., 2d ser., 4, 1849, p. 399.—Barrande, Neues Jahrb. f. Min., etc., 1850, p. 778; Syst. Sil. du Centre Boheme, 1, 1852, p. 577, pls. 29, 34.—Roemer, Neues Jahrb. f. Min., etc., 1853, p. 581.—McCoy, British Pal. Rocks Fossils, 1854, p. 167.—Pictet, Traite de Pal., 2d ed., 1854, p. 504.—Chapman, Canadian Jour., n. s., 1, 1856, p. 272; ibid., 8, 1863, p. 32; Expos. Min. Geol. Canada, 1864, p. 140.—Salter, Mon. British Tril., Pal. Soc., 1865, p. 103; Cat. Camb. Sil. Foss., 1873, p. 133.—Angelin, Pal. Scandinavica, 3d ed., 1878, p. 20.—Zittel, Handb. Pal., 2, 1885, p. 604.—Hall and Clarke, Pal. New York, 7, 1888, pp. 23, 24, fig.—Miller, N. A.

HOMALONOTUS—Continued.

Geol. Pal., 1889, p. 550.—Koken, Die Leitfossilien, Leipzig, 1896, p. 23, fig. 14, figs. 4–6.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 312; ibid., 7, 1901, p. 221.—Beecher, Zittel-Eastman Textb. Pal., 1, 1900, p. 635.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 34, No. 8, 1901, p. 57.—Grabau, Bull. New York State Mus., 45, 1901, p. 221.—Woodward, Geol. Mag., dec. 4, 10, 1903, p. 20.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 316.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 724.

Trimerus Green, Tril. North America, 1832, p. 81.—Salter, Mon. British Tril., Pal. Soc., 1865, p. 104.—Zittel, Handb. Pal., 2, 1885, p. 605.—Koken, Die Leitfossilien, Leipzig, 1896, p. 23.—Clarke, Arch. Mus. Nac. Rio de Janeiro, 9, 1890, p. 10, footnote.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 724.

Dipleura Green, Mon. Tril. North America, 1832, p. 78.—Salter, Mon. British Tril., Pal. Soc., 1865, p. 105.—Zittel, Handb. Pal., 2, 1885, p. 605.—Koken, Die Leitfossilien, Leipzig, 1896, p. 23.—Beecher, Amer. Jour. Sci., 4th ser., 3, 1897, p. 105, pl. 3, fig. 27.—Clarke, Arch. Mus. Nac. Rio de Janeiro, 9, 1890, p. 10, footnote.—Raymond, Zittel-Eastman, Textb. Pal., 1913, p. 724.

Brongniartia Eaton, Geol. Textb., 1832, p. 32, pl. 2, fig. 20; Amer. Jour. Sci., 22, 1832, p. 165.—Edwards, Hist. Nat. d. Crust., 3, 1840, p. 346.—Salter, Mon. British Tril., Pal. Soc., 1865, p. 104.—Zittel, Handb. Pal., 3, 1885, p. 605.—Koken, Die Leitfossilien, Leipzig, 1896, p. 23.

Brongniatia Green, Mon. Tril. North America, 1832, p. 90.

HOMALONOTUS ATLAS Castelnau. See Homalonotus delphinocephalus.

Homalonotus? bistrami Hock.

Homalonotus bistrami Hock, Neues Jahrb. Min., Geol. Pal., 34, 1912, p. 249, pl. 8, figs. 19, 20.

Ordovician: Cochabamba, Bolivia.

Homalonotus dawsoni Hall.

Homalonotus dawsoni Hall, Canadian Nat. Geol., 5, 1860, p. 155, fig. 17.—Dawson, Acad. Geol., 2d ed., 1868, p. 606, fig. 214; Canadian Nat. Geol., 5, 1860, p. 298, fig. 1; Acadian Geol., Suppl. Chap., 1860, p. 57, footnote; p. 68, fig. 63; ibid., 2d ed., 1878, p. 77, fig. 14; Geol. Mag., dec. 2, 4, 1877, p. 57, fig. 2.

Silurian (Moydart, Stonehouse): Arisaig, Nova Scotia.

Homalonotus delphinocephalus (Green).

Trimerus delphinocephalus Green, Mon. Tril. North America, 1832, p. 82, pl. 32, fig. 1.—Harlan, Trans. Geol. Soc. Pennsylvania, 1, pt. 1, 1834, p. 105.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 724, fig. 1402.

Brongniartia platycephala Harlan, Trans. Geol. Soc. Pennsylvania, 1, pt. 1, 1834, p. 105.

Homalonotus atlas Castelnau, Ess. Syst. Sil. l'Amer. Sept., 1843, p. 20, pl. 4, fig. 4.

Homalonotus giganteus Castelnau, ibid., p. 20, pl. 3, fig. 1.

Homalonotus herculaneus Castelnau, ibid., p. 20, pl. 4, fig. 5.

Ogygies latissimus Eaton, Amer. Jour. Sci. and Arts, 21, 1832, p. 136.

Homalonotus delphinocephalus Murchison, Sil. Syst., 1839, p. 651.—Hall, Geol. New York, pt. 4, 1843, p. 103, fig. 34, tab. org. rem., 11, fig. 1.—Owen, Amer. Jour. Sci. Arts, 48, 1845, p. 307, pl. 34, p. 311.—Hall, Pal. New York, 2, 1852, p. 104, pl. 31, figs. 5a–b; p. 309, pl. 68, figs. 1–14.—Billings, Canadian Nat., Geol., 1, 1856, p. 320, fig. 10.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 8, fig. 4.—Hall, Trans. Albany Inst., 4, 1863, p. 227.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 319, fig. 339.—Chapman, Canadian Jour., n. s., 8, 1863, p. 32, fig. 148; p. 212, fig. 222; Expos. Min.

Homalonotus delphinocephalus—Continued.

Geol. Canada, 1864, p. 140, fig. 148; p. 184, fig. 222.—Hall, 28th Rep. New York State Mus. Nat. Hist., 1877, doc. ed., pl. 32, figs. 17, 18; mus. ed., 1879, p. 187, pl. 32, figs. 17, 18; 11th Rep. Dep. Geol. Nat. Hist. Indiana, 1882, p. 332, pl. 34, figs. 17, 18.—Miller, N. A. Geol. Pal., 1889, p. 550, fig. 1014.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 288, fig.—Grabau, Bull. Buffalo Soc. Nat. Hist., 7, 1901, p. 221, fig. 153; Bull. New York State Mus. Nat. Hist., 45, 1901, p. 221, fig. 153.—Foerste, Cincinnati Soc. Nat. Hist., Jour. 21, 1909, p. 34, pl. 2, figs. 19a–c.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 317, fig. 1630.

Upper Clinton: Niagara County, etc., New York; Pennsylvania; Maryland; Ontario (Rochester); Lewis County, Kentucky (West Union); ?Waldron, Indiana (Waldron).

Plastotype.—Cat. No. 4910, U.S.N.M.

HOMALONOTUS GIGANTEUS Castelnau. See Homalonotus delphinocephalus.

HOMALONOTUS HERCULANEUS Castelnau. See Homalonotus delphinocephalus.

Homalonotus linares Salter.

Homalonotus Linares Salter, Quart. Jour. Geol. Soc. London, 17, 1861, p. 66, pl. 5, figs. 1, 2.

Silurian: Mount Illampu, Bolivia.

Homalonotus trentonensis Simpson.

Homalonotus trentonensis Simpson, Trans. Amer. Phil. Soc., n. s., 16, 1890, p. 460, fig. 31.

Brongniartia trentonensis Collie, Bull. Geol. Soc. Amer., 14, 1903, p. 418, pl. 59, figs. 1, 2.

Trenton: Reedsville, Bellefonte, etc., Pennsylvania.

HOMOCRINUS Hall. Genotype: H. parvus Hall.

Homocrinus Hall, Pal. New York, 2, 1852, p. 185; ibid., 3, for 1859, 1861, p. 102.—Meek and Worthen, Geol. Surv. Illinois, 2, 1866, p. 182.—Zittel, Handb. Pal., 1, 1879, p. 361.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, pp. 285, 300 (Rev. Pal., pt. 1, pp. 62, 77); ibid., 1886, p. 115; ibid., 1890, p. 380; Amer. Jour. Sci., 3d ser., 26, 1883, p. 376, fig. 6.—Miller, N. A. Geol. Pal., 1889, p. 255.—Bather, Ann. Mag. Nat. Hist., 6th ser., 5, 1890, p. 324, pl. 14, fig. 16; Kongl. Sv. Vet. Akad. Handl., 25, No. 2, 1893, p. 101; Geol. Mag., dec. 4, 6, 1899, p. 33, fig. 7; Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 179, fig.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 155.—Zittel, Grundzuge Pal., 1, 1910, p. 152.—Slocom, Field Columbian Mus., 2, Geol. Ser., 1908, p. 289, fig. 7.—Kirk, Proc. U. S. Nat. Mus., 46, 1914, p. 473.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 217.

HOMOCRINUS? ÆMULUS Wachsmuth and Springer. See Cyathocrinus? æmulus.

HOMOCRINUS ALTERNATUS Hall. See Dendrocrinus alternatus.

Homocrinus ancilla (Hall).

Dendrocrinus ancilla Hall, Trans. Albany Inst., 10, 1883, p. 65 (adv. sheets, 1879, p. 9); 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 271, pl. 15, fig. 19.

Homocrinus ancilla Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 144 (Rev. Pal., pt. 3, sec. 2, p. 220).—Slocom, Field Columbian Mus., 2, 1908, p. 289, pl. 85, figs. 9–11.

Niagaran: Waldron, Indiana (Waldron); near Lemont, Illinois (Racine).

HOMOCRINUS ANGUSTATUS Meek and Worthen. See Dendrocrinus angustatus.

HOMOCRINUS CONSTRICTUS Hall. See Ohiocrinus constrictus.

Homocrinus cylindricus Hall.

Homocrinus cylindricus Hall, Pal. New York, 2, 1852, p. 186, pl. 41, figs. 2a–c, 3a–c.—Slocom, Field Columbian Mus., 2, Geol. Ser., 1908, p. 291, pl. 84, figs. 14, 15.

Niagaran: Lockport, New York (Rochester); near Lemont, Illinois (Racine).

HOMOCRINUS GRACILIS Hall. See Dendrocrinus gracilis.

HOMOCRINUS LAXUS Hall. See Ohiocrinus laxus.

HOMOCRINUS NUCLEUS Wachsmuth and Springer. See Botryocrinus nucleus.

Homocrinus parvus Hall.

Homocrinus parvus Hall, Pal. New York, 2, 1852, p. 185, pl. 41, figs. 1a–f.—Kirk, Proc. U. S. Nat. Mus., 46, 1914, p. 474, pl. 42, figs.1–8.

Clinton (Rochester): Lockport, New York.

HOMOCRINUS POLYDACTYLUS Shumard. See Cupulocrinus polydactylus.

HOMOCRINUS POLYXO Wachsmuth and Springer. See Botryocrinus polyxo.

HOMOCRINUS SCOPARIUS Hall. See Lasiocrinus scoparius.

HOMOCYSTIS Carpenter. See Cheirocrinus Eichwald.

HOMOCYSTITES Barrande. See Cheirocrinus Eichwald.

HOMŒOSPIRA Hall and Clarke. Genotype: Rhynchospira evax Hall.

Homœospira Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 112; 13th Ann. Rep. New York State Geol., 1895, p. 792.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 337; 2d ed., 1913, p. 414.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 200; Bull. New York State Mus., 45, 1901, p. 200.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 344.

Homœospira apriniformis Hall.

Atrypa aprinis Hall (not Verneuil), Pal. New York, 2, 1852, p. 280, pl. 57, fig. 7.

Rhynchospira? aprinis Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 77.

Rhynchospira apriniformis Hall, Pal. New York, 3, 1859, p. 485.

Rhynchonella aprinis Miller, N. A. Geol. Pal., 1889, p. 367.

Homœospira apriniformis Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 111, pl. 83, figs. 24, 25.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 200, fig. 121; Bull. New York State Mus., 45, 1901, p. 200, fig. 121.

Clinton (Rochester): Lockport, New York.

Homœospira beecheri Foerste.

Homœospira beecheri Foerste, Jour. Geol., 11, 1903, p. 709; Bull. Sci. Lab. Denison Univ., 14, 1909, p. 90, pl. 1, figs. 8A, B.

Niagaran (Brownsport): Brownsport Furnace, Decatur County, Tennessee.

Homœospira evax (Hall).

Rhynchospira evax Hall, Trans. Albany Inst., 4, 1863, p. 213.

Retzia evax Hall, 28th Rep. New York State Mus. Nat. Hist., 1879, p. 160, pl. 25, figs. 13–21; 11th Rep. State Geol. Indiana, 1882, p. 302, pl. 25, figs. 13–21.—Beecher and Clarke, Mem. New York State Mus., 1, 1889, p. 55, pl. 5, figs. 1–9.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 863, figs.—Miller, N. A. Geol. Pal., 1889, p. 366, fig. 604.

Homœospira evax—Continued.

Homœospira evax Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 112, pl. 50, figs. 15–20 (?32–35).

Homeospira (Retzia) evax Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 344, fig. 441.

Niagaran (Waldron): Waldron, etc., Indiana; Newsom, Tennessee.

Homœospira fiscellostriata Savage.

Homœospira fiscellostriata Savage, Bull. Geol. Surv., Illinois, 23, 1913, p. 87, pl. 4, figs. 23, 24.

Upper Medinan (Edgewood): Louisiana, Missouri.

Homœospira immatura Savage.

Homœospira immatura Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 51, pl. 1, figs. 16–18.

Upper Medinan (Girardeau): Near Thebes, Illinois.

Homœospira pisum Foerste.

Homœospira pisum Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 90, pl. 1, fig. 7.

Niagaran (Brownsport): Bath Springs, Tennessee.

Homœospira schucherti Foerste.

Homœospira schucherti Foerste, Jour. Geol., 11, 1903, p. 709; Bull. Sci. Lab. Denison Univ., 14, 1909, p. 89, pl. 1, fig. 10A, B.

Niagaran (Brownsport): Brownsport Furnace, etc., Tennessee.

Homœospira schucherti elongata Foerste.

Homœospira schucherti-elongata Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 89, pl. 1, fig. 9A, B.

Niagaran (Brownsport): Bath Springs, Tennessee.

Homœospira sobrina (Beecher and Clarke).

Retzia sobrina Beecher and Clarke, Mem. New York State Mus., 1, 1889, p. 61, pl. 5, figs. 10–16.

Homœospira sobrina Hall and Clarke, Pal. New York, 8 pt. 2, 1893, p. 112, pl. 50, figs. 26–28.

Niagaran (Waldron): Waldron, Indiana.

Homœospira subcircularis Savage.

Homœospira subcircularis Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 88, pl. 4, figs. 26, 27.

Upper Medinan (Edgewood-Noix): Near Louisiana, Missouri.

HOMOTRYPA Ulrich. Genotype: H. curvata Ulrich.

Homotrypa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 240.—Foord, Contr. Micro-Pal. Cambro-Sil., 1883, p. 9.—Miller, N. A. Geol. Pal., 1889, p. 309.—Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 370, 409.—Rominger, Amer. Geol., 6, 1890, p. 119.—Ulrich, Geol. Minnesota, 3, 1893, p. 235; Zittel's Textb. Pal., (Engl. ed.), 1896, p. 273.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 575.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 29.—Bassler, Proc. U. S. Nat. Mus., 26, 1903, pp. 565, 566.—Grabau and Shimer, N. A. Index Fossils, 1, p. 128.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 748.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 184, 185; Zittel-Eastman Textb. Pal., 1913, p. 332, fig. 475.

Homotrypa alta Cumings and Galloway.

Homotrypa alta Cumings and Galloway, 37th Ann. Rep. Dep. Geol. and Nat. Res. Indiana, 1913, p. 77, pl. 9, figs. 1–1c; pl. 10, figs. 1–1c.

Maysville (Mount Hope-Fairmount): Big Four Railroad, near Guilford, Indiana.

Homotrypa? arbuscula Ulrich.

Homotrypa arbuscula Ulrich, Geol. Surv. Illinois, 8, 1890, p. 409, pl. 38, figs. 3–3c.—Keyes, Missouri Geol. Surv., 5, 1894, p. 13.

Black River: High Bridge, Kentucky (Lowville); Calhoun County and Dixon, Illinois (Platteville).

Cotypes.—Cat. Nos. 43304, 43305, U.S.N.M.

Homotrypa austini Bassler.

Homotrypa austini Bassler, Proc. U. S. Nat. Mus., 26, 1903, p. 584, pl. 24, figs. 5–9.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 838, pl. 16, figs. 7–7b; pl. 29, figs. 11, 11a.

Richmond (Whitewater): Near Wilmington, Ohio.

Cotypes.—Cat. No. 41762, U.S.N.M.

Homotrypa bassleri Nickles.

Homotrypa bassleri Nickles, Jour. Cincinnati Soc. Nat. Hist., 20, 1902, p. 103, 104, fig. 1–5.—Bassler, Proc. U. S. Nat. Mus., 26, 1903, p. 578.

Richmond (Arnheim): Lebanon, Oregonia, etc., Ohio.

Homotrypa callosa Ulrich.

Homotrypa callosa Ulrich, Geol. Minnesota, 3, 1893, p. 243, pl. 20, figs. 15–21.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, figs. 139, 140 (p. 576).

Trenton: Burgin and Frankfort, Kentucky (Wilmore); Cannon Falls, Minnesota (Prosser).

Cotypes.—Cat. Nos. 43578, 43579, U.S.N.M.

Homotrypa cincinnatiensis Bassler.

Homotrypa cincinnatiensis Bassler, Proc. U. S. Nat. Mus., 26, 1903, p. 576, pl. 21, figs. 4–10.

Maysville (Fairmount): Cincinnati, Ohio, and vicinity; Maysville and McKinney, Kentucky.

Cotypes.—Cat. No. 41744, U.S.N.M.

Homotrypa communis Bassler.

Homotrypa communis Bassler, Proc. U. S. Nat. Mus., 26, 1903, p. 581, pl. 23, figs. 1–4.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 839, pl. 17, figs. 1–1d; pl. 29, fig. 12.

Richmond (Waynesville): Oregonia, Waynesville, etc., Ohio; Indiana; Kentucky.

Cotypes.—Cat. No. 41755, U.S.N.M.

Homotrypa? confluens (Foerste).

Monotrypella confluens Foerste, Bull. Sci. Lab. Denison Univ., 2, 1887, p. 172; ibid., 3, 1888, pl. 16, fig. 4.

Homotrypa confluens Foerste, Geol. Surv. Ohio, 7, 1895, p. 600.

Upper Medinan (Brassfield): Dayton, Ohio.

Homotrypa constellariformis Cumings. See Homotrypa ramulosa.

Homotrypa curvata Ulrich.

Homotrypa curvata Ulrich, Jour Cincinnati Soc. Nat. Hist., 5, 1882, p. 242, pl. 10, figs. 7–7d.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, figs. 137, 138 (p. 576).—Bassler, Proc. U. S. Nat. Mus., 26, 1903, p. 575.—

Homotrypa curvata—Continued.

Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 129.—Cumings, 32d Ann. Rep. Dept. Geol. Nat. Res. Indiana, 1908, p. 840, pl. 17, figs. 3–3b; pl. 29, fig. 13.

Monticulipora curvata J. F. James, Jour. Cincinnati Soc. Nat. Hist., 18, 1895, p. 71.

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

Cotypes.—Cat. No. 41729, U.S.N.M.

Homotrypa curvata præcipta Bassler.

Homotrypa curvata var. præcipta Bassler, Proc. U. S. Nat. Mus., 26, 1903, p. 575, pl. 23, fig. 15.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, p. 841, pl. 18, fig. 4; pl. 30, fig. 7, 7a.

Eden (Southgate): West Covington, Kentucky.

Holotype.—Cat. No. 41735, U.S.N.M.

Homotrypa cylindrica Bassler.

Homotrypa cylindrica Bassler, Proc. U. S. Nat. Mus., 26, 1903, p. 585, pl. 22, figs. 8–13.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 842, pl. 17, figs. 4, 4a; pl. 29, fig. 14.

Richmond (Whitewater): Richmond and Versailles, Indiana; Oxford, Ohio.

Cotypes.—Cat. No. 41758, U.S.N.M.

Homotrypa dawsoni (Nicholson).

Monticulipora (Heterotrypa) Dawsoni Nicholson, Genus Monticulipora, 1881, p. 141, pl. 5, figs. 3–3f.

Monticulipora dawsoni Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 241.—James and James, ibid., 11, 1888, p. 15.—J. F. James, ibid., 18, 1895, p. 68.

Homotrypa dawsoni Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 291.—Bassler, Proc. U. S. Nat. Mus., 26, 1903, p. 581, pl. 25, figs. 9, 10.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 842, pl. 17, figs. 5, 5a; pl. 30, fig. 1.

Richmond (Waynesville): Waynesville, Clarksville, etc., Ohio; Versailles, Indiana.

Plesiotypes.—Cat. No. 41749, U.S.N.M.

Homotrypa dumosa Bassler.

Homotrypa dumosa Bassler, Proc. U. S. Nat. Mus., 26, 1903, p. 576, pl. 20, fig. 1; pl. 21, figs. 1–3.

Maysville (Fairmount): Covington, Kentucky, and vicinity.

Cotypes.—Cat. No. 41741, U.S.N.M.

Homotrypa exilis Ulrich.

Homotrypa exilis Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 80; Geol. Minnesota, 3, 1893, p. 236, pl. 19, figs. 10–16.

Black River (Decorah): Minneapolis, Minnesota.

Cotypes.—Cat. No. 43574, U.S.N.M.

Homotrypa flabellaris Ulrich.

Homotrypa flabellaris Ulrich, Geol. Surv. Illinois, 8, 1890, p. 411, pl. 32, figs. 3–3c.—Bassler, Proc. U. S. Nat. Mus., 26, 1903, p. 580.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 129.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 845, pl. 18, figs. 1–1b; pl. 30, fig. 2.

Monticulipora flabellaris J. F. James, Jour. Cincinnati Soc. Nat. Hist., 18, 1895, p. 75.

Maysville (Richmond): Wilmington, Illinois (Fernvale); Ohio; Indiana; Kentucky; Tennessee.

Figured sections of *cotypes.*—Cat. No. 43767, U.S.N.M.

Homotrypa flabellaris frondosa Bassler.

Homotrypa frondosa Cumings (not Chætetes frondosus Edward and Haime, nor Monticulipora frondosa D'Orbigny), Amer. Geol., 29, 1902, p. 208, pl. 10, figs. 11, 12; pl. 11, figs. 2, 5; pl. 12, fig. 1.—Bassler, Proc. U. S. Nat. Mus., 26, 1903, p. 579.

Homotrypa flabellaris var. frondosa Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 846, pl. 18, figs. 3, 3b; pl. 30, fig. 3.

Richmond (Arnheim): Harmans Station, Indiana; Ohio.

Homotrypa flabellaris spinifera Bassler.

Homotrypa flabellaris var. spinifera Bassler, Proc. U. S. Nat. Mus., 26, 1903, p. 580, pl. 21, figs. 11–15.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 847, pl. 18, fig. 2.

Maysville and Richmond: Cincinnati, Ohio, and vicinity (Fairmount); Richmond, Indiana; Oxford, etc., Ohio (Richmond).

Holotype.—Cat. No. 41778, U.S.N.M.

Homotrypa frondosa Cumings. See Homotrypa flabellaris frondosa.

Homotrypa gelasinosa Ulrich.

Homotrypa gelasinosa Ulrich, Geol. Surv. Illinois, 8, 1890, p. 410, pl. 32, figs. 2–2d.—Bassler, Proc. U. S. Nat. Mus., 26, 1903, p. 587.

Monticulipora gelasinosa J. F. James, Jour. Cincinnati Soc. Nat. Hist., 16, 1894, p. 202.

Richmond (Fernvale): Wilmington, Illinois.

Figured sections of *holotype*.—Cat. No. 43768, U.S.N.M.

Homotrypa glabra Cumings and Galloway.

Homotrypa glabra Cumings and Galloway, 37th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1913, p. 78, pl. 11, figs. 1–1d.

Eden (McMicken): Big Four Railroad, near Guilford, Indiana.

Homotrypa grandis Bassler.

Homotrypa grandis Bassler, Proc. U. S. Nat. Mus., 26, 1903, p. 578, pl. 20, figs. 7–10.

Maysville (Leipers): Near Goodlettsville, Davidson County, Tennessee.

Cotypes.—Cat. No. 41764, U.S.N.M.

Homotrypa insignis Ulrich. See Homotrypa subramosa-insignis.

Homotrypa? intercalaris Ulrich.

Homotrypa? intercalaris Ulrich, Geol. Minnesota, 3, 1893, p. 238, fig. 13.

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

Cotypes.—Cat. No. 43577, U.S.N.M.

Homotrypa libana Bassler.

Homotrypa libana Bassler, Proc. U. S. Nat. Mus., 26, 1903, p. 578, pl. 22, figs. 1–3.

Richmond (Arnheim): Lebanon, Ohio.

Holotype.—Cat. No. 34329, U.S.N.M.

Homotrypa minnesotensis Ulrich.

Homotrypa minnesotensis Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 79; Geol. Minnesota, 3, 1893, p. 235, pl. 19, figs. 1–9.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 129.—Sardeson, Jour. Geol., 9, 1901, p. 12.

Black River (Decorah): Minneapolis, St. Paul, Fountain, etc., Minnesota; Decorah, Iowa; Kentucky; Tennessee.

Cotypes.—Cat. Nos. 43571, 43572, U.S.N.M.

Homotrypa minnesotensis montifera Ulrich.

Homotrypa minnesotensis var. montifera Ulrich, Geol. Minnesota, 3, 1893, p. 236, pl. 19, fig. 3a.

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

Holotype.—Cat. No. 43573, U.S.N.M.

Homotrypa nicklesi Bassler.

Homotrypa nicklesi Bassler, Proc. U. S. Nat. Mus., 26, 1903, p. 586, pl. 22, figs. 4–7.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 847, pl. 18, figs. 6, 6a; pl. 30, fig. 4.

Richmond: Raywick, Kentucky.

Cotypes.—Cat. No. 34328, U.S.N.M.

Homotrypa nitida Bassler. See Homotrypa ramulosa.

Homotrypa nodulosa Bassler.

Homotrypa nodulosa Bassler, Proc. U. S. Nat. Mus., 26, 1903, p. 582, pl. 23, figs. 5–11; pl. 25, fig. 15.

Richmond: Hanover, Ohio (Waynesville); Richmond, Indiana (Whitewater).

Cotypes.—Cat. No. 41753, U.S.N.M.

Homotrypa obliqua Ulrich.

Homotrypa obliqua Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 243, pl. 10, figs. 6, 6b.—Miller, N. A. Geol. Pal., 1889, fig. 489 (p. 310).—J. F. James, Jour. Cincinnati Soc. Nat. Hist., 18, 1896, p. 124.—Bassler, Proc. U. S. Nat. Mus., 26, 1903, p. 575, pl. 23, figs. 12–14.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 129.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 848, pl. 19, figs. 1–1b; pl. 30, fig. 6.

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

Holotype and *plesiotypes*.—Cat. Nos. 43671, 41736, U.S.N.M.

Homotrypa pulchra Bassler.

Homotrypa pulchra Bassler, Proc. U. S. Nat. Mus., 26, 1903, p. 577, pl. 20, figs. 11–14.

Maysville (Mount Auburn): Cincinnati, Lebanon, etc., Ohio.

Cotypes.—Cat. No. 41747, U.S.N.M.

Homotrypa ramulosa Bassler.

Homotrypa ramulosa Bassler, Proc. U. S. Nat. Mus., 26, 1903, p. 585, pl. 25, figs. 1–4.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 849, pl. 19, figs. 2–2b; pl. 30, fig. 8.

Homotrypa constellariformis Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 839, pl. 17, figs. 2–2b.

Homotrypa nitida Bassler, Proc. U. S. Nat. Mus., 26, 1903, p. 586, pl. 20, fig. 15; pl. 25, figs. 5–8.—Cumings, 32d Ann. Rep. Dep. Geol. and Nat. Res. Indiana, 1908, p. 848, pl. 18, figs. 5, 5a; pl. 30, figs. 5, 5a.

Richmond (Whitewater): Versailles, Weisburg Station, Osgood, etc., Indiana.

Cotypes.—Cat. Nos. 41771, 41760, U.S.N.M.

Observation.—H. nitida, H. ramulosa, and H. constellariformis have been found to represent the same species, the first being based on the immature branches, the second on the main portions of the zoaria, and the third on the best developed parts.

Homotrypa richmondensis Bassler.

Homotrypa richmondensis Bassler, Proc. U. S. Nat. Mus., 26, 1903, p. 582, pl. 24, figs. 1–4.

Homotrypa richmondensis—Continued.

Richmond (Whitewater): Richmond and Versailles, Indiana; Hanover, Oxford, etc., Ohio.

Cotypes.—Cat. No. 41784, U.S.N.M.

Homotrypa separata Ulrich.

Homotrypa separata Ulrich, Geol. Minnesota, 3, 1893, p. 237, pl. 19, figs. 17–20.—Bassler, Zittel-Eastman Texb. Pal., 1913, p. 332, fig. 477d.

Black River (Decorah): Minneapolis, Chatfield, etc., Minnesota.

Holotype.—Cat. No. 43576, U.S.N.M.

Homotrypa? similis Foord.

Homotrypa similis Foord, Contr. Micro-Pal. Cambro-Sil., 1883, p. 10, pl. 2, figs. 2–2d.—Ulrich, Geol. Minnesota, 3, 1893, p. 242, pl. 20, figs. 28–33.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 185–187.

Trenton: Ottawa, Ontario; St. Paul, Cannon Falls, etc., Minnesota.

Middle Ordovician (Wassalem): Uxnorm, near Reval, Esthonia, Russia.

Plesiotypes.—Cat. Nos. 43575, 57273, U.S.N.M.

Homotrypa solida Nickles and Bassler. See Eridotrypa solida.

Homotrypa spinea Cumings and Galloway.

Homotrypa spinea Cumings and Galloway, 37th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1913, p. 79, pl. 11, figs. 1–1c; pl. 12, figs. 1–1d.

Maysville (Mount Hope-Fairmount): Big Four Railroad, near Guilford, Indiana.

Homotrypa splendens Bassler.

Homotrypa splendens Bassler, Proc. U. S. Nat. Mus., 26, 1903, p. 587, pl. 25, figs. 11–14.

Richmond (Fernvale): Wilmington, Illinois.

Cotypes.—Cat. No. 41761, U.S.N.M.

Homotrypa subramosa Ulrich.

Homotrypa subramosa Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 81; Geol. Minnesota, 3, 1893, p. 239, pl. 19, figs. 21–28.—Ulrich, Zittel's Textb. Pal. (Engl. ed.), fig. 451A–C (not D=Homotrypa separata Ulrich) (p. 273).—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 128, fig. 186c.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 332, fig. 477a–c; Bull. U. S. Nat. Mus., 77, 1911, pp. 187–189, figs. 99, 100.

Black River (Decorah) and Trenton (Prosser): St. Paul, Minneapolis, etc., Minnesota; Decorah, Iowa.

Middle Ordovician (Kuckers): Reval, Esthonia, Russia.

Cotypes and *plesiotypes.*—Cat. Nos., 43570, 57274, U.S.N.M.

Homotrypa subramosa insignis (Ulrich).

Homotrypa insignis Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 82.

Homotrypa subramosa var. insignis Ulrich, Geol. Minnesota, 3, 1893, p. 239.

Trenton (Prosser): St. Paul and Goodhue and Fillmore Counties, Minnesota. Decorah, Iowa.

Cotypes.—Cat. No. 43998, U.S.N.M.

Homotrypa tuberculata Ulrich.

Homotrypa tuberculata Ulrich, Geol. Minnesota, 3, 1893, p. 240, fig. 14.

Black River (Decorah): Cannon Falls, Minnesota.

Cotypes.—Cat. No. 43580, U.S.N.M.

Homotrypa wortheni (James).

Monticulipora (Monotrypa) wortheni James, Paleontologist, no. 6, 1882, p. 50; no. 7 (1883), pl. 1, fig. 2.

Monticulipora wortheni J. F. James, Jour. Cincinnati Soc. Nat. Hist., 16, 1894, p. 207.—James and James, ibid., 10, 1888, p. 184, pl. 11, figs. 3a, b.

Homotrypa wortheni Bassler, Proc. U. S. Nat. Mus., 26, 1903, p. 582, pl. 24, figs. 10–14.—Cumings, 32d Ann. Rept. Dep. Geol. Nat. Res. Indiana, 1908, p. 849, pl. 19, figs. 3, 3c; pl. 30, fig. 9.

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

Plesiotypes.—Cat. No. 41766, U.S.N.M.

Homotrypa wortheni intercellata Bassler.

Homotrypa wortheni var. intercellata Bassler, Proc. U. S. Nat. Mus., 26, 1903, p. 584, pl. 24, fig. 17.

Richmond (Whitewater?): Near Osgood and Versailles, Indiana.

Cotypes.—Cat. No. 41768, U.S.N.M.

Homotrypa wortheni prominens Bassler.

Homotrypa wortheni var. prominens Bassler, Proc. U. S. Nat. Mus., 26, 1903, p. 584, pl. 24, fig. 15, 16.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 851, pl. 30, fig. 10.

Richmond (Elkhorn): Near Richmond, Indiana.

Cotypes.—Cat. No. 41767. U.S.N.M.

HOMOTRYPELLA Ulrich. Genotype: Homotrypella instabilis Ulrich.

Homotrypella Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1888, p. 83.—Miller, N. A. Geol. Pal., 1889, p. 310.—Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 370, 412; Geol. Minnesota, 3, 1893, p. 228.—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.—Ulrich and Bassler, Smiths. Misc. Coll. Quart., 47, 1904, p. 21.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 189; Zittel-Eastman Textb. Pal., 1913, p. 332.

Peronoporella Cumings and Galloway, 37th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1913, p. 81. (Genotype: P. dubia Cumings and Galloway.)

Homotrypella contexta Ulrich.

Homotrypella contexta Ulrich, Geol. Surv. Illinois, 8, 1890, p. 412, pl. 32, figs. 5–5b.

Monticulipora contexta J. F. James, Jour. Cincinnati Soc. Nat. Hist., 18, 1895, p. 74.

Richmond (Fernvale): Wilmington, Illinois.

Fragment of *holotype.*—Cat. No. 43763, U.S.N.M.

Homotrypella dubia (Cumings and Galloway).

Peronoporella dubia Cumings and Galloway, 37th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1913, p. 82, pls. 15, 16, 17.

Maysville (Bellevue) and Richmond (Arnheim): Big Four Railroad, near Harmon Station, Indiana.

HOMOTRYPELLA GRACILIS Ulrich. See Bythopora gracilis.

Homotrypella granulifera (Ulrich).

Chætetes granuliferus Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 128, pl. 12, figs. 9–9b.

Batostomella granulifera Ulrich, ibid., 5, 1882, p. 141.

Homotrypella granulifera Miller, N. A. Geol. Pal., 1889, p. 310.

Homotrypella granulifera—Continued.

Monticulipora (Fistulipora) granulifera J. F. James, Jour. Cincinnati Soc. Nat. Hist., 18, 1896, p. 120.

Trenton (Wilmore): Burgin and Frankfort, Kentucky.

Cotypes.—Cat. No. 43669, U.S.N.M.

Homotrypella hospitalis (Nicholson).

Monticulipora (Prasopora) Selwynii var. hospitalis Nicholson, Genus Monticulipora, 1881, p. 209, fig. 45.

Monticulipora hospitalis James and James, Jour. Cincinnati Soc. Nat. Hist., 11, 1888, p. 26.

Prasopora Selwynii var. hospitalis Nicholson in Steinmann, Neues Jahrb. f. Min., Geol. Pal., 1, 1882, pl. 4, fig. 11.

Prasopora hospitalis Ulrich, Jour. Cincinnati Soc. Nat. Hist., 5, 1882, p. 237.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 371.—Nickles, Bull. Kentucky Geol. Surv., 5, 1905, p. 57, pl. 3, fig. 10.—Bassler, Proc. U. S. Nat. Mus., 30, p. 49, 1906, pl. 7, figs. 1–3.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 871, pl. 23, figs. 1, 1b; pl. 31, fig. 6.

Homotrypella hospitalis Bassler, Bull. U. S. Nat. Mus., 77, 1911, p. 194 (gen. ref.).

Monticulipora (Heterotrypa) winchelli James, Paleontologist, No. 6, 1882, p. 48.

Monticulipora winchelli James, Paleontologist, No. 7, 1883, pl. 1, fig. 5; Jour. Cincinnati Soc. Nat. Hist., 18, 1895, p. 87.

Richmond: A common species in Ohio, Indiana, Illinois, Kentucky, Tennessee, etc.

Homotrypella hospitalis crassa (Ulrich).

Atactoporella crassa Ulrich, Geol. Minnesota, 3, p. 225, pl. 10, figs. 18–21.

Homotrypella hospitalis crassa Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 193–195, figs. 104, 105.

Trenton: St. Paul and Cannon Falls, Minnesota (Prosser); West Covington, Kentucky.

Middle Ordovician (Wassalem): Uxnorm, near Reval, Esthonia, Russia.

Holotype and *plesiotype*.—Cat. Nos. 43501, 57279, U.S.N.M.

Homotrypella instabilis Ulrich.

Homotrypella instabilis Ulrich, 14th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1886, p. 83; Geol. Minnesota, 3, 1893, p. 229, pl. 18, figs. 9–20.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, figs. 168, 169 (p. 586).—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 189–192, figs. 101, 102.

Black River (Decorah): Minneapolis, St. Paul, Cannon Falls, etc., Minnesota.

Middle Ordovician: Near Reval, Esthonia, Russia.

Cotypes and *plesiotypes*.—Cat. Nos. 43561, 57275, U.S.N.M.

Homotrypella meeki Ulrich. See Bythopora meeki.

Homotrypella multiporata Ulrich.

Homotrypella multiporata Ulrich, Geol. Minnesota, 3, 1893, p. 230, pl. 18, figs. 21, 22.

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

Figured sections of *holotype*.—Cat. No. 43559, U.S.N.M.

Homotrypella mundula Ulrich.

Homotrypella mundula Ulrich, Geol. Minnesota, 3, 1893, p. 232, fig. 12a–c.

Trenton (Prosser): Decorah, Iowa; Cannon Falls, Minnesota.

Holotype.—Cat. No. 43560, U.S.N.M.

Homotrypella nodosa Ulrich and Bassler.

Homotrypella nodosa Hayes and Ulrich, U. S. Geol. Surv. Folio 95, 1903, ill. sheet, fig. 14, 15.—Ulrich and Bassler, Smiths. Misc. Coll., Quart., 47, 1904, p. 21, pl. 7, figs. 1–3.

Maysville (Leipers): Columbia, Nashville, etc., Tennessee.

Cotypes.—Cat. No. 43178, U.S.N.M.

Homotrypella norwoodi Nickles.

Homotrypella norwoodi Nickles, Bull. Kentucky Geol. Surv., No. 5, 1905, p. 45, pl. 1, fig. 9–11.

Trenton (Cynthiana?): Near Pleasant Valley, Nicholas County, Kentucky.

Homotrypella? ovata Ulrich.

Homotrypella? ovata Ulrich, Geol. Minnesota, 3, 1893, p. 231, pl. 18, figs. 23–30.

Trenton (Prosser): Cannon Falls and Minneapolis, Minnesota.

Cotypes.—Cat. No. 43562, U.S.N.M.

Homotrypella rustica Ulrich.

Homotrypella rustica Ulrich, Geol. Minnesota, 3, 1893, p. 234, pl. 18, figs. 31–33.

Monticulipora (Fistulipora) rustica J. F. James, Jour. Cincinnati Soc. Nat. Hist., 18, 1896, p. 120.

Homotrypella cf. rustica Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 851, pl. 19, figs. 5, 5a; pl. 21, fig. 4; pl. 30, fig. 11.

Richmond (Maquoketa): Spring Valley, Minnesota.

Figured sections of *holotype*.—Cat. No. 43557, U.S.N.M.

Homotrypella? subgracilis Ulrich. See Bythopora subgracilis.

Horistoma Fischer. See Poleumita Clarke and Ruedemann.

Hormoceras gracile Clarke and Ruedemann. See Actinoceras gracile.

Hormoceras remotiseptum Clarke and Ruedemann. See Actinoceras remotiseptum.

Hormoceras tenuifilum Clarke and Ruedemann. See Actinoceras tenuifilum.

HORMOTOMA Salter.

Genotype: H. salteri Ulrich (=Murchisonia gracilis Salter not Hall).

Murchisonia (part) of authors.

Hormotoma (subgenus of Murchisonia) Salter, Geol. Surv. Canada, Can. Org. Remains, dec. 1, 1859, pp. 18, 22.—Œhlert (subgenus Murchisonia), Extr. Bull. Soc. d'Etud. Sci. d'Angers, 1877, p. 18.—Koken, Neues Jahrb. f. Min., Geol. Pal., 6, Beilage-Bd., 1889, p. 368.—Donald, Quart. Jour. Geol. Soc. London, 51, 1895, p. 211; ibid., 55, 1889, p. 257.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, pp. 959, 1012.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 950.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 648.—Dall, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 525.

Hormotoma? aculeata (Billings).

Loxonema aculeata Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 55.

Anticostian (Gun River, Jupiter River): Near Chaloupe River, Anticosti.

Hormotoma? agilis (Billings).

Murchisonia agilis Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 235.

Hormotoma? agilis Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1014 (gen. ref.).

Canadian (Quebec—G, H): Cape Norman and Table Head, Newfoundland.

Hormotoma anna (Billings).

Murchisonia Anna Billings, Canadian Nat. Geol., 4, 1859, p. 358, figs. 8a–e; Geol. Canada, Geol. Surv. Canada, 1863, p. 119, fig. 32a–f.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 424, figs.

Hormotoma anna Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1014 (gen. ref.).

Canadian: Mingan Islands, Canada.

Hormotoma argylensis (Sardeson).

Murchisonia argylensis Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 97, pl. 5, figs. 11, 12.

Canadian (Shakopee): Near Argyle, Wisconsin; Shakopee and Cannon Falls, Minnesota.

Hormotoma? artemesia (Billings).

Murchisonia Artemesia Billings, Pal. Foss., 1, 1865, Geol. Surv. Canada, p. 345, text fig. 332a, b.

Hormotoma? artemesia Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1013 (gen. ref.).—Bassler, Bull. Virginia Geol. Surv., 29, 1909, pl. 20, figs. 1, 2.

Canadian (Beekmantown): Counties of Leeds and Grenville, Canada; Virginia, etc.

Hormotoma bellicincta (Hall).

Murchisonia bellicincta Hall, Geol. Pal. New York, 1, 1847, p. 179, pl. 39, figs. 1a, b.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 162, pl. 5, figs. 1a, b, 12.—Salter, Quart. Jour. Geol. Soc. London, 15, 1859, p. 380, pl. 13, fig. 11.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 183, fig. 177.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 314.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 18, fig. 7a.—Roemer, Leth. geog., 1, Leth. Pal., Atlas, 1876, pl. 5, fig. 7.—Walcott, Amer. Jour. Sci. Arts, 3d ser., 35, 1888, p. 237, fig. 2.—Koken, Neues Jahrb. f. Min., Geol. Pal., 6, Beilage Bd., 1889, p. 371.—Lesley, Geol. Surv. Pennsylvania, P 4, 1889, p. 426, figs.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 123 (loc. occ.).

Hormotoma bellicincta Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1017, pl. 70, figs. 15–17.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 650, fig. 887a.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, pl. 40, figs. 12, 12a.

Trenton: Watertown, Middleville, Trenton Falls, etc., New York; Goodhue County, Minnesota (Prosser).

Plesiotypes.—Cat. No. 45850, U.S.N.M. (Ulrich and Scofield).

Hormotoma Boylei Donald. See Turritoma boylei.

Hormotoma? cassina (Whitfield).

Murchisonia cassina Whitfield, Bull. Amer. Mus. Nat. Hist., 9, 1897, p. 179, pl. 1, fig. 7.—Seely, Vermont State Geol. Rep., 7, 1910, pl. 59, fig. 7.

Canadian (Beekmantown): Fort Cassin, Vermont.

Hormotoma confusa (Whitfield).

Murchisonia? confusa Whitfield, Bull. Amer. Mus. Nat. Hist., 2, 1889, p. 54, pl. 8, figs. 16–18.—Seely, Vermont State Geol. Rep., 7, 1910, pl. 60, figs. 6, 8.

Canadian (Beekmantown): Shoreham, Vermont.

Hormotoma fasciata Branson.

Hormotoma fasciata Branson, Trans. Acad. Sci. St. Louis, 18, 1909, p. 45, pl. 7, fig. 16.

Black River (Auburn—Decorah): Lincoln County, Missouri.

Hormotoma funata (Billings).

Murchisonia funata Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 55.

Anticostian (Gun River, Jupiter River): The Jumpers, Anticosti.

Hormotoma gigantea (Billings).

Murchisonia gigantea Billings, Geol. Surv. Canada, Rep. Progress for 1853–1856, 1857, p. 298; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 55 (loc. ref.).

Hormotoma gigantea Schuchert and Twenhofel, Bull. Geol. Soc. Amer., 21, 1910, p. 702.

Gamachian (Ellis Bay): Prinsta Bay, Anticosti.

Hormotoma gracilens (Whitfield).

Murchisonia gracilens Whitfield, Bull. Amer. Mus. Nat. Hist., 2, 1889, p. 53, pl. 8, figs. 14, 15.

Hormotoma gracilens Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1014, (gen. ref.).

Canadian (Beekmantown): Beekmantown, New York.

Hormotoma gracilis (Hall).

Murchisonia gracilis Hall, Pal. New York, 1, 1847, p. 181, pl. 39, figs. 4a–c; p. 303, pl. 83, figs. 1a, b.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 162, pl. 17, figs. 9–16; Man. Geol., 1860, p. 102, fig.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 3, fig. 1.—Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, pp. 18, 55.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 315.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 18, fig. 7c.—Whitfield, Geol. Wisconsin, 4, 1882, p. 217, pl. 5, fig. 19.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 157, fig.—Walcott, Amer. Jour. Sci. Arts, 3d ser., 35, 1888, p. 239, fig. 7.—Miller, N. A. Geol. Pal., 1889, p. 411, fig. 687.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 428, figs.—Whiteaves, Canadian Rec. Sci., 5, 1893, p. 320.—Keyes, Missouri Geol. Surv., 5, 1894, p. 146.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 123.

Murchisonia cf. gracilis Sardeson, Bull. Minnesota Acad. Nat. Sci., 4, 1896, p. 75, pl. 3, fig. 4.

Hormotoma gracilis Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 192.—Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1015, pl. 70, figs. 18–21, ?22.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, pl. 40, figs. 13a–b.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 649, figs. 885a–d, 886a–d.—Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 139, pl. 1, fig. 3.

Trenton-Richmond: Watertown, Middleville, etc., New York (Trenton). Widely distributed in the United States and Canada.

Plesiotypes.—Cat. No. 45851, U.S.N.M. (Ulrich and Scofield).

Hormotoma gracilis angustata (Hall).

Murchisonia? angustata Hall, Pal. New York, 1, 1847, p. 41, pl. 10, figs. 2a, b.

Hormotoma gracilis var. angustata Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1015, pl. 70, figs. 30–36.—Bassler, Bull. Virginia Geol. Surv., 2A, 1909, pl. 23, fig. 4.

Black River: Watertown, etc., New York; Canada; Virginia; Kentucky; Tennessee; Minnesota; Wisconsin; etc.

Plesiotypes.—Cat. Nos. 45852–45856, U.S.N.M.

Hormotoma gracilis goodhuensis Ulrich and Scofield.

Hormotoma gracilis var. goodhuensis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1015, pl. 70, figs. 42–43.

Black River (Decorah): Goodhue County, Minnesota.

Cotypes.—Cat. No. 45857, U.S.N.M.

Hormotoma gracilis multivolvis Ulrich and Scofield.

Hormotoma gracilis var. multivolvis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1015, pl. 70, figs. 26–29.

Richmond (Maquoketa): Spring Valley, Minnesota.

Cotypes.—Cat. No. 45858, U.S.N.M.

Hormotoma gracilis sublaxa Ulrich and Scofield.

Hormotoma gracilis var. sublaxa Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1015, pl. 70, figs. 23–25.

Black River (Auburn-Decorah): Auburn, Lincoln County, Missouri.

Cotypes.—Cat. No. 45859, U.S.N.M.

Hormotoma infrequens (Billings).

Murchisonia infrequens Billings, Canadian Nat. Geol., 4, 1859, p. 457.

Hormotoma infrequens Raymond, Ann. Carnegie Mus., 4, 1908, p. 191, pl. 55, fig. 4.

Chazyan (Aylmer): Grand Isle, near Cornwall, Canada.

Hormotoma latiangularis Branson.

Hormotoma latiangularis Branson, Trans. Acad. Sci. St. Louis, 18, 1909, p. 44, pl. 7, figs. 11, 12.

Black River (Auburn-Decorah): Auburn, Lincoln County, Missouri.

Hormotoma(?) major (Hall).

Murchisonia major Hall, Geol. Lake Superior Land Dist., 2, 1851, p. 209, pl. 26, figs. 1a–c.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 167.—Keyes, Missouri Geol. Surv., 5, 1894, p. 145, pl. 49, figs. 5a–b.

Hormotoma? major Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1018, pl. 71, figs. 5–7.—Grabau and Shimer, N. A. Index Fossils 1, 1909, p. 650, fig. 889.

Murchisonia bellicincta Owen, Rep. Geol. Surv. Wisconsin, Iowa, and Minnesota, 1852, pl. 2, fig. 8.

Trenton (Prosser and Stewartville): Western shore of Green Bay, etc., Wisconsin; Stewartville, Hader, etc., Minnesota; Iowa; Pike County, Missouri.

Plesiotype and *plastotype.*—Cat. Nos. 17903, 45860, U.S.N.M.

Hormotoma melaniaformis (Shumard).

Murchisonia melaniaformis Shumard, 1st and 2d Ann. Rep. Geol. Surv., Missouri, pt. 2, 1855, p. 208, pl. C, fig. 13.—Keyes, Missouri Geol. Surv., 5, 1894, p. 145, pl. 49, fig. 3.

Hormotoma? melaniaformis Donald, Quart. Jour. Geol. Soc. London, 55, 1899, p. 262 (gen. ref.).

Canadian: Franklin County, Missouri.

Hormotoma multivolvis (Billings).

Murchisonia multivolvis Billings, Geol. Surv. Canada, Rep. Progr. for 1853–6, 1857, p. 299; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 18 (loc. ref.).

Richmond (English Head): Macasty Bay, Anticosti.

Hormotoma obelisca (Whitfield).

Murchisonia (Fusispira?) obelisca Whitfield, Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 317, pl. 26, figs. 5, 6.

Murchisonia obelisca Seely, Vermont State Geol., Rep. 7, 1910, pl. 60, fig. 5.

Canadian (Beekmantown): Fort Cassin, Vermont.

Hormotoma patriciaense Parks.

Hormotoma patriciaense Parks in Tyrrell, 22d Rep. Ontario Bur. Mines, 1913, p. 36.

Niagaran (Guelph): Severn River, Ontario.

Hormotoma procris (Billings).

Murchisonia Procris Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 34 (adv. sheets, 1862).

Hormotoma procris Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1014 (gen. ref.).

Black River (Leray): Pauquette Rapids, Ottawa River, Canada.

HORMOTOMA RUGOSA Schuchert and Twenhofel. See Loxonema rugosa.

Hormotoma salteri Ulrich.

Hormotoma salteri Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1016, pl. 70, figs. 44–51.—Donald, Quart. Jour. Geol. Soc. London, 55, 1899, p. 262, pl. 21, figs. 7–11.—Weller, Geol. Surv. New Jersey Pal., 3, 1903, p. 183, pl. 12, fig. 29.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 649, figs. 887c–d.

Trenton: Between Burgin and Danville, Kentucky (Flanagan); New Jersey.

Cotypes.—Cat. No. 45861, U.S.N.M.

Hormotoma salteri canadensis Ulrich.

Murchisonia (Hormotoma) gracilis Salter, Geol. Surv. Canada, Can. Org. Rem., Dec. 1, 1859, p. 22.—Billings, Geol. Surv. Canada, Geol. Canada, 1863, p. 183, fig. 178.

Hormotoma salteri var. canadensis Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1016, pl. 70, fig. 44.

Black River (Leray): Pauquettes Rapids, Ottawa River, Canada; near Lebanon, Tennessee.

Hormotoma salteri nitida Ulrich.

Hormotoma salteri var. nitida Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1016.

Trenton (Flanagan): Between Burgin and Danville, Kentucky.

Holotypes.—Cat. No. 45862, U.S.N.M.

Hormotoma salteri tennesseensis Ulrich.

Hormotoma salteri var. tennesseensis Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1016, pl. 70, fig. 49.

Black River: Between Nashville and Lebanon, Tennessee.

Cotypes.—Cat. No. 45863, U.S.N.M.

Hormotoma simulatrix (Billings).

Murchisonia simulatrix Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 232, text fig. 218.

Hormotoma simulatrix Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1014 (gen. ref.).

Chazyan (Quebec,—H—M): Table Head and Point Rich, Newfoundland.

Hormotoma subangulata Ulrich and Scofield.

Hormotoma subangulata Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1016, pl. 70, figs. 37–41.

Black River (Decorah): Chatfield and near Cannon Falls, Minnesota.

Cotypes.—Cat. Nos. 45864–45866, U.S.N.M.

Hormotoma subcarinata Grabau.

Hormotoma subcarinata Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 173, pl. 24, figs. 1–5.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 650.

Upper Monroan: Wayne County, Michigan (Lucas); Amherstburg, Ontario (Amherstburg).

Hormotoma subulata (Conrad).

Loxonema subulata Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1842, p. 273, pl. 16, fig. 14.—Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 100.

Murchisonia subulata Hall, Pal. New York, 2, 1852, p. 91, pl. 28, figs. 7a, b, c, d.

Holopella? cf. Loxonema subulata Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 291, pl. 5, fig. 21.

Loxonema? (cf. Holopella) subulata Foerste, Geol. Surv. Ohio, Pal., 7, 1893, p. 556, pl. 30, fig. 21.

Early Silurian: Medina, Reynales Basin, and Wolcott, New York (Clinton); Todds Fork and Dayton, Ohio (Brassfield).

Hormotoma tenera Savage.

Hormotoma tenera Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 96, pl. 6, fig. 9.

Upper Medinan (Edgewood): Near Edgewood and Louisiana, Missouri.

Hormotoma terebriformis Foerste.

Hormotoma terebriformis Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 137, pl. 3, figs. 8a, b.

Trenton (Upper): Near Rogers Gap, Kentucky.

Hormotoma teretiformis (Billings).

Murchisonia teretiformis Billings, Geol. Surv. Canada Rep. Progr. for 1853–1856, 1857, p. 298; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, pp. 18, 55.

Murchisonia bellicincta var. teretiformis Whiteaves, Canadian Rec. Sci., 5, 1893, p. 320.

Hormotoma teretiformis Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1014 (gen. ref.).

Richmond (Charleton): Charleton Point, Anticosti.

Hormotoma trentonensis Ulrich and Scofield.

Murchisonia bellicincta Hall (part), Pal. New York, 1, 1847, pl. 39, fig. 1e (not 1a–1d).—Owen, Geol. Rep. Wisconsin, Iowa, Minnesota, 1852, pl. 2, fig. 8.

Murchisonia major Whitfield (not Hall), Geol. Wisconsin, 4, 1882, p. 244, pl. 9, fig. 4.

Hormotoma trentonensis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 1017, pl. 70, figs. 13, 14.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 650, fig. 887b, 888.

Trenton: New York, Canada, Minnesota, Illinois, Kentucky, Tennessee.

Holotype.—Cat. No. 45867, U.S.N.M.

Hormotoma tricarinata Grabau.

Hormotoma tricarinata Grabau, Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 175, pl. 25, figs. 3–4.

Upper Monroan (Lucas): Gibraltar quarry, Wayne County, Michigan.

Hormotoma vesta (Billings).

Murchisonia Vesta Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 276, fig. 280; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 32, fig. 33 (adv. sheets, 1862).—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 431, fig.—Koken, Neues Jahrb. Min., Geol. Pal., 6, 1889, Beilage-Band, p. 375.

Hormotoma vesta Ulrich, Geol. Minnesota, 3, pt. 2, 1897, p. 1014 (gen. ref.).

Canadian (Beekmantown): Phillipsburg, Quebec.

Hormotoma whiteavesi Clarke and Ruedemann.

Hormotoma whiteavesi Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 72, pl. 8, figs. 5, 9.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 332.

Hormotoma whiteavesi—Continued.

Loxonema magnum Whiteaves (not Whitfield), Geol. Surv. Canada, Pal. Foss., 3, pt. 1, 1884, p. 17 (loc. occ.); Geol. Surv. Canada, Pal. Foss., 3, pt. 2, p. 87, pl. 13, fig. 2.

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

Hormotoma winnipegensis Whiteaves.

Hormotoma Winnipegensis Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 192, pl. 21, fig. 1.

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

Black River or Richmond: Lake Winnipeg, Canada.

HORNERA? DICHOTOMA Hall. See Thamniscus dichotomus.

HORTHOLUS AMERICANUS D'Orbigny. See Barrandeoceras americanum.

HOUGHTONIA Rominger. See Calapœcia Billings.

HUDSONASTER Stürtz. Genotype: Palæasterina rugosa Billings.

Palæaster (part) of authors.

Hudsonaster Stürtz, Verh. naturh. Ver. preuss. Rheinl., etc., 1899, p. 224.—Schuchert in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 21; Bull. U. S. Nat. Mus., 88, 1915, p. 53.

Protopalæaster Hudson, Ottawa Nat., 26, 1912, p. 5; ibid., 27, 1913, pp. 77–84.—Raymond, ibid., 1912, p. 105. (Genotype: P. narrawayi Hudson.)

Hudsonaster incomptus (Meek).

Palæaster incomptus Meek, Amer. Jour. Sci., 3d ser., 4, 1872, p. 275; Geol. Surv. Ohio, Pal., 1, 1873, p. 64, pl. 4, figs. 5a, b.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 577, figs.—James, Jour. Cincinnati Soc. Nat. Hist., 18, 1895, p. 133.

Palæaster simplex Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 29, pl. 1, fig. 6.—Miller, N. A. Geol. Pal., 1889, p. 266, fig. 380.—James, Jour. Cincinnati Soc. Nat. Hist., 18, 1895, p. 132.

Palæaster clarkei Miller, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 102, pl. 3, fig. 5.

Palæaster clarkana Miller, Jour. Cincinnati Soc. Nat. Hist., 3, 1880, p. 236.—James, ibid., 18, 1895, p. 133.

Hudsonaster incomptus Schuchert in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 21; Bull. U. S. Nat. Mus., 88, 1915, p. 61, pl. 6, figs. 1, 2.

Maysville and Richmond: Cincinnati, Ohio, and vicinity; Waynesville, Raysville, etc., Ohio.

Hudsonaster matutinus (Hall).

Asterias matutina Hall, Pal. New York, 1, 1847, pp. 91, 318, pl. 29, figs. 5a, b.

Cœlaster matutina D'Orbigny, Prodr. de Pal., 1, 1849, p. 22 (gen. ref.).

Palæaster matutina Hall, 20th Rep. New York State Cab. Hist., p. 283, rev. ed., 1868 (1870), p. 325, pl. 9, fig. 2.

Hudsonaster matutinus Schuchert in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 21; Bull. U. S. Nat. Mus., 88, 1915, p. 57, pl. 2, fig. 2; pl. 3, fig. 2; pl. 5, figs. 1, 2.

Petraster rigidus (part) Billings, Geol. Surv. Canada, Can. Org. Rem., dec. 3, 1858, pl. 10, fig. 3b (not fig. 3a).—Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 294; rev. ed., 1870, p. 337.

Trenton: Trenton Falls, etc., New York; Lachine, Quebec; Government House Bay, Ontario.

Hudsonaster millerl Schuchert.

Hudsonaster milleri Schuchert in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 22; Bull. U. S. Nat. Mus., 88, 1915, p. 60, pl. 4, fig. 2.

Trenton (Wilmore): Fayette County, Kentucky.

Hudsonaster narrawayl (Hudson).

Protopalæaster narrawayi Hudson, Ottawa Nat., 26, 1912, p. 25, pl. 1–3; Bull. New York State Mus., 164, 1913, p. 130, pl. 5.—Raymond, Ottawa Nat., 26, 1912, p. 105, figs. 2–4.—Hudson, Ottawa Nat., 27, 1913, pp. 77–84, 2 pls.

Hudsonaster narrawayi Schuchert in Frech, Foss. Cat., 1, Anim., pt. 3, 1914, p. 22; Bull. U. S. Nat. Mus., 88, 1915, p. 59, pl. 1, fig. 1; pl. 2, fig. 1; pl. 4, fig. 1.

Black River: City View Postoffice, Ottawa, Ontario; St. Paul, Minnesota

Stones River (Lebanon): Shelbyville, Tennessee.

Hudsonaster rugosus (Billings).

Palæasterina rugosa Billings, Geol. Surv. Canada, Rep. Progress for 1853–56, 1857, p. 291; Geol. Surv. Canada, Can. Org. Rem., 3, 1858, p. 77, p. 19.—Chapman, Canadian Jour., n. s., 6, 1861, p. 517.—Wright, Mon. British Foss. Echin., Oolitic, 2, pt. 1, 1862 (Pal. Soc. for 1861), p. 27.—Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 9.

Hudsonaster rugosa Stürtz, Verh. naturh. Ver. preuss. Rheinl., 56, etc., 1899, p. 225.—Schuchert, Bull. U. S. Nat. Mus., 88, 1915, p. 64, pl. 3, fig. 1.

Richmond (Charleton): Charleton Point, Anticosti.

HUGHMILLERIA Sarle. Genotype: H. socialis Sarle.

Hughmilleria Sarle, Bull. New York State Mus., Pal., 69, 9, 1903, p. 1087.—Clarke, Bull. New York State Mus., 107, 1907, p. 307.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 412.—Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 329.—Clarke, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 785.

Hughmilleria magna Clarke and Ruedemann.

Hughmilleria magna Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 341, pl. 85, figs. 11–19.

Trenton (Schenectady): Schenectady, Duanesburg, and Rotterdam Junction, Schoharie County, New York.

Hughmilleria shawangunk Clarke.

Hughmilleria shawangunk Clarke, Bull. New York State Mus., 107, 1907, p. 308, pl. 4, figs. 1–4; pl. 5, figs. 1–6, 8, 9.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 413, fig. 1714.—Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 342, pls. 64–66; pl. 69, fig. 1.

Medinan (Shawangunk): Otisville, New York; Delaware Water Gap, Pennsylvania.

Hughmilleria socialis Sarle.

Hughmilleria socialis Sarle, Bull. New York State Mus., 69, 1903, p. 1091, pls. 6–9, 10, figs. 1–6, 8, 9; 11–14; 15, figs. 4–6; 24, fig. 1; 25, figs. 1, 3, 4; 26, figs. 3, 5.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 413, fig. 1714.—Clarke and Ruedeman, Mem. New York State Mus., 14, 1912, p. 335, pls. 59–63 (p. 428, fig. 118, Hughmilleria pittsfordensis in error).

Cayugan (Pittsford): Pittsford, New York.

Hughmilleria socialis robusta Sarle.

Hughmilleria socialis var. robusta Sarle, Bull. New York State Mus., 69, 1903, p. 1097, pl. 21, figs. 1, 2.—Clarke and Ruedemann, Mem. New York State Mus., 14, 1912, p. 340, pl. 63, fig. 16.

Cayugan (Pittsford): Pittsford, New York.

HUNGAIA Walcott. Genotype: Dikelocephalus magnificus Billings.

Hungaia Walcott, Smiths. Misc. Coll., 57, 1914, p. 351.

Hungaia magnifica (Billings).

Dikelocephalus magnificus Billings, Canadian Nat. Geol., 5, 1860, p. 307, fig. 5; Geol. Canada, Geol. Surv. Canada, 1863, p. 235, figs. 255a, b; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 299, fig. 376.

Remopleurides magnificus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 294 (gen. ref.).

Dicellocephalus magnificus Matthew, Trans. Roy. Soc. Canada, 10, sec. 4, 1893, p. 11, footnote.—Frech, Leth. Geog., Leth. Pal., 2, 1897, Bd., pl. 1b, figs. 18a, b.

Apatokephalus magnificus Brögger, Nyt Mag. f. Naturvid., 36, 1897, p. 175, fig. 10, p. 184.

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

HURONIA Stokes. Genotype: H. bigsbyi Stokes.

Huronia Stokes, Trans. Geol. Soc. London, 2d ser., 1, 1824, Expl. pl. 28; Proc. Geol. Soc. London, 2, 1838, p. 689; Trans. Geol. Soc. London, 2d ser., 5, 1840, p. 710.—Woodward, Man. Mollusca, pt. 2, 1851, p. 88, fig. 49.—Saemann, Palæontographica, 3, 1852, pp. 156, 161.—Barrande, Neues Jahrb. f. Min., etc., 1855, p. 407.—Billings, Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, p. 326.—Barrande, Syst. Sil. du Centre Boheme, 2, pt. 3, 1874, p. 784; Cephalopodes, Ext. Syst. Sil. du Centre Boheme, 1877, p. 104.—Zittel, Handb. Pal., 2, 1884, p. 369.—Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1884, p. 273.—Miller, N. A. Geol. Pal., 1889, p. 442.—Foord, Cat. Foss. British Mus., 1, 1888, p. 199.

HURONIA ANNULATA Hall. See Hurenia bigsbyi.

Huronia bigsbyi Stokes.

Huronia Bigsbyi Stokes, Trans. Geol. Soc. London, 2d. ser., 1, 1824, Expl. pl. 28, fig. 1.—Barrande, Syst. Sil. du Centre Boheme, 2, pt. 3, 1874, p. 743, pl. 436, figs. 1–3; Supp., 1877, pl. 474, figs. 2–4.

Huronia annulata Hall, Geol. Lake Sup. Land District, Foster and Whitney's Rep., 1851, p. 221, pl. 34, fig. 4.

Niagaran: Drummond Island, Lake Huron.

Huronia distincta Barrande.

Huronia sp. Stokes, Trans. Geol. Soc. London, 2d ser., 5, 1840, p. 710, pl. 40, fig. 2.

Huronia distincta Barrande, Syst. Sil. du Centre Boheme, 11, pt. 3, 1874, p. 745, pl. 231, fig. 2.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 207.

Niagaran: Drummond Island, Lake Huron.

Huronia minuens Barrande.

Huronia minuens Barrande, Syst. Sil. du Centre Boheme, 11, pt. 3, 1874, p. 744, pl. 435, fig. 4.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 204.

Niagaran: Drummond Island, Lake Huron.

Huronia obliqua Stokes.

Huronia sp. Stokes, Trans. Geol. Soc. London, 2d ser., 5, pt. 3, 1840, p. 710, pl. 40, fig. 3.

Huronia obliqua Stokes, Trans. Geol. Soc. London, 2d ser., 1, 1824, pl. 28, fig. 4.—Castelnau, Essai Syst. Sil. l'Amerique Septent., 1843, p. 32, pl. 9, fig. 1.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 205.

Orthoceras (Huronia) sp. Barrande, Syst. Sil. Boheme, 2, 3, 1874, p. 743, pl. 231, fig. 3.

Niagaran: Drummond Island, Lake Huron.

Huronia persiphonata (Billings).

Orthoceras persiphonatum Billings, Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, p. 329; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 57 (loc. ref.).

Huronia persiphonata Foord, Cat. Foss. Ceph. Brit. Mus., 1, 1888, p. 204.

Anticostian (Gun River, Jupiter River): Cormorant Point, Anticosti.

Huronia portlocki Stokes.

Huronia Portlockii Stokes, Proc. Geol. Soc. London, 2, 1838, p. 689; Trans. Geol. Soc. London, 2d ser., 5, 1840, p. 710, pl. 40, fig. 5.—Foord, Cat. Foss. Ceph. British Mus., 2, 1891, p. 383.—Ami, Canadian Rec. Sci., 4, 1891, p. 399.

Orthoceras (Huronia) Portlocki Barrande, Syst. Sil. du Centre Boheme, 2, pt. 3, 1874, p. 741, pl. 232, fig. 4.

Niagaran: Drummond Island, Lake Huron.

HURONIA ROMINGERI Barrande. See Huronia turbinata.

HURONIA SPILÆROIDALIS Stokes. See Actinoceras sphæroidale.

Huronia turbinata Stokes.

Huronia turbinata Stokes, Trans. Geol. Soc. London, 2d ser., 1, 1824, Expl. pl. 28, fig. 3.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 206.

Huronia romingeri Barrande, Syst. Sil. Boheme, 2, 3, 1874, p. 758; Suppl. 1877, pl. 474, figs. 5, 6.

Niagaran: Drummond Island, Lake Huron; Point Detour, Michigan.

Huronia vertebralis Stokes.

Huronia vertebralis Stokes, Trans. Geol. Soc. London, 2d ser., 1, 1824, Expl. pl. 28, figs. 2, 6.—Woodward, Man. Mollusca, pt. 1, 1851, p. 89, fig. 49, footnote; 3d ed., 1875, p. 192, fig. 56.—Hall, Geol. Lake Sup. Land Dist., Foster and Whitney's Rep., 1851, p. 221, pl. 24, fig. 1.—Barrande, Syst. Sil. du Centre Boheme, 2, 1874, pt. 3, p. 746, pl. 231, figs. 6, 7, pl. 436, figs. 5–7.—Roemer, Leth. geog., 1, Leth. Pal., Atlas, 1876, pl. 16, fig. 3.—Zittel, Handb. Pal., 2, 1884, p. 369, fig. 508.—Foord, Cat. Foss. Ceph. Brit. Mus., 1, 1888, p. 202.—Miller, N. A. Geol. Pal., 1889, p. 442, text fig. 744.

Orthoceras canadense Billings, Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, pp. 321–328; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 57.

Niagaran: Drummond Island, Lake Huron.

Anticostian (Chicotte): Southwest Point, Anticosti.

HYALOSTELIA Zittel. Genotype: Hyalonema smithi Young.

Hyalostelia Zittel, Handb. Pal., 1, 1879, p. 185.—Hinde, Mon. British Foss. Sponges, Pal. Soc., 1888, p. 109.—Koken, Die Leitfossilien, Leipzig, 1896, p. 342.—Zittel-Eastman Textb. Pal., 1, 1900, p. 55; ibid., 2d ed., 1913, p. 62.

Hyalostelia? metissica Dawson.

Hyalostelia Metissica Dawson, Canadian Rec. Sci., 3, 1888, p. 54.—Hinde, Canadian Rec. Sci., 3, 1888, p. 68.—Dawson and Hinde, Trans. Roy. Soc. Canada, 7, sec. 4, 1890, p. 49, fig. 20.—Dawson, ibid., 2d ser., 2, sec. 4, 1896, p. 108, fig. 17, pl. 3, fig. 10.

Pyritonema metissicum Rauff, Palæontographica, 40, 1894, p. 261.

Canadian? (Levis?): Little Metis, Quebec.

HYALOSTELIA SOLIVAGA Ulrich. See Hindia sphæroidalis.

HYATTELLA Hall and Clarke. See Hyattidina Schuchert.

HYATTELLA JUNIA Hall and Clarke. See Hyattidina congesta junia.

HYATTIDINA Schuchert. Genotype: Atrypa congesta Conrad.

Hyattella Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 61, fig. 45; 13th Ann. Rep. New York State Geol., 1895, p. 767.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 338.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 348.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 204; Bull. New York State Mus., 45, 1901, p. 204.

Hyattidina (Hyattella preoccupied) Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 415.

Hyattidina charletona Twenhofel.

Hyattidina charletona Twenhofel, Bull. Victoria Mem. Mus., 3, 1914, p. 34, pl. 1, figs. 6, 7.

Richmond (Charleton): Charleton Point, Anticosti.

Hyattidina congesta (Conrad).

Atrypa congesta Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1842, p. 265, pl. 16, fig. 18.—Hall, Geol. New York, Rep. 4th Dist., 1843, p. 71, fig. 2; Pal. New York, 2, 1852, p. 67, pl. 23, fig. 1.—Billings, Canadian Nat. Geol., 1, 1856, p. 136, pl. 2, fig. 4.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 823, fig. 632.

Atrypa quadricostata Hall, Pal. New York, 2, 1852, p. 68, pl. 23, fig. 2.

Triplesia? congesta Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 77.

Triplesia? quadricostata Hall, ibid., 1859, p. 78.

Rhynchonella quadricostata Miller, N. A. Geol. Pal., 1889, p. 369.

Camerella congesta Nettelroth, Kentucky Fossil Shells, Mem. Kentucky Geol. Surv., 1889, p. 48.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 112, figs.

Hyattella congesta Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 61, fig. 45; pl. 40, figs. 23–28; pl. 81, figs. 26–28.—Grabau, Bull. New York State Mus., 45, 1901, pp. 204, 205, figs. 131, 131a; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 204, figs. 131, 131a.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 348, figs. 451–452.

Clinton (Lower): Rochester, Reynales Basin, etc., New York; Ontario.

Anticostian (Gun River): Island of Anticosti.

Plesiotypes.—Cat. No. 51340, U.S.N.M. (Nettelroth).

Hyattidina congesta junia (Billings).

Athyris junia Billings, Catalogue Sil. Foss. Anticosti, 1866, p. 46.

Hyattella junia Hall and Clarke, Pal. New York, 8, pt. 2, 1893, p. 62, pl. 40, figs. 29–31.

Anticostian (Gun River): Six miles east of Otter River, Jupiter River, and the Jumpers, Anticosti.

Hyattidina? lamellosa (Weller).

Hyattella? lamellosa Weller, Geol. Surv. New Jersey, Rep. Pal., 3, 1903, p. 258, pl. 23, figs. 15–18.

Helderbergian (Rondout): Two miles south of Tristates, New York.

HYBOCRINUS Billings. Genotype: H. conicus Billings.

Hybocrinus Billings, Geol. Surv. Canada, Rep. Progr., 1853–56, 1857, p. 274; Geol. Surv. Canada, dec. 4, 1859, p. 23.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 8th ser., 21, 1874, p. 5.—Zittel, Handb. Pal., 1, 1879, p. 350.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, pp. 285, 297, 373 (Rev. Pal., 1, p. 74, 150); ibid., 1886, pp. 110, 119, 122; ibid., 1890, pp. 355, 390, 393, pl. 10, fig. 7.—Wetherby, Jour. Cincinnati Soc. Nat. Hist., 3, 1880, p. 152.—Carpenter, Quart. Jour. Geol. Soc. London, 38, 1882, pp. 298,

HYBOCRINUS—Continued.

305.—Wachsmuth and Springer, Amer. Jour. Sci., 3d ser., 26, 1883, p. 365.—Miller, N. A. Geol. Pal., 1889, p. 255.—Bather, Ann. Mag. Nat. Hist., 6th ser., 5, 1890, p. 324, pl. 14, fig. 3; Kongl. Sv. Vet. Akad. Handl., 25, No. 2, 1893, p. 21; Geol. Mag., dec. 4, 6, 1889, p. 33, fig. 6; Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 145, fig. 57, 3.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 151.—Zittel, Grundzuge Pal., 1910, p. 151.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 500.—Springer, Mem. Geol. Surv. Canada, 15P, 1911, pp. 13-23; Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 211.

Hybocrinus (Anomalocrinus) Meek and Worthen. See Anomalocrinus Meek.

Hybocrinus conicus Billings.

Hybocrinus conicus Billings, Geol. Surv. Canada, Rep. Progr. for 1853-56, 1857, p. 274; Geol. Surv. Canada, dec. 4, 1859, p. 29, pl. 2, figs. 2a, b.—Wetherby, Jour. Cincinnati Soc. Nat. Hist., 3, 1880, p. 153.—Miller, N. A. Geol. Pal., 1889, p. 255, fig. 341.—Springer, Mem. Geol. Surv. Canada, 15P, 1911, pl. 4, fig. 6.

Trenton (Curdsville): Ottawa, Ontario; Mercer County, Kentucky.

Hybocrinus? (Anomalocrinus) incurvus Meek and Worthen. See Anomalocrinus incurvus.

Hybocrinus pristinus Billings.

Hybocrinus pristinus Billings, Geol. Surv. Canada, dec. 3, 1858, p. 25, figs. 4, 5; dec. 4, 1859, p. 23, pl. 1, fig. 2a.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 501.

Chazyan (Aylmer): Caughnawaga, and Islands of Montreal, Jesus, and Bizard, Canada.

Hybocrinus tumidus Billings.

Hybocrinus tumidus Billings, Geol. Surv. Canada, Rep. Progr. 1853-56, 1857, p. 275; Geol. Surv. Canada, dec. 4, 1859, p. 28, pl. 2, figs. 1a-1e.—Wetherby, Jour. Cincinnati Soc. Nat. Hist., 3, 1880, p. 153, pl. 5, figs. 2a-c.—Carpenter, Quart. Jour. Geol. Soc. London, 38, 1882, p. 298, fig. A; pl. 11, figs. 3-5.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 501, fig. 1812.—Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 18, pl. 5, figs. 1-5.

Trenton (Curdsville): Ottawa, Ontario; Woodford and Mercer Counties, Kentucky.

Hybocystis Bather. See Hybocystites Wetherby.

HYBOCYSTITES Wetherby. Genotype: H. problematicus Wetherby.

Hybocystites Wetherby, Jour. Cincinnati Soc. Nat. Hist., 3, 1880, p. 150.—Carpenter, Quart. Jour. Geol. Soc. London, 38, 1882, p. 308.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, pp. 360, 373 (Rev. Pal., pp. 186, 199.)—Miller, N. A. Geol. Pal., 1889, p. 256.—Zittel, Grundzuge Pal., 1910, p. 151.

Hybocystis Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 145.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 152.—Springer, Mem. Geol. Surv. Canada, 15P, 1911, pp. 13-25; Zittel-Eastman Textb. Pal., 1, 1913, p. 211.

Hybocystites eldonensis (Parks).

Hybocystis eldonensis Parks, Ottawa Nat., 21, 1908, p. 234, pl. 2, fig. 4.—Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 13, pl. 2, figs. 1-10.

Trenton (Curdsville): Eldon township, Victoria County (near Kirkfield), Ontario.

Observation.—Probably the same as H. problematicus.

Hybocystites problematicus Wetherby.

Hybocystites problematicus Wetherby, Jour. Cincinnati Soc. Nat. Hist., 3, 1880, p. 150, pl. 5, figs. 1a–c.—Carpenter, Quart. Jour. Geol. Soc. London, 38, 1882, p. 307, pl. 11, figs. 6–24.—Miller, N. A. Geol. Pal., 1889, p. 256, fig. 342.

Hybocystis problematicus Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 95, fig. 1.—Parks, The Ottawa Nat., 21, 1908, p. 232, pl. 2, figs. 1–3, 5.—Springer, Mem. Geol. Surv. Canada, 15P, 1911, p. 21 (under H. eldonensis); pl. 2, figs. 11, 12.

Trenton (Curdsville): Mercer and Woodford Counties, Kentucky; Kirkfield, Ontario.

HYDROLÆNUS CONIFRONS Salter. See Illænus conifrons.

HYOLITHELLUS Billings. Genotype: Hyolithes micans Billings.

Hyolithellus Billings, Canadian Nat. Geol., n. s., 6, 1871, p. 240; Amer. Jour. Sci., 3d ser., 3, 1872, p. 360.—Walcott, Bull. U. S. Geol. Surv., 30, 1886, p. 141.—Miller, N. A. Geol. Pal., 1889, p. 391.—Matthew, Trans. Roy. Soc. Canada, 2d ser., 5, sec. 4, 1899, p. 107.

Hyollthellus papillatus Walcott.

Hyolithellus papillatus Walcott, Smiths. Misc. Coll., 57, 1912, p. 267, pl. 43, figs. 3, 4.

Upper Cambrian or Ozarkian (Potsdam): Marble River, near Chateaugay, Franklin County, New York.

Holotype.—Cat. No. 58553, U.S.N.M.

HYOLITHES Eichwald. Genotype: H. acutus Eichwald.

Hyolithes Eichwald, Sil. Sch. Syst., Ehstland, 1840, p. 97.—Barrande, Syst. Sil. du Centre Boheme, 3, 1867, p. 55.—Billings, Canadian Nat., n. s., 6, 1871, p. 213.—Ford, Amer. Jour. Sci., 3d ser., 1, 1871, p. 472; 3, 1872, p. 352.—Kayser, Beitr. Geol. Pal. Argent. Repub., Pal. Suppl., 3, 1876, p. 8.—Hall, Pal. New York, 5, pt. 2, 1879, p. 191.—Waagen, Mem. Geol. Surv. India, Pal. Indica, 13th ser., 1, 1880, p. 175.—Zittel, Handb. Pal., 2, 1882, p. 316.—Koninck, Ann. d. Mus. Roy. d'Hist. Nat. de Belgique, 8, 1883, p. 223.—Matthew, Trans. Roy. Soc. Canada, 3, sec. 4, 1886, p. 45.—Walcott, Bull. U. S. Geol. Surv., 30, 1886, p. 131.—Remele, Zeits. d. d. geol. Gesell., 41, 1889, p. 762.—Miller, N. A. Geol. Pal., 1889, p. 391.—Matthew, Canadian Rec. Sci., 5, 1893, pp. 435–436, 437.—Holm, Sveriges Geol. Unders., ser. C, No. 112, 1893, p. 6, 9, 13, 45, 151.—Matthew, Canadian Rec. Sci., 5, 1893, p. 433.—Koken, Die Leitfossilien, Leipzig, 1896, p. 98, fig. 77; p. 400.—Matthew, Trans. Roy. Soc. Canada, 2d ser., 7, sec. 4, 1901, p. 93.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 950.

Hyollthes baconi Whitfield.

Hyolithes Baconi Whitfield, Ann. Rep. for 1877, Wisconsin Geol. Surv., 1878, p. 77; Geol. Wisconsin, 4, 1882, p. 225, pl. 6, figs. 9–11.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 158, fig.

Black River (Platteville): Beloit, etc., Wisconsin; Minnesota.

Hyolithes cliftonensis Foerste.

Hyolithes cliftonensis Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 62, pl. 3, figs. 38a, b.

Clinton (Osgood): Clifton, Tennessee.

Hyollthes(?) dubius Miller and Faber.

Hyolithes(?) dubius Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 17, 1894, p. 155, pl. 8, fig. 23.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 964, pl. 42, fig. 3.

Richmond: Versailles, Indiana.

Hyolithes gibbosus Hall and Whitfield.

Hyolithes gibbosus Hall and Whitfield, 23d Ann. Rep. New York State Cab. Nat. Hist., 1873, p. 242, pl. 11, figs. 1–3.—Walcott, Smiths. Misc. Coll., 57, 1912, p. 265, pl. 43, figs. 5, 6.

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

Hyolithes newsomensis Foerste.

Hyolithes newsomensis Foerste, Jour. Geol., 11, 1903, p. 707; Bull. Sci. Lab. Denison Univ., 14, 1909, p. 63, pl. 1, figs. 3A, B.

Niagaran (Waldron): Newsom, Swallow Bluff, and Iron City, Tennessee.

Hyolithes parviusculus (Hall).

Theca parviuscula Hall, Geol. Wisconsin, 1862, p. 55, fig. 10.

Hyolithes parviusculus James, Amer. Geol., 5, 1890, p. 355.

Richmond (Maquoketa): Wisconsin, Illinois, Iowa, and Missouri.

Hyolithes pinniformis Ruedemann.

Hyolithes pinniformis Ruedemann, Bull. New York State Mus., 162, 1912, p. 111, pl. 7, figs. 12, 13.

Trenton (Canajoharie): Canajoharie, New York.

Hyolithes rhine Ruedemann.

Hyolithes rhine Ruedemann, Bull. New York State Mus., 49, 1901, p. 36, pl. 2, figs. 12–15.

Mohawkian (Rysedorph): Rysedorph Hill, Rensselaer County, New York.

Hyolithes subimbricatus Ringueberg.

Hyolithes subimbricatus Ringueberg, Proc. Acad. Nat. Sci. Philadelphia, 1888, p. 135, pl. 7, fig. 7.

Clinton (Rochester): Lockport, New York.

Hyolithes vanuxemi Walcott.

Hyolithes Vanuxemi Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 85, pl. 11, figs. 16, 16a, b.

Lower Pogonip: Northeast of Adams Hill, Eureka District, Nevada.

Cotypes.—Cat. No. 17375, U.S.N.M.

Hyolithes versaillesensis Miller and Faber.

Hyolithes versaillesensis Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 17, 1894, p. 155, pl. 8, figs. 20–22.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 765, fig. 1409.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 965, pl. 42, figs. 4, 4a.

Richmond: Versailles, Indiana.

HYPANTHOCRINITES Phillips. See Eucalyptocrinus Goldfuss.

HYPANTHOCRINITES DECORUS Hall. See Eucalyptocrinus cælatus lævis.

HYPANTHOCRINUS Hall. See Eucalyptocrinus Goldfuss.

HYPANTHOCRINUS DECORUS Hall. See Eucalyptocrinus cælatus levis.

HYPSELOCONUS Berkey. Genotype: Metoptoma recurva Whitfield.

Hypseloconus Berkley, Amer. Geol., 21, 1898, p. 282.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 604.

Hypseloconus recurvus (Whitfield).

Metoptoma recurva Whitfield, Ann. Rep. for 1877, Wisconsin Geol. Surv., 1878, p. 61; Geol. Wisconsin, 4, 1882, p. 196, pl. 3, figs. 14, 15.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 142, fig.

Hypseloconus recurvus—Continued.

Hypseloconus recurvus Berkey, Amer. Geol., 21, 1898, p. 284, pl. 19, figs. 3–8, 13–16, 27–31; pl. 21, figs. 8, 12, 13, 14, 16, 20.—Sardeson, Jour. Geol., 11, 1903, p. 479, fig. 6.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 604, fig. 804a, b.

Ozarkian (Mendota): East of Baraboo, Wisconsin.

HYPTIOCRINUS Wachsmuth and Springer. See Cyphocrinus Miller.

HYPTIOCRINUS TYPUS Wachsmuth and Springer. See Cyphocrinus gorbyi.

HYSTRICURUS Raymond. Genotype: Bathyurus conicus Billings.

Hystricurus Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 60; Zittel-Eastman Textb. Pal., 1913, p. 716.

Hystricurus conicus (Billings).

Bathyurus conicus Billings, Canadian Nat. Geol., 4, 1859, p. 266, fig. 12d; Geol. Canada, Geol. Surv. Canada, 1863, p. 122, fig. 42; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 353, fig. 341.—Whitfield, Bull. Amer. Mus. Nat. Hist., 2, 1889, p. 61, pl. 13, figs. 15–21.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 288.—Seely, Vermont State Geol. Rep., 7, 1910, pl. 57, figs. 4, 5.

Hystricurus conicus Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 60, pl. 7, fig. 9.

Canadian (Beekmantown): St. Timothy, on Beauharnois Canal, Canada; Comstock Landing, New York; Fort Cassin, Vermont; Cow Head, Newfoundland (Quebec-P).

Hystricurus cordai (Billings).

Bathyurus Cordai Billings, Canadian Nat. Geol., 5, 1860, p. 321, fig. 26; ibid., 6, 1861, p. 314; Geol. Canada, Geol. Surv. Canada, 1863, p. 238, fig. 269; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 259, fig. 242; p. 412, fig. 395.

Bathyurus seelyi Whitfield, Bull. Amer. Mus. Nat. Hist., 11, 1889, p. 62, pl. 13, figs. 8–14.—Seely, Vermont State Geol., Rep. 7, 1910, pl. 57, figs. 6, 7.

Hystricurus cordai Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 61.

Canadian: Point Levis, Quebec (Levis conglomerates); Phillipsburg, Quebec (Beekmantown); Cow Head and Bay St. John, Newfoundland.

Hystricurus crotalifrons (Dwight).

Bathyurus(?) crotalifrons Dwight, Amer. Jour. Sci., 3d ser., 27, 1884, p. 253, pl. 7, figs. 4, 4a, 5, 6.

Hystricurus crotalifrons Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 61.

Canadian (Beekmantown): Rochdale, Dutchess County, New York.

Hystricurus? tuberculatus (Walcott).

Bathyurus? tuberculatus Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 91, pl. 12, fig. 9.

Upper Pogonip: Ridge southwest of Wood Cove, Eureka District, Nevada.

Cotype.—Cat. No. 24654, U.S.N.M.

ICHNOPHYCUS Hall. Genotype: I. tridactylus Hall.

Ichnophycus Hall, Pal. New York, 2, 1852, p. 26.—Miller, N. A. Geol. Pal., 1889, p. 120.

Ichnophycus tridactylus Hall.

Ichnophycus tridactylus Hall, Pal. New York, 2, 1852, p. 26, pl. 10, fig. 7a, b.—Miller, N. A. Geol. Pal., 1889, p. 120, fig. 41.

Clinton: New Hartford, New York.

ICHTHYOCRINUS Conrad. Genotype: I. lævis Conrad.

Ichthyocrinus Conrad, Jour. Acad. Nat. Sci. Philadelphia, 1842, 8, p. 279.—D'Orbigny, Prodr. de Pal., 1, 1849, p. 46.—Hall, Pal. New York, 2, 1852, pp. 195–355.—McCoy, British Pal. Rocks Foss., 1854, p. 54.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 319.—Hall, Rep. Geol. Surv. Iowa, 1, 1858, pt. 2, p. 557.—Beyrich, Ann. Mag. Nat. Hist., 4th ser., 7, 1871, p. 403.—Salter, Cat. Camb. and Sil. Foss., 1873, p. 126.—Angelin, Icon. Crinoid., 1878, p. 13.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1878, p. 252; ibid., 1886, p. 67; ibid., 1888, p. 353; ibid., 1890, p. 387.—Zittel, Handb. Pal., 1, 1879, p. 355.—Miller, N. A. Geol. Pal., 1889, p. 256.—Bather, Nat. Sci., 12, 1898, p. 341.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 145, fig. 53.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 188, fig. 108.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 163.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 159; Bull. New York State Mus., 45, 1901, p. 159.—Springer, Jour. Geol., 14, 1906, p. 516.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 563.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 204.

Ichthyocrinus? clintonensis Hall.

Ichthyocrinus? clintonensis Hall, Pal. New York, 2, 1852, p. 181, pl. A40, fig. 5.

Lower Clinton: Reynales Basin, Niagara County, New York.

Ichthyocrinus conoideus Ringueberg.

Ichthyocrinus conoideus Ringueberg, Ann. New York Acad. Sci., 5, 1890, p. 305, pl. 3, fig. 5.—Springer, Mon. Crin. Flex., Smith. Inst. (in press).

Niagaran (Lockport-Gasport member): Lockport, New York.

Ichthyocrinus corbis Winchell and Marcy.

Ichthyocrinus corbis Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 89, fig.—Miller, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 175, pl. 4, fig. 5; N. A. Geol. Pal., 1889, p. 256, fig. 343.

Niagaran (Racine): Chicago and Cicero, Illinois.

Ichthyocrinus lævis Conrad.

Ichthyocrinus lævis Conrad, Jour. Acad. Nat. Sci. Philadelphia, 8, 1842, p. 279, pl. 15, fig. 16.—Hall, Pal. New York, 2, 1852, p. 195, pl. 43, figs. 2a–p.—Billings, Canadian Nat. Geol., 1, 1856, p. 59, pl. fig. 4.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 319, pl. 100, fig. 17.—Emmons, Man. Geol., 1860, p. 110, fig. 100.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 7, fig. 3.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 258.—Miller, N. A. Geol. Pal., 1889, p. 256, fig. 344.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 159, fig. 54; Bull. New York State Mus., 45, 1901, p. 159, fig. 54.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 564, fig. 1900.

Cyathocrinites pyriformis Hall, Nat. Hist. New York Geol., 4, 1843, p. 11, fig. 3; p. 112, tab. ill. 17, fig. 3.—Owen, Amer. Jour. Sci. Arts, 48, 1845, p. 314, fig. 3.

Cyathocrinus pyriformis Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 167, figs.

Lecanocrinus simplex Hall, Pal. New York, 2, 1852, p. 202, pl. 46, figs. 2a–e.

Ichthyocrinus simplex Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879 (Rev. Pal., 1, 1879, p. 35).

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

Ichthyocrinus simplex Wachsmuth and Springer. See Ichthyocrinus lævis.

Ichthyocrinus subangularis Hall.

Ichthyocrinus subangularis Hall, Trans. Albany Inst., 4, 1863, p. 201 (abstract, p. 7); 20th Rep. New York State Cab. Nat. Hist. (extras, 1865), p. 325, pl.

Ichthyocrinus subangularis—Continued.

11 (2), figs. 15, 16; p. 385, fig. 11; p. 391; rev. ed., 1870, p. 367, pl. 11, figs. 15, 16; p. 429, text fig; 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875, 1877, pl. 16, figs. 11–13; mus. ed., 1879, p. 137, pl. 16, figs. 11–13; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 268, pl. 15, figs. 12, 13; pl. 16, figs. 11–13.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, p. 146, pl. 15, figs. 3–5.—Springer, Jour. Geol., 14, 1906, p. 477, pl. 6, fig. 2; Mon. Crin. Flex., Smith. Inst. (in press).

Niagaran: Waldron, Indiana (Waldron); Bridgeport and Romeo, Illinois (Racine).

IDIOCRINUS Wachsmuth and Springer. See Gazacrinus Miller.

IDIOCRINUS ELONGATUS Wachsmuth and Springer. See Gazacrinus inornatus.

IDIOCRINUS TENNESSEENSIS Wachsmuth and Springer. See Ormocrinus tennesseensis.

IDIOSTROMA Winchell. Genotype: I. cæspitosum Winchell.

Idiostroma Winchell, Proc. Amer. Assoc. Adv. Sci., 15, 1867, p. 99.—Nicholson, Mon. British Strom., Pal. Soc., 1886, pp. 10, 11, 99.

Idiostroma nattressi Grabau.

Idiostroma nattressi Grabau, Michigan Geol. Surv., Geol., 1st ser., 1909, p. 94, pl. 9, figs. 5–7; pl. 8, figs. 2, 3.

Upper Monroan (Anderdon and Amherstburg): Near Amherstburg, Ontario.

IDIOTRYPA Ulrich. Genotype: Idiotrypa parasitica Ulrich.

Idiotrypa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 272.—Miller, N. A. Geol. Pal., 1889, p. 310.—Ulrich, Geol. Surv. Illinois, 8, 1890, p. 375.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 591.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 34.—Bassler, ibid., 292, 1906, p. 39.

IDIOTRYPA PARASITICA Ulrich. See Idiotrypa punctata.

Idiotrypa punctata (Hall).

Trematopora?? punctata Hall, Pal. New York, 2, 1852, p. 151, pl. 40A, figs. 4a–c.

Idiotrypa punctata Bassler, Bull. U. S. Geol. Surv., 292, 1906, p. 40, pl. 17, figs. 4–10; pl. 24, figs. 17–19.

Idiotrypa parasitica Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 273, pl. 13, figs. 1–1c.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, figs. 187–189 (p. 591).

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

Plesiotypes.—Cat. Nos. 35496, 43674, U.S.N.M. (Holotype of I. parasitica).

ILIONIA Billings. Genotype: I. canadensis Billings.

Ilionia Billings, Canadian Nat., n. s., 7, 1874, p. 301.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 13.—Miller, N. A. Geol. Pal., 1889, p. 483.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 379.

Ilionia canadensis Billings.

Ilionia Canadensis Billings, Canadian Nat., n. s., 7, 1874, p. 301, fig. 1, 2.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 13, fig. 3; p. 14, fig. 4; ibid., pt. 2, 1905, p. 67.

Silurian: Port Daniel, Bay of Chaleurs, Quebec; Elora and Hespeler, Ontario (Guelph).

Illonia? costulata Whiteaves.

Ilionia(?) costulata Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 15, pl. 2, fig. 5; ibid., pt. 2, 1895, p. 68 (loc. occ.).

Niagaran (Guelph): Elora and Durham, Ontario.

ILIONIA GALTENSIS Whiteaves. See Prolucina galtensis.

Illonia? parvula Whiteaves.

Ilionia(?) parvula Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 288, pl. 28, figs. 6–8.

Niagaran: Ami Island near northeast shore of Lake Winnipegosis, Manitoba.

Illonia sinuata (Hall).

Anatina? sinuata Hall, Pal. New York, 3, 1859, p. 265, pl. 49, figs. 3a–3d.

Ilionia sinuata Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 15.—Schuchert, Amer. Geol., 31, 1903, p. 168.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 379.

Cayugan (Cobleskill and Manlius): Litchfield and Winfield, Herkimer County, New York.

ILLÆNOIDES Weller. Genotype: I. triloba Weller.

Illænoides Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 226.

Illænoides triloba Weller.

Illænoides triloba Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 226, pl. 17, figs. 6–9; pl. 19, figs. 12–14.

Niagaran (Racine): Bridgeport, Joliet, and near Lemont, Illinois.

ILLÆNURUS Hall. Genotype: I. quadratus Hall.

Illænurus Hall, 16th Ann. Rep. New York State Cab. Nat. Hist., 1863, p. 176; Trans. Albany Inst., 5, 1867, p. 167.—Zittel, Handb. Pal., 2, 1885, p. 612.—Miller, N. A. Geol. Pal., 1889, p. 550.

ILLÆNURUS COLUMBIANA Weller. See Smyphysurus convexus.

Illænurus convexus Whitfield.

Illænurus convexus Whitfield, Ann. Rep. for 1877, Wisconsin Geol. Surv., 1878, p. 66; Geol. Wisconsin, 4, 1882, p. 203, pl. 4, figs. 3–5.—Chamberlin, ibid., 1, 1883, p. 141, fig.

Ozarkian (Mendota): East of Baraboo, Wisconsin.

ILLÆNURUS EUREKENSIS Walcott. See Symphysurus eurekensis.

ILLÆNUS Dalman. Genotype: Entomostracites crassicauda Wahlenberg.

Illænus Dalman, Svenska Vet.-Akad. Handl., 1826, 1827, p. 248.—Dalman-Engelhart, Die Palaeaden, Nurnberg, 1828, p. 50.—Green, Mon. Tril. N. A., 1832, p. 18.—Portlock, Rep. Geol. Londonderry, 1843, p. 299.—Burmeister, Org. der Tril., Berlin, 1843, p. 118.—Goldfuss, Neues Jahrb. f. Min., etc., 1843, pp. 541, 553.—Emmrich, Neues Jahrb. f. Min., etc., 1845, p. 41.—Rouault, Bull. Soc. Geol. France, 2d ser., 4, 1847, p. 318.—Hawle and Corda, Abh. d. k. bohmischen Gesell. d. Wiss., 5, 1847 (extract), p. 54, pl. 3, fig. 29.—McCoy, Ann. Mag. Nat. Hist. (2), 4, 1849, p. 399.—Salter, Mem. Geol. Surv. United Kingdom, dec. 2, 1849, pls. 3, 4.—Barrande, Neues Jahrb. f. Min., etc., 1850, p. 779; Syst. Sil. du Centre Boheme, 1, 1852, p. 669.—McCoy, British Pal. Rocks Fossils, 1854, p. 171.—Angelin, Pal. Scandinavica, 3d ed., Holmiæ, 1854, p. 41.—Pictet, Traité de Pal., 2d ed., 2, 1854, p. 514.—Nieszkowski, Archiv. f. Naturk. Liv-, Ehst- u. Kurl. (1), 1, 1857, p. 579.—Hitchcock, Geol. Vermont, 1, 1862, p. 280.—Volborth, Mem. l'Acad. Imp. Sci. St. Peters-

ILLÆNUS—Continued.

burg, 7th ser., 6, 1863, p. 2.—Chapman, Canadian Jour. n. s., 8, 1863, p. 30.—Expos. Min., Geol., Canada, 1864, p. 138.—Salter, Mon. British Tril., Pal. Soc., 1867, pp. 180, 182.—Malaise, Desc. Terr. Sil. du Centre de la Belgique, 1873, p. 85.—Steinhardt, Beit. z. Naturk. Preus. Phys.-Oekon. Gesell., Konigsberg, 1874, p. 40.—Holm, Bihang K. Svenska Vet.-Hand., 7, 1882, pp. 12, 15.—Zittel, Handbuch d. Pal., 2, 1885, pp. 610, 611.—Holm, Mem. l'Acad. Imp. Sci. St. Petersburg, 7th ser., 33, 1886, pp. 18, 20, 42.—Clarke, Jour. Morph., 2, 1888, pp. 254, 264.—Miller, N. A. Geol. Pal., 1889, p. 550. Koken, Die Leitfossilien, Leipzig, 1896, p. 28, fig. 17, figs. 1–3.—Beecher, Amer. Jour. Sci., 4th ser., 3, 1897, p. 104, pl. 3, fig. 19.—Reed, Geol. Mag., dec. 4, 1, 1898, p. 499.—Beecher, Zittel-Eastman Textb. Pal., 1, 1900, p. 630.—Grabau, Bull. New York State Mus. 45, 1901, p. 222.—Jaekel, Zeits. d. d. geol. Gesell., 53, 1901, p. 149.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 222.—Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 34, 1901, pp. 25, 26, 57.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 292.—Raymond, Zittel-Eastman Textb. Pal., 1913, p. 719.

Illænus aboynensis Whiteaves.

Illænus aboynensis Whiteaves, Geol. Surv. Can., Pal. Foss., 3, pt. 2, 1895, p. 108, pl. 15, figs. 7–8.

Niagaran (Guelph): Aboyne, Ontario.

Illænus ambiguus Foerste.

Illænus ambiguus Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 106, pl. 14, figs. 9a, 9b, 10a–10c, 11; 15th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1887, p. 480, fig. 3, p. 478; Bull. Sci. Lab. Denison Univ., 2, 1887, p. 94; Proc. Boston Soc. Nat. Hist., 24, 1889, p. 267; Geol. Surv. Ohio, 7, 1893, p. 525, pl. 26, 9a–9b, 10a–10c, 11.

Upper Medinan (Brassfield): Dayton, Ohio; Hanover, Indiana.

Illænus americanus (Billings).

Illænus crassicauda Hall (not Wahlenberg), Pal. New York, 1, 1847, p. 24, pl. 4 (bis), fig. 13.—Marcou, Geol. Map U. S., Boston, 1853, p. 22, pl. 1, fig. 2.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 215, pl. 18, fig. 5; pl. 15, fig. 15; pl. 3, fig. 13; Manual Geol., 1860, p. 100, fig. 89.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 3, fig. 9.—Hitchcock, Geol. Vermont, 1, 1862, p. 280.—Chapman, Canadian Jour., n. s., 8, 1863, p. 30, fig. 143; p. 201, fig. 196a; Expos. Min., Geol. Canada, 1864, p. 138, fig. 143; p. 173, fig. 196a.—Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 322, pl. 3, fig. 1a, b.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 160, fig.—Brainerd and Seely, Bull. Amer. Mus. Nat. Hist., 3, 1890, p. 22.—Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 716.

Illænus americanus Billings, Canadian Nat. Geol., 4, 1859, p. 371; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 329, fig. 316a–d, 318.—Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 714, figs. 20–23.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 234.—Ruedemann, Bull. New York State Mus., 49, 1901, p. 61.—Raymond and Narraway, Ann. Carnegie Mus., 4, nos. 3, 4, 1908, pl. 60, figs. 1–3.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 295, fig. 1604.

Illænus taurus Hall, Rep. Geol. Surv. Wisconsin, 1861, p. 49.—Meek and Worthen; Geol. Surv. Illinois, 3, 1868, p. 320, pl. 3, fig. 2.—Miller, N. A. Geol. Pal., 1889, p. 551, fig. 1017.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 73, pl. 12, figs. 4–9.—Rowley, Missouri Bur. Geol. and Mines, 2d ser., 8; 1908, p. 57, pl. 15, fig. 1.

Trenton: Ottawa, L'Original, etc., Canada; New York; Illinois; Wisconsin, Minnesota; etc.

Illænus angusticollis Billings.

Illænus angusticollis Billings, Canadian Nat. Geol., 4, 1859, p. 376, fig. 10; Geol. Canada, Geol. Surv. Canada, 1863, p. 151, fig. 113a–d.—Raymond and Narraway, Ann. Carnegie Mus., 4, 1908, p. 245, pl. 61, figs. 1–5.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 294.

Black River: Island of St. Joseph, Grants Island, Lake Huron; La Petite Chaudiere, Hull, Canada.

Illænus arcturus Hall. See Thaleops arcturus.

Illænus arcuatus Billings.

Illænus arcuatus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 279, fig. 265.

Chazyan (Quebec-P): Cow Head, Newfoundland.

Illænus argentinus Kayser.

Illænus argentinus Kayser, Zeits. d. d. geol. Gesell., 49, 1897, p. 283, pl. 7, figs. 8, 9.

Ordovician: East of Jachal, San Juan, Argentina.

Illænus armatus Hall. See Bumastus armatus.

Illænus (Bumastus) barriensis Hall. See Bumastus ioxus.

Illænus bayfieldi Billings.

Illænus Bayfieldi Billings, Canadian Nat. Geol., 4, 1859, p. 369, figs. 4–6; Geol. Canada, Geol. Surv. Canada, 1863, p. 133, fig. 65a–c.—Raymond, Ann. Carnegie Mus., 3, 1905, p. 348, pl. 13, figs. 11, 12; 7th Rep. Vermont State Geol., 1910, pl. 35, figs. 11, 12.

Chazyan (Mingan): Mingan Islands, Canada.

Illænus chicagoensis Weller. See Bumastus chicagoensis.

Illænus clavifrons Billings. See Thaleops clavifrons.

Illænus conifrons Billings.

Illænus conifrons Billings, Canadian Nat. Geol., 4, 1859, p. 378, fig. 11; Geol. Canada, Geol. Surv. Canada, 1863, p. 151, figs. 111a, b.

Hydrolænus conifrons Salter, Mon. British Tril., Pal. Soc., 1867, p. 182 (gen. ref.).

Chazyan (Mingan): Mingan Islands, Canada.

Illænus conradi Billings.

Illænus Conradi Billings, Canadian Nat. Geol., 4, 1859, p. 372, figs. 7–9; Geol. Canada, Geol. Surv. Canada, 1863, p. 151, figs. 110a–c.—Vogdes, Occ. Papers California Acad. Sci., No. 4, 1893, p. 330.—Raymond and Narraway, Ann. Carnegie Mus., 4, 1908, p. 245, pl. 60, figs. 9, 10.

Black River (Leray): Falls of La Petite Chaudiere, vicinity of Ottawa, Canada.

Illænus consimilis Billings.

Illænus consimilis Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, pp. 277, 331, figs. 263a–c, 317, 318a.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 294, fig. 1604a.

Chazyan (Quebec—L, M, N): Point Rich and Table Head, Newfoundland.

Illænus consobrinus Billings.

Illænus consobrinus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 280, figs. 266a, b; p. 332, footnote, figs. 320a–c.

Chazyan (Quebec—P): Cow Head, Newfoundland.

Illænus cornigerus Hall and Whitfield.

Illænus cornigerus Hall and Whitfield, 24th Rep. New York State Mus. Nat. Hist., 1872, p. 186; 27th Rep. New York State Cab. Nat. Hist., 1875, pl. 13, figs. 20, 21.

Niagaran (Louisville?): Falls of the Ohio.

ILLÆNUS CRASSICAUDA? Hall (1847). See Bumastus erastusi.

ILLÆNUS CRASSICAUDA of American authors. See Illænus americanus.

ILLÆNUS CRASSICAUDA AMERICANA Billings. See Illænus americanus.

ILLÆNUS CUNICULUS Hall. See Bumastus cuniculus.

Illænus danielsi Miller and Gurley.

Illænus danielsi Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 3, 1893, p. 76, pl. 7, figs. 3–5.

Niagaran: Bonfield, near Kankakee, Illinois.

Illænus daytonensis Hall and Whitfield.

Illænus daytonensis Hall and Whitfield, Pal. Ohio, 2, 1875, p. 119, pl. 5, figs. 14–16.—Foerste, Bull. Sci. Lab. Denison Univ., 1, 1885, p. 104, pl. 14, figs. 4a–4b, 6, 7a–7c; Bull. Sci. Lab. Denison Univ., 2, 1887, p. 93, pl. 8, figs. 6–7; Geol. Surv. Ohio, 7, 1895, p. 525, pl. 26, figs. 4a–4b, 6, 7a–c; pl. 27, figs. 6, 10a; Proc Boston Soc. Nat. Hist., 24, 1889, p. 268; Jour. Geol., 11, 1903, p. 706.

Upper Medinan (Brassfield): Dayton, Fair Haven, etc., Ohio.

Illænus depressus Foerste.

Illænus depressus Foerste, Cincinnati Soc. Nat. Hist. Jour., 21, 1909, p. 33.

Clinton (West Union): Spring, Big Salt Lick Creek, and near Martins, Lewis County, Kentucky.

ILLÆNUS ERASTUSI Raymond. See Bumastus erastusi.

Illænus fraternus Billings.

Illænus fraternus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 276, figs. 262a, b.

Chazyan (Quebec—L, N, P): Point Rich, Table Head, and near Portland Creek, Newfoundland.

ILLÆNUS GLOBOSUS Billings. See Bumastus globosus.

ILLÆNUS GRAFTONENSIS Weller. See Bumastus graftonensis.

Illænus grandis Billings.

Illænus grandis Billings, Canadian Nat. Geol., 4, 1859, p. 380; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, pp. 27, 60 (loc. ref.).

Anticostian (Becsie River—Chicotte): Charleton Point, Gamache Bay, and Southwest Point, Anticosti.

ILLÆNUS HARRISI Weller. See Bumastus harrisi.

ILLÆNUS HERRICKI Foerste. See Thaleops ovata.

ILLÆNUS IMPERATOR Hall. See Bumastus imperator.

Illænus incertus Billings.

Illænus incertus Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 332, fig 319a, b.

Canadian (Beekmantown): Stanbridge, Quebec.

ILLÆNUS INDETERMINATUS Raymond. See Bumastus limbatus.

ILLÆNUS INDETERMINATUS Walcott. See Bumastus indeterminatus.

ILLÆNUS INSIONIS Hall. See Bumastus insignis.

ILLÆNUS (BUMASTUS) INSIONIS Meek. See Illænus springfieldensis.

ILLÆNUS IOXUS Chamberlin. See Bumastus ioxus.

Illænus latiaxiatus Raymond and Narraway.

Illænus latiaxiatus Raymond and Narraway, Ann. Carnegie Mus., 4, 1908, p. 243, pl. 60, figs. 4–8.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 295.

Black River: Tetreauville and Mechanicsville, near Ottawa, Canada; Pattersonville and Newport, New York.

Illænus latidorsatus Hall.

Illænus latidorsata Hall, Pal. New York, 1, 1847, p. 230, pl. 60, figs. 6a, b.

Trenton: Near Watertown, New York.

ILLÆNUS MADISONIANUS Whitfield. See Bumastus niagarensis.

ILLÆNUS MADISONIANUS var. DEPRESSA Foerste. See Bumastus niagarensis.

ILLÆNUS MADISONIANUS var. ELONGATUS Foerste. See Bumastus niagarensis.

ILLÆNUS MILLERI Billings. See Bumastus milleri.

ILLÆNUS (NILEUS) MINNESOTENSIS Foerste. See Nileus vigilans.

ILLÆNUS NIAGARENSIS Whitfield. See Bumastus niagarensis.

ILLÆNUS ORBICAUDA Billings. See Bumastus orbicaudatus.

ILLÆNUS ORBICAUDATUS Billings. See Bumastus orbicaudatus.

ILLÆNUS OVATUS Hall. See Thaleops ovata.

ILLÆNUS PTEROCEPHALUS Whitfield. See Thaleops? pterocephalus.

Illænus punctatus Raymond.

Illænus punctatus Raymond, Annals Carnegie Mus., 3, 1905, p. 347, pl. 13, fig. 10; 7th Rep. Vermont State Geol., 1910, p. 226, pl. 35, fig. 10.

Chazyan (Crown Point, Valcour): Crown Point and Valcour Island, New York.

Illænus simulator Billings.

Illænus simulator Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 327, fig. 315a, b.

Canadian (Beekmantown): Stanbridge, Quebec.

Illænus springfieldensis Meek.

Illænus (Bumastus) insignis? Meek, Pal. Ohio, 1, 1873, p. 189, figs. A, B, pl. 15, figs. 5a, c.

Illænus springfieldensis Meek, Pal. Ohio, 1, 1873, p. 129.

Niagaran (Guelph): Springfield, Ohio.

ILLÆNUS TAURUS Hall. See Illænus americanus.

Illænus transversalis Weller.

Illænus transversalis Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 2, 1907, p. 224, pl. 16, figs. 7–9.

Niagaran (Racine): Bridgeport, Illinois.

ILLÆNUS TRENTONENSIS Emmons. See Bumastus milleri.

Illænus tumidifrons Billings.

Illænus tumidifrons Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 278, fig. 264a, b.

Chazyan (Quebec P.): Cow Head, Newfoundland.

ILLÆNUS VINDEX Billings. See Thaleops vindex.

ILLÆNUS (BUMASTUS) WORTHENANUS Meek and Worthen. See Bumastus armatus.

INACHUS PERVETUS Conrad. See Euomphalus pervetus.

INACHUS UNDATUS Emmons (part). See Plectoceras? undatus.

INACHUS UNDATUS Conrad (part). See Plectoceras halli.

INDIANOCRINUS Miller and Gurley. Genotype: I. punctatus Miller and Gurley.

Indianocrinus Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 7, 1895, p. 83.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 748.—Bather, Treatise on Zool. (Lankester), pt. 3, 1900, p. 145.

Indianocrinus punctatus Miller and Gurley.

Indianocrinus punctatus Miller and Gurley, Bull. Illinois State Mus. Nat. Hist., 7, 1895, p. 83, pl. 5, figs. 8–13.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 748, fig. 1362.

Niagaran (Laurel): St. Paul, Indiana.

INOCAULIS Hall. Genotype: I. plumulosa Hall.

Inocaulis Hall, Amer. Jour. Sci. Arts, 2d ser., 11, 1851, p. 401; Pal. New York, 2, 1852, p. 176; 20th Rep. New York State Cab. Hist., 1868, p. 218, rev. ed., 1870, p. 252.—Nicholson, Mon. British Grapt., 1872, p. 131.—Spencer, Bull. Mus. Univ. State Missouri, 1, 1884, p. 33; Trans. Acad. Sci. St. Louis, 4, 1884, p. 562, 583.—Miller, N. A. Geol. Pal., 1889, p. 193.—James, Jour. Cincinnati Soc. Nat. Hist., 14, pt. 2, 1892, p. 161.—Pocta, Syst. Sil. Centre Bohème, 8, pt. 1, 1894, p. 197.—Elles and Wood, Mon. British Grapt., Pal. Soc., 1903, p. 34.—Ruedemann, Mem. New York State Mus., 2, 1908, p. 185.

INOCAULIS ANASTOMOTICA Ringueberg. See Palæodictyota anastomotica.

INOCAULIS ARBUSCULA Ulrich. See Dictyonema arbusculum.

INOCAULIS BELLA Hall and Whitfield. See Palæodictyota bella.

INOCAULIS CANADENSIS Whiteaves. See Dictyonema canadense.

Inocaulis cervicornis Spencer.

Inocaulis cervicornis Spencer, Canadian Nat., 10, 1882, p. 165, nom. nud.; Bull. Mus. Univ. State Missouri, 1, 1884, p. 37, pl. 5, fig. 5; Trans. Acad. Sci. St. Louis, 4, p. 587, pl. 5, fig. 5.—Gurley, Jour. Geol., 4, 1896, pp. 99, 308.—Bassler, Bull. U. S. Nat. Mus., 65, 1909, p. 51, fig. 65.

Niagaran dolomite: Hamilton, Ontario.

Inocaulis congregatus Gurley.

Inocaulis congregatus (Gurley MS.) Bassler, Bull. U. S. Nat. Mus., 65, 1909, p. 54, fig. 70.

Niagaran dolomite: Hamilton, Ontario.

Inocaulis diffusus Spencer.

Inocaulis diffusa Spencer, Canadian Nat., 10, 1882, p. 165, nom. nud.; Bull. Mus. Univ. State Missouri, 1, pp. 15, 36, 37, pl. 5, fig. 4; Trans. Acad. Sci. St. Louis, 4, pp. 565, 586, 587, pl. 5, fig. 4.—Gurley, Jour. Geol., 4, 1896, pp. 99, 308.—Bassler, Bull. U. S. Nat. Mus., 65, 1909, pp. 52, 53, figs. 67, 68.

Niagaran dolomite: Hamilton, Ontario.

Inocaulis diffusus crassiramus Gurley.

Inocaulis diffusus crassiramus (Gurley MS.) Bassler, Bull. U. S. Nat. Mus., 65, 1909, pp. 53, 54, fig. 69.

Niagaran dolomite: Hamilton, Ontario.

Inocaulis divaricatus Hall.

Inocaulis divaricata Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 225, pl. 1, fig. 3; Trans. Albany Inst., 10, 1883, p. 58.—Spencer, Bull. Mus. Univ. State Missouri, 1, 1884, p. 35; Trans. Acad. Sci. St. Louis, 4, 1884, p. 585.—Gurley, Jour. Geol., 4, 1896, pp. 99, 309.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 191.

Niagaran (Waldron): Waldron, Indiana.

Inocaulis flabellum James. See Licrophycus flabellum.

Inocaulis grantl (Dawson).

Buthotrephis Grantii Dawson, Quart. Jour. Geol. Soc. London, 46, 1890, p. 613, fig. 16; p. 614, fig. 17.

Inocaulis vegetabilis (Gurley MS.) Bassler, Bull. U. S. Nat. Mus., 65, 1909, p. 55 pl. 5, fig. 1.

Niagaran dolomite: Hamilton, Ontario.

Inocaulis phycoides Spencer.

Inocaulis phycoides Spencer, Canadian Nat., 10, 1882, p. 165, nom. nud.; Bull. Mus. Univ. State Missouri, 1, 1884, p. 38, pl. 5, figs. 6, 7, 7a; Trans. Acad. Sci. St. Louis, 4, 1884, p. 588, pl. 5, figs. 6, 7.—Gurley, Jour. Geol., 4, 1896, pp. 99, 309.—Bassler, Bull. U. S. Nat. Mus., 65, 1909, pp. 51, 52, fig. 66.

Niagaran dolomite: Hamilton, Ontario.

Inocaulis plumulosus Hall.

——— ——— Hall, Rep. Surv. 4th Dist. New York, 1843, p. 116, fig. 1.

Inocaulis plumulosa Hall, Pal. New York, 2, 1852, p. 176, pl. 40G, figs. 2a, b; Geol. Surv. Canada, dec. 2, 1865, p. 18, fig. 26; 20th Rep. New York State Cab. Hist., 1868, p. 185, fig. 28; rev. ed., 1870, p. 215, fig. 28.—Nicholson, Mon. British Grapt., 1872, p. 132, fig. 73.—Spencer, Canadian Nat., 8, 1878, p. 458; ibid., 10, 1882, p. 166.—Spencer, Bull. Mus. Univ. State Missouri, 1, 1884, pp. 14, 34, 35, pl. 5, fig. 1; Trans. Acad. Sci. St. Louis, 4, 1884, pp. 564, 584, 585, pl. 5, fig. 1.—Pocta, Sil. Syst. Boheme, 8, pt. 1, 1894, p. 197.—Gurley, Jour. Geol., 4, 1896, pp. 99, 309.—Miller, N. A. Geol. Pal., 1889, p. 193, fig. 183.—Ruedemann, Mem. New York State Mus., 11, 1908, p. 188, pl. 2, fig. 4; pl. 7, figs. 1, 2, fig. 93.—Bassler, Bull. U. S. Nat. Mus., 65, 1909, pp. 46–49, figs. 59–62.

Clinton (Rochester): Lockport, Rochester, etc., New York.

Niagaran dolomite: Hamilton, Ontario.

Plesiotypes.—Cat. No. 54281, U.S.N.M.

Inocaulis? problematica Spencer. See Dendrograptus? problematicus.

Inocaulis ramulosus Spencer.

Inocaulis ramulosa Spencer, Canadian Nat., 10, 1882, p. 165, nom. nud.; Bull. Mus. Univ. State Missouri, 1, p. 38, 1884, pl. 6, fig. 1; Trans. Acad. Sci. St. Louis, 4, 1884, p. 588, pl. 6, fig. 1.—Gurley, Jour. Geol., 4, 1896, pp. 99, 309.—Bassler, Bull. U. S. Nat. Mus., 65, 1909, pp. 49, 50, figs. 63, 64.

Niagaran dolomite: Hamilton, Ontario.

Inocaulis? strictus Gurley.

Inocaulis? strictus (Gurley MS.) Bassler, Bull. U. S. Nat. Mus., 65, 1909, p. 54, pl. 2, fig. 6; fig. 71.

Niagaran dolomite: Hamilton, Ontario.

Inocaulis? thallosus Gurley.

Inocaulis? thallosus (Gurley MS.) Bassler, Bull. U. S. Nat. Mus., 65, 1909, p. 55, pl. 2, fig. 5.

Niagaran dolomite: Hamilton, Ontario.

INOCAULIS VEGETABILIS (Gurley) Bassler. See Inocaulis granti.

INOCAULIS WALKERI Spencer. See Acanthograptus walkeri.

INTRICARIA Hall. See Chasmatopora Eichwald.

IOCRINUS Hall. Genotype: Actinocrinus subcrassus Meek and Worthen.

Iocrinus Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 210 (extract 1866, p. 5).—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, pp. 285, 293 (Rev. Pal., pt. 1, pp. 62, 70); ibid., 1886, p. 127; ibid., 1890, p. 380; Amer. Jour. Sci., 3d ser., 26, 1883, pp. 370, 376, fig. 4.—Walcott, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 210.—Miller, N. A. Geol. Pal., 1889, p. 256, fig. 345.—Bather, Ann. Mag. Nat. Hist., 6th ser., 5, 1890, p. 324, pl. 14, fig. 5; pl. 15, fig. 2; Kongl. Sv. Vet. Akad. Handl., 25, 1893, p. 21; Geol. Mag., dec. 4, 3, 1896, p. 73; ibid., dec. 4, 6, 1899, p. 42, footnote, fig. 18; Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 145, fig. 26, 1; 28; 58, 1.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 153.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 713.—Zittel, Handb. Pal., 1, 1910, p. 151.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 212.

Iocrinus crassus (Meek and Worthen).

Heterocrinus crassus Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, 1865, p. 147; Geol. Surv. Illinois, 3, 1868, p. 324, pl. 4, figs. 1a–c; Geol. Surv. Illinois, 6, 1875, p. 493, pl. 23, fig. 1.

Iocrinus crassus Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 295 (Rev. Pal., pt. 1, p. 72) (gen. ref.).

Richmond (Maquoketa): Kendall County, Illinois.

Iocrinus subcrassus Meek and Worthen).

Actinocrinus subcrassus Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, (1), 17, 1865, p. 148.

Heterocrinus subcrassus Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 325, pl. 4, figs. 5a–d.—Dyche, Science, 20, 1892, p. 66; Amer. Geol., 10, 1892, p. 30; Jour. Cincinnati Soc. Nat. Hist., 15, 1892, p. 101.

Heterocrinus (Iocrinus) subcrassus Meek and Worthen, Proc. Acad. Nat. Sci. Philadelphia, (1), 1871, 23 (3), 1, p. 310; Geol. Surv. Ohio, 1, pt. 2, p. 15, pl. 1, figs. 9a, b.

Iocrinus subcrassus—Continued.

Iocrinus subcrassus Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 295 (Rev. Pal., pt. 1, p. 72); ibid., 1890, p. 381, pl. 10, fig. 5.—Bather, Geol. Mag., dec. 4, 6, 1899, p. 35, fig. 11.—Miller, N. A. Geol. Pal., 1889, p. 257, fig. 346; Treatise on Zool., pt. 3, Echinoderma, London, p. 120, fig. 26, 1.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 726, pl. 4, figs. 7, 7a.

Heterocrinus? (Iocrinus) Polyxo Hall, 24th Rep. New York State Cab. Nat. Hist., 1872, p. 212, pl. 5, figs. 1–4 (extract, 1871).

Trenton–Richmond: Cincinnati, Ohio, and vicinity; Indiana; Kentucky.

Iocrinus trentonensis Walcott.

Iocrinus trentonensis Walcott, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 210, pl. 17, figs. 7, 8.

Trenton: Trenton Falls, New York.

ISCHADITES Murchison. Genotype: Tetragonis murchisoni Eichwald.

Ischadites Murchison, Siluria, 1837, p. 697.—Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 86.—Gumbel, Abh. d. Math.-Phys. Classe d. k. Bay. Akad. d. Wiss., 12, 1 Abth., 1875, p. 172.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1878, p. 19.—Zittel., Handb. Pal., 1, 1880, p. 728.—Roemer, Leth. Geog., 1, Theil, Leth. Pal., Erste Lief, 1880, p. 291.—Hinde, Quart. Jour. Geol. Soc. London, 11, 1884, p. 810.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 9, 1886, pp. 246, 249.—Schluter, Zeits. d. d. geol. Gesell., 39, 1887, p. 7.—Geinitz, ibid., 40, 1888, p. 19.—Rauff, ibid., 40, 1888, p. 606.—Hinde, Mon. British Foss. Sponges, Palaeontographical Soc., 1888, p. 119.—Rauff, Abh. d. math.-phys. Classe d. k. bayer. Akad. Wiss., 18, 3, Abth., 1892, p. 692.—Winchell and Schuchert, Geol. Minnesota, 3. pt. 1, 1895, p. 61, pl. F, figs. 5–10; Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 72.

Palæospongia D'Orbigny, Prodr. de Pal., 1, 1849, p. 26.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 540.—Bornemann, Nova Acta der Ksl. Leop.-Carol. Deutschen Akad. der Natur., 51, 1886, p. 21.—Hinde, Geol. Mag., dec. 3, 4, 1887, p. 228.—Miller, N. A. Geol. Pal., 1889, p. 162.—Rauff, Neues Jahrb. f. Min., Geol. Pal., 2, 1891, p. 92. (Genotype, ——— cyathiformis Hall.)

Tetragonis Eichwald, Urwelt. Russlands, heft 2, 1842, p. 81.—Chapman, Canadian Jour., n. s., 2, 1857, p. 304.—Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 386.—Roemer, Leth. Geog., 1 Theil, Leth. Pal., Erste Lief, 1880, p. 303.—Zittel, Handb. Pal., 1, 1880, p. 728.—Roemer, Zeits. d. d. Gesell., 35, 1883, pp. 705, 707.

Selenoides Owen, Geol. Surv. Wisconsin, Iowa, and Minnesota, 1852, p. 586.

Dictyocrinus Hall, Pal. New York, 3, 1859, p. 135.

Receptaculites (part) Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 378.

Ischadites canadensis Billings.

Ischadites canadensis Billings, Geol. Canada, 1863, p. 309, fig. 313; p. 327.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, Pal., 1895 (ext., 1893), p. 66.

Receptaculites canadensis Billings, Pal. Foss., 1, 1865, p. 384, fig. 363; Canadian Nat. Geol., 2d ser., 2, 1865, p. 191, fig. 10.—Roemer, Leth. Pal., 1880, p. 289.—Hinde, Quart. Jour. Geol. Soc. London, 40, 1884, p. 844.

Niagaran (Lockport?): Township of Esquesing, Ontario.

Ischadites circularis (Emmons).

Receptaculites circularis Emmons, Amer. Geology, 1, pt. 2, 1855, p. 230, fig. 82; Man. Geol., 1860, p. 103, fig. 93.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 852, fig.—James, Jour. Cincinnati Soc. Nat. Hist., 14, p. 63, pt. 1.

Ischadites circularis—Continued.

Ischadites circularis Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p.65.
Lorraine shales: New York.

Ischadites cyathiformis (Hall).

——— cyathiformis Hall, Pal. New York, 1, 1847, p. 72, pl. 25, figs. 6a–6c.
Ischadites cyathiformis Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 65 (extr., 1893).
Palæospongia cyathiformis d'Orbigny, Prodr. d. Pal., 1, 1849, p. 26 (gen. ref.).
Palæochonia cyathiformis Fromental, Introduction Etude Eponges Foss., Caen., 1859, p. 45.
Mohawkian (Chambersburg): Carlisle, Pennsylvania.

Ischadites dickhauti James. See Lepidolites dickhauti.

Ischadites elongatus James. See Lepidolites dickhauti.

Ischadites hemisphericus Winchell and Marcy. See Receptaculites hemisphericus.

Ischadites insularis (Billings).

Receptaculites? insularis Billings, Cat. Silurian Foss. Anticosti, Geol. Surv. Canada, 1866, p. 29.—Hinde, Quart. Jour. Geol. Soc. London, 40, 1884, p. 846.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 61 (extr., 1893).
Gamachian (Ellis Bay): Gamache Bay, Anticosti.

Ischadites iowensis (Owen).

Selenoides iowensis Owen, Geol. Surv. Wisconsin, Iowa, Minnesota, 1852, p. 587, pl. 2B, fig. 13.
Receptaculites (Selenoides) iowensis Hall, Rep. Geol. Surv. Wisconsin, 1861, p. 14.—Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 385, fig. 364.—Hall, 16th Ann. Rep. New York State Cab. Nat. Hist., 1863, pp. 68, 69.—Billings Canadian Nat. and Geol., 2d ser., 2, 1865, p. 191, fig. 11.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 852, fig.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 2, 1893, p. 64, pl. F, figs. 5–6.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 143.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 153.
Receptaculites (Ischadites) iowensis Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 19, fig. 30.
Orbitulites reticulata Owen, Geol. Rep. Iowa, Wisconsin, Illinois, 1844, pl. 18, fig. 7.
Receptaculites reticulata Hall, Rep. Supt. Geol. Surv. Wisconsin, 1861, p. 11 (gen. ref.).
Receptaculites fungosum Hall, Rep. Geol. Surv. Wisconsin, 1861, p. 15.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 45, pl. 5, figs. 5, 6.
Receptaculites globulare Hall, Rep. Geol. Surv. Wisconsin, 1861, p. 16.—Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 301, pl. 2, figs. 2a–b.—Whitfield, Mem. Amer. Mus. Nat. Hist., 1, pt. 2, 1895, p. 44, pl. 5, fig. 7.
Receptaculites sp. Meek and Worthen, Geol. Surv. Illinois, 3, 1868, pt. 3, p. 301, pl. 2, figs. 1a, b.
Ischadites kœnigii (part) Hinde, Quart. Jour. Geol. Soc. London, 40, 1884, p. 836.
Trenton (Prosser-Galena): Iowa; Illinois; Wisconsin; Minnesota and Manitoba.

Ischadites kœnigii Hinde (part). See Ischadites iowensis and I. subturbinatus.

Ischadites subturbinatus Hall.

Receptaculites subturbinatus Hall, Trans. Albany Inst., 4, 1863, p. 224; 28th Rep. New York State Mus. Nat. Hist., 1879, p. 103, pl. 3, figs. 1–3 (doc. ed., 1875 (1877), pl. 3, figs. 1–3); 11th Rep. State Geol. Indiana, 1882, p. 221, pl. 2, figs. 1–3.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 855, text figs.

Ischadites subturbinatus Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895 (ext., 1893), p. 66.

Ischadites kœnigii (part) Hinde, Quart. Jour. Geol. Soc. London, 40, 1884, p. 836.

Niagaran (Waldron): Waldron, Indiana.

ISCHADITES TESSELATUS Winchell and Marcy. See Receptaculites tesselatus.

ISCHYRINIA Billings. Genotype: I. winchelli Billings.

Ischyrinia Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 16.—Miller, N. A. Geol. Pal., 1889, p. 483.

Ischyrina Clarke, Mem. New York State Mus., 6, 1904, p. 406, expl. pl. 9.

Observation.—Probably the same as Technophorus.

ISCHYRINIA PLICATA Billings. See Technophorus plicata.

Ischyrinia winchelli Billings.

Ischyrinia Winchelli Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1886, p. 16, figs. 4a–4c.—Miller, N. A. Geol. Pal., 1889, p. 483, fig. 834.

Richmond (English Head and Charleton): Macasty Bay, Anticosti.

Plastotype.—Cat. No. 46204, U.S.N.M.

ISCHYRODONTA Ulrich. Genotype: I. truncata Ulrich.

Anodontopsis (part) Meek, Amer. Jour. Sci. Arts, 3d ser., 2, 1871, p. 209; also 1873, Ohio Pal., 1, p. 141.

Ischyrodonta Ulrich, Amer. Geol., 6, 1890, p. 173; Geol. Surv. Ohio., 7, 1893, p. 671.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 981.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 416.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 700.

ISCHYRODONTA CURTA Foerste. See Ischyrodonta unionoides.

Ischyrodonta decipiens Ulrich.

Ischyrodonta decipiens Ulrich, Geol. Surv. Ohio, 7, 1893, p. 673, pl. 54, figs. 16–19.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 999, pl. 45, figs. 3–3c.

Richmond (Elkhorn): Near Richmond, Indiana.

Cotypes.—Cat. Nos. 46205, 46206, U.S.N.M.

Ischyrodonta elongata Ulrich.

Ischyrodonta elongata Ulrich, Amer. Geol., 6, 1890, p. 175, figs. 12a–c; Geol. Surv. Ohio, 7, 1893, p. 675, pl. 54, figs. 20, 21.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1000, pl. 45, figs. 4, 4a.

Richmond (Whitewater): Oxford, Ohio; Richmond, Indiana.

Holotype and *plesiotype.*—Cat. Nos. 46207, 46208, U.S.N.M.

Ischyrodonta miseneri Ulrich.

Ischyrodonta miseneri Ulrich, Rep. Geol. Surv. Ohio, 7, 1893, p. 675, pl. 54, figs. 10, 11.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1001, pl. 45, figs. 5, 5a.

Cypricardites miseneri Miller, N. A. Geol. Pal., 2d App., 1897, p. 781 (gen. ref.).

Richmond (Whitewater): Richmond, Indiana.

Holotype.—Cat. No. 46209, U.S.N.M.

Ischyrodonta modiolliformis Ulrich.

Ischyrodonta modioliformis Ulrich, Geol. Surv. Ohio, 7, 1893, p. 676, pl. 54, figs. 4–9.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1001, pl. 45, figs. 6, 6c.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 416, fig. 539.

Richmond (Whitewater): Richmond, Indiana.

Cotypes.—Cat. No. 46210, U.S.N.M.

Ischyrodonta ovalis Ulrich.

Ischyrodonta ovalis Ulrich, 19th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1892, p. 242, fig. 27; Geol. Surv. Ohio, 7, 1893, p. 674, pl. 54, figs. 12–15; Geol. Minnesota, 3, pt. 2, 1894, p. 477, fig. 35.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1002, pl. 45, figs. 7–7b.

Cypricardites ovalis Miller, N. A. Geol. Pal., 2d App., 1897, p. 781 (gen. ref.).

Richmond (Whitewater): Near Richmond, Indiana.

Holotype.—Cat. No. 46211, U.S.N.M.

Ischyrodonta truncata Ulrich.

Ischyrodonta truncata Ulrich, Amer. Geol., 6, 1890, p. 174, fig. 11.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 700, fig. 1258.—Ulrich, Geol. Surv. Ohio, 7, 1893, p. 672, fig. 1.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1003, pl. 45, figs. 8–8c.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 416, fig. 540.

Richmond (Whitewater): Oxford, Ohio, and Richmond, Indiana.

Cotypes.—Cat. No. 46212, U.S.N.M.

Ischyrodonta unionoides (Meek).

Anodontopsis? unionoides Meek, Amer. Jour. Sci. Arts, 2, 1871, p. 299.

Anodontopsis (Modiolopsis?) unionoides Meek, Pal. Ohio, 1, 1873, p. 141, pl. 12, figs. 2a, b.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 227.

Modiolopsis unionoides Miller, N. Amer. Geol. Pal., 1890, p. 491 (gen. ref.).

Ischyrodonta unionoides Ulrich, Geol. Surv. Ohio, 7, 1893, p. 677, pl. 54, figs. 1–3.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1004, pl. 46, figs. 1, 1a.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 416, fig. 538.

Ischyrodonta curta Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 298, pl. 3, fig. 14.

Maysville (Bellevue): Cincinnati, Ohio, and vicinity. Pulaski shales of New York and Canada.

Plesiotypes.—Cat. No. 46213, U.S.N.M.

Isoarca logani Woodward. See Ctenodonta nasuta.

ISOCHILINA Jones. Genotype: Leperditia ottawa Jones.

Isochilina Jones, Geol. Surv. Canada, dec. 3, 1858, p. 97; Ann. Mag. Nat. Hist., 3d ser., 1, 1858, p. 248; Monthly Microsc. Jour., 4, 1870, p. 191.—Barrande, Syst. Sil. du Centre Boheme, 1, Suppl., 1872, p. 533.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 7th ser., 21, No. 2, 1873, p. 8.—Zittel, Handb. Pal., 2, 1885, p. 552.—Vogdes, Annals New York Acad. Sci., 5, 1889, p. 22, pl. 2, fig. 18.—Miller, N. A. Geol. Pal., 1889, p. 551.—Koken, Die Leitfossilien, Leipzig, 1896, p. 40.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 307.—Ulrich, Zittel-Eastman Textb. Pal., 1, 1900, p. 643.—Grabau, Bull. New York State Mus., 45, 1901, p. 218; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 218.—Jaekel, Zeits. geol. Gesell., 53, 1901, p. 149.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 341.—Bassler, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 737.

ISOCHILINA AMIANA Ulrich. See Isochilia gregaria.

ISOCHILINA AMIANA var. INSIGNIS Ulrich. See Isochilina cristata.

Isochilina amii Jones.

Isochilina Amii Jones, Cont. Micro-Pal., Geol. Surv. Canada, pt. 3, 1891, p. 68, pl. 10, figs. 14a, -b.

Trenton: Lorette, Quebec.

Isochilina ampla Ulrich.

Isochilina ampla Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, pt. 1, 1891, p. 179, pl. 11, figs. 8a-d.

Trenton (Cathcys): Nashville, Tennessee.

Cotypes.—Cat. No. 41291, U.S.N.M.

Isochilina armata (Walcott).

Leperditia (Isochilina) armata Walcott, 35th Rep. New York State Mus. Nat. Hist., 1884, p. 213, pl. 17, fig. 10 (extract, 1883, p. 7).

Isochilina kentuckiensis Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1891, p. 179, pl. 11, figs. 11a–11d.

Black River (Lowville): Russia, Herkimer County, New York; High Bridge and Frankfort, Kentucky.

Plesiotype.—Cat. No. 43155, U.S.N.M. (Holotype of I. kentuckiensis.)

Isochilina armata pygmæa Ruedemann.

Isochilina armata pygmæa Ruedemann, Bull. New York State Mus., 49, 1901, p. 72, pl. 7, figs. 19–25.

Mohawkian (Rysedorph): Rysedorph Hill, Rensselaer County, New York.

Isochilina? clavigera (Jones).

Beyrichia clavigera Jones, Geol. Surv. Canada, Cont. Micro-Pal., pt. 3, 1891, p. 65, pl. 11, fig. 7.

Isochilina? clavigera Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 282, fig. 3.

Stones River (Pamelia): Aylmer, Quebec.

Plesiotype.—Cat. No. 41653, U.S.N.M.

Isochilina clavigera clavifracta (Jones).

Beyrichia clavigera clavifracta Jones, Geol. Surv. Canada, Cont. Micro-Pal., pt. 3, 1891, p. 65, pl. 11, fig. 8.

Stones River (Pamelia): Aylmer, Quebec.

Isochilina cristata (Whitfield).

Primitia? cristata Whitfield, Bull. Amer. Mus. Nat. Hist., 2, 1889, p. 59, pl. 13, figs. 1, 2.—Lesley, Geol. Surv. Pennsylvania Rep. P 4, 1889, p. 743, figs.

Isochilina cristata Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 23, pl. 1, fig. 8.—Seely, Vermont State Geol., Rep., 7, 1910, pl. 61, fig. 15.

Isochilina amiana var. insignis Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, pt. 1, 1891, p. 181, pl. 11, fig. 13.

Canadian (Beekmantown): Cave Island, Ball's Bay, Lake Champlain; drift at Ottawa, Ontario.

Plesiotype.—Cat. No. 41290, U.S.N.M. (Holotype of I. amiana insignis).

ISOCHILINA CYLINDRICA Grabau. See Leperditia cylindrica.

Isochilina gracilis (Jones).

Leperditia (Isochilina) gracilis Jones, Ann. Mag. Nat. Hist. (3), 1, 1858, p. 248, pl. 10, fig. 2; Geol. Surv. Canada, dec. 13, 1858, p. 98, pl. 11, fig. 15.

Isochilina gracilis—Continued.

Isochilina gracilis Jones, Monthly Micros. Jour., 4, 1870, p. 185, pl. 61, fig. 18.—Dwight, Trans. Vassar Bros. Inst., 5, 1890, p. 76.

Trenton or Black River: White Horse Rapids, Isle Jesus, Canada.

ISOCHILINA GRANDIS Jones. See Isochilina grandis latimarginata.

Isochilina grandis latimarginata (Jones).

Leperditia marginata? Jones (not Keyserling), Ann. Mag. Nat. Hist., 2d ser., 17, 1856, p. 94, 100, pl. 7, figs. 14a–d.

Isochilina grandis Jones (not Schrenk), Ann. Mag. Nat. Hist., 5th ser., 8, 1881, p. 347; ibid., 9, 1882, p. 171.

Isochilina grandis var. latimarginata Jones, Cont. Micro-Pal., Geol. Surv. Canada, pt. 3, 1891, p. 78, pl. 10, figs. 1–4.

Niagaran: Long Point, Lake Winnipegosis, Cedar Lake, and Saskatchewan River, Canada.

Isochilina gregaria (Whitfield).

Primitia gregaria Whitfield, Bull. Amer. Mus. Nat. Hist., 2, 1889, p. 58, pl. 13, figs. 3–5.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 743, figs.

Isochilina gregaria Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 22, pl. 1, figs. 9, 10.—Seely, Vermont State Geol. Rep., 7, 1910, pl. 61, figs. 16, 17.

Isochilina ottawa Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 551.

Isochilina Ottawa var. intermedia Jones, Contr. Micro-Pal., Geol. Surv. Canada, pt. 3, 1891, p. 66, pl. 10, figs. 10a, b, 11a, b.

Isochilina amiana Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, pt. 1, 1891, p. 180, pl. 11, figs. 12a–c.

Canadian (Beekmantown): Cave Island, Ball's Bay, Vermont; drift at Ottawa, Ontario.

Plesiotype.—Cat. No. 41289, U.S.N.M. (Holotype of I. amiana.)

Isochilina gregaria ulrichiana Jones.

Isochilina gregaria ulrichiana Jones, Geol. Mag., dec. 4, 10, 1903, p. 301, figs. 1, 2a, b.

Trenton(?): Hamilton, Ontario (drift).

Isochilina jonesi Wetherby.

Isochilina jonesi Wetherby, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 80, pl. 2, figs. 7, 7a.—Miller, N. A. Geol. Pal., p. 552, fig. 1018.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, pt. 1, 1891, p. 179, pl. 11, figs. 9a–c.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 342, figs. 1656l–n.

Trenton (Perryville): Mercer County, Kentucky.

ISOCHILINA KENTUCKIENSIS Ulrich. See Isochilina armata.

ISOCHILINA LABELLOSA Jones. See Leperditella? labellosa.

Isochilina labrosa Jones.

Isochilina labrosa Jones, Ann. Mag. Nat. Hist., 6th ser, 3, 1889, p. 383, figs. 3, 4; pl. 17, fig. 11.—Chapman, Proc. Roy. Soc. Victoria, n. s., 17, pt. 1, 1904, p. 299, pl. 16, fig. 3.

Silurian: Cap Bon Ami, New Brunswick; ?Cave Hill, Lilydale, Victoria.

Isochilina musculosa Foerste.

Isochilina musculosa Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1909, p. 30, pl. 1, fig. 2.

Cayugan (Kokomo): Kokomo, Indiana.

Isochilina ottawa (Jones).

Leperditia (Isochilina) Ottawa Jones, Ann. Mag. Nat. Hist., 3d ser., 1, 1858, p. 243, pl. 10, fig. 1; Geol. Surv. Canada, dec. 3, 1858, p. 97, pl. 11, fig. 14.

Isochilina ottawa Jones, Ann. Mag. Nat. Hist., 5th ser., 14, 1884, p. 345; Cont. Micro-Pal., Geol. Surv. Canada, pt. 3, 1891, p. 66.

Leperditia Ottawa Dwight, Vassar Bros. Inst., 5, 1890, p. 76.

Canadian (Beekmantown): Grenville, Quebec.

ISOCHILINA OTTAWA var. Jones. See Isochilina gregaria.

ISOCHILINA OTTAWA var. INTERMEDIA Jones. See Isochilina gregaria.

Isochilina panolensis Foerste.

Isochilina panolensis Foerste, Bull. Kentucky Geol. Surv., 7, 1906, p. 328; Jour. Cincinnati Soc. Nat. Hist., 21, 1909, p. 30, pl. 1, fig. 1.

Clinton (Waco): Panola and near Irvine, Kentucky.

Isochilina saffordi Ulrich.

Isochilina saffordi Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1891, p. 178, pl. 11, figs. 10a–d.

Trenton (Catheys): Nashville, Tennessee.

Holotype.—Cat. No. 41288, U.S.N.M.

ISOCHILINA SCOFIELDI Miller. See Macronotella scofieldi.

Isochilina seelyi (Whitfield).

Primitia Seelyi Whitfield, Bull. Amer. Mus. Nat. Hist., 2, 1889, p. 60, pl. 13, figs. 6, 7.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 744, figs.

Isochilina seelyi Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 22, pl. 1, fig. 7.—Seely, Vermont State Geol. Rep., 7, 1910, pl. 61, fig. 17.

Canadian (Beekmantown): Shoreham, Vermont; Providence Island, Lake Champlain.

Isochilina? subnodosa Ulrich.

Isochilina subnodosa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1891, p. 177, pl. 11, figs. 7a–c.—Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 282, fig. 2.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 342, figs. 1656i–k.

Trenton (Perryville): Perryville, etc., Kentucky.

Holotype.—Cat. No. 41294, U.S.N.M.

Isochilina whiteavesi Jones.

Isochilina whiteavesii Jones, Cont. Micro-Pal., Geol. Surv. Canada, pt. 3, 1891, p. 68, pl. 10, figs. 13a, b.

Trenton: Lorette Falls, Quebec.

ISOGRAPTUS GIBBERULUS Moberg. See Didymograptus (Isograptus) caduceus.

ISOTELOIDES Raymond. Genotype: I. whitfieldi Raymond.

Isoteloides Raymond, Ann. Carnegie Mus., 7, No. 1, 1910, pp. 36, 67; 7th Rep. Vermont State Geol., 1910, p. 223; Trans. and Proc. Roy. Soc. Canada, 5, 3d ser., sec. 4, 1912, p. 115.

Isoteloides angusticaudus (Raymond).

Isotelus angusticaudum Raymond, Ann. Carnegie Mus., 3, 1905, p. 345, pl. 13, figs. 3, 4.

Isoteloides angusticaudus Raymond, 7th Rep. Vermont State Geol., 1910, p. 223, pl. 35, figs. 3, 4; pl. 37, fig. 7; pl. 38, fig. 1; pl. 39, fig. 8; Ann. Carnegie Mus., 7, 1910, p. 68, pl. 17, fig. 7; pl. 18, fig. 1; pl. 19, fig. 8.—Perkins, Rep. Vermont State Geol., 8th ser., 1912, pl. 18, fig. 1.

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

Isoteloides homalonotoides (Walcott).

Asaphus homalonotoides Walcott, 31st Rep. New York State Mus. Nat. Hist., 1879, 1880, adv. sheets Sept. 20, 1877, p. 70.—Whitfield, Geol. Wisconsin, 4, 1882, p. 237, pl. 5, fig. 4.

Asaphus triangulatus Whitfield, Ann. Rep. for 1879, Wisconsin Geol. Surv., 1880, p. 59.

Isoteloides homalonotoides Raymond, Ann. Carnegie Mus., 7, 1910, p. 52, pl. 16, figs. 9–11.

Black River: Dunleith, Illinois; Grant County, Wisconsin; Pattersonville, New York; Ottawa, Canada.

Trenton: Smiths Basin, New York.

Isoteloides whitfieldi Raymond.

Asaphus canalis Whitfield (not Hall), Bull. Amer. Mus. Nat. Hist., 1, 1886, p. 336, pl. 34, figs. 1–8; ibid., 2, 1889, p. 64, pls. 11, 12.—Seely, Vermont State Geol., Rep. 7, 1910, pl. 58.

Isotelus canalis Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 291, fig. 1600.

Isoteloides whitfieldi Raymond, Ann. Carnegie Mus., 7, 1910, p. 36, pl. 16, figs. 1–4, fig. 4.

Canadian (Beekmantown): Crown Point, New York; Fort Cassin, Vermont.

ISOTELUS DeKay. Genotype: I. gigas DeKay.

Isotelus DeKay, Ann. Lyceum Nat. Hist. New York, 1, p. 174.—Green, Mon. Tril. N. A., 1832, pp. 17, 64.—Edwards, Hist. Nat. d. Crust., 3, 1840, p. 297.—Portlock, Rep. Geol. Londonderry, 1843, p. 293.—Goldfuss, Neues Jahrb. f. Min., etc., 1843, pp. 541, 554.—McCoy, Ann. Mag. Nat. Hist., (2), 4, 1849, p. 399; British Pal. Rocks, Fossils, 1854, p. 169.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 215.—Salter, Mem. Geol. Surv. United Kingdom, dec. 11, 1864, pl. 3; Mon. British Tril., Pal. Soc., 1866, p. 147.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 137.—Zittel, Handb. Pal., 2, 1885, p. 608.—Brögger, Afh. Sveriges Geol. Unders., ser. C, No. 82, 1886, p. 31; Bihang till K. Sven. Vet.-Akad. Handl., 11, No. 3, 1886, p. 31.—Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 700.—Koken, Die Leitfossilien, Leipzig, 1896, p. 28.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 8th ser., 6, 1898, pp. 11, 12, 33.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1052.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 291.—Slocom, Field Mus. Nat. Hist., Geol. Ser., 4, 1913, p. 47.—Raymond, Trans. and Proc. Roy. Soc. Canada, 5, 3rd ser., sec. 4, 1912, p. 115; Zittel-Eastman Textb. Pal., 1913, p. 719.

Isotelus alacer Billings. See Brachyaspis alacer.

Isotelus angusticaudus Raymond. See Isoteloides angusticaudus.

Isotelus arenicola Raymond.

Isotelus arenicola Raymond, Ottawa Nat., 24, 1910, p. 130, figs. 1, 2 (?pl. 2, fig. 5).

Chazyan (Aylmer): Deschenes and Britannia, near Ottawa, and West Hawkesbury, Canada.

Isotelus? bearsi Raymond. See Vogdesia bearsi.

Isotelus benjamini Ulrich.

Isotelus benjamini Ulrich in Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 144, fig. 4.

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

Isotelus beta Raymond.

Asaphus sp. beta Raymond, Ann. Carnegie Mus., 3, 1905, p. 342, pl. 12, fig. 9.

Isotelus beta Raymond, 7th Rep. Vermont State Geol., 1910, pl. 36, fig. 9, pl. 39, figs. 4–7; Ann. Carnegie Mus., 7, 1910, p. 67, pl. 19, figs. 4–7.

Chazyan (Crown Point, Valcour): Crown Point, Valcour Island, Plattsburgh, and Chazy, New York.

Isotelus canalis Hall.

Isotelus canalis (Conrad MS.) Hall, Pal. New York, 1, 1847, p. 25, pl. 4 (bis), figs. 17–19.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 236, pl. 3, figs. 17–19.

Asaphus canalis Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 70 (gen. ref.).—Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 270, figs. 255a, b; p. 352, fig. 340.

Chazyan: Chazy, New York; Newfoundland.

Observation.—Neither defined nor figured so as to be recognized.

ISOTELUS CANALIS Clarke. See Isotelus gigas.

ISOTELUS CANALIS Grabau and Shimer. See Isoteloides whitfieldi.

ISOTELUS CANALIS Weller. See Asaphellus gyracanthus.

Isotelus covingtonensis Ulrich.

Isotelus covingtonensis Ulrich in Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1914, p. 145, figs. 1, 2.

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

Isotelus cyclops Green.

Isotelus cyclops Green, Monthly Amer. Jour. Geol., 2, 1832, p. 560, pl., fig. 7; Mon. Tril. N. A., 1832, p. 69, fig. 7, cast 24.

Middle Ordovician: Western New York.

Plastotype.—Cat. No. 25703, U.S.N.M.

ISOTELUS EMORYI Walcott. See Onchometopus emoryi.

ISOTELUS FLORENCEVILLENSIS Calvin. See Onchometopus susae.

ISOTELUS GIGAS of authors. See Isotelus jacobus, I. latus, and I. iowensis.

Isotelus gigas DeKay.

Isotelus gigas DeKay, Annals Lyceum Nat. Hist. New York, 1, 1824, p. 176, pl. 12, fig. 1; pl. 13, fig. 1.—Green, Monthly Amer. Jour. Geol., 1832, p. 560; Mon. Tril. N. A., 1832, p. 71, cast 21, 22.—Milne-Edwards, Crust., 3, 1840, p. 298.—Troost, 5th Geol. Rep. Tennessee, 1840, p. 57.—Vanuxem, Nat. Hist. New York, Geol., 3, 1842, p. 47, fig. 1.—Emmons, ibid., 2, 1842, p. 389, fig. 1.—Mather, ibid., 1, 1843, p. 397, fig. 1.—Goldfuss, Neues Jahrb. f. Min., etc., 1843, p. 554.—Owen, Amer. Jour. Sci., 47, 1844, p. 363, fig. 1.—Hall, Pal. New York, 1, 1847, p. 25, pl. 4 (bis), fig. 16; p. 231, pl. 60, figs. 7a–i; pl. 61, figs. 3a–f, 3i–m, 4a–c; pl. 62, figs. 1a–c, 2; pl. 63; also p. 254, pl. 66, fig. 5.—Emmons, Amer. Geology, 1, pt. 2, 1855, p. 215, pl. 16, figs. 9–12.—Billings, Canadian Nat. Geol., 1, 1856, pp. 45, 46, figs. 9, 11.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 819, fig. 610.—Emmons, Man. Geol., 1860, p. 100, fig. 89.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, pl. 3, fig. 11.—Hitchcock, Geol. Vermont, 2, 1862, pl. 12, fig. 5.—Chapman, Expos. Min., Geol. Canada, 1864, p. 136, fig. 140.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 302, figs.—Clarke, Geol. Minnesota, 3, pt 2, 1894, p. 701, figs. 6–8; p. 706.—Schuchert, Proc. U. S. Nat. Mus., 22, 1900, p. 174.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 192, pl. 14, figs. 6, 7.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 292, fig. 1601.—Raymond, Ann.

Isotelus gigas—Continued.

Carnegie Mus., 7, 1910, p. 53, pl. 15, figs. 1, 2.—Ruedemann, Bull. New York State Mus., 162, 1912, p. 116, pl. 10, fig. 1.—Slocom, Field Mus. Nat. Hist., Geol. Ser., 4, 1913, p. 47.—Raymond, Roy. Soc. Canada, Trans. and Proc., 3d ser., 5, sec. 4, 1912, p. 119, pl. 2, figs. 7, 9; p. 120, pl. 3, fig. 6; Bull. Mus. Comp. Zool., 58, 1914, p. 248, pl. 1, figs. 1, 2; pl. 2, figs. 2–5; pl. 3, fig. 3.

Asaphus gigas Dalman, K. K. Akad. Handl. for 1826, 1827, p. 276.—Packard, Amer. Nat., 14, 1880, pp. 505–508, figs. 2–4.—Nicholson and Etheridge, Mon. Sil. Foss. Girvan Dist., 1880, p. 153, pl. 10, figs. 18, 19.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 160, fig.—Miller, N. A. Geol. Pal., 1889, p. 531, fig. 967.—Rowley, Missouri Bur. Geol., Mines, 2d ser., 8, 1908, p. 57, pl. 15, fig. 2.

Asaphus (Isotelus) gigas Hall, Rep. Geol. Surv. Wisconsin, 1862, p. 41, fig. 5.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 138.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 232.

Asaphus platycephalus Stokes, Trans. Geol. Soc. London, 2d ser., 1, 1824, p. 208.—Bronn, Leth. Geog., 1, 1835, p. 115, pl. 9, fig. 8.—Green, Amer. Jour. Sci., 37, 1839, p. 37.—Buckland, Bridgw. Treatise, 2, 1840, p. 76, pl. 63, fig. 12.—Burmeister, Org. Tril., 1846, p. 110, pl. 2, fig. 12 (Roy. Soc. ed., 1846).—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 219, fig. 229.—Chapman, Canadian Jour., n. s., 4, 1859, p. 142; 8, 1863, p. 29, fig. 140; p. 200, fig. 196; Expos. Min. and Geol., 1864, p. 172, fig. 196.—Billings, Canadian Nat.,1864 (2), 1, 1864, p. 370.—Woodward, Quart. Jour. Geol. Soc. London, 26, 1870, p. 487, fig. 1.—Dana, Amer. Jour. Sci., 3d ser., 1, 1871, pp. 320, 386; Ann. Mag. Nat. Hist., 4th ser., 7, 1871, p. 366.—Woodward, Geol. Mag., 8, 1871, pl. 8, fig. 1.—Dana, Canadian Nat., n. s., 6, 1872, p. 348.—Eichwald, Neues Jahrb. f. Min. Geol. Pal., 1873, p. 1, pl. 1.—Walcott, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875 (1877), footnote, p. 95; ibid., mus. ed., 1879; 31st Rep. New York State Mus. Nat. Hist., 1879, pp. 62, 64; Bull. Mus. Comp. Zool., 8, 1881, pp. 191–216, pl. 2, fig. 9; Science, 3, 1884, p. 281.—Woodward, Geol. Mag., dec. 3, 1, 1884, p. 78, text fig.

Asaphus (Isotelus) platycephalus Burmeister, Org. der Tril., Berlin, 1843, p. 127, pl. 2, fig. 12.

Isotelus platycephalus Bronn and Roemer, Leth. Geog., 1, 1851–56, p. 632, pl. 9, fig. 8; pl. 9′, fig. 5.

Isotelus planus DeKay, Ann. Lyceum Nat. Hist. New York, 1, 1824, p. 178, pl. 13, fig. 2.—Green, Monthly Amer. Jour. Geol., 1832, p. 560; Mon. Tril. N. A., 1832, p. 68, cast 23.—Goldfuss, Neues Jahrb. f. Mem., etc., 1843, pl. 554.

Asaphus planus Dalman, K. K. Akad. Handl., 1827, p. 276.

Isotelus stegops Green, Mon. Tril. N. A., 1832, p. 71, cast 26, 27.

Brongniatia isotelea Eaton, Geol. Textb., 2d ed., 1832, p. 33, pl. 2, fig. 22.

Asaphus Murchisoni Castelnau, Essai Syst. Sil. l'Amer. Sept., 1843, p. 19, pl. 4, fig. 3.

?Isotelus canalis Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 707, fig. 9.

Mohawkian and Cincinnatian: United States and Canada.

Observation.—Several distinct species are undoubtedly recorded in the above citations. (See Raymond, 1914.)

Isotelus harrisi Raymond.

Isotelus harrisi Raymond, Annals Carnegie Mus., 3, 1905, p. 343, pl. 12, figs. 3, 5, 7.—Schmidt, Mem. Imp. Acad. Sci., St. Petersburg, 20, 1907, p. 75.—Raymond, 7th Rep. Vermont State Geol., 1910, p. 221, pl. 34, figs. 3, 5–7; pl. 37, fig. 1; Ann. Carnegie Mus., 7, 1910, p. 65, pl. 17, fig. 1, fig. 2.

Chazyan: Crown Point, Valcour Island, Chazy, and Coopersville, New York; Isle La Motte, Vermont (Crown Point, Valcour); Mingan Islands, Canada (Mingan).

Isotelus harrisi Raymond (part). See Isotelus platymarginatus.

Isotelus iowensis (Owen).

Asaphus (Isotelus) iowensis Owen, Rep. Geol. Surv. Wisconsin, Iowa, Minnesota, 1852, p. 577, tab. 2A, figs. 1–7.—Lesley, Geol. Surv. Pennsylvania Rep., P 4, 1889, p. 41, figs.

Isotelus iowensis Clarke, Geol. Minnesota, 3 pt., 2, 1894, p. 704.—Slocom, Field Mus. Nat. Hist., Geol. Ser., 4, 1913, p. 48, pl. 13, figs. 1, 2.—Raymond, Bull. Mus. Comp. Zool., 58, 1914, p. 255, pl. 2, fig. 6; pl. 3, figs. 1, 2.

Isotelus gigas Clarke (part), Geol. Minnesota, 3, pt. 2, 1894, p. 703, fig. 5.—Weller, Geol. Surv. New Jersey, Pal., 3, 1902, pl. 14, fig. 5.

Richmond (Maquoketa): Turkey River, Clermont, and Elgin, Iowa.

Cotypes.—Cat. No. 17906, U.S.N.M.

Isotelus jacobus Clarke.

Isotelus gigas Hall (part), Pal. New York, 1, 1847, pl. 61, figs. 3g, 3b.

Isotelus jacobus Clarke, Geol. Minnesota, 3, pt. 2, 1894, p. 706, footnote.

Trenton: Middleville, New York.

Isotelus latus Raymond.

Isotelus latus Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 45, pl. 5.

Asaphus platycephalus Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 184, text fig. 183; Cat. Sil. Foss. Anticosti, 1866, p. 24, fig. 7; Quart. Jour. Geol. Soc. London, 26, 1870, p. 486, pls. 31, 32.

Isotelus gigas Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 293, fig. 1602.

Trenton: Ottawa, Ontario.

Isotelus longævus Savage.

Isotelus longævus Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 103, pl. 6 fig., 15.

Upper Medinan (Edgewood): Near Edgewood, Illinois.

Isotelus maximus Locke.

Isotelus maximus Locke, 2d Ann. Rep. Geol. Surv. Ohio, 1838, p. 246, figs. 8, 9; Amer. Jour. Sci., 41, 1841, p. 161; Trans. Assoc. Amer. Geol. and Nat., 1843, p. 14.—Clarke, 10th Rep. State Geol. New York for 1890, 1891, p. 87; 44th Rep. New York State Mus., 1892, p. 111; Geol. Minnesota, 3, pt. 2, 1894, p. 701, figs. 5–7; p. 706.—Ruedemann, Bull. New York State Mus., 49, 1901, p. 59, pl. 4, fig. 1.—Raymond and Narraway, Ann. Carnegie Mus., 7, 1910, p. 55, fig. 3—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 292, fig. 1603.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1060, pl. 55, fig. 1.—Slocom, Field Mus. Nat. Hist., Geol. Ser., 4, 1913, p. 47.—Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 46, pl. 4, fig. 8; Bull. Mus. Comp. Zool., 58, 1914, p. 257.

Asaphus maximus Clarke, 46th Rep. New York State Mus., 1893, p. 195; 12th Rep. State Geol. New York for 1892, 1894, p. 49.

Asaphus (Isotelus) maximus Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 233.

Isotelus megistos Locke, Amer. Jour. Sci., 42, 1842, p. 366, pl. 3, fig.; Trans. Assoc. Amer. Geol., Nat., 1843, p. 221, pl. 6, fig. 1.—Anon., Amer. Jour. Sci., 2d ser., 6, 1848, p. 431.—Taylor, ibid., 10, 1850, p. 113.

Asaphus megistos Chapman, Canadian Jour., n. s., 4, 1859, pp. 140, 142.—Billings, Geol. Canada, Geol. Surv. Canada, 1863, p. 184, fig. 182; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, pp. 26, 60.—Walcott, 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1877, p. 89; mus ed., 1879, p. 89.—Mickelborough, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, pp. 200–206, figs. 1, 3 (2).—

Isotelus maximus—Continued.

Walcott, Science, 3, 1884, p. 280, fig. 1.—Woodward, Geol. Mag., 3, 1, 1884, p. 162, figs. 1–3.—Ford and Dwight, Amer. Jour. Sci., 3d ser., 31, 1886, p. 254, pl. 7, fig. 16.—Miller, N. A. Geol. Pal., 1889, p. 531, fig. 968.—Beecher, Amer. Jour. Sci., 4th ser., 13, 1902, p. 169, pl. 5, figs. 5, 6; Geol. Mag., dec. 4,, 9, 1902, p. 158, figs. 5, 6.—Rowley, Missouri Bur. Geol. and Mines, 2d ser., 8, 1908, p. 58, pl. 15, fig. 3.

Asaphus (Isotelus) megistos Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 159, pl. 14, fig. 13.—Miller, Cincinnati Quart., Jour. Sci., 1, 1874, p. 137.

Trenton-Richmond: Cincinnati, Ohio. Many localities in the United States and Canada.

Plesiotype.—Cat. No. 33458, U.S.N.M. (Mickelborough).

Observation.—The above citations, like those of I. gigas, probably refer to several species.

Isotelus megalops Green.

Isotelus megalops Green, Mon. Tril. N. Amer., 1832, p. 70, cast No. 25.

Trenton: Near Trenton Falls, New York.

Plastotype.—Cat. No. 25694, U.S.N.M.

Isotelus megistos Locke. See Isotelus maximus.

Isotelus obtusa Raymond. See Onchometopus obtusus.

Isotelus planus DeKay. See Isotelus gigas.

Isotelus platycephalus Bronn. See Isotelus gigas.

Isotelus platymarginatus Raymond.

Isotelus harrisi (part) Raymond, Ann. Carnegie Mus., 3, 1905, pl. 12, fig. 4.

Isotelus platymarginatus Raymond, Ann. Carnegie Mus., 7, 1910, p. 66, pl. 17, figs. 2–5; pl. 19, fig. 3; 7th Rep. Vermont State Geol., 1910, p. 225, pl. 34, fig. 4; pl. 37, figs. 2–5; pl. 39, fig. 3.

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

Isotelus stegops Green. See Isotelus gigas.

Isotelus susæ Clarke. See Onchometopus susæ.

Isotrypa ambigua Ulrich. See Loculipora ambigua.

JAEKELOCYSTIS Schuchert. Genotype: J. hartleyi Schuchert.

Jaekelocystis Schuchert, Amer. Geol., 32, 1903, p. 230; Smiths. Misc. Coll., 47, 1904, p. 222.

Jaekelocystis avellana Schuchert.

Jaekelocystis avellana Schuchert, Smiths. Misc. Coll., 47, 1904, p. 226, pl. 37, figs. 11, 12, fig. 28; Maryland Geol. Surv., Low. Dev., p. 235, pl. 38, figs. 3, 4.

Helderbergian (Keyser): Keyser, West Virginia.

Holotype.—Cat. No. 35056, U. S.N.M.

Jaekelocystis hartleyi Schuchert.

Jaekelocystis hartleyi Schuchert, Amer. Geol., 32, 1903, p. 231; Smiths. Misc. Coll., 47, pt. 2, 1904, p. 224, fig. 27, pl. 37, figs. 4–8.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 468, fig. 1776.—Schuchert, Maryland Geol. Surv., Low. Dev., 1913, p. 233, pl. 37, figs. 12–16.

Helderbergian (Keyser): Keyser, West Virginia.

Cotypes.—Cat. No. 35055, U.S.N.M.

Jaekelocystis papillatus Schuchert.

Jaekelocystis papillatus Schuchert, Smiths. Misc. Coll., 47, 1904, p. 225, pl. 37, figs. 9, 10; Maryland Geol. Surv., Low. Dev., 1913, p. 234, pl. 38, figs. 1, 2.

Helderbergian (Keyser): Keyser, West Virginia.

Holotype and *paratype*.—Cat. No. 35057, U.S.N.M.

JONESELLA Ulrich. Genotype: J. crepidiformis Ulrich.

Jonesella Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 121.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 708.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 667.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 349.—Bassler, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 738.

JONESELLA CRASSA Ulrich. See Ctenobolbina crassa.

Jonesella crepidiformis (Ulrich).

Leperditia crepiformis Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 10, pl. 7, figs. 3, 3a.

Jonesella crepidiformis Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 122, pl. 7, figs. 8a–c; Geol. Minnesota, 3, pt. 3, 1894, p. 667, figs. 47a–c.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 349, figs. 1658a–c.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 738, fig. 1425f.

Eden (Economy): Covington, Kentucky, and vicinity.

Cotypes.—Cat. No. 41359, U.S.N.M.

Jonesella digitata Ulrich.

Jonesella digitata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 122, pl. 7, figs. 10a–c.

Richmond (Arnheim): Marion County, Kentucky.

Holotype.—Cat. No. 41358, U.S.N.M.

Jonesella obscura Ulrich.

Jonesella obscura Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 668, pl. 44, figs. 17–19.

Trenton (Prosser): Cannon Falls, Minnesota.

Cotypes.—Cat. No. 41529, U.S.N.M.

Jonesella pedigera Ulrich.

Jonesella pedigera Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 122, pl. 7, figs. 9a, 9b; Geol. Minnesota, 3, pt. 2, 1894, p. 667, figs. 47d, e.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 349, figs. 1658d, e.

Eden (Economy): Covington, Kentucky, and vicinity.

Holotype.—Cat. No. 41360, U.S.N.M.

JOVELLANIA Bayle. Genotype: Orthoceras buchi Verneuil.

Jovellania Bayle, Bull. Soc. Geol. France, 3d ser., 7, 1879, p. 91.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 326; ibid., 2, 1891, p. 397.

JOVELLANIA CAPITOLINUM Foord. See Actinoceras? cuvieri.

Jovellania murrayi (Billings).

Orthoceras murrayi Billings, Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, p. 332.

Jovellania murrayi Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 328, fig. 50.

Black River: St. Joseph's Island, Lake Huron.

Jovellania semiplanata (Whiteaves).

Orthoceras semiplanatum Whiteaves, Trans. Roy. Soc. Canada, 9, sec. 4, 1892, p. 81, pl. 8, figs. 3, 3a.

Jovellania semiplanata—Continued.

Tripteroceras semiplanatum Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 214.

Jovellania semiplanata Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 4, 1906, p. 345 (gen. ref.).

Black River or Richmond: Lower Fort Garry, Manitoba.

KIONELASMA Simpson. See Lindströmia Nicholson and Thompson.

KIONOCERAS Hyatt. Genotype: Orthoceras doricum Barrande.

Kionoceras Hyatt, Proc. Boston Soc. Nat. Hist., 22, 1883, p. 275.—Newell, Proc. Boston Soc. Nat. Hist., 23, 1888, p. 469.—Hyatt, Zittel-Eastman Textb. Pal., 1, 1900, p. 519; 2d ed., 1913, p. 600.—Clarke and Ruedemann, Mem. New York State Mus., 5, p. 82.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 61.

KIONOCERAS ANGULATUM Newell. See Kionoceras cancellatum.

Kionoceras bellatulum (Billings).

Orthoceras bellatulum Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 58.

Anticostian (Gun River and Jupiter River): Three miles east Challoupe River, Anticosti.

Kionoceras cancellatum (Hall).

Orthoceras cancellatum Hall (not Eichwald), Pal. New York, 2, 1852, p. 292, pl. 63, figs. 1, 4a, b; pl. 65, figs. 4a, b.

Orthoceras subcancellatum Hall in Miller, Amer. Pal. Foss., 1st ed., 1877, p. 245; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 323, pl. 33, fig. 5.—Lesley, Geol. Surv. Pennsylvania, Rep. P4, 1889, p. 559, fig.

Kionoceras cancellatum Whiteaves, Geol. Surv. Canada, Ann. Rep., n. s., 14, App. F, 1904, p. 55; Geol. Surv. Canada, Pal. Fossils, 3, pt. 4, 1906, p. 264 (discusses synonymy).

Orthoceras columnare Hall (not Marklin, 1857), Rep. Progr. Geol. Surv. Wisconsin, 1867, p. 4; 20th Rep. New York State Cab. Hist., 1868, p. 351, pl. 19, (10), figs. 4–8 (extras Jan., 1865); rev. ed. 1868 (1870), p. 411, pl. 19, figs. 4–6, 8.

Kionoceras columnare Newell, Proc. Boston Soc. Nat. Hist., 23, 1888, p. 469.

Orthoceras orus Hall in Miller, Amer. Pal. Foss., 1st ed., 1877, p. 245.

Orthoceras (Kionoceras) orus Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 469, pl. 21, fig. 1; pl. 25, fig. 2.

Kionoceras orus Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 62, fig. 1266.

Orthoceras Hoyi McChesney, Desc. New Fossils, 1861, p. 92.

Orthoceras lineolatum McChesney, Desc. New Fossils, 1861, p. 93.

Orthoceras irregulare McChesney, Desc. New Fossils, 1861, p. 94.

Orthoceras woodworthi McChesney, Plates Illust. New sp. Fossils, 1865, pl. 7, fig. 7; Trans. Chicago Acad. Sci., 1, 1868, p. 53, pl. 7, fig. 7.

Orthoceras cadmus Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 83.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 38.

Orthoceras virgatum? Hall (not Sowerby), Pal. New York, 2, 1852, p. 298, pl. 63, figs. 2a, b, 3.

Orthoceras scammoni McChesney, Desc. New Fossils, 1861, p. 92.—Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 101.—Hall, 20th Rep. New York State Cab. Hist., 1868, p. 381; rev. ed. 1868 (1870), p. 412, footnote.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 99.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 77.

Kionoceras cancellatum—Continued.

Orthoceras angulatum Hall (not Wahlenberg, 1821), 20th Rep. New York State Cab. Hist., 1868, p. 353, pl. 19 (10), figs. 10, 11; rev. ed. 1868 (1870), p. 413, pl. 19, figs. 9–11; pl. 24, fig. 1.—Meek and Worthen, Geol. Surv. Illinois, 6, 1875, p. 504, pl. 24, figs. 8, 8a.

Orthoceras (Kionoceras) angulatum Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 472, pl. 21, fig. 3.

Kionoceras angulatum Newell, Proc. Boston Soc. Nat. Hist., 23, 1888, p. 470.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 61, fig. 1265.

Clinton-Guelph: Rochester and Lockport, New York; Ontario; Ohio; Indiana; Illinois; Wisconsin; etc.

Observation.—The name cancellatum and the above synonymy is held until a careful study of these cephalopods is made.

Plesiotype.—Cat. No. 52951, U.S.N.M. (Kindle and Breger).

KIONOCERAS COLUMNARE Newell. See Kionoceras cancellatum.

Kionoceras crawfordi (Foerste).

Orthoceras (Kionoceras) crawfordi Foerste, Proc. Boston Soc. Nat. Hist., 24, 1889, p. 284, pl. 5, fig. 26; Geol. Surv. Ohio, Pal., 7, 1893, p. 546, pl. 30, fig. 26.

Upper Medinan (Brassfield): Soldiers' Home, near Dayton, Ohio.

Kionoceras darwini (Billings).

Orthoceras darwini Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 161 (adv. sheets, 1861).—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 38, pl. 6, figs. 2, 2a; ibid., pt. 2, 1895, p. 100.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 76, fig. 8.

Orthoceras (Kionoceras) darwini Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 811 (gen. ref.).

Kionoceras darwini Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 84, pl. 10, fig. 22; pl. 11, fig. 6; pl. 12; figs. 1–8.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 62, fig. 1267.

Cyrtoceras myrice Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 149, pl. 8, fig. 9.—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 1, 1884, p. 39, pl. 6, figs. 3, 3a.

Niagaran (Guelph): New Hope, Durham, etc., Ontario; Shelby and Rochester, New York; Yellow Springs, Ohio; Offley Island, Kennedy Channel, Arctic America.

Kionoceras delphiense (Kindle and Breger).

Orthoceras (Kionoceras) delphiensis Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 470, pl. 20, figs. 1, 2.

Niagaran: Delphi, Indiana.

Kionoceras kentlandense (Kindle and Breger).

Orthoceras (Kionoceras) kentlandensis Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 470, pl. 21, fig. 2.

Niagaran: Kentland, Indiana.

Kionoceras laqueatum (Hall).

Orthoceras laqueatum Hall, Pal. New York, 1, 1847, p. 13, pl. 3, fig. 12; pl. 56, figs. 2a–c; ibid., var. a, p. 206, pl. 56, fig. 3.—Emmons Amer. Geology, 1, pt. 2, 1855, p. 149.—Emerson, Narrative Hall's 2d Arctic Exped., U. S. Navy Dept., 1879, p. 579.—Foord, Cat. Foss. Ceph. Brit. Mus., 1, 1888, p. 16.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 552, figs.

Kionoceras laqueatum—Continued.

Orthoceras (Kionoceras) laqueatum Clarke and Ruedemann, Bull. New York State Mus., 65, 1903, p. 627 (gen. ref.).

Canadian (Beekmantown): New York.

Kionoceras magnisulcatum (Billings).

Orthoceras magni-sulcatum Billings, Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, p. 330; Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 23 (loc. ref.).—Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 3, 1897, p. 212.

Richmond: Charleton Point, Anticosti (Charleton); Lake Winnipeg, Canada.

KIONOCERAS MEDULLARE Clarke and Ruedemann. See Protokionoceras medullare.

KIONOCERAS ORUS Grabau and Shimer. See Kionoceras cancellatum.

Kionoceras strix (Hall and Whitfield).

Orthoceras strix Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 149, pl. 9, fig. 3.—Foord, Cat. Foss. Ceph. British Mus., 1, 1888, p. 76.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 558, fig.

Kionoceras strix Newell, Proc. Boston Soc. Nat. Hist., 23, 1888, p. 469.

Niagaran (Guelph): Yellow Springs, Ohio; Wabash, Indiana.

KLITAMBONITES Pander. See Clitambonites Pander.

KLŒDENELLA Ulrich and Bassler. Genotype: Klœdenia pennsylvanica Jones.

Klœdenella Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 317.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 358.—Bonnema, Kon. Akad. Wetensch. Amsterdam, 1914, p. 4.

Klœdenella clarkei (Jones).

Beyrichia clarkei Jones, Jour. Geol. Soc. London, 46, 1890, p. 17, fig. 2.

Bollia clarkei Ulrich, Geol. Minnesota, 3, 1894, pt. 2, p. 669.

Klœdenella clarkei Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 319; Maryland Geol. Surv., Low. Dev., 1913, p. 533, pl. 97, fig. 21.

Helderbergian: Herkimer County, New York (Manlius transition); Cumberland, Maryland (Keyser).

Klœdenella clarkei paupera Ulrich and Bassler.

Klœdenella clarkei paupera Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, pl. 43, fig. 5; Maryland Geol. Surv., Low. Dev., 1913, p. 534, pl. 98, figs. 1–3.

Helderbergian (Keyser): Cumberland, Maryland.

Holotype.—Cat. No. 53280, U.S.N.M.

Klœdenella halli (Jones).

Beyrichia hallii Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 15, pl. 4, fig. 21.

Bollia halli Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 669 (gen. ref.).

Klœdenella halli Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 319, fig. 62, pl. 43, fig. 4.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 359, fig. 1663q.

Helderbergian (Manlius transition): Herkimer County, etc., New York.

Klœdenella pennsylvanica (Jones).

Klœdenia pennsylvanica Jones , Amer. Geol., 4, 1889, p. 341, pl., figs. 5a–d, 6 (not 7a, b, 8, 9).

Klœdenella pennsylvanica Ulrich and Bassler, Proc. U. S. Nat. Mus., 1908, 35, p. 304, fig. 54; p. 318, pl. 43, figs. 1–3; Maryland Geol. Surv., Low. Dev., 1913, p. 533, pl. 97, figs. 18–21.

Helderbergian: Perry County, Pennsylvania; Tonoloway, etc., Maryland, (Keyser).

Klœdenella symmetrica (Hall).

Beyrichia symmetrica Hall, Pal. New York, 2, 1852, p. 317, pl. 67, fig. 16.

Bollia symmetrica Jones, Amer. Geol., 4, 1889, p. 339 (gen. ref.); Quart. Jour. Geol. Soc. London, 46, 1890, p. 12.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 657.—Grabau, Bull. New York State Mus., 45, 1901, p. 219, fig. 151; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 219, fig. 151.—Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 319, fig. 61.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 352, fig. 1661.

Bollia lata Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 12.

Clinton (Rochester): Lockport, Rochester, etc., New York; Ontario; Pennsylvania; Maryland.

Klœdenella trisulcata (Hall).

Beyrichia trisulcata Hall, Pal. New York, 3, 1859, p. 381.—Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 14, pl. 1, fig. 2.

Klœdenella trisulcata Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 318.

Helderbergian (Manlius transition): Herkimer County, New York.

Klœdenella turgida Ulrich and Bassler.

Klœdenia pennsylvanica Jones (part), Amer. Geol., 4, 1889, p. 341, figs. 8, 9 (not figs. 5–7).

Klœdenella turgida Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 318, pl. 43, figs. 6, 7; Maryland Geol. Surv., Low. Dev., 1913, p. 535, pl. 98, figs. 4–6.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 738, fig. 1425l.

Helderbergian (Keyser): Perry County, Pennsylvania; Cumberland, Maryland; Keyser, West Virginia.

Cotypes.—Cat. No. 53278, U.S.N.M.

Klœdenella turgida ventrosa Ulrich and Bassler.

Klœdenia pennsylvanica Jones (part), Amer. Geol., 4, 1889, p. 341, figs. 7a, 7b (not figs. 5, 6, 8, 9).

Klœdenella turgida ventrosa Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, pl. 43, fig. 8; Maryland Geol. Surv., Low. Dev., 1913, p. 535, pl. 98, fig. 7.

Helderbergian (Keyser): Perry County, Pennsylvania; Cumberland, Maryland.

Holotypes.—Cat. No. 53279, U.S.N.M.

KLŒDENIA Jones and Holl. Genotype: Beyrichia wilckensiana Jones.

Klœdenia Jones and Holl, Ann. Mag. Nat. Hist., 5th ser., 17, 1886, p. 362.—Krause, Zeits. d. d. geol. Gesell, 41, 1889, p. 21.—Koken, Die Leitfossilien, Leipzig, 1896, p. 39, fig. 26A.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 708.—Ulrich, Zittel-Eastman Textb. Pal., 1, 1900, p. 644.—Ulrich and Bassler, Proc. U. S. Nat. Mus., 1908, p. 300.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 355.

Klœdenia barretti (Weller).

Beyrichia barretti Weller, Geol. Surv. New Jersey, Pal. 3, 1903, p. 254, pl. 23, fig. 9.

Klœdenia barretti Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 301 (gen. ref.); Maryland Geol. Surv., Low. Dev., 1913, p. 532, pl. 97, fig. 17.

Helderbergian: Two miles south of Tristates, New York (Decker Ferry); Tonoloway, Maryland (Keyser).

Klœdenia centricornis Ulrich and Bassler.

Klœdenia centricornis Ulrich and Bassler, Proc. U. S. Nat. Mus., 1908, 35, pl. 38, fig. 23; Maryland Geol. Surv., Low. Dev., 1913, p. 529, pl. 97, figs. 1–4.—Bassler, Zittel-Eastman Textb. Pal., 1913, p. 738, fig. 1425i.

Helderbergian (Keyser): Cumberland, Maryland.

Holotype.—Cat. No. 53305, U.S.N.M.

Klœdenia fimbriata Ulrich and Bassler.

Klœdenia fimbriata Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, pl. 38, fig. 22; Maryland Geol Surv., Low. Dev., 1913, p. 529, pl. 97, figs. 5-7.

Helderbergian: Herkimer County, New York; Cumberland, Maryland (Keyser).

Holotype.—Cat. No. 53306, U.S.N.M.

Klœdenia initialis (Ulrich).

Beyrichia initialis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 658, pl. 43, figs. 82, 83.

Klœdenia initialis Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 301, pl. 38, figs. 12, 13.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p, 355, fig. 1663, e, f.

Black River (Decorah): Minneapolis, Minnesota.

Holotype.—Cat. No. 41666, U.S.N.M.

Klœdenia jerseyensis (Weller).

Beyrichia jerseyensis Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 255, pl. 23, fig. 5.

Klœdenia jerseyensis Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 301.

Helderbergian (Decker Ferry): Two miles south of Tristates, New York.

Klœdenia kokomoensis Foerste.

Klœdenia kokomoensis Foerste, Cincinnati Soc. Nat. Hist., Jour., 21, 1909, p. 32, pl. 1, figs. 3a–b.

Cayugan (Kokomo): Kokomo, Indiana.

Klœdenia kümmeli (Weller).

Beyrichia kümmeli Weller, Geol. Surv. New Jersey, Pal. 3, 1903, p. 266, pl. 24, fig. 21.

Klœdenia kümmeli Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 301 (gen. ref.); Maryland Geol. Surv., Low. Dev., 1913, p. 531, pl. 97, fig. 16.

Helderbergian: Two miles south of Tristates, New York ("Manlius"); Tonoloway, Maryland (Keyser).

Klœdenia manliensis (Weller).

Beyrichia manliensis Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 268, pl. 23, fig. 10.

Klœdenia manliensis Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 301, pl. 38, fig. 21.

Klœdenia manliusensis Clarke, Mem. New York State Mus., No. 9, pt. 2, 1909, p. 20.

Helderbergian: Two miles South of Tristates, New York (Keyser-"Manlius"); Dalhousie, New Brunswick (Dalhousie).

Pleiotypes.—Cat. No. 53941, U.S.N.M.

Klœdenia manliensis deckerensis (Weller).

Beyrichia deckerensis Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 256, pl. 23, fig. 11.

Klœdenia manliensis deckerensis Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 301.

Helderbergian (Decker Ferry): Two miles south of Tristates, New York.

KLŒDENIA MANLIUSENSIS Clarke. See Klœdenia manliensis.

Klœdenia monroensis Grabau.

Klœdenia monroensis Grabau, Michigan Geol. Surv., Geol., 1st ser., 1909, p. 206, pl. 15, fig. 11.

Lower Monroan (Raisin River): Newport, Michigan.

Klœdenia montaguensis (Weller).

Beyrichia montaguensis Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 267, pl. 24, fig. 23.

Klœdenia montaguensis Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 301.

Helderbergian ("Manlius"): Two miles south of Tristates, New York.

Klœdenia nearpassi (Weller).

Beyrichia nearpassi Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 255, pl. 23, figs. 7, 8.

Klœdenia nearpassi Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 301, p. 304, fig. 55, 56 (gen. ref.); Maryland Geol. Surv., Low. Dev., 1913, p. 530, pl. 97, figs. 12, 13.

Helderbergian: Two miles south of Tristates, New York (Decker Ferry); Tonoloway, Maryland (Keyser).

Klœdenia notata (Hall).

Beyrichia notata Hall, Pal. New York, 3, 1859, p. 379.

Klœdenia notata Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 13, pl. 4, figs. 22, 23.

Helderbergian (Manlius transition): Herkimer County and near Utica, New York.

KLŒDENIA PENNSYLVANICA Jones. See Klœdenella pennsylvanica, K. turgida, and K. turgida ventrosa.

Klœdenia prænuntia Ulrich and Bassler.

Klœdenia prænuntia Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 301, pl. 38, fig. 15.

Trenton (Hermitage): Four miles south of Carthage, Tennessee.

Holotype.—Cat. No. 41643, U.S.N.M.

Klœdenia smocki (Weller).

Beyrichia smocki Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 268, pl. 24, fig. 24.

Klœdenia smocki Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 302.

Helderbergian ("Manlius"): Two miles south of Tristates, New York.

Klœdenia sussexensis (Weller).

Beyrichia sussexensis Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 253, pl. 23, figs. 3–4.

Klœdenia sussexensis Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 302, pl. 38, figs. 19, 20; Maryland Geol. Surv., Low. Dev., 1913, p. 532, pl. 97, figs. 14, 15.

Beyrichia perinflata Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 254, pl. 23, fig. 6.

Helderbergian: Two miles south of Tristates, New York (Decker Ferry); Tonoloway, Maryland (Keyser); Dalhousie, New Brunswick (Dalhousie).

Plesiotypes.—Cat. No. 53940, U.S.N.M.

Klœdenia wallpackensis (Weller).

Beyrichia wallpackensis Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 266, pl. 24, fig. 22.

Klœdenia wallpackensis Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 302.

Helderbergian ("Manlius"): Two miles south of Tristates, New York.

KOKENIA Ulrich and Scofield. See Kokenospira Bassler.

KOKENOSPIRA Bassler (new name). Genotype: Bucanella esthona Koken.
Bucanella Koken (part), Neues Jahrb. Min., Geol., Beilageband, 6, 1889, p. 389 (not Meek, 1870).
Kokenia Ulrich and Scofield (not Holzapfel, 1895), Geol. Minnesota, 3, pt. 2, 1897, pp. 849–882.

Kokenospira costalis (Ulrich and Scofield).
Kokenia costalis Ulrich and Scofield, Geol. Minnesota, 3, pt. 2, 1897, p. 882, pl. 64, figs. 46–49.—Schuchert, Proc. U. S. Nat. Mus., 1900, p. 164.
Trenton: Near Cannon Falls, Minnesota (Prosser); Frobisher Bay, Baffin Land.
Holotype.—Cat. No. 45868, U.S.N.M.

KRAUSELLA Ulrich. Genotype: K. inæqualis Ulrich.
Krausella Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 691.—Miller, N. A. Geol. Pal., 2d App., 1897, p. 788.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 362.

Krausella anticostiensis (Jones).
Bairdia anticostiensis Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 548, pl. 21, figs. 3a, b.
Krausella anticostiensis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 691.
Richmond (English Head, Charleton): English Head, etc., Anticosti.

Krausella arcuata Ulrich.
Krausella arcuata Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 692, pl. 44, figs. 47–53.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 362, figs. 1667a–c.
Black River: Minneapolis, Minnesota; Mineral Point, Wisconsin; Dixon, Illinois (Platteville); High Bridge, Kentucky (Lowville).
Cotypes.—Cat. Nos. 41717–41719, U.S.N.M.

Krausella inæqualis Ulrich.
Krausella inæqualis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 692, pl. 44, figs. 44, 46.
Black River (Platteville): Dixon, Illinois.
Holotype.—Cat. No. 41727, U.S.N.M.

KUTORGINA Hall and Clarke. See Billingsella Hall and Clarke.

LABECHIA Edwards and Haime. Genotype: Monticularia conferta Lonsdale.
Labechia Edwards and Haime, Mon. Polyp. Foss. Terr. Pal., 1851 (Arch. Mus. Hist. Nat., 5), pp. 155, 279.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 444.—Milne-Edwards, Hist. Nat. Corall., 3, 1860, p. 284.—Salter, Cat. Camb. Sil. Foss., 1873, p. 109.—Lindstrom, Ann. Mag. Nat. Hist., 4th ser., 18, 1876, p. 4.—Steinmann, Palæontographica, 25, 1878, p. 112.—Nicholson and Murie, Jour. Linnean Soc. London, Zool., 14, 1878, p. 234.—Nicholson, Tab. Corals Pal. Period, 1879, p. 350.—Zittel, Handb. Pal., 1, 1879, p. 287.—Roemer, Leth. geog., pt. 1, Leth. Pal., 1883, p. 541.—Nicholson, Mon. British Strom., Pal. Soc., 1886, pp. 13, 19, 60.—Waagen, Neues Jahrb. f. Min., Geol. Pal., 1, 1889, p. 259.—Grabau and Shimer, N. A. Index Fossils, 1, 1906, p. 46.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 699.—Parks, Univ. Toronto Studies, Geol. Ser., 5, 1908, p. 31; ibid., No. 7, 1910, p. 25.

LABECHIA CANADENSE Nicholson. See Stromatocerium canadense.

LABECHIA CORRUGATA Foerste. See Dermatostroma corrugatum.

LABECHIA CORRUGATA-GLYPTA Foerste. See Dermatostroma glyptum.

Labechia delicatula Parks.

Labechia delicatula Parks, Univ. Toronto Studies, Geol. Ser., No. 5, 1908, p. 32, pl. 9, figs. 4–6

Clinton (Osgood): Osgood, Indiana.

Cotypes.—Cat. No. 41218, U.S.N.M.

Labechia durhamensis Parks.

Labechia durhamensis Parks, Univ. Toronto Studies, Geol. Ser., No. 4, 1907, p. 20, pl. 2, figs. 4–6; pl. 3, fig. 1; pl. 6, figs. 1, 2.

Niagaran (Guelph): Durham, Guelph, etc., Ontario.

LABECHIA HURONENSIS Whiteaves. See Stromatocerium huronense.

Labechia macrostyla Parks.

Labechia macrostyla Parks, Univ. Toronto Studies, Geol. Ser., No. 7, 1910, p. 25, pl. 22, fig. 12; pl. 23, figs. 1, 2, 11.

"Lower Trenton drift": Ann Arbor, Michigan.

Holotype.—Cat. No. 36929, U.S.N.M.

Labechia minora Parks.

Labechia minora Parks, Univ. Toronto Studies, Geol. Ser., No. 4, 1907, p. 22, pl. 3, figs. 2, 5, 6.

Niagaran (Guelph): Elora, Durham, etc., Ontario.

LABECHIA MONTIFERA Ulrich. See Stromatocerium montiferum.

LABECHIA OHIOENSIS Nicholson. See Stromatocerium huronense.

LABECHIA PAPILLATA of authors. See Dermatostroma papillatum.

LABECHIA SCABRA Harper and Bassler. See Dermatostroma scabrum.

Labechia subcylindrica (James).

Stromatopora subcylindrica James, Jour. Cincinnati Soc. Nat. Hist., 7, 1884, p. 20, fig. 1.—J. F. James, ibid., 9, 1887, pp. 39, 103, 251; ibid., 15, 1892, p. 90.—Miller, N. A. Geol. Pal., 1889, p. 166.

Labechia subcylindrica Parks, Univ. Toronto Studies, Geol. Series, No. 7, 1910, p. 27, pl. 23, figs. 3, 4, 6, 7.

Richmond (Waynesville): Near Morrow, Ohio.

LABYRINTHITES Lambe. Genotype: L. chidlensis Lambe.

Labyrinthites Lambe, Cruise of the "Neptune," App. 4, 1906, p. 327.

Labyrinthites chidlensis Lambe.

Labyrinthites chidlensis Lambe, Cruise of the "Neptune," App. 4, 1906, p. 328.

Ordovician?: Cape Chidley, Hudson Strait, Arctic America.

LACCOPHYLLUM Simpson. Genotype: L. acuminatum Simpson.

Laccophyllum Simpson, Bull. New York State Mus., 39, 1900, p. 201.

Laccophyllum acuminatum Simpson.

Laccophyllum acuminatum Simpson, Bull. New York State Mus., 39, 1900, p. 202, figs. 7–9.

Niagaran (Brownsport): Perry County, Tennessee.

LAGENOGRAPTUS Hall. See Monograptus Geinitz.

LAMELLOPORA Owen. See Strombodes Schweigger.

LAMPTEROCRINUS Roemer. Genotype: L. tennesseensis Roemer.

Balanocrinites Troost (not Agassiz, 1845), Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 50 (not defined); Amer. Jour. Sci. and Arts, (2) 8, 1847, p. 419.—Roemer, Sil. Fauna West Tennessee, Breslau, 1860, p. 31.

Balanocrinus Hall, 28th Rep. New York State Mus. Nat. Hist., mus. ed., 1879, p. 131.

Lampterocrinus Roemer, Sil. Fauna West Tennessee, Breslau, 1860, p. 40.—Hall, Trans. Albany Inst., 4, 1863, p. 202.—Hall, 20th Rep. New York State Cab. Nat. Hist. (extras 1865), 1868, p. 328; ibid., rev. ed., 1870, footnote, p. 372.—Zittel, Handb. d. Pal., 1, 1879, p. 375.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, pp. 358, 373 (Rev. Pal., pt. 2, pp. 184, 199); ibid., 1885, p. 323.—Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 260.—De Loriol, Pal. Francaise, 11, 1882, p. 59.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 207.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 199, fig. 124.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 145.—Weller, Bull. Chicago Acad. Sci., 4, pt. 1, 1900, p. 80, fig. 39.—Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 102.—Zittel, Grundzuge Pal., 2, 1910, p. 161.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 548.—Springer, Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 187.

Lampterocrinus? comptus Rowley.

Lampterocrinus? comptus Rowley, Amer. Geol., 34, 1904, p. 279, pl. 16, figs. 57, 58.

Upper Medinan (Edgewood): Three miles west of Louisiana, Missouri.

Lampterocrinus? dubius Weller.

Lampterocrinus? dubius Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 84, pl. 2, figs. 6, 7.

Niagaran (Racine): Lemont and Joliet, Illinois.

Lampterocrinus inflatus (Hall).

Balanocrinus inflatus Hall, Rep. Sup. Geol. Surv. Wisconsin, 1861, p. 22.

Lampterocrinus inflatus Hall, Prelim. Notice, 18th Rep. New York State Cab. Nat. Hist., 1865, p. 24, pl. 1, fig. 6; 20th Rep. New York State Cab. Nat. Hist., 1868 (extras 1865), p. 328, pl. 10 (1), fig. 6; rev. ed., p. 374, pl. 10, fig. 6.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 81, figs. 2–3.

Niagaran (Racine): Racine, Wisconsin; Bridgeport and Romeo, Illinois.

Lampterocrinus parvus Hall.

Lampterocrinus parvus Hall, 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 272, pl. 15, fig. 6; Trans. Albany Inst., 10, 1883, p. 65.

Niagaran (Waldron): Waldron, Indiana.

Lampterocrinus robustus Weller.

Lampterocrinus robustus Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 83, pl. 2, figs. 4, 5.

Niagaran (Racine): Romeo, Lemont, and Joliet, Illinois.

Lampterocrinus? subglobosus Weller.

Lampterocrinus? subglobosus Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 83, pl. 3, fig. 5.

Niagaran (Racine): Bridgeport and Hawthorne, Illinois.

Lampterocrinus tennesseensis Roemer.

Lampterocrinus tennesseensis Roemer, Sil. Fauna West. Tennessee, Breslau, 1860, p. 37, pl. 4, figs. 1a, 1b; Leth. geog., 1, Leth. Pal., Atlas, 1876, pl. 11, fig. 13.—Miller, N. A. Geol. Pal., 1889, p. 257, fig. 347.—Wachsmuth and Springer, Mem. Mus. Comp. Zool., Harvard, 20, 1897, p. 208, pl. 13, figs. 10a–d.—Bather, Treatise on Zoology, pt. 3, Echinoderma, 1900, p. 199, fig. 124.—Foerste, Jour. Geol., 11, 1903, p. 712 (loc. occ.).—Wood, Bull. U. S. Nat. Mus., 64, 1909, p. 103, pl. 7, figs. 8–10.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 548, fig. 1877.

Balanocrinites sculptus Troost, Amer. Jour. Sci. Arts, 2d ser., 8, 1850, p. 419; Proc. Amer. Assoc. Adv. Sci., 2, 1850, p. 60 (nom. nud.).

Niagaran (Brownsport): Decatur and Wayne Counties, Tennessee.

Plesiotypes.—Cat. No. 39920, U.S.N.M. (Troost's type of B. sculptus).

Lapworthura cylindrica Parks. See Tæniaster cylindricus.

LASIOCRINUS Kirk. Genotype: Homocrinus scoparius Hall.

Homocrinus Hall (part), Pal. New York, 2, 1852, p. 185; ibid., 3, 1859, p. 102.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, Rev. Pal., pt. 1, 1879; ibid., 1886, p. 77; pt. 3, p. 220.—Bather, Crin. Gotland, 1893, p. 101.

Lasiocrinus Kirk, Proc. U. S. Nat. Mus., 46, 1914, p. 482.

Lasiocrinus scoparius (Hall).

Homocrinus scoparius Hall, Pal. New York, 3, 1859, p. 102, pl. 1, figs. 1–9.—Bather, Kongl. Svenska Vet. Akad. Handl., 25, 1893, p. 105.—Talbot, Amer. Jour. Sci., 20, 1905, p. 19, pl. 3, fig. 3.

Dendrocrinus (Homocrinus) scoparius Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1881, p. 302 (Rev. Pal., 1, p. 79).

Lasiocrinus scoparius Kirk, Proc. U. S. Nat. Mus., 46, 1914, p. 482.

Helderbergian (Manlius transition beds or Coeymans): Schoharie and Wheelocks Hill, Litchfield, Herkimer County, New York.

LASIOGRAPTUS Lapworth. Genotype: L. costatus Lapworth.

Lasiograptus Lapworth, Geol. Mag., 10, 1873, p. 559.—Zittel, Handb. Pal., 1, 1879, p. 302.—Kokeu, Die Leitfossilien, Leipzig, 1896, p. 329.—Roemer and Frech, Leth. geog., 1, Theil, Leth. Pal., 1, 3, Lief, 1897, p. 671.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 472–479.

Lasiograptus bimucronatus (Nicholson).

Graptolithus sp. Hall, Pal. New York, 3, 1859, p. 507, figs. 1–3.

Diplograptus bimucronatus Nicholson, Ann. Mag. Nat. Hist., 4, 1869, p. 236, pl. 11, fig. 12.—Clarke, Geol. Mag., 4th ser., 9, 1902, p. 499.

Hallograptus bimucronatus Lapworth, Cat. West. Scott. Foss., 1876, p. 7, pl. 2, fig. 5S.

Hallograptus (Lasiograptus) bimucronatus Roemer and Frech, Leth. Pal., 1, 1897, p. 672, fig. 224.

Diplograptus (Hallograptus) bimucronatus Lapworth, Belfast Field Club, Ann. Rep. and Proc., 2d ser., app., pt. 4, 1877, p. 134, pl. 6, fig. 23.

Lasiograptus bimucronatus Tullberg, Sver. Geol. Und. Ser. C, No. 50, 1882, p. 20.

Lasiograptus mucronatus Lapworth, Proc. and Trans. Roy. Soc. Canada, 4, 1887, p. 178.—Gurley, Jour. Geol., 4, 1896, p. 299.—Roemer and Frech, Leth. Pal., 1, 1897, p. 672, fig. 224.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 481–483, pl. 29, figs. 12–18; pl. 30, figs. 6–8; pl. 31, figs. 4–5; text figs. 458–463.

Lasiograptus bimucronatus—Continued.

Graptolithus whitfieldi (part) Hall, Geol. Surv. Canada, Canadian Org. Rem., dec. 2, 1865, pl. B, figs. 6–11.

Ordovician: Scotland (Glenkiln); Wales; Ireland; Scania; Kenwood, Stockport, etc., New York (Normanskill); Arkansas.

Lasiograptus bimucronatus timidus Ruedemann.

Lasiograptus bimucronatus mut. timidus Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 483–484, pl. 29, figs. 19, 20; text figs. 464, 465.

Utica: Flat Creek, near Mohawk, and Holland Patent, New York; Cincinnati, Ohio.

Lasiograptus (Thysanograptus) eucharis (Hall).

Retiograptus eucharis Hall, Geol. Surv. Canada, Can. Org. Rem., dec. 2, 1865, p. 146, pl. 14, fig. 9; New York State Cab. Nat. Hist., 20th Ann. Rep., 1868, pp. 206, 224, pl. 4, fig. 9.—Walcott, Trans. Alb. Inst., 10, 1881 (adv. sheets, 1879, p. 35).—Ami, Can. Geol. Surv. Ann. Rep., pt. 11, 1889, pp. 23K, 117K; Can. Rec. Sci., 5, 1893, pp. 180, 236.—Roemer and Frech, Leth. geog., 1 Theil., Leth. Pennsylvania, 1, 3 Lief., 1897, p. 608, fig. 173.

Retiograpsus eucharis Nicholson, Mon. British Grapt., 1872, p. 124, fig. 63.

Glossograptus? eucharis Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 397–400, pl. 26, figs. 18, 19; pl. 27, figs. 11–13, text figs. 346–352.

Diplograptus pristiniformis Ruedemann, Amer. Jour. Sci., 3d ser., 18, 1895, pp. 453, 455, figs. 2, 3.—Wiman, Bull. Geol. Inst. Upsala, 2, pt. 2, 1895, pp. 69, 71, figs. 2, 3.

Diplograptus ruedemanni Gurley, Jour. Geol., 4, 1896, pp. 298, 307.—Ruedemann, 14th Rep. State Geol. New York for 1894, 1897, p. 219, pl. 1, figs. 2–4, 6–7, 10; pl. 2, figs. 1–4; pl. 5, fig. 1.—Tornquist, Zoolog.Centralbl., 4, 1897, p. 5.—Ruedemann, Bull. New York State Mus., 42, 1901, p. 523 ff.

Diplograptus cf. aculeatus Frech, Roemer and Frech, Leth. Pal., 1, 1897, p. 632, pl. A, fig. 2.

Lasiograptus (Thysanograptus) eucharis Ruedemann, Bull. New York State Mus., 162, 1912, p. 84, figs. 24–28.

Trenton: Lake St. John, etc., Quebec (Collingwood); Vermont; Mohawk and Hudson Valleys, New York (Snake Hill, Canajoharie, and Schenectady).

Lasiograptus mucronatus (Hall).

Graptolithus mucronatus Hall, Pal. New York, 1, 1847, p. 268, pl. 73, figs. 1a–d.

Diplograptus mucronatus Geinitz, Die Graptolithen, 1852, p. 23.—Carruthers, Mem. Geol. Surv., 3, 1866, 330, pl. 11A, fig. 6; pl. 12, fig. 1; ibid. 5, 1868, p. 131, pl. 5, fig. 2.—Nicholson, Geol. Mag., 4, 113, pl, 7, figs. 5, 5a; Quart. Jour. Geol. Soc. London, 24, 1868, p. 139.—McCoy, Pal. Victoria, Prodr., dec. 1, 1874, p. 10, pl. 1, fig. 5.—Walcott, Trans. Alb. Inst., 10, 1883 (adv. sheets, 1879, p. 34).—Ami, Can. Geol. Surv. Rep., 2d ser., 3, pt. 2, 1889, p. 117K.—Walcott, Bull. Geol. Soc. Am., 1, 1890, p. 339.—Clark, Geol. Mag., 4th ser., 9, 1902, p. 498.

Diplograptus (Lasiograptus) mucronatus Lapworth, Belfast Nat. Field Club Ann. Rep., 1, 1877, p. 134, pl. 6.

Lasiograptus mucronatus Lapworth, Proc. and Trans. Roy. Soc. Canada, 4, 1887, 178f.—Gurley, Geol. Surv. Arkansas, Ann. Rep., 3, 1892, p. 413.—Ruedemann Bull. New York State Mus., 42, 1901, p. 544.—Weller, Geol. Surv. New Jersey, Pal., 3, 1902, p. 212, pl. 16, figs. 16, 17.—Dale, Bull. U. S. Geol. Surv., 242, 1904, p. 33.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 479–481, pl. 29, figs. 9–11; pl. 30, figs. 1–5; pl. 31, figs. 1–3; figs. 456, 457.

Chazyan (Normanskill): Mt. Moreno, Kenwood, Glenmont, etc., New York; Arkansas; Quebec. Glenkiln shale of Great Britain.

LASIOGRAPTUS MUCRONATUS Lapworth. See Lasiograptus bimucronatus.

LASIOTHRIX Dawson and Hinde. Genotype: L. curvicostata Dawson and Hinde.

Lasiothrix Dawson and Hinde, Trans. Roy. Soc. Canada, 7, sec. 4, 1890, p. 50.—Dawson, ibid., 2d ser., 2, sec. 4, 1896, p. 114.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 667.

Lasiothrix curvicostata Dawson and Hinde.

Lasiothrix curvicostata Dawson and Hinde, Trans. Roy. Soc. Canada, 7, sec. 4, 1890, p. 51, fig. 21.—Dawson, ibid., 2d ser., 2, sec. 4, 1896, p. 144, fig. 24.

Canadian? (Levis?): Metis, Quebec.

Lasiothrix flabellata Dawson and Hinde.

Lasiothrix flabellata Dawson and Hinde, Trans. Roy. Soc. Canada, 7, sec. 4, 1890, p. 51, fig. 22.—Dawson, ibid., 2d ser., 2, sec. 4, 1896, p. 115, fig. 25.

Canadian? (Levis?): Metis, Quebec.

LECANOCRINUS Hall. Genotype: L. macropetalus Hall.

Lecanocrinus Hall, Pal. New York, 2, 1852, p. 199.—Pictet, Traite de Pal., 2d ed., 4, 1857, p. 319.—Billings, Geol. Surv. Canada, Rep. Progr. for 1853–56, 1857, p. 278.—Schultze, Denk. d. Kais. Akad. Wiss., Math.-Naturw., Cl. 26, Abth. 2, 1867, p. 152, fig. 7.—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 262 (Rev. Pal., pt. 1, p. 39); ibid., 1890, p. 388.—Beyrich, Ann. Mag. Nat. Hist., 4th ser., 7, 1871, p. 404.—Angelin, Icon. Crinoid., 1878, p. 11.—Zittel, Handb. Pal., 1, 1879, p. 355.—Miller, N. A. Geol. Pal., 1889, p. 257.—Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 147, fig. 54.—Bather, Treatise on Zool , pt. 3, Echinoderma, London, 1900, p. 188.—Wachsmuth, Zittel-Eastman Textb. Pal., 1, 1900, p. 163.—Grabau, Bull. New York State Mus., 45, 1901, p. 160; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 160.—Springer, Amer. Geol., 30, 1902, p. 94; Jour. Geol., 14, 1906, p. 517.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 564.—Springer, Zittell-Eastman Textb. Pal., 2d ed., 1913, p. 203.

Cyrtidocrinus Angelin Icon. Crin. Suec., 1878, p. 20.

LECANOCRINUS CALICULUS Hall. See Pycnosaccus calyculus.

LECANOCRINUS ELEGANS Billings. See Protaxocrinus elegans.

LECANOCRINUS EXCAVATUS Ringueberg. See Asaphocrinus ornatus.

LECANOCRINUS GREENEI Miller and Gurley. See Anisocrinus greenei.

Lecanocrinus hemisphericus Rowley.

Lecanocrinus hemisphericus Rowley, Amer. Geol., 34, 1904, p. 271, pl. 14, fig. 17–19.

Niagaran (Bainbridge): Near St. Mary's, Ste. Genevieve County, Missouri.

Observation.—Probably the same as L. pisiformis (Roemer).

LECANOCRINUS INCISUS Ringueberg. See Asaphocrinus incisus.

LECANOCRINUS LÆVIS Billings. See Protaxocrinus lævis.

Lecanocrinus macropetalus Hall.

Lecanocrinus macropetalus Hall, Pal. New York, 2, 1852, p. 199, pl. 45, figs. 1a-h.—Emmons, Man. Geology, 1860, p. 63, fig. 42.—Miller, N. A. Geol. Pal., 1889, p. 257, fig. 348.—Grabau, Bull. New York State Mus., 45, 1901, p. 160, fig. 55; Bull. Buffalo Soc. Nat. Sci., 7, p. 160, fig. 55.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 564, fig. 1901, 1902.

Lecanocrinus macropetalus—Continued.

Cyathocrinus? Hall, Geol. 4th Dist. New York, Tab. Org. Rem., No. 21, 1843, figs. 5a–b.

Clinton (Rochester): Lockport, New York.

Lecanocrinus meniscus Springer.

Lecanocrinus meniscus Springer, Mono. Crin. Flex., Smith. Inst. (in press).

Niagaran (Brownsport): Decatur County, Tennessee.

LECANOCRINUS NITIDUS Ringueberg. See Asaphocrinus ornatus.

LECANOCRINUS ORNATUS Hall. See Asaphocrinus ornatus.

LECANOCRINUS OSWEGOENSIS Miller and Gurley. See Anisocrinus oswegoensis.

Lecanocrinus pisiformis (Roemer).

Poteriocrinus pisiformis Roemer, Sil. Fauna West. Tennessee, Breslau, 1860, p. 54, pl. 4, figs. 7a–d.—Shumard, Trans. Acad. Sci. St. Louis, 2, 1866, p. 392.

Arachnocrinus pisiformis Meek and Worthen, Geol. Surv. Illinois, 2, 1866, p. 177 (gen. ref.).—Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, Rev. Pal., pt. 1, 1879, p. 94.—Miller, N. A. Geol. Pal., 1889, p. 224, fig. 248.

Cyathocrinus pisiformis Whitfield, Geol. Wisconsin, 4, 1882, p. 353 (gen. ref.).

Lecanocrinus pisiformis Wachsmuth and Springer, Proc. Acad. Nat. Sci. Philadelphia, 1886, p. 268 (Rev. Pal., pt. 2, 227).

Niagaran: Decatur County, Tennessee (Brownsport); ?Wisconsin (Racine).

Observation.—See also L. hemisphericus Rowley.

Lecanocrinus pusillus (Hall).

Cyathocrinus pusillus Hall, Trans. Albany Inst., 4, 1863, p. 200; Prelim. Notice, 18th Rep. New York State Cab. Nat. Hist., 1865, p. 20; 20th Rep. New York State Cab. Nat. Hist., 1868, p. 324, rev. ed., 1870, p. 366; 28th Rep. New York State Mus. Nat. Hist., doc. ed., 1875, 1877, pl. 15, figs. 1–6.

Lecanocrinus pusillus Hall, 28th Rep. New York State Mus. Nat Hist., mus. ed., 1879, p. 136, pl. 15, figs. 1–6; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 267, pl. 14, figs. 1–6; pl. 15, fig. 7.—Springer, Mono. Crin. Flex., Smith. Inst. (in press).

Lecanocrinus tennesseensis Miller, 17th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1892, p. 651, pl. 7, figs. 7, 8 (adv. sheets, 1891, p. 41).

Niagaran (Waldron): Waldron, Indiana; Newsom, Tennessee.

LECANOCRINUS PUSILLUS Winchell and Marcy. See Lecanocrinus waukoma.

Lecanocrinus puteolus Ringueberg.

Lecanocrinus puteolus Ringueberg, Bull. Buffalo Soc. Nat. Hist., 5, 1886, p. 11, pl. 1, fig. 8.

Clinton (Rochester): Lockport, New York.

LECANOCRINUS SIMPLEX Hall. See Ichthyocrinus lævis.

Lecanocrinus solidus Ringueberg.

Lecanocrinus solidus Ringueberg, Bull. Buffalo Soc. Nat. Hist., 5, 1886, p. 8, pl. 1, fig. 4.

Clinton (Rochester): Lockport, New York.

LECANOCRINUS TENNESSEENSIS Miller. See Lecanocrinus pusillus.

Lecanocrinus waukoma (Hall).

Cyathocrinus waukoma Hall, Adv. Pub. 18th Rep. New York State Cab. Nat. Hist., 1865, p. 20, pl (2), figs. 11, 12; 20th Rep. New York State Cab. Nat. Hist., 1868, p. 324, pl. 11 (2), figs. 11, 12; rev. ed., 1870, p. 367, pl. 11, figs. 11, 12.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 191, fig.

Lecanocrinus waukoma—Continued.

Lecanocrinus waukoma Weller, Bull. Chicago Acad. Sci., Nat. Hist. Surv., 4, pt. 1, 1900, p. 148, pl. 15, figs. 6–11.

Lecanocrinus pusillus Winchell and Marcy (not Hall), Mem. Boston Soc. Nat. Hist., 1, 1865, p. 90.

Niagaran (Racine): Racine and Waukesha, Wisconsin; Bridgeport, Romeo, Lemont, etc., Illinois.

LEDA LEVATA Emmons. See Ctenodonta levata.

LEDA PLANA Emmons. See Lyrodesma planum.

LEDA PULCHELLA Emmons. See Ctenodonta pulchella.

LEIOCLEMA Rominger. See Lioclema Ulrich.

LEIOCLEMA FLORIDA Ulrich. See Nicholsonella florida.

LEIOCLEMA? LAMINATUM Ulrich. See Fistulipora laminata.

LEIOCLEMA SINGULARE Ulrich. See Trematopora? singularis.

LEIODITIA Ulrich. See Elpe Barrande.

LEIOPTERIA Hall. Genotype: L. dekayi Hall.

Leiopteria Hall, Pal. New York, 5, pt. 1, Lam. 1883, p. 4; ibid., 1884, p. 13; 35th Rep. New York State Mus. Nat. Hist., 1884, p. 406; Rep. State Geol. New York, 1884, p. 14.—Whidborne, Mon. Dev. Fauna South England, 2, Pal. Soc., 1892, p. 78.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, 1899, p. 246.—Hind, Mon. British Carb. Lam., 2, Pal. Soc., 1901, p. 9.

Liopteria Miller, N. A. Geol. Pal., 1889, p. 484.—Clarke, Archivos Mus. Nat. Rio Janeiro, 10, Eng. ed., 1900, p. 48.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 208; Bull. New York State Mus. 45, 1901, p. 208.—Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 424.

Leiopteria rubra Williams.

Leiopteria rubra Williams, Proc. U. S. Nat. Mus., 45, 1913, p. 345, pl. 31, fig. 4.

Silurian (Pembroke): Giffs Bay, Washington County, Maine.

Holotype.—Cat. No. 58971, U.S.N.M.

Leiopteria subplana (Hall).

Avicula subplana Hall, Pal. New York, 2, 1852, p. 283, pl. 59, figs. 3a–c.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 823, fig. 628.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 70, fig.

Pterinea subplana Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 52 (gen. ref.).

Pteronites? subplana Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 243, pl. 22, fig. 1.

Liopteria(?) subplana Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 208, fig. 136; Bull. New York State Mus., 45, 1901, p. 208, fig. 136.

Leiopteria? subplana Grabau and Shimer, N. A. Index Fossils, 1, 1909, p. 424, fig. 554.

Silurian: Lockport, etc. (Rochester-Guelph) and Schoharie Valley, New York (Cobleskill).

?Helderbergian (Keyser): Two miles south Tristates, New York.

LEIOSTEGIUM Raymond. Genotype: Bathyurus quadratus Billings.

Leiostegium Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 68.

Leiostegium breviceps (Billings).

Bathyurus breviceps Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 262, fig. 246.

Leiostegium breviceps Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 69.

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

Leiostegium quadratum (Billings).

Bathyurus quadratus Billings, Canadian Nat. Geol., 5, 1860, p. 321, fig. 27; Geol. Canada, Geol. Surv. Canada, 1863, p. 238, fig. 272; Pal. Foss., 1, Geol. Surv, Canada, 1865, p. 412, fig. 396.

Leiostegium quadratum Raymond, Bull. Victoria Memorial Mus., 1, 1913, p. 68, pl. 7, fig. 17.

Canadian (Levis-Limestone): Point Levis, Quebec.

LEJOPYGE Hawle and Corda. Genotype: Battus lævigatus Hisinger.

Lejopyge Hawle and Corda Abh. böhm. Gesell. Wiss., 5, 1847, p. 51, pl. 3, fig. 25.

Lejopyge cyclopyge? (Tullberg).

Agnostus cyclopyge Tullberg, Sveriges Geol. Undersok., ser. C, No. 42, 1880, p. 26, pl. 2, fig. 15.

Agnostus cf. cyclopyge Matthew, Geol. Surv. Canada, Rep. Camb. Rocks C. Breton, 1903, p. 222.

Canadian (Bretonian—Div. C3b): East Bay, east of Bras d'Or Lake, Cape Breton, Nova Scotia. Lower Ordovician of Europe.

LEPADOCRINUS Cumings. See Lepadocystis Carpenter.

LEPADOCRINUS Hall (part). See Lepocrinites Conrad and Apiocystites Forbes.

LEPADOCRINUS MOOREI Cumings. See Lepadocystis moorei.

LEPADOCYSTIS Carpenter. Genotype: Lepocrinites moorei Meek.

Lepadocystis Carpenter, Linn. Soc. Jour. Zool., 24, 1891, p. 10.—Bather, Treatise on Zoology, pt. 3, Echinoderma, 1900, p. 61.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 458.

Lepadocrinus Zittel (part), Handb. Pal., 1, 1879, p. 421.—Miller (part), N. A. Geol. Pal., 1889, p. 257.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 714.

Meekocystis Jaekel, Stammesges. Pelmat., 1, Thecoidea u. Cystoidea, Berlin, 1899, p. 277. (Genotype: Lepocrinites moorei Meek.)

LEPADOCYSTIS CLINTONENSIS Parks. See Brockocystis clintonensis.

Lepadocystis moorei (Meek).

Lepocrinites moorei Meek, Amer. Jour. Sci., 3d ser., 2, 1871, p. 296; Geol. Surv. Ohio, Pal., 1, 1873, p. 39, pl. 3, figs. 4a–c.

Lepadocystis moorei Carpenter, Linn. Soc. Jour. Zool., 24, 1891, 10.—Bather, Treatise on Zool., pt. 3, Echinoderma, London, 1900, p. 61, fig. 28.—Foerste, Bull. Sci. Lab. Denison Univ., 17, 1914, p. 459, pl. 5, fig. 1.

Meekocystis moorei Jaekel, Stammes. Pelmat., 1, Thecoidea u. Cystoidea, Berlin, 1899, p. 278, fig. 58, p. 279.

Lepadocrinus moorei Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 727, pl. 4, figs. 6–6b.

Richmond (Whitewater): Richmond, Indiana.

LEPERDITELLA Ulrich. Genotype: Leperditia inflata Ulrich.

Leperditia (part) Ulrich, Amer. Geol., 10, 1892, p. 263.

Leperditella Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 636; Zittel-Eastman Textb. Pal., 1, 1900, p. 643.—Bassler, ibid., 2d ed., 1913, p. 737.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 339.

Leperditella æquilatera (Ulrich).

Leperditia æquilatera Ulrich, Amer. Geol., 10, 1892, p. 265, pl. 9, figs. 9–11.

Leperditella æquilatera Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 636, fig. 46c.

Stones River (Ridley): Bottom of gorge at High Bridge, Kentucky.

Holotype: Cat. No. 41312, U.S.N.M.

Leperditella canalis Ulrich.

Leperditella canalis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 637, pl. 43, figs. 1–3.

Leperditia canalis Miller, N. A. Geol. Pal., 2d App., 1897, p. 788.

Black River (Platteville): Minneapolis and near Cannon Falls, Minnesota.

Holotype.—Cat. No. 41304, U.S.N.M.

Leperditella? dorsicornis Ulrich. See Primitia dorsicornis.

Leperditella germana (Ulrich).

Leperditia germana Ulrich, Amer. Geol., 10, 1892, p. 266, pl. 9, figs. 16–18.

Leperditella germana Ulrich, Geol. Minnesota, 3, pt. 2, 1894, pp. 636, 638, pl. 45, figs. 24–26.

Black River (Platteville): Mineral Point, Wisconsin.

Holotype.—Cat. No. 41307, U.S.N.M.

Leperditella? glabra (Ulrich).

Primitia glabra Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1890, p. 134, pl. 10, figs. 9a–9c.

Leperditella? glabra Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 639.

Richmond (Whitewater): Oxford and Blanchester, Ohio; Richmond, Indiana.

Holotype.—Cat. No. 41827, U.S.N.M.

Leperditella inflata (Ulrich).

Leperditia inflata Ulrich, Amer. Geol., 10, 1892, p. 265, pl. 9, figs. 12–15.

Leperditella inflata Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 636, figs. 46a–46d.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 339, fig. 1656a–c.

Stones River (Ridley): Bottom of gorge at High Bridge, Kentucky.

Cotypes.—Cat. No. 41311, U.S.N.M.

Leperditella? labellosa (Jones).

Isochilina labellosa Jones, Cont. Canadian Micro-Pal., Geol. Surv. Canada, pt. 3, 1891, p. 69, pl. 10, figs. 16a–c, 17, 19.

Leperditella? labellosa Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 637.

Stones River (Pamelia): Aylmer, Quebec; Gloucester, Carleton County, Ontario.

Leperditella macra Ulrich.

Leperditella macra Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 638, pl. 43, figs. 7–9.

Leperditia macra Miller, N. A. Geol. Pal., 2d App., 1897, p. 788 (gen. ref.).

Black River (Decorah): Minneapolis, Minnesota.

Holotype.—Cat. No. 41306, U.S.N.M.

Leperditella mundula (Ulrich).

Leperditia mundula Ulrich, Amer. Geol., 10, 1892, p. 265, pl. 9, figs. 4–8.

Leperditella mundula Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 636, fig. 46e–46h.

Stones River (Ridley): Bottom of gorge at High Bridge, Kentucky.

Cotypes.—Cat. No. 41309, U.S.N.M.

Leperditella? obscura (Jones).

Leperditia? obscura Jones, Cont. Micro-Pal., Geol. Surv. Canada, pt. 3, 1891, p. 71, pl. 10, figs. 15a–c.

Leperditella? obscura Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 637.

Trenton: Falls of Lorette, Quebec.

Leperditella ornata Weller.

Leperditella ornata Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 209, pl. 13, figs. 13–15.

Trenton: Near Iliff's Pond, two miles southeast of Newton, New Jersey.

Leperditella persimilis Ulrich.

Leperditella persimilis Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 637, pl. 43, figs. 4–6.

Leperditia persimilis Miller, N. A. Geol. Pal., 2d App., 1897, p. 788 (gen. ref.).

Black River (Decorah): Minneapolis, Minnesota.

Holotype.—Cat. No. 41308, U.S.N.M.

Leperditella sulcata (Ulrich).

Leperditia sulcata Ulrich, Amer. Geol., 10, 1892, p. 266, pl. 9, figs. 19–21.

Leperditella sulcata Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 636, fig. 46j.—Bassler, Bull. Virginia Geol. Surv., 2a, 1909, pl. 23, fig. 14.

Black River (Lowville): High Bridge, Kentucky; Tennessee; Virginia.

Holotype.—Cat. No. 41313, U.S.N.M.

Leperditella sulcata ventricornis Ulrich.

Leperditella sulcata var. ventricornis Ulrich, Amer. Geol., 10, 1892, p. 266, pl. 9, figs. 22, 23; Geol. Minnesota, 3, pt. 2, 1894, p. 636, fig. 46k.

Black River (Lowville): High Bridge, Kentucky.

Holotype.—Cat. No. 41314, U.S.N.M.

Leperditella tumida (Ulrich).

Leperditia tumida Ulrich, Amer. Geol., 10, 1892, p. 264, pl. 9, figs. 1–3.

Leperditella tumida Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 636.—Bassler, Bull. Virginia Geol. Surv., 2a, 1909, pl. 23, fig. 13.

Black River (Lowville): High Bridge, Kentucky; Tennessee; Virginia.

Holotype.—Cat. No. 41310, U.S.N.M.

LEPERDITIA Rouault. Genotype: L. brittanica Rouault.

Leperditia Rouault, Bull. Soc. Geol. France, 2d ser., 8, 1851, p. 377.—Jones, Ann. Mag. Nat. Hist., 2d ser., 1856, p. 84; Monthly Microsc. Jour., 4, 1870, pp. 188–190.—Barrande, Syst. Sil. du Centre Boheme, 1 Suppl., 1872, p. 523.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 21, 1873.—Miller, Cincinnati Quart. Jour. Sci., 1, 1874, p. 121.—Alth, Anhandl. geol. Reichsanstalt, 7, Heft 1, 1874, p. 66.—Nicholson and Lydecker, Man. Pal., 1, 1879, p. 506.—Jones, Ann. Mag. Nat. Hist., 5th ser., 8, 1881, p. 334.—Schmidt, Mem. l'Acad. Imp. Sci. St. Petersburg, 31, 1883.—Vine, Proc. Yorkshire Geol. Polyt. Soc., n. s., 8, 1884, p. 234.—Zittel, Handb. Pal., 2, 1885, p. 551.—Jones and Kirkby, Proc. Geol. Assoc., 9, 1887, p. 503.—Nicholson and Lydecker, Man. Pal., 1, 1879, p. 506.—Miller, N. A. Geol. Pal., 1889, p. 552.—Vogdes, Ann. New York Acad. Sci., 5, 1889, p. 23, pl. 2, fig. 17.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 708.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 633.—Koken, Die Leitfossilien, 1896, p. 40.—Grabau, Bull. Buffalo Soc. Nat. Sci., 6, p. 307; ibid., 7, 1901, p. 218.—Ulrich, Zittel's Textb. Pal. (Amer. ed.), 1900, p. 643.—Grabau, Bull. New York State Mus., 45, 1901, p. 218.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1041.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 339.—Bassler, Zittel-Eastman Textb. Pal., 2d ed., 1915, p. 737.

LEPERDITIA ÆQUILATERA Ulrich. See Leperditella æquilatera.

Leperditia alta (Conrad).

Cytherina alta Conrad in Vanuxem, Nat. Hist. New York, Geol., 3, 1842, p. 112, fig. 6.—Mather, Geol., New York, 1, 1843, p. 349, fig. 6.—Hall, ibid., 4, 1843, p. 142, fig. 6; tab. ill. 26, fig. 6.—Owen, Amer. Jour. Sci. Arts, 2d ser., 1, 1846, p. 47, fig. 6.—Emmons, Man. Geol., 1860, p. 113, fig. 102.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, p. 58, pl. 9, fig. 6.

Leperditia alta Jones, Ann. Mag. Nat. Hist., 2d ser., 17, 1856, p. 88, pl. 7, figs. 6, 7; ibid., 3d ser., 1, 1858, p. 250, pl. 10, figs. 8, 9; Geol. Surv. Canada, dec. 3, p. 95.—Hall, Pal. New York, 3, 1859, p. 373, pl. 79a, figs. 6a–e.—Emerson(?) Narrative Hall's Sec. Arctic Exped., U. S. Navy Dep., 1879, p. 579, fig. 5.—Jones, Ann. Mag. Nat. Hist., 5th ser., 8, 1881, p. 345.—Whitfield, Geol. Wisconsin, 4, 1882, p. 323, pl. 25, figs. 8, 9.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 198, fig.—Jones, Ann. Mag. Nat. Hist., 5th ser., 14, 1884, p. 342; Quart. Jour. Geol. Soc. London, 44, 1890, p. 25, pl. 1, figs. 6a, b; Cont. Micro-Pal., Geol. Surv. Canada, pt. 3, 1891, p. 84, pl. 13, figs. 10, 11.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, pp. 259, 265, pl. 24, figs. 25–28.—Grabau, Bull. New York State Mus., 92, 1906, p. 115, fig. 24a.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 341.

Cayugan and Helderbergian: Manlius, etc., New York; New Jersey; etc.

LEPERDITIA ALTA Whitfield (1891). See Leperditia ohioensis.

Leperditia altoides Weller.

Leperditia altoides Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 252, pl. 23, figs. 1, 2.—Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 513, pl. 97, figs. 8, 9.

Helderbergian: Flatbrookville, New Jersey (Rondout); Devil's Backbone, near Cumberland and Tonoloway, Maryland (Keyser).

LEPERDITIA ALTOIDES Grabau. See Leperditia ohioensis.

Leperditia amygdalina Jones.

Leperditia amygdalina Jones, Ann. Mag. Nat. Hist., 3d ser., 1, 1858, p. 341; Geol. Surv. Canada, dec. 3, 1858, p. 97, pl. 11, figs. 18, 19; Ann. Mag. Nat. Hist., 5th ser., 8, 1881, p. 344, pl. 19, fig. 9; ibid., 14, p. 342; Cont. Micro-Pal., Geol. Surv. Canada, pt. 3, 1891, pp. 98, 99.

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

Leperditia angulifera Whitfield.

Leperditia angulifera Whitfield, Ann. New York Acad. Sci., 2, 1882, p. 197; ibid., 5, 518, pl. 5, figs. 28–30; Geol. Surv. Ohio, Pal., 7, 1893, p. 418, pl. 1, figs. 28–30.—Sherzer, Geol. Surv. Michigan, 7, pt. 1, 1900, pl. 17, figs. 28–30.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 340, fig. 1654.—Grabau, Michigan Geol. Surv., Geol., 1st ser., 1909, p. 203, pl. 30, figs. 28–30.

Lower Monroan (Greenfield): Greenfield, Ohio.

Leperditia anna Jones.

Leperditia anna Jones, Ann. Mag. Nat. Hist., 3d ser., 1, 1858, p. 247, pl. 9, fig. 18; Geol. Surv. Canada, dec. 3, 1858, p. 96, pl. 11, fig. 13; Cont. Micro-Pal., Geol. Surv. Canada, pt. 3, 1891, pp. 98, 99.

Canadian (Beekmantown): St. Anne, Canada.

Leperditia anticostiana (Jones).

Leperditia Canadensis var. Anticostiana Jones, Geol. Surv. Canada, dec. 3, 1858, p. 95, pl. 11, fig. 17.

Leperditia anticostiana—Continued.

Leperditia fabulites var. anticostiana Jones, Ann. Mag. Nat. Hist., 5th ser., 8, 1881, p. 344, pl. 19, fig. 8.

Leperditia Anticostiana Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 66.—Jones, Ann. Mag. Nat. Hist., 5th ser., 14, 1884, p. 341.—Dwight, Trans. Vassar Bros. Inst., 5, 1890, p. 76.

Leperditia Anticostiensis Jones, Geol. Surv. Canada, Cont. Micro-Pal., pt. 3, 1891, pp. 98, 99.

Anticostian (Jupiter River): East Point and Jumpers, Anticosti.

LEPERDITIA ANTICOSTIENSIS Jones. See Leperditia anticostiana.

Leperditia appressa Ulrich.

Leperditia appressa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1891, p. 176, pl. 11, figs. 5a–d.

Trenton (Perryville): Danville and Harrodsburg, Kentucky.

Cotypes.—Cat. Nos. 41281, 41282, U.S.N.M.

Leperditia arctica (Jones).

Leperditia baltica var. arctica Jones, in Salter Sutherland's Jour. Voyage in Baffin's Bay, etc., 2, App., 1852, p. 221, pl. 5, fig. 13; ibid., Quart. Jour. Geol. Soc. London, 9, 1853, p. 314.

Leperditia arctica Jones, Ann. Mag. Nat. Hist., 2d ser., 17, 1856, p. 87, pl. 7, figs. 1–5.

Niagaran: Cape Hotham, Assistance Bay, Seal Island, Baring Bay, etc., Arctic America.

LEPERDITIA (ISOCHILINA) ARMATA Wâlcott. See Isochilina armata.

LEPERDITIA BALTHICA var. b. Kolmodin. See Leperditia hisingeri.

Leperditia balthica guelphica Jones.

Leperditia balthica var. guelphica Jones, Cont. Micro-Pal.., Geol. Surv. Canada, pt. 3, 1891, p. 80, pl. 13, figs. 12a, b, 13a–c.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 2, 1895, p. 106 (loc. occ.).—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 106, pl. 21, figs. 9–11.

Niagaran (Guelph): Durham and Aboyne, Ontario; Rochester, New York.

Leperditia balthica primæva Jones.

Leperditia balthica var. primæva Jones, Cont. Micro-Pal., Geol. Surv. Canada, pt. 3, 1891, p. 70, pl. 10, fig. 18.

Stones River (Pamelia): Carleton County, Ontario.

LEPERDITIA BALTICA var. ARCTICA Jones. See Leperditia arctica.

LEPERDITIA BILLINGSI Jones. See Aparchites billingsi.

LEPERDITIA BIVERTEX Ulrich. See Ulrichia bivertex.

Leperditia bivia White.

Leperditia bivia White, Rep. U. S. Geogr. Surv. West 100th Merid., 4, 1877, p. 58, pl. 3, figs. 7a–d (Prelim. Rep. 1874, p. 11).—Walcott, U. S. Geol. Surv., Mon. 8, 1884, p. 88.

Upper Pogonip: Queen Spring Hill, Schell Creek Range, Nevada.

Cotypes.—Cat. No. 17411, U.S.N.M.

LEPERDITIA BYRNESI Miller. See Dicranella? byrnesi.

Leperditia caeca Jones.

Leperditia caeca Jones, Contr. Micro-Pal., Geol. Surv. Canada, pt. 3, 1891, p. 88, pl. 12, figs. 6, 7, 9.

Niagaran: Saskatchewan River, Canada.

Leperditia cæcigena Miller.

Leperditia cæcigena Miller, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 263, pl. 6, figs. 5, 5a.—Ulrich, ibid., 1891, p. 176, pl. 11, figs. 6a–d.—Miller, N. A. Geol. Pal., 1889, p. 552, fig. 1021.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1047, pl. 53, fig. 10–10c.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 340, fig. 1656d, e.

Richmond (Whitewater–Saluda): Versailles, Madison, etc., Indiana.

Plesiotypes.—Cat. No. 41276, U.S.N.M.

Leperditia cæcigena frankfortensis Ulrich.

Leperditia cæcigena var. frankfortensis Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1891, p. 277.

Trenton (Perryville): Reservoir Hill, Frankfort, Kentucky.

Cotypes.—Cat. No. 41279, U.S.N.M.

Leperditia canadensis Jones (part). See Leperditia nana and L. canadensis, louckiana.

Leperditia canadensis Jones.

Leperditia Canadensis Jones (part), Ann. Mag. Nat. Hist., 3d ser., 1, 1858, p. 244, pl. 9, figs. 11–15.—Chapman, Canadian Jour., n. s., 8, 1863, p. 195, fig. 15; Expos. Min. Geol. Canada, 1864, p. 167, fig. 163.—Billings, Cat. Sil. Foss. Anticosti, Geol. Surv. Canada, 1866, p. 28 (loc. occ.).—Emerson(?), Narrative Hall's Sec. Arctic Exped., U. S. Navy Dep., 1879, p. 580, fig. 6.—Jones, Ann. Mag. Nat. Hist., 5th ser, 14, 1881, p. 340.—Dwight, Trans. Vassar Bros. Inst. 5, 1890, p. 76.—Jones, Geol. Surv. Canada, Cont. Micro-Pal., pt. 3, 1891, pp. 97, 99.

Canadian (Beekmantown): Grenville, etc., Quebec.

Leperditia Canadensis var. anticostiana Jones. See Leperditia anticostiana.

Leperditia Canadensis var. Josephiana Jones. See Leperditia fabulites.

Leperditia canadensis labrosa Jones.

Leperditia Canadensis var. labrosa Jones, Ann. Mag. Nat. Hist., 3d ser., 1, 1858, p. 245, pl. 9, fig. 13; Geol. Surv. Canada, 3, 1858, p. 93, pl. 11, fig. 8; Ann. Mag. Nat. Hist., 5th ser., 8, 1881, p. 343; Geol. Surv. Canada, Cont. Micro-Pal., pt. 3, 1891, pp. 97, 99.

Chazyan (Aylmer): Hawkesbury, Ontario.

Leperditia canadensis louckiana Jones.

Leperditia Canadensis var. Louckiana Jones, Geol. Surv. Canada, dec. 3, 1858, p. 93, pl. 11, fig. 11; Geol. Surv. Canada, Cont. Micro-Pal., pt. 3, 1891, pp. 97, 99.

Leperditia canadensis? Jones, Ann. Mag. Nat. Hist., 3d ser., 1, 1858, p. 245, pl. 9, figs. 16, 17.

Leperditia fabulites var. louckiana Jones, Ann. Mag. Nat. Hist., 5th ser., 8, 1881, p. 343.

Leperditia louckiana Jones, Ann. Mag. Nat. Hist., 5th ser., 14, 1884, p. 340.—Dwight, Vassar Bros. Inst., 5, 1890, p. 76 (loc. occ.).

Trenton: Loucks Mill, Castor River, Canada.

LEPERDITIA CANADENSIS var. NANA Jones. See Leperditia nana.

Leperditia canadensis pauquettiana Jones.

Leperditia Canadensis var. Pauquettiana Jones, Geol. Surv. Canada, dec. 3, 1858, p. 94, pl. 11, fig. 12; Geol. Surv. Canada, Cont. Micro-Pal., pt. 3, 1891, pp. 97, 99.

Leperditia fabulites var. pauquettiana Jones, Ann. Mag. Nat. Hist., 5th ser., 8, 1881, p. 343.

Black River (Leray): Pauquette's Rapids, Allumette Island, Ottawa River, Canada.

LEPERDITIA CANALIS Miller. See Leperditella canalis.

Leperditia capax Safford.

Leperditia capax Safford, Geol. Tennessee, 1869, p. 290 (nom. nud.).

Trenton: Nashville, Tennessee.

LEPERDITIA CLAYPOLEI Jones. See Primitiella claypolei.

Leperditia concinnula Billings.

Leperditia concinnula Billings, Geol. Surv. Canada, Pal. Foss., 1, 1865, p. 299.

Chazyan (Quebec-L, M): Point Rich and Table Head, Newfoundland.

LEPERDITIA CREPIFORMIS Ulrich. See Jonesella crepidiformis.

Leperditia cylindrica (Hall).

Cytherina cylindrica Hall, Pal. New York, 2, 1852, p. 14, pl. 4, figs. 8a, b.

Leperditia (Isochilina) cylindrica Jones, Ann. Mag. Nat. Hist, 3d ser., 1, 1858, p. 253.

Leperditia cylindrica Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 80 (gen. ref.).—Jones, Ann. Mag. Nat. Hist., 5th ser., 14, 1884, p. 344.

Isochilina cylindrica Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 218; Bull. New York State Mus., 45, 1901, p. 218.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 342.

Upper Medinan: Medina, Lockport, etc., New York.

LEPERDITIA (ISOCHILINA) CYLINDRICA Hall. See Bythocypris cylindrica.

LEPERDITIA (?PRIMITIA) DORSICORNIS Ulrich. See Primitia dorsicornis.

Leperditia elongata Weller.

Leperditia elongata Weller, Geol. Surv. New Jersey, Rep. Pal., 3, 1903, p. 259, pl. 23, fig. 13.—Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 514, pl. 97, fig. 11.

Helderbergian: Two miles south of Tristates, New York (Rondout); Tonoloway, Maryland (Keyser).

Leperditia faba Hall.

Leperditia faba Hall, 28th Rep. New York State Mus., doc. ed., 1875, pl. 32, figs. 1–3; mus. ed., p. 186, pl. 32, figs. 1–3; 11th Ann. Rep. Indiana Dep. Geol. Nat. Hist., 1882, p. 331, pl. 34, figs. 1–3.

Niagaran (Waldron): Waldron, Indiana.

Leperditia fabulites (Conrad).

Cytherina sp. Hall, Pal. New York, 1, 1847, p. 44, pl. 10, fig. 12.

Cytherina fabulites Conrad, Proc. Acad. Nat. Sci. Philadelphia, 1, 1843, p. 332.

Leperditia fabulites Jones, Ann. Mag. Nat. Hist., 2d ser., 17, 1856, p. 89; ibid., 3d ser., 1, 1858, p. 341; ibid., 5th ser., 8, 1881, p. 342, pl. 20, fig. 4; ibid., 5th ser., 14, 1884, p. 342.—Chamberlin, Geol. Wisconsin, 1, 1883, p. 160, fig.—

Leperditia fabullites—Continued.

Dwight, Trans. Vassar Bros. Inst., 5, 1890, p. 76.—Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1891, p. 173, pl. 11, figs. 1a, d, 2.—Jones, Geol. Surv. Canada, Cont. Micro-Pal., pt. 3, 1891, p. 98, 99.—Ulrich, Geol. Minnesota, 3, pt. 2, 1894, p. 634, pl. 43, figs. 10–14.—Ruedemann, Bull. New York State Mus., 49, 1902, p. 70, pl. 5, figs. 19, 20.—Weller, Geol. Surv. New Jersey, Pal. 3, 1903, p. 208, pl. 13, figs. 11, 12.—Ulrich and Bassler, Proc. U. S. Nat. Mus., 35, 1908, p. 282, fig. 1.—Bassler, Bull. Virginia Geol. Surv., 2a, 1909, pl. 3, figs. 3–7.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 340, fig. 1653.

Leperditia canadensis var. josephiana Jones, Ann. Mag. Nat. Hist., 3d ser., 1, 1858, p. 341; Geol. Surv. Canada, dec. 3, 1858, p. 94, pl. 11, fig. 16.

Leperditia fabulites josephiana Jones, Ann. Mag. Nat. Hist., 5th ser., 1881, p. 344, pl. 19, fig. 7; pl. 20, figs. 7, 8.

Leperditia josephiana Jones, Ann. Mag. Nat. Hist., 5th ser., 14, 1884, p. 341; Cont. Micro-Pal., Geol. Surv. Canada, pt. 3, 1891, p. 97 (loc. occ.).—Dwight, Trans. Vassar Bros. Inst., 5, 1890, p. 76 (loc. occ.).

Black River: Mineral Point, etc., Wisconsin; Minnesota; New York; Canada; etc.
Stones River: Tennessee, etc.
Plesiotypes.—Cat. Nos. 41263, 41267, U.S.N.M. (Ulrich).

Leperditia fabulites var. anticostiana Jones. See Leperditia anticostiana.

Leperditia fabulites var. josephiana Jones. See Leperditia fabulites.

Leperditia fabulites var. louckiana Jones. See Leperditia canadensis var. louckiana.

Leperditia fabulites var. pauquettiana Jones. See Leperditia canadensis var. pauquettiana.

Leperditia fimbriata Ulrich. See Aparchites fimbriatus.

Leperditia fonticola Hall.

Leperditia fonticola Hall, 20th Rep. New York State Cab. Nat. Hist., 1868, p. 335, pl. 21 (12), figs. 1–3; rev. ed., 1870, p. 428, pl. 21, figs. 1–3.

Niagaran (Byron): Fond du Lac, Wisconsin.

Leperditia frontalis Jones.

Leperditia frontalis Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 547, pl. 21, figs. 8a, 8b.

Anticostian (Jupiter River): Near The Jumpers, Anticosti.

Leperditia germana Ulrich. See Leperditella germana.

Leperditia gibbera Jones.

Leperditia gibbera Jones, Ann. Mag. Nat. Hist., 2d ser., 17, 1856, p. 90, pl. 7, figs. 8–10.

Niagaran: Beechy Island, Lancaster Sound, Arctic America.

Leperditia gibbera var. scalaris Jones. See Leperditia scalaris.

Leperditia gigantea Weller.

Leperditia gigantea Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 260, pl. 23, fig. 14.—Ulrich and Bassler, Maryland Geol. Surv., Low. Dev., 1913, p. 514, pl. 97, fig. 10.

Helderbergian: Two miles south of Tristates, New York (Rondout); Tonoloway, Maryland (Keyser).

Leperditia (Isochilina) gracilis Jones. See Isochilina gracilis.

LEPERDITIA GRANILABIATA Ulrich. See Aparchites granilabiatus.

Leperditia hisingeri Schmidt.

Cytherina balthica (part) Hisinger, Leth. Suecica, 1837, p. 10, pl. 30, fig. 1.

Cythere baltica Roemer, Bronn's Leth. Geogn., 2, 1854, p. 528 (part), pl. 9, fig. 8a–c.

Leperditia balthica (part) Jones, Ann. Mag. Nat. Hist., 2d ser., 17, 1856, p. 85, pl. 6, figs. 3a–e; ibid., 5th ser., 8, 1881, p. 333, pl. 19, figs. 10, 11.

Leperditia balthica var. b. Kolmodin, Bidrag till Kannedomen om Sveriges Silurika Ostracoder, 1869, p. 14, figs. 4, 5.

Leperditia hisingeri Schmidt, Mem. Acad. Imp. Sci. St. Petersburg, 7th ser., 21, 1873, p. 16, fig. 23; ibid., 31, 1883, p. 14, pl. 5, figs. 5–7.—Jones, Geol. Surv. Canada, Cont. Micro-Pal., Geol. Surv. Canada, pt. 3, 1891, p. 82, pl. 13, figs. 1, 9.—Krause, Zeits. d. d. geol. Gesell., 43, 1891, p. 489, pl. 29, fig. 4.

Leperditia schmidti Kolmodin, Ofvers. Vet.-Akad. Forh., 36, 1880, p. 133.

Silurian: Europe; Long Point, Lake Winnepegosis, Grand Rapids, Saskatchewan River, and Beechy Island, Lancaster Sound, Canada.

Leperditia hisingeri egena Jones.

Leperditia Hisingeri var. egena Jones, Geol. Surv. Canada, Contr. Micro.-Pal, pt. 3, 1891, p. 82, pl. 12, fig. 8.

Niagaran: Grand Rapids, Saskatchewan River, Canada.

Leperditia hisingeri fabulina Jones.

Leperditia Hisingeri var. fabulina Jones, Geol. Surv. Canada, Cont. Micro-Pal., pt. 3, 1891, p. 82, pl. 10, figs. 5, 7; pl. 12, fig. 15; pl. 13, figs. 2, 3, 5, 6.

Niagaran: Long Point, Lake Winnipegosis, and foot of Grand Rapids, Saskatchewan River, Canada.

Leperditia hisingeri gibbera Jones.

Leperditia Hisingeri var. gibbera Jones, Geol. Surv. Canada, Cont. Micro-Pal., pt. 3, 1891, p. 82, pl. 13, fig. 4.

Niagaran: Long Point, Lake Winnipegosis, Canada.

Leperditia illinoisensis Savage.

Leperditia illinoisensis Savage, Bull. Geol. Surv. Illinois, 23, 1913, p. 123, pl. 7, fig. 27.

Upper Medinan (Channahon): Will County, Illinois.

LEPERDITIA INFLATA Ulrich. See Leperditella inflata.

Leperditia jonesi Hall.

Leperditia jonesi Hall, Pal. New York, 3, 1859, p. 372; 12th Rep. New York State Cab. Nat. Hist., 1859, p. 80.—Jones, Ann. Mag. Nat. Hist., 5th ser., 14, 1884, p. 342.—Schuchert, Amer. Geol., 31, 1903, p. 169.

Cytherina alta? Conrad, Hall, Pal. New York, 2, 1852, p. 338, pl. 78, figs. 2a–d.

Cayugan (Cobleskill): Schoharie, New York.

LEPERDITIA JOSEPHIANA Jones. See Leperditia fabulites.

Leperditia limatula Raymond.

Leperditia limatula Raymond, Amer. Jour. Sci., 4th ser., 20, 1905, p. 380; Ann. Carnegie Mus., 7, 1911, p. 253, fig. 25.

Chazyan: Valcour Island, Valcour and Chazy, New York (Crown Point); East Tennessee (Lenoir).

Leperditia linneyi Ulrich.
Leperditia linneyi Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1891, p. 174, pl. 11, figs. 3a–3e.
Trenton (Perryville): Harrodsburg, Frankfort, etc., Kentucky.
Cotypes.—Cat. No. 41272, U.S.N.M.

LEPERDITIA LOUCKIANA Jones. See Leperditia canadensis louckiana.

LEPERDITIA MACRA Miller. See Leperditella macra.

Leperditia marginata Schmidt.
Leperditia marginata Schmidt, Mem. Imp. Acad. Sci. St. Petersburg, 7th ser., 21, 1873, p. 19, pl., fig. 29; ibid., 31, 1883, p. 18, pl. 1, figs. 13–19.—Jones, Cont. Micro-Pal., Geol. Surv. Canada, pt. 3, 1891, p. 86, pl. 10, figs. 6a–c.
Silurian: Russia; east side of Lake Winnepegosis, Canada.

LEPERDITIA MARGINATA Jones. See Isochilina grandis and I. grandis latimarginata.

LEPERDITIA MILLEPUNCTATA Ulrich. See Aparachites millepunctata.

LEPERDITIA (ISOCHILINA) MINUTISSIMA Hall. See Aparchites minutissimus.

Leperditia morgani Safford.
Leperditia Morgani Safford, Geol. Tennessee, 1869, p. 290 (nom. nud.)
Trenton: Nashville, Tennessee.

LEPERDITIA MUNDULA Ulrich. See Leperditella mundula.

Leperditia nana (Jones).
Leperditia canadensis Jones (part), Ann. Mag. Nat. Hist., 3d ser., 1, 1858, p. 244; Contr. to Canadian Micro-Pal., 1891, p. 97.
Leperditia canadensis var. nana Jones, Geol. Surv. Canada, dec. 3, 1858, p. 92, pl. 2, figs. 6, 7, 9, 10; Ann. Mag. Nat. Hist., 5th ser., 8, p. 343.
Leperditia nana Raymond, Ann. Carnegie Mus., 7, 1911, p. 254.
Canadian (Beekmantown): Grenville, Quebec.
?Chazyan: Valcour Island, Crown Point, etc., New York.

LEPERDITIA? OBSCURA Jones. See Leperditella obscura.

Leperditia ohioensis Bassler (new name).
Leperditia alta Whitfield (not Conrad), Ann. New York Acad. Sci., 5, 1891, p. 517, pl. 5, fig. 27; Geol. Surv. Ohio, Pal., 7, 1893, pp. 417–418, pl. 1, fig. 27.—Meek, Geol. Surv. Ohio, Pal., 1, 1873, p. 187, pl. 17, figs. 2a, b.
Leperditia altoides Grabau (not Weller), Michigan Geol. Surv., Geol. Ser., 1, 1909, p. 205, pl. 30, fig. 27.
Lower Monroan (Greenfield): Greenfield and Ballville, Ohio.

LEPERDITIA (ISOCHILINA) OTTAWA Jones. See Isochilina ottawa.

Leperditia ovata Jones.
Leperditia ovata Jones, Ann. Mag. Nat. Hist., 3d ser., 1, 1858, p. 252, pl. 10, fig. 14; Geol. Pennsylvania, 2, pt. 2, 1858, p. 834, fig. 697.
Trenton: Potter's Fort, Penns Valley, Pennsylvania.

Leperditia parvula Hall. Not recognized.
Leperditia parvula Hall, Pal. New York, 3, 1859, p. 376.
Tentaculite limestone: Herkimer County, New York.

Leperditia pennsylvanica Jones.

Leperditia Pennsylvanica Jones, Ann. Mag. Nat. Hist., 3d ser., 1, 1858, p. 251, pl. 10, figs. 12, 13.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 834, fig. 699.

Clinton: Near Barre Forge, Pennsylvania.

LEPERDITIA PERSIMILIS Miller. See Leperditella persimilis.

Leperditia phaseolus (Hisinger).

Cytherina phaseolus Hisinger, Leth. Sues., 1837, p. 9, pl. 1, fig. 1.

Leperditia phaseolus Jones, Contr. Canadian Micro-Pal., 3, 1891, p. 85, pl. 13, figs, 7, 8.

Silurian: Europe; Saskatchewan River, at Roche Rouge, Canada.

Leperditia phaseolus guelphica Jones.

Leperditia phaseolus var. guelphica Jones, Cont. Micro-Pal., Geol. Surv. Canada, pt. 3, 1891, p. 86, fig. 5.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 2, 1895, p. 106 (loc. occ.).

Niagaran (Guelph): Durham, Ontario.

LEPERDITIA RADIATA Ulrich. See Elpe radiata.

Leperditia resplendens Ruedemann.

Leperditia resplendens Ruedemann, Bull. New York State Mus., 49, 1901, p. 71, pl. 5, figs. 21–27.

Mohawkian (Rysedorph): Rysedorph Hill, Rensselaer County, New York.

Leperditia scalaris (Jones).

Leperditia gibbera var. scalaris Jones, Ann. Mag. Nat. Hist., 3d ser., 1, 1858, p. 250, pl. 10, figs. 10, 11.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 834, fig. 698.

Leperditia scalaris Grabau, Bull. Geol. Soc. Amer., 11, 1900, p. 371, pl. 22, figs. 6a–d; Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 219, fig. 150; Bull. New York State Mus., 45, 1901, p. 219, fig. 150; ibid., Bull. 92, 1906, p. 111; Michigan Geol. Surv., Geol., 1st ser., 1909, p. 202, pl. 32, fig. 6a–d.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 340, fig. 1655.

Cayugan: Williamsville, Buffalo, Akron, etc., New York; Ontario (Akron); Schoharie and High Falls, New York (Cobleskill).

LEPERDITIA SCHMIDTI Kolmodin. See Leperditia hisingeri.

Leperditia selwyni Jones.

Leperditia selwynii Jones, Geol. Surv. Canada, Cont. Micro-Pal., pt. 3, 1891, p. 89, pl. 12, figs. 1–5.

Anticostian (Jupiter River): Jupiter River, Anticosti.

Leperditia sinuata Hall.

Leperditia sinuata Hall, Canadian Nat. Geol., 5, 1860, p. 158.—Dawson, Acadian Geol., 2d ed., 1868, p. 609.—Jones, Quart. Jour. Geol. Soc. London, 46, 1890, p. 24, pl. 1, figs. 12a–c.

Silurian: Arisaig, Nova Scotia.

Leperditia subcylindrica Ulrich.

Leperditia subcylindrica Ulrich, Cont. Micro-Pal., Geol. Surv. Canada, pt. 2, 1889, p. 49, pl. 9, figs. 4–4b.—Whiteaves, Geol. Surv. Canada, Pal. Foss., 3, pt. 2, 1895, p. 125.

Richmond (Stony Mountain): Stony Mountain, Manitoba.

Leperditia sublævis (Shumard).

Cythere sublævis Shumard, 1st and 2d Ann. Rep. Geol. Surv. Missouri, 2, 1855, p. 195, pl. 8, fig. 15.

Leperditia sublævis Keyes, Missouri Geol. Surv., 4, 1894, p. 239.

St. Peter (Joachim): St. Louis, Ste. Genevieve, and Ralls Counties, Missouri.

LEPERDITIA SULCATA Ulrich. See Leperditella sulcata.

Leperditia symmetrica Holtedahl.

Leperditia symmetrica Holtedahl, 2d Arct. Exp., 1898–1902, No. 32, 1914, p. 37, pl. 8, fig. 15.

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

LEPERDITIA TUMIDA Ulrich. See Leperditella sulcata.

Leperditia tumidula Ulrich.

Leperditia tumidula Ulrich, Jour. Cincinnati Soc. Nat. Hist., 13, 1891, p. 175, pl. 11, figs. 4a–c.

Trenton (Perryville): Danville, Kentucky.

Holotype.—Cat. No. 41284, U.S.N.M.

Leperditia turgida Billings.

Leperditia turgida Billings, Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 299.

Canadian (Quebec—F, H): Port aux Choix and Cape Norman, Newfoundland.

LEPERDITIA UNICORNIS Ulrich. See Primitiella unicornis.

Leperditia ventralis Billings.

Leperditia ventralis Billings, Geol. Surv. Canada, Pal. Foss., 1, 1865, p. 300.

Chazyan (Quebec—N): Bonne Bay, Newfoundland.

Leperditia whiteavesi Jones.

Leperditia Whiteavesi Jones, Geol. Surv. Canada, Cont. Micro-Pal., pt. 3, 1891, p. 87, fig. 6; pl. 12, figs. 11–14.

Niagaran: Chemahawin and Old Fort Island, Cedar Lake, Saskatchewan River, Canada.

LEPIDOCOLEUS Faber. Genotype: Plumulites jamesi Hall and Whitfield.

Lepidocoleus Faber, Jour. Cincinnati Soc. Nat. Hist., 9, 1886, p. 15.—Miller, N. A. Geol. Pal., 1889, p. 553; ibid., 1st App., 1892, p. 709.—Clarke, Amer. Geol., 17, 1896, pp. 137, 139; Zittel-Eastman Textb. Pal., 1900, p. 649; ibid., 2d ed., 1913, p. 743.

Lepidocoleus jamesi (Hall and Whitfield).

Plumulites Jamesi Hall and Whitfield, Geol. Surv. Ohio, Pal., 2, 1875, p. 106, pl. 4, figs. 1–3.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 274, fig. 19.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 723, figs.

Lepidocoleus Jamesi Faber, Jour. Cincinnati Soc. Nat. Hist., 9, 1886, p. 15, pl. 1, figs. A–F.—Hall and Clarke, Pal. New York, 7, 1888, p. 64, fig.—Miller, N. A. Geol. Pal., 1889, p. 553, figs. 1022–1023.—Miller and Faber, Jour. Cincinnati Soc. Nat. Hist., 17, 1894, p. 32.—Clarke, Amer. Geol., 17, 1896, pp. 137–143, pl. 7, fig. 9.—Ruedemann, Bull. New York State Mus., 42, 1901, p. 521, pl. 2, figs. 10–12.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 1050, pl. 53, figs. 13–13d.

Trenton and Cincinnatian: Cincinnati, Ohio, and vicinity; Saratoga County, New York.

Lepidocoleus sarlei Clarke.

Lepidocoleus sarlei Clarke, Amer. Geol., 17, 1896, pp. 14–143, pl. 7, figs. 1–6.—Grabau and Shimer, N. A. Index Fossils, 2, 1910, p. 371, fig. 1671.

Clinton (Rochester): Rochester, New York.

LEPIDODISCUS CINCINNATIENSIS Sharman and Newton. See Agelacrinites cincinnatiensis.

LEPIDODISCUS FABERI Cumings. See Agelacrinites faberi.

LEPIDODISCUS PILEUS Sladen. See Agelacrinites pileus.

LEPIDOLITES Ulrich. Genotype: L. dickhauti Ulrich.

Lepidolites Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 20.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 67, pl. F, figs. 11, 12 (extras, 1893).—Ulrich, Amer. Geol., 1, 1888, p. 324.—Miller, N. A. Geol. Pal., 1889, p. 160.

Ischadites James, Jour. Cincinnati Soc. Nat. Hist., 8, 1885, p. 163.

Receptaculites James, Jour. Cincinnati Soc. Nat. Hist., 14, 1891, p. 60.

Lepidolites dickhauti Ulrich.

Lepidolites dickhauti Ulrich, Jour. Cincinnati Soc. Nat. Hist., 2, 1879, p. 21, pl. 7, figs. 17–17b.—Winchell and Schuchert, Geol. Minnesota, 3, pt. 1, 1895, p. 67, pl. F, figs. 11, 12.

Ischadites dickhauti James, Jour. Cincinnati Soc. Nat. Hist., 8, 1885, p. 165; ibid., 9, 1886, p. 249.

Receptaculites dickhauti James, ibid., 14, 1891, p. 63.

Lepidolites elongatus Ulrich, ibid., 2, 1879, p. 22, pl. 7, fig. 16.

Ischadites elongatus James, ibid., 8, 1885, p. 165.

Eden (Southgate): Covington, Kentucky.

Cotypes.—Cat. No. 46533, U.S.N.M.

LEPIDOLITES ELONGATUS Ulrich. See Lepidolites dickhauti.

LEPOCRINITES Conrad. Genotype: L. gebhardi Conrad.

Lepocrinites Conrad, Ann. Rep. New York Geol. Surv., 1840, p. 207.—Vanuxem, Nat. Hist. New York, Geol., 3, 1842, p. 117, fig. 4.—Mather, ibid., 1, 1843, p. 346, fig. 4.—Schuchert, Smiths. Misc. Coll., 47, 1904, p. 213.

Lepocrinus or Lepadocrinus Hall, Pal. New York, 3, 1859, p. 125, pl. 7, figs. 1–20.

Apiocystites Jaekel (part), Stammesg. Pelmat., Berlin, 1, 1899, p. 279, fig. 59.

Lepadocrinus Bather (part), Treatise Zool., pt. 3, Echinoderma, London, 1900, p. 61.—Haeckel, Die Amphorideen und Cystoideen, Leipzig, 1896, p. 134.

Lepocrinites gebhardi Conrad.

Lepocrinites gebhardii Conrad, 4th Ann. Rep. New York Geol. Surv., 1840, p. 207.—Vanuxem, Nat. Hist. New York, Geol., 3, 1842, p. 117, fig. 4.—Mather, ibid., 1, 1843, p. 346, fig. 4.—Hall., ibid., 4, 1843, tab. ill. 27, fig. 4.—Owen, Amer. Jour. Sci., 2d ser., 1846, p. 49, fig. 4.—Lincklaen, 14th Rep. New York State Cab. Nat. Hist., 1861, p. 58, pl. 9, fig. 2.—Schuchert, Smiths. Misc. Coll., 47, pt. 2, 1904, p. 215.

Lepocrinus gebhardi Hall, Pal. New York, 3, 1859 (1861), p. 127, pl. 7, figs. 1–20.—Haeckel, Die Amphorideen und Cystoideen, Leipzig, 1896, p. 135.

Apiocystites gebhardi Jaekel, Stammesg. Pelmat., 1, Berlin, 1899, p. 282, fig. 59.

Helderbergian (Manlius transition beds or Coeymans): Schoharie, etc., New York.

Lepocrinites manlius Schuchert.

Lepocrinites manlius Schuchert, Smiths. Misc. Coll., 47, 1904, p. 214, pl. 37, figs. 2, 3; pl. 39, figs. 15, 16; text fig. 23; Maryland Geol. Surv., Low. Dev., 1913, p. 231, pl. 32, figs. 8, 9; pl. 35, figs. 15,16.

Helderbergian (Keyser): Keyser, West Virginia.

Holotype.—Cat. No. 35062, U.S.N.M.

LEPOCRINITES MOOREI Meek. See Lepadocystis moorei.

LEPOCRINUS Hall. See Lepocrinites Conrad.

LEPTÆNA Dalman.

Genotype: Productus rugosa Hisinger=Conchita rhomboidalis Wilckens.

Leptæna Dalman, Kongl. Svenska Vet.-Akad. Handl., for 1827, 1828, pp. 93, 94.—King, Mon. Permian Foss., Pal. Soc., 1850, p. 104.—Billings, Canadian Nat. Geol., 1, 1856, p. 133.—Pictet, Traité de Pal., 2d ed., 4, 1857, p. 60.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, Jan., p. 56.—Zittel, Handb. Pal., 1, 1880, p. 678.—Winchell, 9th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1881, p. 118.—Miller, N. A. Geol. Pal., 1889, p. 347.—Beecher, Amer. Jour. Sci., 3d ser., 44, 1892, pp. 145, 147.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 276.—Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 409.—Hall and Clarke, 11th Ann. Rep. New York State Geol., 1894, p. 277.—Koken, Die Leitfossilien, Leipzig, 1896, p. 237, fig. 198, 4–6.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, 313.—Grabau, Bull. New York State Mus., 45, 1901, p. 180; Bull. Bufialo Soc. Nat. Sci., 7, 1901, p. 180.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 225.—Cumings, 32d Ann. Rep., Dep. Geol. Nat. Res. Indiana, 1908, p. 889.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 384.

Leptagonia McCoy, Carb. Foss. Ireland, 1844, p. 116, figs. 11–13.—D'Orbigny, Compt. Rend. de l'Acad. Sci., 25, 1847, p. 267.—McCoy, British Pal. Rocks and Foss., 1854, p. 247.—Zittel, Handb. Pal., 1, Munich, 1880, p. 678.—Winchell, 9th Ann. Rep. Geol. Nat. Hist. Surv. Minnesota, 1881, p. 118.—Koken, Die Leitfossilien, Leipzig, 1896, p. 237, fig. 198, 4–6.

Plectambonites Oehlert, Fischer's Manual Conch., 1887, p. 1283.

LEPTÆNA ALTERNATA Conrad. See Rafinesquina alternata.

LEPTÆNA ALTERNISTRIATA Hall. See Rafinesquina alternata alternistriata.

LEPTÆNA ASPERA James. See Plectambonites rugosa.

LEPTÆNA BARABUENSIS Whitfield. See Syntrophia barabuensis.

LEPTÆNA BIPARTITA Hall. See Strophcodonta (Leptostrophia) bipartita.

LEPTÆNA CAMERATA Hall. See Rafinesquina deltoidea.

Leptæna charlottæ Winchell and Schuchert.

Leptæna charlottæ Winchell and Schuchert, Amer. Geol., 9, April 1, 1892, p. 288; Geol. Minnesota, 3, 1893, p. 410, pl. 32, figs. 1–5.

Strophomena halli Sardeson, Bull. Minnesota Acad. Nat. Sci., 3, April 9, 1892, p. 334, pl. 4, figs. 36–38.

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

LEPTÆNA CORRUGATA Hall. See Strophcodonta corrugata and S. corrugata pleuristriata.

LEPTÆNA DECIPIENS Billings. See Leptella decipiens.

LEPTÆNA DEFLECTA Hall. See Dinorthis (Plectorthis) deflecta.

LEPTÆNA DELTOIDEA Hall. See Rafinesquina deltoidea.

LEPTÆNA DELTOIDES Owen. See Rafinesquina minnesotensis.

LEPTÆNA DEPRESSA Hall. See Leptæna rhomboidalis.

LEPTÆNA EUGLYPHA Hisinger. See Strophonella euglypha.

LEPTÆNA FASCIATA Hall. See Leptæna incrassata.

LEPTÆNA FILITEXTA Hall. See Strophomena incurvata.

LEPTÆNA GIBBOSA Miller. See Plectambonites gibbosus.

Leptæna gibbosa (James).

Strophomena gibbosa James, Cincinnati Quart. Jour. Sci., 1, 1874, p. 333.

Leptæna gibbosa Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 316; ibid., 17, 1912, p. 116, pl. 1, figs. 5a–c.

Eden (Economy): Cincinnati, Ohio, and vicinity; Boyd and north of Ford, Kentucky.

Leptæna gibbosa invenusta Foerste.

Leptæna gibbosa invenusta Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 315, pl. 7, fig. 3.

Eden (Fulton or Lower Economy): Two miles west of Drennan Springs, Kentucky.

LEPTÆNA GLABRA Foerste. See Plectambonites glaber.

Leptæna incrassata Hall.

Leptæna incrassata Hall, Pal. New York, 1, 1847, p. 19, pl. 4 bis, figs. 2a–c.—Rogers, Geol. Pennsylvania, pt. 2, 1858, p. 817, fig. 519.

Strophomena incrassata Billings, Canadian Nat. and Geol., 4, 1859, p. 443.—Winchell and Schuchert, Pal. Minnesota, 3, pt. 1, 1893, p. 410.—Raymond, Carnegie Mus., 7, 1911, p. 230, pl. 34, figs. 32–37, figs. 1–5.

Leptæna fasciata Hall, Pal. New York, 1, 1847, p. 19, pl. 4 bis, figs. 3a, b (not 3c).

Strophomena fasciata Emmons, Amer. Geology, 1, pt. 2, 1855, p. 235, pl. 3, fig. 24.—Hall, 12th Ann. Rep. New York State Cab. Nat. Hist., 1858, p. 70.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1126, fig.

Rafinesquina fasciata Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 283.

Leptæna plicifera Hall, Pal. New York, 1, 1847, p. 19, pl. 4 bis, fig. 1.

Strophomena plicifera Emmons, Amer. Geology, 1, pt. 2, 1855, pl. 3, figs. 21b, c.—Hall, 12th Rep. New York State Cab. Nat. Hist., 1859, p. 70.

Dalmanella? plicifera Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 202.

Chazyan: Mingan Islands, Canada (Mingan); Chazy, Valcour Island, Crown Point, etc., New York (Crown Point, Valcour).

LEPTÆNA INCRASSATA Hall. See Rafinesquina incrassata.

Leptæna julia (Billings).

Strophomena julia Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 127, fig. 105 (adv. sheets, 1862).

Leptæna julia Shaler, Bull. Mus. Comp. Zool., 1865, p. 65.

Anticostian (Jupiter River): The Jumpers, Anticosti.

LEPTÆNA MELITA Hall and Whitfield. See Dalmanella melita.

LEPTÆNA MESACOSTA Shumard. See Rafinesquina mesicosta.

LEPTÆNA MINNESOTENSIS Sardeson. See Plectambonites minnesotensis.

Leptæna nitens (Billings).

Strophomena nitens Billings, Canadian Nat. Geol., 5, 1860, p. 53, fig. 1; Pal. Foss., 1, Geol. Surv. Canada, 1865, p. 118, fig. 97 (adv. sheets, 1862); Geol. Canada, 1863, p. 209, fig. 208.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1130, figs.

Rafinesquina nitens Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 283.

Leptæna nitens Whiteaves, Pal. Foss., Geol. Surv. Canada, 3, pt. 2, 1895, p. 120.

Richmond: Charleton Point, etc., Anticosti (Charleton and English Head and Gamachian); Stony Mountain, Manitoba (Stony Mountain); Wyoming; etc.

LEPTÆNA OBSCURA Hall. See Rafinesquina obscura.

LEPTÆNA ORTHIDIDEA Hall. See Strophomena? orthididea.

LEPTÆNA PATENTA Hall. See Strophonella patenta.

LEPTÆNA PLANOCONVEXA Hall. See Strophomena planoconvexa.

LEPTÆNA PLANUMBONA Hall. See Strophomena planumbona.

LEPTÆNA PLICATELLA Ulrich. See Plectambonites plicatellus.

LEPTÆNA PLICIFERA Hall. See Leptæna incrassata.

LEPTÆNA PRECOSIS Sardeson. See Plectambonites precosis.

LEPTÆNA PROFUNDA Hall. See Strophcodonta profunda.

LEPTÆNA PROLONGATA Foerste. See Plectambonites transversalis prolongatus.

LEPTÆNA QUADRILATERA Shaler. See Leptæna rhomboidalis.

LEPTÆNA RECEDENS Sardeson. See Plectambonites recedens.

LEPTÆNA RECTA Hall. See Dinorthis (Plæsiomys) deflecta.

Leptæna reticulata (Shaler).

Strophomena reticulata Shaler, Bull. Mus. Comp. Zool., 4, 1865, p. 62.

Richmond (Charleton) and Gamachian (Ellis Bay): Ellis Bay, Anticosti.

Leptæna rhomboidalis (Wilckens).

Conchita rhomboidalis Wilckens, Nachricht von selten Versteinerungen, 1769, p. 77, pl. 8, figs. 43, 44.

Anomites rhomboidalis Wahlenberg, Acta Soc. Upsala, 3, 1821, p. 65.

Strophomena undulosa Conrad, 5th Ann. Rep. Geol. Surv. New York, 1841, p. 54.

Strophomena depressa Vanuxem, Geol. New York, Rep. 3d Dist., 1842, p. 79, fig. 5.—Hall, ibid., Rep. 4th Dist., 1843, p. 77, fig. 5; p. 104, fig. 2.—Billings, Canadian Nat. Geol., 1, 1856, p. 59, pl. 1, fig. 5.—Roemer, Sil. Fauna West. Tennessee, 1860, p. 65, pl. 5, fig. 2.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1126, figs.

Strophomena undulatus Vanuxem, Geol. New York, Rep. 3d Dist., 1842, p. 139, fig. 3.—Hall, ibid., Rep. 4th Dist., 1843, p. 175, fig. 3.—Yandell and Shumard, Cont. Geol. Kentucky, 1847, p. 11.

Productus? sulcatus Castelnau, Essai Syst. Sil. l'Amérique Septentrionale, 1843, p. 39, pl. 13, fig. 7.

Productus sulcifer de Verneuil, ibid., 1843, p. 39.

Leptæna depressa Hall, Pal. New York, 2, 1852, p. 62, pl. 21, fig. 8; p. 257, pl. 53, fig. 6.—Rogers, Geol. Pennsylvania, 2, pt. 2, 1858, p. 823, fig. 630.

Leptæna rhomboidalis—Continued.

Strophomena rugosa Hall, Pal. New York, 3, 1859, p. 195, pl. 19, fig. 1.—Safford, Geol. Tennessee, 1869, p. 315, fig. 11.—Miller, N. A. Geol. Pal., 1889, p. 383, fig. 623.—Lesley, Rep. Geol. Surv. Pennsylvania, P 4, 1890, p. 1138, fig.

Strophomena rhomboidalis Billings, Canadian Jour., 6, 1861, p. 336, figs. 111, 112; Geol. Canada, 1863, p. 311, fig. 314; p. 367, fig. 373; Proc. Portland Soc. Nat. Hist., 1863, p. 107, pl. 3, fig. 1.—Chapman, Expos. Min. and Geol. Canada, 1864, p. 115, fig. 96; p. 193, fig. 232.—Hall, Pal. New York, 4, 1867, p. 76, pl. 12, figs. 16–18; p. 414, pl. 15, figs. 15, 16.—Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 426, pl. 10, fig. 7.—Davidson, Mon. British Sil. Brach., Pal. Soc., 1871, p. 281, pl. 39, figs. 1–21; pl. 44, fig. 1.—Billings, Pal. Foss., 2, 1874, p. 27.—White, Wheeler's Expl. Surv. West 100th Merid., 4, 1875, p. 85, pl. 5, fig. 5.—Hall and Whitfield, King's U. S. Geol. Expl. 40th Parl., 4, 1877, p. 253, pl. 4, fig. 4.—Hall, 28th Rep. New York State Mus. Nat. Hist., 1879, p. 151, pl. 22, figs. 4–10; 11th Rep. State Geol. Indiana, 1882, p. 288, pl. 22, figs. 4–10; 2d Ann. Rep. New York State Geol., 1883, pl. 38, figs. 17–31.—Walcott, Mon. U. S. Geol. Surv., 8, 1884, p. 118.—Hall, 35th Rep. New York State Mus. Nat. Hist., 1884, pl. 22, fig. 1.—Herrick, Amer. Geol., 3, 1889, pl. 4, fig. 6.—Beecher and Clarke, Mem. New York State Mus., 1, 1889, p. 18, pl. 2, figs. 1–13.—Nettleroth, Kentucky Fossil Shells, Mem. Geol. Surv. Kentucky, 1889, p. 150, pl. 18, figs. 1–3.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1131, figs.—Foerste, Proc. Boston Soc. Nat. Hist., 24, 1890, p. 298.—Beecher, Amer. Jour. Sci., 3d ser., 41, 1891, p. 357, pl. 17, figs. 18–21.—Herrick, Geol. Ohio, 7, 1895, pl. 20, fig. 6.

Strophomena analoga Davidson, Quart. Jour. Geol. Soc. London, 19, 1863, p. 173, pl. 9, fig. 18.—Dawson, Acadian Geol., 3d ed., 1878, p. 295, fig. 95.

Leptæna quadrilatera Shaler, Bull. Mus. Comp. Zool., 4, 1865, p. 65.

Leptæna rhomboidalis Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 279, pl. 8, figs. 17–31; pl. 15A, figs. 40–42; pl. 20, figs. 21–24.—Foerste, Geol. Ohio, 7, 1895, p. 566.—Weller, Jour. Geol., 3, 1895, p. 912.—Girty, Mon. U. S. Geol. Surv., 32, pt. 2, 1899, p. 525; 19th Ann. Rep. U. S. Geol. Surv., 1899, p. 563.—Clarke, Mem. New York State Mus., 3, 1900, p. 57.—Grabau, Bull. Buffalo Soc. Nat. Sci., 7, 1901, p. 180, fig. 84.—Weller, Trans. Acad. Sci. St. Louis, 11, 1901, p. 159, pl. 14, figs. 19, 20; p. 180, pl. 16, figs. 7, 8.—Kindle, 25th Ann. Rep. Indiana Dep. Geol. Nat. Res., 1901, p. 593, pl. 4, fig. 5.—Weller, Jour. Geol., 9, 1901, p. 136.—Grabau, Bull. New York State Mus., 45, 1901, p. 180, fig. 84.—Ruedemann, Bull. New York State Mus., 49, for 1901, 1902, p. 18.—Clarke and Ruedemann, Mem. New York State Mus., 5, 1903, p. 42.—Weller, Geol. Surv. New Jersey, Pal., 3, 1903, p. 228, pl. 20, fig. 10; p. 278, pl. 27, fig. 9; p. 302, pl. 33, fig. 10; p. 325, pl. 41, fig. 10; p. 366, pl. 51, fig. 19.—Girty, U. S. Geol. Surv., Prof. Paper 21, 1904, p. 48, pl. 10, fig. 3.—Kindle and Breger, 28th Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1904, p. 431, pl. 2, fig. 17.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 226, figs. 273a–b.—Foerste, Jour. Cincinnati Soc. Nat. Hist., 21, 1909, p. 20.—Maynard, Maryland Geol. Surv., Low. Dev., 1913, p. 308, pl. 56, figs. 13–17.—Savage, Bull. Geol. Surv., Illinois, 23, 1913, p. 47, pl. 1, fig. 11; pl. 4, fig. 3, p. 72.

Leptæna (Strophomena) rhomboidalis Beecher, Amer. Jour. Sci., 3d ser., 46, 1892, p. 150, pl. 1, figs. 7–9.

Plectambonites rhomboidalis Keyes, Geol. Surv. Missouri, 5, 1895, p. 70, fig. 6.

Silurian-Mississippian: Widely distributed throughout Europe and America.

Plesiotypes.—Cat. Nos. 56722, 56723, U.S.N.M.

Leptæna richmondensis Foerste.

Leptæna tenuistriata Hall (part), Pal. New York, 1, 1847, p. 108, pl. 31A, fig. 4.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 8, figs. 12–16.

Leptæna richmondensis—Continued.

Strophomena tenuistriata Safford, Geol. Tennessee, 1869, p. 275, fig. 2.

Strophomena rhomboidalis Meek, Pal. Ohio, 1, 1873, p. 75, pl. 5, fig. 6.—Miller, Jour. Cincinnati Soc. Nat. Hist., 4, 1881, p. 1.

Strophomena tenuistriata Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 55.—Hall, 2d Ann. Rep. New York State Geol., 1883, pl. 38, figs. 12–16.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1890, p. 1134, figs.

Leptæna rhomboidalis Cumings, 32d Ann. Rep. Dep. Geol. and Nat. Res. Indiana, 1908, p. 909, pl. 34, figs. 5–5d.

Leptæna richmondensis Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 211, pl. 4, figs. 10a, b; ibid., 17, 1912, p. 117, pl. 1, figs. 6a–c.

Richmond: Ohio, Indiana, Kentucky, and Tennessee.

Leptæna richmondensis precursor Foerste.

Leptæna richmondensis precursor Foerste, Bull. Sci. Lab. Denison Univ., 14, 1909, p. 211, pl. 4, fig. 11; Ohio Nat., 12, 1912, p. 453, pl. 22, fig. 7.

Richmond (Arnheim): Arnheim and other localities in Ohio and Kentucky.

LEPTÆNA RUGOSA James. See Plectambonites rugosa.

LEPTÆNA SAXEA Sardeson. See Plectambonites saxea.

LEPTÆNA SERICEA Sowerby. See Plectambonites sericeus.

LEPTÆNA SERICEA var. RUGOSA Meek. See Plectambonites rugosa.

LEPTÆNA SORDIDA Billings. See Leptella sordida.

Leptæna(?) stelzneri Kayser.

Leptæna stelzneri Kayser, Palæontographica, Suppl., 3, 1876, p. 21, pl. 3, fig. 21.—Schuchert, Bull. U. S. Geol. Surv., 87, 1897, p. 241.

Ordovician: Guaco, Argentina.

LEPTÆNA STRIATA Hall. See Strophonella striata.

LEPTÆNA SUBPLANA Hall. See Schuchertella subplana.

LEPTÆNA SUBQUADRATA Hall. See Christiania subquadrata.

LEPTÆNA SUBTENTA Hall. See Strophomena planumbona subtenta.

LEPTÆNA SUBTENTA (part) Hall. See Strophomena trentonensis.

LEPTÆNA SULCATA Verneuil. See Strophomena sulcata.

LEPTÆNA TENUILINEATA Hall. See Rafinesquina tenuilineata.

Leptæna tenuistriata Sowerby.

Leptæna tenuistriata Sowerby in Murchison's Sil. Syst., 2, 1839, p. 636, pl. 22, fig. 2a.—Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 45, pl. 5, fig. 9.

Caradoc sandstone: Montgomeryshire, England.

Trenton (Hermitage): Clifton, Tennessee.

LEPTÆNA TENUISTRIATA Hall. See Leptæna richmondensis.

LEPTÆNA TRANSVERSALIS Hall. See Plectambonites transversalis.

LEPTÆNA TRANSVERSALIS var. ALABAMENSIS Foerste. See Plectambonites transversalis alabamensis.

LEPTÆNA TRANSVERSALIS var. PROLONGATA Foerste. See Plectambonites transversalis prolongatus.

LEPTÆNA TRILOBATA Owen. See Strophomena trilobata.

Leptæna unicostata (Meek and Worthen).

Leptæna (n. sp.?) Owen, Geol. Surv. Wisconsin, Iowa, Minnesota, 1852, pl. 2B, fig. 3.

Strophomena unicostata Meek and Worthen, Geol. Surv. Illinois, 3, 1868, p. 335, pl. 4, fig. 11.—Whitfield, Geol. Wisconsin, 4, p. 262, pl. 12, fig. 14.

Rafinesquina unicostata Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 15A, fig. 39; pl. 20, fig. 25.

Leptæna unicostata Winchell and Schuchert, Geol. Minnesota, 3, 1893, p. 411, pl. 32, figs. 6–9.—Whiteaves, Pal. Foss., 3, pt. 3, 1897, p. 174.—Grabau and Shimer, N. A. Index Fossils 1, 1907, p. 226, figs. 271i–j.

Richmond: Savannah and Wilmington, Illinois; Delafield and Iron Ridge, Wisconsin; Spring Valley and Granger, Minnesota; Lattners, Iowa; Rapids of the Nelson River, Lake Winnipeg, Manitoba; Texas; etc.

LEPTAGONIA McCoy. See Leptæna Dalman.

LEPTELLA Hall and Clarke. Genotype: Leptæna sordida Billings.

Leptella Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 293; 11th Ann. Rep. New York State Geol., 1894, p. 277.—Miller, N. A. Geol. Pal., 1st App., 1892, p. 688.

Leptella decipiens (Billings).

Leptæna decipiens Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 74, fig. 67; p. 219 (adv. sheets 1862); Geol. Canada, 1863, p. 231, fig. 243.

Leptella decipiens Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 294.

Ozarkian or Canadian: Point Levis, Quebec (Levis-Limestone No. 2); four miles northeast of Portland Creek, Newfoundland (Quebec—P).

Leptella sordida (Billings).

Leptæna sordida Billings, Pal. Fossils, 1, Geol. Surv. Canada, 1865, p. 73, text fig. 66 (adv. sheets 1862); Geol. Canada, 1863, p. 231, fig. 242.

Leptella sordida Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 293, pl. 15A, figs. 12–16.

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

LEPTOBOLUS Hall. Genotype: L. lepis Hall.

Leptobolus Hall, Description n. sp. Foss. from Hudson River Group, 1871, p. 3; 24th Rep. New York State Cab. Nat. Hist., 1872, p. 226.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, Jan., p. 10.—Nicholson, Rep. Pal. Prov. Ontario, pt. 2, 1875, p. 85.—Zittel, Handb. Pal., 1, 1880, p. 665.—Miller, N. A. Geol. Pal., 1889, p. 348.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pp. 73, 165; 11th Ann. Rep. New York State Geol., 1894, p. 241.—Schuchert, Zittel-Eastman Textb. Pal., 1, 1900, p. 307.—Matthew, Trans. Roy. Soc. Canada, 2d ser., 8, sec. 4, 1902, p. 102.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 194.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, p. 890.—Schuchert, Zittel-Eastman Textb. Pal., 1913, p. 372.

LEPTOBOLUS GEMMULUS Matthew. See Lingulella ferruginea.

LEPTOBOLUS GRANDIS Matthew. See Lingulella grandis.

Leptobolus insignis Hall.

Leptobolus insignis Hall, Descrip. n. sp. Foss. from Hudson River Group, 1871, p. 3, pl. 3, fig. 17; 24th Rep. New York State Cab. Nat. Hist., 1872, p. 227, pl. 7, fig. 17.—Nicholson, Pal. Province Ontario, 1875, p. 85.—Ami, Canadian Rec. Sci., 3, p. 103 (loc. occ.).—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 74, pl. 3, figs. 1–6.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 194.

Utica: Middleville, Utica, etc., New York; Ottawa, Ontario; Cincinnati, Ohio (Fulton); Macasty Bay, Anticosti (Macasty).

Leptobolus lepis Hall.

Leptobolus lepis Hall, Description n. sp. Foss. from Hudson River Group, 1871, p. 3, pl. 3, figs. 19, 20; 24th Rep. New York State Cab. Nat. Hist., 1872, p. 226, pl. 7, figs. 19, 20.—Hall and Whitfield, Pal. Ohio, 2, 1875, p. 69, pl. 1, figs. 10, 11.—Miller, Cincinnati Quart. Jour. Sci., 2, 1875, p. 11.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, p. 74, pl. 3, figs. 8–10.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 911, pl. 34, figs. 6, 6a.

Trenton (Upper): Cincinnati, Ohio, and vicinity.

Leptobolus lepis cliftonensis Foerste.

Leptobolus lepis cliftonensis Foerste, Bull. Sci. Lab. Denison Univ., 16, 1910, p. 21, pl. 2, figs. 20a–c.

Trenton (Hermitage): Clifton, Tennessee.

Leptobolus occidentalis Hall.

Leptobolus occidentalis Hall, Description n. sp. Foss. from Hudson River Group, 1871, p. 3, pl. 3, fig. 18; 24th Rep. New York State Cab. Nat. Hist., 1872, p. 227, pl. 7, fig. 18.—Hall and Clarke, Pal. New York, 8, pt. 1, 1892, pl. 3, fig. 7.—Grabau and Shimer, N. A. Index Fossils, 1, 1907, p. 194.

Richmond: Hawleys Mills, Iowa; Platteville, Wisconsin (Maquoketa); Arkansas and Oklahoma (Sylvan).

Leptobolus walcotti Ruedemann.

Leptobolus walcotti Ruedemann, Bull. New York State Mus., 42, 1901, p. 569, pl. 1, figs. 6–12.

Chazyan (Normanskill): Mount Moreno, near Hudson, New York; Arkansas; Tennessee.

LEPTOCŒLIA Hall. See Cœlospira Hall.

LEPTOCŒLIA DISPARILIS Hall. See Atrypina disparilis.

LEPTOCŒLIA INTERMEDIA Hall. See Atrypina intermedia.

LEPTODESMA Hall. Genotype: L. potens Hall.

Leptodesma Hall, Pal., New York, 5, pt. 1, Lam. (adv. copy), 1883, p. 4; ibid., 1, 1884, pp. 13, 175; 35th Rep. New York State Mus. Nat. Hist., 1884, pp. 347, 406c.—Miller, N. A. Geol. Pal., 1889, p. 484.—Jackson, Amer. Nat., 24, 1890, p. 1141; Mem. Boston Soc. Nat. Hist., 4, 1890, p. 381.—Clarke, Amer. Geol., 13, 1894, pp. 286–289, figs.—Hind, Mon. British Carb. Lam., 2, Pal. Soc., 1901, p. 10.

Leptodesma rhomboidea (Hall).

Avicula rhomboidea Hall, Pal. New York, 2, 1852, p. 84, pl. 27, figs. 2a, b, c, d.

Leptodesma rhomboideum Whitfield and Hovey, Bull. Amer. Mus. Nat. Hist., 11, 1899, pl. 2, p. 158 (gen. ref.).

Clinton: New Hartford and Sodus, New York; Arisaig, Nova Scotia.

LEPTODOMUS McCoy. Genotype: L. fragilis McCoy.

Leptodomus McCoy, Syn. Char. Carb. Foss. Ireland, 1844, p. 66; British Pal. Rocks and Foss., 1854, p. 277.—Pictet, Traite de Pal., 2d ed., 3, 1855, p. 531.—Billings, Proc. Portland Soc. Nat. Hist., 1, 1863, p. 117.—Winchell and Marcy, Mem. Boston Soc. Nat. Hist., 1, 1865, p. 108.—Zittel, Handb. Pal., 2, Munich, 1881, p. 129.—Miller, N. A. Geol. Pal., 1889, p. 485.—Koken, Die Leitfossilien, Leipzig, 1896, p. 526.

Leptodomus (Sanguinolites) aratus Hall.

Leptodomus (Sanguinolites) aratus Hall, Canadian Nat. Geol., 5, 1860, p. 152.—Dawson, Acadian Geol., 2d ed., 1868, p. 603.

Silurian: Arisaig, Nova Scotia.

LEPTODOMUS (AMPHICŒLIA) LEIDYI Whitfield. See Amphicœlia leidyi.

LEPTODOMUS NEGLECTUS Whitfield. See Amphicœlia neglecta.

LEPTODOMUS UNDULATUS Whitfield. See Ambonychia undulata.

LEPTOGRAPTUS Lapworth. Genotype: Graptolithus flaccidus Hall.

Leptograptus Lapworth, Geol. Mag., 10, 1873, p. 558.—Zittel, Handb. Pal., 1, Munich, 1879, p. 298.—Tullberg, Sveriges Geol. Unders., Ser. C, No. 55, 1883, pp. 12, 14.—Koken, Die Leitfossilien, Leipzig, 1896, p. 328.—Wiman, Bull. Geol. Inst. Univ. Upsala, 2, pt. 2, 1896, p. 266.—Walther, Zeits. geol. Gesell., 49, 1897, p. 251.—Roemer and Frech, Leth. geog., 1, Theil, Leth. Pal., 1, 3 Lief., 1897, p. 591; Zittel-Eastman Textb. Pal., 1, 1900, p. 118.—Elles and Wood, Mon. British Grapt., Pal. Soc., 1903, p. 104.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 260; Zittel-Eastman Textb. Pal., 2d ed., 1913, p. 130.

Leptograptus annectans (Walcott).

Graptolithus annectans Walcott, Trans. Albany Inst., 10, 1883 (adv. sheets 1879), pp. 20, 35, pl. 1, figs. 2, 2a.

Leptograptus annectans Lapworth, Trans. Roy. Soc. Canada, 4, 1886, 183.—Ami, Can. Rec. Sci., 9, 1893, 180.—Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 264–266, pl. 14, fig. 5; figs. 180–183.

Graptolithus tenuis? Ulrich, Cat. Foss. Cincinnati group, 1880.

Utica: Holland Patent, New York; Cincinnati, Ohio, and vicinity.

Plesiotype.—Cat. No. 54274, U.S.N.M.

Leptograptus flaccidus (Hall).

Graptolithus flaccidus Hall, Geol. Surv. Canada, dec. 2, 1865, p. 143, pl. 2, figs. 17–19.

Graptolithus (Monoprion) flaccidus Hall, 20th Rep. New York State Cab. Hist., 1868, pl. 3, figs. 10, 11; rev. ed., 1870, pl. 3, figs. 10, 11; p. 223.

Leptograptus flaccidus Gurley, Jour. Geol., 4, 1896, p. 99 (gen. ref.).—Elles and Wood, Mon. British Grapt., Pal. Soc., 1903, p. 106, figs. 62a–g; pl. 14, figs. 1a–g.

Trenton (Collingwood): Lake St. John, east from Blue Point, Quebec.

Leptograptus flaccidus spinifer Elles and Wood.

Leptograptus flaccidus var. spinifer Elles and Wood, Mon. British Grapt., pt. 3, 1903, Pal. Soc., 1903, p. 108, pl. 14, figs. 2a–c.

Leptograptus flaccidus var. spinifer mut. trentonensis Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, pp. 262, 263, pl. 14, figs. 8, 9; text figs. 176–178.

Ordovician: England (Hartfell); Glenmont and Mount Moreno, New York (Normanskill).

LEPTOGRAPTUS FLACCIDUS SPINIFER mut. TRENTONENSIS Ruedemann. See Leptograptus flaccidus spinifer.

Leptograptus flaccidus trentonensis Ruedemann.
Leptograptus flaccidus mut. trentonensis Ruedemann, Mem. New York State Mus., 11, pt. 2, 1908, p. 261, pl. 14, fig. 7; figs. 172–175.
Chazyan (Normanskill): Glenmont and Mount Moreno, New York.

Leptograptus macrotheca Gurley.
Leptograptus? macrotheca Gurley, Jour. Geol., 4, 1896, p. 69.
Canadian (Levis): Point Levis, Quebec.

LEPTOGRAPTUS SUBTENUIS Walcott. See Didymograptus subtenuis.

LEPTOGRAPTUS TENUIS Lapworth. See Didymograptus subtenuis.

LEPTOPLASTUS Angelin. Genotype: L. stenotus Angelin.
Leptoplastus Angelin, Pal. Scandinavica, 3d ed., Holmiae, 1878, p. 46.—Brögger, Die sil. Etagen 2–3, Kristiania, 1882, p. 113.—Matthew, Trans. Roy. Soc. Canada, 9, sec. 4, 1892, p. 53.—Koken, Die Leitfossilien, Leipzig, 1896, p. 20, fig. 11, fig. 2.— Lindstrom, Kongl. Sven. Vet.-Akad. Handl., 34, No. 8, 1901, p. 22.

LEPTOPLASTUS (SPHÆROPHTHALMUS) ALATUS Brogger. See Sphærophthalmus alatus.

LEPTOPLASTUS (CTENOPYGE) FLAGELLIFER Linnarsson. See Ctenopyge flagellifer.

Leptoplastus latus Matthew.
Leptoplastus latus Matthew, Canadian Rec. Sci., 4, 1891, p. 462, figs. 1–3; Trans. Roy. Soc. Canada, 9, sec. 4, 1892, p. 54, pl. 13, figs. 10a–c.
Canadian (Bretonian—Div. C3b): St. John, New Brunswick.

LEPTOPLASTUS (CTENOPYGE?) LOBATA Brögger. See Ctenopyge? lobata.

LEPTOPLASTUS (CTENOPYGE) SPECTABILIS Brögger. See Ctenopyge spectabilis.

LEPTOPLASTUS SPINGER Matthew. See Acantholenus spiniger.

Leptoplastus spinosus Matthew.
Leptoplastus spinosus Matthew, Trans. Roy. Soc. Canada, 9, sec. 4, 1894, p. 106, pl. 17, figs. 4a–e.
Canadian (Bretonian—Div. C3b): St. John, New Brunswick.

LEPTOPOTERION Ulrich. Genotype: L. mammiferum Ulrich.
Leptopoterion Ulrich, Amer. Geol., 3, 1889, pp. 235, 239.—Miller, N. A. Geol. Pal., 1889, p. 161.—James, J. F., Jour. Cincinnati Soc. Nat. Hist., 14, pt. 1, 1891, p. 54.—Rauff, Abh. d'math.-phys. Classe bayer Akad. Wiss., 17, 1892, p. 691.

Leptopoterion mammiferum Ulrich.
Leptopoterion mammiferum Ulrich, Amer. Geol. 3, 1889, p. 239.—J. F. James, Jour. Cincinnati Soc. Nat. Hist., 14, 1891, p. 54.
Chirospongia faberi Miller, N. A. Geol. Pal., 1889, p. 156, fig. 99.—J. F. James, Jour. Cincinnati Soc. Nat. Hist., 14, pt. 1, 1891, p. 65.
Maysville (Corryville): Cincinnati, Ohio.

LEPTOSTROPHIA Hall and Clarke. See Strophomenta subgenus Leptostrophia.

LEPTOTRYPA Ulrich. Genotype: L. minima Ulrich.

Leptotrypa Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 158.—Miller, N. A. Geol. Pal., 1889, p. 311.—Ulrich, Geol. Surv. Illinois, 8, 1890, pp. 377, 455; Geol. Minnesota, 3, 1893, p. 316.—Simpson, 14th Ann. Rep. State Geol. New York for 1894, 1897, p. 580.—Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 31.—Ulrich and Bassler, Smiths. Misc. Coll., 47, 1904, pp. 24, 28.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 749.—Bassler, Bull . U. S. Nat. Mus., 77, 1911, p. 207.

LEPTOTRYPA ACERVULOSA Ulrich. See Cyphotrypa acervulosa.

Leptotrypa calceola (Miller and Dyer).

Monticulipora calceola Miller and Dyer, Jour. Cincinnati Soc. Nat. Hist., 1, 1878, p. 26, pl. 1, figs. 11, 11a.—James and James, ibid., 11, 1888, p. 27.—J. F. James, ibid., 18, 1895, p. 87.

Monticulipora (Monotrypa) calceola Nicholson, Genus Monticulipora, 1881, p. 185, pl. 1, figs. 3–3e.

Leptotrypa calceola Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 159.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 853, pl. 20, figs. 1–1c.

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

Leptotrypa clavacoidea (James).

Chætetes clavacoideus James, Cat. Low. Sil. Foss., 1871, p. 1. (nom. nud.); Cat. Foss. Cincinnati Group, 1875, p. 1.

Monticulipora clavacoidea James, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 236.—James and James, ibid., 1888, 11, p. 25.—J. F. James, ibid., 18, 1895, p. 84.

Monticulipora (Monotrypa) clavacoidea Nicholson, Genus Monticulipora, 1881, p. 182, fig. 37.

Leptotrypa clavacoidea Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 159.—Bassler, Proc. U. S. Nat. Mus., 30, 1906, p. 42.—Cumings, 32d Ann. Rep. Dep. Geol. Nat. Res. Indiana, 1908, p. 854, pl. 20, figs. 3, 3c.

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

LEPTOTRYPA CLAVIFORMIS Ulrich. See Stigmatella claviformis.

LEPTOTRYPA CLAVIS Ulrich. See Stigmatella clavis.

Leptotrypa? cortex Ulrich.

Leptotrypa cortex Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 162.

Eden (Economy): Covington, Kentucky.

Holotype.—Cat. No. 43677, U. S.N.M.

LEPTOTRYPA DISCOIDEA Ulrich. See Amplexopora? discoidea.

LEPTOTRYPA? DYCHEI Nickles and Bassler. See Stigmatella dychei.

LEPTOTRYPA FILIOSA Ulrich. See Amplexopora filiasa.

Leptotrypa hexagonalis Ulrich.

Leptotrypa hexagonalis Ulrich, Geol. Surv. Illinois, 8, 1890, p. 455, pl. 36, figs. 6, 6a; Geol. Minnesota, 3, 1893, p. 317.—Bassler, Bull. U. S. Nat. Mus., 77, 1911, pp. 208–210, figs. 112–114.

Black River (Platteville): Mineral Point, Janesville, and Beloit, Wisconsin; Calhoun County, Illinois; Minneapolis, Minnesota.

Middle Ordovician (Kuckers): Near Jewe, Esthonia, Russia.

Holotype and *plesiotypes*.—Cat. Nos. 44057, 57293, U.S.N.M.

LEPTOTRYPA INFORMIS Ulrich. See Cyphotrypa informis.

LEPTOTRYPA? IRREGULARIS Nickles and Bassler. See Stigmatella irregularis.

LEPTOTRYPA MACULATA Ulrich. See Spatiopora maculata.

Leptotrypa minima Ulrich.

Leptotrypa minima Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 159, pl. 6, figs. 2–2b.

Maysville (Bellevue): Hamilton, Ohio.

Cotypes.—Cat. No. 43676, U.S.N.M.

LEPTOTRYPA OFFULA Ulrich. See Paleschara? offula.

Leptotrypa ornata Ulrich.

Leptotrypa ornata Ulrich, Jour. Cincinnati Soc. Nat. Hist., 6, 1883, p. 160, pl. 6, figs. 4, 4a.

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

Cotypes.—Cat. No. 43678, U.S.N.M.

LEPTOTRYPA SEMIPILARIS Ulrich. See Cyphotrypa semipilaris.

Leptotrypa? sphærion (Hall).

Paleschara? sphærion Hall, 28th Ann. Rep. New York State Mus., doc. ed., 1876, pl. 8, figs. 14, 15.

Paleschara? (Chætetes?) sphærion Hall, ibid., mus. ed., 1879, p. 121, pl. 8, figs. 14, 15; 11th Ann. Rep. Indiana Geol. Nat. Hist., 1882, p. 247, pl. 7, figs. 14, 15.—Lesley, Geol. Surv. Pennsylvania, Rep. P 4, 1889, p. 592, fig.

Leptotrypa sphærion Nickles and Bassler, Bull. U. S. Geol. Surv., 173, 1900, p. 299.

Niagaran (Waldron): Waldron, Indiana.

LEPTOTRYPA STIDHAMI Ulrich. See Cyphotrypa stidhami.

LESUEURILLA Koken. See Maclurites Lesueur.

LEVISIA Walcott. Genotype: Agraulos agenor Walcott.

Levisia Walcott, Smiths. Misc. Coll., 57, no. 4, 1911, p. 86; Cambrian Faunas of China, Carnegie Institution, 3, 1913, p. 177.

Levisia nasuta Walcott.

Levisia nasuta Walcott, Smiths. Misc. Coll., 57, 1911, p. 87, pl. 17, fig. 5, and figs. 7, 7a; Cambrian Faunas of China, Carnegie Institution, 1913, p. 178.

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

Levisia richardsoni Walcott.

Levisia richardsoni Walcott, Smiths. Misc. Coll., 57, 1911, p. 86, pl. 17, figs. 4, 4a; Cambrian Faunas of China, Carnegie Institution, 1913, p. 178.

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