A BIBLIOGRAPHY OF THE CONODONTS WITH DESCRIPTIONS OF EARLY MISSISSIPPIAN SPECIES

By Grace B. Holmes

Of the Eastern High School, Washington, D. C.

INTRODUCTION

The present contributions to the study of the conodonts was prepared at the suggestion of Dr. R. S. Bassler and under his direction in the paleontological laboratory of the United States National Museum where extensive collections of these toothlike structures were available. As Doctors Ulrich and Bassler had just completed their paper on the classification of the conodonts and had applied their new classification in the description of an Upper Devonian fauna of western New York and an early Mississippian one from Tennessee, it was thought best that my work should carry these studies to the Mississippian rocks of Alabama and also include for the ready reference by students illustrations of previously described species, with exception of three publications, and a bibliography of the group. The exceptions mentioned refer to the work of Bryant in 1921, Ulrich and Bassler in 1926, and Roundy in 1926, copies of which are still available to the student.

ZOOLOGICAL AFFINITIES OF THE CONODONTS

The affinities of the conodonts have been a subject of controversy almost since their discovery by Pander in 1856. That there was no doubt in Pander's mind as to their relationship may be ascertained from the title of his monograph. He studied the internal as well as the external structure of the fossils and saw in their formation fishlike characters somewhat of the Selachian type.

The question concerning the affinities of these fossils seems to have had its birth in the mind of Dr. J. S. Newberry, of Ohio, who after studying specimens found in the Cleveland shales remained undecided for some years whether they were Marsipobranchii (Cyclostomata) or Annelids.

Hinde, who made the most comprehensive study of conodonts of any paleontologist up to Bryant's work of 1921, classified them as primitive vertebrates, probably Myxinoids. He based his conclusions upon two facts: First, no gastropods which possessed such

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teeth were found in the same formations nor did any crustaceans have such spines; and, secondly, the annelid jaws which he found in the same beds are composed of chitin, while the conodont teeth contain both calcium carbonate and calcium phosphate. He was of the same opinion in 1900, namely, that the teeth belonged to fish rather than to some invertebrate.

In 1886 Rohon and Zittel decided that "the conodonts have structurally nothing in common either with the dentine of Selachia and other fishes, the horny teeth of Cyclostomi, the lingual teeth of the Mollusca, the hooklets of the Cephalopoda, or the broken segment spines of the Crustacea; on the other hand, both in form and in structure, they agree remarkably with the masticatory apparatus of the Annelida and Gephyrea." They came to the conclusion that since there is this agreement, all these microscopic teeth, those acknowledged by Hinde to be annelids and those which he called conodonts, are the oral or oesophageal teeth of worms.

In reviewing the literature on conodonts it will be found that the most thorough students of these fossils believe they are the remains of primitive vertebrates, probably some simple fish. In neither of John Smith's papers on conodonts of Scotland can one find a suggestion that these are not fish teeth, but an exception is found when Asser Hadding places them in the phylum Annelida.

In Grabau's Text-Book of Geology, conodonts are described as horny, jawlike, or toothed structures developed within the body—the oesophageal jaws of worms.

Bryant in 1921 remarks: "On the whole, the longer I have studied these organisms the more have I become convinced that the true conodonts have hardly anything really diagnostic in common with annelid jaws. If, as I shall hereinafter try to demonstrate, certain of the leaflike forms are of the nature of pavement teeth, then the conclusion seems almost unavoidable that the conodonts must be considered as the dentition of some primitive type of fishes."

In the recent publication on the subject of conodonts by Ulrich and Bassler they are regarded as teeth and plates of primitive fish. Their classification is as follows:

Class PISCES

TYPICAL CONODONTS (teeth of primitive fishes)

Family DISTACODIDAE Ulrich and Bassler

Distacodus Hinde, 1879 (*Machairodus* Pander, 1856, preoccupied; *Machairodia* Smith, 1907); *Acodus* Pander, 1856; *Acontiodus* Pander, 1856; *Drepanodus* Pander, 1856; *Scolopodus* Pander, 1856; *Oistodus* Pander, 1856; *Paltodus* Pander, 1856.

Family PRIONIODIDAE Ulrich and Bassler

Prioniodus Pander, 1856; *Subprioniodus* Smith, 1907; *Cordylodus* Pander, 1856; *Belodus* Pander, 1856; *Ligonodina*, Ulrich and Bassler.

Family PRIONIODINIDAE Ulrich and Bassler

Cornuramia Smith, 1907; *Hindeodella*, Ulrich and Bassler; *Pachysomia* Smith, 1907; *Lonchodina*, Ulrich and Bassler; *Prioniodina*, Ulrich and Bassler; *Prioniodella*, Ulrich and Bassler; *Bryantodus*, Ulrich and Bassler; *Euprioniodina*, Ulrich and Bassler; *Hibbardella*, Ulrich and Bassler; *Lonchodus* Pander, 1856; *Valentia* Smith, 1907; *Prionognathus* Pander, 1856; *Palmatodella*, Ulrich and Bassler; *Diplododella*, Ulrich and Bassler; *Synprioniodina*, Ulrich and Bassler.

FISH PLATES (dermal plates)

Family POLYGNATHIDAE Ulrich and Bassler

Polygnathus (Hinde) Bryant, 1921; *Ancyrodella* Ulrich and Bassler; *Palmatolepis* Ulrich and Bassler; *Panderodella* Ulrich and Bassler; *Polygnathellus* Ulrich and Bassler; *Gnathodus* Pander, 1856; *Ctenognathus* Pander, 1856.

BIBLIOGRAPHY OF CONODONT LITERATURE

1856. PANDER, C. H., Monographie der Fossilen Fische des Silurischen Systems der Russich-Baltischen Gouvernements, St. Petersburg, 91 pages, 9 plates. (Contains original definition of conodonts with description of numerous genera and species.)

1861. HARLEY, J., Geological Society, London, Quarterly Journal, volume 17, pages 543–552, plate 17. (Discusses zoological position. Probably several of his specimens described are not conodonts.)

1861. OWEN, RICHARD, Paleontology, Second Edition, Edinburgh, page 117. (Brief discussion of position.)

1863. VON EICHWALD, C. E., Bulletin de la Societe Imperiale des Naturalistes de Moscou, volume 36, page 375. (Brief discussion of systematic position.)

1870. MOORE, CHARLES, British Association for the Advancement of Science. Report of the 39th Meeting, 1869, pages 375–377. (Conodonts discussed but no specific description or figures.)

1875. NEWBERRY, J. S., Geological Survey, Ohio, Report, volume 2, part 2, Paleontology, pages 41–44, plate 57. (Illustrates various specimens without generic or specific names and discusses systematic position.)

1878. ULRICH, E. O., Journal Cincinnati Society of Natural History, volume 1, pages 87–91, plate 4. (Briefly discusses conodonts.)

1879. HINDE, G. J. Quarterly Journal, Geological Society, London, volume 35, pages 351–369, plates 15–17. (A general review of conodonts, with discussion of zoological relations and description of new forms.)

1880. Young, John, Glasgow Natural History Society, Proceedings, volume 4, pages 5 and 74. (Notice of occurrence of conodonts in Silurian and Devonian strata in England.)

1881. Mason, Robert, Glasgow Natural History Society, Proceedings, volume 4, page 190. (Records discovery of conodonts at a new locality in Scotland.)

1882. Rolle, Fr., Handwörterbuch der Mineralogie, Geologie, und Paleontologie, volume 1, page 408. (Short discussion.)

1884. James, U. P., Cincinnati Society Natural History Journal, volume 7, pages 143–149, plate 7. (Describes two conodonts.)

1886. Rohon J. V., and Zittel, V., Sitzungsberichte der mathematische-physikalischen Classe der k. Akademie der Wissenschaften zu München, volume 16, pages 108–136, plates 1, 2. (Discussion of zoological position from a chemical and physical standpoint.)

1887. Clarke, J. M., New York State Geologist, Sixth Annual Report for 1886, pages 30–33, plate A1. (Description and figures of conodonts and annelid jaws from the Devonian of New York.)

1898. Girty, George H., American Journal of Science, series 4, volume 6, pages 384–395. (Describes and illustrates a species from the Upper Devonian of Kentucky.)

1899. Grabau, A. W., Bulletin Buffalo Society Natural Sciences, volume 6, pages 150–158. (Reproduces Hinde's figures with condensed descriptions.)

1900. Smith, John, Natural History Society, Glasgow, Transactions, new series, volume 5, pages 336–338. (Discusses occurrence of Scotch Carboniferous conodonts.)

1900. Hinde, G. J., Natural History Society, Glasgow, Transactions, new series, volume 5, pages 338–346, plates 9, 10. (Describes and figures 13 species of Scotch Carboniferous conodonts.)

1907. Smith, John, Natural History Society, Glasgow, Transactions, new series, volume 7, part 3, pages 235–252, plates 5–9. (Discusses occurrence of conodonts in Silurian rocks of Scotland and describes about 40 species and 4 new genera.)

1910. Grabau, A. W., and Shimer, H. W., North American Index Fossils, Invertebrates, volume 2, pages 243–245. (Conodonts of Genesee, Waverly, Chazy, and Lorraine listed. Figures copied from Hinde.)

1913. Hadding, Assar, Lunds University Arsskrift, new series, volume 9, No. 15. Kongl. Fysiografiske Sällskapets Handlingar, new series, volume 24, No. 15, pages 30–32. (Describes eight new species of conodonts.)

1921. Bryant, William L., Buffalo Society Natural Science Bulletin, volume 13, No. 2, pages 1–58, plates 1–16. (Reviews the literature and discusses zoological position of conodonts. (Describes fauna of Genundewa limestone of western New York.)

1921. Grabau, Amadeus W., A Textbook of Geology, Part 2, Historical Geology, pages 140 and 584. (Notes occurrence of conodonts in Upper Ordovician and Upper Devonian. Mentions probable zoological position.)

1923. Parks, W. A., assisted by Madeline Fritz. The Stratigraphy and Paleontology of Toronto and vicinity, part 3, Gastropods, Cephalopods, and Vermes. Thirty-first Annual Report, Ontario, Department of Mines, volume 31, part 9, pages 1–45, plates 1–6. (Hinde's work on annelids and conodonts of Toronto region copied.)

1923. Dean, Bashford A., Bibliography of Fishes, volume 3, American Museum on Natural History. (Mentions that the zoological position of conodonts is disputed.)

1924. CLARK, THOMAS H., Bulletin American Paleontology, volume 10, No. 41, pages 67–70, plate 6. (Describes seven supposed species of conodonts.)

1925. ROUNDY, P. V., Bibliography of Conodont and Paleozoic annelid jaw literature, 4 pages. (Mimeographed; distributed by the Division of Geology and Geography, National Research Council, Washington, D. C.)

1926. ULRICH E. O. and BASSLER R. S., A classification of the tooth-like fossils conodonts, with descriptions of American Devonian and Mississippian species. Proceedings U. S. National Museum, volume 68, pages 1–63, plates 1–11. (Digest of classification in Bulletin Geological Society of America, 1925, vol. 36, pp. 218–220.)

1926. ROUNDY, P. V. The microfauna in Mississippian Formations of San Saba County, Texas. Professional Paper 146, U. S. Geological Survey, pages 5–17 plates 1–4. (Describes 10 species and varieties of conodonts, seven of which are new.)

1926. BUTTS, CHARLES. Geology of Alabama. Geological Survey of Alabama, Special Rept. No. 14, plate 48. (Gives illustrations of sixteen species figured in the present article.)

BIBLIOGRAPHIC LIST OF CONODONTS

In this condensed bibliographic list of conodonts only the page and plate citations are given since the title of the work can be determined from the foregoing bibliography of literature. For the proper generic references, I have followed the work of Ulrich and Bassler.

Acodus PANDER, 1856 (p. 21). Genotype (first species): *Acodus erectus* Pander, 1856.

Acodus acutus PANDER, 1856 (p. 21, pl. 1, fig. 12). Lower Ordovician, Baltic Provinces.

Acodus crassus PANDER, 1856 (p. 22, pl. 1, fig. 10; pl. 2, fig. 13). Lower Ordovician, Baltic Provinces.

Acodus erectus PANDER, 1856 (p. 21, pl. 1, fig. 1). Lower Ordovician, Baltic Provinces.

Acodus planus PANDER, 1856 (p. 22, pl. 1, fig. 9). Lower Ordovician, Baltic Provinces.

Acodus sigmoideus PANDER, 1856 (p. 21, pl. 1, fig. 11). Lower Ordovician, Baltic Provinces.

Acontiodus PANDER, 1856 (p. 28). Genotype (first species): *Acontiodus latus* Pander, 1856.

Acontiodus gracilis PANDER, 1856 (p. 28, pl. 2, figs. 2*a–c*). Lower Ordovician, Baltic Provinces.

Acontiodus latus PANDER, 1856 (p. 28, pl. 2, figs. 1*a–c*). Lower Ordovician, Baltic Provinces.

Acontiodus triangularis PANDER, 1856 (p. 28, pl. 2, figs. 35*a–d*). (*Acontiodus triangulosis* on plate). Lower Ordovician, Baltic Provinces.

Ancyrodella ULRICH and BASSLER, 1926 (p. 48). Genotype: *Ancyrodella nodosa* ULRICH and BASSLER, 1926.

Ancyrodella hamata ULRICH and BASSLER, 1926 (p. 48, pl. 7, fig. 7). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Ancyrodella malleus ULRICH and BASSLER, 1926 (p. 49, pl. 7, figs. 1, 2). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Ancyrodella nodosa ULRICH and BASSLER, 1926 (p. 48, pl. 1, figs. 10–13). Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Ancyrodella symmetrica ULRICH and BASSLER, 1926 (p. 49, pl. 8, fig. 1). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Belodus PANDER, 1856 (p. 30). Genotype and only species: *Belodus gracilis*, Pander, 1856.

Belodus gracilis PANDER, 1856 (p. 30, pl. 2, fig. 21). Lower Ordovician, Baltic Provinces.

Bryantodus ULRICH and BASSLER, 1926 (p. 21). Genotype: *Bryantodus typicus* ULRICH and BASSLER, 1926.

Bryantodus coalescens ULRICH and BASSLER, 1926 (p. 25, pl. 4, fig. 28). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.

Bryantodus conjunctus ULRICH and BASSLER, 1926 (p. 24, pl. 4, figs. 8, 9). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.

Bryantodus crassidens ULRICH and BASSLER, 1926 (p. 23, pl. 6, figs. 17, 18). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.

Bryantodus crassus ULRICH and BASSLER, 1926 (p. 27, pl. 10, fig. 14). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Bryantodus cristatus BRYANT, 1921. *Prioniodus cristatus* BRYANT, 1921 (p. 20, pl. 3, fig. 9; pl. 6, fig. 7). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.

Bryantodus curvalulus ULRICH and BASSLER, 1926 (p. 28, pl. 9, fig. 13). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Bryantodus curvatus ULRICH and BASSLER, 1926 (p. 26, pl. 4, figs. 19, 20). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.

Bryantodus dubius SMITH, 1900. *Polygnathus dubius* SMITH, 1900. (Not Hinde, 1879), (p. 341, pl. 9, fig. 1). Carboniferous, Lower limestone, Birkhead, etc., west Scotland.

Bryantodus duplicatus HINDE, 1879. *Polygnathus duplicatus* HINDE, 1879 (p. 364, pl. 16, fig. 19). "Genesee, Bear Creek, Ontario."

Bryantodus germanus ULRICH and BASSLER, 1926 (p. 25, pl. 10, fig. 18). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Bryantodus gracilis ULRICH and BASSLER, 1926 (p. 27, pl. 10, fig. 10). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Bryantodus immersus HINDE, 1879, *Polygnathus immersus* HINDE, 1879 (p. 364, pl. 16, fig. 21). *Prioniodus immersus* BRYANT, 1921 (p. 19, pl. 6, fig. 2). "Genesee, Kettle Point, Ontario." Reported by Bryant from the Genundewa limestone.

Bryantodus incertus ULRICH and BASSLER, 1926 (p. 27, pl. 10, fig. 8). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Bryantodus inequalis ULRICH and BASSLER, 1926 (p. 22, pl. 6, fig. 14). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Bryantodus insolens ULRICH and BASSLER, 1926 (p. 25, pl. 10, fig. 17). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Bryantodus macrodentatus BRYANT, 1921, *Prioniodus macrodentatus* BRYANT, 1921 (p. 18, pl. 8, fig. 10). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.

Bryantodus minutus ULRICH and BASSLER, 1926 (p. 27, pl. 10, fig. 6). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Bryantodus multidens ULRICH and BASSLER, 1926 (p. 22, pl. 6, figs. 15, 16). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Bryantodus muricatus BRYANT, 1921, *Prioniodus muricatus* BRYANT, 1921 (p. 18, pl. 5, fig. 7). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.

Bryantodus nelsoni ULRICH and BASSLER, 1926 (p. 28, pl. 10, fig. 9). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Bryantodus nitidus ULRICH and BASSLER, 1926 (p. 24, pl. 4, figs. 12–14). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.

Bryantodus normalis ULRICH and BASSLER, 1926 (p. 24, pl. 4, figs. 25–27). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Bryantodus obliquus ULRICH and BASSLER, 1926 (p. 23, pl. 6, figs. 19, 21). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Bryantodus obtusus BRYANT, 1921, *Prioniodus obtusus* BRYANT, 1921 (p. 20, pl. 3, fig. 6, pl. 6, fig. 1). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.

Bryantodus parvulus BRYANT, 1921, *Prioniodus parvulus* BRYANT, 1921 (p. 20, pl. 9). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.

Bryantodus pergracilis ULRICH and BASSLER, 1926 (p. 27, pl. 10, fig. 11). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Bryantodus politus HINDE, 1879, *Prioniodus politus* HINDE, 1879 (p. 358, pl. 15, figs. 11, 12); Parks, 1922 (p. 37, pl. 6, figs. 26, 27). Upper Cincinnatian, Lorraine-Dundas, Garrison Common, Ontario.

Bryantodus pravus BRYANT, 1921, *Prioniodus pravus* BRYANT, 1921 (p. 18, pl. 8, fig. 5). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.

Bryantodus radiatus HINDE, 1879, *Polygnathus radiatus* HINDE, 1879, (p. 364, pl. 16, fig. 20). *Prioniodus radiatus* BRYANT, 1921 (p. 16, pl. 4, figs. 10–12; pl. 5, figs. 1–5, 8; pl. 6, fig. 5; pl. 7, figs. 1, 2, 4, 6, 8; pl. 14, fig. 1). "Genesee, Kettle Point, Ontario". Identified by Bryant from Genundewa limestone of western New York.

Bryantodus retusus BRYANT, 1921, *Prioniodus retusus* BRYANT, 1921 (p. 17), pl. 4, figs. 8, 9; pl. 5, figs. 9, 11; pl. 8, fig. 3). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.

Bryantodus semiseparatus ULRICH and BASSLER, 1926 (p. 24, pl. 4, fig. 16). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Bryantodus sinuatus, ULRICH and BASSLER, 1926 (p. 23, pl. 6, figs. 22–24). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Bryantodus spatulatus BRYANT, 1921, *Prioniodus spatulatus* BRYANT, 1921 (p. 18, pl. 8, fig. 9). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.

Bryantodus subbrevis ULRICH and BASSLER, 1926 (p. 28, pl. 10, figs. 15, 16). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Bryantodus subradiatus ULRICH and BASSLER, 1926 (p. 26, pl. 10, figs. 12, 13). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Bryantodus tenuis ULRICH and BASSLER, 1926 (p. 26, pl. 10, fig. 7). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Bryantodus transitans ULRICH and BASSLER, 1926 (p. 26, pl. 4, figs. 10, 11). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Bryantodus tridentatus ULRICH and BASSLER, 1926 (p. 22, pl. 6, fig. 13). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.

Bryantodus typicus ULRICH and BASSLER, 1926 (p. 21, figs. 11, 12). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.

Centrodus PANDER, 1856. See *Lonchodus* PANDER, 1856.

Centrodus convexus PANDER, 1856. See *Lonchodus convexus*.

Centrodus distans SMITH, 1907. See *Lonchodus distans*.

Centrodus duplicatus HINDE, 1900. See *Hindeodella duplicata*.

Centrodus erectus SMITH, 1907. See *Lonchodus erectus*.

Centrodus invalidus BRYANT, 1921. See *Prioniodella invalida*.

Centrodus lineatus HINDE, 1900. See *Hindeodella lineata*.

Centrodus obliquus SMITH, 1907. See *Lonchodus obliquus*.

Centrodus princeps BRYANT, 1921. See *Lonchodus princeps*.

Centrodus simplex PANDER, 1856. See *Lonchodus simplex*.

Cordylodus PANDER, 1856 (p. 33). Genotype (first species): *Cordylodus angulatus* PANDER, 1856.

Cordylodus angulatus PANDER, 1856 (p. 33, pl. 2, figs. 26–31, 34). Lower Ordovician, Baltic Provinces.

Cordylodus ramosus HADDING, 1913 (p. 31, pl. 1, fig. 6). Ordovician Dicellograptus zone, southern Norway.

Cordylodus rotundatus PANDER, 1856 (p. 33, pl. 2, figs. 32, 33). Lower Ordovician, Baltic Provinces.

Cornuramia SMITH, 1907 (p. 246); ULRICH and BASSLER, 1926 (p. 41). Genotype: *Cornuramia monodonta* SMITH, 1907.

Cornuramia bicornua SMITH, 1907 (p. 251, pl. 9, fig. 49). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Cornuramia diplodonta SMITH, 1907 (p. 246, pl. 5, fig. 25). Ordovician, Arenig-Llandeilo, Ravengill, Scotland.

Cornuramia monodonta SMITH, 1907 (p. 246, pl. 6, fig. 20). Ordovician, Arenig-Llandeilo, Ravengill, etc., Scotland.

Ctenognathus PANDER, (1856, p. 32); ULRICH and BASSLER, 1926 (p. 54) ROUNDY, 1926 (p. 16). Genotype: *Ctenognathus murchisoni* PANDER, 1856.

Ctenognathus kayserlingii PANDER, 1856 (p. 32, pl. 2A, fig. 15). Carboniferous limestone, Tula, Russia.

Ctenognathus murchisoni PANDER, 1856 (p. 32, pl. 4, fig. 17; pl. 6, figs. 18*a*, *b*). Silurian, Rootsiküle, Russia.

Ctenognathus obliquus PANDER, 1856. See *Hindeodella obliqua*.

Ctenognathus verneuilli PANDER, 1856 (p. 32, pl. 4, fig. 18; pl. 2A, figs. 13, 14, 16, 17). Devonian, Wells on the Wolchow, Russia. Species of *Valentia*, *Prioniodina*, and *Hindeodella* are represented by these illustrations.

Diplododella ULRICH and BASSLER, 1926 (p. 41). Genotype: *Diplododella bilateralis* ULRICH and BASSLER, 1926.

Diplododella bilateralis ULRICH and BASSLER, 1926 (p. 41, text fig. 21, p. 16). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Distacodidae ULRICH and BASSLER, 1926 (p. 6).

Distacodus HINDE, 1879 (p. 357). Proposed for *Machairodus* PANDER, 1856 (p. 22) preoccupied. *Machairodia* SMITH, 1907 (p. 246), also proposed in place of *Machairodus* PANDER. Genotype: *Distacodus* (*Machairodus*) *incurvus* PANDER, 1856.

Distacodus angustus PANDER, 1856. *Machairodus angustus* PANDER, 1856 (p. 23, pl. 1, fig. 35). Lower Ordovician, Baltic Provinces.

Distacodus canaliculatus PANDER, 1856. *Machairodus canaliculatus* PANDER, 1856 (p. 24, pl. 1, fig. 23). Lower Ordovician, Baltic Provinces.

Distacodus dilatatus PANDER, 1856. *Machairodus dilatatus* PANDER, 1856 (p. 22, pl. 1, fig. 14; pl. 2, fig. 14). Lower Ordovician, Baltic Provinces.

Distacodus ensiformis PANDER, 1856. *Machairodus ensiformis* PANDER, 1856 (p. 23, pl. 1, figs. 25–28; pl. 2, fig. 36). Lower Ordovician, Baltic Provinces.

Distacodus inaequalis PANDER, 1856. *Machairodus inaequalis* PANDER, 1856 (p. 23, pl. 2, fig. 38). Lower Ordovician, Baltic Provinces.

Distacodus incurvus PANDER, 1856. *Machairodus incurvus* PANDER, 1856 (p. 23, pl. 1, fig. 22). Lower Ordovician, Baltic Provinces; HINDE, 1879 (p. 357, pl. 15, fig. 9), and PARKS, 1922 (p. 36, pl. 6, fig. 23). Upper Ordovician, Lorraine-Dundas, Garrison Common near Toronto, Ontario.

Distacodus planus PANDER, 1856. *Machairodus planus* PANDER, 1856 (p. 24, pl. 2, fig. 39). Lower Ordovician, Baltic Provinces.

Distacodus rectus ULRICH and BASSLER, 1926 (p. 6, pl. 9, fig. 22). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Distacodus rhombeus SMITH, 1907. *Machairodia rhombeus* (Pander ?) SMITH, 1907 (p. 246, pl. 6, fig. 19). Ordovician. Arenig-Llandeilo, Ravengill, etc., southern uplands of Scotland.

Distacodus rhomboideus PANDER, 1856. *Machairodus rhomboideus* PANDER, 1856 (p. 22, pl. 2, figs. 10–12). Lower Ordovician, Baltic Provinces.

Distacodus solidus PANDER, 1856. *Machairodus solidus* PANDER, 1856 (p. 23, pl. 2, fig. 15). Lower Ordovician, Baltic Provinces.

Distacodus sulcatus SMITH, 1907. *Machairodus sulcata* SMITH, 1907 (p. 246, pl. 6, fig. 17). Ordovician, Arenig-Llandeilo, Ravengill, southern uplands of Scotland.

Drepanodus PANDER, 1856 (p. 20). Genotype (first species): *Drepanodus inflexus* PANDER, 1856.

Drepanodus acutus PANDER, 1856 (p. 21, pl. 2, fig. 9). Lower Ordovician, Baltic Provinces.

Drepanodus arcuatus PANDER, 1856 (p. 20, pl. 1, figs. 2, 4, 5, 17, 30, 31). Lower Ordovician, Baltic Provinces; HINDE, 1879 (p. 357, pl. 15, figs. 7, 8); GRABAU and SHIMER, 1910 (p. 245, figs. 1537 *d*, *e*); PARKS, 1922 (p. 36, pl. 6, figs. 21, 22). Ordovician, Lorraine-Dundas, Toronto, Canada.

Drepanodus falcatus HADDING, 1913 (p. 30, pl. 1, fig. 3). Ordovician, Dicellograptus zone, southern Norway.

Drepanodus flexuosus PANDER, 1856 (p. 20, pl. 1, figs. 6–8). Lower Ordovician, Baltic Provinces; SMITH, 1907 (p. 246, pl. 6, fig. 18). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Drepanodus inflexus PANDER, 1856 (p. 20, pl. 1, fig. 3; pl. 2, fig. 16). Lower Ordovician, Baltic Provinces.

Drepanodus obtusus PANDER, 1856 (p. 21, pl. 2, fig. 11). Lower Ordovician, Baltic Provinces.

Drepanodus robustus HADDING, 1913 (p. 31, pl. 1, fig. 5). Ordovician, Dicellograptus zone, southern Norway.

Drepanodus verutus HADDING, 1913 (p. 31, pl. 1, fig. 4). Ordovician, Dicellograptus zone, southern Norway.

Euprioniodina ULRICH and BASSLER, 1926 (p. 29). Genotype: *Euprioniodina deflecta* ULRICH and BASSLER, 1926.

Euprioniodina acicularis HINDE, 1879, *Prioniodus acicularis* HINDE, 1879 (p. 360, pl. 15, figs. 18, 19). Devonian, Genesee, Kettle Point, Ontario; GRABAU, 1899 (p. 151, fig. 33E).

Euprioniodina ? *alata* HADDING, 1913, *Prioniodus alatus* HADDING, 1913 (p. 32, pl. 1, figs. 9, 10). Ordovician, Dicellograptus zone, southern Norway.

Euprioniodina bryanti ULRICH and BASSLER, 1926 (p. 29, pl. 3, figs. 13, 14; pl. 1, fig. 21). Upper Devonian, Rhinestreet shale of the Portage group Shaleton, Erie County, N. Y.

Euprioniodina conferta ULRICH and BASSLER, 1926 (p. 29, pl. 3, fig. 13, 14; pl. 1, fig. 21). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Euprioniodina conferta ULRICH and BASSLER, 1926 (p. 29, pl. 3, fig. 17). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Euprioniodina curvata SMITH, 1907, *Prioniodus curvatus* SMITH, 1907 (p. 249, pl. 8, fig. 40). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Euprioniodina deflecta ULRICH and BASSLER, 1926 (p. 29, pl. 3, figs. 11, 12). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Euprioniodina ? *discedens* HADDING, 1913, *Prioniodus discedens* HADDING, 1913 p. 32, pl. 1, fig. 11). Ordovician, Dicellograptus zone, southern Norway.

Euprioniodina ? *furcata* HINDE, 1879, *Prioniodus furcatus* HINDE, 1879 (p. 358, pl. 15, fig. 13); PARKS, 1923 (p. 37, pl. 6, fig. 27). Upper Ordovician, Lorraine-Dundas, Garrison Common near Toronto, Ontario.

Euprioniodina ? *lanceolata* SMITH, 1907, *Polygnathus lanceolatus* SMITH, 1907 (p. 245, pl. 5, fig. 16). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Euprioniodina peculiaris ULRICH and BASSLER, 1926 (p. 30, pl. 10, fig. 3). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Euprioniodina perangulata ULRICH and BASSLER, 1926 (p. 30, pl. 3, fig. 10). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Euprioniodina ? *radicans* HINDE, 1879, *Prioniodus radicans* HINDE, 1879 (p. 356, pl. 15, figs. 1–6; GRABAU and SHIMER, 1910 (p. 244, figs. 1538 *a–c*). Lower Ordovician (Chazy) Grenville, Quebec.

Gnathodus PANDER, 1856 (p. 33). Genotype (first species): *Gnathodus mosquensis* PANDER, 1856. See also HINDE, 1879 (p. 365); BRYANT, 1921 (p. 22); ULRICH and BASSLER, 1926 (p. 54), and ROUNDY, 1926 (p. 12).

Gnathodus americanus BRYANT, 1921 (p. 22, pl. 7, fig. 5). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.; ULRICH and BASSLER, 1926 (p. 54, pl. 1, fig. 5). Upper Devonian, Rhinestreet shale of the Portage group, Chaleton, Erie County, N. Y.

Gnathodus ? crassus HINDE, 1879, *Polygnathus crassus* HINDE, 1879 (p. 365, pl. 17, fig. 3); GRABAU, 1899 (p. 155, fig. 38); GRABAU and SHIMER, 1910 (p. 243, fig. 1535*c*). Genesee, Genundewa limestone, North Evans, Eighteen Mile Creek, N. Y. Possibly a side view of a *Polygnathus*.

Gnathodus ? *curvatus* HINDE, 1879, *Polygnathus* ? *curvatus* HINDE, 1879 (p. 366, pl. 17, fig. 7). "Genesee shale, Bear Creek, Ontario."

Gnathodus ? *eriensis* HINDE, 1879, *Polygnathus* ? *eriensis* HINDE, 1879 (p. 366, pl. 17, fig. 6). "Erratic boulder of black Genesee shale, north shore of Lake Erie, Ontario."

Gnathodus mosquensis PANDER, 1856 (p. 34, pl. 2A, fig. 10*a*, *b*, *c*). Carboniferous, Moscow, Russia, *Polygnathus* (*Gnathodus*) *mosquensis* HINDE, 1879 (p. 342, pl. 9, figs. 2–4). Carboniferous limestone, Dalry, etc., West Scotland.

Gnathodus texanus ROUNDY, 1926 (p. 12, pl. 2, figs. 7, 8). Barnett shale of Mississippian, San Saba County, Tex.

Gnathodus texanus, var. *bicuspidus* ROUNDY, 1926 (p. 12, pl. 12, fig. 9). Barnett shale of Mississippian, San Saba County, Tex.

Hibbardella ULRICH and BASSLER, 1926 (p. 37). Genotype: *Prioniodus angulatus* HINDE, 1879.

Hibbardella angulata HINDE, 1879, *Prioniodus angulatus* HINDE, 1879 (p. 360, pl. 15, fig. 17); GRABAU, 1899 (p. 151 fig. 33D); GRABAU and SHIMER, 1910 (p. 244, fig. 1537*h*); BRYANT, 1921 (p. 17). Upper Devonian, Rhinestreet shale of the Portage group, western New York. ? *Prioniodus angulatus* HINDE, 1900 (p. 343, pl. 10, figs. 18, 19). Carboniferous lower limestone. Dalry, etc., West Scotland; *Hibbardella angulata* (Hinde) ULRICH and BASSLER, 1926 (p. 37, pl. 3, figs. 1–4). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Hibbardella ? *confertissima* ULRICH and BASSLER, 1926 (p. 38, pl. 3, fig. 5). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Hibbardella multidens ULRICH and BASSLER, 1926 (p. 38, pl. 3, figs. 8, 9). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Hibbardella subaequalis ULRICH and BASSLER, 1926 (p. 38, pl. 3, figs. 6, 7). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Hindeodella ULRICH and BASSLER, 1926 (p. 38). Genotype: *Hindeodella subtilis* ULRICH and BASSLER, 1926.

Hindeodella alternata ULRICH and BASSLER, 1926 (p. 40, pl. 1, figs. 14, 15). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Hindeodella decurrens ULRICH and BASSLER, 1926 (p. 40, pl. 8, fig. 13). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Hindeodella dubia SMITH, 1907. *Polygnathus dubius* SMITH, 1907, not Hinde, 1879 (p. 245, pl. 5, fig. 15). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Hindeodella duplicata PANDER, 1856, *Lonchodus* (*Centrodus*) *duplicatus* PANDER, 1856 (p. 31, pl. 2A, figs. 7, 8). Carboniferous limestone, Tula, Russia. *Centrodus duplicatus* (Pander) HINDE, 1900 (p. 341, pl. 9, fig. 12). Carboniferous, upper limestone, Monkcastle, Kilwinning, west Scotland.

Hindeodella lineata PANDER, 1856, *Lonchodus* (*Centrodus*) *lineatus* PANDER, 1856 (p. 31, pl. 2A, fig. 9). Carboniferous limestone, Tula, Russia. *Centrodus lineatus* (Pander) HINDE, 1900 (p. 341, pl. 9, figs. 13, 14). Carboniferous, upper limestone, Monkcastle, Kilwinning, west Scotland. *Lonchodus* ? *lineatus* ROUNDY, 1926 (p. 15, pl. 3, figs. 6–8). Barnett shale of Mississippian, San Saba County, Tex.

Hindeodella longidens ULRICH and BASSLER, 1926 (p. 40, pl. 8, figs. 14, 15). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Hindeodella obliqua PANDER, 1856, *Centrodus obliquus* PANDER, 1856 (p. 33, pl. 2A, figs. 11, 12). Devonian, Gostinopolskoi, Pristan on the Wolchow River; HINDE, 1900 (p. 344, pl. 10, figs. 27–29). Carboniferous, lower limestone, Birkhead, Dalry, west Scotland.

Hindeodella recta ULRICH and BASSLER, 1926 (p. 40, pl. 8, fig. 16). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Hindeodella similis ULRICH and BASSLER, 1926 (p. 39, pl. 8, fig. 20). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Hindeodella subequalis ULRICH and BASSLER, 1926 (p. 41, pl. 4, fig. 21). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.

Hindeodella subtilis ULRICH and BASSLER, 1926 (p. 39, pl. 8, figs. 17–19). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Ligonodina ULRICH and BASSLER, 1926 (p. 12), Genotype: *Ligonodina pectinata* ULRICH and BASSLER, 1926.

Ligonodina deflecta ULRICH and BASSLER, 1926 (13 pl. 2, figs. 3, 4). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.

Ligonodina falciformis ULRICH and BASSLER, 1926 (p. 14, pl. 2, figs. 11–13). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Ligonodina hibbardi ULRICH and BASSLER, 1926 (p. 14, pl. 2, figs. 7, 8). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Ligonodina hindei ULRICH and BASSLER, 1926 (p. 14, pl. 2, figs. 14–16). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Ligonodina magnidens ULRICH and BASSLER, 1926 (p. 14, pl. 2, figs. 5, 6). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Ligonodina panderi HINDE, 1879. *Prionodus panderi* HINDE, 1879 (p. 361, pl. 16, fig. 4); GRABAU, 1899 (p. 152, fig. 33H); GRABAU and SHIMER, 1910 (p. 244, fig. 1533*a*). Upper Devonian, Genesee or Portage, Eighteen Mile Creek, N. Y. *Ligonodina panderi* (Hinde) ULRICH and BASSLER, 1926 (p. 13, pl. 2, figs. 1, 2). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Ligonodina pectinata ULRICH and BASSLER, 1926 (p. 13, pl. 2, figs. 9, 10). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Ligonodina simplex ULRICH and BASSLER, 1926 (p. 15, pl. 9, fig. 28). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Ligonodina tridentata ULRICH and BASSLER, 1926 (p. 15, pl. 9, fig. 5). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Lonchodina ULRICH and BASSLER, 1926 (p. 30). Genotype: *Lonchodina typicalis* ULRICH and BASSLER, 1926.

Lonchodina abnormis ULRICH and BASSLER, 1926 (p. 34, pl. 6, figs. 8–10). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Lonchodina alternata ULRICH and BASSLER, 1926 (p. 35, pl. 6, fig. 4). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Lonchodina arcuata ULRICH and BASSLER, 1926 (p. 32, pl. 5, fig. 15). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Lonchodina bilateralis ULRICH and BASSLER, 1926 (p. 32, pl. 5, fig. 18.) Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Lonchodina clavata HINDE, 1879, *Prioniodus clavatus* HINDE, 1879, (p. 360. pl. 15, fig. 16) ; GRABAU, 1899 (p. 151, fig. 33c) : GRABAU and SHIMER, 1910 (p. 244, fig. 1537*b*) ; BRYANT, 1921 (p. 16, pl. 6, figs. 3, 6). Upper Devonian. Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.

Lonchodina delicatula ULRICH and BASSLER, 1926 (p. 33, pl. 5, fig. 11). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Lonchodina discreta ULRICH and BASSLER, 1926 (p. 36, pl. 10, figs. 1, 2). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Lonchodina erratica HINDE, 1879, *Prioniodus erraticus* HINDE, 1879 (p. 359, pl. 15, fig. 14) ; GRABAU, 1899 (p. 150, fig. 33A) ; GRABAU and SHIMER, 1910, p. 244, fig. 1537*c*) ; BRYANT, 1921 (p. 17, pl. 2, fig. 10; pl. 7, fig. 1). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.

Lonchodina geniculata ULRICH and BASSLER, 1926 (p. 36, pl. 4, fig. 15). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County. N. Y.

Lonchodina ? increbescens ULRICH and BASSLER, 1926 (p. 35, pl. 5, fig. 20; pl. 3, figs. 15, 16). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Lonchodina paucidens ULRICH and BASSLER, 1926 (p. 34, pl. 6, fig. 1). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Lonchodina peracuta ULRICH and BASSLER, 1926 (p. 33, pl. 5, fig. 19). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Lonchodina perlonga ULRICH and BASSLER, 1926 (p. 32, pl. 5, figs. 6, 7). Upper Devonian, Rhinestreet shade of the Portage group, Shaleton, Erie County, N. Y.

Lonchodina ? projecta ULRICH and BASSLER, 1926 (p. 35, pl. 5, figs. 9, 10). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Lonchodina ? prona ULRICH and BASSLER, 1926 (p. 36, pl. 5, figs. 16, 17). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Lonchodina rectangulata ULRICH and BASSLER, 1926 (p. 37, pl. 10, fig. 4). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Lonchodina rectidens ULRICH and BASSLER, 1926 (p. 31, pl. 5, figs. 13, 14). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Lonchodina separata ULRICH and BASSLER, 1926 (p. 31, pl. 5, fig. 12). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Lonchodina ? spinata HADDING, 1913, *Polygnathus spinatus* HADDING, 1913, (p. 32, pl. 1, fig. 8). Ordovician, Dicellograptus zone, Southern Norway.

Lonchodina subangulata ULRICH and BASSLER, 1926 (p. 32, pl. 5, fig. 3). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Lonchodina subrecta ULRICH and BASSLER, 1926 (p. 33, pl. 5, figs. 4, 5). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Lonchodina subsymmetrica ULRICH and BASSLER, 1926 (p. 34, pl. 6, figs. 5–7; pl. 5, fig. 8; pl. 1, fig. 24). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Lonchodina transversa ULRICH and BASSLER, 1926 (p. 34, pl. 6, figs. 2, 3). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Lonchodina typicalis ULRICH and BASSLER, 1926 (p. 31, pl. 5, figs. 1, 2). Upper Devonian, Rhinestreet shale of the Portage group, Shaleton, Erie County, N. Y.

Lonchodus PANDER, 1856 (p. 80) (*Centrodus* PANDER, 1856, p. 31, preoccupied); ULRICH and BASSLER, 1926 (p. 42); ROUNDY, 1926 (p. 15) Genotype (first species): *Lonchodus* (*Centrodus*) *simplex* PANDER, 1856.

Lonchodus convexus PANDER, 1856. *Centrodus convexus* PANDER, 1856 (p. 31, pl. 2A, fig. 4). Carboniferous limestone, Tula, Russia. *Polygnathus* (*Centrodus*) *convexus* (Pander) HINDE, 1900 (p. 342, pl. 9, figs. 6–8). Carboniferous, Upper limestone, Monkcastle, Dalry, etc., west Scotland.

Lonchodus coronatus HINDE, 1879, *Polygnathus coronatus* HINDE, 1879 (p. 365, pl. 17. fig. 1). Devonian, Genesee, Kettle Point, Ontario; GRABAU and SHIMER, 1910 (p. 243, fig. 1535*a*); BRYANT, 1921 (p. 21). Bryant records this species from Portage shale at Sturgeon Point, N. Y. Possibly a species of *Lonchodina* but Hinde's restoration does not match any of the species so far noted.

Lonchodus curvatus SMITH, 1907. *Polygnathus curvatus* SMITH, 1907 (p. 245, pl. 5, fig. 11). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Lonchodus distans SMITH, 1907. *Centrodus distans* SMITH, 1907 (p. 244, pl. 5, fig. 7). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Lonchodus duplicatus PANDER, 1856. See *Hindeodella duplicata.*

Lonchodus erectus SMITH, 1907. *Centrodus erectus* SMITH, 1907 (p. 244, pl. 5, figs. 1, 2, 4, 5). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Lonchodus lineatus PANDER, 1856. See *Hindeodella lineata.*

Lonchodus minus SMITH, 1907. *Polygnathus minus* SMITH, 1907 (p. 245, pl. 5, fig. 8). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Lonchodus obliquus SMITH, 1907. *Centrodus obliquus* SMITH, 1907 (p. 244, pl. 5, fig. 3). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Lonchodus parvus SMITH, 1907. *Polygnathus parvus* SMITH, 1907 (p. 245, pl. 5, fig. 6). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Lonchodus princeps HINDE, 1870. *Polygnathus princeps* HINDE, 1879 (p. 365, pl. 16, fig. 23); GRABAU, 1899 (p. 155, fig. 36); *Centrodus princeps* (Hinde) BRYANT, 1921 (p. 22, text fig. 6). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, New York. *Polygnathus princeps* (Hinde) SMITH, 1907 (p. 245, pl. 5, figs. 9, 10, 12, 13). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Lonchodus simplex PANDER, 1856. *Centrodus simplex* PANDER, 1856 (p. 31, pl. 2A, figs. 2, 3, 5, 6). Carboniferous limestone, Tula, Russia; ROUNDY, 1926 (p. 15, pl. 3, figs. 1–5). Barnett shale of Mississippian, San Saba County, Texas.

Machairodia SMITH, 1907. See *Distacodus* HINDE, 1879.

Machairodus PANDER, 1856. See *Distacodus* HINDE, 1879.

Oistodus PANDER, 1856 (p. 27). Genotype (first species): *Oistodus lanceolatus* PANDER, 1856.

Oistodus acuminatus PANDER, 1856 (p. 27, pl. 2, fig. 20). Lower Ordovician, Baltic Provinces.

Oistodus inaequalis PANDER, 1856 (p. 27, pl. 2, fig. 37). Lower Ordovician, Baltic Provinces.

Oistodus lanceolatus PANDER, 1856 (p. 27, pl. 2, figs. 17–19). Lower Ordovician, Baltic Provinces.

Oistodus parallelus PANDER, 1856 (p. 27, pl. 2, fig. 40). Lower Ordovician, Baltic Provinces.

Pachysomia SMITH, 1907, (p. 246); ULRICH and BASSLER, 1926 (p. 43). Genotype: *Pachysomia wanlockensis* Smith, 1907.

Pachysomia wanlockensis SMITH, 1907 (p. 246, pl. 6, fig. 23). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Palmatodella ULRICH and BASSLER, 1926 (p. 41). Genotype: *Palmatodella delicatula* ULRICH and BASSLER, 1926.

Palmatodella delicatula ULRICH and BASSLER, 1926 (p. 41, pl. 10, fig. 5; text fig. 20). Mississippian, Chattanooga shale, north of Huntsville, Alabama and Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Palmatolepis ULRICH and BASSLER, 1926 (p. 49). Genotype: *Palmatolepis perlobata* ULRICH and BASSLER, 1926.

Palmatolepis asymmetrica ULRICH and BASSLER, 1926 (p. 50, pl. 7, fig. 18). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Palmatolepis bifurcata ULRICH and BASSLER, 1926 (p. 50, pl. 7, figs. 16, 17). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Palmatolepis extralobata ULRICH and BASSLER, 1926 (p. 50, pl. 8, fig. 3). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Palmatolepis glaber ULRICH and BASSLER, 1926 (p. 51, pl. 9, figs. 18–20). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Palmatolepis lobatula ULRICH and BASSLER, 1926 (p. 50, pl. 7, figs. 3, 4). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Palmatolepis peculiaris ULRICH and BASSLER, 1926 (p. 51, pl. 8, figs. 11, 12). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Palmatolepis perlobata ULRICH and BASSLER, 1926 (p. 49, pl. 7, figs. 19–23). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Palmatolepis punctata HINDE, 1879. *Polygnathus punctatus* HINDE, 1879 (p. 367, pl. 17, fig. 14); GRABAU, 1899 (p. 157, fig. 43); GRABAU and SHIMER, 1910 (p. 244, fig. 1536*d*); BRYANT, 1921 (p. 25). Devonian, Genundewa limestone, at base of Genesee, North Evans, Eighteen Mile Creek, New York; ULRICH and BASSLER, 1926 (p. 51, pl. 1, figs. 6, 7). Rhinestreet shale of Portage group, Shaleton, Erie County, New York.

Paltodus PANDER, 1856 (p. 24). Genotype (first species): *Paltodus subaequalis* PANDER, 1856.

Paltodus bicostatus PANDER, 1856 (p. 25, pl. 1, fig. 21). Lower Ordovician, Baltic Provinces.

Paltodus canaliculatus PANDER (p. 25, pl. 1, fig. 36). Lower Ordovician, Baltic Provinces.

Paltodus obtusus PANDER, 1856 (p. 24, pl. 1, figs. 13, 16, 29, 32). Lower Ordovician, Baltic Provinces.

Paltodus rotundatus PANDER, 1856 (p. 25, pl. 1, figs. 33, 34). Lower Ordovician, Baltic Provinces.

Paltodus subaequalis PANDER, 1856 (p. 24, pl. 1, fig. 24). Lower Ordovician, Baltic Provinces.

Paltodus truncatus PANDER, 1856 (p. 25, pl. 1, figs. 18–20). Lower Ordovician, Baltic Provinces.

Panderodella ULRICH and BASSLER, 1926 (p. 52). Genotype: *Panderodella truncata* ULRICH and BASSLER, 1926.

Panderodella maxillaris ULRICH and BASSLER, 1926 (p. 53, pl. 9, fig. 21). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Panderodella scitula HINDE, 1900, *Polygnathus scitulus* HINDE, 1900 (p. 343, pl. 9, figs. 9–11). Carboniferous, upper limestone, Dalry, etc., west Scotland.

Panderodella serrata HINDE, 1879, *Polygnathus serratus* HINDE, 1879 (p. 365, pl. 17, figs. 4, 5). Devonian, Genesee, Kettle Point, Ontario.

Panderodella solida HINDE, 1879, *Polygnathus solidus* HINDE, 1879 (p. 365, pl. 17, fig. 2); GRABAU, 1899 (p. 155, fig. 37); GRABAU and SHIMER, 1910 (p. 243, fig. 1535*b*); BRYANT, 1921 (p. 27, pl. 7, figs. 7–10, 12). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.

Panderodella subcrassa ULRICH and BASSLER, 1926 (p. 53, pl. 9, fig. 14). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Panderodella truncata ULRICH and BASSLER, 1926 (p. 52, pl. 9, figs. 15–17), Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Polygnathellus ULRICH and BASSLER, 1926 (p. 53). Genotype: *Polygnathellus typicalis* Ulrich and Bassler, 1926.

Polygnathellus colligatus BRYANT, 1921, *Prioniodus colligatus* BRYANT, 1921, (p. 17, pl. 3, figs. 1, 2, 4; pl. 5, figs. 6, 10; pl. 6, fig. 8; pl. 7, figs. 2, 6). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.

Polygnathellus curvatus ULRICH and BASSLER, 1926 (p. 54, pl. 1, fig. 4). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.

Polygnathellus typicalis ULRICH and BASSLER, 1926 (p. 53, pl. 1, figs. 1–3). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.

Polygnathidae ULRICH and BASSLER, 1926 (p. 43).

Polygnathus HINDE, 1879 (p. 361); BRYANT, 1921 (p. 23); ULRICH and BASSLER, 1926 (p. 43); ROUNDY, 1926 (p. 13). Genotype: *Polygnathus pennatus* HINDE, 1879 (*Polygnathus dubius* HINDE, 1879, part).

Polygnathus ? acaulis ULRICH and BASSLER, 1926 (p. 47, pl. 8, figs. 4, 5). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Polygnathus alternans HADDING, 1913. See *Prioniodus ? alternans.*

Polygnathus argos T. H. CLARK, 1924 (p. 70, pl. 6, fig. 7). Not a conodont. probably fringe of appendage of merostome or trilobite. Canadian, Point Levis, Canada.

Polygnathus bilineatus ROUNDY, 1926 (p. 13, pl. 3, fig. 10). Barnett shale of Mississippian, San Saba County, Tex.

Polygnathus caelatus BRYANT, 1921 (p. 27, pl. 13, figs. 1–13). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.

Polygnathus ? claviger ROUNDY, 1926 (p. 14, pl. 4, figs. 1, 2). Barnett shale of Mississippian, San Saba County, Tex.

Polygnathus concentricus ULRICH and BASSLER, 1926 (p. 47, pl. 8, figs. 6, 7). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Polygnathus confluens ULRICH and BASSLER, 1926 (p. 46, pl. 7, figs. 14, 15). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Polygnathus convexus HINDE, 1900. See *Lonchodus convexus.*

Polygnathus crassulus ULRICH and BASSLER, 1926 (p. 48, pl. 8, figs. 8–10). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Polygnathus crassus HINDE, 1879. See *Gnathodus ? crassus.*

Polygnathus cristatus HINDE, 1879 (p. 366, pl. 17, fig. 11); J. M. CLARKE, 1886 (pl. A–1, fig. 20); BRYANT, 1921 (p. 24); *Polygnathus dubius* HINDE, 1879 (p. 363, pl. 16, figs. 16, 18); J. W. CLARKE, 1886 (pl. A–1, fig. 20). Described from Genundewa limestone at North Evans, but probably from Portage beds of same locality, according to Bryant.

Polygnathus ? curvatus HINDE, 1879. See *Gnathodus curvatus.*

Polygnathus curvatus SMITH, 1907. See *Lonchodus curvatus.*

Polygnathus delicatulus ULRICH and BASSLER, 1926 (p. 45, pl. 7, figs. 9. 10). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Polygnathus dubius HINDE, 1879 (p. 362, pl. 16, figs. 6–18); GRABAU, 1899 (p. 153, fig. 34); GRABAU and SHIMER, 1910 (p. 243, figs. 1533*c–i;* 1534*a–c*). Described from an assemblage of species of different genera on a slab probably of Portage age, western New York; J. M. CLARKE, 1886, pl. A–1. Naples shale, Naples, N. Y. *See Polygnathus pennatus.*

Polygnathus dubius SMITH, 1900. See *Bryantodus dubius.*

Polygnathus dubius SMITH, 1907. See *Hindeodella dubia.*

Polygnathus duplicatus HINDE, 1879. See *Bryantodus duplicatus.*

Polygnathus ? eriensis HINDE, 1879. See *Gnathodus eriensis.*

Polygnathus foliatus BRYANT, 1921 (p. 24, pl. 10, figs. 13–16). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.

Polygnathus folium ULRICH and BASSLER, 1926 (p. 46, pl. 7, fig. 5). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Polygnathus germanus ULRICH and BASSLER, 1926 (p. 46, pl. 7, figs. 11, 12). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Polygnathus glaber ULRICH and BASSLER, 1926 (p. 46, pl. 7, fig. 13). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Polygnathus immersus HINDE, 1879. See *Bryantodus immersus*.

Polygnathus lanceolatus SMITH, 1907. See *Euprioniodina ? lanceolata*.

Polygnathus linguiformis HINDE, 1879 (p. 367, pl. 17, fig. 15); GRABAU, 1899 (p. 157, pl. 44); BRYANT, 1921 (p. 25, pl. 11, figs. 1–9; pl. 14, fig. 2). *Polygnathus simplex* HINDE, 1879 (p. 367, pl. 17, fig. 18); GRABAU, 1899 (p. 157, fig. 46). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y. North Shore of Lake Erie, Ontario.

Polygnathus minus SMITH, 1907. See *Lonchodus minus*.

Polygnathus mosquensis HINDE, 1879. See *Gnathodus mosquensis*.

Polygnathus nasutus HINDE, 1879. See *Synprioniodina nasuta*.

Polygnathus navicula HINDE, 1900 (p. 342, pl. 9, fig. 5). Carboniferous. Upper limestone near Douglass, West Scotland.

Polygnathus ordinatus BRYANT, 1921 (p. 24, pl. 10, figs. 10, 11). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.

Polygnathus palmatus HINDE, 1879 (p. 367, pl. 17, figs. 16, 17); GRABAU, 1899 (p. 157); GRABAU and SHIMER, 1910 (p. 244, fig. 1536*h*). Genesee (?Portage) Kettle Paint, Ontario.

Polygnathus parvus SMITH, 1907. See *Lonchodus parvus*.

Polygnathus pauperatus SMITH, 1907. See *Prioniodus pauperatus*.

Polygnathus pennatus HINDE, 1879 (p. 366, pl. 17, fig. 8); J. M. CLARKE, 1886 (pl. A–1, fig. 9); GRABAU, 1899 (p. 156, fig. 39); GRABAU and SHIMER, 1910 (p. 243, fig. 1536*a*); BRYANT, 1921 (p. 23, pl. 10, figs. 1–9). *Polygnathus dubius* HINDE, 1879 (part), (p. 363, pl. 16, fig. 17); J. M. CLARKE, 1886 (pl. A–1, figs. 2, 3, 13). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.

Polygnathus pennatulus ULRICH and BASSLER, 1926 (p. 45, pl. 7, fig 8, pl. 9, figs. 24, 25). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Polygnathus peracutus BRYANT, 1921 (p. 25, pl. 10, fig. 12). Upper Devonian. Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.

Polygnathus princeps HINDE, 1879. See *Lonchodus princeps*.

Polygnathus punctatus HINDE, 1879. See *Palmatolepis punctata*.

Polygnathus radiatus HINDE, 1879. See *Bryantodus radiatus*.

Polygnathus rhomboideus ULRICH and BASSLER, 1926 (p. 46, pl. 7, fig. 6). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Polygnathus rimulatus ULRICH and BASSLER, 1926 (p. 45, pl. 1, figs. 8, 9). Devonian, Rhinestreet shale, Shaleton, N. Y.

Polygnathus rotundilobus BRYANT, 1921 (p. 26, pl. 12, figs. 1–6; text fig. 7). *Polygnathus tuberculatus* HINDE, 1879 (part) (p. 366, pl. 17, fig. 10). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.

Polygnathus scitulus HINDE, 1900. See *Panderodella scitula*.

Polygnathus serratus HINDE, 1879. See *Panderodella serrata*.

Polygnathus simplex HINDE, 1879. Synonym for *Polygnathus linguiformis* HINDE, 1879.

Polygnathus solidus HINDE, 1879. See *Panderodella solida.*

Polygnathus spinatus HADDING, 1913. See *Lonchodina ? spinata.*

Polygnathus sublatus ULRICH and BASSLER, 1926 (p. 47, pl. 8, fig. 2). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Polygnathus taffi ROUNDY, 1926 (p. 13, pl. 3, fig. 11). Barnett shale of Mississippian, San Saba County, Tex.

Polygnathus texanus ROUNDY, 1926 (p. 14, pl. 3, fig. 13). Barnett shale of Mississippian, San Saba County, Tex.

Polygnathus truncatus HINDE, 1879 (p. 366, pl. 17, figs. 12, 13) ; GRABAU, 1899 (p. 156, fig. 42) ; GRABAU and SHIMER, 1910 (p. 243, figs. 1536*b*, *c*). "Genesee, Bear Creek, Ontario."

Polygnathus tuberculatus HINDE, 1879 (p. 366, pl. 17, figs. 9, 10) ; GRABAU, 1899 (p. 156, fig. 40) ; GRABAU and SHIMER, 1910 (p. 244, figs. 1536*e*, *f*) ; BRYANT, 1921 (p. 25, pl. 12, figs. 7–9). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.

Polygnathus wilsoni U. P. JAMES, 1884 (p. 148, pl. 7, fig. C). Ordovician (Maysville) Warren County, Ohio. Fossil of uncertain affinities.

Prioniodella ULRICH and BASSLER, 1926 (p. 18). Genotype: *Prioniodella normalis* Ulrich and Bassler, 1926.

Prioniodella aequidens ULRICH and BASSLER, 1926 (p. 19, pl. 4, figs. 6, 7). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.

Prioniodella brevispina ULRICH and BASSLER, 1926 (p. 20, pl. 10, fig. 21). Missippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Prioniodella conferta ULRICH and BASSLER, 1926 (p. 21, pl. 10, fig. 25.) Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Prioniodella gracilis ULRICH and BASSLER, 1926 (p. 20, pl. 10, figs. 22, 23). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Prioniodella inaequalis ULRICH and BASSLER, 1926 (p. 19, pl. 4, figs. 2, 3). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.

Prioniodella informata ULRICH and BASSLER, 1926 (p. 20, pl. 10, figs. 19, 20). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Prioniodella invalida BRYANT, 1921. *Centrodus invalidus* BRYANT, 1921 (p. 21, pl. 3, figs. 3, 5). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.

Prioniodella multidens ULRICH and BASSLER, 1926 (p. 19, pl. 4, figs. 4, 5). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.

Prioniodella normalis ULRICH and BASSLER, 1926 (p. 19, pl. 4, figs. 1, 1′). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.

Prioniodella robusta ULRICH and BASSLER, 1926 (p. 20, pl. 10, fig. 24). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Prioniodidae ULRICH and BASSLER, 1926 (p. 7).

Prioniodina ULRICH and BASSLER, 1926 (p. 18). Genotype: *Prioniodina subcurvata* Ulrich and Bassler, 1926.

Prioniodina? gemina HINDE, 1900. *Prioniodus geminus* HINDE, 1900 (p. 344, pl. 10, fig. 25). Carboniferous, Upper limestone, Glencart, etc., west Scotland.

Prioniodina recedens BRYANT, 1921, *Prioniodus recedens* Bryant, 1921 (p. 13, text fig. 3; pl. 1, figs. 1, 2, 6–14; pl. 2, figs. 1–4, 7, 9). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.

Prioniodina separata ULRICH and BASSLER, 1926 (p. 18, pl. 4, figs. 17, 18). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.

Prioniodina subcurvata ULRICH and BASSLER, 1926 (p. 18, pl. 4, figs. 22–24). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.

Prioniodina? volborthii PANDER, 1856. *Prioniodus volborthii* PANDER, 1856 (p. 30, fig. A on p. 20). Carboniferous? of Russia.

Prioniodinidae ULRICH and BASSLER, 1926 (p. 15).

Prioniodus PANDER, 1856 (p. 29); ROUNDY, 1926 (p. 10); ULRICH and BASSLER, 1926 (p. 8). Genotype (first species); *Prioniodus elegans* PANDER, 1856.

Prioniodus abbreviatus HINDE, 1879 (p. 359, pl. 15, fig. 15): GRABAU, 1899 (p. 150, fig. 33B); GRABAU and SHIMER, 1910 (p. 244, fig. 1537*a*); BRYANT, 1921 (p. 14, pl. 1, figs. 3–5; pl. 3, fig. 7). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.

Prioniodus acicularis HINDE, 1879. See *Euprioniodina acicularis.*

Prioniodus alatus HINDE, 1879 (p. 361, pl. 16, fig 5); GRABAU, 1899 (p. 153, fig. 331); GRABAU and SHIMER, 1910 (p. 244, fig. 1533*b*); BRYANT, 1921 (p. 15, pl. 3, fig. 10; pl. 4, figs. 1–7). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.; ULRICH and BASSLER, 1926 (p. 11, pl. 1, figs. 25, 26). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.

Prioniodus alatus HADDING, 1913. See *Euprioniodina ? alata.*

Prioniodus ? alternans HADDING, 1913. *Polygnathus alternans* HADDING, 1913 (p. 32, pl. 1, fig. 7). Ordovician, Dicellograptus zone), southern Norway.

Prioniodus angulatus HINDE, 1879, 1900. See *Hibbardella angulata.*

Prioniodus armatus HINDE, 1879 (p. 360, pl. 15, figs. 20, 21); GRABAU, 1899 (p. 152, fig. 33F); GRABAU and SHIMER, 1910 (p. 244, figs. 1537 *f, g*); BRYANT, 1921 (p. 18); ULRICH and BASSLER, 1926 (p. 12). "Genesee, North Evans, N. Y." Apparently from Rhinestreet shale of Portage, western New York.

Prioniodus ? carinatus PANDER, 1856 (p. 30, pl. 2, fig. 25). Lower Ordovician, Baltic Provinces.

Prioniodus clavatus HINDE, 1879. See *Lonchodina clavata.*

Prioniodus colligatus BRYANT, 1921. See *Polygnathellus colligatus.*

Prioniodus complex HINDE, 1900 (p. 344, pl. 10, fig. 24). Carboniferous, Upper limestone, Glencart, etc., west Scotland.

Prioniodus concavus ULRICH and BASSLER, 1926 (p. 10, pl. 9, fig. 11). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Prioniodus cristatus BRYANT, 1921. See *Bryantodus cristatus.*

Prioniodus cultratus ULRICH and BASSLER, 1926 (p. 9, pl. 9, fig. 7). Mississippian Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Prioniodus curvatus SMITH, 1907. See *Euprioniodina curvata.*

Prioniodus curvidens ULRICH and BASSLER, 1926 (p. 11, pl. 1, figs. 16, 17). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie, County, N. Y.

Prioniodus dilata BRYANT, 1921, *Prioniodus dilatus* BRYANT, 1921 (p. 20, pl. 7, figs. 3, 4, 11). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.

Prioniodus discedens HADDING, 1913. See *Euprioniodina ? discedens.*

Prioniodus disparilis ULRICH and BASSLER, 1926 (p. 10, pl. 9, fig. 12). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Prioniodus dorcens T. H. CLARK, 1924 (p. 68, pl. 6, fig. 3). Not a conodont, but a spiny terminal fragment of trilobite. Canadian, Point Levis, Canada.

Prioniodus dychei U. P. JAMES, 1884 (p. 148, pl. 7, figs. A, C.). Ordovician (Maysville), Warren County, Ohio. Probably an annelid jaw.

Prioniodus elegans PANDER, 1856 (p. 29, pl. 2, figs. 22, 23). Lower Ordovician, Baltic Provinces. HINDE, 1879 (p. 358, pl. 15, fig. 10); GRABAU and SHIMER, 1910 (p. 244, fig. 1538*d*); PARKS, 1922 (p. 36, pl. 6, fig. 24). Upper Ordovician, Lorraine-Dundas, Toronto, Ontario.

Prioniodus equalis SMITH, 1907 (p. 249, pl. 8, figs. 38, 39). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Prioniodus erraticus HINDE, 1879. See *Lonchodina erratica.*

Prioniodus furcatus HINDE, 1879. See *Euprioniodina ? furcata.*

Prioniodus geminus HINDE. See *Prioniodina? gemina.*

Prioniodus hamatus BRYANT, 1921 (p. 15, text fig. 5; pl. 2, figs. 5, 6, 8, 11). Upper Devonian, Genundewa limestone at base of Genesee, North Evans, Eighteen Mile Creek, N. Y.

Prioniodus healdi ROUNDY, 1926 (p. 10, pl. 4, fig. 5). Barnett shale of Mississippian, San Saba County, Tex.

Prioniodus immersus BRYANT, 1921. See *Bryantodus immersus.*

Prioniodus inequalis ULRICH and BASSLER, 1926 (p. 10, pl. 9, fig. 6). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Prioniodus inflatus SMITH, 1907 (p. 249, pl. 8, fig. 36). Ordovician, Arenig Llandeilo, southern uplands of Scotland.

Prioniodus inutilis ULRICH and BASSLER, 1926 (p. 11, pl. 1, fig. 23). Upper Devonion, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.

Prioniodus lelaps T. H. CLARK, 1924 (p. 69, pl. 6, fig. 4). Not a conodont, but an annelid jaw, Canadian, Point Levis, Canada.

Prioniodus macconochii SMITH, 1907 (p. 249, pl. 8, figs. 41, 42). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Prioniodus macrodentatus BRYANT, 1921. See *Bryantodus macrodentatus.*

Prioniodus melampus T. H. CLARKE, 1924 (p. 68, pl. 6, fig. 2). Not a conodont, but the spiny terminal fragment of a trilobite, Canadian, Point Levis, Canada.

Prioniodus muricatus BRYANT, 1921. See *Bryantodus muricatus.*

Prioniodus nasutus BRYANT, 1921. See *Synprioniodina nasuta.*

Prioniodus obtusus BRYANT, 1921. See *Bryantodus obtusus.*

Prioniodus pamphagus T. H. CLARK, 1924 (p. 70, pl. 6, fig. 6). Not a conodont, but an annelid jaw and the same as *Prioniodus lelaps* T. H. Clark, 1924 Canadian, Point Levis, Canada.

Prioniodus panderi HINDE, 1879. See *Ligonodina panderi.*

Prioniodus parvidentatus ULRICH and BASSLER, 1926 (p. 9, pl. 9, fig. 1). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant Tenn.

Prioniodus parvulus BRYANT, 1921. See *Bryantodus parvulus.*

Prioniodus pauperatus SMITH, 1907. *Polygnathus pauperatus* SMITH, 1907, (p. 245, pl. 5, fig. 14). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Prioniodus peracutus HINDE, 1900 (p. 343, pl. 10, figs. 21–23). Carboniferous, lower and upper limestone, Monkcastle, Dalry, etc., west Scotland; ROUNDY, 1926 (p. 10, pl. 4, figs. 6–8) Barnett shale of Mississippian, San Saba County, Tex.

Prioniodus politus HINDE, 1879. See *Bryantodus politus.*

Prioniodus porcatus HINDE, 1900 (p. 344, pl. 10, fig. 26). Carboniferous, upper limestone, Monkcastle, etc., west Scotland.

Prioniodus pravus BRYANT, 1921. See *Bryantodus pravus.*

Prioniodus proclinatus ULRICH and BASSLER, 1926 (p. 10, pl. 1, fig. 22). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.

Prioniodus proclinis ULRICH and BASSLER, 1926 (p. 9, pl. 9, figs. 8–10). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Prioniodus radiatus BRYANT, 1921. See *Bryantodus radiatus.*

Prioniodus radicans HINDE, 1879. See *Euprioniodina radicans.*

Prioniodus recedens BRYANT, 1921. See *Prioniodina recedens.*

Prioniodus retusus BRYANT, 1921. See *Bryantodus retusus.*

Prioniodus reversus ULRICH and BASSLER, 1926 (p. 10, pl. 9, fig. 4). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Prioniodus spatulatus BRYANT, 1921. See *Bryantodus spatulatus.*

Prioniodus spicatulus ULRICH and BASSLER, 1926 (p. 9, pl. 9, figs. 2, 3). Mississippian, Hardin sandstone at base of Chattanooga shale, Mount Pleasant, Tenn.

Prioniodus spicatus HINDE, 1879 (p. 361, pl. 16, figs. 1–3); CLARKE, 1886, (pl. A–1, fig. 22); GRABAU, 1899 (p. 152, fig. 33G); BRYANT, 1921 (p. 19). Upper Devonian, Portage-Naples and Rhinestreet shales, western New York; HINDE, 1900 (p. 343, pl. 10, fig. 20). Carboniferous, lower limestone, Birkhead, Dalry, etc., west Scotland.

Prioniodus subcompactus SMITH, 1907 (p. 249, pl. 8, fig. 37). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Prioniodus sulcatus PANDER, 1856 (p. 29, pl. 2, fig. 24). Lower Ordovician, Baltic Provinces.

Prioniodus tigris T. H. CLARK, 1924 (p. 69, pl. 6, fig. 5). Not a conodont, but probably fringe appendage of merostome or trilobite. Canadian, Point Levis, Canada.

Prioniodus theron T. H. CLARK, 1924 (p. 67, pl. 6, fig. 1). Not a conodont; probably fringe appendage of merostome or trilobite. Canadian, Point Levis, Canada.

Prioniodus tulensis PANDER, 1856 (p. 30, pl. 2A, figs. 1, 18–20). Carboniferous limestone. Tula, Russia; HINDE, 1900 (p. 343, pl. 9, figs. 15–20). Carboniferous, upper and lower limestone, Glencart, Dalry, etc., west Scotland.

Prioniodus undosus ULRICH and BASSLER, 1926 (p. 12, pl. 1, figs. 18–20). Upper Devonian, Rhinestreet shale of Portage group, Shaleton, Erie County, N. Y.

Prioniodus volborthii PANDER, 1856. See *Prioniodina volborthii.*

Prionognathus PANDER, 1856 (p. 34); ULRICH and BASSLER, 1926 (p. 43). Genotype (only species): *Prionognathus brandtii*, Pander, 1856.

Prionognathus brandtii PANDER, 1856 (p. 34, pl. 4, fig. 19). Silurian, Rootsiküle, Island of Oesel. Probably not a conodont.

Scolopodus PANDER, 1856 (p. 25). Genotype (first species): *Scolopodus sublaevis* Pander, 1856.

Scolopodus aequilateralis PANDER, 1856 (p. 26, pl. 2, fig. 5). Lower Ordovician, Baltic Provinces.

Scolopodus costatus PANDER, 1856 (p. 26, pl. 2, fig. 7). Lower Ordovician, Baltic Provinces.

Scolopodus quadratus PANDER, 1856 (p. 26, pl. 2, fig. 6). Lower Ordovician, Baltic Provinces.

Scolopodus semicostatus PANDER, 1856 (p. 26, pl. 2, fig. 4). Lower Ordovician, Baltic Provinces.

Scolopodus striatus PANDER, 1856 (p. 26, pl. 2, fig. 8). Lower Ordovician, Baltic Provinces.

Scolopodus sublaevis PANDER, 1856 (p. 25, pl. 2, fig. 3). Lower Ordovician, Baltic Province.

Subprioniodus SMITH, 1907 (p. 247). Genotype: *Subprioniodus paucidentatus* Smith, 1907. Genus retained provisionally for Ordovician species of *Prioniodus* referred here by Smith.

Subprioniodus acutus SMITH, 1907 (p. 250, pl. 9, fig. 45; pl. 7, fig. 33). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Subprioniodus calcarus SMITH, 1907 (p. 250, pl. 9, fig. 46). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Subprioniodus crassus SMITH, 1907 (p. 250, pl. 9, fig. 48). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Subprioniodus cringcrampensis SMITH, 1907 (p. 248, pl. 7, fig. 35). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Subprioniodus distans SMITH, 1907 (p. 250, pl. 9, fig. 44). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Subprioniodus equalis SMITH, 1907 (p. 248, pl. 7, fig. 31). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Subprioniodus falcatus SMITH, 1907 (p. 250, pl. 9, fig. 51). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Subprioniodus fardingensis SMITH, 1907 (p. 250, pl. 9, fig. 47). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Subprioniodus furcatus SMITH, 1907 (p. 247, pl. 6, fig. 22). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Subprioniodus gibbosus SMITH, 1907 (p. 247, pl. 7, fig. 27). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Subprionidus huntlawensis SMITH, 1907 (p. 248, pl. 7, fig. 34 a, b). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Subprioniodus lanceolatus SMITH, 1907 (p. 247, pl. 7, fig. 29). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Subprioniodus obliquo-lanceolatus SMITH, 1907 (p. 248, pl. 7, fig. 30). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Subprioniodus parvus SMITH, 1907 (p. 247, pl. 7, figs. 26, 28). Ordovician, Arenig-Llandeilo, southern uplands, of Scotland.

Subprioniodus paucidentatus SMITH, 1907 (p. 247, pl. 6, fig. 21). Ordovician, Arenig-Llandeilo, southern uplands, of Scotland.

Subprioniodus peracutus SMITH, 1907 (p. 248, pl. 7, fig. 32). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

Subprioniodus subserratus SMITH, 1907 (p. 250, pl. 9, fig. 43). Ordovician, Arenig-Llandeilo, southern uplands, of Scotland.

Synprioniodina ULRICH and BASSLER, 1926 (p. 42). Genotype: *Synprioniodina alternata* Ulrich and Bassler, 1926.

Synprioniodina alternata ULRICH and BASSLER, 1926 (p. 42, text fig. 22). Mississippian, Chattanooga shale, 13 miles east of north of Huntsville, Ala.

Synprioniodina nasuta HINDE, 1879. *Polygnathus nasutus* HINDE, 1879 (p. 364, pl. 16, fig. 22); GRABAU, 1899 (p. 155, fig. 35). *Prioniodus nasutus* (Hinde) BRYANT, 1921 (p. 19). Devonian, Genesee shales, North Evans, Eighteen Mile Creek, N. Y.

Valentia SMITH, 1907 (p. 251); ULRICH and BASSLER, 1926 (p. 43). Genotype (only species): *Valentia morrochensis* SMITH, 1907.

Valentia morrochensis SMITH, 1907 (p. 257, pl. 9, fig. 50). Ordovician, Arenig-Llandeilo, southern uplands of Scotland.

DESCRIPTION OF EARLY MISSISSIPPIAN SPECIES

All of the species herein described were obtained in the Chattanooga black shale of Early Mississippian age at a locality 13 miles east of north of Huntsville, Ala.

Family PRIONIODIDAE Ulrich and Bassler, 1926

Genus PRIONIODUS (Hinde) Bryant, 1921

PRIONIODUS ALABAMENSIS, new species

Plate 9, figs. 1. 2

Tooth consisting of a long, thin, tapering, recurved cusp rising from a flat, thick bar. This central cusp is not produced below the base. A series of short, sharp pointed denticles which are well separated, rises at an acute angle from the bar.

Cotypes.—Cat. No. 11431, U.S.N.M.

PRIONIODUS ALATOIDES, new species

Plate 9, fig. 3

This is a more delicate species than Hinde's *Prioniodus alatus.* The bar is straight, flat, and thin. The cusp is very wide at the base but tapers to a sharp point, extends below and forms an obtuse angle with the bar. The denticles and the cusp rise from the bar at obtuse angles.

Holotype.—Cat. No. 11432, U.S.N.M.

PRIONIODUS CULTRATUS Ulrich and Bassler, 1926

Plate 9, fig. 4

1926. *Prioniodus cultratus* Ulrich and Bassler, Proc. U. S. Nat. Mus., vol. 68, art. 12, p. 9, pl. 9, fig. 7.

Tooth composed of a broad, flat, tapering cusp rising from the slightly deflected end of a moderately flat bar at a right angle. Four long, sharp pointed, slightly recurved denticles are placed on the bar at obtuse angles with the base of the cusp. These are succeeded by several short, smaller denticles.

Plesiotype.—Cat. No. 11433, U.S.N.M.

Genus LIGONODINA Ulrich and Bassler, 1926

LIGONODINA PARVULA, new species

Plate 9, fig. 5

The pointed, recurved cusp extends below a slightly curved bar on which are several denticles, well rounded and set at obtuse angles to

the bar. A wide space separates the cusp and the denticles, which in turn are removed from one another by means of a space about equal to the width of a denticle. The characteristic suckerlike markings are present on the downward extension of the main cusp.

Holotype.—Cat. No. 11434, U.S.N.M.

Family PRIONIODINIDAE Ulrich and Bassler, 1926

Genus HINDEODELLA Ulrich and Bassler, 1926

HINDEODELLA TENERRIMA, new species

Plate 9, figs. 6, 7

A long, thin, sharp pointed cusp rises from a very slender bar. Two broken denticles are on one side of the cusp and nine or ten are on the other side, all widely spaced. Due to the concavity of the bar immediately below the cusp, it may be inferred that this is the inner side of the jaw.

Cotypes.—Cat. No. 11435, U.S.N.M.

HINDEODELLA MINUTIDENS, new species

Plate 9, fig. 8

The upright denticles in this specimen are so minute and regularly, though closely, spaced and the bar is so long and flat that this conodont resembles a fine-toothed saw.

Holotype.—Cat. No. 11436, U.S.N.M.

HINDEODELLA GERMANA, new species

Plate 9, fig. 9

The anterior side of the bar is very thick and bears several needlelike, irregular denticles. On the posterior side the denticles, which slant backward, are alternately long and short. In one or two places two small denticles are found between the longer ones. The posterior end of the bar terminates in a spinelike point.

Holotype.—Cat. No. 11437, U.S.N.M.

HINDEODELLA SUBTILIS Ulrich and Bassler

Plate 9, figs. 10, 11

1926. *Hindeodella subtilis* Ulrich and Bassler, Proc. U. S. Nat. Mus., vol. 68, art, 12, p. 39, pl. 8, figs. 17–19.

This species, described from the Hardin sandstone, is well represented in the succeeding Chattanooga black shale, where entire specimens, such as those in Figure 10, are not uncommon. The characteristic basketlike expansion at the anterior end and the minuteness and decided alternation of the denticles along the bar are features easily

recognized. Figure 11 represents a variety in which the alternation of the denticles is not so evident and the denticles are shorter.

Plesiotypes.—Cat. No. 11438, U.S.N.M.

Genus LONCHODINA Ulrich and Bassler, 1926

LONCHODINA IRREGULARIS, new species

Plate 9, fig. 12

Bar slightly outwardly bowed, irregularly curved, with the anterior end shorter and bent abruptly downward. Main cusp located at the point of downward bending, followed posteriorly by two equally large denticles separated by a minute one. Rest of bar occupied by narrow, more delicate denticles decreasing in size to the extremities. The irregularity of curvature and the three larger central denticles characterize this species.

Holotype.—Cat. No. 11439, U.S.N.M.

LONCHODINA DISCRETA Ulrich and Bassler

Plate 9, fig. 13

1926. *Lonchodina discreta* Ulrich and Bassler, Proc. U. S. Nat. Mus., vol. 18, p. 36, pl. 10, figs. 1, 2.

A pointed, short, robust cusp rises from an irregularly curved, narrow bar. The cusp is separated from the denticles on each side by spaces several times its diameter. The two denticles on one side of the bar are short and robust; on the other side there are three which are thin.

Plesiotype.—Cat. No. 11440, U.S.N.M.

Genus PRIONIODELLA Ulrich and Bassler, 1926

PRIONIODELLA ARCUATA, new species

Plate 9, fig. 14

Tooth minute, broadly arched, the bar of which is very narrow, but well rounded. Denticles all similar, being delicate and needle-like, but the long ones are grouped on the anterior part of the bar and the short ones on the posterior. The decided curvature of the bar, the absence of a main cusp, and the two sets of delicate denticles characterize this species.

Holotype.—Cat. No. 11441, U.S.N.M.

PRIONIODELLA INUTILIS, new species

Plate 9, fig. 15

Bar broad, very slightly curved, bearing closely arranged, but distinctly separated denticles rather equal in size.

Holotype.—Cat. No. 11442, U.S.N.M.

Genus PRIONIODINA Ulrich and Bassler, 1926

PRIONIODINA SEPARANS, new species

Plate 9, figs. 16, 17

Tooth consisting of a slender curved bar bearing fourteen or more rather short, flattened denticles, separated from each other by more than their own diameter and with a main cusp about twice the size of a denticle, developed at the angle of curvature. The cusp is slightly extended below the bar into a protuberance. The denticles are very similar to each other and to the cusp in shape.

Cotypes.—Cat. No. 11443, U.S.N.M.

PRIONIODINA UNDULATA, new species

Plate 9, fig. 18

This bar is slightly arched along the posterior extension, but is sharply deflected at the cusp, forming a right angle. The main cusp is very long, stout, well rounded, and bluntly pointed. The denticles on both sides are similar to the cusp but they are about one-third the size and they vary somewhat as to length. The denticles farthest from the cusp are upright but the nearer they approach the cusp, the more they bend toward this great central tooth. A space a little less than the width of the denticles separates them.

Holotype.—Cat. No. 11444, U.S.N.M.

Genus BRYANTODUS Ulrich and Bassler, 1926

BRYANTODUS INEQUALIS, new species

Plate 10, figs. 1, 2

The bar is traversed for half its length by a median ridge. The other half is very flat, curling slightly at the end. A broad, short, sharply pointed, and slightly recurved cusp rises at an obtuse angle from the center of the bar. The cusp is about four times as broad as the denticles at its base. Posterior to the main cusp the denticles are short and slightly separated. On the anterior side the denticles are about twice this length, although they gradually become shorter as they approach the end of the bar. As the denticles become shorter they are at right angles with the bar, whereas the long ones near the cusp are noticeably curved toward that tooth.

The unequal size of the two sets of denticles marks this species.

Cotypes.—Cat. No. 11445, U.S.N.M.

BRYANTODUS INCLINATUS, new species

Plate 10, fig. 3

Tooth triangular in outline, consisting of a broad flat sharp pointed main cusp, inclined to the bar, followed posteriorly by at least 10

slender denticles diminishing in size toward the extremity and anteriorly by three or four similar denticles. All of the denticles are also blunt and are very much alike except in length. All are inclined with the main cusp.

The strong inclination of both main cusp and denticles characterize this species.

Holotype.—Cat. No. 11446, U.S.N.M.

BRYANTODUS GERMANUS, new species

Plate 10, fig. 5

The wide, almost flat bar is traversed for its entire length by a median line The upper and lower portions of the bar thus lie in two different planes. From the center of the upper half a broad angled and strongly recurved tooth rises. On the concave side of this cusp there is a broad, blunt denticle about as long as the cusp. The other denticles vary in length but are of the same general shape. On the other side of the cusp the denticles are longer, flatter, and very sharp pointed. Narrow but equal spaces separate all of the denticles.

Holotype.—Cat. No. 11447, U.S.N.M.

BRYANTODUS SUBANGULATUS, new species

Plate 10, fig. 6

This narrow bar is very strongly arched or angulated. On one side of the cusp the denticles are much shorter than those on the other side. All of the denticles become gradually shorter toward the ends of the bar.

Holotype.—Cat. No. 11448, U.S.N.M.

Genus EUPRIONIODINA Ulrich and Bassler, 1926

EUPRIONIODINA GERMANA, new species

Plate 10, fig. 7

The moderately arched bar is broad and angulated on one side of the cusp. On the other side it is stout but somewhat flat. Broad, heavy denticles rise from the long side of the bar. The terminal denticle is about as broad as any two of the others. All of the denticles are separated by very narrow spaces. There is a wide space on each side of the cusp which is round, very thick, and slightly extended below the bar. On the short side of the bar the denticles are thinner than the others but they are quite substantial looking. They are short and widely spaced.

Holotype.—Cat. No. 11449, U.S.N.M.

Genus DIPLODODELLA Ulrich and Bassler, 1926

DIPLODODELLA BILATERALIS Ulrich and Bassler, 1926

Plate 10, fig. 8

1926. *Diplododella bilateralis* Ulrich and Bassler, Proc. U. S. Nat. Mus., vol. 68, p. 41, text, fig. 21.

The short, narrow, blunt cusp rises from the center of a strongly arched bar, both sides of which are about equal in length. The median ridge, extending the whole length of the bar, divides the bar into two parts which lie in different planes. Beneath the cusp there is a small concave depression. The denticles, which are alike on both sides of the cusp, seem to rise from the median ridge rather than from the edge of the bar. Spaces wider than the denticles separate them. The denticles themselves vary in size; the nearer the ends of the bar, the smaller and thinner they become.

Holotype.—Cat. No. 11306, U.S.N.M.

Genus HIBBARDELLA Ulrich and Bassler, 1926

HIBBARDELLA CURVATA, new species

Plate 10, fig. 9

This is a tiaralike tooth. There are five short, thick denticles with blunt points on each side of a narrow but very robust bar. Very wide spaces separate the denticles. The crownlike appearance is helped by the curved contour of the strongly arched bar. The blunt-pointed cusp is very wide, thick, and long.

Holotype.—Cat. No. 11450, U.S.N.M.

Genus PALMATODELLA Ulrich and Bassler, 1926

PALMATODELLA DELICATULA Ulrich and Bassler, 1926

Plate 10, fig. 10

1926. *Palmatodella delicatula* Ulrich and Bassler, Proc. U. S. Nat. Mus., vol. 68, p. 4, pl. 10, fig. 5, text fig. 20.

This sharply arched bar is distinctly divided into two parts. On one side of the long, angular cusp which has its origin in the peak of the bar, the round, thick bar bears a number of short, sharp-pointed and well-separated denticles. The other side has the appearance of a flat, finely serrated palm leaf. Here the denticles gradually diminish in length from the very long one next to the cusp to the one at the end of the bar which is so minute as to be hardly distinguished from the bar itself. Spaces about the width of very fine hairs separate these denticles.

Holotype.—Cat. No. 11307, U.S.N.M.

Genus SYNPRIONIODINA Ulrich and Bassler, 1926

SYNPRIONIODINA ALTERNATA Ulrich and Bassler, 1926

Plate 10, figs. 11, 12

1926. *Synprioniodina alternata* Ulrich and Bassler, Proc. U. S. Nat. Mus., vol. 68, p. 42, text, fig. 22.

Both of these specimens exhibit the interior sides of two opposite plates. The long, stout cusp, tapering to a very blunt point, divides the bar into two unequal parts. The denticles are merely indicated on the short side of the sharply arched bar. The long side bears a number of long, needlelike denticles. In some places the relatively wide spaces between the denticles are filled with very fine denticles. In Figure 11 the denticles are much longer than those in Figure 12.

Holotype and plesiotype.—Cat. No. 11308, U.S.N.M.

SYNPRIONIODINA PLANA, new species

Plate 10, fig. 13

The bar is very broad, flat, and strongly arched. A median ridge divides the bar into two parts. The cusp is flat, very wide, and tapers a little toward a rather wide, blunt point. It is about twice the length of the other denticles, which are similar in shape. The spaces become wider as both ends of the bar are approached. All of the denticles are set at right angles to the bar, which is very long on the steeper side of the arch. This specimen, as well as several others the bars of which are divided by the median ridge, gives one the impression of being one of a series, set in a jaw, as the shark's teeth are.

Holotype.—Cat. No. 11451, U.S.N.M.

Family POLYGNATHIDAE Ulrich and Bassler, 1926

Genus PANDERODELLA Ulrich and Bassler, 1926

PANDERODELLA RECTA, new species

Plate 10, fig. 14

Our figure shows the convex side of the plate or tooth, the bar of which is very flat and broad. The cusp, which is scarcely different from the other short, blunt pointed denticles, is moderately produced as a flange below the bar. These denticles are all widely separated. The terminal tooth of the long side helps to form a convex end to the bar.

Holotype.—Cat. No. 11452, U.S.N.M.

PANDERODELLA SUBRECTA, new species

Plate 10, fig. 15

This specimen is a modification of *Panderodella recta*. The deflection of the bar is more noticeable. The denticles on the long side of the bar are short, spear-shaped, and evenly spaced. Those on the deflected side are needlelike.

Holotype.—Cat. No. 11453, U.S.N.M.

Genus POLYGNATHUS (Hinde) Bryant, 1921

POLYGNATHUS GYRATILINEATUS, new species

Plate 11, figs. 1, 2

Plate an irregular polygon with the tubercules united so as to form parallel ridges extending in concentric lines from one side of the median ridge to a place on the other side directly opposite the point of origin. The median ridge, which is slightly flexed to the right and to the left, is produced beyond the plate into a carina bearing denticles.

Cotypes.—Cat. No. 11454, U.S.N.M.

POLYGNATHUS PERGYRATUS, new species

Plate 11, fig. 3

This species is very similar to *Polygnathus gyratilineatus* but the lines are much closer together. The posterior end of the plate is produced into a carina as usual in this type of species.

Holotype.—Cat. No. 11455, U.S.N.M.

POLYGNATHUS TRILOBATUS, new species

Plate 11, fig. 4

As its name indicates this is a distinctly three-lobed plate. The anterior lobe is long and narrow, while the lateral lobes sweep in broad lines from the anterior lobe to the carina. A low median ridge rises in the middle of the anterior lobe becoming flattened towards the top but gradually narrowing posteriorly until it is produced beyond the plate into a broad carina, bearing denticles. The tubercules of the basal portion are stronger and more concentrically arranged than in *Polygnathus concentricus*. The tubercules of the anterior lobe extend from side to side across the top of the median ridge.

Holotype.—Cat. No. 11456, U.S.N.M.

POLYGNATHUS CONCENTRICUS Ulrich and Bassler, 1926

Plate 11, figs. 5–7

1926. *Polygnathus concentricus* Ulrich and Bassler, Proc. U. S. Nat. Mus., vol 68, p. 47, pl. 8, figs. 6, 7.

The plate is roughly triangular, having three well-defined lobes. The rounded lateral lobes gradually disappear into the sides of the sharp-pointed anterior lobe by means of a shallow, curving indentation. The plate is slightly depressed toward the posterior end but elevated in the anterior lobe. The median ridge, which is low but sharp in the posterior end, extends the entire length of the plate and in the anterior lobe becomes broad, being produced beyond the plate by a carina bearing several round, compressed denticles. Both the median ridge and the carina are somewhat sinuous in their courses. Short tubercules are concentrically arranged in the lobes. In the anterior lobe, where they cross the median ridge, they are so closely spaced as to appear as continuous lines. Compared with *Polygnathus trilobatus*, this species differs in its more finely marked basal portion and in the extension of the median ridge to the anterior extremity.

Plesiotypes.—Cat. No. 11457, U.S.N.M.

POLYGNATHUS RHOMBOIDEUS Ulrich and Bassler

Plate 11, figs. 11, 12

1926. *Polygnathus rhomboideus* Ulrich and Bassler, Proc. U. S. Nat. Mus., vol. 68, p. 46, pl. 7, fig. 6.

Plate rhomboidal in shape. Posterior lobe long and narrow. Lateral lobes slightly broader and somewhat rounded. The median ridge which extends the length of the plate is extended beyond the plate by a short, narrow carina, bearing several denticles, varying in shape and size. These denticles are extensions of those borne on the median ridge. In the anterior end of the plate the ridge is traversed by tubercules concentrically arranged but terminating abruptly at the ill-defined base of the ridge. Parallel rows of denticles extend from the anterior lobe to the origin of the carina, where they turn at a sharp angle and terminate in the margin of the lateral lobes.

The rhomboidal shape, less conspicuous transverse ribs, fewer rows of tubercules, and their more longitudinal arrangement, distinguish this species from its allies such as *Polygnathus concentricus*.

Plesiotypes.—Cat. No. 11456, U.S.N.M.

POLYGNATHUS PENNATULOIDEA, new species

Plate 11, fig. 14

This species is somewhat similar to *Polygnathus pennatulus* Ulrich and Bassler. The high median ridge is surmounted by

numerous tubercules. It extends the whole length of the plate, beyond which it is produced by means of a long, robust carina, bearing several large denticles. The tubercules on the plate are arranged in less definite order than in *P. pennatulus*.

Holotype.—Cat. No. 11, 461, U.S.N.M.

POLYGNATHUS PENNATULUS Ulrich and Bassler

Plate 11, fig. 15

1926. *Polygnathus pennatulus* ULRICH and BASSLER, Proc. U. S. Nat. Mus., vol. 68, p. 45, pl. 7, fig. 8; pl. 9, figs. 24, 25.

The narrow median ridge which bears denticles throughout its length extends from the anterior end of the plate to the carina, which is slightly deflected. Several stout denticles are borne on the carina. The tubercules on both sides of the plate occur in short parallel lines extending from the margin to a depression at the base of the ridge.

Plesiotype.—No. 11, 462, U.S.N.M.

Genus PALMATOLEPIS Ulrich and Bassler, 1926

PALMATOLEPIS INEQUALIS, new species

Plate 11, figs. 8–10

This plate is divided into three parts by the unequal bifurcations of the median ridge. The main part of the ridge which is produced beyond the plate by a short, blunt carina, is broad and stout. The branches which are thin and high bear six or seven denticles. The short, blunt tubercules on each section of the plate are generally arranged at right angles to the main ridge or its branches. Figure 10 is the under surface of plate with the same bifurcated ridges but without ornament.

Cotypes.—Cat. No. 11, 458, U.S.N.M.

PALMATOLEPIS ELONGATA, new species

Plate 11, fig. 13

This is a long, narrow, minute plate with the finely denticulated median ridge extending its whole length. The ridge is very low at the anterior end but rises toward the posterior end where it becomes high and broad. On one side of the plate there is a short, pointed lobe. The relative smoothness of the surface serves to distinguish this species from *Palmatolepis perlobata* Ulrich and Bassler to which it is related.

Holotype.—Cat. No. 11, 460, U.S.N.M.

PALMATOLEPIS PERLOBATUS Ulrich and Bassler

Plate 11, figs. 16–19

1926. *Palmatolepis perlobatus* Ulrich and Bassler, Proc. U. S. Nat. Mus., vol. 68, p. 49, pl. 7, figs. 19–23.

Plate irregularly diamond shaped, flexed either to the right or to the left in the posterior portion. The ridge extends the whole length of the plate and is slightly produced beyond by a short, thick carina. The anterior portion of the ridge is indicated by a low, narrow line. From a central prominence the ridge thickens toward the carina. One side, which is rounded, extends slightly beyond the center. The other side which is produced in the central region by an angular lobe extends almost the entire length of the median ridge but becomes gradually narrower as it approaches the carina. In the anterior lobe the short, blunt tubercules converge toward the central prominence. This in the posterior half of the plate are at right angles to the central ridge.

Plesiotype.—Cat. No. 11, 463, U.S.N.M.

EXPLANATION OF PLATES

Plate 1

All of the figures on this and the following seven plates are copied from the authors cited. The magnification was often not stated but it lies usually between 10 and 20 diameters.

Fig. 1. *Distacodus* (*Machairodus*) *angustus* Pander, 1856.
2. *Distacodus* (*Machairodus*) *canaliculatus* Pander, 1856.
3, 4. *Distacodus* (*Machairodus*) *dilatatus* Pander, 1856.
5–9. *Distacodus* (*Machairodus*) *ensiformis* Pander, 1856.
10. *Distacodus* (*Machairodus*) *inaequalis* Pander, 1856.
11. *Distacodus* (*Machairodus*) *incurvus* Pander, 1856.
12. *Distacodus incurvus* (Pander) Hinde, 1879.
13. *Distacodus* (*Machairodus*) *planus* Pander, 1856.
14. *Distacodus* (*Machairodia*) *rhombeus* (Pander) Smith, 1907.
15. *Distacodus* (*Machairodia*) *sulcata* Smith, 1907.
16. *Belodus gracilis* Pander, 1856.
17. *Distacodus* (*Machairodus*) *rhomboideus* Pander, 1856.
18. *Distacodus* (*Machairodus*) *rhomboideus* Pander, 1856, var.
19. *Distacodus* (*Machairodus*) *solidus* Pander, 1856.
20. *Acodus acutus* Pander, 1856.
21, 22. *Acodus crassus* Pander, 1856.
23. *Acodus erectus* Pander, 1856.
24. *Acodus planus* Pander, 1856.
25. *Acodus sigmoideus* Pander, 1856.
26. *Acontiodus gracilis* Pander, 1856.
27. *Acontiodus latus* Pander, 1956.
28. *Acontiodus triangularis* Pander, 1856.
29. *Drepanodus acutus* Pander, 1856.
30–35. *Drepanodus arcuatus* Pander, 1856.
36, 37. *Drepanodus arcuatus* (Pander) Hinde, 1879.
38. *Drepanodus falcatus* Hadding, 1913.
39–41. *Drepanodus flexuosus* Pander, 1856.
42. *Drepanodus inflexus* Pander, 1856.

PLATE 2

FIG. 1. *Drepanodus flexuosus* (Pander) Smith, 1907.
2. *Drepanodus inflexus* Pander, 1856.
3. *Drepanodus obtusus* Pander, 1856.
4. *Drepanodus robustus* Hadding, 1913.
5. *Drepanodus verutus* Hadding, 1913.
6. *Scolopodus aequilateralis* Pander, 1856.
7. *Scolopodus costatus* Pander, 1856.
8. *Scolopodus quadratus* Pander, 1856.
9. *Scolopodus semicostatus* Pander, 1856.
10. *Scolopodus striatus* Pander, 1856.
11. *Scolopodus sublaevis* Pander, 1856.
12. *Oistodus parallelus* Pander, 1856.
13. *Oistodus inaequalis* Pander, 1856.
14. *Oistodus acuminatus* Pander, 1856.
15–17. *Oistodus lanceolatus* Pander, 1856.
18. *Paltodus bicostatus* Pander, 1856.
19. *Paltodus canaliculatus* Pander, 1856.
20, 21. *Paltodus rotundatus* Pander, 1856.
22–25. *Paltodus obtusus* Pander, 1856.
26. *Paltodus subaequalis* Pander, 1856.
27–29. *Paltodus truncatus* Pander, 1856.

PLATE 3

FIG. 1. *Prioniodus sulcatus* Pander, 1856.
2. *Prioniodus carinatus* Pander, 1856.
3. *Prioniodus alternans* Hadding, 1913.
4–6. *Prioniodus elegans* Pander, 1856.
7. *Prioniodus elegans* (Pander) Hinde, 1879.
8. *Prioniodus abbreviatus* Hinde, 1879.
9, 10. *Prioniodus armatus* Hinde, 1879.
11–13. *Prioniodus spicatus* Hinde, 1879.
14. *Prioniodus spicatus* Hinde, 1900.
15. *Prioniodus spicatus* (Hinde) Clarke, 1886.
16–19. *Prioniodus tulensis* Pander, 1856.
20–22. *Prioniodus tulensis* (Pander) Hinde, 1900.
23, 24. *Prioniodus equalis* Smith, 1907.
25. *Prioniodus inflatus* Smith, 1907.
26. *Prioniodus porcatus* Hinde, 1900.
27. *Prioniodus lelaps* T. H. Clark, 1924.
28, 29. *Prioniodus macconochii* Smith, 1907.
30. *Prioniodus tigris* T. H. Clark, 1924.
31. *Prioniodus pamphagus* T. H. Clark, 1924.
32. *Prioniodus complex* Hinde, 1900.
33. *Prioniodus dorcens* T. H. Clark, 1924.
34. *Prioniodus* (*Polygnathus*) *pauperatus* Smith, 1907.
35. *Prioniodus subcompactus* Smith, 1907.
36. *Prioniodus melampus* T. H. Clark, 1924.
37–39. *Prioniodus peracutus* Hinde, 1900.
40. *Prioniodus alatus* Hinde, 1879.

PLATE 4

FIG. 1. *Subprioniodus subserratus* Smith, 1907.
2. *Subprioniodus calcarus* Smith, 1907.
3–5. *Subprioniodus acutus* Smith, 1907.
6. *Subprioniodus crassus* Smith, 1907.
7. *Subprioniodus distans* Smith, 1907.
8. *Subprioniodus cringcampensis* Smith, 1907.
9. *Subprioniodus equalis* Smith, 1907.
10. *Subprioniodus falcatus* Smith, 1907.
11. *Subprioniodus furcatus* Smith, 1907.
12. *Subprioniodus fardingensis* Smith, 1907.
13. *Subprioniodus gibbosus* Smith, 1907.
14, 15. *Subprioniodus huntlawensis* Smith, 1907.
16. *Subprioniodus lanceolatus* Smith, 1907.
17. *Subprioniodus obliquo-lanceolatus* Smith, 1907.
18, 19. *Subprioniodus parvus* Smith, 1907.
20, 21. *Subprioniodus paucidentatus* Smith, 1907.
22. *Subprioniodus peracutus* Smith, 1907.
23–29. *Cordylodus angulatus* Pander, 1856.
30. *Cordylodus ramosus* Hadding, 1913.
31, 32. *Cordylodus rotundatus* Pander, 1856.
33. *Cornuramia bicornua* Smith, 1907.
34. *Cornuramia diplodonta* Smith, 1907.
35. *Cornuramia monodonta* Smith, 1907.
36. *Hindeodella* (*Polygnathus*) *dubius* (Hinde) Smith, 1907.
37, 38. *Hindeodella* (*Centrodus*) *duplicatus* Pander, 1856.
39. *Hindeodella* (*Centrodus*) *duplicatus* (Pander) Hinde, 1879.
40, 41. *Hindeodella* (*Centrodus*) *lineatus* (Pander) Hinde, 1879.
42. *Hindeodella* (*Centrodus*) *lineatus* Pander, 1856.
43. *Ligonodina* (*Prioniodus*) *panderi* Hinde, 1879.
44. *Prioniodus theron* T. H. Clark, 1924.

PLATE 5

FIGS. 1, 2. *Hindeodella* (*Ctenognathus*) *obliquus* Pander, 1856.
3–5. *Hindeodella* (*Ctenognathus*) *obliquus* (Pander) Hinde, 1879.
6. *Pachysomia wanlockensis* Smith, 1907.
7. *Lonchodina* (*Polygnathus*) *spinata* Hadding, 1913.
8. *Lonchodina* (*Prioniodus*) *erraticus* Hinde, 1879.
9. *Lonchodina* (*Prioniodus*) *clavatus* Hinde, 1879.
10. *Prioniodina* (*Prioniodus*) *geminus* Hinde, 1879.
11. *Prioniodina* (*Prioniodus*) *volborthii* Pander, 1856.
12. *Bryantodus* (*Polygnathus*) *radiatus* Hinde, 1879.
13. *Bryantodus* (*Polygnathus*) *duplicatus* Hinde, 1879.
14. *Bryantodus* (*Polygnathus*) *immersus* Hinde, 1879.
15, 16. *Bryantodus* (*Prioniodus*) *politus* Hinde, 1879.
17, 18. *Euprioniodina* (*Prioniodus*) *alata* Hadding, 1913.
19. *Euprioniodina* (*Prioniodus*) *discedens* Hadding, 1913.
20, 21. *Euprioniodina* (*Prioniodus*) *acicularis* Hinde, 1879.
22. *Euprioniodina* (*Polygnathus*) *lanceolata* Smith, 1907.
23. *Euprioniodina* (*Prioniodus*) *furcata* Hinde, 1879.
24–29. *Euprioniodina* (*Prioniodus*) *radicans* Hinde, 1879.
30. *Euprioniodina* (*Prioniodus*) *curvata* Smith, 1907.
31. *Hibbardella* (*Prioniodus*) *angulatus* Hinde, 1879.
32, 33. *Hibbardella* (*Prioniodus*) *angulatus* Hinde, 1900.

PLATE 6

FIG. 1. *Lonchodus* (*Polygnathus*) *parvus* Smith, 1907.
2–5. *Lonchodus* (*Centrodus*) *simplex* Pander, 1856.
6. *Lonchodus* (*Centrodus*) *obliquus* Smith, 1907.
7–10. *Lonchodus* (*Centrodus*) *erectus* Smith, 1907.
11. *Lonchodus* (*Centrodus*) *convexus* Pander, 1856.
12–14. *Lonchodus* (*Polygnathus*) *convexus* (Pander) Hinde, 1900.
15. *Lonchodus* (*Centrodus*) *distans* Smith, 1907.
16. *Lonchodus* (*Polygnathus*) *princeps* Hinde, 1879.
17–20. *Lonchodus* (*Polygnathus*) *princeps* (Hinde) Smith, 1907.
21. *Lonchodus* (*Polygnathus*) *curvatus* Smith, 1907.
22. *Lonchodus* (*Polygnathus*) *coronatus* Hinde, 1879.
23. *Lonchodus* (*Polygnathus*) *minus* Smith, 1907.
24. *Valentia morrochensis* Smith, 1907.
25. *Panderodella* (*Polygnathus*) *solidus* Hinde, 1879.
26–28. *Panderodella* (*Polygnathus*) *scitulus* Hinde, 1900.
29, 30. *Panderodella* (*Polygnathus*) *serratus* Hinde, 1879.
31. *Gnathodus mosquensis* Pander, 1856.
32. *Gnathodus* (*Polygnathus*) *crassus* Hinde, 1879.
33. *Gnathodus* (*Polygnathus*) *curvatus* Hinde, 1879.
34, 35. *Prionognathus brandtii*, Pander, 1856.

PLATE 7

FIG. 1. *Gnathodus* (*Polygnathus*) *ericusis* Hinde, 1879. (Side view.)
2–4. *Polygnathus* (*Gnathodus*) *mosquensis* (Pander) Hinde, 1900.
5. *Polygnathus* ? *simplex* Hinde, 1879.
6. *Polygnathus cristatus* (Hinde) Clarke, 1885.
7. *Polygnathus cristatus* Hinde, 1879.
8, 9. *Polygnathus cristatus* Hinde (*Polygnathus dubius*, part), 1879.
10, 11. *Polygnathus pennatus* Hinde, 1879.
12. *Polygnathus pennatus* (Hinde) Clarke, 1885.
13. *Polygnathus argos* T. H. Clark, 1924.
14. *Polygnathus naricula* Hinde, 1900.
15, 16. *Polygnathus palmatus* Hinde, 1879.
17. *Palmatalepis* (*Polygnathus*) *punctatus* Hinde, 1879.
18, 19. *Polygnathus tuberculatus* Hinde, 1879.
20, 21. *Polygnathus truncatus* Hinde, 1879.
22. *Polygnathus linguiformis* Hinde, 1879.
23. *Ctenognathus murchisoni* Pander, 1856.
24. *Ctenognathus keyserlingii* Pander, 1856.
25–29. *Ctenognathus verneuilli* Pander, 1956.
30. *Synprioniodina* (*Polygnathus*) *nasutus* Hinde, 1879.

PLATE 8

FIG. 1. *Prioniodina* (*Polygnathus*) *dubius* (Hinde) Smith, 1900. A species of *Bryantodus*.
2–13. *Polygnathus dubius* Hinde, 1879. Devonian (probably Portage) western New York. Specimens of different genera as follows, referred to this species: 2, 4, *Bryantodus;* 3, *Prioniodina;* 5, 8, *Hindeodella;* 7, *Gnathodus* or *Polygnathus;* 6, 9, 11, 12, *Lonchodus* or undetermined; 13, *Lonchodina;*
14–32. *Polygnathus dubius* (Hinde) Clarke, 1885. Specimens from the Naples shale at Naples, Ontario County, N. Y., referred by Clark in 1885 to this species. Genera represented as follows: 14–16, 19, 21, 22, side views of *Polygnathus;* 17, 25, *Bryantodus;* 18, *Prioniodus;* 20, 23, 24, *Lonchodus;* 26–28, 31, *Hindeodella;* 30, *Polygnathellus;* 29, 32, *Euprioniodina.*

PLATE 9

All the specimens illustrated here and on plates 9 and 10 are from the Chattanooga black shale of Lower Mississippian age at a locality 13 miles east of north of Huntsville, Ala. All are magnified 12 diameters.

FIGS. 1, 2. *Prioniodus alabamensis*, new species.
3. *Prioniodus alatoides*, new species.
4. *Prioniodus cultratus* Ulrich and Bassler.
5. *Ligonodina parvula*, new species.
6, 7. *Hindeodella tenerrima*, new species.
8. *Hindeodella minutidens*, new species.
9. *Hindeodella germana*, new species.
10, 11. *Hindeodella subtilis* Ulrich and Bassler.
12. *Lonchodina irregularis*, new species.
13. *Lonchodina discreta* Ulrich and Bassler.
14. *Prioniodella arcuata*, new species.
15. *Prioniodella inutilis*, new species.
16, 17. *Prioniodina separans*, new species.
18. *Prioniodina undulata*, new species.

PLATE 10

Chattanooga black shale 13 miles east of north of Huntsville, Ala. Magnified 12 diameters.

FIGS. 1, 2. *Bryantodus inequalis*, new species.
3. *Bryantodus inclinatus*, new species.
4. *Bryantodus*, species.
5. *Bryantodus germanus*, new species.
6. *Bryantodus subangulatus*, new species.
7. *Euprioniodina germana*, new species.
8. *Diplododella bilateralis* Ulrich and Bassler.
9. *Hibbardella curvata*, new species.
10. *Palmatodella delicatula* Ulrich and Bassler.
11, 12. *Synprioniodina alternata* Ulrich and Bassler.
13. *Synprioniodina plana*, new species.
14. *Panderodella recta*, new species.
15. *Panderodella subrecta*, new species.

PLATE 11

Chattanooga black shale, 13 miles east of north of Huntsville, Ala. Magnified 12 diameters.

FIGS. 1, 2. *Polygnathus gyratilineatus*, new species.
3. *Polygnathus pergyratus*, new species.
4. *Polygnathus trilobatus*, new species.
5–7. *Polygnathus concentricus* Ulrich and Bassler.
8–10. *Palmatolepis inequalis*, new species.
11, 12. *Polygnathus rhomboideus* Ulrich and Bassler.
13. *Palmatolepis elongatus*, new species.
14. *Polygnathus pennatuloideus*, new species.
15. *Polygnathus pennatulus* Ulrich and Bassler.
16–19. *Palmatolepis perlobatus* Ulrich and Bassler.

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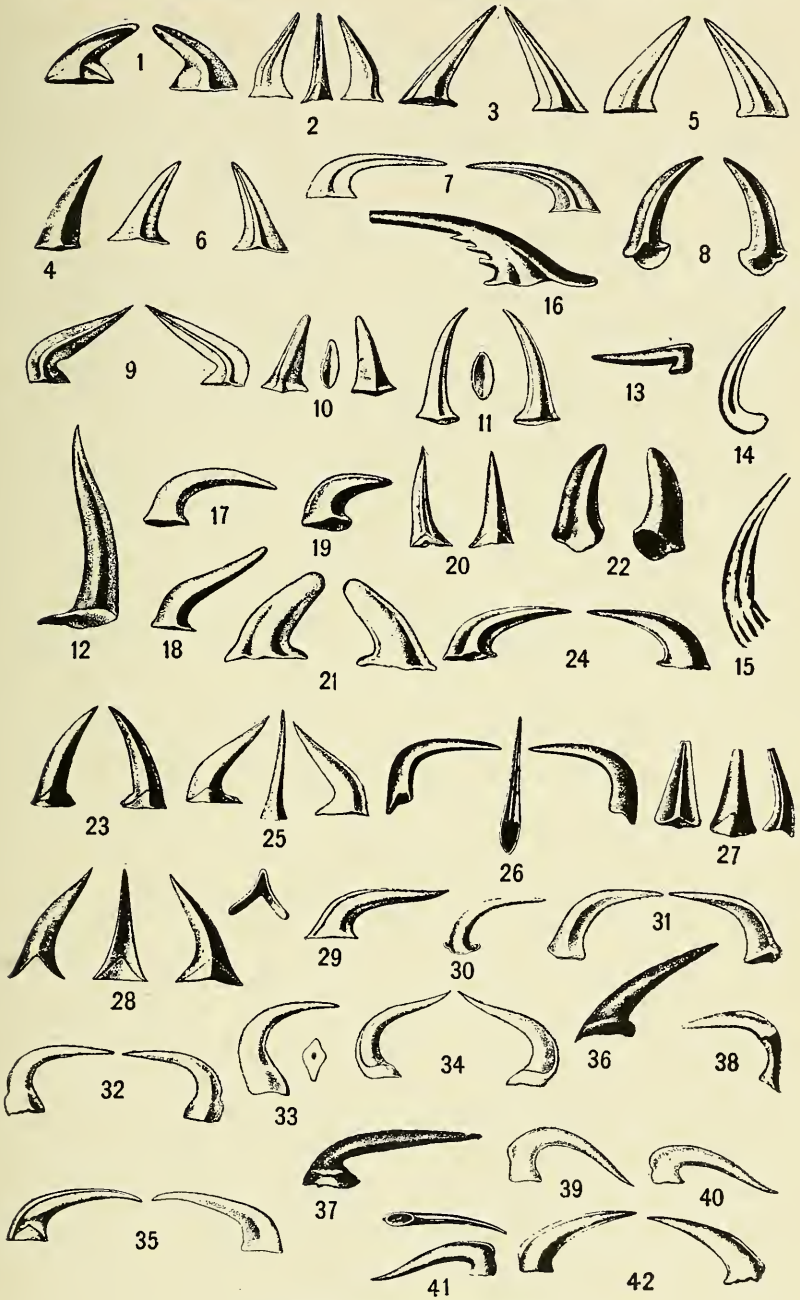

ILLUSTRATIONS OF CONODONTS

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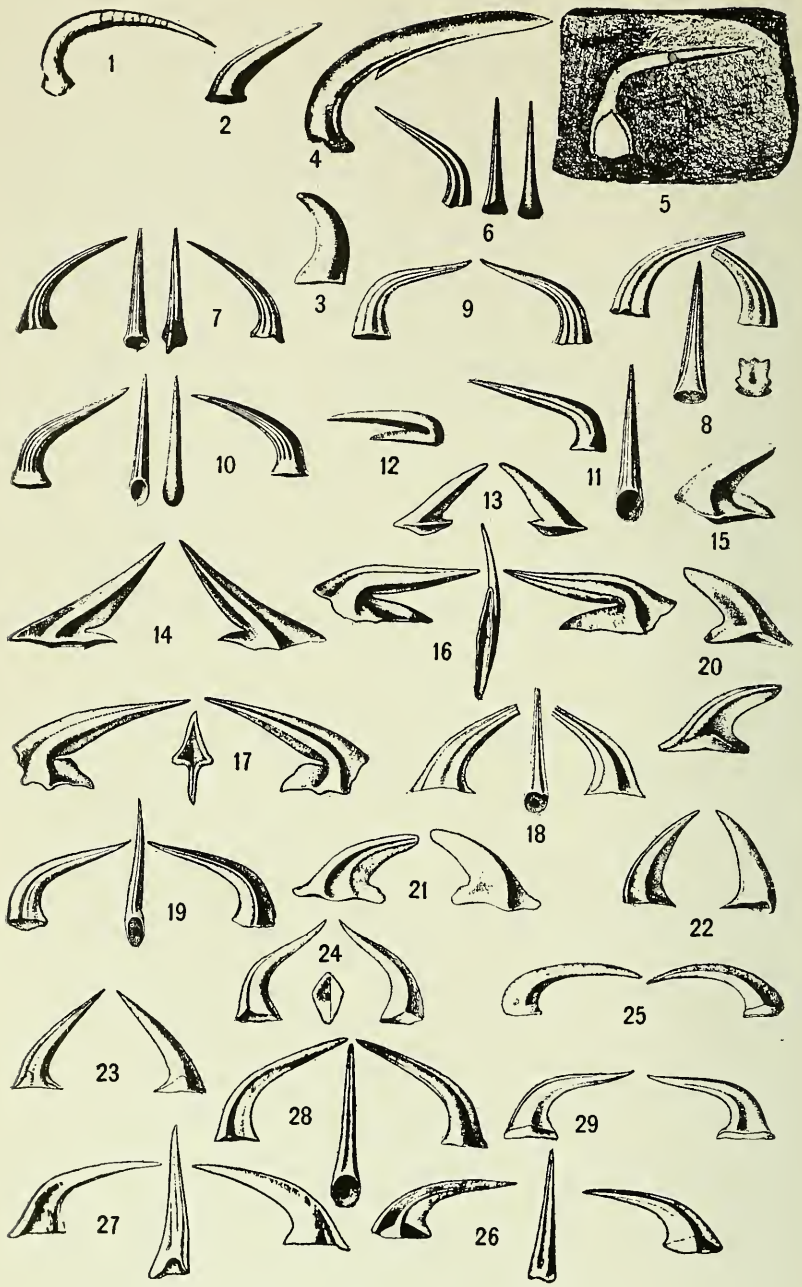

ILLUSTRATIONS OF CONODONTS

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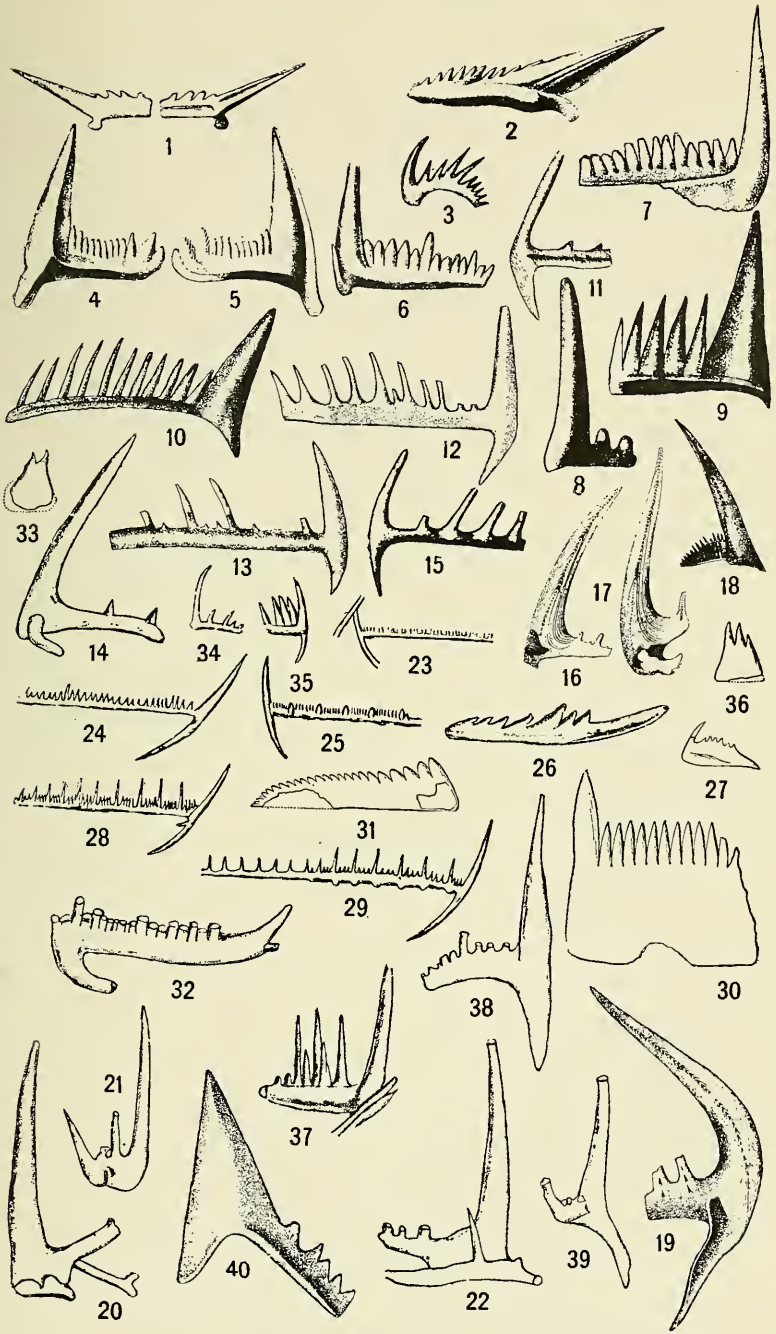

ILLUSTRATIONS OF CONODONTS

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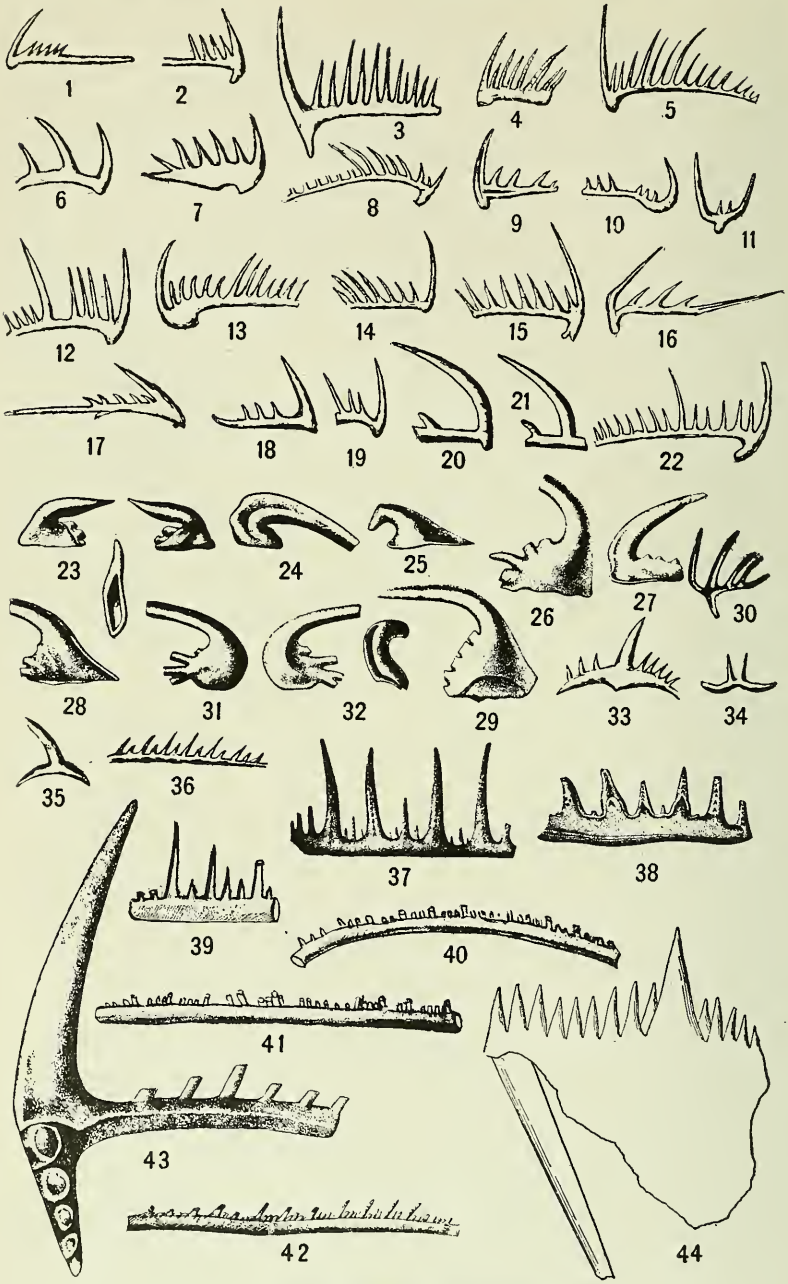

ILLUSTRATIONS OF CONODONTS

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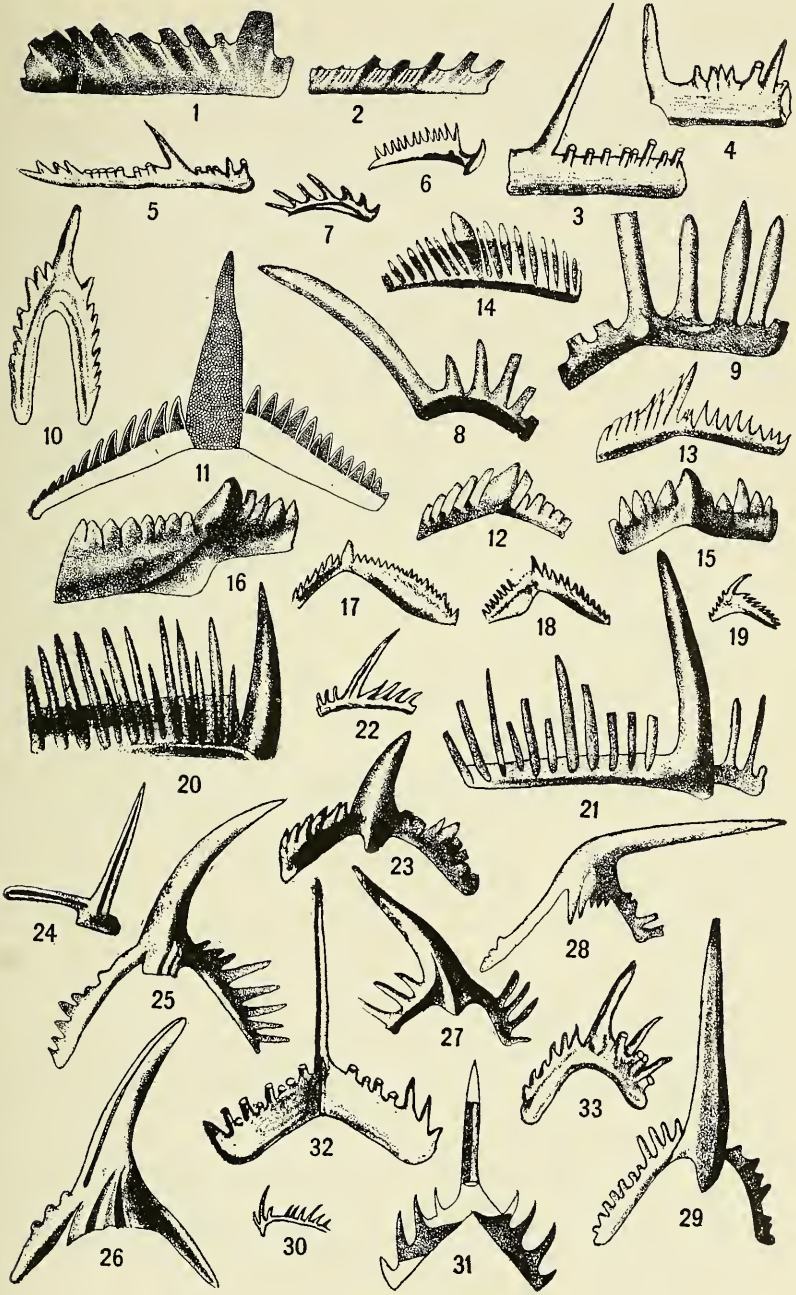

ILLUSTRATIONS OF CONODONTS

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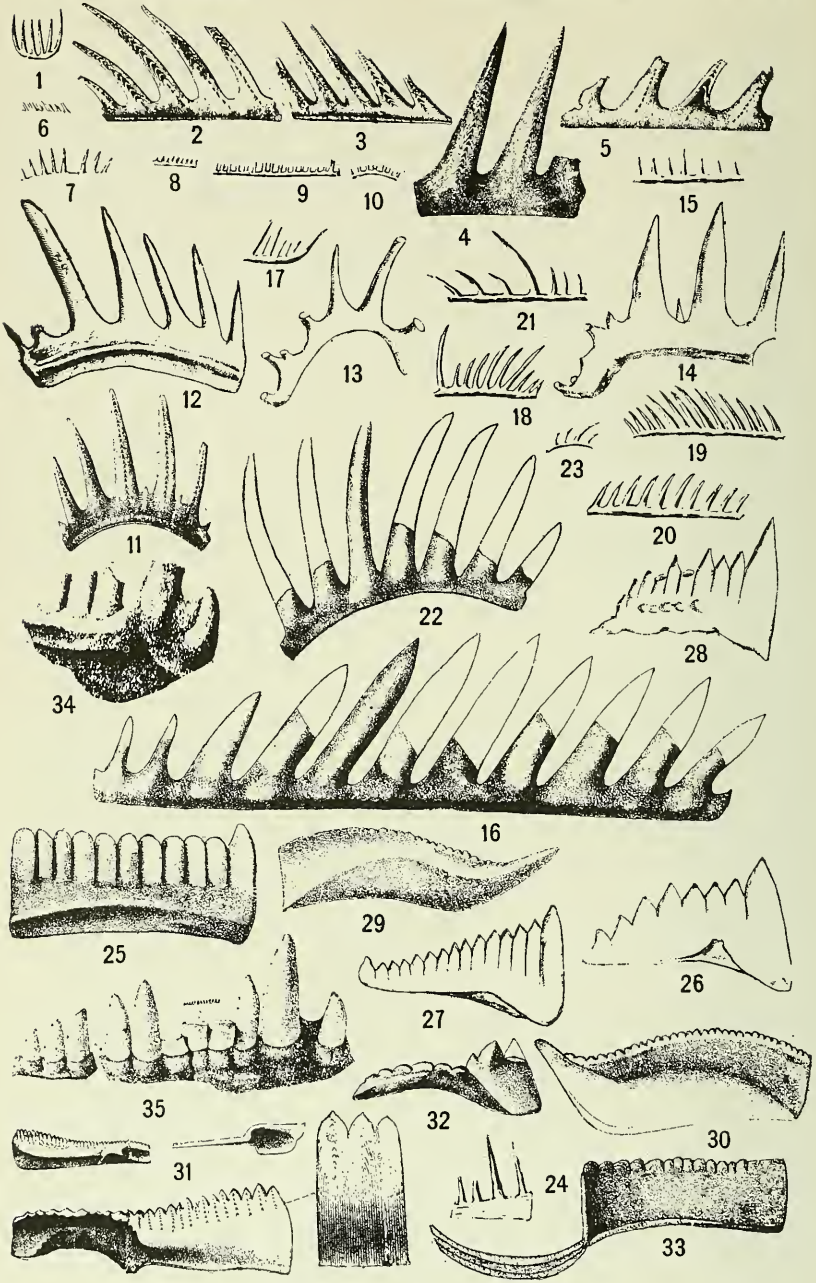

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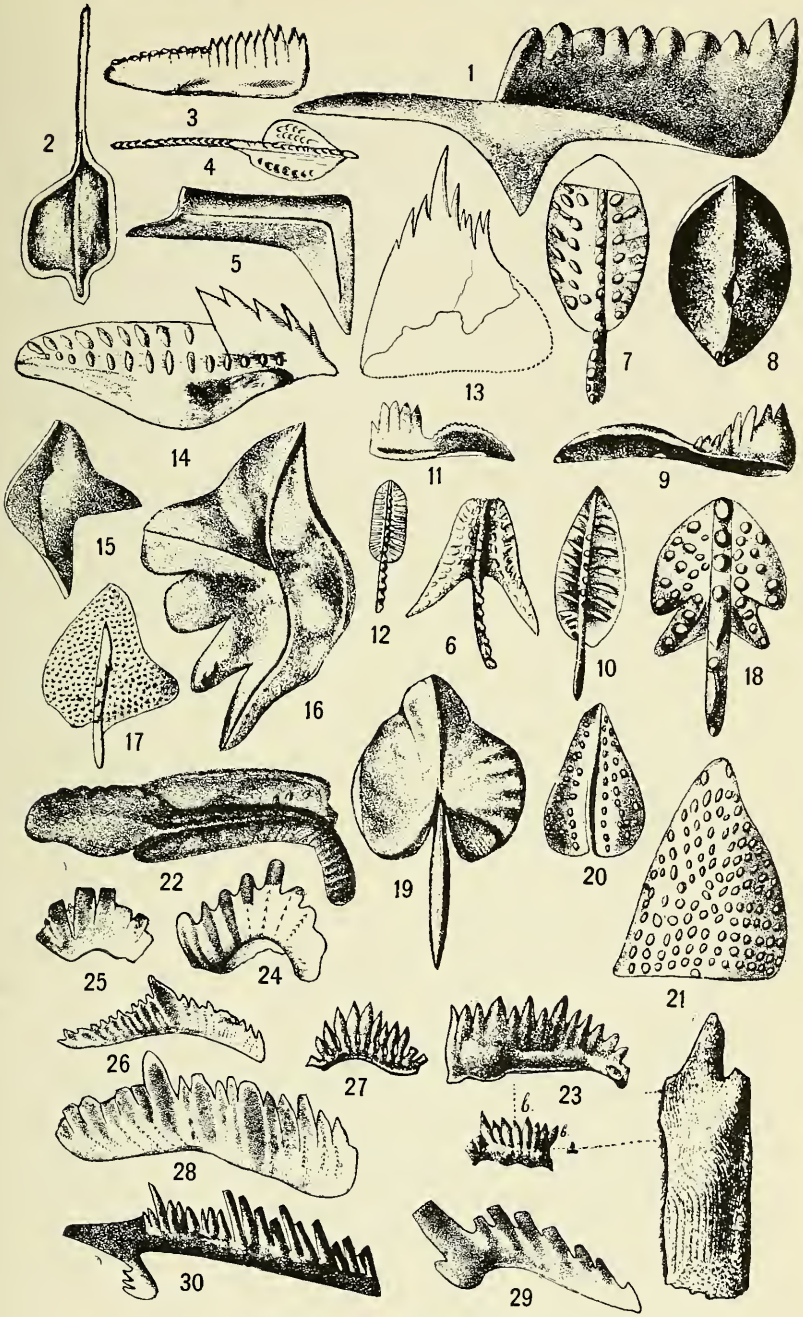

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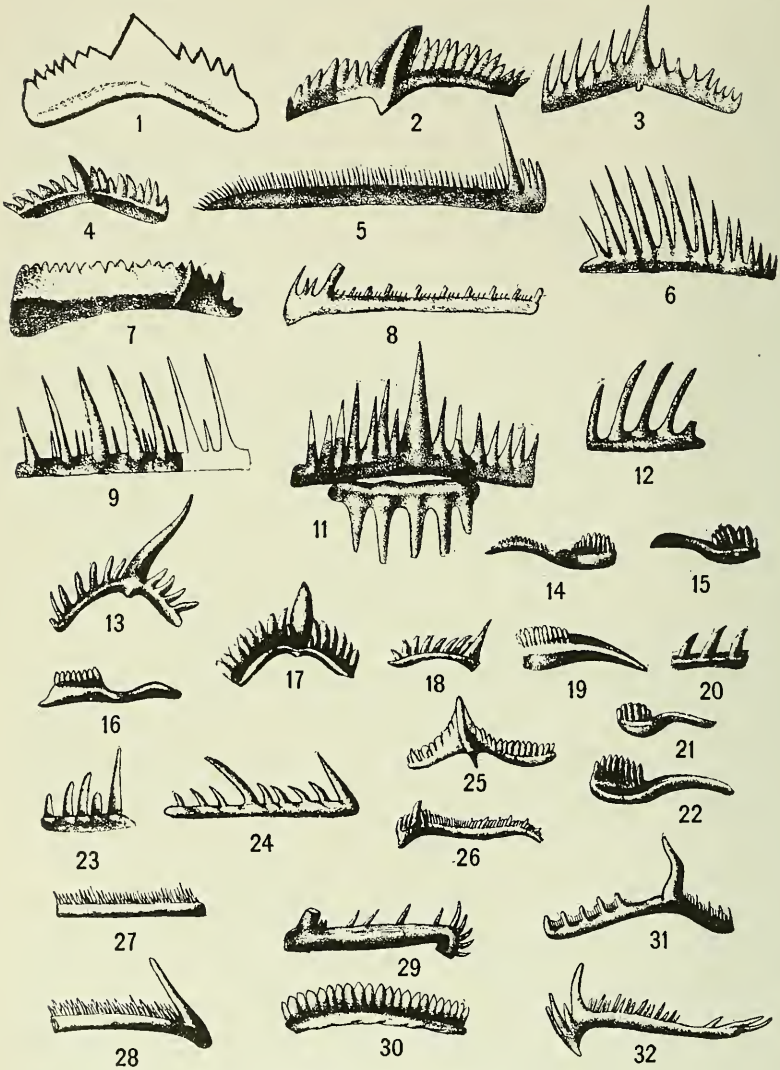

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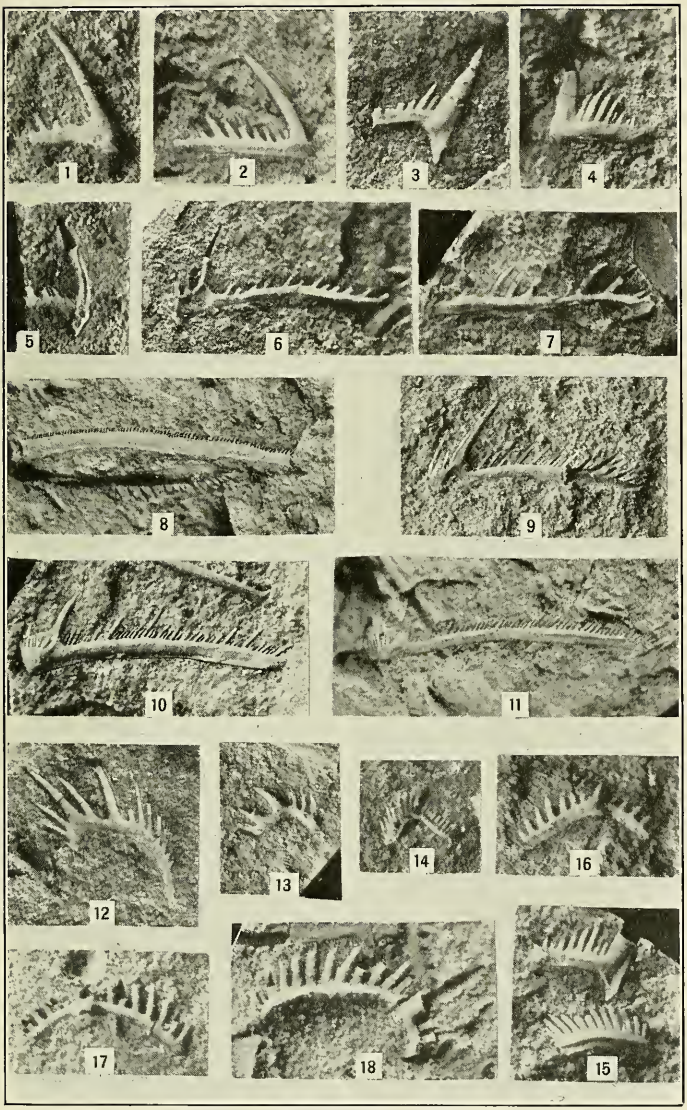

EARLY MISSISSIPPIAN CONODONTS

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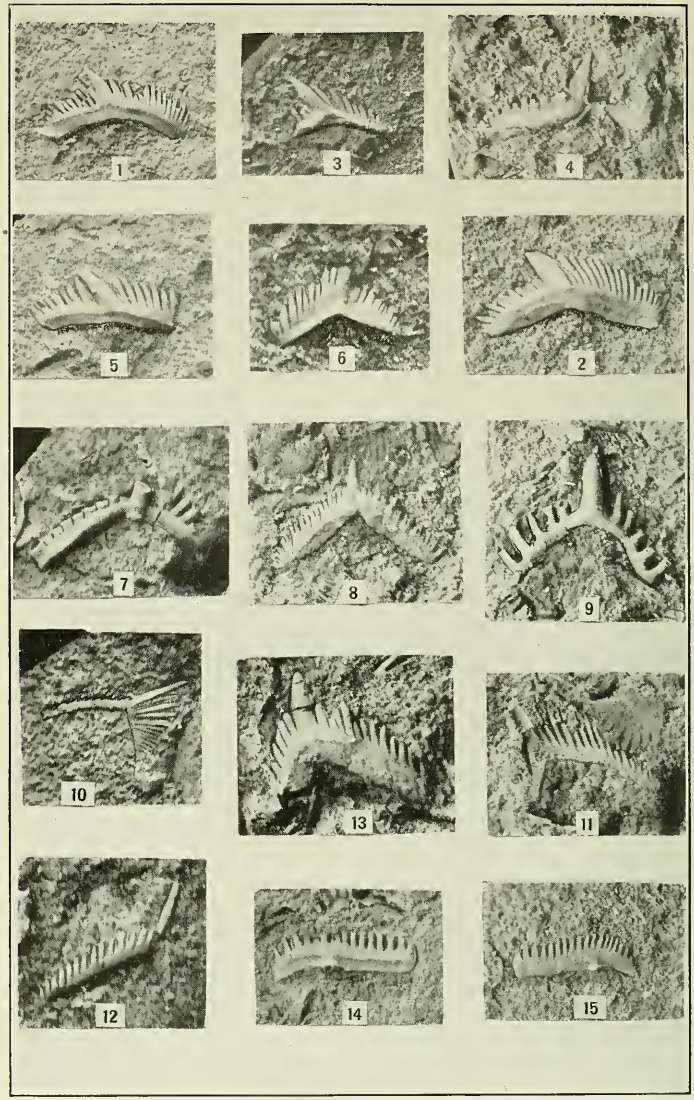

EARLY MISSISSIPPIAN CONODONTS

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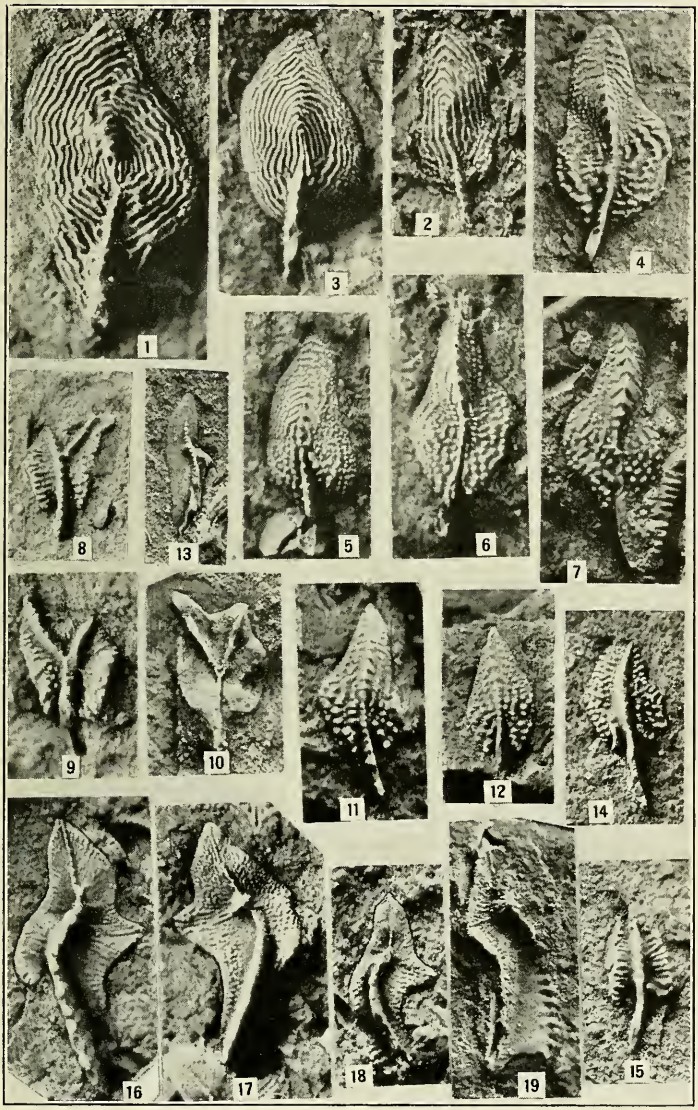

EARLY MISSISSIPPIAN CONODONTS

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