

Myriapods, Arachnids, and Insects of the world, with references to all published papers and works on the subject, covering 744 octavo pages.

13. Vertebrates.—(a) *Fishes*. — *Ganoids*. Fig. 1100, *Eurylepis tuberculata* Newb.; 1101, *Cœlacanthus elegans* Newb., Linton, Ohio, remarkable for not having the tail heterocercal, although strictly vertebrated; 8 other species of *Eurylepis*, 2 of *Cœlacanthus*, and 3 of *Rhizodus*, have been described by Newberry from Linton, also *Palæoniscus scutigera* and *P. peltigerus* Newb., Ohio; *P. Leidyani* Lea, Pa.; *P. gracilis* N. & W., Ill.; *P. Browni* of Albert Coal Mine, N. B.; *P. Jacksoni* Dn. Other Ganoids occur, of the genera *Megalichthys*, *Amblypterus*, *Pygopterus*, and *Rhadinichthys*, in the Coal-measures of the United States and Nova Scotia.

Among *Selachians*, the following European genera have been recognized in the Coal-measure limestones of Pennsylvania, Ohio, Indiana, Illinois, etc., — the species being generally distinct from those of the Old World: *Diplodus*, *Cladodus*, *Orodus*; *Diplodus compressus* Newb., Linton, Ohio; *D. latus* Newb., *ibid.*; *D. gracilis* Newb., *ibid.*; *Petalodus*, *Ctenoptychius*, *Chomatodus*; Fig. 1102, *Petalodus destructor* N. & W., from Illinois; 1104 a, 1104 b, *Petrodus occidentalis* N. & W., from Illinois, Indiana, etc.; 1103, fin-spine found associated with the scales of *Petrodus occidentalis*, and referred by F. H. Bradley to the same species. *Cholodus*, *Pelodus*, *Calopodus*, *Ctenoptychius* are other genera. Of fin-spines, there are *Orthacanthus arcuatus* Newb., Linton; *Compsacanthus laevis* Newb., Linton; *Drepanacanthus anceps* N. & W., from Springfield, Ill., and others.

The genera of the Subcarboniferous are in part represented among the Carboniferous species, as *Diplodus*, *Orodus*, *Cladodus*; *Petalodus* (Fig. 1102, *P. destructor* N. & W., Ill.), *Petrodus* (Fig. 1104 a, b, *P. occidentalis*, N. & W., Ill., Ind., etc.), *Ctenoptychius*, *Chomatodus*, *Deltodus*, *Pœcilodus*, *Xystrodus*. Besides, there are 4 species of *Agassizodus*, all from the Coal-measures. Also fin-spines of the genera *Compsacanthus*, *Drepanacanthus*, etc. For figures and descriptions of fossil species the most important volumes are those of the *Ohio Geological Report* by Newberry, and those of the *Illinois Report* by Newberry and Worthen and St. John and Worthen.

(b) *Amphibians*. — Fig. 1109, *Pelion Lyelli* Wyman, Linton, Ohio; Fig. 1108, *Amphibamus grandiceps* Cope, Morris, Ill.; Fig. 1110, vertebræ and ribs from Linton, figured by Wyman, but not named, referred by Cope doubtfully to the snake-like *Molgophis macrurus* Cope. *Baphetes planiceps* Owen, from Pictou, N.S.; the specimen is a portion of the skull 7 inches broad. The genera *Phlegethontia* and *Molgophis* of Cope are referred to *Dolichosoma* of Huxley by Fritsch. For descriptions and figures of the species of Ohio, see *Geol. Rep.*, Pal. ii.; of Nova Scotia, Dawson's *Acad. Geol.*, and its supplement of 1878, the latter containing also figures of Insects, Crustaceans, and Myriapods; also Supplement of 1891, and later in the *Trans. Roy. Soc.* The Linton layer in Ohio is a local formation of cannel coal at the bottom of the Pittsburg coal-bed, indicating, as Newberry states, lake-like conditions during the progress of the layer. Twenty-three consecutive footprints of an Amphibian, *Thenaropus heterodactylus*, were found by A. T. King, near Westmoreland, Pa., in a layer about 100' below the horizon of the Pittsburg coal; the tracks of the hind-feet 5-toed, and of the fore-feet 4-toed, — the former 5½ inches long, and the latter 4½ inches; and the distance between the successive tracks 6 to 8 inches, and between the 2 lines about the same. Another species from the same region is the *Chirotherium Reiteri* of Moore.

2. PERMIAN PERIOD.

On the Permian Flora of West Virginia, etc., see Fontaine and White, *l.c.*; contains 38 plates. The following are the Coal-measure species which continue, according to these authors, into the Permian or Upper Barren Measures of West Virginia and Pennsylvania: *Calamites Suckovi*, *Sphenophyllum filiculme*, *Annularia longifolia*, *A. sphenophylloides*, *Neuropteris hirsuta*, *N. flexuosa*, *N. auriculata*, *N. cordata*, *Pecopteris arborescens*, *P.*