

monoidea." He thinks that, on the whole, the observed succession of the organisms in time coincides with what on the theory of evolution it ought to have been. "The straight cones predominate in Silurian and earlier periods, while the loosely coiled are much less numerous, and the close-coiled and involute, though present, are extremely rare." He believes that traces of this succession may be found in the structure of the shells themselves. The nautilus, in its embryological development and subsequent growth, passes through the stages of the nearly or quite straight shell, then of a slightly curved shell, and then of a completely curved shell, the spiral being continued till sometimes the inner whorls are entirely enveloped in the outer.³²

Neumayr, from a prolonged study of European Jurassic and Cretaceous cephalopods, concluded that "propagation, filiation, and migration are sufficient to explain the origin of the whole Jurassic Ammonite and Belemnite fauna of central Europe. There is nothing to warrant the supposition of any new creation, but all the known facts are in harmony with the theory of descent."³³

Among the fossil mammalia many indications have been pointed out of an evolution of structure. Of these, one of the best known and most striking is the genealogy of the horse, as worked out by Prof. O. C. Marsh.³⁴ The original, and as yet undiscovered, ancestor of our modern horse had five toes on each foot. In the oldest known equine type (*Eohippus*—an animal about the size of a fox, belonging to the early part of the Eocene period) there were four well-developed toes, with the rudiment of a fifth, on each fore-foot, and three on each hind-foot. In a later part of the

³² Science, iii. 1884, pp. 122, 145. For an elaborate presentation of his views see his essay on the "Genesis of the Arietidae," Mem. Mus. Comparat. Zool. Harvard, xvi. 1889, where also full references to the literature of the subject treated of by him will be found.

³³ Jahrb. Geol. Reichsanst. xxviii. 1878, p. 78; also Abhandl. Geol. Reichsanst. 1873; Sitzb. K. Akad. Wiss. Wien, lxxi. 1875, p. 639. Verh. Geol. Reichsanst. 1880, p. 83 (in reply to the anti-Darwinian views of T. Fuchs, op. cit. 1879, 1880), and his memoirs already cited on p. 1087. W. Branco, Z. Deutsch. Geol. Ges. xxxii. 1880, p. 596. An example of the tracing of pedigree among trilobites was supplied by R. Hoernes, Jahrb. Geol. Reichsanst. xxx. 1880, p. 651. On the geological history and affiliations of the Palæozoic invertebrates, the student should consult Prof. Gaudry's "Les Enchaînements du Monde Animal: Fossiles Primaires," 1883.

³⁴ Amer. Journ. Sci. 1879, p. 499. Consult also his interesting paper on "Recent polydactyle Horses," op. cit. xlii. 1892, p. 339.