

sively through the Jurassic period, and died out in the Lower Neocomian. Their place was taken by the Bourgueticrinidæ, which were formerly associated with them into one family. We have no certain evidence of the occurrence of the typical genus *Bourgueticrinus* in other than Cretaceous rocks; though stem-joints which have been referred to this genus occur both in Jurassic and in Eocene deposits. It is not unlikely, however, that they belong to *Thiolliericrinus* or to *Rhizocrinus* respectively. The latter genus, which is represented by two living species, is probably exclusively confined to the Tertiary rocks, except perhaps for the so-called *Bourgueticrinus alabamensis* from the Cretaceous formation of Alabama, U.S.; and some of the stem-joints hitherto referred to *Rhizocrinus* or to *Bourgueticrinus* may possibly belong to *Bathycrinus*, no calyx of which has yet been found in the fossil state.

As regards the fossil Holopodidæ, there are *Micropocrinus* of the Italian Miocene, *Cyathidium* in the Chalk of Faxoe, the singular *Gymnocrinus* in the Oxfordien of France and Switzerland, and lastly in the Middle Lias *Cotylecrinus* and *Eudesicrinus*; while *Edriocrinus* from the Upper Silurian and Devonian, a type much resembling *Holopus* in character, is a proof of the great antiquity of these sessile Crinoids.

The Pentacrinidæ are remarkable for their long geological history. The type genus *Pentacrinus* first appears in the Trias, together with the short-lived *Encrinus*. It persisted through the whole of the Secondary and Tertiary periods, and is represented by eight species at the present time. On the other hand, *Extracrinus* with its characteristic stem, dicyclic base, and peculiar arm-divisions is confined to the Lias and Lower Oolites, unless, as I am disposed to think, the *Pentacrinus asteriscus* which has been found in the Western Territories of the United States associated with Alpine Trias fossils and *Spirifera*, is also to be referred to this genus. *Balanocrinus*, known as yet only by stem-joints, ranges from the Middle Lias to the Lower Neocomian. The remaining genus *Metacrinus* is confined to Oceania and the shallower parts of the Pacific, and is at present unknown in the fossil state.

The general character of the fossil Pentacrinidæ is essentially the same as that of their recent representatives, except that they often had much longer stems which sometimes reached as much as 50 or even 70 feet; while the number of arms was frequently limited to ten, which is not the case in any recent species but *Pentacrinus naresianus* (Pls. XXVIII.-XXXa.). Some of them also appear to have been devoid of external basals. But in two cases, at any rate, *Pentacrinus dixonii* and *Pentacrinus fisheri*, this is due to error; for the basals have been overlooked and therefore described as absent.¹

Three genera of the Comatulidæ, *Antedon*, *Actinometra*, and *Eudiocrinus* are known in the fossil state. The last named is at present limited to the Lower Neocomian of

¹ On the supposed Absence of Basals in the Eugeniocrinidæ and in certain other Neocrinoids, *Ann. and Mag. Nat. Hist.*, 1883, ser. 5, vol. xi. pp. 327-334.