

It may be noted, as the fact is not general among the Urodela, that the *Pleurodeles Waltlii* observed in the menagerie of the Museum accomplished all their transformations without quitting the water, and the most developed still remain there habitually.—*Comptes Rendus*, July 12, 1880, p. 127.

*On the Tertiary Echinida of Belgium.* By M. G. COTTEAU.

We have just investigated and described the Echinida of the Tertiary deposits of Belgium. The species, belonging to seventeen genera, are thirty-one in number. This little fauna, notwithstanding its comparative poverty, is none the less very interesting, whether we study it from a stratigraphical point of view, or compare it with the fauna which was developed in other countries at corresponding epochs, or examine the species from a purely zoological point of view.

Of the thirty-one species, twenty-three belong to the Lower Tertiary or Eocene group. Four of these occur in the Landenian system—*Holaster Dewalquei*, *Hemiaster nux* and *Vincenti*, and *Schizaster Corneti*. Three of these are new and hitherto peculiar to Belgium; only one, *Hemiaster nux*, was previously known and described from a higher level, in France in the beds with *Serpula spiræa* at Biarritz, in Italy in the Eocene of Vicenza and Verona, and in Switzerland in the Nummulitic deposits of Yberg.

The Laekonian is the system richest in Echinida, including sixteen species, some of which are very abundant, namely *Cyphosoma tertiarium* and *Vincenti*, *Caratomus Lehôni*, *Nucleolites approximatus*, *Echinolampas affinis* and *Duponti*, *Pygorhynchus Gregoirei*, *Echinocyamus propinquus* and *gracilis*, *Lenita patellaris*, *Scutellina lenticularis* and *rotunda*, *Brissopsis bruxellensis*, *Schizaster acuminatus*, *Spatangus pes equuli*, and *Maretia grignonensis*. Five of the most abundant and best characterized of these species, *Pygorhynchus Gregoirei*, *Lenita scutellaris*, *Scutellina lenticularis* and *rotunda*, and *Maretia grignonensis*, have been collected in the Calcaire grossier of the neighbourhood of Paris, and establish the concordance of those deposits with the Laekonian system of Belgium. One species, *Echinolampas affinis*, is wanting in the environs of Paris, but occurs in France at Cassel (Nord) and at Blaye (Gironde) in the Eocene, and in Switzerland in the Nummulitic deposits of Yberg. There remain ten species at present peculiar to Belgium.

Eight species belong to the Pliocene group, the Diestian and Scaldisian systems, namely *Cidaris belgica*, *Echinus Nysti* and *Colbeaui*, *Psammechinus sphaeroideus*, *Dewalquei*, and *Cogelsi*, *Echinocyamus Forbesi*, and *Schizaster Scillae*. The last two only have been indicated outside of Belgium, namely *Echinocyamus Forbesi*, common in the Red Crag of Suffolk, and erroneously confounded by Forbes with the *E. pusillus* of the European seas, and *Schizaster Scillae*, which, in the south of France and Northern Italy, characterizes the Pliocene marls of Perpignan, Nice, and Asti.

Several of these species, both Eocene and Pliocene, deserve particular notice from a zoological point of view. We may cite in the

first rank *Holaster Dewalquei* of the Landenian system. This is the first time that the genus *Holaster*, so abundantly represented in the different stages of the Cretaceous formation, has been met with in the Tertiary. This species, although the last of the series, presents perfectly all the characters of the type; it is remarkable for its large size, its regularly cordiform aspect, its inflated and subgibbous upper surface, and its angular and very deep anterior groove. M. Manzoni has already noticed in the Tertiary of the environs of Bologna a species nearly allied to *Holaster Dewalquei*, but distinct, namely *Hemipneustes italicus*. We may also cite *Caratomus Leboni* from the Laekenian of St. Gilles, a very curious species, differing from the true *Caratomi* by the structure of the anterior ambulacral areas and the form of the peristome. And we may mention *Echinus Colbeaui*, which we only know in the state of an interior cast, but which is distinguished from its congeners by its large size, its sub-conical form, its lower surface pulvinate and rounded at the margins, and by its peristome opening in a well-marked depression of the lower surface. Nor must we forget *Spatangus pes equuli*, peculiar to the Eocene of Belgium, and which will always be recognized with facility by its elevated hemispherical form, its flat lower surface with trenchant edges, and its very deep anterior groove with keeled margins.—*Comptes Rendus*, July 19, 1880, p. 182.

*On the Antiquity of certain Subordinate Types of Freshwater and Land Mollusca.* By C. A. WHITE, Palæontologist to the U.S. National Museum.

Among existing freshwater and land Mollusca there are certain comprehensive genera which may be divided into a greater or less number of more or less distinctly definable groups that are respectively recognizable by certain common characteristics, less conspicuous than those which separate the larger genera from each other. These minor groups have been treated as genera, subgenera, or as still less important sections by the various authors who have discussed them, according to the individual estimate that has been placed upon the relative value of the characters by which they are recognized. It is my present purpose, not to discuss the value of these distinctions as means of zoological classification, but to show that a considerable number, not only of the larger genera of living North-American freshwater and land Mollusca, but also a large proportion of the minor or subordinate types which those genera respectively embrace, had their origin as such at least as early as the closing epochs of the Cretaceous or the immediately following epochs of the Eocene Tertiary period.

The fossil collections upon which these observations are based, and which alone are referred to in the following remarks, are those which have been obtained by the different U.S. Government Surveys in the western portion of our national domain. The strata which have furnished these fossils are, in the ascending order, those of the Fox Hills, Laramie, Wahsatch, Green River, and Bridger groups. The first-named of these groups is unquestionably Cretaceous; and