NOTICES OF MEMOIRS.

I.—On Two New Forms of Polyodont and Gonorhynchid Fishes from the Eocene of the Rocky Mountains. By Prof. E. D. Cope. Mem. Nat. Acad. Sci., vol. iii. pp. 161–165, with double plate.

In 1883 (Amer. Nat. p. 1152) and again in 1885 (*ibid.* p. 1090), Prof. Cope briefly noticed a portion of the trunk of a fish from the Eocene of Wyoming, displaying many points of resemblance to the living Acipenseroid *Polyodon*, but remarkable on account of its possession of distinct scales, not confined to the upper lobe of the tail. The genus and species received the name of *Crossopholis magnicaudatus*, and in the present memoir Prof. Cope adds a detailed description, with figures, making known also a considerable portion of the skull of the fish. In many respects, the cranial bones are very similar to those of *Polyodon*, but the snout is relatively shorter, and more closely corresponds in form to that of *Psephurus*. The body is long and slender, with short dorsal and anal fins, remotely situated, and the former commencing slightly in advance of the latter. The scales are numerous, in oblique series, not quite in contact; and each consists of a small subquadrate disk, with a row of long, sharp, backwardly-directed spines arranged upon the posterior margin. In an individual measuring 0·170 m. from the anterior extremity of the dorsal fin to the notch of the caudal, the scales only measure about one millimetre each way: the caudal fulcra are large and strong. Another novelty from the Wyoming shales first noticed by Prof. Cope in 1885 (Amer. Nat. p. 1091) is also figured and described in detail, namely, the *Notogoneus osculus*. This is of great interest as being scarcely distinguishable from the living *Gonorhynchus*, except in the dentition; for the latter genus—the only representative of its family previously known—is solely confined to the seas of South Africa, South and Western Australia, and Japan. As well remarked, "The discovery of this type in the Eocene beds of North America is a notable addition to ichthyological science. It is parallel with the occurrence of the family of the Osteoglossidæ in the same formation, a family also now confined to the Southern Hemisphere." The memoir concludes with a figure and description of a small *Priscacara*, supposed to be adult and referable to a new species, *P. hypsacanthus*; and it is also added that a newly acquired specimen of *P. serrata* displays massive superior and inferior pharyngeal bones, covered with obtuse grinding teeth. A. S. W.

II.—Eocene Chelonia from the Salt Range. By R. Lydekker, B.A., F.G.S. Palæont. Indica, ser. 10, vol. iv. pp. 59—65, plates xii. and xiii. 1887.

Two interesting Chelonian fossils were obtained from the Lower Eocene of Nila, in the Punjab Salt-Range, by Dr. H. Warth, in 1886, and presented by him to the Indian Museum, Calcutta. These form the subject of the present memoir, and are interesting as being the only known Indian Chelonia of earlier date than those

of the Siwalik period, with the exception of the small *Platemys Leithi* from the inter-trappean beds of Bombay. The first specimen described comprises the greater portion of the carapace and plastron of a Pleurodiran Chelonian, characterized by the absence of epidermal shields. In the latter feature it agrees precisely with the genus *Carettochelys*, recently discovered by Dr. E. P. Ramsay in the Fly River, New Guinea, and may therefore be placed in the family of *Carettochelyidæ*, as defined by Boulenger; its generic distinctness, however, is indicated by the neural plates being in contact, not separated by the costals, and also perhaps by the presence of a mesoplastron. The plastron is marked by a pitted sculpture, and the genus and species receives the name of *Hemichelys Warthi*. The second fossil is much less complete than the first, and is provisionally referred to a new species of *Podocnemis*, under the name of *P. indica*. The greater portion of the carapace is preserved, and its total length would probably be about 35 inches; it is oval, tectiform, not keeled, and narrowed posteriorly. Though now confined to South America, the occurrence of *Podocnemis* and *Platemys*, in the Indian Tertiaries, is not an altogether unexpected fact, the former, at least, also being met with in the Lower Eocene of England; and, as Mr. Lydekker remarks, the available evidence now seems to point to the conclusion, that the original habitat of this group of fresh-water Chelonia was in the northern portion of the Old World, whence they have been driven perhaps by the competition of the Emydians. A. S. W.

III.—Om Postglaciala aflagringar med *Ancylus fluviatilis* på Gotland. Af Henr. Munthe. Öfversight af Kongl. Vetensk.-Akad. Förhandlingar, 1887, No. 10, pp. 719–732.

On Post-Glacial Deposits with *Ancylus fluviatilis* on the Isle of Gotland. By Henry Munthe.

DURING the last three summers the author of this paper has been investigating the Quaternary deposits of the Isle of Gotland, and he has discovered in various localities shore-deposits or raised beaches (Strandvallar) at different elevations up to 150 feet above the present sea-level, which contain the shells of freshwater mollusca exclusively, more particularly of *Ancylus fluviatilis* and *Limnæa ovata*. These deposits consist of rounded stones, coarse and fine gravels, and intercalated beds of fine sand, they are chiefly re-arranged glacial deposits formed from the limestone of the district. The shells usually occur in the layers of sand. In 24 localities examined, the *L. ovata* is found in all save one, and the *Ancylus* in 19, whilst species of *Pisidium* are present in 10. Other species of less frequent occurrence are *Limnæa palustris*, *Planorbis contortus* and *marginatus*, *Valvata cristata* and *Bythinia tentaculata*, with some Ostracoda. The shells are usually well preserved.

Some of these raised shelly beaches are situated on the summits of partially or entirely isolated limestone plateaux, where there is not the least ground for supposing the former existence of small

freshwater lakes, nor is there any possibility that the shells can have been washed into the sea by rivers and then re-deposited in the beaches. The author believes that these beaches were formed at a time when the Baltic was a freshwater sea containing a molluscan fauna whose principal representatives are the above-named species of *Ancylus* and *Limnæa*.

There are also on the Isle of Gotland raised beaches of marine origin containing *Litorina*, etc., which are seldom at a higher level than 50 feet, though one has been described by Lindström near Wisby, which is 80 feet above the sea-level. The marine raised beaches are, however, at a distinctly lower level than those with freshwater shells, and must have belonged to a later period, when the freshwater fauna had been supplanted by marine forms.

Shell-beaches of a similar character and relative position, and containing the same freshwater mollusca, have been described by Friedr. Schmidt in Esthonia and on the islands of Ösel and Mohn, but this author regards them, in part at least, as river-deposits, although there are no distinct traces of old river-beds in the localities where they occur.[1] Prof. James Geikie has also referred to these Russian deposits as indicating that the Gulfs of Finland and Bothnia were freshwater seas at the close of the Glacial period.

Further discoveries are requisite before it is possible to lay down approximately the limits of the Baltic at the time when these Gotland freshwater beaches were formed, or to ascertain the nature and position of the barrier which dammed its waters 150 feet above their present level; but the author concludes that its northern half at least, together with the Gulfs of Finland and Riga, formed at the time a single freshwater basin. G. J. H.

REPORTS AND PROCEEDINGS.

Geological Society of London.

I.—March 28, 1888.—W. T. Blanford, LL.D., F.R.S., President, in the Chair.—The following communications were read :—

1. "On some Eroded Agate Pebbles from the Soudan." By Prof. V. Ball, M.A., F.R.S., F.G.S.

The majority of the pebbles in a collection made by Surgeon-Major Greene in the Soudan, and presented by him to the Science and Art Museum in Dublin, are of very similar character to the agate and jasper pebbles derived from the basalts of India. It may be concluded inferentially that they came originally from a region in which basaltic rocks occur to a considerable extent. A certain number of them are eroded in a manner unlike anything noticed in India, though it is probable that similar eroded pebbles will eventually be found there.

Throughout India, wherever there is deficient subsoil-drainage or excessive evaporation and limited rainfall, salts are apparent either in supersaturated subsoil-solutions or as crystallizations in

[1] Prehistoric Europe, p. 470.