

## REVIEWS.

I.—THE EXTINCT VERTEBRATA OF THE MORAY FIRTH AREA. By R. H. TRAQUAIR, M.D., LL.D., F.R.S. [Reprint from Brown and Buckley's "Vertebrate Fauna of the Moray Basin" (Edinburgh, 1896), pp. 235–285, pls. i–ix.]

MESSRS. BROWN AND BUCKLEY have done good service to Vertebrate Palæontology by inducing Dr. Traquair to contribute to their recently published volume on the vertebrate animals of the Moray Basin, a summary of the known fossil fishes from the Old Red Sandstone of that area. The supplement occupies fifty pages, and is illustrated by nine plates of Old Red fishes drawn by Dr. Traquair himself; only ten pages of it are devoted to the enumeration of the vertebrata of the Triassic, Jurassic, and Pleistocene deposits. Six of the nine plates are occupied with useful restorations, some already published elsewhere, but the majority quite new, and giving a much more correct idea of the Old Red Sandstone fishes than any restorations previously attempted. They are only marred by the process of reproduction, which imparts to them an inartistic coarseness.

After some preliminary remarks on the distribution and divisions of the Old Red Sandstone in the Moray Basin, accompanied by an enumeration of the literature of the subject, Dr. Traquair proceeds to treat of the fishes of the Lower Old Red Sandstone (Orcaian Series). They are systematically arranged, though not technically described; and the known localities for each species are carefully enumerated. The Acanthodians are named *Diplacanthus striatus*, *D. tenuistriatus*, *Rhadinacanthus longispinus*, *Mesacanthus pusillus*, *Cheiracanthus Murchisoni*, and *C. latus*. Restored figures of *Diplacanthus* and *Cheiracanthus* are added. The subclass Ostracodermi and the order Antiarcha are admitted, three species of *Pterichthys* (*Milleri*, *productus*, and *oblongus*) being recorded here. Of the Dipnoi, the sole representative is *Dipterus Valenciennesi*, of which a new restoration is given. Though common in the Caithness Flags, this fish is very rare in the Moray Firth area. The subclass Teleostomi (Dr. Traquair no longer speaks of Ganoidei) includes *Glyptolepis leptopterus*, *Gyroptychius microlepidotus*, *Osteolepis macrolepidotus*, *Diplopterus Agassizi*, and *Cheirolepis Trailli*, while the characters of all, except the first, are shown in restored figures. The "Order Placodermata" is placed "incertæ sedis" under the Teleostomi. *Coccosteus decipiens* and *Homosteus Milleri* are recorded here, the first a very common fish, the second known in the Moray area only from Hillhead quarry, near Dalcross.

The fishes of the Upper Old Red Sandstone of Moray are shown to represent two distinct faunas—that of Nairn in the west, that of Elgin in the east. These are treated separately, and a table of localities at the end indicates at a glance the species found in each. The first species mentioned from Nairn, *Asterolepis maxima*, was described by Dr. Traquair in great detail in the Palæontographical

Society's volume for 1894. The three remaining species are known only by fragments, but seem to be new to the locality, if not entirely new. Some detached scales (one figured) are identified with *Holoptychius decoratus*, Eichwald, sp., from Wenden, Livonia. Imperfect Rhizodont jaws are described and figured as *Polyplocodus leptognathus*, sp. nov.; while the anterior median ventral plate of a large Coccosteian is regarded as indicating a new species, *Coccosteus magnus*. The species from the Elgin district are more numerous and more interesting. The curious Elasmobranch armour-plates described nearly two years ago as *Psammosteus Taylora*, are treated in detail, and Dr. Traquair incidentally gives the new generic name, *Turinina*, to the *Cephalopterus* of Powrie (preoccupied 1809) from the Lower Old Red Sandstone of Turin Hill, Forfar. There are further valuable notes on the Elasmobranch spine, *Cosmacanthus Malcolmsoni*, which proves to be a paired spine, not bilaterally symmetrical as supposed by Agassiz. A restored outline of *Bothriolepis major* is given, and this is described as the largest known Asterolepid, the total length of the armour being sometimes probably not less than a foot and a half. Three portions of armour from Rosebrae Quarry, near Elgin, are regarded as indicating another species, *Bothriolepis cristata*, sp. nov., distinguished by an elevated crest on its dorsal surface. *Phyllolepis concentrica*, *Conchodus ostreiformis*, and *Holoptychius nobilissimus* are merely recorded; but a figure of *Holoptychius Flemingi* (from Dura Den, Fifeshire) is added to complete the series of restorations. *Holoptychius giganteus* is believed to claim many detached teeth besides the characteristic scales. Fragments of jaws seem to belong to *Polyplocodus*; and a brief reference to *Glyptopomus minor* concludes the enumeration.

We hope this is only the forerunner of a more extensive work on the Palæozoic Fishes of Scotland, which would summarize the results of Dr. Traquair's numerous papers, and make them more readily accessible to non-specialists. Most geological and biological handbooks still display lamentable ignorance of the subject, and a general treatise like the present would do much towards enlightenment.

A. S. W.

II.—MOLLUSQUES ÉOCÉNIQUES DE LA LOIRE-INFÉRIEURE. By M. COSSMANN. (Bull. Soc. Sci. Nat. Ouest France, 1895, Tome V, pp. 159–197, Plates v–vii, Fascicule 1.)

**M.** COSSMANN, who undoubtedly ranks as the leading Tertiary Malacologist of France, is preparing a Monograph of the Eocene Molluscan fauna of Brittany, the first part of which is now before us. The majority of the shells have been obtained from special excavations made at Bois-Gouët, in the Saffré Basin, under the direction of M. Dumas; others have been collected at Coislin and La Close, near Camphon; whilst the remainder come from the dolomitic district of Arthon. These different localities, situated in the department of La Loire-Inférieure, have yielded a number of new species as well as all those listed in Vasseur's