

THE
GEOLOGICAL MAGAZINE.

No. XVII.—NOVEMBER 1865.

ORIGINAL ARTICLES.

I. NOTE ON THE PALÆONTOLOGY OF THE RHÆTIC (PENARTH*)
BEDS IN WESTERN AND CENTRAL SOMERSET.

By W. BOYD DAWKINS, M.A., Oxon., F.G.S., of the Geological Survey of Great Britain.

A BRIEF notice of some of the more important Rhætic Fossils in the district described in this MAGAZINE (vol. i. p. 257) may perhaps be some guide to the identification of the beds in other British localities.

Of the more common and characteristic forms, *Pecten Valoniensis* and *Sargodon tomicus* were derived from the same layer as that which yielded a tooth of *Hypsiprymnopsis Rhæticus* below the bone-bed. The former comprises two bands of limestone in the upper portion of the *Avicula Contorta* series, or middle member, at Watchet and Uphill. My colleagues, Messrs. Etheridge and Bristow, have also found it to occupy the same horizon at Penarth. The chisel-shaped teeth of the latter in the unworn state, having their cutting edge traversed by a notch, were probably the anterior incisiform teeth of a fish allied to *Sargus*. Teeth of *Acrodus minimus* are enormously abundant in the Middle Rhætic series. *Pleurophorus angulatus* is also very abundant in the same horizon and forms a layer of 'Pleurophorus' limestone. (See Quart. Journ. Geol. Soc. vol. xx. p. 396.) *Avicula contorta* is restricted to the Middle Rhætic division, while *Ostrea interstriata* is common both to the middle and upper divisions; and *Cardium Rhæticum* is found throughout. These last three species are figured in the plates accom-

* Since the paper published in the GEOLOGICAL MAGAZINE (Vol. I., p. 257) was written, Sir Roderick Murchison, F.R.S., Mr. Bristow, F.R.S., and Mr. Etheridge, F.G.S., on an examination of the beds therein described, and also of the corresponding strata in South Wales, have determined upon naming them the Penarth series, from their great development at that place, and from the desirability of having a British name for a series of rocks well represented in the British Isles, and shown by a distinct colour on the Map of the Geological Survey.—[See British Association Reports in GEOLOGICAL MAGAZINE, Vol. I., p. 236.]

GENERA AND SPECIES	Lower Rhatic	Middle Rhatic	White Lias, or Upper Rhatic	Lower Lias, or Ammonites- planorbis-zone
<i>Hypsiprymnopsis Rhaticus</i> , Dawkins	—	—		
<i>Acrodus minimus</i> , Ag.	—	—		
<i>A. acutus</i> , Ag.	—	—		
<i>Hybodus plicatilis</i> , Ag.	—	—		
<i>H. pyramidalis</i> , Ag.	—	—		
<i>H. reticulatus</i> , Ag.	—	—		
<i>Gyrolepis Alberti</i> , Ag.	—	—		
<i>G. tenuistriatus</i> , Ag.	—	—		
<i>Sargodon Tomicus</i> , Plin.	—	—		
<i>Saurichthys acuminatus</i> , Ag.	—	—		
<i>S. apicalis</i> , Ag.	—	—		
<i>Squaloraja</i>	—	—		
<i>Desmacanthus cloacinus</i> , Quenst.	—	—		
<i>Beloteuthis</i> , vel <i>Geoteuthis</i> , sp.	—	—		
<i>Axinus cloacinus</i> , Op. & Suess	—	—		
<i>A. elongatus</i> , Moore	—	—		
<i>Anatina Suessi</i> , Oppel.	—	—		
<i>A. præcursor</i> , Quenst.	—	—		
<i>Anatina</i> ?	—	—		
<i>Cardinia</i> ?	—	—		
<i>Pleurophorus elongatus</i> , Moore	—	—		
<i>P. angulatus</i> , Moore	—	—		
<i>Pleurophorus</i> , sp.	—	—	—	
<i>Myophoria postera</i> , Quenst.	—	—	—	
<i>Pteromya Crowcombeia</i> , Moore	—	—	—	
<i>Avicula contorta</i> , Portl.	—	—	—	
<i>A. solitaria</i> (?), Moore	—	—	—	
<i>Avicula</i> ?	—	—	—	
<i>Lima præcursor</i> , Quenst.	—	—	—	
<i>L. pectinoides</i> , Sow.	—	—	—	—
<i>L. punctata</i> , Sow.	—	—	—	—
<i>Modiola minima</i> , Sow.	—	—	—	—
<i>M. Hillana</i> (juv.), Sow.	—	—	—	—
<i>Gervillia præcursor</i> , Quenst.	—	—	—	—
<i>Placunopsis Alpina</i> , Winkl.	—	—	—	—
<i>Ostrea interstriata</i> , Emm.	—	—	—	—
<i>O. Liassica</i> , Strickl.	—	—	—	—
<i>Pecten Valoniensis</i> , Defr.	—	—	—	—
<i>P. Rhaticus</i> , Quenst.	—	—	—	—
<i>Pecten</i> ?	—	—	—	—
<i>Trigonia curvirostris</i> , Quenst.	—	—	—	—
<i>Cypricardia Suevica</i> , Moore	—	—	—	—
<i>Myacites striatogranelata</i> , Moore	—	—	—	—
<i>Pullastra arenicola</i> , Strickl.	—	—	—	—
<i>Cardium Rhaticum</i> , Merian	—	—	—	—
<i>Leda</i> ?	—	—	—	—
<i>Cerithium Henriici</i> , Martin	—	—	—	—
<i>Chemnitzia nitida</i> , Moore	—	—	—	—
<i>Chemnitzia</i> ?	—	—	—	—
<i>Cylindrites elongatus</i> , Moore	—	—	—	—
<i>Coprolites</i>	—	—	—	—
<i>Annelida</i>	—	—	—	—
<i>Serpulæ</i>	—	—	—	—
<i>Cladophyllia</i> ?	—	—	—	—
<i>Montlivaltia</i> ?	—	—	—	—
<i>Fucoides</i>	—	—	—	—

panying Mr. C. Moore's paper in the Geological Society's Journal, vol. xvii. pl. 15 and 16. The two latter are found in large numbers in the White Lias or upper member, along with *Modiola minima*.

The foregoing table gives the range of the Rhætic Fauna in the district which I have examined. Its lacunæ, so far as relates to other localities in Britain and Ireland, may be filled up by a reference to the papers of Dr. Wright, F.G.S., and Mr. R. Tate, F.G.S. (Quart. Journ. Geol. Soc. vol. xvi. and vol. xx.).

To this list of the Fauna of the district a large addition must be made from the collection and the paper of Mr. Charles Moore, F.G.S. already mentioned.

Among the mammalia that this gentleman discovered with so much diligence in a fissure of the Mountain Limestone near Frome are teeth of *Microlestes antiquus* (Plieninger), or the small mammal first found in the bone-breccia of Diegerloch, together with several forms which, as yet wanting names, probably belong to diverse Marsupial families. On comparing them with the recent Marsupial remains in the Hunterian and British Museums, I find that two stout recurved canines, oval in section, bear a striking resemblance in form to those of the opossum (*Didelphys*) or the *Myrmecobius*; while a third is remarkably akin to the lower canine of *Peragalea* or *Dasyurus*. There can be little doubt that these three canines indicate the presence of animals of carnivorous or insectivorous habit on the land of the Rhætic period. One trenchant recurved tooth, on the other hand, compressed parallel to the median line, bears the form of the small upper canine of the Kangaroo-rat of Australia. Three small procumbent incisiform teeth, also bearing a strong resemblance to the upper incisors of *Hypsiprymnus*, point towards the phytophagous group of the Marsupials; the Kangaroo-rats (*Hypsiprymnidæ*), and their allies. Of the tubercular molars one cannot be differentiated from the second true molar of *Plagiaulax minor* (Falc.) figured by Dr. Falconer, F.R.S., in the Geological Society's Journal, vol. xviii. p. 367, fig. 15), to which genus I have little hesitation in ascribing it. The genus *Plagiaulax* therefore existed on the Secondary continent from the period of the deposit of the Purbeck strata down to that of the Penarth or Rhætic beds.

The rest of the mammalian teeth differ from those of any known existing or extinct mammal, and possibly may have belonged to the *Microlestes* of Diegerloch, of which but one tooth is at present known. The interest of science demands that this remarkable collection of mammalian teeth should be figured and described as soon as possible. The above scanty notes from my note-book are merely published that they may not lie fallow for years, like a similar collection made long ago, for a determination of which we are still anxiously waiting. Teeth of *Lepidotus* are also to be added to the list found by Mr. Moore at Beer, Vallis, and Holwell; together with *Anatina Suessii*, Oppel; *Arca Lycettii*, Moore; *Axinus concentricus*, and *A. depressus*, Moore; *Discina Townshendii*, Davidson; *Gervillia ornata*, Moore; *Ostrea fimbriata*, Moore; *Trochus nudus*, and *T. Waltoni*, Moore; *Leda Titiei*, Moore; *Straparolus Suessii*, Moore;

Cerithium constrictum, *C. decoratum*, *C. cylindricum*, and *C. Rhæticum*, Moore; *Chiton Rhæticus*, Moore; *Cylindrites fusiformis*, *C. ovalis*, and *C. oviformis*, Moore; *Nardita acuminata*, Buckman; *Cypris lassica*, Brodie; *Estheria minuta*, Alberti; and *Pollicipes Rhæticus*, Moore; figures and descriptions of most of these are to be found in Mr. Charles Moore's valuable paper in the Quarterly Journal of the Geological Society, vol. xvii. p. 498–516, pl. 15, 16.

II. ON CAULOPTERIS PUNCTATA, Goepp., A TREE-FERN FROM THE UPPER GREENSAND OF SHAFTESBURY IN DORSETSHIRE.

By WILLIAM CARRUTHERS, F.L.S., of the British Museum.

(Plate XIII.)

THE Upper Greensand is a marine formation. Dr. Fitton, in his elaborate Memoir on 'The Strata below the Chalk' (Geol. Trans., Second Series, Vol. IV.), has enumerated 60 species of Mollusca, 2 Annelids, 3 Echinoderms, and 2 Protozoons from the beds in the South of England belonging to this period. These numbers have been more than doubled since the publication of that paper. They still retain the same proportions; but the fossils which Dr. Fitton characterised as 'fish remains' have been referred to 9 genera, and there have been added 4 genera of Saurians. As might be expected, very few vegetable remains have been observed. Dr. Fitton records the occurrence of some impressions of leaves. The remains of what appear to be sea-weeds are occasionally met with. Specimens of fossil wood have also been found. William Cunningham, Esq. F.G.S., of Devizes, who has kindly, through the Editor, furnished me with some particulars regarding the Upper Greensand deposits near Shaftesbury, informs me that for forty years he has been collecting the fossils of these beds, and that during that time he has obtained about thirty specimens of woods, many of them certainly drift woods, as they had been attacked by lithophagous molluscs. I have examined all the specimens of these woods contained in the collections of the British Museum, and I find that they are all Coniferous. Little more than this can be said. The woody fibres contain a single row of discs, and I have not detected any spiral fibres associated with them.

With so few vegetable remains, it is thus of no small interest to find the stem of a Tree-fern in these beds. The specimen, of which a portion is figured, is in the Palæontological collection of the British Museum. It is a cast in sandstone, and is only a fragment, 14 inches long by 6 inches broad; other portions of the same trunk are in the collections of the Revs. T. Stanton and J. Penny. The stem had been floated out to sea, and been tossed about or rubbed till the bases of the stipes were worn off, and nothing remained but the woody portion marked with the scars of the stipes. The bed in which it was buried formed an admirable matrix around the specimen, which in process of time entirely disappeared, and its place was ultimately filled with sand, which has preserved on its surface the most delicate markings left in the cavity. No structure