

Palæotherium and the modern single-hoofed *Equus*, through *Paloplotherium*, *Anchitherium* and *Hipparion*. "Thus the succession in time accords with the gradational modifications by which *Palæotherium* is linked on to *Equus*." (Owen op. cit. p. 793.)

Prof. Huxley, in a lecture delivered before the Royal Institution of Great Britain on Feb. 7, 1868, pointed out the close affinities existing between the *Dinosauria* and Birds. The recent discovery by Prof. O. C. Marsh, of Yale College, Ct., U.S.A., of a remarkable extinct bird with biconcave vertebræ and well-developed teeth in both jaws, adds another link to the remarkable fossil bird from Solenhofen, the *Archæopteryx lithographica*, and sufficiently proves the justness of Dr. Darwin's conclusion. Other evidence (we learn) will shortly be forthcoming in this country tending in the same direction.

Compact as is the Avian class, we have, even among living birds, many anomalous forms, such as the all-but-wingless Penguins, and the lately exterminated Auk, and Dodo. The Rhea and Ostrich have only rudimentary wings, the Cassowary and Apteryx none at all, nor had the gigantic birds of New Zealand a trace of wings, yet they managed to live on save for the interference of man upon the scene of their existence—notwithstanding Mr. Leifchild's condemnation of such wingless monstrosities.

It may be interesting to our readers, as well as to the author of "The Higher Ministry of Nature," to know that there is now living on the Continent of Australia a bipedal lizard,¹ which certainly goes a long way to meet a bird, with well-developed teeth, biconcave vertebræ, and a long rat-like tail!

To those who wish to follow the author "one step further," when he suggests "the probability of Angelic and Human Continuity," we leave the perusal of this singular volume. There can be no doubt of the earnestness and sincerity of the author, but, like all earnest advocates, he is not altogether impartial; for whilst, on the one hand, he charges Darwin with gathering a vast *army of facts* or phenomena, and drilling them during many years upon one system, he has collected an equally extensive *series of extracts* from ancient and modern writers, and presses them in favour of his own peculiar tenets with all the logic he can command. Mr. Leifchild is an apt illustration of the old adage, "Logically demonstrate your case, and I will undertake to prove by logic that the very reverse of what you have stated is the truth."

III.—SKETCH OF A NEW GEOLOGICAL MAP OF VICTORIA. By R. BROUGH SMYTH, F.G.S., etc., Secretary for Mines for the Colony of Victoria.

WE have lately had forwarded to us the above publication from the Government Mining Department of the Colony of Victoria. The sketch is in the form of a lithograph, printed in colours, on the scale of one inch to ten miles, and is intended to accompany

¹ "The great Frilled Lizard," *Chlamydosaurus Kingii*. This lizard habitually runs about on its *hind-legs*, seldom or never touching the ground with its fore-paws, which are but little developed.

the Official Catalogue of the Victorian Court in the London Exhibition of the present year. The map furnishes us with the latest information and opinions held by the authorities of the Victorian Mining Department on Victorian Geology. The geological features are chiefly taken from Mr. Selwyn's Sketch Map, published by the late Geological Survey of Victoria, with additions by Mr. Brough Smyth and certain of the Mining Surveyors under his direction. The basis of the topographical portion of Mr. Smyth's New Geological Sketch Map was a compilation made at the Office of Mines in 1866, from recent surveys, and in this respect has a considerable advantage over Mr. Selwyn's earlier one.

In certain essential points the present map differs from that of Mr. Selwyn. Should these additions eventually prove to be correct, the value of the map will be considerably increased, as they refer to rock masses generally yielding economic minerals of considerable value.

In the large eastern province of the Colony, Gippsland, much alteration has been made in the relative boundaries of the Crystalline rocks and the Upper and Lower Silurians. This, as this wild and hilly portion of the country becomes opened up and better known, is nothing more than might have been expected. A more clear and well defined line has also been drawn between the Upper and Lower Silurian deposits in the central portions of the Colony.

The remaining rocks of Palæozoic age were formerly delineated on Mr. Selwyn's Map by one colour, and called in a general way "Upper Palæozoic." The upper portion of this series at certain localities contains the remains of *Lepidodendra* (Mount Tambo, Mansfield, Avon River, etc.), and it was thought extremely probable that these might represent some portion of the European Carboniferous Series. Certain small patches of fossiliferous limestone in Eastern Gippsland (Buchan, Bindi, etc.), regarding the identity of which some doubts were entertained, are now mapped by Mr. Smyth as Devonian, apparently on the strength of certain fossils, some of which were pronounced by Professor McCoy to be identical with species from the Devonian of the Eifel. Those mentioned by Mr. Smyth in the explanation of the Sketch Map are *Spirifera levis-costata*, the remains of Placodermatous Fish, and Corals. The upper portion of the series before mentioned as containing *Lepidodendra* are now definitely coloured as Carboniferous.

The boundaries of the Carbonaceous Secondary beds, in places coal-bearing, occupying some portion of the southern sea-board, have not undergone any very considerable change since they were first laid down by Mr. Selwyn.

A series of beds on the east side of Port Philip Bay, much resembling in their lithological aspect our Lower Tertiaries, and formerly provisionally called Eocene, are on this Map termed '*Oligocene*.' They are well seen at Mounts Eliza and Martha, and at Schnapper Point, where the following fossils appear very characteristic:—*Voluta anticingulata*, McCoy; *V. antiscallar*, McCoy; *V. Hannaford*, McCoy; *V. strophodon*, McCoy; *Cypræa gastroplox*, McCoy; *Trivia avallanoides*, McCoy; *T. australis*, McCoy, and many others.

In the present unsatisfactory state of our knowledge regarding the Australian Tertiary series, it would perhaps be well if Victorian geologists would adopt a suggestion of Prof. Martin Duncan's (On the Fossil Corals of the Australian Tertiary Deposits, Quart. Journ. Geol. Soc., vol. xxvi., p. 288), that instead of subdividing their Tertiary series, whilst so little is known about them, into Pliocene, Miocene, and Eocene, or Oligocene, as the case may be, they should content themselves for the present with merely calling them all Cainozoic.

The artistic portion of Mr. Smyth's Sketch Map is everything that could be desired; the type is clear and good, and the colours evenly and correctly laid on. We shall be glad to see further geological efforts on the part of the Victorian Mining Department, but should advise them to pay a little more attention to palæontological nomenclature, than is evinced in the few names of fossils given in the letter-press description of the Map in the Essay attached to the Exhibition Catalogue. R. E.

IV.—A MONOGRAPH OF THE BRITISH GRAPTOLITIDÆ. By Prof. H. A. NICHOLSON, M.D., D.Sc., M.A., etc. Part I. (Edinburgh: Blackwood & Sons. 1872.)

WITHIN the last few years much has been added to our knowledge of the peculiar group of fossils which form the subject of the present Monograph. Since 1866, when Prof. Nicholson commenced his labours on the group, the British Graptolites have been treated of in five-and-twenty memoirs, and the number of species known to Britain has been at least doubled. This result is mainly due to the researches of Prof. Nicholson in the Skiddaw Slates and Coniston Flags of the English Lake-district, and in the Moffat group of the south of Scotland, and it is upon the extensive collection which he has made from these richly graptoliferous rocks that the present work is chiefly based.

The first and only part as yet published "is intended to serve as an Introduction to the study of the Graptolitidæ generally."

The first chapter is devoted to the bibliography of the group, and comprises a chronological history from 1727, when Bromel, in describing the fossils of Sweden, evidently mistakes graptolites for leaves of grasses, to 1871, when the discovery of a British specimen with gonothecæ finally settled the much-debated question of the zoological position of these interesting fossils, showing that they were truly referable to the Hydrozoa, and nearly related to the Sertularians and Plumularians, as first suggested by Portlock in 1843.

In chapter ii. the "general form of Graptolites," their mode of preservation, and the sediments in which they occur, are successively treated of. Under the first heading the terminology employed is explained. It is to be regretted that the author still adheres to the terms "frond" and "stipe." The former is certainly not a suitable term for the entire exo-skeleton of an animal, nor is the latter for its component parts, or as it is here expressed, "the separate simple elements which make up the complex species."