

distribution of the particular rocks under discussion are plentifully supplied, and reference to the volume is immensely simplified by means of excellent subject and locality indices.

IV.—LIMITS OF THE SECONDARY AND TERTIARY PERIODS.

IN a recent number of the Proceedings of the Palæontological Society of America (Bulletin Geological Society of America, vol. xxv, p. 321, 1914) Professor H. F. Osborn gives an interesting summary of a discussion held at a meeting of the Society as to the precise line that should be drawn between the Secondary and Tertiary periods. Very divergent views seem to have been expressed. Thus Dr. F. H. Knowlton endeavoured to show that palæobotany indicates that no sharp line of demarcation exists between the two periods, and expressed his belief that the real division occurred long before the close of the Age of Reptiles. On the other hand, most of the disputants seem to have tended to the traditional view that the extinction of the Dinosaurs marks the termination of the Cretaceous period and that the only important survival of a Cretaceous reptile till Tertiary times is that of *Champsosaurus*. Several papers resulting from this discussion have been published in the Proceedings of the Geological Society of America, especially by W. D. Matthew ("Evidence of the Palæocene Vertebrate Fauna on the Cretaceous-Tertiary Problem") and Barnum Brown ("Cretaceous-Eocene Correlation in New Mexico, Wyoming, Montana, Alberta"). Dr. W. J. Sinclair has also contributed an important paper to this discussion (Bulletin American Museum Natural History, 1914, p. 297).

V.—BRIEF NOTICES.

1. **BRITISH MUSEUM (NATURAL HISTORY).**—The "Return" ordered by the House of Commons for 1913-14 (price 1s.) is as interesting as its predecessors. A systematic record of accessions to the Geological and Mineralogical Departments is given. Among the principal items are the Piltown skull, etc.; specimens illustrating the Holocene deposits of Newquay and the North of Ireland; Trilobites from the Comley Sandstone; large collections of Carboniferous and Devonian corals; three Silurian corals figured by Thomas Pennant in 1757; 760 Carboniferous and Devonian fishes (Traquair Collection); 1,400 Carboniferous and 300 Cretaceous fossils from Ireland (Wright and Donaldson Collections); the Pennant Collection of minerals; rocks from Ecuador (Whymper Collection); a fine series illustrative of the ruby-mines of Burma; and numerous exceptionally fine mineral specimens.

2. **EALING SCIENTIFIC AND MICROSCOPICAL SOCIETY.**—A report of Dr. Smith Woodward's lecture on "Fossil Man" appears in the Report for 1913-14, and some notes on "Ancient Hanwell" by Mr. H. Beasley. Although the latter deals with historic times there are points of interest in topography for those who study prehistoric conditions.

3. NORFOLK AND NORWICH NATURALISTS' SOCIETY.—The only paper of interest to geologists in the Transactions of this Society (vol. ix, pt. v) is an excellent sketch of the life of Horace Bolingbroke Woodward by his friend and colleague Clement Reid, illustrated by a good portrait.

4. NORWICH.—The Report of the Norwich Castle Museum for 1913 has reached us. Beyond the accession of a series of Gault fossils from Elstow, Bedfordshire, there seems nothing of importance to record in the geological collections, but the general work carried on in the Museum under Mr. Frank Leney, the curator, is most excellent, and merits the highest commendation.

5. A NORFOLK GEOLOGIST.—In the Bulletin (173) of the New York State Museum are reproduced two leaves from the notebooks of Richard Cowling Taylor, the well-known Norfolk geologist, who emigrated to the United States about 1830 and followed up his researches in that country. These are printed in colours, deal with American geology, and seem to connect him with the New York State Geological Survey, a connexion apparently previously unknown.

6. RUGBY.—The Report of the Rugby School Natural History Society for 1913 is not very encouraging so far as geology is concerned. It is satisfactory to learn that the re-naming and re-arrangement of local fossils in the School Museum is proceeding, but there must be new fossils to be found at Napton and a systematic search should be made.

7. LIVERPOOL GEOLOGICAL SOCIETY.—The President's (C. B. Travis) address issued in the Proceedings (vol. xii, pt. i) dealt with penplanation in the British Islands, and forms a good summary of the subject. The record of Triassic footprints is continued by H. C. Beasley and F. T. Maidwell; some curious ctenoid markings on Triassic slabs are described by Beasley as possibly equisetiform in origin; and a paper by W. T. Walker describes the Liassic outcrop near Whitchurch, Shropshire.

8. The Proceedings of the Yorkshire Geological Society for 1914 contains a valuable paper by Dr. Wheelton Hind (p. 25) commenting upon the interesting facies of the Millstone Grit fauna obtained from the Cayton Gill Beds, which has "a large number of species common to it and the *Dibunophyllum* Beds of the Carboniferous Limestone, and does not contain the *Goniatite* fauna and its associated Lamelli-branchia subsequently met with in the slate beds between the different members of Millstone Grit". The North American *Prothyris elegans* also found in the Millstone Grit of Scotland and at Congleton Edge is reported by Dr. Hind as occurring in the Grit at Colsterdale.

9. PAISLEY ABBEY.—During excavations for the foundations of the restored choir of Paisley Abbey a quantity of hazel-nuts, pieces of hazel-wood, and willow stumps with other vegetable matter, were found. These are discussed in a paper by the Rev. C. A. Hall and Duncan Smith in the Trans. Paisley Phil. Inst. for 1914, where, incidentally, a good deal of information relating to the district has been brought together.

10. FOSSIL MAMMALS FROM THE CRIMEA.—In a memoir entitled *Mammifères fossiles de Sebastopol* (Mem. Comité Geologique, n.s., livr. 87, Petrograd 1914) A. Borrissiak describes a mammalian fauna of Middle Sarmatian age which in many respects is very similar to the widely distributed fauna of the Pikermi type. The most important new genus is *Achtiaria*, which is a member of the Giraffidæ and not very remote in structure from *Samotherium* and *Okapi*: the dentition and some limb-bones are described. The author also gives an account of new species of *Tragoceros* and *Aceratherium* and of a new variety of *Hipparion gracile*.

11. INDIAN GEOLOGICAL TERMINOLOGY.—This is a list of terms used by writers on Indian geology, now arranged in alphabetical order by Holland & Tipper in the Memoirs of the Geological Survey of India (vol. xliii, pt. i, 1913). It is modelled on the well-known American publications of similar nature, and gives the general history of the word and the present fixation of its meaning, if that meaning has changed since the introduction of the term itself.

12. In the Memoirs of the Geological Survey of India (vol. xli, pt. ii, pp. 148–245, 1914) Dr. L. Leigh Fermor contributes an interesting account of the geology and coal resources of Korea State, Central Provinces. The geological formations represented are: 1, Deccan Trap; 2, Gondwana, (a) Supra-Barakars, (b) Barakars, (c) Talchirs; 3, Archæan. The geology corresponds generally with the physical division into three plateaux. The lowest, that of Patna and Khargaon, is largely composed of rocks of the Talchir formation. On it rest two outliers of the Barakar rocks, comprising the Kurasia and Koneagarh Coal-fields, and these are outliers of the second or Sanhat plateau. The third or Deogarh plateau corresponds with the Supra-Barakar rocks.

13. In the Records of the Geological Survey of India (vol. xlv, pt. i, pp. 41–51, 1914), Dr. W. A. K. Christie describes a carbonaceous aerolite which fell near Chabra, in the Native State of Tonk, Rajputana, on January 22, 1911. The Tonk meteorite, as it is called, is chiefly interesting on account of its highly carbonaceous character, the chemical analysis showing it to contain no less than 2·70 per cent of carbon; the composition of the carbonaceous matter is uncertain. Under the microscope the stone appeared as a structureless, irregularly cracked mass, and, though no chondritic structure was apparent, it should be classed as K (coaly chondrite) in Brezina's classification.

14. MINING DISTRICTS OF THE DILLON QUADRANGLE, MONTANA, AND ADJACENT AREAS. By ALEXANDER N. WINCHELL. United States Geological Survey, Bulletin 574. pp. 191, with 16 figures and 8 plates. Washington, 1914.

The region carefully described in this memoir lies just south of Butte, and measures about 49 miles wide east to west and 60 miles long. Gold placer-mining dates back as far as 1852 and was wonderfully productive; by the present day the diggings have been worked out, but the life of placer-mining has been prolonged by dredging operations. At the same time the deep mines have proved

of considerable importance. The future outlook is not bright owing to the apparent exhaustion of the ore bodies, and the low prices recently ruling for silver, lead, and copper. The geological structure was largely determined by intrusion from below of the great Boulder batholith—mainly a quartz-monzonite—which seems to have penetrated important areas in Tertiary times. The igneous rocks include a wide range of types. The different mines are described in detail, and a copious index is given at the close of the memoir.

15. **THE FERNANDO FOSSILIFEROUS SANDSTONES.**—Mr. Walter A. English's paper (University of California Publications, Bull. Dept. of Geology, November, 1914) on the Fernando group of fossiliferous sandstones and shales of Newball, California, is interesting as giving the results of an attempt to decide the age and relationship of beds which have been for a number of years indeterminate. Mr. English concludes that the beds in question are probably of basal Pliocene and Upper Pliocene or Pleistocene age respectively. He gives detailed accounts of the result of his collecting in various horizons and describes seven new species (two of Lamellibranchia and five of Gastropoda).

16. **MOLLUSCA OF THE MARINE MIOCENE OF CALIFORNIA.**—In the Bulletin of the Department of Geology of the University of California, vol. viii, No. 7, Mr. Bruce Martin gives descriptions of seventeen new species and varieties of Gastropoda and one of Lamellibranchia from the late Marine Neocene of California. These descriptions have been prepared in advance of a paper dealing with the correlation of the Pliocene beds of the middle and west coast of California during his recent investigation, of which Mr. Martin obtained the material from which the new species are forthcoming.

REPORTS AND PROCEEDINGS.

I.—GEOLOGICAL SOCIETY OF LONDON.

1. *December 16, 1914.*—Dr. A. Smith Woodward, F.R.S., President, in the Chair.

A lecture was delivered by Professor W. M. Flinders Petrie, D.C.L., LL.D., F.R.S., F.B.A., on the Palæolithic Age and its Climate in Egypt.

He said that the classes of worked flints peculiar in Egypt are : (1) Irregular, with broad unregulated fractures. (2) Rounders, flaked in all directions to an edged disc. (3) Hoofs, very thick, rudely domed with an obtuse edge. (4) Lunes, with obtuse edges. (5) Crescent scrapers. Irregular flints, similar to those from St. Acheul, are found in high Nile gravels.

The regular European types occur exactly like those classed as Chellean and Acheulian. The Mousterian forms are so often found in various periods that they cannot be assigned without evidence of age. The Aurignacian survive into the early civilization. The large class of flints from the Fayum desert comprises all the Solutrean types, and also Robenhausian forms. The flakes of the early civilization (8000 to 6000 B.C.) are identical with Magdalenian.