

Research Items.

MEXICAN ARCHÆOLOGY.—Since the days of the Spanish occupation, the neighbourhood of Mexico City has supplied a rich field for the exploration of the antiquities of the pre-Columbian period. The most important problem to be solved is the investigation of the strata showing the succession of cultures—the Archaic, Toltec, that is pre-Aztec or Teotihuacan, and Aztec. Some progress in this direction is outlined in a report by Mr. A. M. Tozzer, published in Bulletin 74 of the Bureau of American Ethnology. It is at present impossible to determine with exactness the demarcation between the Toltec and Aztec cultures, the inference being that the former flourished towards the end of the first millenium A.D., and their influence in Yucatan, at least, extended into the fifteenth century. The artifacts discovered belong principally to the Toltec culture, those of the Aztec period being few in number and relatively unimportant, while a few things which are clearly pre-Toltec or Archaic were encountered. It is interesting to record that the methods of scientific archæology are being applied to this area, with expectations of important discoveries in the near future.

FOSSIL MAN.—The Trustees of the British Museum have just issued a third edition of the useful little "Guide to the Fossil Remains of Man in the Department of Geology and Palæontology in the British Museum (Natural History)." The guide was first prepared on account of the interest in the study of fossil man which had been aroused by the discovery of the Piltdown Skull, and, as an introduction to the specimens and casts exhibited, described the main conclusions bearing on the question of the evolution of man which are furnished by palæontology, geology, and anthropology. In the third edition, the later part of the guide has been rewritten and extended to include an account of the skull found in the Broken Hill Mine, Rhodesia, in 1921, and two plates giving four aspects of the skull have been added. The more remarkable features of the skull are briefly described, and the chief points in which it presents similarities to the anthropoids, Neanderthal man, and modern man are noted. As regards the question of antiquity, it is pointed out that the life of the southern hemisphere has been less progressive than that of the northern, and the discovery of primitive species of man in comparatively modern deposits was to be expected. After summarising the evidence it is concluded that either the accumulation of animal remains in the cave is modern compared with deposits left by palæolithic cave men of Europe, or the animal life of Rhodesia has changed more slowly than that of Europe.

GEOLOGY IN NEW ZEALAND.—Prof. J. Park reviews the structure of New Zealand in the Transactions of the N.Z. Institute, vol. liii., 1921, a publication that includes several papers on geology. As seems usual in that enterprising and fortunate dominion, the illustrations are of very fine quality. Brother Fergus (M. J. Gilbert) describes the unconformable series of the Waikato Heads district, where an "older-mass" terminating in the post-Jurassic peneplain is capped by a "younger-mass" of undetermined Cainozoic age. Mr. J. A. Bartrum revises the geology of Great Barrier Island, which guards the Hauraki Gulf on the long promontory of the North Island; he has discovered a large area of delicately banded Cainozoic rhyolites, previously described as slates and sinter. Dr. C. A. Cotton's account of the warped land-surface

near Port Nicholson, the harbour of Wellington, is written with a true geographic instinct.

THE GALICIAN PETROLEUM INDUSTRY.—On April 11, a paper on "Galicia and its Petroleum Industry," by Mr. Albert Millar, was read at the Institute of Petroleum Technologists, in which was embodied technical and economic information of interest and importance. The most important area at the present time is still that of Boryslaw-Tustanowice-Mraznica, this being the district of the largest producing wells during the last fifteen years. As is well known, however, there has been a steady decline in production latterly, both in this area and in Galicia as a whole. While this causes alarm in certain quarters, it has been the means of promoting the development of new fields, chiefly those of Hordyszcze, Ratoczyn, and Opaka, in the Tustanowice district; deep drilling at Popiele and Jasienica, north-east of Boryslaw, has also been undertaken. The bulk of the oil, which is of high grade and has a paraffin base, has hitherto been obtained from Oligocene beds, together with a smaller quantity from Eocene deposits. The Cretaceous rocks, petroliferous in Western Galicia, are largely an unknown factor as regards their ultimate commercial value, as they have been penetrated only by a few wells in the main region, and the results were inconclusive. Many experts believe that water troubles will prove more formidable at the Cretaceous horizon than is the case in the younger sands. Unquestionably water is the greatest difficulty to contend with in Galicia, and the calamitous experiences at Tustanowice, where "200 ton" wells were rapidly watered, have done much to inspire misgiving as to future prospects. Emulsification up to, and in some cases more than, 20 per cent., has resulted in special methods being devised for separating the oil. Zuber believed this water to be the indication of exhaustion of the field, but later observers favour its localisation to Eocene sands. Gasoline extraction, started in 1914, has made much headway, 660,000 klg. being obtained last year, a record production for Galicia.

A NEW METHOD OF GAUGING THE DISCHARGE OF RIVERS.—The method of gauging discharge based on the principle underlying chemical hydrometry has been in use for some time. It depends on the liberation of a known quantity of salt in solution into the river at a known rate and the estimation of the amount of salt in the river some distance below the inlet of the salt solution. This method has been proved to give very accurate results, but its chief disadvantage is the cumbersome nature of the preparations involved, not to speak of the cost. In the Scientific Proceedings of the Royal Dublin Society for April, Prof. J. Joly describes a method of utilising the same principles which gives even more accurate results and is very economical in labour and money. Radioactive measurements can be made with great accuracy by a simple form of electrocope. In the place of salt, which has to be introduced into the river by the hundredweight, a few litres of a solution containing a trace of radium is sufficient. Prof. Joly proposes to use pitchblende dissolved in nitric acid and then diluted with water. The solution is fed into the river under constant pressure. The water samples when collected are conveyed back to the laboratory and stored in ordinary boiling flasks for ten or twelve days. The emanation is then boiled off into a small exhausted bulb, from which it is introduced into the electrocope. At the end of three hours the electrocope is read and the river discharge can then be deduced.