

RECENT WORK IN PALÆONTOLOGY.

SEVEN new genera of trilobites, *Menomonina*, *Millardia*, *Dresbachia*, *Norwoodia*, *Saratogia*, *Vanuxemella*, and *Hanburia*, are described in C. D. Walcott's second paper on "Cambrian Trilobites" (Smithsonian Miscell. Coll., vol. lxiv., No. 3, 1916). The first four are placed in Beecher's Proparia, and "establish the existence of a strong group of the order in Cambrian time."

Part 3 of vol. lxxi. of the Quarterly Journal of the Geological Society of London (September, 1916) contains evidence that the honours of research in Cambrian faunas are not to be left entirely to workers in North America. V. C. Illing (p. 386) describes a rich fauna of Middle Cambrian age from ninety feet of strata in the Stockingford Shales near Nuneaton. More than fifty distinct forms of trilobites are recorded. T. C. Nicholas, in "Notes on the Trilobite Fauna of the Middle Cambrian of the St. Tudwal's Peninsula (Carnarvonshire)" (p. 451), somewhat modestly regards his work as a supplement to the remarkable discoveries near Nuneaton. Prof. C. Lapworth, who first recognised the Cambrian age of the beds near Nuneaton, has added some stimulating remarks in the discussion on both these papers.

Prof. H. Douvillé, in describing the marine invertebrate fossils collected during the British expedition to Tibet (Mem. Geol. Surv. of India, Palæontologia Indica, vol. v., Mem. 3, 1916), is able to revise the classification of the strata in this little-known district. The interest centres in the passage-beds from the Cretaceous to the Eocene (p. 44), which are marked by gastropods of Danian and Cainozoic types side by side, while a Cretaceous type of nautilus occurs in Operculina limestones, and, with other fossils, is held to carry these beds down into the Danian stage.

Little by little our knowledge of dinosaurs in South Africa spreads. In April, 1915 (Proc. Geol. Soc. S. Africa, vol. xviii., 1916, p. xxxiii), H. B. Maufe, director of the Geological Survey of Southern Rhodesia, communicated a report by S. H. Haughton on bones found twenty-five miles from Bulawayo. These came from the Forest Sandstone, and resemble Thecodontosaurus and Gyposaurus from the Cave Sandstone of the Cape Province and the Orange Free State. Mr. Maufe consequently regards the Forest Sandstone as of Stormberg age. A month later, A. W. Rogers read a paper on "The Occurrence of Dinosaurs in Bushmanland" (Trans. Roy. Soc. S. Africa, vol. v., 1915, p. 265). The remains were found in the ancient infilling of a valley cut in gneiss, and the author draws the interesting conclusion (p. 268) that the present valley was initiated in Mesozoic times, when the climate was wetter than at present, and that continuous infilling has since gone on. S. H. Haughton (*ibid.*, p. 259) refers the bones and a tooth to a new genus, *Kangnasaurus*, intermediate between the Upper Jurassic *Camptosaurus* and the Upper Cretaceous *Mochlodon*. It is thus probable that the alluvial deposit is of Cretaceous age.

E. L. Troxell describes two interesting birds' eggs of Oligocene age from near Harrison, Nebraska (Journ. Washington Acad. Sci., vol. vi., 1916, p. 422). They are probably those of a water-fowl, and are now filled by calcite. In one case chalcedony has crept in at the narrow end, and a layer of agate preceded the deposition of the calcite. In the other case a large central amber-coloured crystal of calcite, surrounded by white crystals of smaller grain, reproduces by a coincidence the colouring of the original contents.

G. E. Pilgrim and G. de P. Cotter describe "Some newly discovered Eocene Mammals from Burma" (Records Geol. Surv. of India, vol. xlvii., 1916, p. 42).

The remains are of special importance, as representing the earliest known Asiatic mammals. The Yaw Clays and underlying Pondaung beds in which they are found probably "correspond with some part of the Upper Eocene." Ninety-five per cent. of the specimens from the Pondaung sandstones represent *Anthracotheres*. A Titanotherid, *Telmatherium* (?) *birmanicum*, n. sp., shows by its teeth an intermediate character between the Eocene and Oligocene members of the family.

Clement Reid and J. Groves (Proc. Roy. Soc., B, vol. lxxxix., 1916, p. 252) find that the remains of *Characæ* in the Purbeck limestones are partly silicified. This has enabled them to etch out certain interesting structures connected with the stem, including clusters of small club-shaped processes set on the "sheathing tubes" of a new genus which they style *Clavator*. In addition to the photographs of specimens, which are faithfully given, a sketch would be welcome showing the author's reconstruction of the plant in its habit as it lived.

The investigation of the Mesozoic floras of Queensland has been aided by the discovery of a Cretaceous marine fauna below plant-beds that were supposed to be Triassic (A. B. Walkom, "Flora of the Ipswich and Walloon Series," Queensland Geol. Survey, Publication No. 252). It is possible that the two underlying series dealt with in the present memoir may prove to be of Jurassic age. The equisetales of the Ipswich beds have affinities with Rhætic forms.

G. A. J. C.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—A Grace passed the Senate on February 10 approving the establishment of the new research degrees, Master of Letters and Master of Science. The object of these is to encourage students to remain in residence for one or two years after they have completed their work for the Tripos, and engage in research under competent direction. These new degrees are mainly intended for Cambridge graduates, but they will be open to properly accredited students from other universities. The proposal to establish new research degrees has been under careful consideration by the University throughout the greater part of the duration of the war. A suggestion that a doctorate should be awarded to research students of the standing in question was rejected on the ground that the degrees of Litt.D. and Sc.D. were already in existence and demanded a much higher standard of attainments.

The Senate also formally approved the proposal to found an Institute of Agricultural Mechanism in the University. The Board of Agriculture and Fisheries and the Development Commission have had under consideration the question of an institute for investigating problems relating to agricultural machinery, and they suggested that such an institute might be most suitably established at Cambridge in association with the schools of engineering and agriculture, financial support being provided from the Development Fund. The proposal was cordially welcomed by the authorities concerned, and the Senate has authorised the appointment, as soon as the necessary funds are available, of an engineer as director and an agriculturist as assistant-director, the first duties of whom will be to formulate a definite programme of work for the institute.

LEEDS.—In the twelfth annual report of the University of Leeds, for the year 1915-16, attention is specially directed to the generous gifts of Sir James

Roberts, Lord and Lady Cowdray, and Mr. Walter Morrison for the endowment of the chairs of the Russian and Spanish languages and literatures.

Reference is made to the departure of the chancellor, the Duke of Devonshire, on his appointment to the position of Governor-General of Canada.

Rawdon College (Baptist) has been affiliated to the University, following the precedent of Mirfield College (Church of England) and Headingley College (Wesleyan Methodist). In spite of a diminished staff, members of which have been seconded by the Government for war work, the teaching has been maintained with its usual efficiency, and a substantial amount of pure research has been published; in addition to which several of the science and technical departments of the University have continued to give valuable aid to the Ministry of Munitions in connection with the textile industries, leather, and the testing of the raw material for explosives and of the finished product; and to the Royal Society War Committee in the preparation of necessary drugs. The many activities of the University in other departments, such as the training of welfare workers, of munition workers, and of women for farm work, are enumerated on pp. 45 and 46. The total number of day students was 698 (465 men and 233 women), and of evening students 103.

A loss of income through the reduction in the number of students is estimated at several thousand pounds, but the economies effected, together with a special grant from the National Exchequer, have saved the University from financial embarrassment. A list of nearly one thousand students, staff, and members of the University O.T.C. who have joined the Colours is given in an accompanying pamphlet.

LONDON.—Applications for grants from the Dixon Fund for assisting scientific investigations will be received not earlier than April 1, and not later than by the first post of May 15. Particulars of the grants may be obtained from the Academic Registrar, University of London, South Kensington.

An appointment to the Gilchrist studentship for women will shortly be made, and the Lindley triennial studentship of the value of 100*l.* will be awarded. The studentship is open to students qualified to undertake research in physiology, and will be held in the physiological laboratory of the University. Particulars of the candidate's qualifications and of the mode in which he proposes to carry out his research must reach the Academic Registrar by April 30.

The Rosebery prize of 25*l.* for the session 1915-16 of the London School of Economics and Political Science has been awarded to Messrs. W. G. Chapman and W. H. Jarvis for their joint paper on "Workmen's Trains." The Rosebery prize of 10*l.* for the same session has not been awarded.

It is reported from Zurich that, in consequence of lack of coal and the impossibility of heating the buildings, all lectures in the University of Vienna have been suspended since January 29.

MR. C. J. STILL has resigned his position as lecturer and demonstrator in chemistry at the Municipal Technical Institute, Belfast, to become a research chemist with Messrs. Levinstein, Ltd., Manchester.

WE learn from *Engineering* that the Liebig Scholarship Society of Germany has recently been formed, with a capital of upwards of a million marks from German industries, for the purpose of assisting young German chemistry students to proceed with their studies, after their examinations, by working as assistants in the technical high schools.

THE following gifts in America for educational work are announced in *Science*: 200,000*l.* by the Billings family of Chicago to the University of Chicago towards the endowment of the medical school; 10,000*l.* by Mr. J. H. Schiff to New York University for the division of public affairs in the school of commerce; and a bequest by Mr. J. D. Archbold to Syracuse University amounting to 100,000*l.*

ACCORDING to *Science*, a school of fisheries in connection with the University of Washington is to be established within the next two years, provided that the Appropriation Bill for the University is passed as it stands. The passing of the appropriation would make possible the addition to the University staff of an expert authority on fishing and fisheries, increased laboratory space and equipment, and the enlargement of the scope of the University.

PROF. W. RIPPER, having been appointed vice-chancellor of the University of Sheffield in place of the Rt. Hon. H. A. L. Fisher, will be unable to deliver the course of Howard lectures on "Works Organisation and Efficiency" at the Royal Society of Arts in April and May; he will, however, deal with the subject in a paper at one of the ordinary meetings after Easter. Howard lectures on "The National Shortage of Cheap Iron-ore Supplies" will be delivered at the Royal Society of Arts on April 30 and May 7 by Prof. W. G. Fearnside.

By the will of Sir George Franklin, Pro-Chancellor of the University of Sheffield, who died on September 23, 1916, the following sums, among others, have been bequeathed, in the event of his adopted daughter leaving no issue:—25,000*l.* to the University of Sheffield to be applied for founding such chairs (to be called after him) as the council may decide, hoping that a portion may be applied in the foundation of a chair having for its object the advancement of some branch of medical science connected with the relief of human suffering; and 5000*l.* to the Corporation of Sheffield, the income to be applied by the local education committee in providing scholarships tenable at Sheffield University for boys and girls educated at the Central Secondary School.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, January 25.—Sir J. J. Thomson, president, in the chair.—Hon. R. J. Strutt: Spectroscopic observations on the active modification of nitrogen. V. The faint red bands 6394.45, 6468.53, 6544.81, and 6623.52, belonging to the first positive group, truly belong to the afterglow spectrum of nitrogen. The second positive group is entirely absent from the afterglow spectrum. The β and γ groups only appear when oxygen-containing gases are introduced into the afterglow, or are originally present in the nitrogen used. Using nitrogen that only gives the β and γ bands very faintly, it is found that oxygen or nitric oxide added to the afterglow brings in the β and γ bands with a certain relative intensity which may be called the standard. Carbon dioxide gives greater relative intensity to the β bands, and carbon monoxide to the γ bands. If nitric oxide or nitrogen peroxide is introduced in sufficient quantity into the overglow, the β and γ groups disappear and a visually greenish continuous spectrum is substituted. Nitric oxide in a blow-pipe flame gives this same greenish continuous band, together with the γ , but not the β , group. Chemical tests show that when oxygen is introduced into the afterglow there is no detectable oxidation of nitrogen, and certainly not nearly enough to account for the β and γ bands on the view that