

SEVERAL representatives of British universities are now in Belgium as guests of the Belgian Government, in order to examine, among other matters, an arrangement for the exchange of teachers and students between British and Belgian universities.

THE under-mentioned staff appointments have been made at the Bradford Technical College:—*Head of Department of Chemistry*: Prof. R. B. Abell. *Lecturer in Chemistry*: Mr. H. P. Starck. *Head of Department of Biology*: Mr. A. Malins Smith. *Head of Department of Dyeing*: Dr. L. L. Lloyd.

ON November 22 President Poincaré inaugurated the French University of Strasbourg. Every endeavour is to be made to attract to the University English and Scottish students who before the war found their way to Bonn, Heidelberg, and Göttingen. The Paris correspondent of the *Times* says that the Germans have left behind them credits amounting to nearly 30,000,000 francs (1,200,000l.), which are available for the improvement of the scientific equipment of the University.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, November 13.—Sir J. J. Thomson, president, in the chair.—Lt.-Col. R. McCarrison: The genesis of œdema in beri-beri. Conclusions previously reached by physiological methods of adrenalin estimation are confirmed by chemical methods. Deficiency of certain accessory food factors gives rise to a greatly increased production of adrenalin. Whatever the function of adrenal medulla may be, excessive production of adrenalin, under conditions of "vitaminic" deficiency, is concerned with causation of œdema.—W. Robinson: The microscopical features of mechanical strains in timber and the bearing of these on the structure of the cell-wall in plants. The gross and microscopic characteristics of failure in compression are described for spruce, ash, and pitch pine. It is shown that failure is initiated by the development of microscopic planes of slipping in the cell-walls of the wood. The appearance of the slip planes in the cell-walls is accompanied by profound changes in the behaviour of the latter towards many stains and reagents. These changes are discussed in relation to their possible bearing on the process of lignification of cell-walls. In addition to compression, the failures in longitudinal tension and longitudinal shearing are described.—W. B. Bottomley: The effect of nitrogen-fixing organisms and nucleic acid derivatives on plant-growth. The products of the nitrogen-fixing organism, *Azotobacter chroococcum*, are shown to have a marked effect in increasing the rate of growth of plants of *Lemna minor* in water culture; and the derivatives of nucleic acid, which the author has found can be extracted from raw peat, are also able to act as accessory food substances. The addition of these two separate materials to the culture solution increased the number of plants from 1817 in mineral solutions only to 96,921 and 80,179 respectively in the liquids containing these substances. Not only was the rate of multiplication increased by these organic materials, but the plants supplied with them also maintained their normal size and health. The nitrogen-fixing organism, *Bacillus radicola*, is found to have a similar effect to that of *Azotobacter chroococcum*. A similar series of experiments was carried out with the ash of the crude nucleic acid derivatives and of the *Azotobacter* growth, and neither of these materials had the slightest effect on the rate of multiplication or the health of the *Lemna* plants. It is therefore the

organic material which is so essential for the complete metabolism of these plants, and they cannot maintain their normal growth and vigour for any length of time without the presence of small quantities of organic substances.—Agnes Arber: The vegetative morphology of *Pistia* and the Lemnaceæ. Anatomical examination of the "limb" of the leaf of *Pistia stratiotes*, L., the river lettuce, shows that, in addition to normally orientated vascular bundles, there is a series of inverted bundles towards the upper surface. This fact is regarded as indicating that the leaf is of the nature of a petiolar phyllode. This interpretation is extended to the distal part of the frond of the Lemnaceæ (duckweeds).—W. J. Young, A. Breinl, J. J. Harris, and W. A. Osborne: Effects of exercise and humid heat upon the pulse rate, blood pressure, body temperature, and blood concentration. The results point to the fact that both exercise and humid heat play a part in producing a rise in blood pressure, pulse rate, and rectal temperature. The degree of rise, however, is controlled by atmospheric conditions, which influence the rate of cooling of the body.

Zoological Society, November 4.—Dr. A. Smith Woodward, vice-president, in the chair.—F. Martin Duncan: Photographs showing the actinic quality of the light from a living *Pyrophorus* beetle. In describing the method employed to obtain the records, the author stated that photospectroscopically the greatest intensity of light action appeared to be in the yellow-green region.—E. Heron-Allen: Skiagraphs of the foraminiferan genus *Verneuilina* from examples grown in a hypertonic tank.—Miss Joan B. Proctor: The variation in the number of dorsal scale-rows in our British snakes.—Dr. G. A. Boulenger: Some new fishes from near the west coast of Lake Tanganyika.—Dr. G. Marshall: The species of the *Balaninus* occurring in Borneo (Coleoptera, Curculionidæ).—The Hon. P. Methuen: Description of a new snake from the Transvaal, together with a new diagnosis and key of the genus *Xenocalamus*, and of some *Batrachia* from Madagascar.—Prof. J. P. Hill: The placentation of *Tarsius*.—R. I. Pocock: The external characters of *Tarsius*.

Geological Society, November 5.—Mr. G. W. Lamplugh, president, in the chair.—H. H. Thomas: Some features in the topography and geological history of Palestine. A perfectly new method of illustrating and investigating some branches of physical geology is afforded by aeroplane photography. It seems, first, to illustrate in a very striking and convincing form many geological phenomena, such as the structure of a volcano or the land-forms resulting from erosion, and may be of value in the teaching of the science. In the second place it may, in certain circumstances, become a valuable means of research, especially in connection with river development or denudation in a region which is somewhat inaccessible, or where the surface of the ground is very complicated and the main features are obscured by a mass of less important detail. The lecture dealt principally with the illustration of the physical features of Palestine, and owes its origin to the systematic photo survey made over Central Palestine during the war. The lacustrine deposits of the Jordan Valley and their weathering were shown, and also the form of the drainage channels running down into the main valley. The depression of the Dead Sea with reference to the surrounding country has resulted in cañon formation in many places. Some evidences of faulting at different periods can be distinguished. The Jordan at present forms an interesting study in river development, and many of its main features were demonstrated. The relation of the Jordan to the Orontes

has been considered, and an aeroplane photographic survey of the country between the two rivers indicates that the Jordan probably originated in northern Syria in earlier times. The Syrian portion of the stream has been captured by the younger Orontes, and this has had a very important effect on the whole topography of the Jordan Valley.

Linnean Society, November 6.—Dr. A. Smith Woodward, president, in the chair.—Col. H. E. Rawson: Plant-sports produced at will. The author had observed near Cape Town that shrubs of Kei-apple (*Aberia caffra*) died when they were deprived of the full sun up to a certain altitude in the early morning. This led to experiments in screening plants about this hour for various periods. "Selective screening" resulted in various sports in form and modifications of colour in *Tropaeolum majus*. A special form of *Papaver rhoeas* was obtained and fixed, and other experiments were detailed. The author sums up thus:—The intensity of the light regulates and modifies the coloured bands upon all parts of the plant which have been excited by interference. In Nature selective screening prevails universally, and these experiments suggest that it is deserving of study to bring out its latent potentialities.—L. Hogben: Nuclear phenomena in the oocytes of *Neuroterus*, a gall-fly. The atypical separation of polar bodies in the Hymenoptera parasitica is a consequence of the interruption of the first polar metaphase which appears precociously before the egg is laid. There is no evidence for "amitosis" in the germ-cells of Hymenoptera.—L. V. Lester-Garland: A revision of the genus *Baphia*, Afzel. The author had studied the rich material in the herbaria of the British Museum and at Kew, the number of known species having increased from six (Bentham and Hooker fil. in 1865) to sixty in the present enumeration. The genus is practically confined to tropical Africa, one outlier reaching as far south as Natal, and another as far east as Borneo.

Royal Meteorological Society, November 7.—Sir Napier Shaw, president, in the chair.—Prof. Vilhelm Bjerknes: The structure of the atmosphere when rain is falling. Though a comprehensive mathematical analysis of atmospheric movements might be slow in yielding a general solution of the problem of weather forecasting, yet results of practical value were likely to be obtained during the course of the analysis. Such results had been applied to the forecasting of rain in Norway with a fair measure of success. The basis of the method consisted in drawing "lines of flow" of the air and noting where these showed regions of convergence or divergence. Such lines of flow indicated two lines of convergence in a typical depression: (1) where a warm south-westerly wind blows almost normally against the flank of a relatively cold south-easterly current (the warm air rising over the cold here leads to steady rain over a belt some hundreds of kilometres in breadth); and (2) where the cold south-easterly current, curving round the north side of the centre of depression, cuts under the warm south-westerly wind. This causes a region of squally and showery weather along a second narrower belt. Another important application of the lines of flow lies in the forecasting of thunderstorms. Experience showed that in quiet weather in Norway under the system of diurnal breezes certain points regularly become centres of convergence, and it was at these points that thunderstorms first developed, spreading later to surrounding regions.

Royal Anthropological Institute, November 11.—Sir Everard im Thurn, president, in the chair.—S. H. Warren: A stone-axe factory at Graig-lwyd, Pen-

maenmawr. Stone axes of Neolithic types were extensively manufactured out of the fine-grained (andesitic) margin of the Penmaenmawr intrusion of igneous rock. Blocks of scree, many of them of large size, which fell from the crags were gradually flaked down in successive stages until a satisfactory stone-axe blade, ready for polishing, was obtained. There are examples showing every stage of the process, arrested unfinished through accidental breakage, or because the shape being produced was unsatisfactory. Under the last heading it was excessive thickness of the blade which was the greatest source of trouble. Many of the unfinished "wasters" are broken in half, producing the segmental form to variations of which the unfortunate names of "tea-cosy" and "toe-cap" have been applied. Among the waste of the axe-making industry, which is found in great profusion on the mountain-side, the resemblances to Mousterian flake industries are very striking. Equally instructive parallels are to be observed among the "wasters" with characteristic examples of the earlier Palæolithic industries, notably with the earliest of all, or the pre-Chelles. Axes made of the Graig-lwyd rock are being identified from other localities, and further research along these lines is expected to give interesting results.

MANCHESTER.

Literary and Philosophical Society (Chemical Section), October 24.—Sir Henry A. Miers in the chair.—Sir William J. Pope: The photography of coloured objects. Previous to the war all the various methods of colour photography—the first of which was devised by Prof. Joly, of Dublin—the modern processes of photographic colour-printing, and the present-day panchromatic photographic methods for obtaining a correct rendering in monochrome of parti-coloured objects, were based upon the success which has been attained in imparting sensitiveness throughout the visual spectrum to the ordinary blue-sensitive photographic plate. By staining the plate with erythrosine it becomes sensitive to green and orange; plates so treated are termed orthochromatic. A number of dyestuffs belonging to the class of cyanine dyes discovered by Greville Williams in 1856 are capable, however, of sensitising a photographic plate throughout the whole range of the visible spectrum. Experimental investigation of sensitising dyestuffs was instituted in the chemical laboratories of the University of Cambridge by Dr. W. H. Mills and Sir William J. Pope at the end of 1914. Methods for producing the ordinary sensitising dyestuffs on a technical scale were devised, and all the sensitisers used by the Allies have been prepared in the Cambridge laboratories since the German importation ceased. The best panchromatic plate made in pre-war days possessed about one-third the sensitiveness to red as to blue light. At the present time a very rapid panchromatic plate is on the market which is much faster to red than to blue light; the rapidity of the plate to red light has been thus increased about fourfold.

DUBLIN.

Royal Irish Academy, November 11.—Prof. G. H. Carpenter in the chair.—Mrs. Lilian Porter: Floral development in *Tricuspidaria lanceolata*. Both pentamerous and hexamerous flowers occur. The calyx is quincuncial or irregularly imbricated; the corolla is usually induplicate-valvate, but shows a tendency to contortion; the stamens arise on an enlargement of the receptacle in groups of three alternating with the petals; one stamen is terminal and two are lateral, as in early stages of *Tilia*, thus emphasising the relationship between *Elæocarpaceæ* and *Tiliaceæ*.

PARIS.

Academy of Sciences, November 3.—M. Léon Guignard in the chair.—H. Deslandres: Remarks on the constitution of the atom and the properties of band spectra. The concluding paper of four communications on the same subject. A model atom is proposed, the vibrations of which would fall in with the observed regularities in band spectra.—P. Termier and G. Friedel: The structure of the coal basin of Gard.—P. Sabatier and A. Mailhe: The catalytic reduction of the halogen acetic esters. At 300° C. ethyl chloroacetate can be reduced by hydrogen in presence of nickel to ethyl acetate, some aldehyde and ethylene being formed by secondary reactions. Under similar conditions ethyl dichloroacetate can be reduced to the monochloroacetate, and ultimately to ethyl acetate. The reaction can also be applied to ethyl trichloroacetate and ethyl bromoacetate.—G. Bouligand: Limited and harmonic functions in an infinite domain, zero on the frontier.—S. Stoilow: A classification of ensembles of zero measure.—E. Kogbetliantz: The unicity of ultra-spherical developments.—N. E. Nörlund: The calculus of finite differences.—T. Carleman: Integral equations.—C. Frémont: A new method for testing the fragility of metallic tubes. Two new methods of testing notched tubes by shock are detailed.—M. Amans: Thrust and power of rotating blades unequally bent.—G. Fayet and A. Schaumasse: Return of the periodic comet 1911 VII. (Schaumasse). This comet came under the influence of Jupiter, and its elements were, in consequence, considerably modified, and, although the perturbations have been calculated, the exact position of the comet was a matter of uncertainty. After some months' searching a feeble comet (magnitude 12.5) was discovered on October 29, which is very probably the 1911 VII. comet advanced eighteen days. The positions on October 29 and 30 are given, together with the positions of the comparison stars.—G. Sagnac: Comparison of experiment with the mechanical theory of the undulatory æther.—G. Bruhat: Separators of radiations: application to spectro-polarimetry.—MM. Ledoux-Lebard and Dauvillier: The fundamental constants of the spectrometry of the X-rays. Different values for the reticular distance d_n for calcite vary between 3.0279 and 3.04 (in 10^{-8} cm.). The results of Bragg, Webster, Compton, Uhler, and Cooksey and Siegbahn are reviewed and in part recalculated, and give $3.0346 \cdot 10^{-8}$ cm. as the most probable figure.—P. Loisel: The radio-activity of the water from the large spring at Bagnoles-de-l'Orne and its variations. The amount of radium present in this water varies between 22 and $109 \cdot 10^{-12}$ g. per litre, with a mean of 68. The cause of the variation is unknown.—J. A. Muller: Remarks on chemical decompositions, simultaneous or successive, provoked by physical agents.—J. Guyot and J. J. Simon: The action of sulphuric anhydride and of oleum on methyl alcohol. The preparation of dimethyl sulphate. The action of 60 per cent. fuming sulphuric acid upon pure methyl alcohol in the proportions indicated in the paper gives a yield of more than 90 per cent. of methyl sulphate.—E. Léger: δ -cinchonine and its isomers: its relations with niquine.—M. Stuart-Menteath: Some points on the geology of the Pyrenees.—J. de Lapparent: Devonian rocks containing radiolaria in the valley of Bruche (Alsatian Vosges).—P. Mazé, M. Vila, and M. Lemoigne: The action of cyanamide and dicyanodiamide on the development of maize. Cyanamide (0.162 gram per litre), with or without nitrate, kills the seedling. Dicyanodiamide at the same concentration does not kill the plant, and in presence of nitrate is not toxic. Neither acts as a plant-food.—M. Ringelmann: Researches on the resistance to wear of

parts of agricultural machines.—J. Pellegrin: The fresh-water fishes of Morocco.—J. Legendre: The food of *Eleotris Legendrei*. This fish is strictly carnivorous, and during the winter eats its own species.—V. Galippe: Micro-organisms living in paper: their resistance to the action of heat and of time. Living organisms were obtained from filter-paper which had been sterilised in an autoclave at 120° C. Living organisms were also obtained from paper of various ages, the oldest being a papyrus dating from about 200 B.C.—F. d'Hérelle: An epidemic of bird-typhus.

MELBOURNE.

Royal Society of Victoria, October 9.—Mr. J. A. Kershaw, president, in the chair.—F. Chapman: Notes on a collection of Tertiary fossils from the Ooldea Soak, South Australia. The author identifies two sets of fossils, the older series being Miocene (Janjukian), and the younger a raised beach deposit of older Pleistocene age. The most remarkable of the Miocene fossils is *Orbicella (Heliastrea) tasmaniensis*, which hitherto has been confined to the Miocene of Tasmania. This appears to indicate the former existence of land across the Great Bight connecting a lost remnant of the former southerly extension of the Australian continent. The later, Pleistocene, deposits at Ooldea contain the foraminifer Orbitolites, now extinct in these latitudes. The Miocene determinations in this area confirm Prof. J. W. Gregory's and Mr. J. T. Jutson's views of the age of similar limestones in Western Australia.—A. J. Ewart and J. R. Tovey: Contributions to the flora of Australia, No. 28. Two new species are described, *Casuarina Helmsi* and *Plagianthus monoica*, and the appearance of a number of new naturalised aliens, of which one, *Lolium subulatum*, has proved a useful grass in dry districts. An observation is recorded on a Moreton Bay fig, a large tree of which was ringed at the outbreak of the great war, but did not die until the declaration of peace. The death of the tree was due to the starvation of the roots, and as the young wood was removed the older wood retained the power of conducting water indefinitely. Data are also given in regard to the growth-expansion of an elm which appear to throw doubt upon Trowbridge and Weil's conclusion that frost cracks are formed, not by the expansion of frozen water, but by the contraction of the wood of the tree.

SYDNEY.

Royal Society of New South Wales, October 1.—Prof. C. E. Fawsitt, president, in the chair.—G. J. Burrows: The hydrolysis of urea hydrochloride.—Prof. O. U. Vonwiller: Notes on the elastic properties of selenium. Selenium in the vitreous form shows viscosity effects like those of pitch. When distorting forces are applied, in addition to the immediate elastic strain, disappearing with removal of the forces, there is a continuous yielding, the distortion increasing so long as the forces are applied. The rate of movement is much greater when the substance is illuminated than when it is in darkness. This effect of light has not hitherto been recorded. Selenium in the crystalline form shows the viscosity effect, but it is very much less than with the vitreous modification.

BOOKS RECEIVED.

Elementary Calculus. By C. H. P. Mayo. Pp. xx+345+(Answers) xxxix. (London: Rivingtons.) 10s.
School Mechanics. Part. i. School Statics. By W. G. Borchardt. Pp. viii+266. (London: Rivingtons.) 6s.
Manganese Ores. By A. H. Curtis. Pp. x+118. (London: J. Murray.) 3s. 6d. net.