

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—The University has gratefully accepted an offer received from Mrs. King, of Worthing, to give 100*l.* 5 per cent. War Stock for the establishment of a scholarship for research work on fevers, in memory of her daughter, Nita King, a member of a Voluntary Aid Detachment, who died of cerebro-spinal fever in France.

LONDON.—Prof. Bernard Pares, professor of Russian history, language, and literature in the University of Liverpool, has been appointed the first incumbent of the chair of Russian which has been established by endowment from the London County Council, and will be tenable at King's College.

The degree of D.Sc. (Economics) has been conferred on Mr. A. D. Smith, an internal student, of the London School of Economics, for a thesis entitled "The Development of Rates of Postage."

DR. ARNOLD EILOART has been appointed assistant lecturer in chemistry, and Mr. J. T. Westwood assistant lecturer in mechanical engineering, at the Technical College, Huddersfield.

MISS E. C. TALBOT, of Margam, has presented to the council of University College, Cardiff, a benefaction amounting to about 30,000*l.*, which will produce a salary of 1500*l.* per annum for the purposes of a chair in preventive medicine. The first occupant of the chair is to be nominated for election by the council by an expert board, of which Sir Wm. Osler is to be chairman.

PARTICULARS of a novel form of technical instruction have reached us from America. A winter school for the training of librarians is to be held at the Riverside Public Library, Riverside, California, from January 7 to March 2 of next year, and the services of numerous experts in library administration have been secured as lecturers and demonstrators. Among the subjects of lectures included in the attractive programme offered to intending students are:—The library as a museum, high-school libraries, library mechanics and handicraft, cataloguing and classification, office filing and indexing, and binding and repair work.

THERE is evidence that the need for improved technical education in France is engaging the attention of the authorities. The question was first raised a year ago by a paper by M. Léon Guillet in the *Bulletin* of the French Society of Civil Engineers for October-November, 1916. The meeting at which the paper was read was presided over by the Minister of Commerce and Industry, and out of the discussion which arose a committee was formed for the purpose of submitting recommendations to the Minister mentioned. Discussion was invited from persons not members of the society, and the results are published in the *Bulletin* of the society, January-April, 1917, and the *Revue de Métallurgie*, May-June, 1917. A summary of the committee's recommendations also appears in the September-October number of the *Bulletin de la Société d'Encouragement pour l'Industrie Nationale*.

THE Committee on the Neglect of Science has published an article by Sir Ray Lankester on the new scheme of examination for Class I. of the Civil Service. This is of considerable interest to those concerned with the position to be occupied by science in secondary-school and university education in the future. An admirable summary of the report of the Government Committee under the chairmanship of Mr. Stanley Leathes is embodied in this statement, and Sir Ray Lankester frankly admits that the new proposals are a great advance in the direction desired by the Neglect of

Science Committee. The Government Committee, in its report, has, however, contented itself with attempting to secure equality of opportunity to all branches of learning, and considers that the schools and universities should do the rest. Whether the theoretical advance will prove of practical value remains to be seen, for the older universities and great public schools are, without exception, dominated by the "classics." In the concluding sentence of Sir Ray Lankester's article the position is summed up as follows:—"Mr. Stanley Leathes's Committee, instead of rescuing education from the professional vested interests of the classical schoolmasters, hands back the victim, after many professions of good will, to the tender mercies of those who are banded together to starve, torture, and discredit her, and remorselessly to maintain the domination and the pecuniary allurements of the 'classical system.'"

SOCIETIES AND ACADEMIES:

LONDON.

Royal Society, December 13.—Sir J. J. Thomson, president, in the chair.—Prof. B. Moore: The formation of nitrites from nitrates in aqueous solution by the action of sunlight and the assimilation of the nitrites by green leaves in sunlight. Dilute solutions of nitrates exposed either to sunlight or to a source of light rich in light-energy of short wave-length (such as light from mercury vapour arc enclosed in silica) undergo conversion of nitrate into nitrite. There is an uptake of chemical energy in this reaction transformed from light-energy, as in the formation of organic carbon compounds in foliage leaves; it is to be added to the relatively small number of endothermic reactions induced by light. When green leaves are immersed in nitrate solution comparatively little nitrite accumulates, indicating that nitrites are rapidly absorbed by the green leaf. Nitrates taken up by plants from soil would, in presence of sunlight, be changed to nitrites, which are much more reactive than nitrates. This indicates that the early stages of synthesis of nitrogenous compounds are carried out in the green leaf and aided by sunlight. Rain-water collected for a considerable time contains no nitrites, all having been oxidised to nitrates, but if exposed to bright sunlight or ultra-violet light for a few hours a strong reaction for nitrites is always obtained. There is no hydrogen peroxide or ozone in air at surface level. The fresh odour in open air, commonly referred to as "ozone," is probably nitrogen trioxide, which at high dilutions has the odour of ozone. The oxides of nitrogen are probably formed by the action of sunlight, rich in ultra-violet rays, in upper regions of the atmosphere upon air and aqueous vapour.—J. R. Moir: The transition from rostro-carinate flint implements to the tongued-shaped implements of river-terrace gravels. Seven flint implements, exhibiting a beak-like profile, have been found, associated with early palæoliths, in certain ancient valley gravels. The implements described exhibit certain characteristics of form only before seen in the rostro-carinates discovered beneath the Pliocene Red Crag and in other pre-Palæolithic deposits in East Anglia. They show also by the nature of their flaking and provenance that they are of early Palæolithic age. The dual character of these specimens is very marked and points to the conclusion that the knowledge of the manner in which to make a palæolith was acquired by long experience in producing rostro-carinates. This view finds support in the experiments in flint-flaking which have been carried out. The specimens have been recovered from a wide area in southern England, and it seems reasonable to regard them as presenting transitional types linking the rostro-carinates with the earliest palæoliths.

Physical Society, November 23.—Mr. W. R. Cooper, vice-president, in the chair.—Prof. J. W. Nicholson: Some problems of stability of atoms and molecules. The paper is mainly concerned with the possible existence and stability of atoms, and of molecules formed after the manner suggested by Stark, the link between the atoms in a molecule being provided by a stationary electron on the molecular axis. Atoms on the Rutherford model, though dynamically unstable, are stable for the simple vibrations ordinarily excited; but it is shown in the paper that atoms with such a stationary electron have a much more limited degree of stability. Moreover, they cannot exist even in an undisturbed state unless they are endowed with a negative charge, for no steady motion is possible, and this conclusion extends even to atoms regulated according to a dynamics such as that of Bohr. Stark's conclusions do not, therefore, survive a quantitative treatment, and molecules cannot be formed in the manner he supposes. The paper also discusses the more symmetrical problem, in which there are two such stationary electrons in an undisturbed atom, and it is shown that systems with a transitory existence, which are known by their spectra to occur in the solar corona, are apparently unaccompanied by the still more transitory systems which would be formed by the attachment of an electron after the manner of Stark. This is a further argument against the possibility that two atoms in a molecule can be linked by a single electron, or by two electrons, which attract both atoms.—T. H. Blakesley: Uses of certain methods of classification in optics. This consisted of an account of the additions which, in the course of the intervening years, the author had been enabled to make in the general diagram of optical properties, first communicated by him to the Physical Society in the year 1903 (Proceedings, vol. xviii., p. 591).

Geological Society, December 5.—Dr. Alfred Harker, president, in the chair.—E. Heron-Allen and J. E. Barnard: Application of X-rays to the determination of the interior structure of microscopic fossils, particularly with reference to the dimorphism of the Nummulites. Mr. Heron-Allen said that in the year 1826 d'Orbigny published among the *nomina nuda* that compose his "Tableau Méthodique de la Classe Céphalopodes" the name *Rotalia dubia*. G. Berthelin was the first investigator to make use of the "Planches inédites" which had been partly completed by d'Orbigny for the illustration of his unpublished work upon the Foraminifera. Berthelin made for his own use careful tracings of 246 of A. d'Orbigny's unfinished outline-sketches; among them was the sketch of *R. dubia*. On the death of Berthelin the tracings passed into the possession of Prof. Carlo Fornasini, of Bologna, who reproduced them all between the years 1898 and 1908. Fornasini's opinion was that the organism depicted by d'Orbigny was probably referable to the Ostracoda. Messrs. A. Earland and E. Heron-Allen, while examining the material brought by Dr. J. J. Simpson from the Kerimba Archipelago in 1915, discovered undoubted Foraminifera of an unknown type, which resembled Berthelin's tracing. Prof. Boule sent the d'Orbigny type-specimen to London, and the Rhizopodal nature of *R. dubia* was established. It is not a *Rotalia*, and it must await determination until more specimens are obtained. It has been named provisionally *Pegidia papilata*. Mr. Barnard experimented with the object of ascertaining the interior structure of the shell by means of the X-rays. A skiagraph of the dense test of *Biloculina bulloides*, d'Orb., shows the arrangement of the earlier chambers as clearly as it is indicated in Schlumberger's sections. The application of X-rays to the dense imperforate shells, *Cornuspira foliacea* (Philippi),

produced skiagraphs showing the dimorphism of the shells. The skiagraph of *Astrorhiza arenaria*, Norman, shows the internal cavities that contained the protoplasmic body. Two arenaceous forms, *Botellina labyrinthica*, Brady, and *Jaculella obtusa*, Brady, are distinguished at once by skiagraphs: Mr. Barnard afterwards experimented on still more difficult material. *Operculina complanata*, DeFrance, the umbilical portion of which is obscured by secondary shell-substance, furnished a skiagraph that showed curious distortions of the internal septa. The determination of the Nummulites, depending on a knowledge of the internal structure, is facilitated by the application of X-rays.

Optical Society, December 13.—Prof. F. J. Cheshire, president, in the chair.—J. W. French: Proposed standard system of optical notation and sign convention. The author pointed out that owing to the non-existence of standards, confusion often arises in the interpretation and use of optical formulæ, due to indefiniteness as to the sign convention employed in their construction. The suggested scheme, which contained about one hundred clauses, dealt with the notation for points, lengths, and angles and the sign convention for lengths and angles. Certain of the quantities were dealt with historically, as, for example, the substitution of the Greek letter " μ " for " n ," to represent a refractive index. It was suggested that the more controversial clauses might be discussed by a committee which would issue supplementary lists that would ultimately cover all points, including the definition of terms and other standards.—T. Smith: Optical nomenclature and symbolism. The author dealt with the definitions of fundamental quantities, and conventions for positive directions, angles, curvatures, and powers. The necessity for a number of new symbols was shown; a special symbolism was required for oblique pencils. The new symbols proposed for frequently recurring quantities were explained.

Linnean Society, December 13.—Sir David Prain, president, in the chair.—Capt. A. W. Hill: Seeds enclosed in a stony endocarp and their germination. In certain genera the seed or seeds are protected by inclusion within a stony endocarp. In such cases it is found that definite provision is made during the development of the fruit for the liberation of the seeds on germination from their stony envelope. In the case of *Prunus* and similar normally one-seeded fruits splitting apart of the two halves of the endocarp takes place, but in such three- to five-seeded fruits as *Canarium*, *Sclerocarya*, *Dracontomelon*, *Saccoglottis*, *Aubrya*, etc., special fenestræ or opercula are provided which are pushed away by the germinating embryo. In *Davidia* not only are special fenestræ removed, but also portions of the intervening skeletal structure of the endocarp. The remarkable fruit of *Pleiogynium* encloses several seeds which germinate without any disintegration of the endocarp.—Mrs. Haig Thomas: Skins illustrating results obtained in crossing species of pheasants. The cross between silver pheasant (*Gennaues nycthemerus*) and Swinhoe's pheasant (*G. swinhoei*) gave a remarkable series of segregating forms in the F_2 generation. Amongst these were birds scarcely distinguishable from *swinhoei*. The F_1 form was a combination very distinct from the parental types; and, judging from the frequency with which some of the new forms occurred in F_2 , it was evident that they behaved as dominants and likely that they could have been bred true. The cross *Phasianus versicolor* \times *P. formosanus* had been made reciprocally. Crosses involving several pairs showed that there were consistent differences according to the way in which the cross was made.

Royal Meteorological Society, December 19.—Major H. G. Lyons, president, in the chair.—P. Bolton: The computation of wind velocity from pilot balloon observations. In this problem the required wind velocities occur as the bases of a succession of triangles in which two sides, a , b , and the included angle C are obtained by simple calculations from theodolite observations. To solve such triangles *directly* by the ordinary slide-rule method, the two numbers a , b on the logarithmic scale must be brought into coincidence on the logarithmic sine scale with two angles differing by the magnitude of the angle C . When this has been done the other elements of the triangle can be read off directly. The paper suggests a means of reducing the labour of setting the scales. A prepared chart of logarithmic sine curves is used, which in effect takes the place of the logarithmic sine scale of the slide rule. The other scales are rearranged with the view of reducing the arithmetical work involved in the complete solution of the problem.—E. G. Bilham: The use of monthly mean values in climatological analysis. The objects of the paper are:—(1) To determine to what extent computations based on calendar monthly mean values are vitiated by the fact that the latter are of unequal length; and (2) to provide means of applying numerical corrections on account of errors arising from this cause. The mean month is defined as an exact one-twelfth division of the year, or 30.437 days, and that period is used as the standard to which the results derived from the actual months are reduced. The matter is of special interest in connection with the computation of Fourier coefficients to represent the seasonal variation of a meteorological element such as temperature. Regarding the year as a cycle of 360° , errors arise from the fact that the monthly mean values will in general differ by small amounts from the ordinates of the curve corresponding with 15° , 45° , etc. The corrections to be applied to the original monthly means and to the Fourier amplitudes have been determined. The use of these corrections is suggested as an alternative to the employment of five-day means in cases where special accuracy is required.

CALCUTTA.

Asiatic Society of Bengal, November 7.—Sir Charles Elliot: Zoological results of a tour in the Far East. *Mollusca nudibranchiata (ascoglossa)*. The author describes a new species of Stiliger remarkable in the possession of pointed oral tentacles and tentacular prolongations of the foot. The species was found in pools of brackish water at the edge of the Talé Sap, or inland sea of Singgora, in Peninsular Siam.—S. Kemp: Zoological results of a tour in the Far East. Decapoda and Stomatopoda. In the course of his tour in Japan, China, and the Malay Peninsula Dr. Annandale obtained eighty-five species of Decapoda and Stomatopoda. Considered as a whole, the main interest of this large collection lies in the fact that all the species were obtained in fresh or brackish water. Little attention has hitherto been paid to the habitat of Decapoda, and, as a rule, no indication is to be found in the literature as to whether a species inhabits fresh, brackish, or salt water. Dr. Annandale's collection supplies precise information on this point, and shows that a surprisingly large number of forms have been able to establish themselves in water that is fresh or of greatly reduced salinity.—Karm Chand Mehta: Some observations and experiments on the rust on *Launea asplenifolia*, D.C. The cause of rust on this plant is *Puccinia butteri*. The author has had diseased plants under his observation for a year. He describes the habit and behaviour of the parasite and host, and discusses some microscopic details of the parasite.

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BOOKS RECEIVED.

Creative Psychics: The Art of Regeneration. By F. Henkel. Pp. 81. (Los Angeles: Golden Press.) 25 cents.

A Text-book of Inorganic Chemistry. Edited by Dr. J. Newton Friend. Vol. iv., Aluminium and its Congeners, including the Rare Earth Metals. By H. F. V. Little. Pp. xx+485. (London: C. Griffin and Co., Ltd.) 15s. net.

The Cause, Prevention, and Treatment of Cancer and other Diseases. By Lt.-Col. W. H. Hildebrand. Pp. viii+163. (London: Cole and Co.)

James Geikie: The Man and the Geologist. By Dr. M. I. Newbigin and Dr. J. S. Flett. Pp. xi+227. (Edinburgh: Oliver and Boyd; London: Gurney and Jackson.) 7s. 6d. net.

DIARY OF SOCIETIES.

SATURDAY, DECEMBER 29.

ROYAL INSTITUTION, at 3.—Electricity and Electric Currents: Prof. J. A. Fleming.

TUESDAY, JANUARY 1.

ROYAL INSTITUTION, at 3.—The Electric Current as a Heater and Chemist: Prof. J. A. Fleming.

THURSDAY, JANUARY 3.

ROYAL INSTITUTION, at 3.—Electricity as an Illuminator and Doctor Prof. J. A. Fleming.

CHILD STUDY ASSOCIATION, at 5.30.—Discussion: The Education of the Clever Child: Openers: G. F. Daniell and Miss M. Berryman.

SATURDAY, JANUARY 5.

ROYAL INSTITUTION, at 3.—Electric Dynamos, Motors, Transformers, and Railways: Prof. J. A. Fleming.

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