

for human weakness and human reticences. Such is the Teutonic form of efficiency, against which the armies of England and India are battling in Europe at this moment. The efficiency which we want in the India of to-day is of a different and a better type. It seeks for a steady improvement of the conditions which stimulate self-development; it does not despise the feelings and frailties of mankind; and it moves through the portals of conviction towards the goal of the ideal. It is in this sense that efficiency must ever be the rally-cry of our University. We can never stand still but must always move forward, striving for the best, with a divine discontent for all the spurious imitations and the makeshifts which we may be asked to accept in its place. In the ordinary life of the world we have constantly to endure the second best or something still poorer, in art, in music, in literature, in our companionships. But let us not foist the second best, if we can help it, on our students. The temptations to be content with it will assail them soon enough. Be it our part to give them the best we can command, and to help them to enjoy and desire it. In this way shall we raise the true efficiency of our University and ensure for our graduates their proper place in the van of Indian progress."

#### SOCIETIES AND ACADEMIES.

##### MANCHESTER.

**Literary and Philosophical Society**, December 1.—Mr. F. Nicholson, president, in the chair.—C. H. Lander: Graphical determination of the stresses in the main spars of monoplanes. One of the most complex problems connected with the design of beams continuous over several supports is presented by the main spars of monoplanes. The stresses are made up of direct compressions and those due to bending moments, the determinations of the latter being most complicated. The lift of a wing surface for small angles increases with the angle of incidence and with the square of the velocity: at a speed of about 60 miles per hour the lift of a certain type of curved wing varies from 5 lb. at  $4^\circ$  up to a maximum of 11.7 lb. at  $17^\circ$ ; at 120 miles per hour these lifts would be four times as great. Most monoplanes are designed for a load of  $0.007V^2$  lb. per square foot,  $V$  being the designed speed in feet per second. From this the loading on the spar may be determined for different angles. The method of solution of the stresses then varies according to the manner in which the lift wires are attached to the spar. The direct application of Claxton Fidler's method of solution of continuous beams may be used when the lift wires are attached to the spar at the neutral axis. When these wires are attached at the lower side of the spar, the longitudinal moments induced may be assumed and their diagrams plotted as though the spars were discontinuous over the points of support, characteristic points obtained, and the true base line drawn by Fidler's method. A modification of Fidler's method can also be used in the case of wires badly adjusted or injured.—Prof. W. H. Lang: Studies in the morphology of *Isoëtes*. Pt. I.—The general morphology of the stock of *Isoëtes*. The external form and gross anatomy of the two-lobed stock of *Isoëtes lacustris* is described. The upper portion of the stock corresponds to the shoot, the lower portion behaves as a downwardly growing rhizophore, on which roots arise in acropetal succession. The position of the deeply-seated growing line of the rhizophoric region corresponds to that of the secondary meristem of the base of the stem, but its mode of growth is different. The growth proceeds, and the roots are brought to the surface, as if the lower apex

were not only drawn out and deeply sunken, but the opposed sides of the depression were congenitally united. When the roots are exposed by the splitting process at the groove they stand exogenously on the surface. This mode of interpreting the morphology of *Isoëtes* proves satisfactory when applied either to the explanation of the growth of the stock itself or in comparisons with *Lepidodendrea* and *Pleuromeia*. The rhizophoric region of the stock of *Isoëtes* is regarded as the structure in existing plants most closely comparable to the stigmarian base of the *Lepidodendrea*.

December 15.—Mr. F. Nicholson, president, in the chair.—F. R. Lankshear: Quantitative absorption spectra. Part ii.—A new ultra-violet photometer. A new ultra-violet photometer was described, in which, by a system of condensers and prisms, two equal beams of light are obtained. One beam passes through the absorbing liquid and the other through a central adjustable sector. Corrections due to the intermittent nature of light thus become unnecessary.—W. C. Jenkins and E. L. Rhead: Some notes on aerolites: the Appley Bridge aerolite of October 13, 1914. A summary of observations made on the mass found at Appley Bridge, and the results of preliminary analyses of its chemical composition.

##### PARIS.

**Academy of Sciences**, December 7.—M. P. Appell in the chair.—Haton de la Goupillière: A property of arithmetical progressions.—J. Bostler and H. G. Block: Observations of the eclipse of the sun of August 21, 1914, made at Strömsund (Sweden) by the expedition from Meudon Observatory. The main object of the expedition was to photograph the spectrum of the corona in the whole visible field, including the red, and, if possible, obtain some indications of its velocity of rotation. The weather conditions proved extremely favourable. The results of the observations are summarised on p. 460.—M. Skossarewsky: The electrolytic dissociation of acetylene and its metallic derivatives. The electrolytic dissociation of acetylene and its monosodium derivative has been proved by measurements of conductivity in solution in liquid ammonia. The dissociation increases with the dilution of the solution. The temperature coefficient of the specific conductivity is about 2 per cent. for  $1^\circ$  C., and is nearly independent of the concentration.—M. Tiffenau: Molecular transposition in the cyclohexane series: passage to the cyclopentane series. Orthiodo-hydroxycyclohexane, treated with silver nitrate, gives the aldehyde of cyclopentane-carboxylic acid. The removal of hydriodic acid causes the opening of the ring, and passing from a cyclohexane to a cyclopentane derivative. Homologues of the cyclohexane alcohol behave in a similar manner.—Marcel Le Brazidec: Molecular transposition in the phenylcyclohexane series: migration of a phenyl group without passage to the cyclopentane series. Iodo-phenylcyclohexanol, on elimination of hydriodic acid with silver nitrate gives phenylcyclohexanone, a cyclopentane derivative not being formed.—C. Grossmann: The uranium minerals of Fiadanana, Madagascar. Externally the mineral resembles euxenite and contains from 12 to 40 per cent. of  $U_2O_4$ . The mineral with the higher proportion of uranium possesses a radio-activity nearly double that of pure black uranium oxide, and may prove a possible source of radium compounds.—Maurice Lugeon: Some consequences of the presence of crystalline sheets underlying the Niesen zone (Switzerland).—Fernand Guéguen: The alteration termed "piqûre" of sail and tent canvas. The loss of strength of canvas in certain spots after exposure to the open air is shown to be due to the

development in the tissue of various moulds. It does not seem to be due to accidental contamination of the fabric, but is caused by the development, under the influence of moist heat, of filaments of mould present in the new material. Sterilisation by steam is suggested as the most practical means of dealing with the trouble.

### BOOKS RECEIVED.

Electrical Engineering in India. By J. W. Meares. Pp. xxxvi+517. (Calcutta: Thacker, Spink and Co.; London: W. Thacker and Co.) 15s.

Preparations and Exercises in Inorganic Chemistry. By W. Lowson. Pp. vii+128. (London: Methuen and Co., Ltd.) 2s. 6d.

Mikrographie des Holzes. By Dr. J. W. Moll and H. H. Janssonius. Vierte Lieferung. Pp. 336. (Leiden: E. J. Brill.)

The Fauna of British India, including Ceylon and Burma. Mollusca II. (Trochomorphidæ—Janellidæ). By G. K. Gude. Pp. xii+520. (London: Taylor and Francis.) 20s.

Memoirs of the Geological Survey, Scotland. The Geology of Caithness. By C. B. Crampton and R. G. Carruthers. Pp. viii+194. Sheets 110 and 116, to accompany the foregoing. (London: H.M.S.O.; E. Stanford, Ltd.) 4s.

Magnetism and Electricity, including the Principles of Electrical Measurements. By S. S. Richardson. New edition. Pp. ix+598. (London: Blackie and Son, Ltd.) 4s. 6d.

Pottery, for Artists, Craftsmen, and Teachers. By G. J. Cox. Pp. ix+200. (London: Macmillan and Co., Ltd.) 5s. 6d. net.

Canada. Department of Mines. Geological Survey. Memoir 41. The "Fern Ledges" Carboniferous Flora of St. John, New Brunswick. By M. C. Stopes. Pp. vi+142+xxv plates. Memoir 54. Annotated List of Flowering Plants and Ferns of Point Pelee, Ont., and Neighbouring Districts. By C. K. Dodge. Pp. 131. Mines Branch. Lode Mining in Yukon. By T. A. MacLean. Pp. ix+205. The Copper Smelting Industries of Canada. By Dr. A. W. G. Wilson. Pp. xiv+184+plates. (Ottawa: Government Printing Bureau.)

The Rare Earths: their Occurrence, Chemistry, and Technology. By S. I. Levy. Pp. xiv+345. (London: Edward Arnold.) 10s. 6d. net.

Numerical Trigonometry. By N. J. Chignell. Pp. 126+xii. (Oxford: Clarendon Press.) 2s. 6d.

The Principles and Practice of Judging Live-Stock. By Prof. C. W. Gay. Pp. xviii+413. (London: Macmillan and Co., Ltd.) 6s. 6d. net.

The Chemistry of Cyanogen Compounds and their Manufacture and Estimation. By H. E. Williams. Pp. viii+423. (London: J. and A. Churchill.) 10s. 6d. net.

Huxley Memorial Lectures to the University of Birmingham. With an Introduction by Sir Oliver Lodge. Pp. 157. (Birmingham: Cornish Bros., Ltd.) 5s. net.

Hazell's Annual for 1915. Edited by T. A. Ingram. Pp. 592. (London: Hazell, Watson, and Viney, Ltd.) 3s. 6d. net.

The Chemistry of the Radio-Elements. By Prof. F. Soddy. Part i. Second edition. Pp. viii+151. (London: Longmans and Co.) 4s. net.

Catalogue of the Lepidoptera Phalænæ in the British Museum. Supplement, vol. i. Catalogue of the Amatidæ and Arctiadæ (Nolinæ and Lithosianæ) in

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the Collection of the British Museum. By Sir George F. Hampson. Pp. xxviii+858. (London: Longmans and Co., and others.) 25s.

The Pupil's Class-Book of Geography: The British Dominions. By E. J. S. Lay. Pp. 128. (London: Macmillan and Co., Ltd.) 6d.

First Book of Physiology and Hygiene. By G. D. Cathcart. Pp. vi+158. (London: Macmillan and Co., Ltd.) 1s. 6d.

Scottish National Antarctic Expedition. Ornithology of the Scottish National Antarctic Expedition. By W. E. Clarke, Dr. R. N. R. Brown, and L. N. G. Ramsay. Pp. 203-306+vii plates. The Seals of the Weddell Sea: Notes on their Habits and Distribution. By Dr. R. N. R. Brown. Pp. 185-198+ix plates. (Edinburgh: Scottish Oceanographical Laboratory.) 11s. and 3s. 6d. respectively.

Science and Religion. By Seven Men of Science, speakers in Browning Hall during Science Week, 1914. Pp. 138. (London: W. A. Hammond.) 1s. net.

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