

the year 1917-18 as follows:—25l., Mr. Nilratan Dhar, for research on temperature coefficients of chemical reactions; 30l., Mr. H. R. Nettleton, for researches on the measurement of the Thomson effect in wires; 20l., Dr. D. Ellis, towards the cost of publication of a book on "Iron Bacteria"; 100l., Mr. Birbal Sahni, to enable him to carry out botanical investigations at Cambridge.

Regulations have been adopted for the degree of B.Sc. in horticulture for external students.

THE appointment is announced of Mr. G. Gerald Stoney to be professor of mechanical engineering in the Manchester School of Technology. Mr. Stoney has had a seat on the Board of Inventions and Research under Lord Fisher, and on the Engineering Committee of the Advisory Council for Scientific and Industrial Research. Prospectuses of the university courses in the School of Technology for the session 1917-18 are now available, and provide full particulars of the work expected from students proceeding to the degrees of Bachelor of Technical Science and Master of Technical Science.

THE report of the conference convened by the Workers' Educational Association, held on May 3 last in the Central Hall, Westminster, has just been published. The findings of the conference are the more impressive since they represent the conclusions of a widely representative body of delegates, numbering between 700 and 800, not only from labour organisations and co-operative societies, but from educational associations, teachers' organisations, local authorities, and the universities. The resolutions call for the establishment of small and easily accessible nursery schools for the due care and nurture of young children from two years of age until six; the abolition of all exemptions from school attendance up to fourteen; the raising of the school age up to fifteen within five years, and to sixteen within three further years; the provision of maintenance allowance over the age of fourteen, and the abolition of all child labour for wages during compulsory full-time attendance; the immediate reduction of the size of classes to forty pupils, and ultimately to thirty; the establishment of adequate medical inspection and treatment of all scholars and improvement in school meals; better facilities for games, swimming, and open-air teaching, together with means of conveyance where children reside more than a mile from school. The policy of the conference was declared to be the establishment of a broad highway so as to ensure the highest facilities of education to all capable scholars. To this end it is proposed to limit the hours of labour for all young persons under eighteen years of age to twenty-five hours per week, and to establish compulsory part-time education for such persons of not fewer than twenty hours per week, and that such education shall be directed to the full development of the bodies, minds, and characters of the pupils. Further, it is demanded that free, full-time secondary education shall be provided, together with an adequate supply of scholarships to enable scholars of ability to enter a university. In order to secure the necessary supply of good teachers of both sexes, it is claimed that adequate salaries shall be paid and pensions provided with equal pay for equal service. Each local education authority is to be required to submit a complete scheme for its area to the Board of Education, 75 per cent. of the total cost of which shall be met from the National Exchequer, and where the conditions are inadequately fulfilled there shall be a reduced percentage.

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SOCIETIES AND ACADEMIES.

PARIS.

Academy of Sciences, June 18.—M. A. d'Arsonval in the chair.—J. **Boussinesq**: The limiting equilibrium of a sandy mass under given conditions.—C. **Guichard**: Surfaces such that the Laplace equation of the network formed by the lines of curvature is integrable.—A. **Righi**: The ionisation of the X-rays in a magnetic field. Earlier work by the author on the influence exerted by the magnetic field on the phenomena of discharge pointed to the existence of a new action of the field on gases tending to increase their ionisation. This effect, to which the name magneto-ionisation is given, may be explained on the assumption that the electromagnetic force acting upon a satellite electron in the atom causes a variation in the energy necessary to separate the electron from the atom. In the present paper a direct experimental proof of this effect is given.—R. Bourgeois was elected a member of the section of geography and navigation in succession to the late M. Hatt, and E. Solvay a correspondant for the section of chemistry in the place of the late Sir Henry Roscoe.—G. D. **Birkhoff**: A generalisation of Taylor's series.—H. **Duport**: The law of universal attraction.—Ed. **Chauvenet**: The zirconyl sulphates. The six combinations of zirconia and sulphuric acid described in a previous paper are considered from the points of view of modes of formation and probable composition. All are represented as zirconyl salts containing the group ZrO.—J. **Bougault**: The action of iodine on alkalis. A study of the oxidising powers of iodine in presence of caustic soda, sodium carbonate, and sodium bicarbonate.—M. **Guerbet**: The condensation, under the action of potash, of cyclohexanol with isopropyl alcohol. The synthesis of cyclohexylisopropyl alcohol.—M. **Sauger**: The time of fall of a stone to the centre of the earth. The problem is considered, taking into account the variation of the density of the globe with the depth. The time found is 19m. 15s.; on the assumption of a density equal to the mean density the time found is 79s. greater.—L. **Daniel**: The preservation of our oaks. The spread of the fungus causing the *Blanc du Chêne* is shown to be connected with the method of lopping the trees. The usual practice is a drastic lopping every seven years. This destroys the normal moisture equilibrium of the tree; the absorptive apparatus remains intact, but the reduction in the leaf surface causes the retention of an excess of moisture in the tissues, a condition favourable to the spread of the fungus. It has been proved that trees just lopped are more easily attacked than those lopped the preceding year; the latter are more easily attacked than those trees lopped several years earlier. A modified system of lopping is proposed, but it is pointed out that State action will probably be necessary, since the interests of the farmers and owners are opposed, and it is not likely that the cultivators will willingly change their present system of working.—Mme. Marie **Phisalix**: The parotid poison gland of the Colubridæ.—W. **Kopaczewski**: Researches on the serum of *Muraena helena*. The serum of this species is very toxic. A dose of 0.05 c.c. is fatal to a guinea-pig, an amount corresponding to 4.19 mgr. of dry substance. 0.4 c.c. of serum killed a rabbit in four minutes, and 1.5 c.c. killed a dog (5 kilograms) in seventy minutes.—A. **Krempf**: A new endoglobular hematozoa in man (*Haemogregarina hominis*). The organism was isolated from the hypertrophied spleen of a Chinese from the neighbourhood of Tientsin. Only one case is described, but it would appear that the disease caused by this organism is common in some parts of China.

June 25.—M. A. d'Arsonval in the chair.—A. Lacroix : The transformation of some basic eruptive rocks into amphibolites.—G. Bigourdan : The observations attributed to Prince Louis of Valois; and on the astronomer, Jacques Valois. The observations attributed to Prince Emmanuel of Valois (1596 to 1663) were really due to Jacques Valois (or de Valois), whose life is only known through his correspondence.—L. Maquenne and E. Demoussy : The influence of water and mineral matter on the germination of peas. The presence of traces of mineral matter derived from glass favours the germination of seeds, and if it is required to study the process of germination in distilled water, it is necessary to use a quartz condenser in making the distilled water and to store the water in quartz or platinum vessels. Comparative experiments, germinating peas in quartz and glass vessels, always gave a better development of roots in the glass than in the quartz vessels. The magnitude of the effects observed was unexpected, and it is pointed out that in botanical and physiological experiments attention must always be paid to the possible intervention of soluble products derived from the glass.—A. Gautier : An artificial soil, nearly free from all mineral or organic material, suitable for the study of plant cultures and for the examination of the influence of various chemical manures. The medium proposed is powdered charcoal (*braise de boulanger*) first heated to redness, then boiled with hydrochloric acid, and extracted with distilled water. This may advantageously replace glass powder, cotton, or sand media for botanical cultures. It has been especially useful in studying the effects of traces of fluorides on vegetation.—E. Aries : The specific heats of fluids maintained in the saturated state.—G. Julia : Binary indeterminate conjugated forms remaining invariant by a group of linear substitutions.—W. Sierpinski : An extension of the notion of the density of ensembles.—E. Jablonski : Contribution to the study of the most general case of shock in a system of material points submitted to Newton's law.—E. Belot : Some principles applicable to comparative planetography.—P. Th. Dufour : Experimental researches on the terrestrial tetrahedron and the distribution of land and sea. Globules of liquid paraffin wax are immersed in methyl alcohol of the same density as the paraffin, and carried to a temperature slightly above the melting point of the wax. On allowing to cool slowly, the liquid globule remains perfectly spherical. If the bath is kept in motion, so as to produce a regular solidification, symmetrical tetrahedral globules are obtained, with convex faces and rounded points. The effect of variations in the density of the earth's crust on the form assumed by slow cooling is discussed in connection with these experiments.—A. Leduc : The expansion of argon and neon. Internal pressure in the monatomic gases. The coefficient of expansion of argon between 5.47° C. and 29.07° C. is 0.003664; of neon between 11.95° C. and 31.87° C., 0.003669, with a possible error of 2 in the last figure.—P. Chevenard : An anomaly of cementite in carbon steels, annealed, tempered, or half-tempered.—J. Bougault : A new method of estimating aldehydic sugars. The method is based on the oxidation to the corresponding acid by iodine and sodium carbonate, the iodine used being determined. A small correction is required on account of a secondary reaction.—Ph. Glangaud : The ancient glaciers of the Monts-Dore volcanic massif.—L. Moreau : Radiological researches on the angle of inclination of the human heart. The angle of inclination of the normal human heart is usually given in the treatises on anatomy as between 55° and 60°. One hundred subjects examined by a radiological method gave a figure which, in 74 per

cent. of the cases examined, was between 65° and 78°.—L. G. Seurat : The evolution of *Maupasina Weissi*.—H. Vallee and L. Bazy : The active vaccination of man against tetanus. The liquid injected consisted of a tetanotoxin neutralised with a solution of iodine in potassium iodide. Vaccinated rabbits resisted the effect of a quantity of toxin sufficient to kill 2000 kilograms of living substance. The vaccination treatment is more especially proposed to combat latent tetanus.

BOOKS RECEIVED.

- A Bibliography of Fishes. By B. Dean. Enlarged and edited by C. R. Eastman. Vol. i. Pp. x+718. (New York : American Museum of Natural History.)
Bibliography of the Published Writings of H. Fairfield Osborn for the Years 1877-1915. Second edition, Part i., Classified by Subject. Part ii., Chronologic. Bibliography. Pp. 74. (New York : American Museum of Natural History.)
A Chemical Sign of Life. By S. Tashiro. Pp. ix+142. (Chicago : University of Chicago Press; London : Cambridge University Press.) 1 dollar, or 4s. net.
Manuals of Health. I., Food. By Dr. A. Hill. Pp. 64. (London : S.P.C.K.) 9d.

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