

OWING to the increasing interest shown by the public in hygiene and public health, more especially in the national question of the saving of "child and infant life," the governing body of the Battersea Polytechnic has decided to open the Hygiene Department for public inspection on Saturday, November 25, from 3 to 6 p.m. The lecture-rooms and laboratories, together with an exhibition of apparatus and models used for teaching purposes, will be on view. No tickets of admission are required.

IN consequence of so many probable competitors for the Fairchild Scholarship and prizes of the Pharmaceutical Society having been called to the colours, the trustees of the scholarship have decided that the examination for the awards shall not be held in 1917. It has also been decided that an arrangement shall be made by which those who are on service who would be eligible for the 1917 scholarship may, if they shall so desire, be admitted to an examination after the war.

IN August, 1915, the Board of Education gave notice that after 1916 the Lower General Examinations would no longer be held in any subjects of science and technology, but that the Higher General Examinations would for the present be continued. It is now announced that no Lower Examinations will be held in 1917, but that the Board of Education hopes to hold next year Higher Examinations in accordance with its regulations and syllabuses of 1916. After 1917 no Higher Examinations will be held in pure mathematics, theoretical mechanics, heat, magnetism and electricity, organic chemistry, coal-mining, and metallurgy.

RECENT issues of *Science* have recorded a number of bequests to higher education in the United States. The more important of these are as follows:—Yale University has received some 137,000*l.* from the estate of the late Mr. J. S. Hotchkiss; under the will of Mr. W. W. Lawrence, of Pittsburgh, Princeton University will ultimately receive 125,000*l.*; under the will of the late president of the University of Pennsylvania Museum, Mr. E. B. Coxe, junior, the University was bequeathed 100,000*l.* as an endowment of the museum, and 20,000*l.* towards increasing the salaries of professors; Columbia University has received 20,000*l.* from Mr. J. N. Jarvie for the new dental school; and the University of California 14,000*l.* from Prof. G. H. Howison and his wife. The General Education Board of the Rockefeller Foundation has undertaken to provide 40,000*l.* to complete the 200,000*l.* endowment fund which Vassar College is raising.

THE British Prisoners of War Book Scheme (Educational) makes an urgent appeal for books on natural history and scientific subjects generally, to meet actual requests received from British prisoners (soldiers, sailors, and civilians) interned in enemy or neutral countries. Among the special books asked for this week are:—"Cambridge Natural History"; "British Fresh-Water Algæ" (West); "Fungus Diseases of Trees" (Hartog); "History of European Fauna" (Scharff); "Mammalia" (Beddard); "Mammalia of India" (Blanford); and "Birds of India" (Jerdon). Books of a modern and advanced character are also needed in forestry, electrical engineering, motor engineering, telegraphy, wireless telegraphy, mineralogy, and veterinary science. Readers who may be able and willing to contribute one or more of the above works to this war charity are invited to forward to Mr. A. T. Davies, at the Board of Education, Whitehall, London, S.W., a list of the books they can offer. They will then be notified as to the acceptance of their gifts. Further particulars of the book scheme may also be had on application to Mr. Davies.

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THE incidence of infant mortality, especially in urban districts, has emphasised the urgent need for greater efforts directed to the protection of infant life. Among the agencies for securing this aim systematic instruction in the hygiene of child-life occupies an important place. Voluntary societies exist through which much work has already been done, and the Local Government Board for Ireland has recently issued a circular letter outlining a scheme dealing with maternity and child welfare, in aid of which a grant of 5000*l.* has been made available. To ensure due co-operation between medical and other public officers on one hand and voluntary workers on the other, and to render the work of the latter efficient and effective, the Department of Agriculture and Technical Instruction for Ireland has prepared and circulated a syllabus of instruction in child hygiene. The Department is prepared to consider the recognition of classes in the syllabus conducted by local technical instruction, and other approved, committees, and in certain circumstances to pay grants in aid. The instruction must be under the direction of a qualified medical practitioner and a trained nurse, but recognition may be extended to other suitable persons. If desired, the Department is prepared to conduct an examination at the close of a course of instruction, and to award certificates of proficiency.

AN article on "Science in the School," in the *Times Educational Supplement*, by Sir Clifford Allbutt, may be commended to the thoughtful consideration of headmasters and others. The notion of some headmasters that it is sufficient to introduce science in a school as a "complementary" subject is unsparingly pilloried. The methods of science must permeate the curriculum, since, as the article urges, they pertain "to all spheres of knowledge and wisdom, natural and humane, a leaven rather than an ingredient." The cry of *what* is to be taught to boys is of less importance than the vision of *how* things are to be taught. In young boys "the brain-web is built, not by reflecting, but by doing." The qualities wanted of young men in the greater world are spontaneity, initiative, ready wits in tight places, all of which depend upon structures in the brain, organised, not by reading, but by former activities. Affirming these things, Sir Clifford Allbutt reiterates "science is a method, a method to inform, not our studies of material things only, but all studies, material, social, and spiritual." It is good to find the article insisting that before we can have good teaching we must have trained teachers; it would have been better if it had been added that we must have reasonably paid teachers. The suitable form of science teaching for various classes in the school is described, and altogether the essay should assist the anxious headmaster. It is a pity, however, that Sir Clifford Allbutt seems not to have acquainted himself with the work of the many secondary schools which have been developed since the Education Act of 1902. There at least the boys study mensuration in the practical way he suggests, and much work in experimental science of a sane kind is being accomplished.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, November 9.—Sir J. J. Thomson, president, in the chair.—W. M. Bayliss: Methods of raising a low arterial pressure. When the arterial pressure is low from loss of blood it cannot be brought back, except to a certain degree, by the injection of saline solutions into the veins in quantity equal to that of the blood lost. But if the viscosity of such solutions is made equal to that of blood, a return to normal height is possible. The effect of saline injections containing gum or gelatine is also much more lasting than

that of simple saline solutions. The difference in this respect is due to the osmotic pressure of the colloids added, by which loss of water by the kidneys or to the tissues is prevented. Solutions containing gum do not produce œdema in artificial perfusion of organs. When the fall of blood pressure is due to peripheral vasodilatation, then gum or gelatine solutions, although more effective than pure saline, produce a much less permanent rise than in cases of loss of blood.—A. J. **Brown** and F. **Tinker**: Selective permeability: the absorption of phenol and other solutions by the seeds of *Hordeum vulgare*. The paper deals with the concentrations in which solutions of various organic solutes diffuse into barley seeds across the semi-permeable membrane of the latter. It is found that the membrane and the starchy contents of the seeds act selectively towards the solutions in such a way that the concentration of an aniline or a phenol solution which enters the seeds is about three times as strong as the outside solution from which it has diffused. Somewhat similar results are obtained for the diffusion of acetic acid solutions into the seeds; but in this case it is found also that the "adsorbed" solution which enters the seeds becomes saturated at a concentration of 80 per cent. acid. The amount of solution which enters the seeds is determined by the relative concentrations of the solutions inside and outside. The research also brings out the fact that the permeability of the barley membrane is due to selective adsorption.—C. **Shearer**: The toxic action of dilute pure sodium chloride solutions on the meningococcus.—C. **Shearer** and H. W. **Crowe**: The rôle of the phagocyte in cerebro-spinal meningitis. Good evidence has been obtained for thinking that under certain conditions the meningococcus can be taken up by the leucocytes, but not killed by them. In the case of freshly isolated strains the leucocytes will not take them up at first. With old cultures, on the other hand, ingestion on the part of the phagocytes takes place with great rapidity. In a short time the germs are killed and completely digested by the leucocytes. This happens also with the majority of the nasal strains examined from chronic carriers, although they show great individual differences.—S. B. **Schryver** and Mary **Hewlett**: Investigation dealing with the phenomena of "clot" formations. Part IV.—The diphasic erosive action of salts on the cholate gel.—I. **Jørgensen** and F. **Kidd**: Some photochemical experiments with pure chlorophyll and their bearing on theories of carbon assimilation.

Zoological Society, November 7.—Dr. S. F. Harmer, vice-president, in the chair.—Dr. F. E. **Beddard**: Two new species of Cestodes. The first species was obtained from a slow lemur and was referred to the genus *Linstowia*; the second occurred in a black-headed partridge, and was placed in the genus *Cotugnia*.—Dr. J. F. **Gemmill**: The development of some starfishes. The species of which the development was traced are:—*Asterias glacialis*, *Cribrella oculata*, *Solaster endeca*, and *Stichaster roseus*.

Geological Society, November 8.—Dr. Alfred Harker, president, in the chair.—Dr. S. **Smith**: *Aulina rotiformis*, gen. et sp. nov., *Phillipsastraea hennahi* (Lonsdale), and the genus *Orionastræa*. A description of a new coral genus of colonial habit, *Aulina*, obtained from the highest limestone associated with the Lower Carboniferous—the Fell Top Limestone of Northumberland and its equivalent horizon in Teesdale, the Botany Beds.

Royal Meteorological Society, November 15.—Major H. G. Lyons, president, in the chair.—C. E. P. **Brooks**: A meteorologist in China. The work was described of the late Capt. L. H. Tamplin, who resided

in eastern China from 1902 to 1915, and took very full and accurate meteorological observations, chiefly at Chinkiang, but for a time at Wuhu, and finally at Amoy. These observations are made the basis of a discussion of the climate of the coastal region of China and its controlling factors. In addition to his actual observations, Capt. Tamplin's close acquaintance with the Chinese enabled him to note some quaint weather superstitions, and he also made some important observations on the causes of flood and famine in China.—Lieut. A. E. M. **Geddes**: The storm of November 11–13, 1915, in its passage over the British Isles. This storm was remarkable for its close resemblance to a very severe storm which crossed the British Isles on November 11–13 in 1901. Both disturbances gave unusually heavy rainfall over Ireland and England, but in both cases there was very little precipitation over Scotland. All records available at the Meteorological Office have been examined, and from them weather maps have been constructed for intervals of two hours. From these maps the path of the centre of the storm has been traced with great detail. In this case the path skirted the southern coast of the British Isles, whereas in the case of 1901 it was from Galway to the Wash. The two-hourly maps have been used for working out the air circulation in the storm. Two distinct air supplies can be identified: (1) a supply of warm air from the south, and (2) a supply of much colder air from the east.

CAMBRIDGE.

Philosophical Society, October 30.—Annual general meeting.—Prof. Newall, president, in the chair.—C. T. R. **Wilson**: Methods of investigation in atmospheric electricity.—L. A. **Borradaile**: The functions of the mouth-parts of the common prawn. The author stated that food is seized by either pair of chelipeds or by the third maxillipeds, and by them placed within the grasp of the second maxillipeds, which direct it, according as it is finely divided or coarse, to the maxillules or to the incisor processes of the mandibles. By these two pairs of limbs it is further divided and passed into the chamber guarded by the lips, where the molar processes grind it still further. The first maxillipeds and maxillæ play subsidiary parts, if any, in the manipulation of the food.—J. T. **Saunders**: The growth of *Daphne pulex*. The author showed that at least two adult forms of *D. pulex* existed, differing only in size and fecundity. Both forms had embryos in the brood pouch, but the larger forms had more than the smaller. More than one adult form probably occurs in other Entomostraca, and this would account for the great difficulty, which is experienced in this group, of determining species.—W. A. D. **Rudge**: A self-recording electrometer for atmospheric electricity.—C. E. Van **Horn**: An axiom in symbolic logic.—S. **Ramanujan**: The expression of a number in the form $ax^2+by^2+cz^2+du^2$.—J. G. P. **Nicod**: A reduction in the number of primitive propositions of logic.

PARIS.

Academy of Sciences, November 6.—M. Camille Jordan in the chair.—The President announced the death of M. Léauté.—G. **Bigourdan**: The position and co-ordinates of the old observatory in the rue Vincenne. Important work was done at this observatory between 1666 and 1669, some details being given. The exact position of the instruments has been lost, but is now reconstructed by the author from old maps and contemporary documents.—M. Aries was elected a correspondent of the Academy in the section of mechanics in the place of the late M. Considère.—W. H. **Young** and Mme. Grace Chisholm **Young**: The normal frontier of a region or of an ensemble.—G. **Koenigs**:

A particular plane movement with two parameters.—**E. de Coninck** and **M. Gérard**: The atomic weight of lead. The method used was to determine the ratio of lead nitrate to the lead oxide obtained by ignition. For ordinary lead the value 206.98 is given, and for lead extracted from uranium minerals 206.71.—**E. Harlé** and **J. Harlé**: The continental dunes of the *landes* of Gascony.—**R. César-Franck**: The presence of forms of wind erosion in the Isle of Wight.—**J. Dedijer**: The traces of the Glacial period in Albania and New Serbia (upper basins of the Drim Noir and the Skumba).—**C. Sauvageau**: The plantules of some Laminaria.—**L. Daniel**: The effects of continual capillary watering. Various seeds and plants were kept continuously supplied with water by capillary siphons, the amounts of water required for each plant having been previously determined by studies of the transpiration of the plant and soil evaporation. The results were compared with ordinary intermittent watering, and showed distinct advantages for the capillary method.—**L. Roule**: The migration for spawning in lake trout, *Salmo fario lacustris*. The fish are shown to select streams in which the proportion of dissolved oxygen is highest.—**L. Boutan**: The plane of equilibrium or of least effort of Teleostean fish with swimming bladder.—**A. Paillot**: The existence of several varieties and races of Coccobacilli in natural septicemia of the cockchafer.—**J. Courmont** and **A. Devic**: The leucocytosis resulting from antityphoid and antiparatyphoid vaccination.—**J. Danysz**: The causes of intolerance to the arsenobenzenes and the means of avoiding or preventing them.—**G. Sanarelli**: The pathogeny of cholera. Experimental reproduction of the disease.

WASHINGTON, D.C.

National Academy of Sciences (Proceedings, No. 10, vol. ii.).—**F. H. Seares**: Preliminary results on the colour of nebulae. Photographs of the spirals Messier 51, 94, 99 show that the nebulae condensations have large negative colour indices. The knots of nebulosity are bluer than the bluest of the neighbouring stars. The spectral character of the outlying regions differs from that of the central nucleus. In the case of the planetary nebula N.G.C. 3242 no important differences of this sort are revealed.—**K. G. Falk**: The action of alkali in the production of lipolytically active protein. The author discusses inactivation of the enzymes by acid, by alkali, by alcohols, by acetone, by salts, and by heat; nature of the chemical changes involved in the inactivations; and activation of proteins by alkali.—**A. R. Haas**: The excretion of acids by roots. The author finds that no acid other than carbonic was excreted from the roots of corn seedlings. Similar results were obtained with wheat seedlings.—**W. W. Campbell** and **J. H. Moore**: Spectrographic observations of relative motions in the planetary nebulae. Further observations indicating the probability of the hypothesis that the so-called ring nebulae are in reality not ring forms, but ellipsoidal shells. Tentative conclusions are also drawn as to the probable masses of the nebulae.—**S. C. Brooks**: New determinations of permeability. The determinations have been made by a new independent method and by improved older methods. The results agree in showing that living protoplasts are normally permeable to the salts studied, but salts of pure solutions may alter permeability, some causing an increase of permeability, while others cause a decrease, followed by an increase. In a properly balanced solution the permeability remains normal. Cell-walls may be semi-permeable to an extent which renders them important in such experiments.—**A. A. Coble**: Point sets and Cremona groups. Part iii. The group $G_{6,2}$ is used in the problem of determining the lines of a cubic surface. The determination differs from that of Klein.—**C. Barus**: The

interferences of spectra, both reversed and inverted.—**A. M. Banta**: Sex intergrades in a species of Crustacea. The author has collected a large amount of data on several species of Cladocera, which is interesting because of the remarkable array of sex forms, the stock in general consisting of perhaps 40 per cent. normal males and about 8 per cent. normal females, the remainder being intergrades with almost every combination of sex characters.—**G. H. Hardy** and **J. E. Littlewood**: Some problems of Diophantine approximation: a remarkable trigonometrical series. A series is given which is never convergent or summable for any value of θ , and is accordingly not a Fourier's series; and further, a function which does not possess a finite differential coefficient for any value of θ .—**G. N. Lewis**: Steric hindrance and the existence of odd molecules (free radicals). It is contended that the hypothesis underlying the somewhat elusive phrase, "steric hindrance," should not be introduced until phenomena are known which cannot be so well explained in other ways. It is shown how the so-called free radical of organic chemistry may be explained independently of the hypothesis of steric hindrance.—**A. A. Bennett**: Newton's method in general analysis. An extension to general analysis of the special algebraic work of **H. B. Fine**.—**W. D. Harkins**, **R. E. Hall**, and **W. A. Roberts**: The cobaltamines. The authors have determined accurately the freezing-point lowerings caused by eight different cobaltamine salts, and have derived from the results the number of ions into which each salt dissociates. These are found to be in accordance with Werner's theory.—National Research Council: Report of the first meeting of the council; reports of meetings of the Executive Committee; organisation of the Research Council (as at present constituted).

NEW SOUTH WALES.

Linnean Society, August 30.—**Mr. A. G. Hamilton**, president, in the chair.—**R. J. Tillyard**: Further observations on the emergence of dragonfly larvæ from the egg, with special reference to the problem of respiration. The observations were made upon eggs of *Anax papuensis* (Anisoptera) and *Austrolestes leda* (Zygoptera). By curtailment of the oxygen supply during embryological development, larvæ of Anax were made to hatch from the eggs in a weakened condition, so that the pronymphal stage lasted three and a half hours instead of a few seconds. Results:—(1) The first gas to enter the tracheæ appears during the pronymphal stage, and enters simultaneously into dorsal and ventral trunks and their connecting tracheæ. (2) Experiments with a 10 per cent. solution of caustic potash, and with a 4 per cent. solution of azol, indicate that this gas is CO_2 , and that it is replaced by a mixture of oxygen and nitrogen differing little from air. (3) Sections of a pronymph, made to discover the nature of the "cephalic heart," suggest that this is not a special organ, but merely a temporary development in the oesophagus. (4) The abnormal conditions imposed upon one egg, with an embryo which had not completed reversion, caused this embryo to continue its development head downwards, and, finally, to hatch tail foremost. (5) Newly hatched larvæ of *Austrolestes* practise rectal respiration regularly for the first half-hour of larval life, thenceforward intermittently. Practically all dragonfly larvæ must practise rectal respiration directly after hatching to replace the CO_2 in the tracheal system.—**Dr. E. W. Ferguson**: Revision of the Amycterides (Coleoptera), part v. This part deals with the genera *Molochtus* (four species, one new) and *Cubicorrhynchus* (twenty-eight species, seven new).—**A. H. S. Lucas**: Notes from the Botanic Gardens, Sydney. Parthenogenesis in aquatic phanerogams. *Elatine triandra*, Schrank (Elatinaceæ), and *Glossostigma spathulatum*, Arnott (Scrophulariaceæ)

in a submerged state freely produced capsules only, but were induced to produce normal flowers by growing them in soil exposed to sunlight in the open air.—**E. F. Hallmann**: Revision of the genera with Microscleres, included, or provisionally included, in the family Axinellidæ (Porifera), part i. The first part treats of the peculiar and aberrant genus *Trachycladus*, hitherto represented only by the briefly described *T. laevispirulifer*, Carter, and two species imperfectly described by von Lendenfeld, under the generic names *Spirophora* and *Spirophorella*. Seven additional representatives are described, three of which are designated as varieties of *T. digitatus*, Lendenfeld. The genus appears to constitute a connecting link between the Axinellidæ and the Spirastrellidæ, thus pointing to the possibility that these supposedly quite unrelated families may be derived from a common stem.

CAPE TOWN.

Royal Society of South Africa, September 27.—**Dr. L. Péringuey**, president, in the chair.—**H. H. W. Pearson** and **Mary R. H. Thomson**: Some stages in the life-history of *Gnetum*. An account is given of an investigation of the ovule and embryo-sac of *Gnetum africanum* (West Africa) and *G. Gnemon* (Ceylon); the material studied included also *G. Buchholzianum* (West Africa) and *G. scandens* (Poona, Darjeeling, Penang, Singapore), and two species of doubtful identity, one from Singapore and one from Java.—**H. Bohle**: The theory of automatic regulators. Automatic regulators may be classified as sluggish and fast regulators. The theory of each form of regulator is explained in this paper.—**T. F. Dreyer**: Variation in the Mylabridæ illustrating a new theory of evolution based on Mendelism.

BOOKS RECEIVED.

The Portland Cement Industry. By W. A. Brown. Pp. x+158+plates xxxvi. (London: Crosby Lockwood and Son.) 7s. 6d. net.

Ministry of Finance, Egypt. Survey Department. The Geography and Geology of West-Central Sinai. By Dr. J. Ball. Pp. 219+plates xxiv. (Cairo: Government Press.) P.T.30.

Practical Experiments in Heat and Light. By W. St. B. Griffith and P. T. Petrie. Pp. viii+123+viii+112. (London: Rivingtons.) 3s. 6d. net.

Text-Book of Elementary Chemistry. By Dr. F. M. Perkin and E. M. Jagers. Pp. vi+384. (London: Constable and Co., Ltd.) 3s. net.

Facts and Fallacies regarding the Bible. By W. Woods Smyth. New edition. Pp. vii+210+plates. (London: Elliot Stock.) 3s. 6d. net.

Janus and Vesta: A Study of the World Crisis and After. By B. Branford. Pp. xviii+316. (London: Chatto and Windus.) 6s. net.

An Outline of Theosophy. By C. W. Leadbeater. Third impression. Pp. 99. (London: The Theosophical Publishing Society.)

The Weather Map: An Introduction to Modern Meteorology. By Sir Napier Shaw. Pp. 94. (London: H.M.S.O.; the Meteorological Office.) 4d.

The Mirage: A Fantastic Study of Evolution in Australia. By Bunyip. Pp. 64. (London: W. H. and L. Collingridge.) 6d. net.

Aircraft of To-day. By C. C. Turner. Pp. 315. (London: Seeley, Service, and Co., Ltd.) 5s. net.

The Origin of the Earth. By T. C. Chamberlin. Pp. xi+271. (Chicago: The University of Chicago Press; London: At the Cambridge University Press.) 6s. net.

Macmillan's Graphic Geographies. The British Isles. By B. C. Wallis. Pp. 32. (London: Macmillan and Co., Ltd.)

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DIARY OF SOCIETIES.

THURSDAY, NOVEMBER 23.

ROYAL SOCIETY, at 4.—Annual Report of Council.—At 4.30.—The Corrosion and Electrical Properties of Steels: Sir Robert Hadfield and Dr. E. Newbery.—(1) Monoclinic Double Selenates of the Nickel Group; (2) X-ray Analysis and Topic Axes of the Alkali Sulphates and their Bearing on the Law of Valency Volumes: Dr. A. E. H. Tutton.—The Scattering of Plane Electric Waves by Spheres: Dr. T. J. I'a Bromwich.—Numerical Results of the Theory of the Diffraction of a Plane Electromagnetic Wave by a Perfectly Conducting Sphere: J. Proudman, A. T. Doodson, and G. Kennedy.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—The Parallel Operation of Electric Power Stations: J. S. Peck.

FRIDAY, NOVEMBER 24.

PHYSICAL SOCIETY, at 5.—Measurement of the Thomson Effect in Wires: H. R. Nettleton.—Thermoelectric Properties of Fused Metals: C. R. Darling and A. W. Grace.

MONDAY, NOVEMBER 27.

ROYAL SOCIETY OF ARTS, at 5.—Howard Lecture—Coal and its Economic Utilisation: Prof. J. S. S. Brame.

TUESDAY, NOVEMBER 28.

ROYAL ANTHROPOLOGICAL INSTITUTE, at 5.—The Common Objections to the Reality of the Migrations of Early Culture, with Special Reference to the Dogma of the Similarity of the Working of the Human Mind: Prof. G. Elliot Smith.

WEDNESDAY, NOVEMBER 29.

ROYAL SOCIETY OF ARTS, at 4.30.—The Internal Combustion Engine: Dr. Dugald Clerk.

THURSDAY, NOVEMBER 30.

LINNEAN SOCIETY, at 5.—(1) The Floral Anatomy of some Compositæ; (2) Demonstration on the Force for Dispersal of Fruits: J. Small.—A Note on the Seed of *Iris pseudacorus*, Linn.: T. A. Dymes.

SATURDAY, DECEMBER 2.

GEOLOGISTS' ASSOCIATION, at 3.—The Palæoliths of Farnham: H. Bury.

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