

are allowed to men who have been on war service for not less than six months, whether they have previously joined a college or not, and they are exempted either from the previous or from one special examination. Those who have served for shorter periods may also be granted certain exemptions.

At the end of January four hundred naval lieutenants and sub-lieutenants are coming to Cambridge for a six months' course. These are men who were promoted from the rank of midshipman during the war before completing their normal preliminary course of study. They will be distributed among several colleges, and will be under naval discipline. The University will provide instruction for them in physics and engineering, and, in addition, courses in various optional subjects, literary as well as scientific, are being arranged.

A COMMERCIAL library, established by the subscriptions of local business men, was opened in Dundee on January 17 by Sir Alfred Ewing, principal of the University of Edinburgh.

THE Edinburgh University Court has approved the scheme for the founding of a chair of mental diseases, submitted by the board of the Royal Edinburgh Asylum for the Insane, which has offered an endowment of 10,000*l.* towards the salary.

SIR JOHN HERKLESS, principal of St. Andrews University, announced that Mr. George Bonar, president of the Dundee Chamber of Commerce, has given 25,000*l.* to establish a scheme of commercial education in connection with University College, Dundee. One of the conditions of the gift is that a degree of Bachelor of Commerce should be established, and that university students seeking that degree should not be compelled to pass a preliminary examination or to have come from higher or secondary schools, but that boys or youths who present themselves should be admitted if they are able to show that they are capable of improvement and of undertaking university study.

SOME years ago Prof. MacGregor, of Edinburgh University, with the help of a committee of the late Prof. Tait's friends and former students, launched a scheme for establishing a Tait memorial chair in mathematical physics and applied mathematics. Considerable progress in collecting funds had been made, but Prof. MacGregor's death and the advent of the war prevented the scheme being proceeded with. Recently, however, the committee, with the cordial support of the University authorities, has resolved to make a general appeal for funds towards the endowment of the proposed chair. About 15,000*l.* will be required. In connection with this movement an anonymous donor has placed in the hands of the University Court for a certain number of years an investment yielding yearly a considerable interest to accumulate as part of the endowment of the Tait chair of mathematical physics. The Tait memorial committee will welcome similar contributions, which may be intimated to the general secretary of the Royal Society of Edinburgh, who acts as hon. secretary of the committee.

WE learn from *Science* that the will of Capt. J. R. De Lamar, mineowner and director, leaves nearly half of his estate, estimated at 4,000,000*l.*, to the Harvard University Medical School, Johns Hopkins University, and the College of Physicians and Surgeons of Columbia University for medical research. The bequests to these institutions in equal shares consist of his residuary estate, estimated at about 2,000,000*l.* He gave a trust fund of 2,000,000*l.* to his only child, Alice A. De Lamar, with the provision that if she dies without issue the principal of this fund also goes

to the institutions named. The will requests that this fund be used "for the study and teaching of the origin of human disease and the prevention thereof; for the study and teaching of dietetics and of the effect of different food and diets on the human system, and how to conserve health by proper food and diet." The money is to be used to establish fellowships, scholarships, and professorships; to provide laboratories, clinics, dispensaries, and other places for study and research; and to publish the results of such research, not only in scientific journals, but also by popular publications and public lectures.

It was pointed out by Sir J. J. Thomson in his presidential address to the Royal Society in 1917 that much public good might be done by the publication of a popular periodical in which all aspects of progressive knowledge are presented simply and accurately for general readers. Few articles of this type appear in the magazines; and the daily Press is naturally more concerned with subjects of topical interest than with descriptive accounts of the state of knowledge of any particular subject, however stimulating such surveys may be in style or substance. It is believed that teachers would welcome a periodical which would give them at least a glimpse of what is being accomplished in many developing fields of knowledge—scientific or otherwise—and that the extended views thus obtained would often put new life into the body of instruction. To consider proposals for the foundation of a periodical with this intention, a conference was held recently, with the Rev. Dr. Temple in the chair, in the rooms of the Royal Society, at which representatives were present of twenty associations, including the Conjoint Board of Scientific Societies, the Classical, English, Geographical, Public School Science Masters', Historical, Modern Language, Library, and Workers' Educational Associations, Royal Society of Literature, National Home Reading Union, and the chief professional associations of teachers. It was resolved by the conference that "it would be to the national interest if a journal could be established which would represent the growth of the chief branches of knowledge in popular form." An executive committee was appointed to draw up a scheme for the management of the journal, and therefore to secure whatever assistance is possible, by the selection of suitable contributors or guarantors of subscriptions, from the bodies represented at the conference. Should the scheme take practical shape, the proposed journal would stimulate public interest in learning of all kinds, and would thus be a valuable aid in changing the attitude of indifference commonly displayed towards intellectual endeavour in this country.

## SOCIETIES AND ACADEMIES.

LONDON.

**Mineralogical Society**, January 14.—Mr. W. Barlow, past-president, in the chair.—A. Hutchinson: Stereoscopic lantern-slides of crystal pictures. The twin pictures are projected by means of a double lantern through screens of complementary tints—red and green—and are viewed through similarly tinted screens, one for each eye. If the adjustment is correct, a black-and-white picture stands out in relief. This method admits of the properties of crystals and of crystal-structure being demonstrated simultaneously to a large number of students.—L. J. Spencer: Mineralogical characters of turite (=turgite) and some other iron-ores from Nova Scotia. The mineral collection of the late Dr. H. S. Poole, which was presented to the British Museum in 1917, contains, amongst the iron-ores, specimens of magnetite, hæma-



tite, turite, goethite, limonite, chalybite, mesitite, and ankerite from many well-defined localities in Nova Scotia. The dehydration curves and optical characters of turite ( $2\text{Fe}_2\text{O}_3, \text{H}_2\text{O}$ ), goethite ( $\text{Fe}_2\text{O}_3, \text{H}_2\text{O}$ ), and limonite ( $2\text{Fe}_2\text{O}_3, 3\text{H}_2\text{O}$ ) prove that these, at least amongst the large group of ferric hydroxide minerals, are distinct species with crystalline structure; some others are colloidal. Turite (=turgite, an incorrect German transliteration from the Russian) is a hard, lustrous, black mineral, with a radially fibrous and concentric, shelly structure, and gives a dark cherry-red streak; the fibres are optically birefringent and strongly pleochroic. Sharp, brilliant crystals with the forms of goethite, but consisting of anhydrous ferric oxide, *i.e.* pseudomorphs of hæmatite after goethite, were described.

**Royal Meteorological Society, January 15.**—Sir Napier Shaw, president, in the chair.—Sir Napier Shaw: Presidential address: Meteorology—the society and its fellows. Sir Napier Shaw referred to the change in the position of meteorological work during the war from that of a subject of curiosity, which might safely be left to take its chance with such facilities as were left to the ordinary public by inexperienced censors and controllers, to that of a matter of such importance in gunnery and navigation of the sea and air that all reference to it was rigorously excluded from the newspapers, and a number of special services were improvised to meet the need for meteorological information for our own Forces, acting in co-operation with corresponding organisations for the French, American, and Italian Forces. To meet the demand for information about the fundamental principles and practice of the modern science, necessary for those who were called upon to take up technical duties with very limited training, the Meteorological Office had issued a number of books specially written for the purpose. Looking forward, he said that the immediate necessity was the organisation of the meteorological services to satisfy the demands of the home countries and meet possible requirements of the Dominions beyond the seas. The essential conditions of the organisation were, first, that there should be a career for men of ability, and, secondly, that there should be opportunity for suitable preparation by preliminary training in scientific studies, including meteorology, at the universities. At the same time efficient organisation of the public service required that the regular collection of information about the weather should be placed on a proper footing by arrangement between the central authority and local authorities. The duty which the society should discharge in the changed conditions was to foster or create an atmosphere which would make a satisfactory national organisation on those lines possible by the interchange of ideas and the discussion of meteorological subjects.

**Mathematical Society, January 16.**—Mr. J. E. Campbell, president, in the chair.—Prof. Fréchet: The differential of functional operations.—L. J. Mordell: The value of a definite integral.—Dr. T. J. I'A. Bromwich: Operational solutions in conduction of heat.

#### MANCHESTER.

**Literary and Philosophical Society, December 10, 1918.**—Mr. W. Thomson, president, in the chair.—Margaret W. Fishenden: The efficiency of domestic fires and the effects of certain "coal-saving" preparations. The experiments included determinations of (1) the "radiant efficiency," or the percentage of the total calorific value of the coal burned, which entered the room as radiation; (2) the distribution of radiation; (3) the volume of air passing through the room;

(4) the amount of heat passing away above the ceiling level in the hot flue gases; and (5) the heating of the room air. Three different grates gave radiant efficiencies of 21, 24½, and 24 per cent. respectively; the radiant efficiency was not dependent upon the draught, even over such wide limits as from one to nine changes of air per hour. The maximum intensity of radiation was found (upwards) at an angle of about 60° to the horizontal through the centre of the fire. The amount of heat contained in the hot flue gases passing up the flue above the ceiling varied from about 55 per cent. of the total calorific value of the fuel burned for draughts of about 20,000 cubic ft. per hour (nine changes), to about 15 per cent. for one change per hour. The heat used in warming the room air was very small, generally below 10 per cent. Certain advertised preparations, solutions of which were claimed, when previously sprayed upon the coal, greatly to increase the efficiency of fires, had been analysed and found to consist chiefly of common salt. Their use was found to have no effect whatever upon the radiant efficiency, the duration of burning, or the rise of air temperature produced by coal-fires.

January 7.—Mr. W. Thomson, president, in the chair.—Sir E. Rutherford: The work and influence of Joule. Attention was confined to the first five years (1838-43) of Joule's scientific career, which began at the age of nineteen, and an endeavour was made to trace during this period the gradual growth of Joule's power of experimentation and of philosophic insight. This period was, in some respects, the most fruitful and inspiring in Joule's lifetime, for it included his remarkable researches on the transformations of energy in the voltaic cell, the dynamo and motor, and his first measurement of the mechanical equivalent of heat. A brief discussion was given of the reasons why the full recognition of the fundamental importance of Joule's earlier researches was so long delayed and of the difficulties experienced by Lord Kelvin in reconciling Joule's conclusions with the work of Carnot on "Heat Engines." Adjustment of views on both sides was necessary before the foundations of the new science of thermodynamics were securely laid, and before the great principle of the conservation of energy was generally recognised.

#### PARIS.

**Academy of Sciences, December 30, 1918.**—M. Léon Guignard in the chair.—Albert, Prince of Monaco: The course of the floating mines in the North Atlantic and the Arctic Ocean during and after the war. Experiments on the ocean currents have been carried out over a series of years, a large number of objects made of wood, metal, or glass, and constructed so that they float just below the surface out of the direct action of the wind, being used. The results have been accumulated during twenty years, and can obviously be applied to predict the course of floating mines. The probable track of these is shown on a chart, and the most dangerous localities are summarised as the Bay of Biscay, the west coast of Portugal, Morocco, the Canaries, and Madeira. From the Canaries to the Antilles the path of the mines is wider, and the return to Europe follows the course of the Gulf Stream.—A. Lamécère: The Dicyemides.—M. Balland: The preserved fruit and jam distributed to the troops. An account of the adulterations found in these articles of food as supplied to the French Army.—Sir Almroth Wright was elected a correspondant for the section of medicine and surgery in succession to the late J. Bernstein.—E. Vessiot: An integral invariant of hydrodynamics and its application to the theory of general relativity.—L. Lumière: A method of record-



ing graphically by means of a jet of gas. It is proposed to replace the style by a very fine capillary. A stream of air carrying ammonia is led through the jet of this capillary tube and impinges on a moistened paper impregnated with mercurous acetate. The movements of the jet, which may replace the needle of a galvanometer are recorded in black.—A. Meyer: Some derivatives of isatin.—P. Gaubert: The artificial coloration of liquid crystals. The use of indophenol as a colouring material presents great advantages over substances previously employed. By its means interesting results have been obtained relating to Babinet's rule and to the influence of double refraction on polychroism.—Ph. Glangeaud: The volcano of Sancy. Its secondary craters and its lavas.—P. Lesage: The utilisation of the curve of limits of germination of seeds after soaking in solutions. If seeds are immersed in alcohol there is a time beyond which the seed will not germinate, and this is a function of the strength of the alcohol. This relation between strength and time has been worked out for the seeds of *Lepidium sativum*. A possible application to the selective removal of the seeds of dodder is suggested.—L. Lapique: The use of marine algæ for feeding horses. The experiments were carried out on *L. flexicaulis*, which were first dried, then washed freely with the addition of a little lime or acid for the removal of mucilage. The horse requires a certain time to get accustomed to the food, about a week, and then digests the algæ completely. For horses doing no work the seaweed can be used in place of oats; for light work, nutritive equilibrium was obtained with 1500 grams of algæ plus 500 grams of oats. A horse has eaten 140 kilograms of algæ in ninety-six days without visible inconvenience.—Mlle. Lucienne Dehorne: False incubation in *Heteronereis malgremi*.

BOOKS RECEIVED.

- Dreams and Primitive Culture. By Dr. W. H. R. Rivers. Pp. 28. (London: Longmans and Co.) 1s.
- War and Civilisation. By W. J. Perry. Pp. 27. (London: Longmans and Co.) 1s. 6d. net.
- The Philosophy of Mr. B\*rr\*nd R\*ss\*ll. With an Appendix of Leading Passages from Certain Other Works. Edited by P. E. B. Jourdain. Pp. 96. (London: G. Allen and Unwin, Ltd.) 3s. 6d. net.
- The Origin and Evolution of Life. By Prof. H. F. Osborn. Pp. xxxi+322. (London: G. Bell and Sons, Ltd.) 25s. net.
- A Manual of Elementary Zoology. By L. A. Borradaile. Second edition. Pp. xiv+616. (London: H. Frowde and Hodder and Stoughton.) 16s. net.
- Forced Movements, Tropisms, and Animal Conduct. By Dr. J. Loeb. Pp. 209. (Philadelphia and London: J. B. Lippincott Co.) 10s. 6d. net.
- Life and Finite Individuality. Two Symposia. Edited for the Aristotelian Society, with an Introduction, by Prof. H. Wildon Carr. Pp. 194. (London: Williams and Norgate.) 6s. net.
- A Treatise on Gyrostatics and Rotational Motion: Theory and Applications. By Prof. A. Gray. Pp. xx+530. (London: Macmillan and Co., Ltd.) 42s. net.
- A Manual of Geometrical Crystallography: Treating Solely of those Portions of the Subject Useful in the Identification of Minerals. By Prof. G. M. Butler. Pp. viii+155. (New York: J. Wiley and Sons, Inc.; London: Chapman and Hall, Ltd.) 7s. net.
- A Treatise on the Sun's Radiation and Other Solar Phenomena, in Continuation of the Meteorological Treatise on Atmospheric Circulation and Radiation, 1915. By Prof. F. H. Bigelow. Pp. ix+385. (New York: J. Wiley and Sons, Inc.; London: Chapman and Hall, Ltd.) 23s. net.

DIARY OF SOCIETIES.

- THURSDAY, JANUARY 23.
  - ROYAL INSTITUTION, at 3.—Prof. J. N. Collie: Chemical Studies of Oriental Porcelain.
  - ROYAL SOCIETY, at 4.30.—Admiral Sir H. Jackson and Prof. G. B. Bryan: Experiments Demonstrating an Electrical Effect in Vibrating Metals.—Prof. T. H. Havelock: Wave Resistance: Some Cases of Three-dimensional Fluid Motion.—W. S. Abell: Chances of Loss of Merchant Ships.—Prof. W. M. Hicks: A Critical Study of Spectral Series. Part V. The Spectra of the Monatomic Gases.
- INSTITUTION OF ELECTRICAL ENGINEERS, at 6.—A. P. M. Fleming: Planning a Works Research Organisation.
- FRIDAY, JANUARY 24.
  - ROYAL INSTITUTION, at 5.30.—Temp. Lt.-Col. A. Balfour: One Side of War.
  - INSTITUTION OF MECHANICAL ENGINEERS, at 6.—T. T. Heaton: Electric Welding.—Henry Cave: The Development of the Oxy-acetylene Welding and Cutting Industry in the United States.—J. H. Davies: Oxy-acetylene Welding.—F. Hazledine: Oxy-acetylene Welding.
- MONDAY, JANUARY 27.
  - ROYAL GEOGRAPHICAL SOCIETY, at 8.—Commander Spicer Simson, D.S.O., R.N.: The Tanganyika Expedition. (Duty permitting.)
- TUESDAY, JANUARY 28.
  - ROYAL INSTITUTION at 3.—Prof. Spenser Wilkinson: Lessons of the War.
  - INSTITUTION OF CIVIL ENGINEERS, at 5.30.—Hon. R. C. Parsons: Centrifugal Pumps for Dealing with Liquids containing Solid, Fibrous, and Erosive Matters.
- WEDNESDAY, JANUARY 29.
  - ROYAL SOCIETY OF ARTS, at 4.30.—Dr. F. Keeble: Food Production by Intensive Cultivation.
- THURSDAY, JANUARY 30.
  - ROYAL INSTITUTION, at 3.—Prof. J. N. Collie: Chemical Studies of Oriental Porcelain.
  - ROYAL SOCIETY, at 4.30.—Probable Papers: Prof. J. C. McLennan and R. J. Lang: An Investigation of Extreme Ultra-violet Spectra with a Vacuum Grating Spectrograph.—Prof. J. C. McLennan and J. F. T. Young: The Absorption Spectra and the Ionisation Potentials of Calcium, Strontium, and Barium.—Prof. J. C. McLennan, D. S. Ainslie, and D. S. Fuller: Vacuum Arc Spectra of various Elements in the Extreme Ultra-violet.—R. C. Dearn: Emission and Absorption in the Infra-red Spectra of Mercury, Zinc, and Cadmium.—E. Wilson: The Measurement of Magnetic Susceptibilities of Low Order.—Dr. F. Horton and Ann C. Davies: An Experimental Determination of the Ionisation Potential for Electrons in Helium.
- FRIDAY, JANUARY 31.
  - ROYAL INSTITUTION, at 5.30.—Prof. H. H. Turner: Giant Suns.
- SATURDAY, FEBRUARY 1.
  - ROYAL INSTITUTION, at 3.—Prof. H. P. Allen: The Works of J. S. Bach.

CONTENTS.

	PAGE
Diseases of Plants. By E. S. S. . . . .	401
The Double-star Worker's Vade-mecum . . . . .	402
The Science of Iron-founding . . . . .	403
Our Bookshelf . . . . .	404
Letters to the Editor:—	
Wireless Telegraphy and Solar Eclipses.—Prof. J. A. Fleming, F.R.S. . . . .	405
The Neglect of Biological Subjects in Education.—Prof. A. E. Boycott, F.R.S. . . . .	405
The Aurora Borealis of December 25, 1918. (Illustrated).—Scriven Bolton . . . . .	405
Patent Law Amendment . . . . .	405
Natural and Artificial Camouflage . . . . .	408
Dr. H. E. J. Du Bois. By C. G. K. . . . .	408
Notes . . . . .	409
Our Astronomical Column:—	
The Comet 1786 II. . . . .	413
Parallax of the Barnard Star . . . . .	413
The British Science Guild and its Exhibitions . . . . .	413
Educational Conferences . . . . .	414
The Production of Oil from Mineral Sources. By Dr. F. Mollwo Perkin . . . . .	416
University and Educational Intelligence . . . . .	417
Societies and Academies . . . . .	418
Books Received . . . . .	420
Diary of Societies . . . . .	420

Editorial and Publishing Offices:

MACMILLAN AND CO., LTD.,  
ST. MARTIN'S STREET, LONDON, W.C.2.

Advertisements and business letters to be addressed to the Publishers.

Editorial Communications to the Editor.

Telegraphic Address: PHUSIS, LONDON.

Telephone Number: GERRARD 8830.