McDougall, F.R.S., in the medical school buildings of the University, beginning on Friday, April 30.

THE subject for the Jacksonian prize of the Royal College of Surgeons of England for 1921 is "The Pathology, Diagnosis, and Treatment of Tuberculous Disease of the Spinal Column with its Complications."

APPLICATIONS for not more than three Ramsay memorial fellowships for chemical research will be considered by the trustees at the end of June next. They must be received by, at latest, June 15 by Dr. W. W. Seton, organising secretary, Ramsay Memorial Fund, University College, Gower Street, W.C.1. The fellowships will each be of the annual value of 250*l*., with, possibly, a grant of not more than 50*l*. per annum for expenses, and tenable for two years, with the possible extension of a year.

DR. J. H. ANDREW has been appointed to the chair of metallurgy in the Royal Technical College, Glasgow, vacant by the transfer of Dr. Desch to the University of Sheffield. Dr. Andrew graduated in Manchester University with first class honours in chemistry. After research work in metallurgy, he received the M.Sc. degree in 1908, and was awarded the Dalton scholarship. He continued metallurgical investigations in the University laboratories until 1914, was appointed research fellow and demonstrator in 1910, and Carnegie scholar of the Iron and Steel Institute. He received the degree of D.Sc. in 1915. Since June, 1914, Dr. Andrew has been chief of the Metallurgical Research Department of Sir W. G. Armstrong, Whitworth, and Co., Ltd., Manchester, and has gained a wide experience in the metallurgical industry, having had unlimited scope for studying practice and for research. His publications include a number of important papers presented to the leading metallurgical societies.

Societies and Academies.

LONDON.

Royal Microscopical Society, March 17.—Prof. John Eyre, president, in the chair.—T. E. **Wallis**: The Lycopodium method of quantitative microscopy. Various methods have been devised by different workers in an attempt to find a satisfactory method of making determinations of percentage composition by means of the microscope. The most trustworthy of these require specially constructed apparatus and are applicable in certain instances only. The Lycopodium method is simple in principle, and with slight modifications may be used for all kinds of problems. The only apparatus needed is such as is used in ordinary microscopical work. The results are correct to within 10 per cent. of the amount to be determined; they can therefore be utilised with the same confidence as is the case with results obtained by many well-known chemical operations having a similar range of error.—C. **Da Fano**: Method for the demonstration of the Golgi apparatus in nervous and other tissues. The author has been able to obtain a fairly constant staining of this peculiar intracellular formation by substituting cobalt for uranium nitrate in a formula originally proposed by the Spanish biologist, S. Ramon y Cajal. Da Fano's modification can be easily applied to all sorts of tissues, as proved by an interesting series of quite demonstrative microscopic preparations and lantern slides shown at the meeting. Another step has thus been taken in the study of the "internal apparatus" discovered by Golgi in 1898, the functions of which, however, still remain quite mysterious to biologists and physiologists.

Linnean Society, March 18.—Dr. A. Smith Woodward, president, in the chair.—Prof. J. **Small**: The chemical reversal of geotropic response in roots and stems. It was stated that when roots are placed horizontally in a moist atmosphere rendered very faintly alkaline by ammonia vapour they tend to grow upwards. When stems are treated in a similar way with acetic acid vapour they tend to grow downwards. These experiments form preliminary confirmation of a theory of geotropic curvature which has been elaborated as a correlation of previous work on the electrical conductivity of roots with data accumulated by other investigators.

Aristotelian Society, March 22.—Prof. Wildon Carr in the chair.—Clement C. J. **Webb**: Obligation, autonomy, and the common good. It was contended that the notion of obligation in which Kant rightly found the essential feature of our moral consciousness cannot be directly derived (as Green seems to suppose) from the notion of a "common good"; that, on the contrary, the notion of a "common good," and the closely connected notion of a "general will," derives its significance for ethics, and eventually for politics also, from its connection with the notion of obligation; and that this makes it necessary for any truly ethical conception of the State to retain the idea of "authority," as ascertained, indeed, through the general will, because only thus can it be recognised as authority—viz. the community for itself; not, however, as in itself merely the result of the general will, but as the expression of an absolute factor therein, which perhaps may be best described as the sovereignty of God. To the thought expressed in Kant's choice of the word "autonomy" to express the status of the good will may be traced along one line of descent the anti-authoritarian tendency in contemporary ethics and politics.

Geological Society, March 24.—Mr. R. D. Oldham, president, in the chair.—Mrs. Eleanor M. **Reid**: Two pre-Glacial floras from Castle Eden (County Durham). The seeds examined were obtained by Dr. C. T. Trechmann from pre-Glacial clays, found in fissures of the Magnesian Limestone at Castle Eden. The clays were carried by the Scandinavian ice from the area now covered by the North Sea. The study proved the presence of two seed-bearing clays of different ages, the earlier being undoubtedly Pliocene. The Pliocene age is confirmed by M. P. Lesne, who determined the insect remains found intermingled with the seeds. While the work was in progress material from the base of the Pliocene of Pont de Gail (Cantal) gave knowledge for the first time of a seed flora of known age, low down in the Pliocene; it showed that the rate of change in the character of the West European Pliocene flora was slower than had been suggested by Clement Reid and the author. A critical comparison was made between the Cromerian, Teglian, Castle Eden, Reuverian, and Pont de Gail floras on the bases of the percentages of all exotics, and of Chinese-North American exotics—that is, plants now inhabiting the Far East of Asia or North America, but not Western Europe—in each flora. The result proved the Reuverian to be Lower Pliocene, not top of the Middle Pliocene (as formerly suggested), and the Castle Eden flora to be Middle Pliocene. Therefore a study of fossil seeds had made it possible to discriminate between strata intimately mixed *in situ*, and to determine their geological age when unknown.—Mrs. Eleanor M. **Reid**: A comparative review of Pliocene floras, based on the study of fossil seeds. By plotting as a curve the percentages of all exotics, and of Chinese-North American exotics, from the five floras (see above paper), it was found that all lay

along a smooth curve, part of which indicated changes in the Pliocene and part in the Miocene. From this curve certain deductions are drawn, namely: (1) The study of living and fossil seeds can lead to accurate specific determinations. (2) The study of fossil seeds is as accurate a method of determining geological age as is palæontology, and the age indicated for the Reuverian and Castle Eden floras is approximately correct. (3) The destruction and supplanting of the Chinese-North American exotic flora began about the Middle Miocene, at the time when the great European and Asiatic Alpine ranges attained their maximum uplift; but it was to these trans-continental barriers that Clement Reid and the author attributed the extermination of this flora. Therefore, the curve gives strong and independent confirmation of the truth of their theory, and is in accord with the findings of stratigraphy and palæontology. (4) The curve indicates an incoming flora—the present flora of Western Europe and, in part, of Central and Southern Europe—which first appeared in the Miocene. Of this the aquatic element is now chiefly circumpolar in distribution, whereas the dry-soil element mainly centres in the Himalayas. (5) The incoming flora only in part survived in Western Europe; the destruction became greater after the Middle Pliocene; the cause of this is unknown.

CAMBRIDGE.

Philosophical Society, February 23.—Mr. C. T. R. Wilson, president, in the chair.—Prof. **Seward**: The origin of the vegetation of the land. A brief consideration of questions raised by Dr. A. H. Church in a recent memoir on "Thalassiophyta and the Subaerial Transmigration" (Oxford, 1919). "The beginnings of botany are in the sea." Life evolved from the ionised water of a continuous world-ocean two miles in depth. The plankton epoch; unicellular, free-floating plants. The Benthic epoch was initiated when portions of the earth's crust rose to within the reach of light and plants were able to establish themselves on the ocean-floor. Development during the Benthic epoch of complex anchored marine plants. The epoch of the land flora began with the emergence of areas of land and the transference of plants from the hydrosphere to the atmosphere.

MANCHESTER.

Literary and Philosophical Society, March 2.—Sir Henry A. Miers, president, in the chair.—W. J. **Perry**: The search for gold and pearls in Neolithic times. Further research on the distributions of early sites of civilisation and of the sources of gold and pearls has produced a mass of evidence to substantiate and enlarge the thesis of an earlier paper by the author on "Megalithic Monuments and Ancient Mines." The evidence now suggests that not only megalithic monuments, but also early sites in general, marked the settlements of seekers after gold and pearls, amber and purple having also played their part in attracting strangers. These settlements are mostly localised in the basins of rivers containing gold or pearl-bearing mussels, and the distribution map shows that the early seekers for these objects did not allow much to escape them. Further inquiry will be necessary in order to determine the precise age when this search began.—C. L. **Barnes**: Einstein's theory of space and time.

EDINBURGH.

Royal Society, March 1.—Prof. F. O. Bower, president, in the chair.—Prof. J. C. **Ewart**: The nestling feathers of birds. This paper embodied certain facts of observation in regard to the development of nestling feathers which did not harmonise with the view generally taken that feathers were originally developed out of scales. Three facts of fundamental importance should be borne in mind: (1) The geological record has hitherto told us nothing about the evolution of feathers; (2) the embryological record affords no evidence in support of the view that scales grew longer and lighter and, after much spreading and splitting, became feathers; and (3) the true feathers of modern birds are, as a rule, derived from small umbels consisting at the outset of barbs, which result from the splitting of the intermediate layer of cells of a simple dermic papilla similar to the papillæ of the tongue of ducks. A study of simple nestling feathers (prepennæ) leads one to believe that the plumage of primeval birds consisted of umbels (protoptiles) which differed but little from the bundles of hair found in the jerboa and certain other mammals, or of umbels consisting of barbs armed with barbules, as in the feathers forming the first nestling coat of penguins, or of feathers with practically all the structures now associated with true feathers. In course of time feathers of a different type were evolved, which, as they grew, pushed from the skin, and for a time carried on their tips the feathers of the first generation. The second kind of feathers (mesoptiles) are now well represented in penguins and in the emu, and a remnant is still found in ducks and geese; whether the body of Archæopteryx was clothed with protoptiles or with mesoptiles or with plumose feathers it is impossible to say. When all the facts recently established by a study of the development of feathers are duly considered, there is no escape from the conclusion that the wing-quills are only highly specialised nestling feathers, and that it is inconceivable that the first nestling feathers were formed out of scales.—Dr. J. M'Lean **Thompson**: New stelar facts and their bearing on stelar theories for the ferns. In order to know how the complicated vascular system of adult ferns came into existence, knowledge of individual development was necessary. This has now been traced by sections in a number of specially chosen cases, and the results reconstructed into diagrams showing the individual advance. This involves the formation of a pith, inner phloëm, inner endodermis, and frequently, in the early stages of development, pockets of outer endodermis. These tissues are new creations within the vascular system formed by a static change of quality of the elements from the growing point. The solenostele and other higher forms of the vascular system arise by further modification of the structures thus acquired. This involves the formation of gaps in the vascular system, through which the pith and cortex, originally distinct, unite to form one continuous tissue. The ferns dealt with range from the primitive Schizæaceæ to the advanced Pterideæ.—Sir Thos. **Muir**: Note on Pfaffians with polynomial elements.

PARIS.

Academy of Sciences, March 22.—M. Henri Deslandres in the chair.—A. **Lacroix**: The eruptive rocks of the Pyrenees Cretaceous and the nomenclature of the modified eruptive rocks.—G. **Bigourdan**: The pupils of the Observatory of the Collége de France. The observatories of the Military School.—F. E. **Fournier**: General expressions for the resistance of water to the passage of ships floating in open air and for the wave-length of their satellite surge.—A. **Haller** and R. **Cornubert**: The constitution of the dimethyl*cyclo*hexanone obtained by methylation of the sodium derivative of α-methyl*cyclo*hexanone. From a study of the condensation products with benzaldehyde it is concluded that the dimethyl*cyclo*hexanone is unsym-

metrical.—H. **Lecomte**: The tier-like structure of certain woods.—P. A. **Dangeard**: The structure of the plant-cell and its metabolism. A critical discussion of the views of Guilliermond.—M. Maxime Laubeuf was elected a member of the division of the applications of science to industry.—N. E. **Nörlund**: A theorem of Cauchy.—Ch. **Fremont**: Work done in sawing metals by hand. A diagram and description of a pendulum support and guide for a hack-saw. There is an economy of about one-third of the labour.—J. **Vallot**: The calibration in calories of two actinometers adapted to studies in heliotherapy and agricultural climatology.—J. **Guillaume**: Observations of the sun made at the Observatory of Lyons during the fourth quarter of 1919. Observations were possible on sixty-six days during the quarter, and the results are tabulated, showing the spots, their distribution in latitude, and the distribution of the faculæ in latitude.—M. **de Broglie**: The K absorption bands of the rare earths for the X-rays.—P. **Boucherot**: Electrical resonance in a circuit the self-inductance of which contains iron.—C. **Chéneveau** and R. **Audubert**: A nephelometer.—P. **Job**: The constitution of two cobaltammines.—J. **Guyot** and L. J. **Simon**: The combustion by mixtures of sulphuric and chromic acids of organic bodies containing chlorine. Whilst the combustion of hydrocarbons by the wet method is nearly always incomplete, out of nine chlorinated hydrocarbons seven gave correct figures for carbon and only two, pentachloroethane and hexachloroethane, gave low results.—C. A. **Kténas**: The hydrocarbon zone of Western Greece. Sixteen points are marked on a map of Western Greece where indications of oil, bituminous schists, or asphalt have been found.—P. **Fallot**: Observations on drift phenomena in the centre of the Sierra of Majorca.—C. **Störmer**: The absorption of the penetrating corpuscular rays in the earth's atmosphere following non-rectilinear trajectories.—G. **Reboul** and L. **Dunoyer**: The utilisation of cirrus clouds for weather prediction. Rules are given for weather forecasts based on the appearance of cirrus clouds, their displacement and amount. Results of the application of these rules to weather predictions are compared with the observed weather.—V. **Bjerknes**: The temperature of the upper layers of the atmosphere.—G. **Nicolas**: The respiration of plants carrying parasitic fungi.—H. **Coupin**: The time taken by chlorophyll to develop its maximum intensity in the light.—P. **Portier**: Modifications of the testicle of birds under the influence of a diet free from vitamines.—J. **Athanasiu**: The supposed dynamogenic power of alcohol. There is no evidence of increase of muscular power at any period of time after ingestion of alcohol. The experiments described afford a further proof that alcohol is not a food utilisable by the organism.—J. E. **Abelous** and L. C. **Soula**: The action of secretin upon metabolism.—F. **Diénert**: The formation of activated sludge.—A. **Fernbach** and M. **Schoen**: New observations on the biochemical production of pyruvic acid. During the fermentation of sugar by yeast in a solution maintained neutral by chalk an appreciable quantity of pyruvic acid is formed.—J. **Legendre**: The *rôle* of domestic animals in the defence against malaria.

ROME.

Accademia dei Lincei, Class of Physical, Mathematical, and Natural Sciences, January 18.—Prof. A. Ròiti, vice-president, in the chair.—O. M. **Corbino**: A laboratory method for the production of continuous and constant electric currents of high tension.—G. **Ciamician** and C. **Ravenna**: Influence of some organic substances upon the development of plants (iv.).—A. **Angeli** and C. **Lutri**: Chemical researches on the melanins of pyrrole.—Q. **Majorana**: Gravitation (vi.). A continuation of previous researches (1918) on a rather sensational subject, namely, the screening off of gravitation by a massive spherical sheet (in practice, about 100 kg. of mercury placed between two concentric spheres). Last May the author found, or at least believed he had found, a positive effect, *e.g.* a just discernible diminution of the weight of a sphere of lead placed within the cavity of the said sheet; but later he found a slight increase in the weight instead. In the present note the author gives some further details about the improvement of his apparatus, and discusses possible perturbations of thermal and mechanical origin. The net results of his search for a gravitational screening effect are so far inconclusive.—F. **Bottazzi**: Researches on the posterior salivary gland of Cephalopodes (iii.). This note deals with the independence of secretive activity of the presence of free oxygen.—E. **Bompiani**: Metrical invariants and covariants with respect to surface deformations of higher order (species) (iii.).—A. **Rosenblatt**: A theorem of Liapounoff (to be published in the next issue of the *Atti*).—L. **Tonelli**: Primitive functions. An old mathematical subject re-inaugurated about twenty years ago by Lebesgue and others.—E. **Zavattiero**: Relation between the resistance and stress in bismuth.—C. **Ravenna**: Preliminary note on the synthesis of a peptide from aspartic acid with vegetable enzymes.—G. **Sani**: Arbusterine and its derivatives.—L. **Bernardini**: Nicotine in tobacco. A contribution to the study of the genesis and the functions of alkaloids.—E. **Pantanelli**: Influence of nutrition and radical activity upon collapse produced by cold.—A. **Trotter**: The supposed parthenocarpy of the hazel-nut and its possible characters (ii.). Results of observation and experiments are given.

L. SILBERSTEIN.

Books Received.

An Introductory Course in Quantitative Chemical Analysis. By Prof. G. McPhail Smith. Pp. x+206. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd.) 9*s.* net.

New Zealand Plants and their Story. By Dr. L. Cockayne. Second edition. Pp. xv+248. (Wellington, N.Z.: Dominion Museum.) 7*s.* 6*d.*

The Buzzard at Home. By A. Brook. Pp. 15+12 plates. (London: Witherby and Co.) 3*s.* 6*d.* net.

A Synoptical List of the Accipitres (Diurnal Birds of Prey). By H. Kirke Swann. Part iv. Pp. vi+115–64. (London: J. Wheldon and Co.) 4*s.*

Trattato di Chimica Generale ed Applicata all' Industria. By Prof. E. Molinari. Vol. ii. Chimica Organica. Parte prima. Terza edizione. Pp. xix+624. (Milano: U. Hoepli.) 28 lire.

The Principles of Ante-natal and Post-natal Child Physiology, Pure and Applied. By W. M. Feldman. Pp. xxvii+694+6 plates. (London: Longmans and Co.) 30*s.* net.

Calcutta University Commission, 1917–19. Report. Vol. xiii. Evidence and Documents. Statistics relating to Colleges. Pp. xii+221. (Calcutta: Supt. Government Printing, India.) 1.8 rupees.

Year-book of the Royal Society of London, 1920. Pp. iv+236. (London: Harrison and Sons.) 7*s.* 6*d.*

Hydration and Growth. By Dr. D. T. MacDougal. Pp. vi+176. Fluorescence of the Uranyl Salts. By E. L. Nichols, H. L. Howes, and others. Pp. 241+1 plate. Experiments in the Breeding of Cerions. By P. Bartsch. Pp. 55+59 plates. Contributions to Embryology. Vol. ix. Nos. 27 to 46. A Memorial to Franklin Paine Mall. Pp. v+554+plates. (Washington: Carnegie Institution of Washington.)