

MANCHESTER.—Mr. E. D. Telford, lecturer in practical surgery in the University, and a member of the Honorary Staff of the Manchester Royal Infirmary, has been appointed professor of systematic surgery.

By the will of the late Sir William Lorimer, who died on April 9 last, the Court of the University of Glasgow will receive the sum of 10,000*l.*

It is announced in *Science* that, by the will of the late Amos F. Eno, Columbia University, New York, will receive a bequest of about four million dollars.

THE Beaney Scholarship in *Materia Medica* at Guy's Hospital Medical School is vacant. It is of the yearly value of about 50*l.* and tenable for three years. It is open to candidates who have received at least part of their medical education at Guy's Hospital. The latest date for receiving applications is July 7. They should be sent to the Dean of the School, S.E.1.

THE Gull studentship in pathology and allied subjects, of the annual value of about 250*l.* and tenable for three years, is being offered by Guy's Hospital Medical School. The studentship is open to candidates under 35 years of age who have studied in the school. Applications must reach the Secretary to the Board of Electors, Guy's Hospital Medical School, S.E.1, by, at latest, July 7.

THE summer meeting of the Association of Technical Institutions will be held at Oxford on Friday and Saturday, July 7 and 8. The sessions on Friday and Saturday mornings will commence at 10.30 o'clock, when the president, The Right Hon. Walter Runciman, will occupy the chair. The Rev. L. R. Phelps, Provost of Oriel College and Pro-Vice-Chancellor, will welcome, on behalf of the University, the members of the association at the opening of the conference. Papers will be read by Rev. W. Hardy Harwood (Chairman of the Council) and Principal J. F. Hudson (Huddersfield) on "The Relation of Technical Education to the Question of General Education." Principal J. Quick, on "Central Schools and their part in the Preparation of Scholars for Higher Technical and Junior Technical Schools," and by Mr. E. C. Kyte, Secretary of the Library Association, on "Technical Libraries—How to Start and Develop them."

THE annual report of the Livesey Professor, Prof. John W. Cobb, at the University of Leeds, gives an account of the work done in the department of coal gas and fuel industries (with metallurgy) for the session 1920-21. The number of students (41) reached the highest figure in the history of the department; one third (14) taking the fuel and metallurgy course, the remainder (27) the course in fuel and gas engineering. The special evening classes included courses on the distribution of gas (Mr. Walter Hole), coke oven practice (Mr. W. Greaves), steaming in vertical retorts (Dr. A. Parker), and metallurgy (Mr. P. F. Summers). These courses were attended by 49 external students in addition to the full-time registered students. Researches were carried out on the liberation of nitrogen from coal and coke as ammonia, the structures of cokes prepared at different temperatures, the losses of ammonia in coke oven practice, a laboratory apparatus for coal distillation, the expansion of refractory materials, the trustworthiness of recording gas calorimeters, and the efficiency of production of blue water gas. The endowment funds of the department have benefited by substantial donations from the South Metropolitan Gas Company, the South Suburban Gas Company, and from Mr. A. G. Glasgow.

## Societies and Academies.

LONDON.

**Royal Society, June 15.**—Sir Charles Sherrington, president, in the chair.—H. M. Evans: The defensive spines of fishes, living and fossil, and the glandular construction in connexion therewith, and observations on the nature of fish venoms. The gland in the groove of the spine of the sting-ray (*Trygon pastinaca*) consists of two portions—the deepest part of the groove contains an alveolar-connective tissue structure, which is separated from the true glandular epithelium by a pigmented capillary layer. The dorsal fin-spines of the spiny dog-fish *Acanthias* are grooved, and the groove is occupied by a gland with definite follicles. Cestracion also has a well-developed gland at the base of the dorsal fin spines. The spines of *Chimæra* and of the *Pleuracanthidæ* show structures which suggest a specialised function. The nature and properties of Weever venom are described; the filtration of venom profoundly affects its hæmolytic properties. Experiments are described on the native use of abrin as an antidote to fish venoms.—D. W. Cutler, L. M. Crump, and H. Sandon: A quantitative investigation of the bacterial and protozoan population of the soil: with an account of the protozoan fauna. The results of 365 consecutive daily counts of the numbers of bacteria and of six species of protozoa in a natural field soil are given. Large fluctuations occur which cannot be correlated with meteorological conditions. Fourteen-day averages of the daily numbers show marked seasonal changes superimposed on the daily variations in numbers. In general, both bacteria and protozoa are most abundant at the end of November, and fewest during February. The changes are not directly influenced by temperature or rainfall. An inverse relationship is found between the numbers of bacteria and certain amœbæ, and a two-day periodicity obtains for the numbers of the flagellate *Oicomonas termo* which are active.—D. W. Devanesen: The development of the calcareous parts of the lantern of Aristotle in *Echinus miliaris*. All the calcareous elements of the lantern of Aristotle, with the exception of the teeth, are deposited as triradiate spicules. A "compass" arises from two rudimentary spicules. It is the only element of the lantern absent in the "echinus-rudiment." A tooth is a paired structure in consequence of its composition of a double row of lamellæ. A pair of lamellæ is its ultimate unit. A remarkable stage in the consolidation of these lamellæ is the cone-in-cone arrangement. The carina is formed by the beaks of the serially fitting cones. The ossicles of the lantern are compared with those of the mouth-frame of star-fish.—A. Lipschütz, C. Wagner, R. Tamm, and F. Bormann: Further experimental investigations on the hypertrophy of the sexual glands.

**Zoological Society, June 13.**—Prof. E. W. MacBride, vice-president, in the chair.—Miss J. B. Procter: A study of the remarkable tortoise *Testudo loveridgii* Blgr., and the morphogeny of the Chelonian carapace.—J. T. Carter: A microscopical examination of the teeth of the primates.—H. G. Jackson: A revision of the isopod genus *Ligia*, Fabricius.—W. R. B. Oliver: A review of the Cetacea of the New Zealand seas.—F. Wood Jones: On the dental characters of certain Australian rats.

**Linnean Society, June 15.**—Dr. A. Smith Woodward, president, in the chair.—A. B. Rendle: Seedlings of horse-chestnut from which the terminal bud had been removed by cutting through the epicotyledonary stem. Minute buds appeared on the cut surface corresponding in position with the cambium-

layer in the stem. A new shoot was also produced in the axil of each of the cotyledons.—Sir Arthur Shipley: *Furia infernalis*. Linnæus was probably stung by a virulent insect which may have conveyed to his system some pathogenic germs unknown at that time.—T. A. Sprague: The identification of *Sison Ammi*, Linn. *Sison Ammi* is an umbelliferous plant published by Linnæus in the first edition of the "Species Plantarum" in 1753. The type-specimens in the Linnean Herbarium and the British Museum show that it is *Carum copticum*, a medicinal plant which yields the Ajowan seeds and Ajowan oil, from which thymol is obtained. The history of the drug Ammi goes back to Dioscorides, who lived in the first century of the Christian era; he described it as having a minute seed with the flavour of marjoram. Various plants have been described as the Ammi, but in the plates of Umbelliferae published by Rivinius at the end of the seventeenth century, the officinal Ammi is *Carum copticum*. The geographical source of the drug supports this conclusion. The best quality of Ammi was imported from Alexandria, but was actually grown in Arabia, where *Carum copticum* is still cultivated. It has never been found in a wild state.—E. A. Newell Arber: Critical studies of coal-measure plant impressions. The British Upper Carboniferous species of the genus *Lepidostrobus*, Brongn., preserved as incrustations, and other impressions were discussed.—J. Burt Davy: A revision of the South African species of *Dianthus*. Thunberg's specimen of *D. incurvus*, Thunb., does not match any South African material at Kew or the British Museum. Thunberg himself identifies it on the sheet with *D. albens*, Ait., but the specimen does not agree with the type of *D. albens* in the British Museum. In the "Flora Capensis," Sonder recognised nine species of *Dianthus*. Of these, seven only are valid, and to them must be added four species not recognised by Sonder: Six additional species and three varieties are now described, bringing the total number up to seventeen species and three varieties.

Royal Meteorological Society, June 21.—Dr. C. Chree, president, in the chair.—J. E. Clark, H. B. Adames, and I. D. Margary: Report on the phenological observations for the year 1921. After mid-December the mildness until late March was extreme, which gave premature fruit blossom and its usual concomitant of poor fruit crops, except apples. The four early spring flowers were more than 18 days earlier than the 30 years' mean; April and May, 14 days, June, 10, and July, 6 days. Grain-cutting was very early. The warm uprush along the Bristol Channel, and up the Severn and Dee valleys to include the Wirral Peninsula, was almost identical with the isophenal trend and values for 1920. In the north-east of Norfolk there was a recurrence of the cold area so well marked in the years 1919 and 1920, spreading southward from the North Sea, and curving south-eastward by Norwich to include Bungay, and also of the long tongue stretching from the Scottish border southward to include Leicestershire and Rutland. The northerly bulge of warmth just north of the Isle of Wight was again very definite. High ground is, as before, indicated on the maps by relatively late isophenal areas. Among exceptional effects were the brief blooming period of the summer flowers and the earliness of the autumn flowers, especially the Michaelmas daisies; the dormant or destroyed seed-sowing experiences; the frequency of second blossom after the August rains, typically the horse-chestnut; the early departure of the swallows; the dearth of tortoiseshell and allied butterflies, apparently from lack of nettles. October had a week of unparalleled heat, while November opened with severe frosts.

After a partial fall in late July, trees had retained their foliage to an unusually late date, and those frosts had the effect of making many of the leaves brown and shrivelled as if from excess of heat. Planes and elms kept their green leaves almost or quite until December.—L. F. Richardson, A. Wagner, and R. Dietzius: An observational test of the geostrophic approximation in the stratosphere. Wind velocity, at points not too near the earth's surface or the equator, may be found with an accuracy of about 5 per cent. from the horizontal pressure gradient and the rotation of the earth. A test of the error involved in neglecting other considerations is obtained by inserting the "geostrophic" velocities in the equation for the accumulation of mass. Thus a theoretical equality, valid in the stratosphere, between certain derivatives of wind and temperature is obtained. From observations collected by Wagner and Dietzius, the quantities which this theory makes equal have a positive correlation of about four-tenths.

## EDINBURGH.

Royal Society, May 8.—Prof. W. Peddie, vice-president, in the chair.—Prof. E. T. Whittaker: The quantum mechanism in the atom (see p. 23).—A. R. Forsyth: Differential invariants and other concomitants of quadratic differential forms in four variables. The method is that of Lie's continuous groups, and is thus entirely different from the Christoffel method usually expounded. It provides new results which the Christoffel method did not even suggest. It can be applied to obtain Einstein's critical form in the relativity theory of gravitation; on one hand, some of his conditions were covered by others, and on the other hand his form satisfied one equation more than the set he initially postulated.—T. R. MacRobert: The asymptotic expansion of the confluent hypergeometric function, and the Fourier-Bessel expansion.

## PARIS.

Academy of Sciences, June 6.—M. Emile Bertin in the chair.—Ch. Boulanger and G. Urbain: The composition and chemical characters of thortveitite from Madagascar. Five complete analyses of this mineral are given. The proportion of yttrium earths does not exceed 0.5 per cent., while the Norwegian mineral contains 4.18 per cent. Of this group only yttrium, neoytterbium, and lutecium could be detected.—MM. d'Arsonval, Bords, and Touplain: Study of the glacier waters of Argentière and Bossons. There are marked differences in the electrical conductivity and chemical composition of the waters from these two sources.—Carl Stormer: Determination of the external magnetic field of the sun by the structure of the solar corona and the constants of the aurora borealis.—Louis Roy: Electromagnetic actions in an isotropic system.—G. Reboul: A new radiation and its application to the study of the ultraviolet of Millikan and Lyman.—A. Tian: Thermostats with multiple jackets. The copper vessel containing the liquid to be maintained at a constant temperature, is surrounded with felt and placed in one or more boxes, also of copper, which are isolated in the same manner. The external jacket is heated, and a uniform, steady temperature can be thus maintained without stirring. The advantages claimed for this system are that the thermal oscillations due to the regulator are almost entirely eliminated. The temperature of the inside bath is practically independent of variations in the room temperature, and stirring is not required.—Léon and Eugène Bloch: Spark spectra in water.

The photography of spectra of sparks under water, by the automatic separation into arc lines and spark lines and by the differences in the appearance of the lines, appears to be valuable in detecting spectral regularities.—M. de Bellescize: Damping the oscillations of resonators in wireless telegraphy.—A. Recoura: Some new properties of the green sulphate of chromium. Green sulphate of chromium forms complex compounds with potassium sulphate, and the resulting solutions give reactions with benzidine compounds or with barium chloride, indicating that  $\text{SO}_4$  ions are absent or present in small proportions only. Results are given of a study of the effects of temperature, dilution, and time on these complexes.—Paul Riou: The velocity of absorption of carbon dioxide by alkaline solutions.—Mlle. Wurmser: The preparation of ammonium nitrate. An extension of earlier work by M. Rengade on the formation of ammonium nitrate by the interaction of sodium nitrate and ammonium chloride.—Mlle. N. Wolff: Furfural- $\alpha$ -methylcyclohexanone and some of its derivatives. Mono- and difurfuralcyclohexanones.—E. Berger: A formal lamp. A detailed account, with diagrams, of the construction of a new lamp for burning methyl alcohol to formaldehyde. With copper oxide as a catalyst the yield is 25-30 per cent. with silvered asbestos, 35-45 per cent. of the alcohol used is obtained as formaldehyde. Results of the application of the lamp to practical disinfection of rooms are given.—H. Joly: The tectonic direction of the Cretaceous and Tertiary deposits in the neighbourhood of Haro (Logroño, Spain).—P. Lory: The glacial stages and a valley recording these stages (Bédinat, Chaîne de Belledonne).—P. L. Mercanton: The glacial system of the Beerenberg of Jan Mayen. This extinct volcano was climbed by the author, with J. M. Wordie and T. Lethbridge, in August 1921. From the highest point (about 2500 metres) the structure of the crater was made out, and a detailed account of this and the glacier system is given.—MM. Pons and Rémy: The reddish-brown coloration shown in March 1922 by the Briançon snow. Specimens of the coloured snow, collected on March 19 at an altitude of 2350 metres, were examined, after melting, chemically and microscopically. There was practically no organic matter, and the microscope showed no remains of microscopic organisms (Algae, Foraminifera, diatoms), nor were there any vitreous inclusions characteristic of volcanic dust. Chemical analysis showed silica, iron, and alumina. The possible origin of the dust is discussed, but no definite conclusion could be arrived at.—P. Bugnon: The fibrovascular organisation in Mercurialis. Possible descent from a primitive form.—Gustave Chauveaud: The principal variations in the vascular development of the first phyllorhiza of Phanerogams are not determined by intercalary increase.—Louis Lapique: Mechanism of the exchanges between the cell and the surrounding medium. The osmotic pressure in the cells of marine Algæ is higher than that of sea water. This is incompatible with the currently accepted view that all exchanges of the cells are determined by the laws of osmosis. The author holds that, on the contrary, the exchanges of the cells are the result of physiological work and that diffusion and osmotic pressure intervene often as resistances only.—Paul Portier and Marcel Duval: The variation of the osmotic pressure of the blood of the cartilaginous fishes under the influence of modification of the salinity of the surrounding sea water. The dog-fish was used in these experiments, and it was found that the osmotic pressure of the blood was not equal to that of the sea water in which the fish is immersed. There was a tendency for the osmotic pressure of the blood to follow that of the sea water, but the

adjustment was very imperfect. The fish supported dilution of sea water better than enrichment with salt.—E. Fauré-Fremiet and Mlle. H. Garrault: Constitution of the ovarian egg of the carp (*Cyprinus Carpio*).—H. Vallée and H. Carré: The plurality of the aphthous virus.

## BRUSSELS.

Royal Academy of Sciences, June 3.—M. A. Lameere in the chair.—F. Swarts: On trifluoromethylcyclohexane.—F. Swarts: On trifluoroacetic acid.—Th. De Donder: The electromagnetic field and the gravific field.—A. Mélant: The conditions determining the encystment of the infusorian, *Euplotes harpa*.—M. Philippon: A new form of electrical resistance of electrolytes.—M. Nuyens: A change in the variables of M. De Donder.—P. Bruylants and J. Dondeyne: The determination of the atomic weight of selenium.

## Official Publications Received.

The Mellon Institute of Industrial Research of the University of Pittsburgh. Ninth Annual Report on the Industrial Fellowships of the Mellon Institute for the Institute's Fiscal Year, March 1, 1921, to March 1, 1922. Pp. vi+23. (Pittsburgh, Pa.)  
 South Australia: Department of Mines. Mining Review for the Half-Year ended December 31st, 1921. Compiled by Lionel C. E. Gee. No. 35. Pp. 72. (Adelaide.)  
 South Australia. Department of Mines: Geological Survey of South Australia. Bulletin No. 9: The Iron-Ore Resources of South Australia. By R. Lockhart Jack. Pp. 71. (Adelaide.)  
 Bureau of Education, India. Occasional Reports No. 10: Adult Education (University Extra-Mural Teaching in England and Wales). By J. P. Bulkeley. Pp. ix+98. (Calcutta: Government Printing Office.) 8 annas.  
 Bureau of Education, India. Indian Education in 1920-21. Pp. ii+87. (Calcutta: Government Printing Office.) 1.8 rupees.  
 Technical College, Bradford. Diploma and Special Day Courses. Prospectus, Session 1922-23. Pp. 168+plates. (Bradford.)  
 Report of the Fifteenth Meeting of the Australasian Association for the Advancement of Science. Hobart Meeting, held in Melbourne, January 1921. Edited by Dr. Georgina Sweet and Dr. A. C. D. Rivett. Pp. lxxxix+390. (Sydney, N.S.W.: The Association, Elizabeth Street.)

## Diary of Societies.

## FRIDAY, JUNE 30.

ASSOCIATION OF ECONOMIC BIOLOGISTS (at the Royal Horticultural Society's Gardens, Wisley), leaving London 11.15-11.30 A.M.—Annual Field Meeting.  
 ROYAL SOCIETY OF MEDICINE (Laryngology Section), at 4.45.

## MONDAY, JULY 3.

VICTORIA INSTITUTE (at Central Buildings, Westminster), at 4.30.—Right Rev. Bishop Welldon: Modernism. (Annual Address.)  
 FELLOWSHIP OF MEDICINE (at Royal Society of Medicine), at 5.—Dr. J. S. Goodall: So-called Functional Diseases of the Heart.  
 ROYAL INSTITUTE OF GREAT BRITAIN, at 5.—General Meeting.  
 ROYAL INSTITUTE OF BRITISH ARCHITECTS, at 8.—Dr. T. Ashby: Recent Excavations at Rome.  
 ARISTOPHELIAN SOCIETY (at University of London Club, 21 Gower Street), at 8.—W. O. Brigstocke: Probability.

## TUESDAY, JULY 4.

EUGENICS EDUCATION SOCIETY (Annual General Meeting) (at Royal Society), at 5.30.—Dr. Tredgold, Dr. C. H. Bond, Dr. B. Hollander, E. A. Fisher, and others: Conference on the Inheritance of Mental Qualities, Good and Bad.  
 INSTITUTE OF PHYSICS (at Institution of Electrical Engineers), at 5.30.—Sir Alfred Ewing: The Physicist in Engineering Practice, with Special Reference to Applications of Thermodynamics. (Lectures on "Physics in Industry" (2).)  
 SOCIOLOGICAL SOCIETY (at Leplay House, 65 Belgrave Road), at 8.15.—S. C. Ramsey: Regional and Vocational Influences on Architecture.

## WEDNESDAY, JULY 5.

ROYAL METEOROLOGICAL SOCIETY (a Summer Meeting) (at the Croydon Aerodrome), at 3.—G. E. Hay: Address on the Arrangements for supplying Meteorological Information to Pilots.—Inspection of Aerodrome, etc.

## THURSDAY, JULY 6.

ROYAL SOCIETY OF MEDICINE, at 5.—Annual General Meeting.  
 CIVIC EDUCATION LEAGUE (at Leplay House, 65 Belgrave Road), at 8.15.—A. Farquharson: Art as a Mirror of Society.