

At the Indian Institute of Science, Bangalore, the service of Dr. M. O. Forster as director has been extended until April 1933. Dr. V. Subrahmanyan has been appointed professor of biochemistry.

At the end of the year Dr. R. S. Clay is resigning the principalship of the Northern Polytechnic, London, a post he has occupied for twenty-nine years. The governors, staff, students, and members of clubs and societies who have been associated with him during this long period wish to assist in offering some token of their regard and affection, and a committee has been set up to give effect to this general desire. The honorary treasurer of the committee is Mr. W. M. Macbeth, Northern Polytechnic, Holloway, London, N.7.

THE International Federation of University Women has issued a report of its sixteenth council meeting, held at Wellesley College, Massachusetts, last April under the chairmanship of the president of the Federation, Prof. Winifred Cullis, and attended by women graduates of thirty-one countries. Prominent among the activities of the Federation is the establishment of research fellowships to give university women the opportunity of a year's work in a foreign country. The fund for this purpose already exceeds five thousand pounds, exclusive of the collections of the American Association of University Women, which will be allocated partly to national and partly to international fellowships.

### Birthdays and Research Centres.

Dec. 20, 1876.—Dr. W. S. ADAMS, director of Mount Wilson Observatory.

My chief interest for many years has consisted in physical and quantitative studies of stellar spectra. Theoretical astrophysicists have carried on much able research during recent years on problems of stellar constitution and radiation, and the need for observational evidence to aid in discriminating among different theories is pressing. This is especially true of investigations dealing with temperatures and pressures in stellar atmospheres, the opacity coefficient, and the abundance of the elements in different states of excitation and ionisation.

Specific observational studies at Mount Wilson are dealing with the character, intensities, and contours of stellar spectral lines, their differential displacements, and the application of spectral criteria to the determination of the absolute brightness and the distances of stars.

Dec. 22, 1862.—Dr. VAUGHAN CORNISH, past president of Section E (Geography) of the British Association and of the Geographical Association.

The secret of scenic beauty is the enhancement which landscape derives when the grouping happens to be harmonious, whether this be a matter of locality, as when the physical features are harmonious, or of season, as when light or colour are happily blended or contrasted.

During the last six years, I have published a number of original papers in which the principle of harmonious grouping has been applied both to the landscape of the wild and to the scenery of civilisation, and in a chapter entitled "Watching the Seasons" in a recently published book on "The Poetic Impression of Natural Scenery" I have shown its application to the changes of sunlight and foliage.

Every advance in the systematic study of natural beauty will be a social benefit, since an enhanced appreciation of the countryside will provide the majority of our people with a corrective for the inevitable artificiality of urban life.

### Societies and Academies.

LONDON.

Royal Society, Dec. 10.—Sir Arthur Eddington: On the mass of the proton. From the theory of the cosmical constant developed in a previous paper, a wave equation for an electron is developed, which, however, is incomplete. The correct equation contains the factors 10 and 136, representing the number of degrees of freedom associated with the respective energy terms. The mass of a particle satisfying this wave equation is given by an equation having two roots, which evidently correspond to electrons and protons, and their ratio is 1847.60. It is verified that the two roots represent charges of opposite sign.—P. S. H. Henry: The specific heats of air, oxygen, and nitrogen from 20° C. to 370° C. Further developments of the new constant flow calorimeter for the determination of the specific heats of gases at constant pressure are given. These results, whilst agreeing with those obtained by the sound velocity method at room temperature, show a much higher rate of increase of the specific heats with temperature, and a closer approximation to the curves predicted by means of Boltzmann's hypothesis from the spectroscopic frequencies of vibration of the molecules.—W. L. Francis: Studies in membrane behaviour (1). Equilibrium membrane potentials are measured for a buffer concentration gradient of 10:1 using  $N/40-N/400$  and  $N-N/10$  solutions. The e.m.f.'s with and without gelatine on the membranes are compared over the pH range 2.35-7.3. The results, more particularly with weaker solutions, appear to support the modified diffusion theory, that is, the anions are retarded in basic solution and the cations in acid solution. Direct evidence, given by determinations of the transport numbers of the sodium and acetate ions across the membrane in  $N/2$  solution, vetoes this theory. Assuming that the membrane potentials are made up of the ordinary diffusion potential and an opposed e.m.f. due to the combination or adsorption of ions on the protein, an explanation is suggested which conforms with the known behaviour of gelatine in electrolyte solutions.

PARIS.

Academy of Sciences, Nov. 9.—E. Jouguet: The secular stability of the rotors of turbines. A discussion of the criteria of stability according to Stoidola's hypotheses, with the additional criterium suggested by Lamb.—H. Vincent: A theory of the constitution of antibodies. A comparison of the properties of antitoxins and cryptotoxins (toxin + sodium salicylate). Both form a stable complex with the toxin and both are dissociated when the pH is lowered to 4.7: although the toxin is neutralised, it is not destroyed in either case.—André Blondel: The mutual inductances of magnetic leaks in transformers with several secondaries.—Erik Westzyntius: The distribution of integers which are not divisible by any one of the  $n$  smallest prime numbers.—A. Marchand: Various extensions of the idea of a continuum of limited order.—J. Favard: A proposition of Minkowski.—S. Finikoff: Stratifiable parabolic congruences: transformers of  $R_0$  surfaces.—J. Herbrand and C. Chevalley: New demonstration of the theorem of existence in the theory of the body of classes.—H. Parodi: The method of integration by successive arcs giving, in the calculation of the elementary arc, an approximation as close as desired.—Georges Giraud: Problems of values at the boundary in the case of discontinuous data.—J. A. Lappo-Danilevski: The construction of the normal integral matrix of a system of linear differential equations in the neighbourhood of a pole of its coefficients.—A. Markoff: A general property

of Birkhoff's minimal ensembles.—Jacques Devisme: Some partial differential equations.—Arnaud Denjoy: A theorem of Wiman.—Bernard Salomon: Mechanical integrators with holonomical linkages.—Al. Proca: The theory of radiation.—A. Foch and J. Bariol: The motion of a viscous fluid in the neighbourhood of a disc oscillating about its axis.—Th. Got: The value of the Dunkerley formula and its analogues for the approximate calculation of the first critical velocity of a rotating axis.—D. Barbier: The distribution of the poles of the orbits of double stars.—Maurice Curie and A. Lepape: The thermal conductivity of the rare gases. A modification of the thermometric cooling method of E. Müller was used. Data are given for the first time for krypton and xenon; the previously published results for helium, neon, and argon are confirmed.—G. Bruhat and J. Thouvenin: The double refraction produced by the compression of amorphous silica and crystallised quartz and its dispersion in the ultra-violet. Two specimens of fused silica show comparable double refractions on compression, the differences between them being only 5.6 per cent. This double refraction is about 40 per cent higher than that of crystalline quartz. Havelock's formula for the variation of the double refraction with the wave-length is considered to be only a first approximation.—Mlle. M. Quintin: The activity coefficient of the bivalent copper ion in solutions of its sulphate. In the range of concentration studied, including some relatively high concentrations, the Debye theory applies to solutions of copper sulphate, if a correction factor for the dimensions of the ions is included.—S. Rosenblum: The long path  $\alpha$ -rays emitted by  $\text{ThC} + \text{C}'$  and some determinations of the velocities of the  $\alpha$ -rays. The direct measurement of the velocity of the  $\alpha$ -rays has been determined with the aid of the large electromagnet of the Academy of Sciences by the method of magnetic focalisation.—Paul Woog, Miles, Emilie Ganster and Fanny Coulon: The variation of the point of thawing out of mineral oils accompanying changes in their state.—P. Bary and E. Fleurent: The degradation of india-rubber solutions of various concentrations. The changes were followed by the alterations in the viscosity of the solutions.—L. Riéty and G. Salager: An electromotive force of filtration of abnormal value. Solutions of mercuric cyanide, flowing through a capillary tube, set up abnormal electromotive forces, ranging from 0.65 to 3.025 volts with varying concentration.—J. Sambussy: The action of a continued difference of potential on acetone and ether.—Maurice Lambrey: A method of studying the decomposition of gun-cottons at the ordinary temperature. The method is based on the increase of the  $\gamma$  absorption bands of nitric oxide in presence of an inert gas (hydrogen). Clear evidence has been obtained by this method that various specimens of carefully purified gun-cotton evolve traces of nitric oxide at 30° C.—André Kling and Daniel Florentin: The mode of action of dehydrating catalysts in the hydrogenating cracking of phenols. Contrary to expectations, the activity of certain catalysts (alumina, blue oxide of molybdenum) is increased by a preliminary heating to 750° C.—Frèrejacque: The autoxidation of uric acid in the presence of amines.—E. Aubert de La Rüe: The extension of the granular eruptive rocks in the Kerguelen Archipelago.—Yang Kieh: The prolongation towards the west of the dislocated zone situated to the north of the Marche chain.—Henri Besaire: The stratigraphy of the sedimentary formations of the province of Analalava, north-west Madagascar.—V. Frolow: The fall of the Oronto in 1929–30.—E. Diénert: The condensation of water vapour in the soil.—Mlle. Lucie Ricard: The vascular insertion of rootlets.—A. Kopp and D. d'Emmerz de Charmoy: New results on the diseases of sugar cane and maize.—

Polack: Which colours do all colour-blind people fail to distinguish? A modified test for colour-blindness is suggested, stress being laid on the separation of blue, violet, purple, and greenish blue. Separation of the red and green is possible in certain colour-blind people.—Raymond-Hamet: The indirect vaso-dilatory action of the ergot alkaloids.—Fernand Mercier: The influence of dextrorotatory pseudo-cocaine on the hypertensive action of adrenaline. The two optically isomeric cocaines have a different physiological action as regards the hypertensive effect produced by adrenaline.—Mme. M. L. Le Roux: The experimental removal of the ovaries of *Gammarus* and its effect on the evolution of the oostegites.—A. Vandel: The existence of males of parthenogenetic origin and the genotypical constitution of the parthenogenetic females of *Trichoniscus (Spiloniscus) Elisabethae*.—J. Parrod and Mlle. Y. Garreau: The oxidation products of *d*-mannose by ammoniacal copper oxide in the presence of air, at the ordinary temperature. The oxidation products, oxalic acid, imidazol, and *d*-arabino-tetroxy-butyl-4-imidazol, were the same as those previously isolated from the oxidation of *d*-glucose under similar conditions.—H. Belval: The levorotatory glucides of the bulbs of *Lycoris*.—F. Vlès, A. de Coulon, and A. Ugo: The factors of the evolution of tar cancer in mice.

## ROME.

Royal National Academy of the Lincei, May 17.—T. Levi-Civita: Concerning the notes of Hatzidakis and Sakellariou on central motions.—C. Miranda: Extension of the theorems of Hilbert-Schmidt and Picard to singular linear integral equations.—C. Rimini: The flexion of surfaces.—T. Viola: Noteworthy properties of continuous functions.—Pia Nalli: Rigid transports of vectors on surfaces. The results previously deduced for varieties with any number of dimensions are applied to surfaces.—W. Fenchel: Channel waves of permanent type.—N. Hatzidakis: Observations on a paper by M. Sakellariou on "A Class of Central Motions".—A. Bellugi: The gravimetric depression of Carpaneto.—M. Lombardini: Geometric considerations for periodical analysis. The properties of the extremes, zeros, and flexes of the sum of two sine curves, previously considered, are now utilised for deducing the necessary simple conditions to be satisfied by the distribution of the zeros, extremes, and flexes in order that a curve may be regarded as the sum of two sine curves.—Orazio Specchia: Raman spectrum of the ion  $\text{SO}_4$ .—R. Zoja: The distribution of the tensions in a solid with rectangular axis and with rectangular transverse section of variable dimensions (3).—R. Einaudi: The relations existing between Euler's variational equations and the canonical equations of mechanics.—Goffredo Vitali: The calculation of a lens. Pacella's method of calculating a plano-convex lens leads to very simple results when the plane face is replaced by a spherical surface with its centre at the focus of the lens.—Paolo Straneo: The unitary theory of gravitation and electricity (3). Further consequences of the unitary equations. Certain considerations, mainly qualitative, bearing on the author's unitary theory are discussed, with some of the more immediate and simpler consequences, and the general scope of the theory.—L. Malossi: Double sulphates of bismuth with alkali metals (2). Double sulphates of bismuth and lithium. The system  $\text{Bi}_2(\text{SO}_4)_3 \cdot \text{Li}_2\text{SO}_4 \cdot \text{H}_2\text{O}$  forms the two compounds,  $\text{Li}_3\text{Bi}(\text{SO}_4)_3 \cdot 2\text{H}_2\text{O}$  and  $\text{Li}(\text{BiO})\text{SO}_4 \cdot \text{H}_2\text{O}$ .—P. Pratesi: Reactions of addition to unsaturated organic compounds. Application of the electronic theory of valency to unsaturated molecules of various types results in verification of all the regularities with regard to the formation of additive compounds established by Markownikow and Ipatiew

for particular classes of compounds.—G. B. Bonino and P. Cella: Raman spectrum of hydrogenated derivatives of naphthalene. The Raman spectra of deca- and tetra-hydronaphthalene are compared with those of naphthalene and cyclohexane.—G. B. Bonino and L. Brüll: Raman spectrum of dichlorobromomethane. Whereas the Raman spectra of chloroform and bromoform exhibit six frequencies, five of them intense, dichlorobromomethane displays one more, owing to the possibility of oscillations Cl-Br, this not occurring with the other two compounds. The ratio between the values of  $\cos^2\theta$  for chloroform and bromoform equals the inverse ratio between the permanent electric moments for the two compounds. If this relationship holds also for dichlorobromomethane, the electric moment for this compound should be  $1.25 \times 10^{-18}$ .

## Diary of Societies.

FRIDAY, DECEMBER 18.

- SOCIETY FOR EXPERIMENTAL BIOLOGY (in Department of Zoology, University College), at 10.30 A.M., at 2.15, at 4, and at 5.30.
- ROYAL SOCIETY OF MEDICINE (Physical Medicine Section), at 5.30.—Prof. A. V. Hill: The Liberation of Energy by Muscle (Samuel Hyde Memorial Lecture).
- INSTITUTION OF ELECTRICAL ENGINEERS (London Students' Section), at 6.15.
- ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN, at 7.
- SOCIETY OF DYERS AND COLOURISTS (Glasgow Section) (at George Hotel, Glasgow), at 7.15.
- SOCIETY OF CHEMICAL INDUSTRY (Glasgow Section) (at Royal Technical College, Glasgow), at 7.30.
- SOCIETY OF CHEMICAL INDUSTRY (South Wales Section) (at Technical College, Cardiff), at 7.30.—Christmas Lecture.
- JUNIOR INSTITUTION OF ENGINEERS, at 7.30.
- LEICESTER LITERARY AND PHILOSOPHICAL SOCIETY (Chemistry Section) (jointly with Leicester Association of Engineers) (at College of Technology, Leicester), at 7.30.
- SOUTH LONDON BOTANICAL INSTITUTE (at 323 Norwood Road, S.E.24), at 8.
- INSTITUTE OF CHEMISTRY, at 8.—Sir Frank E. Smith: The Chemist and the Community (S. M. Gluckstein Memorial Lecture).
- ROYAL INSTITUTION OF GREAT BRITAIN, at 9.—Rev. Dr. C. Alington: The Education of the Average Man.

SATURDAY, DECEMBER 19.

- SOCIETY FOR EXPERIMENTAL BIOLOGY (in Department of Physiology, University College), at 10.30 A.M., and at 2.15.
- BRITISH PSYCHOLOGICAL SOCIETY (Annual General Meeting) (at 55 Russell Square, W.C.1), at 2.30.
- ROYAL INSTITUTION OF GREAT BRITAIN, at 3.—Roger Fry: Great French Painters (3).
- NORTH-EAST COAST INSTITUTION OF ENGINEERS AND SHIPBUILDERS (Tees-Side Branch—Graduate Section) (at Cleveland Scientific and Technical Institution, Middlesbrough), at 7.30.

MONDAY, DECEMBER 21.

- ROYAL GEOGRAPHICAL SOCIETY, at 5.30.
- SOCIETY OF CHEMICAL INDUSTRY (South Wales Section) (jointly with South Wales Section of Institute of Chemistry) (at Cardiff Technical College), at 7.30.—Christmas Lecture.

TUESDAY, DECEMBER 22.

- LONDON NATURAL HISTORY SOCIETY (at London School of Hygiene and Tropical Medicine) (Plant Galls Section), at 6.30.
- INSTITUTION OF AUTOMOBILE ENGINEERS (Wolverhampton Centre) (at Segrave Club, Wolverhampton), at 7.30.

## Discussion.

TUESDAY, DECEMBER 22.

- CONWAY HALL (Red Lion Square), at 7.—Dr. F. H. Hayward and the Celebration Fellowship: Celebration of Science (Geology).

## Official Publications Received.

### BRITISH.

- Report of British Delegates of the Meeting of the International Council for the Exploration of the Sea, held at Copenhagen, March 23rd-28th, 1931. Pp. 9. (London: Ministry of Agriculture and Fisheries.)
- India: Meteorological Department: Scientific Notes. Vol. 3, No. 30: The Structure of the Sea-Breeze at Poona. By Dr. K. R. Ramanathan. Pp. 131-134+9 plates. 1 rupee; 1s. 9d. Vol. 4, No. 31: The Lunar Atmospheric Tide at Kodaikanal and Periyakulam. By Dr. S. K. Pramanik, S. C. Chatterjee and P. P. Joshi. Pp. 5. 4 annas; 5d. (Calcutta: Government of India Central Publication Branch.)
- The Parliament of the Commonwealth of Australia. Report on Tour of Inspection of the Oil-Fields of the United States of America and Argentina, and on Oil Prospects in Australia. By Dr. W. G. Woolnough. Pp. 118. (Canberra: H. J. Green.) 5s.
- Mysore Geological Department. Records, Vol. 29, 1930. Pp. iv+38+2 plates. (Bangalore: Government Press.) 2 rupees.
- The North Staffordshire Field Club. Transactions and Annual Report, 1930-31. Edited by the Rev. E. Deacon. (Vol. 65.) Pp. 169+A25-A50+7 plates. (Stoke-on-Trent.) 7s. 6d.
- The Indian Forest Records. Vol. 15, Part 3: Standard, Commercial and Heartwood Volume Tables (Factory Working) for Khair (*Acacia catechu*, Willd.) in North India. By H. G. Champion and Ishwar Das Mahendru. Pp. iii+16. 5 annas; 6d. Vol. 16, Part 5: Investigations on the Seed and Seedlings of *Shorea robusta* Gaertn. F. By H. G. Champion and B. D. Pant. Pp. v+33+6 plates. 1.6 rupees; 2s. 3d. (Calcutta: Government of India Central Publication Branch.)
- Journal of the Chemical Society. October. Pp. v+2509-2831+x. (London.)
- The Zoological Survey of India. Memorandum on the Proposals for Retrenchment. By Sir C. V. Raman. Pp. 19. (Calcutta: The Author, 92 Upper Circular Road.)
- Biological Reviews and Biological Proceedings of the Cambridge Philosophical Society. Edited by H. Munro Fox. Vol. 6, No. 4, October. Pp. 345-482. (Cambridge: At the University Press.) 12s. 6d. net.
- Proceedings of the Royal Society. Series A, Vol. 134, No. A823, November 3. Pp. 356. (London: Harrison and Sons, Ltd.) 18s.
- Canada: Department of Mines: Mines Branch. Investigations in Ceramics and Road Materials (Testing and Research Laboratories) 1928-1929. (No. 722.) Pp. ii+143+3 plates. (Ottawa: F. A. Acland.)
- Department of Agriculture: New South Wales. Veterinary Research Report No. 6, Parts 1 and 2. By Dr. H. R. Seddon. Pp. 91+6 plates. (Sydney, N.S.W.: Alfred James Kent.)
- Bulletin of the Department of Zoology, Panjab University. Vol. 1: Fauna of Lahore. 2: Entomotraca (Water-Fleas) of Lahore. By G. L. Arora. Pp. 62-100+plates 5-8. (Lahore.) 3 rupees.
- British Cast Iron Research Association. Tenth Annual Report for the Year ending June 30th, 1931. Pp. 16. (Birmingham.)
- Journal of the Marine Biological Association of the United Kingdom. New Series, Vol. 17, No. 3, October. Pp. 617-1048. (Plymouth.) 15s. net.
- Royal Society of New South Wales, Sydney. Presidential Address by Prof. O. U. Vonwiller delivered on May 6, 1931. Pp. 36. (Sydney.)
- Department of Scientific and Industrial Research. Report of the Springs Research Committee. Pp. iv+75. (London: H.M. Stationery Office.) 1s. 3d. net.
- Empire Marketing Board. Dairy Research: a Report to the Empire Marketing Board. By Sir William Dampier. (E.M.B. 44.) Pp. 60. (London: H.M. Stationery Office.) 1s. net.
- Transactions of the Royal Society of Edinburgh. Vol. 57, Part 1, No. 5: Abnormalities in the Blood Vascular System of the Anura. By Dr. Charles H. O'Donoghue. Pp. 179-224. (Edinburgh: Robert Grant and Son; London: Williams and Norgate, Ltd.) 5s. 6d.
- Air Ministry: Aeronautical Research Committee: Reports and Memoranda. No. 1403 (Ae. 524—Spin 61): Measured Spins on Aeroplane H. By S. B. Gates. Pp. 5+2 plates. 6d. net. No. 1408 (Ae. 529—T. 3060): Relation between Heat Transfer and Surface Friction for Laminar Flow. By A. Fage and V. M. Falkner. Pp. 30+12 plates. 1s. 6d. net. (London: H.M. Stationery Office.)
- Proceedings of the Malacological Society of London. Edited by R. Winckworth. Vol. 19, Part 6, November. Pp. 259-297+plates 30-33. (London: Dulan and Co., Ltd.) 10s. net.
- Malacological Society of London. Library Catalogue (Radley Bequest) 1927. Pp. 23. (London: Dulan and Co., Ltd.) 1s. 6d. net.
- The Victorian Bush Nursing Association. Report and Statement of Accounts to 30th June 1931. Pp. 266. (Melbourne.)
- The Geological Survey of India. Memorandum on the Proposed Retrenchment. By Sir C. V. Raman. Pp. 12. (Calcutta: The Author, 92 Upper Circular Road.)
- Proceedings of the Institution of Chemists (India). Vol. 3, Part 1, October. Pp. 90. (Calcutta.) 4 rupees.
- Catalogue of Indian Insects. Part 21: Lycidae. By Richard Kleine. Pp. iii+52. 1.2 rupees; 2s. Part 22: Phalonidae and Chlidonotidae. By T. Bainbridge Fletcher. Pp. iii+15. 6 annas; 8d. (Calcutta: Government of India Central Publication Branch.)
- Publications of the Dominion Astrophysical Observatory. Vol. 4, No. 15: Luminosity of Planetary Nebulae and Stellar Temperatures. By H. Zanstra. Pp. 205-260. 40 cents. Vol. 6, No. 1: Two Binary Orbits. By W. E. Harper. Pp. 10. Vol. 6, No. 2: The Orbit of H.D. 185936. By S. N. Hill. Pp. 11-16. Vol. 6, No. 3: Measurements of the Wave Lengths of Strong Oxygen and Nitrogen Lines in the Region 43880-4705. By C. S. Beals. Pp. 17-24. Vol. 6, No. 4: Solar Motion Graph. By J. A. Pearce and S. N. Hill. Pp. 2. 25 cents. (Ottawa: F. A. Acland.)
- Memoirs of the Geological Survey of India. Palaeontologia Indica. New Series, Vol. 9, Memoir No. 2: Revision of the Jurassic Cephalopod Fauna of Kachh (Cutch), Part 4. By Dr. L. F. Spath. Pp. iv+279-550+plates 48-102. (Calcutta: Government of India Central Publication Branch.) 34.12 rupees; 53s. 6d.
- The Journal of the Institution of Electrical Engineers. Edited by P. F. Rowell. Vol. 69, No. 419, November. Pp. 1329-1390+xxvi. (London: E. and F. N. Spon, Ltd.) 10s. 6d.