

perhaps I might say any human being, who would support so much applause without feeling the weakness of vanity. Forgive me for allowing my pen to run away with this undisguised praise, it looks so much like compliment, but I assure you it comes straight from the heart, and you *must* know that it is fully deserved." Mrs. Marcet was the author of "Conversations on Chemistry", which Faraday said "gave me my foundation in that science".

Societies and Academies

LONDON

Institute of Metals (Annual General Meeting), March 8. H. A. SLOMAN: Alloys of silver and beryllium. The constitution of the whole range of alloys in the silver-beryllium system has been redetermined by thermal and micrographic analyses. Modifications and amplifications of Oesterheld's original constitutional diagram are proposed. A description is given of new tarnish-resisting silver alloys obtained by the addition to silver and to some 'standard' silvers of very small quantities of beryllium. C. E. PHILLIPS and J. D. GROGAN: Transverse tests of sand-cast aluminium alloy bars. The transverse test in the measurement of the ductility of alloys of low elongation does not yield information concerning ductility which is not obtained equally readily from the tensile test when a high degree of accuracy of measurement is available. D. HANSON and E. G. WEST: Constitution of copper-iron-silicon alloys. The solubility of iron in copper is decreased by the presence of silicon. Over the greater portion of the range of compositions examined, iron exists in the alloys as such; its solubility in the solid state decreases rapidly with fall of temperature and becomes very small below 700° C. Within certain ranges of composition, iron and silicon combine to form another constituent, probably FeSi, which forms a series of alloys with the *a* solid solution. FeSi also appears to form systems of alloys with the alpha, beta, gamma, delta and epsilon constituents of the copper-silicon series. The shape of the liquidus and solidus curves has been determined. R. TAYLOR: Transformations in the copper-palladium alloys. The determination of the electrical resistance-temperature curves has been carried out with a much slower change of temperature than had previously been used. The occurrence of two transformations at 10-30 atomic per cent and 35-50 atomic per cent, respectively, and associated with different types of electrical resistance curve, has been confirmed. OWEN W. ELLIS: The malleability of nickel and of monel metal. A discussion of the effect of annealing temperature on the hardness of two rods, $\frac{1}{2}$ in. and 1 in. in diameter, respectively, of cold-drawn nickel, which were the subject of malleability tests at temperatures varying from 250° to 1,100° C. The relationship between energy of blow and percentage reduction in height of normal $\frac{1}{2}$ -in. samples is demonstrated, as is the influence of the initial hardness of the same material on its resistance to deformation at 750° C. JOHN L. HAUGHTON and J. M. PAYNE: Alloys of magnesium research. (1) The constitution of the magnesium-rich alloys of magnesium and nickel. The constitution of magnesium alloys containing up to 50 per cent nickel has been studied by thermal and microscopic methods. Magnesium forms a eutectic with the compound

Mg₂Ni at a temperature of 507° C. and a composition of 23.5 per cent nickel. The solubility of nickel in solid magnesium is less than 0.1 per cent.

Royal Meteorological Society, Feb. 21. CHANG-WANG TU: China rainfall and world weather. Walker's shorter method has been used for the calculation of the correlation coefficients and his criteria have been applied for testing the reliability of the coefficients. Four fairly homogeneous regions have been chosen and the rainfall of each region is correlated with the pressure, temperature and rainfall of different seasons of various important stations of the world. Increased circulation of the southern oscillation is generally responsible for the heavy rainfall of the rainy season in China. The total correlation coefficients obtained from the equations for the North China coast, Yangtze Delta, Yangtze Valley and south-east China coast are respectively 0.78, 0.62, 0.68 and 0.68. C. E. P. BROOKS: The variation of the annual frequency of thunderstorms in relation to sunspots. Annual frequencies of thunderstorms are formed for 22 groups of stations in all parts of the world, over periods up to 66 years, and are compared with the annual sunspot numbers. When sunspots are numerous, thunderstorms are more frequent than usual in high northern latitudes and in the tropics, but in temperate latitudes the relation, if any, is small. The 11 $\frac{1}{2}$ -year 'thunderstorm cycle' is then compared with the sunspot cycle, and the two are found to run parallel in Sweden and Siberia, but in maritime tropical areas the thunderstorm cycle lags about five months behind the sunspot cycle. Over the earth as a whole, the frequency of thunderstorms at sunspot maximum averages about 22 per cent greater than the frequency at sunspot minimum.

EDINBURGH

Royal Society of Edinburgh, February 5. R. A. FLEMING: The psychology of crime and criminals, with special reference to measures for reformation. The importance of mental defect, of the evil effects of newspaper and other accounts of crimes, and of the influence of detective stories in cinema and theatre were stressed. The great value of Borstal training, provided there was careful grading of inmates, was emphasised and its extension to cases outside the terms of the existing Act was urged. Freud's preconscious and unconscious theories which presuppose a dynamic energy, attached to the thoughts in both, striving for expression in the conscious are accepted, although the present methods of psycho-analysis which take for granted the necessity of unearthing all the sexual thoughts of the analysand, a procedure harmful for patient and psycho-analyst alike, are deprecated.

PARIS

Academy of Sciences, February 5 (*C.R.*, 198, 513-624). JULES DRACH: Systems of partial differential equations with two variables reducible to a Laplace linear system. GABRIEL BERTRAND and P. SERBESCU: The toxicity of aluminium according to its mode of entrance to the system. Continuing their experiments on the alleged poisonous action of aluminium derived from cooking utensils, the authors describe experiments on rabbits proving that when the metal

is introduced through the stomach its toxicity is only one fourth of that when introduced by injection. The view that aluminium introduced into food from cooking vessels is less poisonous than other metals such as copper and nickel introduced into food in the same way is confirmed. J. HAAG: The decomposition of a nucleus into canonical nuclei. LOUIS ROY: The separating power [of telescopes] for two equal components. E. MATHIAS: The storm of June 1, 1933, at Hanoi (Tonkin). J. DIEUDONNÉ: The maximum modulus of the zeros of a polynomial. SERGE TCHOUNIKHIN: The problem of the two classes of a finite group. BERTRAND GAMBIER: Tetrahedra inscribed in a skew cubic and circumscribed with a developable of class 3 or a quadric. J. DELSARTE: The application of the theory of mean periodic functions to the resolution of certain integral equations. J. AVANESSOFF: Inequalities concerning the movements of revolution of a viscous fluid. CAÏUS JACOB: The problem of local unicity concerning the flow of heavy liquids. TCHANG TE-LOU: A new mode of ignition in the internal combustion motor. The action of the high temperature of a disruptive discharge is not always indispensable for ignition; the silent discharge (*effluve*) is equally efficacious. JEAN MASCART: The light of shooting stars. Discussion of the mechanical and electrical theories regarding the production of light by meteorites: the author considers the mechanical theory best accords with the known facts. CH. FABRY: Remarks on the preceding communication. While it is clear that the greater part of the light from a shooting star and the whole of that from its luminous trail is due to the luminosity of a gas, the mechanism of this emission is not clear. L. GOLDSTEIN: The theory of the electric discharge. EMMANUEL GAMBETTA: The measurement or the detection of weak alternating currents. Y. ROCARD: The working of bigrid frequency changers. JEAN PELTIER: The magnetic exploration of metallic specimens. P. DAURE and A. KÄSTLER: The fluorescence of iodine vapour excited by circularly polarised light and observed longitudinally. MME. IRÈNE CURIE and J. JOLIOU: The chemical separation of new radio-elements emitting positive electrons. Study of the effects of the irradiation of boron, aluminium and magnesium with the α -rays of polonium. The results obtained furnish the first chemical proof of the transformations and the capture of the particles by the transformed nuclei. The new elements are named radionitrogen, radiophosphorus and radiosilicon. JEAN THIBAUD: The dematerialisation of the positive electrons. GÉRARD PETIAU: The representation of the nuclear transformations. ALBERTO BETIM: The kinematic method of quantitative spectrum analysis. The method depends on the measurement of the mass of the chemical elements by means of the variation of one of their lines during its electro-vaporisation made with the electric arc. W. BRONIEWSKI and K. WESOLOWSKI: The mechanical properties of the gold-copper alloys. EDOUARD RENCKER: Study of the softening of vitreous bodies. The velocity of penetration of a needle at constant temperature under the action of a spring is taken as an index of plasticity. GUICHARD: Adsorption and catalysis on alumina. J. P. MATHIEU: The hydrolysis of some alkaline metallotartrates. MARCEL BALLAY: Some properties of a cupronickel containing beryllium. M. HAÏSSINSKY: The nature of the radiocolloids. The colloidal solutions given by bismuth nitrate. J. PRAT: The action of hydro-

bromic acid on phenylarsinic acid and amino-phenylarsinic acid. L. ROYER: The experimental study of the modification of the facies of crystals which grow in a solution containing certain foreign substances. H. DERVILLE: The dome-shaped ridge of the Cambrian limestones of the region of Carteret (Manche). J. BONDON, L. CLARIOND and L. NÉLTNER: A new section of the Djebel Sarro (Saharan Morocco). EMM. DE MARTONNE: The *areique* diagonal of South America. PAUL CHAUCHARD: The proportion of dissolved oxygen in the waters of the estuary of the Seine. F. M. BERGOUNIOUX: The group of pleurodire Chelonians in the course of geological time. L. JOLEAUD: Sub-fossil vertebrates of Azaoua (Niger Colony). MLE. R. LE BLANC: The reproduction of *Chaetoceros pseudocurvisetum*. P. LAVIALLE and P. JAEGER: Floral polymorphism: Gynomonocelia and gynodiœcia in *Knautia arvensis*. MLE. BOUGES: Some results of embryonic over- and under-feeding in oats. MAURICE PIETRE: The ripening of wheat grains. The influence of some physicochemical phenomena. MME. L. NOUVEL: Regenerating power in shrimps. The relations with the casting of the shell and the existence of a critical threshold of differentiation of the regenerate. M. PAÏC and P. HABER: The action of the infra-red, visible and ultra-violet rays on hæmolytic alexin (complement) and the absorption spectrum of guinea pig serum. H. BIERRY and B. GOUZON: Proof of the presence of protoporphyrin of the blood by the fluorescence of its stannous complex. In the action of stannous chloride on hæmatin and on hæmoglobin, a complex is formed which by its fluorescence spectrum can be identified with certainty as the stannous derivative of protoporphyrin. N. KOBOZIEFF: The mortality of mice with and without tails. Statistics of abortive embryos. RENÉ LEGROUX and GASTON RAMON: The properties of the tetanus toxin made hypertoxic (hypertoxin). By the action of acids the toxic power of tetanotoxin can be increased thirty to eighty times. S. NICOLAU and MME. L. KOPCIOWSKA: The transformation of the fixed rabic virus into the common virus.

WASHINGTON, D.C.

National Academy of Sciences (*Proc.*, 19, 991-1058, Dec. 15, 1933). L. HARRIS, W. JOST and R. W. B. PEARSE: Separation of hydrogen isotopes by diffusion through palladium. Hydrogen, produced by passing steam from 'electrolysed water' containing 1 part in 1,000 of heavy isotope over heated iron, was passed through an electrically heated palladium tube. The gas was enriched in the heavier isotope 5-8 times when the pressure was reduced from 750 mm. to 39 mm., and a further 1.5 times when it was reduced to 8 mm. Thus a ten-fold increase in concentration is produced at one stage. The method is not considered as likely to compete with the electrolytic method, except in special circumstances. Theoretically it suggests that diffusion of hydrogen through palladium is an atomic process and that there is an activation factor operating in favour of the heavy isotope. HARLOW SHAPLEY and JENKA MOHR: Summary of a variable star survey in an external galaxy. A survey of Cepheid variable stars in the Large Magellanic Cloud. As a whole, about 1.5 per cent of the supergiants between absolute magnitudes -1 and -4 are Cepheid variables. The most numerous periods are 2-3 days, and no important

correlation exists between amplitude of variation and luminosity or period. The diameter of the Cloud is about twelve degrees and its linear diameter not less than 15,000 light years. HENRY NORRIS RUSSELL and DONALD H. MENZEL: The terrestrial abundance of the permanent gases. Although nitrogen is one of the most abundant elements in stars and nebulae, on the earth it forms 0.02 per cent only even of the superficial material. A theoretical discussion leads to the view that the so-called permanent gases were mainly lost by escape into space within a short time of the birth of the earth as matter ejected from considerable depths in the sun. HARLOW SHAPLEY: On the linear diameters of 125 large galaxies. Nothing comparable in size to our galaxy has been found (diameter 30 kiloparsecs). The average galaxy is a little less than 2 kiloparsecs in diameter; the Large Magellanic Cloud is comparable with the mean of the 125 largest systems in 25 selected groups. New values are derived for distances and mean density of matter in these groups. W. E. CASTLE and HANS NACHTSHEIM: Linkage interrelations of three genes for rex (short) coat in the rabbit. Three races of these rabbits, with abnormally short, soft and plush-like hair and curly whiskers have arisen in recent years by a recessive mutation in a different gene. The genes responsible for two of the mutations are in the same chromosome (10-12 per cent crossing over), but the other is in a different chromosome. These races may become important commercially for their pelts. W. E. CASTLE: The gene theory in relation to blending inheritance. Generally speaking, alternative characters (gene determined) characterise individuals; blending characters are more fundamental and characterise species, genera and families. The cytoplasm of the egg affords a mechanism (for example, the organiser of the amphibian egg) for the transmission of such blending characters, though genes borne in chromosomes may modify them. The present assumption that they are determined indirectly by genes is unproved. M. DEMEREC: The effect of X-ray dosage on sterility and number of lethals in *Drosophila melanogaster*. Working under standardised conditions, induced sterility and frequency of induced lethals are approximately proportional to dosage. HARRY H. LAUGHLIN: The specific formula of heredity. MARCUS M. RHOADES: (1) A cytogenetical study of a reciprocal translocation in *Zea*. (2) A secondary trisomy in maize. G. H. PARKER: The colour changes of elasmobranch fishes. Two skates, indistinguishable in colour, became lighter and darker respectively when placed in a white and a black tank. Changing the fish over reversed the changes, one assuming a pinkish hue. Two to twelve hours was required for the changes. EDWIN B. WILSON: On overlap. PAUL S. EPSTEIN: On the temperature dependence of ferro-magnetic saturation. The theory of ferro-magnetism deduced by the author in 1932 fits very well data published by Allen and Constant, which lead to the rule that the ratio of saturation intensity at any temperature to that at the absolute zero, plotted against the ratio of temperature to Curie point, for all ferro-magnetic crystals of the cubic system gives one universal curve. J. L. WALSH: A duality in interpolation to analytic functions by rational functions. G. A. MILLER: Groups involving a small number of squares. F. J. MURRAY: A theory for *-operators analogous to the theory of reducibility for self-adjoint transformations in Hilbert space.

Forthcoming Events

Friday, April 6

SOCIETY OF CHEMICAL INDUSTRY (CHEMICAL ENGINEERING GROUP)—at Leeds. Joint meeting with the Yorkshire Section and the Food Group. Conference on "Air Conditioning, with special reference to the Food Industries". Papers by Dr. Ezer Griffiths, Dr. M. C. Marsh and Dr. L. H. Lampitt.

NINTH INTERNATIONAL CONGRESS OF PURE AND APPLIED CHEMISTRY, April 5-11, to be held at Madrid. Prof. O. Fernández: president.

Official Publications Received

GREAT BRITAIN AND IRELAND

Air Ministry: Aeronautical Research Committee: Reports and Memoranda. No. 1304 (T.V.C. 64): Torsional Resonance Characteristics of a Twelve Cylinder Vee Aero Engine. By B. C. Carter and N. S. Muir. Pp. 39+33 plates. 3s. net. No. 1554 (Strut. 91, 97 and 146): Buckling of Thin Plates in Compression. By H. L. Cox. Pp. 21+8 plates. 1s. 3d. net. No. 1556 (T. 3374): Pitching Moment due to Rotation in Pitch. By Dr. A. S. Halliday, L. W. Bryant and C. H. Burge. Pp. 27+20 plates. 1s. 9d. net. No. 1558 (I.C.E. 946): Tests of a Roots Type Aircraft Engine Supercharger. By the Staff of the Engine Experimental Dept., R.A.E. Pp. 23+16 plates. 1s. 9d. net. (London: H.M. Stationery Office.)

Researches published from the Wards and Laboratories of the London Hospital during 1933. 31 Papers. (London: H. K. Lewis and Co., Ltd.) 7s. 6d. net.

University of London: University College. Annual Report, February 1933-February 1934. Pp. ii+156. (London: Taylor and Francis.)

Committee of the Privy Council for Medical Research. Report of the Medical Research Council for the Year 1932-1933. (Cmd. 4503.) Pp. 161. (London: H.M. Stationery Office.) 2s. 6d. net.

Department of Scientific and Industrial Research. Index to the Literature of Food Investigation. Vol. 5, No. 1, March 1933; No. 2, September 1933. Compiled by Agnes Elisabeth Glennie. Pp. viii+283. (London: H.M. Stationery Office.) 5s. net.

OTHER COUNTRIES

Carnegie Institution of Washington. Year-Book No. 32, July 1, 1932-June 30, 1933, with Administrative Reports through December 15, 1933. Pp. xx+388. (Washington, D.C.: Carnegie Institution.)

U.S. Department of Agriculture. Circular No. 307: Control of Aphids on Alfalfa in the Antelope Valley, Calif. By R. A. Blanchard. Pp. 7. (Washington, D.C.: Government Printing Office.) 5 cents.

Department of Agriculture: Straits Settlements and Federated Malay States. Economic Series, No. 4: Bark Consumption and Bark Reserves on Small Rubber Holdings in Malaya. By H. D. Meads. Pp. iii+50+9 plates. (Kuala Lumpur.) 50 cents.

Smithsonian Miscellaneous Collections. Vol. 91: Reports on the Collections obtained by the First Johnson-Smithsonian Deep-Sea Expedition to the Puerto Rican Deep. No. 3: A New Crab of the Genus *Cyclodorippe*. By Mary J. Rathbun. (Publication 3230.) Pp. ii+1+1 plate. No. 4: Two New Crinoids. By Austin H. Clark. (Publication 3231.) Pp. ii+5+2 plates. No. 5: A New Nematode of the Genus *Diplotriana* from a Hispaniolan Woodpecker. By Everett E. Welr. (Publication 3232.) Pp. ii+3. No. 6: New Trematode Parasites of Birds. By Emmett W. Price. (Publication 3233.) Pp. ii+6+1 plate. No. 7: New Digenetic Trematodes from Marine Fishes. By Emmett W. Price. (Publication 3234.) Pp. ii+8+1 plate. (Washington, D.C.: Smithsonian Institution.)

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 6. By Dr. L. F. Spath. Pp. viii+659-945+plates 125-130. 13.8 rupees; 22s. New Series, Vol. 22, Memoir No. 1: Echinoidea from the Persian Gulf. By E. L. G. Clegg. Pp. ii+35+3 plates. 2.8 rupees; 4s. 6d. (Calcutta: Geological Survey.)

Kungl. Svenska Vetenskapsakademiens Handlingar. Tredje Serien, Band 12, No. 6: The Structure of certain Fossil Spore-Bearing Organs believed to belong to Pteridosperms. By T. G. Halle. Pp. 103+15 plates. Tredje Serien, Band 13, No. 1: Meteorologische Turbulenzuntersuchungen. I. Von Hilding Köhler. Pp. 54. (Stockholm: Almqvist und Wiksells Boktryckeri A.-B.)

Ochrona Przyrody: Organ Państwowej Rady Ochrony Przyrody. Rocznik 13. Pp. iv+207+3 plates. Państwowa Rada Ochrony Przyrody. No. 35: Sprawozdanie z Działalności Państwowej Rady Ochrony Przyrody w Roku 1933. Napisał Prof. Dr. Władysław Szafer. Pp. 26. (Kraków: Państwowej Rady Ochrony Przyrody.)

Polska Akademia Umiejętności, Prace Rolniczo-Leśne, Nr. 7: Badania nad Glebami Górkimi (Researches on Mountain Soils). By Tadeusz Wasowicz. Pp. 47. (Kraków: Polskiej Akademii Umiejętności.)

Union of South Africa: Department of Mines: Geological Survey. The Geology of Capetown and adjoining Country: an Explanation of Sheet No. 247 (Capetown). By Dr. S. H. Haughton; with a Chapter on Underground Water Resources, by H. F. Frommurgis. Pp. 90+2 plates. (Pretoria: Government Printer.) 5s. (including Map).