

Contemporary Birthdays.

- March 27, 1844. Maj.-Gen. Adolphus W. Greely.
 March 27, 1857. Prof. Karl Pearson, F.R.S.
 March 27, 1855. Sir J. Alfred Ewing, K.C.B., F.R.S.
 March 29, 1840. Sir John Scott Keltie.
 March 29, 1853. Dr. Elihu Thomson.
 March 29, 1860. Prof. William B. Benham, F.R.S.
 March 31, 1890. Prof. William L. Bragg, F.R.S.
 March 31, 1854. Sir Dugald Clerk, K.B.E., F.R.S.
 March 31, 1870. Sir William J. Pope, K.B.E., F.R.S.
 March 31, 1859. Sir Frederick W. Andrewes, F.R.S.

Maj.-Gen. GREELY, polar explorer and telegraphist, was born at Newburyport, Mass. He served in the Civil War, 1861-65, and, we believe, was the first volunteer private soldier to reach the grade of brigadier-general, U.S.A. In 1881 he was placed in command of the United States official expedition to establish one of a chain of thirteen circumpolar stations; his party of twenty-five reached farther north than any previous record, discovered new land north of Greenland, and crossed Grinnell Land to the Polar Sea. The final story of the Greely Expedition was one of disaster: there were only seven survivors. General Greely was the United States delegate at the International Telegraph Conference, London, 1903. Under his supervision 3900 miles of telegraph lines, submarine cables, and wireless were installed in Alaska, 1900-4.

Prof. KARL PEARSON was educated at University College School, London, and King's College, Cambridge. He was called to the bar, Inner Temple, 1882. Galton professor of eugenics in the University of London, and editor of *Biometrika*, he has written many memoirs on the mathematical theory of evolution and on heredity.

Sir ALFRED EWING, president of the Royal Society of Edinburgh, was born at Dundee. Formerly professor of mechanism and applied mechanics in the University of Cambridge, he was afterwards (1903-16) Director of Naval Education. Since then he has been Principal and Vice-Chancellor of the University of Edinburgh. He was awarded a Royal medal by the Royal Society, in 1895, for researches on magnetic induction in iron and other metals.

Sir JOHN SCOTT KELTIE was educated at Perth, and the Universities of St. Andrews and Edinburgh. For a number of years he was assistant editor of *NATURE*. Sir John was secretary of the Royal Geographical Society, 1892-1915.

Sir DUGALD CLERK was born in Glasgow. He is universally known as an investigator in the problems of internal combustion engines. The Albert medal of the Royal Society of Arts was allotted him in 1922, "in recognition of contributions . . . to the development of the internal combustion engine, which in its latter forms has rendered aerial navigation possible, and is also extensively employed in the motor-car and in the submarine." Sir Dugald was a Royal medallist of the Royal Society in 1924.

Sir WILLIAM POPE, professor of chemistry in the University of Cambridge, is a Londoner. He was educated at Finsbury Technical College and the Central Technical College, City and Guilds of London. After a professional career at the University of Manchester, he became head of the Chemistry Department, Goldsmiths' Institute, New Cross. Sir William was Longstaff medallist of the Chemical Society, 1903, and Davy medallist, Royal Society, 1914.

Societies and Academies.

LONDON.

Royal Society, March 18.—S. Chapman, J. Topping, and J. Morrall: On the electrostatic potential energy, and the rhombohedral angle, of carbonate and nitrate crystals of the calcite type. Calculations have been made of the electrostatic potential energy of ionic lattices of the calcite type and for the sodium nitrate crystal, in which the lattice is of the same geometrical type, though the ionic charges are different. It seems probable that, owing to the fourfold positive charge in the C ions, the O ions of the CO₃ group will be distorted from their natural symmetrical form, and consequently the electrostatic centre of the O ion will be nearer to the C nucleus than the O nucleus is. The calculations indicate that the electrostatic centre of the O ion is 0.9 Å.U. distant from the centre of the C ion, compared with the value 1.25 Å.U. given by X-ray measurements for the distance between the O and C nuclei. A similar result is obtained for NaNO₃.—G. I. Finch and L. G. Cowen: Gaseous combustion in electric discharges. Pt. I. Steady direct current electric discharges are passed through electrolytic gas at 20-100 mm. pressures, and the rate of steam formation measured for varying conditions. It is found that the rate of combustion is determined only by the current, and up to a certain limiting current, combustion is confined to the cathode zone, depends upon the cathode material, and is directly proportional to the current. On exceeding this limiting current, combustion commences *abruptly* in the inter-electrode zone and is superposed upon cathodic combustion. This inter-electrode combustion is also proportional to current, but, unlike the cathodic, is independent of the electrode material, and dependent upon gas pressure and separation of the electrodes. Little or no combustion takes place in the anode zone. Combustion seems to be primarily determined by ionisation of the gaseous medium for the current. The abrupt superposition of inter-electrode combustion suggests a quantum effect, combustion in the inter-electrode zone depending upon a certain limiting potential fall being attained.—C. N. Hinshelwood and W. K. Hutchison: A homogeneous unimolecular reaction: the thermal decomposition of acetone in the gaseous state. The temperature range used was 506° to 632° C. The heat of activation is 68,500 calories, and the results can be summarised by the equation $l_n k = 34.95 - 68,500/RT$. Calculation shows that the number of molecules reacting per second is about 10⁵ times greater than the maximum number that could be activated by collision. The absolute rate at 835° Abs. is the same as that of the nitrogen pentoxide decomposition at 328° Abs.—H. Lamb: On wave resistance. The case considered is that of a solid of dimensions small compared with the depth below the free surface, travelling horizontally under water. Various particular cases of this have been worked out. There appears to be room for a more general investigation in which no assumption is made as to the form of the solid. The device employed for calculation of the resistance is to introduce small frictional forces, and to equate the work done against resistance to the dissipation of energy.—C. E. Eddy and A. H. Turner: The \bar{L} emission series of mercury.—G. R. Goldsbrough: The properties of torsional vibrations. In order to bring out clearly the nature of the torsional vibrations in reciprocating engine shafts, a simplified model is chosen which emphasises the main characteristics. Even when friction is great, there are two critical

speeds of shaft rotation corresponding to each term in the externally applied force.—E. T. Hanson: The theory of ship waves. The oscillations of a fluid under gravity, when the depth is variable or very great, have been worked out in two special cases. The theory is now extended very generally to cover a series of cases in which the fluid may be treated as a sea, bounded by a sloping shore on one side and extending indefinitely on the other. It is shown that, whenever the inclination of the shore to the horizontal is a submultiple of a right angle, the problem can be completely solved, and in each case there is a doubly infinite number of possible modes of motion under gravity. This extension makes it possible to calculate the precise effect of a sloping shore upon the formation of the beautiful wave pattern which often follows in the wake of a ship.—A. O. Rankine: The effect of temperature on the viscosity of air. The values of the viscosity of air obtained by Williams (*Roy. Soc. Proc.*, A, vol. 110, p. 141) in the lower part of the temperature range are seriously in error. The conclusion that Sutherland's law of the variation of viscosity with temperature becomes invalid for air at the relatively high temperature of 250° C is not justified.

Geological Society, February 24.—Gertrude Lilian Elles: The geological structure of Ben Lawers and Meall Corra-naich (Perthshire). The country dealt with lies between Loch Tay on the south and Glen Lyon on the north, and between the Loch Tay fault on the east and the Erich-Laidon-Tyndrum fault on the west. The line of junction between the Ben Luid schists and the Ben Lawers schists is a mechanical one of the nature of a folded slide, the Ben Lawers slide, the rocks above this slide constituting a veritable nappe, the Ben Lawers nappe. The metamorphic condition of the rocks indicates that the folding now exhibited by them is a relatively late feature of the structural story, and obscures their original relationships, which seem to demand inversion of the beds on a large scale such as would be brought about by recumbent folding.

Physical Society, February 26.—A. Ferguson and I. Vogel: On the hyperbola method for the measurement of surface tension. When a liquid lies between two plates inclined to one another at a small angle, its surface has a hyperbolic section, from which the surface tension can be calculated. The method has recently been improved by Grünmach. Errors arise, however, from the difficulty of determining the horizontal and vertical axes of co-ordinates. This is met by plotting two linearly related functions of the observations, the surface tension being deduced from the co-ordinates of the resulting mean straight line and the angle between the plates. The latter may be measured either directly or by calibration with a liquid of known surface tension.—E. A. Owen and A. F. Dufton: The application of radiography to the study of capillarity. The X-ray shadow of a tube has previously been used for determining the diameter of the bore. A similar method has been used successfully for capillarity measurements, and observations were made of the rise of mercury in copper and steel tubes and between vertical copper plates.

Society of Public Analysts, March 3.—B. S. Evans and S. G. Clarke: An accurate method for the determination of mercury in solution. The mercury (in solution as mercurous nitrate) is deposited on copper and then sublimed. The mercurous solution is percolated for 1½ to 2 hours through a special apparatus (see below), the filter tube of which contains a layer of copper filings. The copper, with the

deposited mercury, is washed with water and then with acetone, and afterwards dried, and the mercury is sublimed on to platinum and weighed. Accurate results are obtained in the presence of arsenic antimony or bismuth, and large amounts of copper and nitrates. Hydrochloric acid interferes with the deposition, and must be removed.—B. S. Evans: An apparatus for continuous percolation and for filtration in neutral atmospheres. The liquid is made to percolate through a filter tube, with the aid of pressure or suction, into a flask, an open return tube ensuring that the pressure in the main funnel and the flask is the same. When the liquid in the flask reaches the end of the return tube, a difference of pressure is established and the liquid is driven back to the main funnel. For filtration in an inert atmosphere a cylinder of the desired gas can be used as the source of pressure.—A. L. Bacharach: Notes on the determination of moisture, calcium and phosphorus in the bones of rats. Conclusions as to the influence of diet, etc., on calcium and phosphorus metabolism are largely based on analyses of the bones of experimental animals. Standardised methods are therefore desirable; a routine method is described, and attention is directed to several possible sources of error.

CAMBRIDGE.

Philosophical Society, February 15.—A. V. Hill: Irreversible phenomena in muscular shortening.

March 1.—F. A. Potts: The development of a harpacticoid Copepod.—J. Gray: The growth of fish during the phase of yolk-sac nutrition.—J. Needham: Intracellular oxidation-reduction potential and anaerobiosis. The intracellular oxidation-reduction potential of *Amoeba proteus* appears to be widely independent of the external concentration of oxygen. *Nyctotherus cordiformis*, an anaerobic protozoan normally living in the frog's large intestine, possesses an internal pH of 7.1 and an internal ν H of 19.0-20.0 under aerobic conditions, while under anaerobic conditions the latter value changes to ν H 9.5-10.5. *Nyctotherus* can therefore reduce strongly electronegative indicators. It is significant that the amoeba, the ν H of which is independent of the environmental oxygen concentration, cannot adapt itself to an anaerobic life and dies in conditions under which *Nyctotherus* will live.—Sir J. Larmor: Insular gravity and oceanic isostasy.—R. Hargreaves: (1) Relativity in connexion with axial rotation. (2) The problem of relativity in reference to several bodies.—R. Vaidyanathaswamy: The general (m, n) correspondence.—S. Goldstein: The stability of a strut under thrust, when buckling is resisted by a force proportional to the displacement.

PARIS.

Academy of Sciences, March 1.—The president announced the death of Prof. Kamerlingh Onnes.—Gaston Julia: The domain of existence of an implicit function defined by an integral relation $G(x, y) = 0$.—H. Krebs: A geometrical representation of some transformations of partial differential equations.—H. Milloux: A property of meromorphic functions at asymptotic value.—A. Kovanko: The necessary and sufficient conditions of the integration of suites of functions capable of summation term by term.—Edgar B. Schieldrop: The non-holonomic deviation.—R. Dugas: The geometrical interpretation of the method of Jacobi in the case of a point of variable mass.—Louis Roy: The propagation of waves on the elastic line with six parameters.—E. G. Barrillon: A mechanical apparatus for tracing hydrodynamical

fields.—Marcel Jacob: The utilisation of measurements of rotatory magnetic polarisation in the analysis of mixtures. In order to circumvent the difficulty introduced by unavoidable changes in the intensity of the magnetising current, a compensation method was arranged, details of which are given.—A. Dauvillier: Researches on electric discharge in gases and the radiations which accompany it.—M. Aubert and E. Aubrée: An extension of the method of critical solubility temperatures for the analyses of petrols. The calculations are based on measurements of the critical solubility temperatures of the petrol in two different solvents—aniiline and benzyl alcohol.—André Job and André Samuel: Complexes produced by the oxidation of the nickelocyanides in the presence of hydroxylamine. The violet complex compound produced by the oxidation in air of potassium nickelocyanide in the presence of hydroxylamine can be converted into a blue compound by the action, in neutral solution, of mercuric chloride, one cyanogen group being removed. Probable formulæ for these coloured complexes are discussed.—J. Bougault: An ether-oxide example of a ketone hydrate.—P. Billon: Combinations of oximes with zinc chloride. In the preparation of oximes with Crismer's salt, the zinc chloride is usually eliminated at the conclusion of the reaction by the addition of water. In the absence of water, an intermediate compound containing zinc chloride can be isolated from the reaction between Crismer's salt and a ketone, and these substances in contact with water decompose, giving the oxime and zinc chloride.—Georges Mouret: The coal basin of Haute-Dordogne. The exactitude of the results obtained by Amiot in this field is confirmed, the exact extent of the basin defined, and the character of its limits recognised.—A. Maige: Variations of the threshold of amylogen condensation in various cells of the plant.—Antonin Nemeç: The humification of the dead layer of forest soils.—L. M. Bétances: The diffuse lymphoid formations of the vertebrates.—Auguste Lumière and Mme. Montoloy: Anthrax infection and immunity by the peritoneum.

ROME.

Royal Academy of Lincei, January 3.—O. M. Corbino: The electronic theory of thermomagnetic phenomena.—Livio Cambi: A supposed nitroprusside of bivalent iron. Doubt is expressed concerning the constitution of the compound to which Ungarelli recently attributed the formula, $\text{Na}_2[\text{Fe}(\text{CN})_5 \cdot \text{NO}] \cdot 9\text{H}_2\text{O}$.—Carlo Severini: The convergence of the series of orthogonal functions.—Giovanni Vacca: New series for Euler's constant, $C = 0.577 \dots$.—Mariano Pierucci: The total energy of the planets. The "energies" of the various planets may be obtained from that of Jupiter by dividing by simple powers of the prime factors 2, 3, and 5; the differences between the values thus calculated and those actually observed being of the same order of magnitude as the errors involved in the determination of the masses.—E. Raimondi: Transformation serving for the study of a current flowing between a sheet and an indefinite plane wall.—D. Graffi: Investigations on the accidental birefringence of colloids in movement.—C. Jucci: Parthenogenesis in silkworms as an illustration of the physiological capacity of individuals and of the race.—Giulio Cotronei: The biology of *Petromyzon*. (iii.) The phenomenon of contraction in the sexual maturity of *Petromyzon marinus*. The processes of sexual maturity in *P. marinus* are similar to those in *P. fluviatilis* and are also accompanied by contraction.—G. Fadda: A case of functional regeneration in *Cyprinodon calaritanus*.

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Official Publications Received.

- Cincuentenario de la Sociedad Científica Argentina (1872-1922). Evolución de la Ciencias en la República Argentina. 13: La Evolución de la Meteorología. Por Guillermo Hoxmark. Pp. 30. (Buenos Aires.)
- The British Mycological Society. Transactions, Vol. 10, Part 4. Edited by Carleton Rea and J. Ramsbottom. Pp. 233-344. (Cambridge: At the University Press.) 7s. 6d. net.
- República Argentina: Ministerio de Agricultura de la Nación. Oficina Meteorológica Nacional. Boletín Mensual. Año 7, 1922. Pp. 86+62 charts. (Buenos Aires.)
- Egyptian Government Almanac for the Year 1926. Pp. viii+324. (Cairo: Government Publications Office.) 5 P.T.
- Department of the Interior: United States Geological Survey. Water-Supply Paper 499: The Papago Country, Arizona; a Geographic, Geologic and Hydrologic Reconnaissance, with a Guide to Desert Watering Places. By Kirk Bryan. Pp. xviii+436+27 plates. 85 cents.
- Water-Supply Paper 533: Surface Water Supply of the United States, 1921. Part 12: North Pacific Slope Drainage Basins. B: Snake River Basin. Pp. vi+292+2 plates. 25 cents.
- Water-Supply Paper 545: Surface Water Supply of the United States, 1922. Part 5: Hudson Bay and Upper Mississippi River Basins. Pp. v+197+2 plates. 25 cents.
- Water-Supply Paper 556: Water Power and Flood Control of Colorado River below Green River, Utah. By E. C. LaRue. Pp. x+176+79 plates. 1 dollar. (Washington, D.C.: Government Printing Office.)
- Department of the Interior: United States Geological Survey. Professional Paper 136: The Flora of the Ripley Formation. By Edward Wilver Berry. Pp. iii+94+23 plates. (Washington, D.C.: Government Printing Office.) 50 cents.
- Sixty-third Annual Report of the Secretary of the State Board of Agriculture of the State of Michigan and Thirty-seventh Annual Report of the Experiment Station from July 1, 1923, to June 30, 1924. Pp. 1080. (Lansing, Mich.)
- Agricultural Experiment Station: Michigan State College of Agriculture and Applied Science. Technical Bulletin No. 69: The Fruiting Habits and Pruning of the Concord Grape. By N. L. Partridge. Pp. 89.
- Technical Bulletin No. 71: Growth of Lettuce as influenced by Reaction of Culture Medium. By John W. Crist. Pp. 25.
- Technical Bulletin No. 72: Potato Spraying and Dusting Experiments in Michigan. By J. E. Kotila and G. H. Coons. Pp. 15.
- Technical Bulletin No. 73: Adsorption by Activated Sugar Charcoal; with particular reference to Adsorption and Soil Acidity. By Elroy J. Miller. Pp. 60.
- Circular Bulletin No. 70: The Present Status of the European Corn Borer in Michigan. By R. H. Pettit. Pp. 14. (East Lansing, Mich.)
- State of Illinois. Department of Registration and Education: Division of the Natural Survey. Bulletin, Vol. 15, Article 5: Changes in the Small Bottom Fauna of Peoria Lake, 1920 to 1922. By Robert E. Richardson. Pp. 325-388.
- Bulletin, Vol. 15, Article 6: Illinois River Bottom Fauna in 1923. By Robert E. Richardson. Pp. 389-422.
- Bulletin, Vol. 15, Article 7: Some Observations on the Oxygen Requirements of Fishes in the Illinois River. By David H. Thompson. Pp. 423-457. (Urbana, Ill.)
- Aeronautical Research Committee. Reports and Memoranda, No. 976 (Ae. 190): Some Experiments on a Model of a B.A.T. "Bantam" Aeroplane with special reference to Spinning Accidents. Part 1: Longitudinal Control and Rolling Experiments, by H. B. Irving and A. S. Batson; Part 2: Experiments on Forces and Moments (including Rudder Control), by H. C. H. Townsend and T. A. Kirkup. (A.3 G. Complete Models, 55, a, b, and c.—T. 1982, a, b, and c.) Pp. 22+16 plates. 1s. 3d. net.
- Reports and Memoranda, No. 988 (M. 31): The Air Bubble Viscometer. By Dr. Gny Barr. Pp. 10+2 plates. 9d. net. (London: H. M. Stationery Office.)
- Proceedings of the Cambridge Philosophical Society. Vol. 23, Part 1. Pp. 102. (Cambridge: At the University Press.) 7s. 6d. net.
- Hull Museum Publications. No. 141: Record of Additions, No. 68. Edited by T. Sheppard. Pp. 51. (Hull.)
- Leeds University. Twenty-first Report, 1924-25. Pp. 164. (Leeds.)
- Royal Botanic Gardens, Kew. Bulletin of Miscellaneous Information, 1925. Pp. iv+448+121. (London: H. M. Stationery Office.) 12s. 6d. net.
- Cornell University: Agricultural Experiment Station. Memoir 91: The Relation of Soil Moisture and Nitrates to the Effects of Sod on Plum and Cherry Trees. By T. L. Lyon, A. J. Heinicke and B. D. Wilson. Pp. 21.
- Memoir 93: A Study of the Oyster-Shell Scale, *Lepidosaphes ulmi* (L.), and one of its Parasites, *Aphelinus mytilaspidis* Le B. Part i: Biology and Morphology of the two forms of Oyster-Shell Scale; Part ii: Biology of a Parasite of the Oyster-Shell Scale. By Grace H. Griswold. Pp. 67.
- Memoir 94: Variations within and between Morphological Varieties of Oats and Barley. By R. G. Wiggans. Pp. 35.
- Memoir 95: An Explanation for the Relative Effects of Timothy and Clover Residues in the Soil on Nitrate Depression. By R. D. Wilson and J. K. Wilson. Pp. 21. (Ithaca, N.Y.)
- Carnegie Institution of Washington. Annual Report of the Director of the Laboratory for Plant Physiology. (Extracted from Year Book No. 24, for the Year 1925.) Pp. 137-169. (Washington, D.C.)
- Cornell University: Agricultural Experiment Station. Bulletin 439: Rearing Calves by the Use of Calf-Meal Gruel. By L. A. Maynard, L. C. Norris and W. E. Krauss. Pp. 23.
- Bulletin 440: An Economic Study of the Marketing of New York Potatoes. By M. P. Rasmussen. Pp. 172.
- Bulletin 441: Economic Studies of Dairy Farming in New York. 4: Grade B Milk with Cash Crops and mixed Hay Roughage, Crop Year 1921. By E. G. Misner. Pp. 76.
- Bulletin 442: Economic Studies of Dairy Farming in New York. 5: Cheese-Factory Milk. By E. G. Misner. Pp. 50.
- Bulletin 447: The Effect of some Legumes on the Yields of succeeding Crops. By T. L. Lyon. Pp. 20. (Ithaca, N.Y.)
- Proceedings of the Ninth West Indian Agricultural Conference, Kingston, Jamaica, January 1924. Pp. 238. (Jamaica, B.W.I.: Government Printing Office.) 2s. 6d.
- Western Australia. Annual Progress Report of the Geological Survey for the Year 1924. Pp. 22. (Perth: Fred. Wm. Simpson.)
- Publikationer fra det Danske Meteorologiske Institut. Aarbøger. Isforholdene i de Arktiske Have (The State of the Ice in the Arctic Seas) 1925. Bearbejdet af (Prepared by) Kaptajn C. I. H. Speersneider. Pp. 32+5 maps. (Kjøbenhavn: G. E. C. Gad.)