Societies and Academies

EDINBURGH

Royal Society, March 4. A. M. COCKBURN : The geology of St. Kilda. The islands of the St. Kilda group appear to represent the peripheral relics of a larger complex of intrusive igneous rocks perhaps some seven miles in diameter. The intrusions are sheet-like and, in order of age, consist of gabbros (including olivine-eucrite), coarse- and fine-grained dolerites, basalts and three granophyres. On St. Kilda these masses, the eucrite excepted, are inclined outwards from the supposed centre of intrusion, suggesting ring-dyke structure. A very abundant series of variously dated, thin, gently inclined sheets are suggestive of cone intrusion. Arcuate structure, however, has not been observed in the field owing to the fragmentary nature of the exposures. J. L. BHADURI : The anatomy of the adhesive apparatus in the tadpoles of *Rana afghana*, Günther, with special reference to the adaptive modifications. A histological description of the cement organs is given and attention is directed to the 'brush-border' fringing the gland cells. The muscles of the disc are described and their homologies discussed. The diaphragm is shown to be modified ; not only has it a thickened tendinous ridge in its central part, but in addition it possesses two distinct apertures for the passage of the diaphragmatobranchialis medialis muscles. An account of the histology of the skin of the disc is given. The cornification, and later tuberculation, of the posterior region of the disc is shown to be correlated with the habits and habitats of the tadpoles. The rim of the sucking disc encloses a lymph space which is considered to be another adaptive modification for counteracting the pressure of the rushing current. A. C. AITKEN : Least squares and linear combination of observations. The paper deals with the equivalence, in practical outcome, of two different approaches to least squares, one based on the assumption that errors are normally distributed in such a way as to give the observations the greatest probability, the other on the postulate that the values to be adopted should be weighted means of the observations, with smallest standard error. Dr. W. F. Sheppard had proved this equivalence for representation by polynomial curves. The present paper confirms it for general functional representation, as well as for the case of correlated errors.

PARIS

Academy of Sciences, February 18 (*C.R.*, **200**, 597–700). L. LECORNU : The return in space. JULES DRACH : Logical integration and the transformation of the equations of dynamics with two variables. Conservative forces. Cubic integrals. H. DESLANDRES : A simple and general relation of the molecular spectrum with electrons and rings of electrons of constituent atoms. J. HAAG : The mathematical theory of mechanical and electrical filters. LOUIS ROY : The deformation of an elastic line round one of its points. JEAN BAPTISTE SENDERENS : The catalytic decomposition of monochlor fatty derivatives. Study of the decomposition of normal butyl chloride, normal propyl chloride and isopropyl chloride with various catalysts. All the catalysts, with the exception of active carbon, cause splitting up into hydrochloric acid and the corresponding olefine. ŠMIDOV and VERČENKO : Some geometric properties

of ensembles. W. BRECKA : Multiply monotone polynomials which diverge the least from zero, the two first coefficients being given. SOULA : An interpretation of Picard's theorem on integral equations. J. REY PASTOR : Series of integrals of successive orders of a function. JEAN DELSARTE : A general principle of development of functions of a real variable in series of integral functions. NICOLAS CIORANESCO : The development of an analytical function of an analytical function and on some consequences. JULIUS WOLFF : The representation of a demi-plane on a demi-plane with an infinity of circular incisions. EDOUARD LAINÉ : Kinetic moment and dynamic moment. GEORGES BOULIGAND : Some processes of partial determinism. MIROSLAV NÉNADOVITCH : The corrections to be applied to the aerodynamic characteristics of a biplane cell under experiment in an air blast with guided or free circular vein. EMILE MERLIN : Two inequalities and the flattening of an equilibrium figure of a homogeneous fluid in rotation round a fixed axis. COMBIER and POIDEBARD : Contribution to the study of sand storms. The photography of sand storms. P. LEJAY : Observations of the intensity of gravity in the Philippines, the Malay Archipelago and the Dutch Indies. EMILE SEVIN : Waves, spin and numbers. MAURICE LÉVY : Selective transformations. The properties of transformation curves and selectivity curves. GEORGES DÈCHÉNE : The electrical resistances at the contact of two semi-conducting substances. The results described resemble those obtained when a semiconducting substance is in contact with a metal, and can be interpreted in the same way. PIERRE JOLIBOIS : The chemical equilibrium in tubes containing rarefied gas in the neighbourhood of the cathode and in the positive column. Study of the dissociation of carbon dioxide in a Geissler tube, arranged so that gas circulates in a closed system. MME. LUCIE LEFEBVRE : The absorption spectrum of ozone at a low temperature. The absorption spectrum of ozone in the visible region (4400 A.–6500 A.) cooled to about $-80°$ C. is identical with that at the ordinary temperature. This does not accord with the results of Chappuis published in 1882. ANTOINE GOLDET : The thermal variation of the magnetic double refraction and molecular electrical electric moments. LOUIS HENRY : The photo-chemical decomposition of nitrous oxide and the energy of dissociation of nitrogen. The energy of dissociation of the nitrogen molecule into two normal atoms has a lower value than that deduced by Dutta (200,400 cal.). It lies between 158,000 and 169,000 cal. ANDRÉ BOULLÉ : Study by means of X-rays of the anhydrous sodium metaphosphates. WOJCIECH SWIETOSŁAWSKI and IGNACE ZLOTOWSKI : A method of measuring the heat evolved by the absorption of γ-radiation. The apparatus described and illustrated, which is a modification of the calorimeter described by Swietosławski and Bartoszewicz, is capable of measuring the heat evolved by γ-radiation within two or three per cent. PAUL DEMOUGIN : The absorption of iodine vapour by activated carbon and by silica gel. The quantities of iodine vapour absorbed in the neighbourhood of the saturation pressure for a given specimen of carbon do not vary with the temperature, whether the temperature is above or below the melting point of iodine. The quantities are proportional to the absorptive powers for other vapours, such as ether. GUSTAVE RIBAUD and ANATOLLAH ROCHAN ZAER : The calculation of flame temperatures. GEORGES FOURETIER : The direct measurement of low pressures

of saturated vapours. GUY GIRE and FRANÇOIS PUCHE : The thermal decomposition of the chlororhodates. JEAN AMIEL : The complex compounds formed by cupric perchlorate and cupric bromate with some primary amines. CHARLES COURTOT and ALFRED BARON : Contribution to the study of the halogenation of wool. JOSEPH WIEMANN : The hydrogenation of a mixture of two α-ethylenic aldehydes. PAUL GAUBERT : Anisotropic liquids. Rapid evaporation of solutions of methylene blue or of neutral red gives liquid residues showing double refraction. EDGAR AUBERT DE LA RUE : The first results of a geological expedition to the New Hebrides. PAUL JODOT : The presence at Faverelles (Loiret) of a small horst in the middle of the large crushed vault, between the fault systems of Cosne and Sancerre. ALBERT ROBAUX : The existence of the upper Eocene and the Oligocene in the Flysch series of the south of the province of Cadiz. JEAN MARCAIS : Concerning a deposit of fossiliferous Trias in the eastern Rif. GIORGI : An observation of globular lightning. LOUIS GENEVOIS and MICHEL PAVLOFF : Researches on the fermentable sugars of wheat flour. MME. JEANNE BOUXIN and RENÉ LEGENDRE : Cephalopods of the genus *Vitreledonella* in the stomachs of germons found in the Bay of Biscay. RAYMOND-HAMET : The action of corynanthine on the penial circulation of the dog. MARCEL BADOUIN : Six cases of thoradelphy in the pig and sheep. W. SARNOWIEC : The allergic reaction in acute infections.

BRUSSELS

Royal Academy (*Bull. Classe Sci.*, 30, No. 12). L. GODEAUX : Involutions of the second order of space (5). J. LEDRUT : Production of hypoglycæmia by intraduodenal injection of dilute hydrochloric acid in *Raia clavata*. The injection causes a drop in the blood sugar, and the effects appear to be the same as in the dog. J. GÉHÉNIAU : Parametric form of a *n*-ple integral. E. LAHAYE : A class of differential equations of the first order possessing a singular point. J. THIBAUD : Penetrating radiation produced in beryllium by bombardment with α-rays. The absorption curve of a neutron beam in lead, iron, bismuth and paraffin wax shows a series of maxima and minima. Possible conclusions from the observations are considered. M. DE HEMPTINNE and J. WOUTERS : Raman spectrum of silicomethane. Liquid silicomethane shows Raman lines of which $\Delta\nu$ is 2,166 cm.$^{-1}$ and 958 cm.$^{-1}$. A. DE WAELE : Note on the evagination of *Cysticercus fasciolaris*, Rud. L. GODEAUX : Algebraic surfaces of genus zero having elliptic tricanonical curves. TH. DE DONDER : A new generalisation of the wave mechanical equation. An extension of a previous generalisation of Schrödinger's equation to take electron spin into account. A. DELGLEIZE : Minimal surfaces and their transformations. YVONNE DUPONT : Polarisation currents. The fictitious currents due to the electro-magnetic polarisation are defined. J. GÉHÉNIAU : The theorem of momentum and energy in a gravitational field. J.-M. DELFOSSE : Raman spectrum of phosphoretted hydrogen. The principal Raman line, $\Delta\nu = 2306$, agrees well with that found by Fung and Barker in the infra-red spectrum, $\nu = 2327$, allowing for change of frequency from liquid to gaseous state. L. LISON : On the phenomena of metachromatism (2). Spectrophotometric study of metachromatic dyes. It is shown that none of the present theories can account for the change of colour of a metachromatic

dye by a chromotropic substance, hydrolytic action and tautomerism being inadequate. J. BORDET : Specificity in biology. G. LEMAÎTRE : The expanding universe.

WASHINGTON, D.C.

National Academy of Sciences (*Proc.*, 21, 1–68, Jan. 15, 1935). WILLIAM KING GREGORY : On the evolution of the skulls of vertebrates with special reference to heritable changes in proportional diameters (anisomerism). When local acceleration or retardation of growth rate of certain parts occurs, the process is termed anisomerism. This process is traced in the most primitive known fossil chordates (Ostracoderms). It is concluded that *Poraspis* and *Palæaspis* are the most primitive. The existing cyclostome orders, petromyzonts and myxinoids, show morphological evidence of an ostracoderm ancestry, while *Amphioxus* is a much degraded anaspid ostracoderm. EMMETT REID DUNN : The snakes of the genus *Ninia*. These Colubrid snakes occur in Panama, Costa Rica and Nicaragua, and seem to come between a group of burrowing forms and a group of arboreal forms. FROELICH G. RAINEY : A new prehistoric culture in Puerto Rico. Excavations of middens at three widely separated sites have revealed two or possibly three culture horizons, (3) doubtful recent, (2) Arawak, (1) crab culture, respectively. The latter is new, and is characterised by the use of painted decoration on well-fired vessels of fine-grained clay, generally with negative designs formed in red and outlined in white paint. H. J. MULLER and A. A. PROKOFYEVA : The individual gene in relation to the chromomere and the chromosome. A selected lot of chromosome breaks in close proximity with one another produced by irradiation in *Drosophila* was analysed. Mutually consistent genetic and cytological results were obtained, and maps showing the positions of genes and breaks within a portion of one large chromomere have been made. Apparent 'mutational' changes accompanying gene rearrangements are due to the influence of neighbouring genes, and this position effect can extend over several genes. The total number of genes in the chromatin of a *Drosophila* salivary gland nucleus is 5,000–10,000. (See also NATURE, Feb. 16, 1935, p. 253.) ROBERT W. WILSON : Cricetine-like rodents from the Sespe Eocene of California. WILLIAM BOWIE : Fundamental geodetic surveys in the United States nearing completion. The U.S. Coast and Geodetic Survey is now completing a series of first-order arcs of triangulation and lines of levels spaced at intervals of about 100 miles, with second-order triangulation and levelling in the intermediate areas. It has been found that mean sea-level along the coast is not an equipotential surface, but increases with increase in latitude. The Canadian and Mexican Governments have unified their triangulation systems with that of the United States, so a single triangulation net is available for the whole of North America. RICHARD J. LOUGEE : Time measurements of an ice re-advance at Littleton, N.H. The data afforded by sections, showing sands and varved clays between an upper and lower till, exposed during the construction of a dam, make it possible to follow the retreat, re-advance and final retreat of the ice at this locality. G. A. MILLER : (1) Groups involving a set of as many conjugates as commutators. (2) Sets of group elements involving only products of more than *n*. C. G. SUITS : The temperature of the copper arc. A condensed discharge between an electrode within the arc and the cathode

of the arc is used as a source of sound. The sound receiver is a non-oscillatory spark discharge, the voltage of which changes abruptly when a sound wave is received ; the change is recorded by an oscillograph. Time intervals recorded in this way are plotted for different lengths of the arc, and from this curve the velocity, free from end corrections, is obtained as a slope. From the velocity of sound in the arc, the temperature can be deduced, allowance being made for changes in density due to dissociation and in specific heats due to excitation. The temperature of the copper arc is about 4,000° K. to within 200° ; it is very sensitive to metallic vapour content. J. A. STRATTON : Spheroidal functions. These functions are defined and their properties discussed from the point of view of physical applications. PHILIP M. MORSE : Addition formulæ for spheroidal functions. They can be used in the study of wave motion in elliptic cylinder and in spheroidal co-ordinates, and in particular in dealing with diffraction problems. PAUL S. EPSTEIN : On the bending of electromagnetic micro-waves below the horizon. A theoretical discussion of the transmission of radiations of wavelengths of the order of 50 cm., based on Huygen's principle. The earth is regarded as a perfectly absorbing screen, and the effect of the atmosphere is neglected. The formulæ derived give results qualitatively in agreement with those obtained by Marconi for radiations from Rocca di Papa on wave-lengths of 50–60 cm.

Forthcoming Events

[*Meetings marked with an asterisk are open to the public.*]

Sunday, April 7

BRITISH MUSEUM (NATURAL HISTORY), at 3 and 4.30.—M. A. Phillips : "Fossil Reptiles".*

Monday, April 8

BRITISH MUSEUM (NATURAL HISTORY), at 11.30.—M. Burton : "Diving Methods employed in Sponge Fisheries".*

VICTORIA INSTITUTE, at 4.30.—Rev. Samuel M. Zwemer : "The Origin of Religion—by Evolution or by Revelation".

Tuesday, April 9

ROYAL PHOTOGRAPHIC SOCIETY (SCIENTIFIC AND TECHNICAL GROUP).—Dr. P. W. Cunliffe : "Photography in Wool Research".

Thursday, April 11

INSTITUTION OF ELECTRICAL ENGINEERS, at 6.—N. Ashbridge, H. Bishop and B. N. MacLarty : "The Droitwich Broadcasting Station".

Friday, April 12

INSTITUTION OF MECHANICAL ENGINEERS, at 6.—A. Fage : "Aerodynamical Research and Hydraulic Practice" (Extra General Meeting).

INSTITUTION OF NAVAL ARCHITECTS, April 10–12.— Annual Meeting to be held at the Royal Society of Arts, John Street, Adelphi, W.C.2.

April 10, at 10.30.—Lord Stonehaven : Presidential Address.

Official Publications Received

GREAT BRITAIN AND IRELAND

University College, Southampton. Avon Biological Research : Annual Report, 1933–34. Pp. 76+4 plates. (Southampton : University College.) 2s. 6d.

Air Ministry : Aeronautical Research Committee : Reports and Memoranda. No. 1620 (A. 157) : Abstract—Transverse Tests on Sand Cast Aluminium Alloy Bars. By C. E. Phillips and J. D. Grogan. Pp. 2. (London : H.M. Stationery Office.) 2d. net.

The Institute of Physics. Conference on Industrial Physics, Manchester, March 28th, 29th, 30th, 1935 : Handbook. Pp. 16. Industrial Physics Conference on Vacuum Devices in Research and Industry : Catalogue of the Exhibition, Manchester 1935. Pp. 40+xxii. (London : Institute of Physics.)

Liverpool Observatory and Tidal Institute. Annual Report 1934. Pp. 15. (Liverpool.)

Proceedings of the Royal Society of Edinburgh, Session 1934–1935. Vol. 55, Part 1, No. 4 : On Least Squares and Linear Combination of Observations. By Dr. A. C. Aitken. Pp. 42–48. (Edinburgh : Robert Grant and Son ; London : Williams and Norgate, Ltd.) 6d.

Report of the Marlborough College Natural History Society for the Year ending Christmas, 1934. (No. 83.) Pp. 126+2 plates. (Marlborough : Marlborough College.) Members, 3s. ; non-Members, 5s.

Society of Chemical Industry : Chemical Engineering Group. Proceedings, Vol. 15, 1933. Pp. 136+6 plates. (London : Chemical Engineering Group.) 10s. 6d.

OTHER COUNTRIES

Second Report of the Royal Institute of Science, Bombay (1926–1934). Pp. ii+73. (Bombay : Royal Institute of Science.) Gratis.

Bulletin of the National Research Council. No. 96 : Selected Topics in Algebraic Geometry, II. Supplemental Report of the Committee on Rational Transformations. Pp. xii+84. (Washington, D.C. : National Academy of Sciences.) 1 dollar.

Sveriges Geologiska Undersökning. Ser. Aa, No. 176 : Beskrivning till kartbladet Storvik. Av B. Asklund och R. Sandegren. Pp. 150+2 plates. (Stockholm : Sveriges Geologiska Undersökning.) 4.00 kr.

The Science Reports of the Tôhoku Imperial University, Sendai, Japan. Second Series (Geology), Vol. 16, No. 3 : On the Growth Rate of Reef Corals and the Sea Water Temperature in the Japanese Islands during the latest Geological Times. By Ting Ying H. Ma. Pp. 25+4 plates. (Tôkyô and Sendai : Maruzen Co., Ltd.)

University of Illinois : Engineering Experiment Station. Bulletin 269 : Laboratory Tests of Three-Span Reinforced Concrete Arch Ribs on Slender Piers. By Wilbur M. Wilson and Ralph W. Kluge. Pp. 122. 1 dollar. Bulletin No. 271 : Determination of Mean Specific Heats at High Temperatures of some Commercial Glasses. By Prof. Cullen W. Parmelee and Alfred E. Badger. Pp. 24. 30 cents. Bulletin No. 272 : The Creep and Fracture of Lead and Lead Alloys. By Prof. Herbert F. Moore, Bernard B. Betty and Curtis W. Dollins. Pp. 50. 50 cents. (Urbana, Ill. : University of Illinois.)

Sudan Government : Wellcome Tropical Research Laboratories. Chemical Section, Publication No. 68 : Report of the Government Chemist for the Year 1934. Pp. 13. (Khartoum : Wellcome Tropical Research Laboratories.)

Government of India : Department of Industries and Labour. Functions and Organisation of the India Meteorological Department, 1935. Pp. 25. (Simla : Government of India Press.)

New York Academy of Sciences. Scientific Survey of Porto Rico and the Virgin Islands. Vol. 15, Part 2 : Crustacea Macrura and Anomura of Porto Rico and the Virgin Islands, by Waldo L. Schmitt ; The Amphipods of Porto Rico and the Virgin Islands, by Clarence R. Shoemaker. Pp. 125–262+4 plates. (New York : New York Academy of Sciences.) 2 dollars.

A Manual on the Air Seasoning of Indian Timbers. By Dr. S. N. Kapur. Pp. vii+113+11 plates. (Delhi : Manager of Publications.) 3 rupees ; 5s. 3d.

Annual Report of the Patna Science College Philosophical Society for the Session 1933–34. Pp. 5. Bulletin of the Patna Science College Philosophical Society. No. 5 : Dr. K. S. Caldwell Commemoration Number. Pp. iv+71. (Patna : Patna Science College.)

Meddelelser fra Kommissionen for Danmarks Fiskeri- og Havundersøgelser. Serie Hydrografi, Bind 3, Nr. 1 : Temperaturmessung mit elektrischem Widerstandsthermometer auf der Kattegatsexpedition im August 1931. Von J. P. Jacobsen. Pp. 22. Serie Fiskeri, Bind 9, Nr. 5 : Periodic Fluctuations in the Size of Various Stocks of Fish and their Causes. By Aage J. C. Jensen. Pp. 71. 5.00 kr. Serie Fiskeri, Bind 9, No. 7 : Marking Experiments with Cod at the Faroes, 2 : Second Report : Experiments in 1923–1927. By A. C. Strubberg. Pp. 36. 3.00 kr. (København : C. A. Reitzels Forlag.)

Memoirs of the Geological Survey of India. Palæontologia Indica. New Series, Vol. 20, Memoir No. 5 : The Triassic, Jurassic and Cretaceous Gastropoda and Lamellibranchia of the Attock District. By L. R. Cox. Pp. v+27+2 plates. (Calcutta : Geological Survey of India.) 1.14 rupees ; 3s. 3d.

CATALOGUES

The Wild-Barfield Heat-Treatment Journal. Vol. 1, No. 4, March. Pp. 41–54. (London : Wild-Barfield Electric Furnaces, Ltd.)

Botanical Books : Herbals, Monographs, Floras, On Gardens and their Management, Wild Flowers, etc. (Catalogue No. 233.) Pp. 40. (London : Dulau and Co., Ltd.)

The "Wigmore" Epidiascope. Pp. 4. (London : Newton and Co.)

A Selection of Interesting Books on a Great Variety of Subjects. (No. 500.) Pp. 156. (London : Bernard Quaritch, Ltd.)

Micro-Projection Apparatus. (List MP. 1935.) Pp. 12. (Manchester : Flatters and Garnett, Ltd.)

Heffer's Book Adviser. No. 8, March : Spring Announcements. Pp. 56. (Cambridge : W. Heffer and Sons, Ltd.)