

distinction of the Copley medal, namely, Francis Kiernan (1836) and Richard Owen (1851). In medical science the former made important contributions respecting the structure of and circulation through the liver. He was one of the founders of the University of London. [Sir] Richard Owen, at the time of his election, was assistant conservator, Royal College of Surgeons, and lecturer in comparative anatomy at St. Bartholomew's Hospital. Most of his early papers were read before the Zoological Society; in 1832, however, the Royal Society published (*Phil. Trans.*) his elaborate study entitled, "On the Mammary Glands of the *Ornithorhynchus paradoxus*". Owen became first Hunterian professor (1835); and superintendent of the Natural History Department, British Museum (1856). In the "Life" of Darwin it is recorded that Owen, a strong opponent of Darwin's views, contributed "a bitter and anonymous article on the 'Origin of Species' to the *Edinburgh Review* of 1860".

The *Beagle* Leaves the Chonos Archipelago

On November 10, 1834, the *Beagle* sailed southward from Valparaiso to survey the Chonos Archipelago as far south as the Peninsula of Tres Montes. The survey occupied about a month and on December 18 Darwin wrote: "We stood out to sea. On the 20th we bade farewell to the south, and with a fair wind turned the ship's head northward. From Cape Tres Montes we sailed pleasantly along the lofty weather-beaten coast, which is remarkable for the bold outline of its hills, and the thick covering of forest even on the almost precipitous flanks. The next day a harbour was discovered, which on this dangerous coast might be of great service to a distressed vessel. It can easily be recognised by a hill 1,600 feet high, which is even more perfectly conical than the famous sugar-loaf at Rio de Janeiro. The next day after anchoring, I succeeded in reaching the summit of this hill. It was a laborious undertaking, for the sides were so steep that in some parts it was necessary to use the trees as ladders. There were also several extensive brakes of the Fuchsia, covered with its beautiful drooping flowers, but very difficult to crawl through. In these wild countries it gives much delight to gain the summit of any mountain. There is an indefinite expectation of seeing something very strange, which, however often it may be balked, never failed with me to occur on each successive attempt. Everyone must know the feeling of triumph and pride which a grand view from a height communicates to the mind. In these little frequented countries there is also joined to it some vanity, that you perhaps are the first man who ever stood on this pinnacle or admired this view."

Dundonald's Rotary Steam Engine

The *Mechanics' Magazine* of December 20, 1834, contains an illustrated account of the rotary steam engine invented by the famous naval commander Thomas Cochrane, tenth Earl of Dundonald (1775-1860): "We give a place to the present description of it in our pages," said the *Mechanics' Magazine*, "for two reasons . . . first because of the considerable talk about it owing partly to the celebrity (for other things than machine inventing) of the noble inventor, and partly to his prodigiously confident representations of its amazing capabilities, and secondly because if we are wrong in the opinion we

have formed of it . . . it would be a thousand pities that the knowledge of an invention, calculated to confer so much benefit on the mechanical world, and to save so much trouble and mortification to hundreds of ingenious mechanics, who are now occupied with the solution of that problem of *which it is said to furnish the best possible practical solution*, should not be as speedily and as widely diffused as possible." Later on, Dundonald was allowed to fit one of his rotary engines in H.M. Paddle Sloop *Janus*, but it proved a failure and was removed from the ship. This engine formed the subject of one of the many reports which Airy, the Astronomer Royal, from time to time made at the request of the Admiralty.

Societies and Academies

PARIS

Academy of Sciences, November 5 (*C.R.*, 199, 897-988). JEAN TILHO: Two sketches concerning the final capture of the Lagone and its consequences for the Tchad basin. Sketch maps illustrating the author's previous communication on the same subject, and further remarks on the serious consequences which would result in the Tchad area. MARIN MOLLIARD: Heather and mycorrhiza. Results on the culture of *Calluna vulgaris* under aseptic conditions: the views of Rayner as to the necessity of the presence of a mould for normal growth are not confirmed. CHARLES ACHARD, AUGUSTIN BOUTARIC and JEAN BOUCHARD: The action of sera on the fluorescent power of solutions of uranine. The fluorescent power of uranine solutions is unaffected by the addition of normal sera (horse, man), and this is also the case with sera from subjects suffering from various diseases. The blood of cancerous patients, however, causes a marked reduction of fluorescence. JULES HAAG: Self-maintained oscillations. J. CABANNES: Theoretical considerations on the luminosity of the upper layers of the atmosphere. The luminosity of the night sky is regarded as a phosphorescence phenomenon in a gaseous mixture of metastable nitrogen, ozone, oxygen and water vapour. HENRI DEVAUX and JEAN GAYREL: The influence of temperature on the electrical conductivity of cupric sulphide in thin layers. The considerable changes in the conductivity of thin layers of cupric sulphide produced by a rise of temperature are attributed to loss of water. LUCIEN DANIEL: Deficient seeds in the grafted Jerusalem artichoke. E. J. GUMBEL: The paradox of the limit age. DAVID WOLKOWITSCH: A generalisation of a theorem of Monge. ALFRED ROSENBLATT: The application of Picard's method of successive approximations to the study of equations of the second order, elliptical and non-linear, with three independent variables. CORNELIS VISSER: The angular derivative of univalent functions. HENRI CARTAN: Pseudo-conformal transformations of the topological product of two domains. TCHANG TE-LOU: A new method for the study of detonation in the motor. It is not sufficient to measure the maximum pressure produced by the detonation: the variation of dp/dt with the time is a better measure of the shock. An apparatus is described which records the curve dp/dt as a function of time. Reproductions of four of these curves are given, showing the effect of advancing the spark. DANIEL BARBIER: The reality of the correlation observed between the eccentricities and periods of double stars. A discussion of the views

of C. K. Seyfert. From a discussion of additional data, the author can neither confirm nor deny the conclusion of the reality of this relation. RAYMOND LAUTIÉ: The density and molecular constitution of a normal pure liquid. WOJCŚECH SWIETOSLAWSKI and JOSEPH SALCEWICZ: The application of Newton's laws of cooling to the measurement of very small thermal effects. The method described has been applied to the determination of the heat produced by a specimen of pitchblende. The temperature change was of the order of 0.0034° per hour. EMILE SEVIN: Waves, spin and numbers. J. SAVARD: The ionisation potentials and energies of formation of some halogen molecules. JEAN SAVORNIN: The influence of the reflective power and sharpness of the edge of a screen on distant refraction. M. C. CHAMIÉ: The supplementary radiations in the recoil of the active deposit of thorium. JULES GUÉRON: The Raman spectrum, constitution and evolution of solutions of stannic chloride. M. MARIE LOUISE DELWAULLE: The system bismuth iodide, potassium iodide, water. PIERRE LOCUTY and PAUL LAFFITTE: The system sulphuric acid, ammonium sulphate, water. PICON: The preparation and properties of ammonium, calcium and quinine aurothiosulphates. A. PERRET and R. PERROT: The reactional aptitude of sodium amide. Study of the reactions of sodium amide with cyanogen, phosgene and sulphuryl chloride. CHARLES DUFRAISSE and MAURICE LOURY: Researches on the dissociable organic oxides. 1, 1-Diphenyl-3, 3-dicarbethoxybenzene. Its dissociable oxide. GEORGES DARZENS and ANDRÉ LÉVY: The fluorine derivatives of butyltoluene and butyl-*m*-xylene. New fluoro-nitro derivatives smelling of musk. JACQUES FROMAGET: The Trias in the north-west part of the syncline of Sam Neua (Tonkin and Laos). P. ROUGERIE: The harmonic analysis of the diurnal variation of the north-south earth currents recorded at the Parc Saint-Maur Observatory. GEORGES DEFLANDRE: Microfossils of plankton origin, preserved in the state of organic matter in flints from the chalk. H. COLIN: The starch of the Floridæ. This has properties intermediate between those of true starch and glycogen. PIERRE LESAGE: The heredity of acquired precocity in *Lepidium sativum*. M. JEANNE LÉVY: Experimental alcoholism. The mechanism of growing used to alcohol. From experiments on the rat it is concluded that there is no acceleration in the oxidation of the alcohol: the effect is due to a reduction in the sensibility of the cells of the brain. ANTOINE MAGNAN: Contribution to the study of flight in birds. MARC DE LARAMBERGUE: Self-fertilisation and cross-fertilisation in *Bullinus contortus*. P. CHEVEY: The vertical distribution of the ichthyological fauna near the eastern coasts of French Indo-China. JACQUES POCHON: The rôle of a cellulolytic bacterium of the stomach, in the transformation of cellulose into glucose, in the interior of the digestive tube of ruminants. It is proved that *Plectridium cellulolyticum* is an important factor in the process of digestion of cellulose in ruminants. GASTON RAMON: Experimental antidiphtheric immunisation by means of living diphtheria bacilli.

CAPE TOWN

Royal Society of South Africa, August 15. R. W. S. CHEETHAM, I. SCHRIRE and H. ZWARENSTEIN: Influence of testicular and of urinary extracts on the creatinine excretion in rabbits. Testicular extract increases the excretion of creatinine transiently in

the normal rabbit by approximately 40 per cent. Testicular suspensions decrease the creatinine elimination in the normal rabbit by approximately 40 per cent. This too is a transient effect. Injection of urinary extract of the male sex hormone first decreases the creatinine excretion by 30 per cent and then increases the elimination by 30 per cent approximately. This is a diphasic effect, and passes off within four days of the injection. B. G. SHAPIRO and H. ZWARENSTEIN: Effect of hypophysectomy and castration on muscle creatine in *Xenopus laevis*. The average creatine content of the hamstring muscles of the South African clawed toad is 400 mgm. per 100 gm. Removal of anterior or both lobes of the pituitary produces a steady decline in muscle creatine. Five months after operation the hypophysectomised animals contain an average of 18 per cent less creatine than the captive control animals. Removal of the testes or of the ovaries has no effect up to five months. S. HONIKMAN, H. A. SHAPIRO and H. ZWARENSTEIN: The bio-assay of the gonadokinetic principle of the anterior pituitary. A curve has been constructed relating dosage of an acid extract of anterior pituitary (sheep and goats) to percentage response (ovulation plus oviposition) in *Xenopus laevis* during July (breeding season). Fifty animals were used for each point: they were kept at 18°–20° C.; readings were taken twenty-four hours after injection; laboratory age of animals did not exceed two weeks. The unit is defined as the amount of original tissue required to produce a 50 per cent response. This was found to be 3.8 mgm., that is, 263 units per gram. BENJAMIN FARRINGTON. Vesalius on china-root. Extracts from a letter of Andreas Vesalius to Dominus Joachim Roelants written at Ratisbon, June 13, 1546. At this time China-root (that is, China-smilax, a species of *sarsaparilla*) had an enormous reputation as a specific for various diseases. Vesalius, in lively and sarcastic style, exposes the inadequacy of the basis on which this reputation rested.

VIENNA

Academy of Sciences, Oct. 25. KARL GROBBEN: Decapod sperm and the position of Eucyphidea in the genealogical tree of the decapod Crustacea. JOSEF HARAND: Critical temperature as a microchemical characteristic. A heating block for the safe and rapid determination of critical temperatures is described. A streaming microscope is used which allows quantities of material as small as 0.1–0.05 mgm. to be employed. Prud'homme's formula for chlorine derivatives of the paraffin series is confirmed, the critical temperature of methane being calculated to be 186.6°. The values for *n*-, *i*-, and commercial butanes are given, and it is shown that a substance gaseous at the ordinary temperature may be identified and its purity determined by means of its critical temperature. Examination of binary systems is also possible. ALFRED FISCHINGER and WILLY HORNIG: Influence of indifferent neutral salts on substantive histological staining. OTTO SCHINDLER: The kidneys of the larvæ of sea fish.

Oct. 31. FRITZ RIEDER: Wilson chamber studies of the ultra-radiation on the Hafelekar (2,300 metres). With the help of Wilson diagrams, a statistics of the electrons liberated by ultra-radiation, as regards their energy and—with some degree of probability—the sign of their charge, is developed. Observations

were made also on heavy corpuscular rays, the liberation of which by ultra-radiation appears established; these have ranges of 0.6 cm. to at least 5.5 cm., calculated to 15° C. and 760 mm. pressure, but their nature and the mode of their formation remain unknown. FRIEDRICH LAUSCHER: Thermal radiation and restriction of horizon. Radiation of basins, valleys and lanes. (1) A general method for deducing the radiation from any surfaces.

Forthcoming Events

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

Saturday, December 15

BRITISH PSYCHOLOGICAL SOCIETY, at 3. Annual General Meeting.

Sunday, December 16

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

Monday, December 17

BRITISH MUSEUM (NATURAL HISTORY), at 11.30.—Dr. W. T. Calman: "The Shipworm".*

ROYAL GEOGRAPHICAL SOCIETY, at 5.—Discussion on "Population Maps" to be opened by Prof. C. B. Fawcett.

Tuesday, December 18

EUGENICS SOCIETY, at 5.15—(at the Linnean Society, Burlington House, W.1).—Dr. Shepherd Dawson: "Disease and Intelligence".

Wednesday, December 19

BRITISH SCIENCE GUILD, at 5 (at the Royal Society of Arts, John Street, Adelphi, London, W.C.2). Col. M. O'Gorman: "Bringing Science into the Road Traffic Problem".

Official Publications Received

GREAT BRITAIN AND IRELAND

Department of Scientific and Industrial Research. Industrial Research Exhibit: a Guide to Stands 6 to 34, Cardiff Engineering Exhibition, 1934, under the auspices of the South Wales Institute of Engineers. Pp. 20. (London: Department of Scientific and Industrial Research.)

Proceedings of the Third International Locust Conference, London, September 18, 1934. (Cmd. 4725.) Pp. 184. (London: H.M. Stationery Office.) 3s. 6d. net.

Year Book of the University Catholic Societies Federation of Great Britain, 1934-1935. Pp. 96. (Glasgow: Hon. Secretary, 13 Fortrose Street.) 1s.

Rothamsted Experimental Station, Harpenden: Lawes Agricultural Trust. Report for 1933. Pp. 200. (Harpenden: Rothamsted Experimental Station.) 2s. 6d.

Natural Science and Archaeology Society, Littlehampton. Reports of Proceedings, 1933. Pp. 22. (Littlehampton.)

Department of Scientific and Industrial Research. Report of the Fuel Research Board for the Year ended 31st March 1934; with Report of the Director of Fuel Research. Pp. vii+178. (London: H.M. Stationery Office.) 3s. net.

University of Durham. Abstracts of Theses for Doctorates presented by Candidates who have received the Degrees in Convocation during the Academic Year 1933-1934. Pp. 12. (Durham.)

Transactions of the Royal Society of Edinburgh. Vol. 58, Part 1, No. 11: The Early Stages in the Development of the Ferret; fertilisation to the Formation of the Prochordal Plate. By Dr. William J. Hamilton. Pp. 251-278+7 plates. (Edinburgh: Robert Grant and Son; London: Williams and Norgate, Ltd.) 6s.

The Royal Technical College, Glasgow. Annual Report on the One Hundred and Thirty-eighth Session adopted at the Annual Meeting of Governors held on the 16th October 1934. Pp. 84. (Glasgow.)

The North of Scotland College of Agriculture. Report on the Work of the North of Scotland College for the Year 1933-34. Pp. 36. (Aberdeen.)

A Review of the Experimental Working of the Five Days Week by Boots Pure Drug Company at Nottingham. By Sir Richard A. S. Redmayne. Pp. 70. (Nottingham: Boots Pure Drug Co., Ltd.) 1s.

The Scientific Proceedings of the Royal Dublin Society. Vol. 21 (N.S.), No. 13: The Measurement of the Current generated by Rectifier Photo-Cells. By H. H. Poole and W. R. G. Atkins. Pp. 133-139. (Dublin: Hodges, Figgis and Co.; London: Williams and Norgate, Ltd.) 6d.

OTHER COUNTRIES

Scientific Reports of the Imperial Institute of Agricultural Research, Pusa (including the Reports of the Imperial Dairy Expert, Physiological Chemist and Sugarcane Expert), 1932-33. Pp. v+203+4 plates. (Delhi: Manager of Publications.) 4.12 rupees; 8s.

The Indian Forest Records. Vol. 20, Part 11: New Termites from India. By Thomas E. Snyder. Pp. ii+28. (Delhi: Manager of Publications.) 9 annas; 1s.

Carnegie Institution of Washington. Publication No. 436: Contributions to American Archaeology. Vol. 2, Nos. 5 to 12. Pp. iii+355+38 plates. (Washington, D.C.: Carnegie Institution.)

Advisory Department of the Imperial College of Tropical Agriculture. Report on the Agricultural Department, St. Lucia, 1933. Pp. iv+51. (Castries, St. Lucia: Government Printing Office.) 6d.

Publications of the Dominion Observatory, Ottawa. Vol. 12: Bibliography of Seismology. No. 2 (Items 2131-2244): April, May, June, 1934. By Ernest A. Hodgson. Pp. 27-44. (Ottawa: King's Printer.) 25 cents.

U.S. Department of Agriculture. Miscellaneous Publication No. 198: An Annotated Bibliography of the Hessian Fly, *Phytophaga destructor* (Say). By J. S. Wade. Pp. 100. (Washington, D.C.: Government Printing Office.) 10 cents.

Proceedings of the California Academy of Sciences, Fourth Series. Vol. 21, No. 17: The Templeton Crocker Expedition of the California Academy of Sciences, 1932. No. 17: The Hepaticae (chiefly Riccia and Anthocerotaceae) of the Galapagos Islands and the Coast and Islands of Central America and Mexico. By Marshall A. Howe. Pp. 199-210+plate 7. Vol. 21, No. 18: The Templeton Crocker Expedition of the California Academy of Sciences, 1932. No. 18: Lichens. By David H. Linder. Pp. 211-224+plate 8. (San Francisco.)

Ceylon. Part 4: Education, Science and Art (D). Administration Report of the Director of Agriculture for 1933. By Dr. W. Youngman. Pp. 184. (Colombo: Government Record Office.) 2 rupees.

Journal of the Faculty of Science, Imperial University of Tokyo. Section 2: Geology, Mineralogy, Geography, Seismology. Vol. 3, Part 8: The Cambro-Ordovician Formations and Faunas of South Chosen—Paleontology, Part 1: Middle Ordovician Faunas. By Teichi Kobayashi. Pp. 329-519+44 plates. 3.50 yen. Vol. 3, Part 9: The Cambro-Ordovician Formations and Faunas of South Chosen—Paleontology, Part 2: Lower Ordovician Faunas. By Teichi Kobayashi. Pp. 521-585+8 plates. 1.00 yen. (Tokyo: Maruzen Co., Ltd.)

Meddelanden från Lunds Observatorium. Ser. 2, Nr. 67: Catalogue of Auroræ borealis observed in Northern Sweden during the Time August 1932-March 1933. By Axel Corlin. Pp. 51. Ser. 2, Nr. 68: Studies on the Stream Motions of the Stars. By W. Gyllenberg. Pp. 114. 9.00 kr. Ser. 2, Nr. 69: Analytical Theory of Regression. By S. D. Wicksell. Pp. 32. 2.50 kr. Ser. 2, Nr. 70: Studies of the Effective Wave-Lengths of Stars. First Paper: Effective Wave-Lengths of 659 Stars in Messier 37 from Plates taken at Mount Wilson. By Jöran M. Ramberg. Pp. 39. 4.00 kr. (Lund.)

Memoirs of the Commonwealth Solar Observatory. Memoir No. 4: Atmospheric Potential Gradient Observations at the Commonwealth Solar Observatory, Mount Stromlo, Canberra. By C. W. Allen. Pp. 47. (Canberra: Government Printer.)

Journal of the Indian Institute of Science. Vol. 17A, Part 8: Utilisation of Indigenous Tanning Materials, Part 1: Manufacture of Tannin Extract from Avaram Bark (*Cassia auriculata*, Linn.). By Keshaviah Aswath Narain Rao and Shaha L. Janniah. Pp. 95-104. 14 annas. Vol. 17A, Part 9: Estimation of Potassium by the Cobaltinitrite Method. By S. D. Sunawala and K. R. Krishnaswami. Pp. 105-112. 12 annas. (Bangalore.)

The Indian Lac Research Institute. Bulletin No. 19: The Heat Curing of Shellac, Part 2: "Depolymerisation". By M. Rangaswami and R. W. Aldis. Pp. 10. 1 rupee. Bulletin No. 20: Further Notes on the Use of *Schleichera trijuga* (Kusum) in Lac Cultivation. By Dorothy Norris; with an Appendix by P. M. Glover. Pp. 4. 8 annas. Bulletin No. 21: A Check List of the *Chalcidoidea* bred at Nankum from the Lac Insect *Laccifer lacca*, with some Notes as regards their Function, Economic Importance and Control. By P. M. Glover. Pp. 14. 1 rupee. (Bangalore.)

Proceedings of the Academy of Natural Sciences of Philadelphia, Vol. 86. Fishes obtained by Mr. H. W. Bell-Marley, chiefly in Natal and Zululand in 1929 to 1932. Pp. 405-514. (Philadelphia.)

National Research Council: Division of Geology and Geography. Report of the Committee on the Measurement of Geologic Time, presented at the Annual Meeting of the Division of Geology and Geography, April 28, 1934. Pp. ii+86. (Washington, D.C.: National Research Council.)

Descriptive Catalogue of the Collection of Microscopes in charge of the Utrecht University Museum, with an Introductory Historical Survey of the Resolving Power of the Microscope, by P. H. Van Cittert. Pp. 110. (Groningen: P. Noordhoff.) 2.90 f.

Bulletin of the American Museum of Natural History. Vol. 67, Article 8: Chalicotheres from Mongolia and China in the American Museum. By Edwin H. Colbert. Pp. 353-387. (New York City.)

Journal of Science of the Hiroshima University, Series B, Div. 2 (Botany). Vol. 2, Article 2: Monographia Hepaticarum Austral-Japonicarum. By Yoshiwo Horikawa. Pp. 101-325+plates 11-21. (Tokyo: Maruzen Co., Ltd.) 2.10 yen.

Canada: Department of Mines: Mines Branch. Investigations in Ore Dressing and Metallurgy (Testing and Research Laboratories), January to June 1933. (No. 743.) Pp. iii+157+4 plates. (Ottawa: Government Printer.)

Carnegie Institution of Washington. Publication No. 415: Contributions to Paleontology—Studies of the Pleistocene Paleobotany of California. Pp. iii+179+31 plates. (Washington, D.C.: Carnegie Institution.)

CATALOGUES

Forced Air Circulation Furnaces. Pp. 12. (London: Wild-Barfield Electric Furnaces, Ltd.)

Catalogue de Livres anciens et modernes rares ou curieux relatifs à l'Orient. (No. 28.) Pp. 62. (Paris: Libr. Adrien-Maisonneuve.)