

## Science News a Century Ago

### Lardner on the Theory of Railways

At a meeting of the Royal Society held on April 28, 1836, Lardner read a paper "On Certain Parts of the Theory of Railways; with an Investigation of the Formulæ Necessary for the Determination of the Resistances to the Motion of Carriages upon Them". In the course of his paper, he treated of the motion of trains on the level, on ascending and descending inclines and around curves. He confined himself to the analytical formulæ expressing various mechanical effects of the most general kind. He had, however, he said, made extensive experiments in the last few years, and had procured the results of experiments by others, and had made numerous observations in the ordinary course of transit by railways, and he announced his intention of placing the results of these experiments before the Society later.

### Darwin in Mauritius

ON April 29, 1836, H.M.S. *Beagle* arrived at Mauritius, where she remained until May 9. Darwin in his "Journal of Researches" gave a short account of the island. On May 1, he took a short walk along the sea-coast, finding the country pleasant but without the charms of Tahiti or the grandeur of Brazil. The next day he ascended La Pouce, 2,600 ft. high. "The centre of the island," he wrote, "consists of a great platform, surrounded by old broken basaltic mountains, with their strata dipping seawards. The central platform, formed of comparatively recent streams of lava, is of an oval shape, thirteen geographical miles across, in the line of its shorter axis. The exterior bounding mountains come into that class of structures called 'Craters of Elevation', which are supposed to have been formed not like ordinary craters, but by a great and sudden upheaval. There appears to me to be insuperable objections to this view; on the other hand, I can hardly believe, in this and some other cases, that these marginal crateriform mountains are merely the basal remnants of immense volcanos, of which the summits either have been blown off, or swallowed up in subterranean abysses."

Since England has taken possession of the island, Darwin said, the export of sugar had increased seventy-five fold, while one of the causes of its prosperity was the excellent state of the roads. Although the French residents must have profited by the prosperity, the English Government was far from popular.

### Baron von Ludwig and Sir John Herschel

IN one of a series of "Letters from a Cadet" published in the *Athenæum* of April 30, 1836, the writer gave an account of his visits to Baron von Ludwig and Sir John Herschel at the Cape of Good Hope. The former was a Dutch gentleman of ample fortunes which enabled him "to indulge his taste for natural history, while his enlightened liberality throws open his magnificent gardens to all strangers on the simple condition of sending in their names . . . his garden is that of a philanthropist as well as a philosopher; his fertile mind teems with projects for the improvement of the colony in which he is settled".

The writer had the pleasure of spending the morning with Herschel, finding him engaged in a course of astronomical researches which, he said, had already afforded some most interesting results. "He had made himself universally respected by his amiability, his readiness to assist the distressed, and his anxiety to join in all local schemes of improvement, whether in education, agriculture, commerce or scientific discovery. It is really a touching sight to behold this man, deservedly ranked among the first of his age, leaving an infant school, which has, in great measure, sprung up under his fostering care and influence, to draw up at the desire of the Cape Literary and Philosophical Society, a body of admirable instructions for the gentlemen composing the scientific expedition at present engaged in exploring the pathless wilds of Southern Africa."

### Agassiz and the Geological Society

AGASSIZ (*Notizen a. d. Gebiet. d. Natur. u. Heilkunde*, April 1836), on the occasion of his visit to London, speaks in the following high terms of praise of the Geological Society: "The Geological Society of London is one of the institutions which have been founded on the most liberal principles and by its influence supports everything which even indirectly can contribute to the progress of science. It is to the generosity of the president and council of this society that I have been able to carry out a work in London which would have been impossible without the support and authorization of a society which enjoys a high reputation unparalleled in the history of the natural sciences. As I found that the collections of the three kingdoms possessed an enormous amount of material important for my work I wondered how I could best avail myself of it, and it was only through the liberality of the English men of science that I was able to take away with me the specimens which appeared to throw a new light on fossil fishes. On the application of Messrs. Greenhough, Sedgwick, Murchison and Lyell, I had permission to examine all these treasures in a room at Somerset House, where Mr. Lonsdale, the conservator of the Society's collections, helped me to arrange 2,000 specimens of fossil fish which I had selected from about 8,000 in England, Scotland and Ireland."

## Societies and Academies

### DUBLIN

Royal Dublin Society, February 25. T. J. NOLAN, J. KEANE and P. A. SPILLANE: The chemical constituents of lichens found in Ireland. (a) *Buellia conescens*. (2). The lichen contains atranorin, chloratranorin, diploicin, for which the formula  $C_{16}H_{10}O_5Cl_4$  has been confirmed, and a substance closely related to diploicin and having the formula  $C_{18}H_{11}O_5Cl_3$ . Diploicin is a depsidone containing one methoxyl and one phenolic hydroxyl group, and is most probably derived from the condensation of two molecules of dichlor-orsellinic acid with the elimination of one molecule of carbon dioxide. T. J. NOLAN, J. KEANE and M. MOHAN: (b) *Lecanora gangaleoides*. (2). The lichen contains atranorin, chloratranorin, gangaleoidine, for which the formula  $C_{18}H_{14}O_7Cl_2$

has been confirmed, and a substance of formula  $C_{26}H_{21}O_{10}Cl_3$  containing one methoxyl group and apparently a tripeptide. Gangaleoidin is shown to be closely related to diploicin and is a depsidone containing one phenolic hydroxyl, one methoxyl and one carboxylic ester group. T. J. NOLAN, J. KEANE and G. KENNEDY: (c) *Lecanora sordida*. (1). The observations of Zopf concerning the constituents of this lichen are confirmed in certain respects. It contains 4 per cent rocellic acid, a dextrorotatory dicarboxylic fatty acid for which the formula  $C_{17}H_{32}O_4$  is confirmed, 0.7 per cent of a mixture of atranorin and chloratranorin and 0.02 per cent of an acid resembling Zopf's thiophanic acid and containing 14.1 per cent of chlorine. J. BELL and W. A. GILLESPIE: The hydrolysis of urea hydrochloride. Determination of the hydrolysis constant of urea hydrochloride in aqueous solution by electrometric methods gave results in agreement with the original values obtained by Walker and Wood, using catalytic methods. J. LYONS and M. O'SHEA: Factors influencing the loss of butter fat in churning. The lesser the proportion of small fat globules in the cream, and the lower the temperature to which the cream is chilled, the more efficient the churning: cream of medium richness, effectively cooled after pasteurisation and agitated in a fairly full container, churns best.

## PARIS

Academy of Sciences, March 16 (*C.R.*, 202, 885-992). ERNEST ESCLANGON: The abnormal solution of a problem of mechanics deduced from the principle of relativity. DIMITRI RIABOUCHINSKY: Contribution to the theory of gaseous jets. LUC PICART was elected a non-resident member in succession to the late Victor Grignard, and MAURICE NICLOUX a *Correspondant* for the Section of Chemistry. CHARLES PISOT: A characteristic property of certain algebraic integrals. TH. MOTZKIN: Transformations which do not augment the number of variations of sign. PAUL VINCENSINI: Certain series of Laplace. ALFRED ROSENBLATT and STANISLAW TURSKI: The conformal representation of plane domains. W. STERNBERG: The integral equation of the first species. STANISLAW MAZUR and WLADYSLAW ORLICZ: Rational functionals. ARNAUD DENJOY: Homographic groups. V. FROLOW: The movements of the mean level of the sea at Brest and at Marseilles. JEAN LEGRAND: Analysis of the oscillations of the mean annual sea-level at Brest. CHARLES JAEGER: Theory of knocking in forced mains with multiple characteristics. The resonance of the fundamental and the harmonics. PIERRE ERNEST MERCIER and JEAN CROSET: A graphical method of solving hyperstatic systems. F. LINK: The photometric consequences of Einstein's deviation. M<sup>lle</sup>. MARIE ANTOINETTE BAUDOT: The new electrodynamics. JEAN LOUIS DESTOUCHES: The electronic nature of light. LA GOLDSTEIN: The shocks of slow electrons in pure oxygen. Electronic affinity. JEAN CAYREL: The Devaux reaction concerning the modification of a superficial film of cupric sulphide by copper. MARCEL PAUTHENIER and M<sup>me</sup>. MARGUERITE MOREAU-HANOT: Remarks on the measurement and production of high potentials. A method of absolute measurement is described in which a sphere is charged to the potential to be measured, and a small disk of platinum of the same curvature is lifted by the repulsion, and falls off the sphere. The authors describe the number of thin disks used as a box of weights for potentials.

ANDRÉ EGAL and ROBERT CHEVALIER: A meter with compensated thermocouples for measuring the calories given out by a hot water central heating installation. BERNARD KWAL and JACQUES SOLOMON: A consequence of the new non-linear electrodynamics. JEAN SAVORNIN: The theory of diffraction by a metallic screen with a rectilinear edge. MICHEL DUFFIEUX and LÉON GRILLET: A new band of nitric oxide. YVES LE GRAND: Two properties of sources of polarized light. OTAKAR VIKTORIN: The emission of ultra-violet radiation in the Reboul effect. A description of experiments showing clearly that an ultra-violet radiation of a wave-length between 2600 and 2000 Å. accompanies the Reboul effect. SALOMON ROSENBLUM: The existence of the  $\alpha_5$  line and the decomposition of the magnetic spectrum of thorium C into two series. JEAN AMIEL: Contribution to the quantitative study of the slow combustion of benzene and of some hydrocarbons: The results are shown in curves, and a formula, admittedly empirical, is given which agrees well with the author's experiments. HENRI MURAOUR and ALBERT MICHEL-LÉVY: Metal spectra obtained by waves of shock. M<sup>me</sup>. MARIE ELISA P. RUMPF: The existence of chlorotitanic acid,  $H_2TiCl_6$ . The Raman spectrum. RENÉ FREYMAN: The measurement of dielectric constants for very short waves with the aid of a recording apparatus. The accuracy of the apparatus described is of the order of 0.5 per cent. The results of its application to pyrrol and to some amines are given. MARCEL PRETTE: The influence of pressure, concentration and temperature on the slow oxidation velocity and aptitude to spontaneous inflammation of mixtures of oxygen and normal pentane below 300°C. RAYMOND QUELET: The chloro-alkylation of anisol: the synthesis of vinylanisols. F. BLONDEL and J. BONDON: The manganese of the Siroua (South Morocco) region. LÉON AUFRÈRE: The *Cervus Somonensis* of the National Museum of Natural History. ALBERT ROBAUX: The distribution of the Flysch in the subbetic along the Londa transversal (Andalusia). ARMAND RENIER: The Armorican chain and Varisque chain. Contribution to the study of the inflections of bundles of folds. CLAUDE GAILLARD: A giant bird in the Eocene deposits of Mont-d'Or Lyonnais. The portions found indicate a bird of the size of the black cassowary of Australia. PAUL ROUGERIE: The relation between the solar activity and the daily amplitude of the north-south telluric currents recorded at the Ebre Observatory. EDMOND GILLES: The ultra-violet absorption of cellophane and of plant tissues and organs. RENÉ SALGUES: Leaf cyanogenesis in *Photinia*. HENRI COLIN and M<sup>lle</sup>. ANDRÉE CHAUDUN: The diastatic degradation of the intercellular cement. M<sup>lles</sup>. EUDOXIE BACHRACH and MADELEINE SIMONET: Diatoms and blue pigmentation. JACQUES MAVAS: An undescribed epithelial organ, the infra-orbital paraganglion. PAUL BEQUEREL: The latent life of some Algae and lower animals at low temperatures and the conservation of life in the universe. M<sup>me</sup>. ANDRÉE DRILHON: Some chemical and physicochemical constants of the internal medium of *Carcinus maenas*. M<sup>me</sup>. PAULETTE CHAIX and CLAUDE FROMAGEOT: New experiments on the action of sulphur derivatives on the fermentation of glucose by propionic bacteria. THÉOPHILE CAHN and JACQUES HOUGET: The final destination of the glucides in the muscle extracts of normal and diabetic dogs. RAYMOND POISSON: *Dermomycoides armoriacus*, a cutaneous parasite of *Triturus palmatus*.

The structure of the zoospore. ETIENNE SERGENT : The preparation of an active serum against scorpion poison. W. KOPACZEWSKI : The lactogelification of the seric proteins in cancer.

#### Moscow

Academy of Sciences (C.R., 1, No. 1; 1936). F. GANTMACHER : Non-symmetrical nuclei of Kellogg. V. KUPRADZE : Dispersion of electromagnetic waves in a non-homogeneous medium. I. I. ISLAMOV and J. M. TOLMACHEV : Colour of corundum. G. M. KOVALENKO : Resistance of gaseous mixtures to electric penetration. N. A. SHISHAKOV : Anomalous structures of fine crystalline silica. K. S. TOPCHJEV : Action of carbon disulphide on methyl-pyridonimmin. N. TUDOROVSKAJA : Some peculiarities in the variations in the refraction index of glass at temperatures below 300° C. V. I. BODYLEVSKIJ : Concerning traces of the Upper Volga stage in the west Siberian plains. G. C. LAEMMLEIN : The sequence of the deposition of silicates from magma and their crystal grid energies. D. KOSTOFF : Studies on polypliod plants. (11) Amphidiploid *Triticum timopheevi*, Zhuk. × *Triticum monococcum*, L. M. L. KARP : Number and distribution of genes in the third chromosome of *Drosophila melanogaster*, affecting the number of sternal bristles. N. P. KALABUCHOV and L. B. LEVINSON : Effect of low temperature upon trypanosomes (*Trypanosoma equiperdum*) in mammals (see NATURE, Oct. 5, 1935, p. 553). A. N. SVETOVIDOV : A new herring from the Caspian Sea, *Caspialosa caspia salina* subsp.n.

#### ROME

Royal National Academy of the Lincei (*Atti*, 22, 181-273) G. SCORZA : Varieties of Veronese. L. PUCCIANI : Electrical and magnetic inductivity in relation to the new electrical metrology. L. PUCCIANI : General considerations on magnetic moment and magnetic poles, intensity of magnetisation and susceptibility, and on the corresponding measurements in a system with four fundamental units. G. A. MAGGI and B. FINZI : A question relating to electro-magnetic harmonic waves. G. PALOZZI : Projective linear element and projective applicability of new lattices of ordinary space. S. CHERUBINO : Series of powers of one variable in one algebra. T. BOGGIO : Some systems of differential equations. B. HOSTINSKÝ : Integration of linear substitutions. A. TERRACINI : Projective deformability of rectilinear congruences. G. MARLETTA : Observations on differential projective geometry. G. ASCOLI : Asymptotic behaviour of integrals of linear differential equations of the second order. L. SONA : Translatory current which attacks a bilateral lamina (2). M. PASTORI : Problem of Clebsch (2). Application to coupled tensors. L. ALLEGRETTI : Measurements of anomalous dispersion of the first doublets of Sr<sup>+</sup> and of Ba<sup>+</sup>. The ratio of the anomalous dispersion coefficients  $N_1/N_2$  for the first doublet of the principal series of Sr<sup>+</sup> and of Ba<sup>+</sup> has the values 2.07 and 2.16, respectively. D. GHIRON : Borovanadates. The existence of two series of borovanadates  $2Me^+O$ ,  $V_2O_5$ ,  $3B_2O_3$  and  $Me^+O$ ,  $V_2O_5$ ,  $B_2O_3$  has been shown. M. FRERI : Anomalous action of nitrous acid on hydrazides of organic acids. The action of nitrous acid on the hydrazide of citraconic acid is described. L. PERETTI : Outcrop of pre-Triassic gneiss near Acqui. V. PUNTONI : *Proteomyces infestans*, Moses and Vianna, and its relation to the genus *Trichosporon* (Behrend, 1890).

## Forthcoming Events

Monday, April 27

ROYAL GEOGRAPHICAL SOCIETY, at 5.30.—Lieut.-Colonel D. L. R. Lorimer : "Life in Hunza" (film).

ENGINEERS' GERMAN CIRCLE, at 6.—(at the Institution of Mechanical Engineers, Storey's Gate, Westminster, S.W.1).—E. Kurzel-Runtscheiner : "Das Technische Museum in Wien".

Tuesday, April 28

ROYAL SOCIETY OF ARTS, at 4.30.—Sir Louis Souchon : "Mauritius".

INSTITUTE OF PATHOLOGY AND RESEARCH, ST. MARY'S HOSPITAL, LONDON, at 5.—Sir Joseph Barcroft, F.R.S. : "The Genesis of Respiratory Movements in the Foetal Sheep".

INSTITUTION OF CIVIL ENGINEERS, at 6.—E. J. Buckton and H. J. Fereday : "Demolition of Waterloo Bridge".

Friday, May 1

INSTITUTION OF ELECTRICAL ENGINEERS (METER AND INSTRUMENT SECTION MEETINGS), at 7.—Clifford C. Paterson : "Uniformity as the Gauge of Quality".

ROYAL INSTITUTION, at 9.—Major W. S. Tucker : "Direction Finding by Sound".

## Official Publications Received

### Great Britain and Ireland

Researches published from the Wards and Laboratories of the London Hospital during 1935. 23 papers. (London : H. K. Lewis and Co., Ltd.) 7s. 6d. net. [263]

The Work of the Heterogeneity of Steel Ingots Committee. Joint Committee of the Iron and Steel Institute and the British Iron and Steel Federation reporting to the Iron and Steel Industrial Research Council. Being a Review of the Work to date (December 31, 1935) compiled at the request of the Committee by Dr. W. H. Hatfield. (Special Report No. 12.) Pp. iv+43. (London : Iron and Steel Institute.) [263]

Report of the Rugby School Natural History Society for the Year 1935. Pp. 52. (Rugby : George Over, Ltd.) [273]

Sea-Fish Commission for the United Kingdom. Second Report: The White Fish Industry. (Cmd. 5130.) Pp. 113. (London : H.M. Stationery Office.) 2s. net. [273]

### Other Countries

Cornell University : Agricultural Experiment Station. Bulletin 637 : Soils of Orleans County, New York, in their relation to Orchard Planting. By A. T. Sweet. Pp. 32. Bulletin 638 : Ten-Year Report of Studies in Child Development and Parent Education. By Ethel B. Waring. Pp. 69. Bulletin 639 : Soil, Field-Crop, Pasture and Vegetable-Crop Management for Delaware County, New York. Part 1 : Soils and Field Crops, by A. F. Gustafson ; Part 2 : Pastures, by D. B. Johnstone-Wallace ; Part 3 : Vegetable Crops, by F. O. Underwood ; Part 4 : Soil Map and Soil-Type Descriptions, by C. S. Pearson, F. B. Howe and A. F. Gustafson. Pp. 88. Memoir 181 : Intercellular Humidity in relation to Fire-Blight Susceptibility in Apple and Pear. By Luther Shaw. Pp. 40. Memoir 182 : Wholesale Prices in Cincinnati and New York. By H. E. White. Pp. 42. (Ithaca, N.Y. : Cornell University.) [14]

Proceedings of the American Academy of Arts and Sciences. Vol. 7, No. 7 : Compressibilities and Electrical Resistance under Pressure, with Special Reference to Intermetallic Compounds. By P. W. Bridgman. Pp. 285-318. 75 cents. Vol. 70, No. 8 : The Specific Volume of Steam in the Saturated and Superheated Condition together with Derived Values of the Enthalpy, Entropy, Heat Capacity and Joule-Thomson Coefficients. Part 4 : Steam Research Program. By Frederick G. Keyes, Leighton B. Smith and Harold T. Gerry. Pp. 319-364. 1 dollar. Vol. 70, No. 9 : Philippine Floridæ from the Mount Apo Region in Mindanao. By Charles T. Brues. Pp. 365-466. 1.50 dollars. (Boston, Mass. : American Academy of Arts and Sciences.) [14]

Records of the Geological Survey of India. Vol. 70 : Quinquennial Review of the Mineral Production of India for the Years 1929 to 1933. By the Director and Senior Officers of the Geological Survey of India. Pp. iv+453+lxvii+7 plates. (Delhi : Manager of Publications.) 6.4 rupees ; 10s. [14]

Indian Central Cotton Committee : Technological Laboratory. Cotton Research in India : being an Account of the Work done at the Indian Central Cotton Committee Technological Laboratory, 1924-1935. By Dr. Nazir Ahmad. Pp. vi+100+12 plates. (Bombay : Indian Central Cotton Committee.) 2 rupees. [14]

U.S. Department of the Interior : Office of Education. Bulletin, 1936, No. 18-1 : How Communities can Help. Pp. vii+77. (Washington, D.C. : Government Printing Office.) 10 cents. [14]