

Science News a Century Ago

The Royal Geographical Society

AT a meeting of the Royal Geographical Society held on January 25, 1836, presided over by Sir John Barrow, accounts were read of the Laccadive Islands and of the English Settlement at Cape Coast Castle. The account of the Laccadive Islands was from the private journal of Lieut. Wood of the East India Company's Marine. There were, he said, about fifty islets all told with a total population of less than 7,000. The islands were of coral formation, the larger ones being generally well planted with coco-nut trees, the manufacture of coir from the outer husk of the nut, into ropes, being the chief source of employment to the natives, beyond fishing, cultivating rice and a few vegetables and gathering cowrie shells, which were found in considerable abundance. The inhabitants were poor and inoffensive, carried no arms and lived in stone-built, thatched houses kept very low as a security against the violent gales by which the islands were often swept.

Records of Halley's Comet

IN a long letter published in *The Times* of January 26, 1836, the Rev. George Cornelius Gorham gave a review of the observations made of Halley's comet from 1456 until 1835, as recorded in various scientific publications, and referred especially to an article which had recently appeared in the *Quarterly Review*. "From these recorded appearances of Halley's comet during its last six visits in about four centuries," he said, "it would seem to be a rash conclusion that this body is gradually wasting away in space, or that the trains and luminous envelopes of comets decrease every time they return to our system (*Quart. Rev.*, Dec. 1835, p. 207), for the train of Halley's was only 4 deg. long as seen in Europe in 1759; it was 40 deg. in 1835, and the comet itself was brighter in the last return than in the preceding. . . . It was perhaps most splendid in 1456—most obscure in 1607—and more conspicuous in 1835 than in 1759. In short, it appears to have waxed and waned in brilliancy, by irregular alternations, during each of its last six perihelion journeys; while its small oblong nucleus has been accompanied by a train of variable colour and magnitude, but is so far from dispersing, that it is considerably longer at present than it was 200 or 300 years ago." Gorham, who was born in 1787 and died in 1857, was third wrangler and second Smith's prizeman in 1808. He took the degree of B.D. in 1820, and his letter was addressed from Maidenhead Parsonage. From 1847 until his death, he was vicar of Brampford Speke, Devonshire, his appointment to this living leading to the famous ecclesiastical case *Gorham v. the Bishop of Exeter*.

The Institution of Civil Engineers

AT a meeting of the Institution of Civil Engineers held on January 26, 1836, Bryan Donkin being in the chair, Mr. C. Bourns read a paper giving a historical account of legislative measures for the jurisdiction of the Port of London, and the regulation of its commerce, from the earliest period, and suggested other enactments for the better regulation of steam vessels in the pool. After the reading of the paper some conversation took place on the effects produced by the new London Bridge. It was stated

that the current of the river was much increased, particularly in the middle of the stream, and that a great alteration had taken place in the tide, which ran out much lower, while there was a greater deposition of mud on the shores. It was agreed that correct observation of the height of the tides, above and below the bridge, would be desirable, and some of the members promised to present tables of them constructed with considerable attention.

The Tides at Liverpool

KEPLER, Galileo, Newton, Daniel Bernoulli, Euler, Maclaurin and Laplace had all contributed to the theory of the tides, a subject which in the first half of the nineteenth century engaged the attention of Whewell, J. W. Lubbock and Airy. On January 28, 1836, Lubbock read a paper to the Royal Society entitled "Discussion of Tide Observations made at Liverpool". A report of this paper said: "The chief purpose which the author has in view in presenting the tables accompanying this paper, which are a continuation of those published in the *Philosophical Transactions* for 1835, and are founded on the observations instituted by Mr. Hutchinson at Liverpool, is to exhibit the diurnal inequality in the height of high water, which is scarcely sensible in the river Thames, but which at Liverpool amounts to more than a foot. The diurnal inequality in the interval appears to be insensible. The author has further ascertained that Bernoulli's formulæ expressing the height of the tide, deduced from the theory of the tides, present a very remarkable accordance with observation."

Societies and Academies

DUBLIN

Royal Dublin Society, December 17, 1935. H. H. DIXON: Sap movement in the bast. M. J. GORMAN and THOMAS TURPIN: An ineffective strain of nodule organism on red clover. This strain was isolated locally and is one of those which produces numerous small nodules distributed over the finer roots. In culture the ineffective strain did not grow in the sugar broths used. An effective strain studied concurrently grew well on the sugar media and produced, as is usual, a slight amount of acid. Other differences between the strains were noted. D. A. WEBB: The nitro-chromic reaction and its application to the estimation of small quantities of alcohol. By a modification of Agulhon's reagent (potassium dichromate in nitric acid) the strength of alcoholic solutions of the order of 100 mgm. per litre can be estimated to within two per cent, and more approximate estimations made down to 2.5 mgm. per litre. The method may be applied to blood serum, urine, milk, coloured fluids and expired air.

PARIS

Academy of Sciences, December 23 (*C.R.*, 201, 1301-1444). The president announced the death of Victor Grignard. MARCEL DELÉPINE and ALAIN HOREAU: The hydrogenation of some carbonyl compounds by nickel and platinised nickel. In the presence of small quantities of alkali, the velocity of hydrogenation

with nickel as catalyst is greatly increased. Details of the reduction of various ketones of different types are given. HENRI DEVAUX: The centrifugal transformation of a thin film of copper sulphide under the influence of metallic copper: the arrest of this transformation by a separation of one Angström. NICOLAS BOURBAKI: A theorem of Carathéodory and measurement in topological spaces. MAURICE DE NEVE: The surfaces of Tzitzéica-Wilczynski. PAUL DELENS: Certain deformations of surfaces. MARCEL BRELOT: The integration of $\Delta u(M) = \varphi(M)$. L. B. ROBINSON: An equation with mixed differences. ANDRÉ MERCIER: Clifford numbers. HENRI ROURE: The average movement of Pluto deduced from observations. JEAN DUFAY: The continuous spectrum of the night sky and the diffusion of light in space. WANG SHIH KY: The diffusion of light in the Milky Way. HENRI BÉNARD: Is the superficial solar photosphere a layer of cellular vortices? From a discussion of previous work on this subject and a re-examination of the Janssen photographs, it is concluded that the extreme photospherical layer, the only one in which convection currents can exist, is constituted by a layer of semi-regular polygonal cellular vortices. ANDRÉ FORTIER: A new arrangement for measuring the viscosity of gases. MARCEL PAUTHENTER and MME. MARGUERITE MOREAU-HANOT: An ionic generator for high potentials. MAURICE LAMBREY and JEAN CORBIÈRE: Some quantitative data on the absorption spectrum of nitrogen peroxide. THADÉE PECZALSKI and NICOLAS SZULC: Study of the concentrations of sodium vapours in the electric arc. LÉON GRILLET and MICHEL DUFFIEUX: The spectrum of first discharge through nitrogen peroxide. JEAN LECOMTE: The infra-red absorption spectra of halogen derivatives of hydrocarbons with nucleus. Summary of the results obtained from the study of the infra-red spectra of about thirty halogen substituted aromatic compounds. RAYMOND RICARD: Observations on the second spark spectrum of mercury. RENÉ de MALLEMANN and FRANCOIS SUHNER: The superficial optical properties of Iceland spar. JEAN ROIG: A photographic method for determining the distribution of light intensity in interference rings. The method described eliminates error due to the slit not being uniformly illuminated and also that due to variable sensibility of the photographic plate. TIEN KIU: The study, between 4000 Å. and 2400 Å., of the contrast of plates treated with solutions of sodium salicylate. Immersion of the plates in solutions of sodium salicylate not only increases the sensibility of the plates in the ultra-violet, but also stabilises and considerably increases the factor of contrast, an important advantage in photographic photometry. MAURICE LAMBREY and JEAN CORBIÈRE: A deviation from the Schwarzschild law observed with certain plates in the ultra-violet. MAURICE CURIE: Heterogeneities in crystals and phosphorescence. ANATOLE ROGOZINSKI: The role of the slit in the distribution of the intensities of the lines of a powder diagram. HORIA HULUBEI: New data on the *K* spectra of molybdenum and rhodium. MME. YVETTE CAUCHOIS: New data on the *K* spectrum of copper. E. LOPOUKHIN: Some properties of the radioactive series. LOUIS CARTAN: The agreement of the nuclear energy balances with the experimental masses of the light elements. RENÉ WURMSER and MME. NÉLIECIA MAYER: The oxidation-reduction potential of reductone. MME. PAULETTE BERTHIER: The filtration of some mineral powders in suspension in water and in various aqueous solu-

tions. PAUL MEUNIER: An electrophotometer with boundary layer cells intended for practical opacimetry. ANDRÉ KLING and MAURICE ROUILLY: A rapid method for the detection of toxic gases used in war. The air is aspirated through water containing bromothymol blue. The hydrolysis of the halogen compounds usually present produces a lowering of *pH* and this is made evident by the indicator. It has been shown that if there is no change of colour after passing 8–10 litres of the air, the toxic gas, if present, is in too small quantity to have injurious effects. MME. GENEVIÈVE GUÉRON, JULES GUÉRON and MARCEL PRETTRE: The induced oxidation of potassium iodide by ozone. MAURICE DODÉ: The structure of nitrogen peroxide deduced from its action on potassium iodide. HENRI MOURREU and GEORGES WETROFF: Phosphorus pernitride, P_4N_6 . This nitride is obtained by heating in a vacuum at 550° C. the products resulting from the action of liquid ammonia on phosphorus trichloride. This nitride is spontaneously inflammable in air, differing from the compound P_3N_5 . JEAN AMIEL: Some organic cupritetrachlorides and cupritetrabromides formed with secondary and tertiary amines and with alkaloids.

(To be continued.)

BRUSSELS

Royal Academy of Sciences (*Bull. Classe Sci.*, 21, No. 10, Oct. 19). L. GODEAUX: Canonical curves (2): Cubic surfaces possessing six Eckardt points. J. E. VERSCHAFFELT: Thermomechanics of the electric conductor (1). The theory of the Peltier and Thomson effects. (2) The relation between the coefficients of the Ettingshausen and Nernst effects. Further thermodynamical treatment of the problem in relation to the work of Bohr, Sommerfeld, Odone and Dupont. E. ASSELBERGHS and W. HENKE: The Siegenian and Gedinnian of Hunsrück and Taunus. The correspondence of the Hunsrück slates and the Taunus quartzite to the Siegenian of the Ardennes is exhibited in a comprehensive table. F. BACKES: Nets which are reproduced after four Laplacian transformations. O. ROZET: Deformation of the paraboloid. L. LONG: New definitions of Weingarten surfaces (*W* surfaces) (1). E. BODSON and F. E. NISOLI: The behaviour of certain diatomic molecules in stellar atmospheres. Application of Russell's theory to the oxides and hydrides of calcium, magnesium, boron and aluminium to determine their abundance as a function of the temperature, the necessary physical data being calculated approximately from the formulæ of Birge and Sponer and of Morse. J. FAUTREZ: Determinations of the dispersion of pluridisperse solutions. Critique of the results obtained with Nistler's apparatus. This apparatus gives accurate results for the radius of the dispersed particles only in the case of unidisperse solutions. The varying results obtained with pluridisperse solutions (solutions containing particles of various radii) give no immediate indication of the actual radii of the particles present. P. BAUDOUX: Skin effect in cylindrical conductors. Generalisation of Kelvin's calculations.

LENINGRAD

Academy of Sciences (*C.R.*, 3, No. 8, 1935). S. KOHN-VOSSEN: The existence of the shortest route. E. J. REMES: On some fundamental theorems

concerning the best approximation of functions of several independent variables. V. G. NEVZGLIADOV: A generalisation of Dirac's method for the calculation of the energy level of a system by permutations as operators, in the case of several original levels. V. A. NEMILOV and A. A. RUDNICKIJ: Physico-chemical investigation of gold-manganese alloys. P. P. BUDNIKOV: Heat of the reaction between kaolin burnt at different temperatures and $\text{Ca}(\text{OH})_2$. O. K. ELPIDINA: On toxins of wilting. Wilting of potato caused by a *Fusarium* is due to a toxin. The toxic principle of *Fusarium* extracts is ammonio-some in salivary glands of *Drosophila*. V. A. KOVDA: The types of alkali soils (solontzi). Five types are distinguished and characterised. A. N. FORMOZOV and A. G. VORONOV: Principal features of the activity of rodents on pastures and meadow land. Quantitative estimations of damage to vegetation; effects of burrowing on the soil. I. V. KOZHANTCHIKOV: Insect metabolism at temperatures below zero. J. M. RALL: New data on the distribution of *Diplomesodon pulchellum*, Licht. (Mammalia, Insectivora) between the Rivers Volga and Ural. A. M. DJAKONOV: New Ophiurans of the genus *Amphiodia* from the Sea of Japan (2). Two species are described. A. BORISSIAK: New materials to the phylogeny of Dicerorhina.

SYDNEY

Royal Society of New South Wales, November 6. GERMAINE A. JOPLIN: Endogenous contact-zone of the magnesian limestones at Ben Bullen, New South Wales. The assemblages produced by the reaction of a quartz-mica-diorite magma and magnesian limestone are described in detail. These are compared with rocks formed by the assimilation of non-magnesian limestones, and though the assemblages are essentially different, certain similarities are noted and parallel degrees of contamination are recognised. It is also shown that certain rocks have been contaminated first by the assimilation of solid limestone and then by solutions carrying lime and magnesia derived from the limestones themselves. D. P. MELLOR and F. M. QUODLING: Birefringence of potassium chloropalladite and potassium chloroplatinite. Crystals of both compounds are strongly birefringent and optically negative. K_2PdCl_4 , $\omega_D = 1.710$, $\epsilon_D = 1.523$; K_2PtCl_4 , $\omega_D = 1.683$, $\epsilon_D = 1.553$. The strong birefringence is attributed to the parallel planar $[\text{PdCl}_4]^{--}$ and $[\text{PtCl}_4]^{--}$ ions which occur in the structures of these compounds. M. B. WELCH: Effect of chemical solutions on some woods. A number of commercial Australian woods were immersed in different concentrations of several acids, alkalis and inorganic salts to determine their ability to withstand chemical action. In general, the coniferous woods proved to be most resistant, whilst many of the hardwood and brush timbers are very inferior.

WASHINGTON, D.C.

National Academy of Sciences (*Proc.*, 21, 587-631, Nov. 15). HARLOW SHAPLEY: A study of 7,900 external galaxies. The results are described of a survey of 174 square degrees of the southern galactic hemisphere (galactic long. 215° to 245° , lat. -38° to -59°). Several fairly distinct groupings of galaxies are found. There is an increase in the number

of galaxies for photographic magnitudes between 15.5 and 17.0, due to a metagalactic cloud at a distance of the order of 22 megaparsecs; the five observed clusters are at much the same distance. HARLOW SHAPLEY and ARTHUR R. SAYER: The angular diameters of globular clusters. Seventy of these diameters, which have been used in estimating relative distances and average linear dimensions, have been re-determined with a Moll densitometer. The new measurements are greater than previous measurements, the mean ratio of new to old being 3.7 ± 0.14 . J. L. CARTLEDGE, M. J. MURRAY and A. F. BLAKESLEE: Increased mutation rate from aged *Datura* pollen. Anthers picked just before they opened were stored for periods of two to twenty days at a temperature of 29° - 31°C .; thus the pollen was kept under somewhat drier conditions than normal, although the temperature was within the range of that to which *Datura* flowers are normally subjected. The plants from such aged pollen showed a high rate of pollen abortion mutation, and the mutations involved the whole plant. Relatively few plants were used and no special precautions were taken, but the results are so consistent that it is suggested that mutations in Nature may be dependent, to an unsuspected extent, on the conditions to which pollen is subjected before it functions in fertilisation. HARRY H. LAUGHLIN: (1) The probability-resultant. The probability-resultant is defined as the combined effect, on the same measured quality, of several mutually independent constituent factors, and is measured in terms of a probability-distribution of the quality among the subject population. The principles underlying the computation of this quantity are demonstrated. (2) How to use the specific formula of heredity. The use of this formula leads to the construction of a Manerkon, a formula which, it is claimed, gives the soundest mathematical judgment at present possible for a particular probability-value. For each Manerkon, a thousand or more cases of a specific relationship covering the entire range of both prediction-basis and thing-predicted are required. I. S. SOKOLNIKOFF and E. S. SOKOLNIKOFF: The problem of Dirichlet for an ellipsoid. Determination of the electric field produced by a distribution of charge in equilibrium on a conducting ellipsoid of revolution lying midway between two parallel conducting planes at zero potential. MARSTON MORSE: Three theorems on the envelope of extremals. G. A. MILLER: Groups of order 2^m determined by subgroups generated by their squares. B. H. WILLIER, T. F. GALLAGHER and F. C. KOCH: Sex-modification in the chick embryo resulting from injections of male and female hormones. A single injection of 0.1 c.c. of sex-hormone solution (aqueous or in ethylene glycol) of varying potency was made into the albumen of eggs of 24 hours incubation. The hormones used were theelin, theelol, bull testis extracts and extracts of male human urine. With theelin and theelol, the left testis of a zygotically determined male develops ovarian characters and the oviducts persist; females are little affected. Bull testis extract produces small effect, but male human urine causes appearance of ovarian tissue on left testis. It is concluded that the left testis, but not the right, bears a germinal epithelium from the seventh to the tenth day, and is thus potentially bisexual. The hormones thus activates a tissue already laid down in normal development. The degree of sex-reversal is roughly proportional to the quantity of female hormone injected.