

Science News a Century Ago

Auroral Display seen at Oxford

SOON after 8 p.m. on November 18, 1835, a vivid auroral display was witnessed near Oxford by the Rev. J. Guillemard, of St. John's College. A rapid succession of rays of light began to shoot up first in the east, and after vanishing there, appeared in nearly the same form in the west. When the display was over, a part of the sky filled with a faint silvery light diffused over a bank of clouds. (*Proceedings of the Ashmolean Society*, 9.)

The Duke of Sussex and the Royal Society

IN 1830, the Duke of Sussex accepted the presidency of the Royal Society in succession to Davies Gilbert; he held the office for eight years. On November 20, 1835, after the first autumn meeting of the Society, a correspondent, "F. R. S.," wrote to the editor of *The Times*: "On the recommencement of the annual session of the Royal Society, last night, it appeared that Mr. Lubbock had resigned his office of treasurer, for no other reason than the total want of co-operation in the objects and business of the society on the part of the Royal President, who on the alleged grounds of ill-health had not attended a single meeting of council. . . ."

"Now, however, on the eve of the annual election, on St. Andrew's day, and according to the approved precedent of the last three or four years, a pathetic letter will be read to the general meeting, apologizing for past neglect, tendering a reluctant resignation, and in the hoped event of its non-acceptance, making large professions of improved conduct in the future.

"The shortness of the notice, and the utter unpreparedness of the society on the present occasion, preclude any other alternative than a sullen and indignant re-election and thus another blank session will accelerate the downward course of the society in scientific usefulness and consequent public estimation.

"It may not be too late in the course of the present session to avert so deplorable a result by some influential members taking measures for vindicating the paramount ascendancy of science over rank, by making such a choice on a future election as shall atone for the original sin of not having placed a Herschell in the chair once occupied by a Newton and a Davy."

Trial of a Cornish Pumping Engine

A CENTURY ago, the pumping engines employed in the mines of Cornwall were among the finest of their kind. Quoting from the *Falmouth Packet*, the *Mechanics' Magazine* for November 21, 1835, said: "A steam-engine, lately erected on a copper mine in this neighbourhood [St. Austell], has been reported to have raised at an average rate of performance, upwards of ninety millions of pounds weight one foot high, with a bushel of coal. The correctness of this statement was questioned by rival engineers and others, and so seriously, that a challenge for a public trial was given and accepted. It took place last week, in presence of a number of most experienced mine agents from different parts of the country, and the result of twenty-four hours' trial was the unprecedented performance of lifting 125½ millions of pounds weight one foot high, with every bushel of coal consumed! The engine is of large

size, the cylinder being 80 inches diameter. The principle is that of Boulton and Watt but improved in economising the heat when generated, so as in the greatest possible degree to apply it to the end of producing steam, and maintaining it until its work is performed. The engineer's name is West."

'Luminous' Appearance of *Oenothera*

DR. BUCKLAND discoursed in the Old Ashmolean Museum at Oxford on November 22, 1835, on the 'luminous' appearance of the flowers of *Oenothera*. It continued uninterruptedly for a considerable length of time; it did not appear to resemble any electric effect; and the opinion which seemed most probable was, that the plant has a power of absorbing light, and giving it out in peculiar circumstances. (*Proceedings of the Ashmolean Society*, 9.)

Societies and Academies

LONDON

Royal Society, November 7. F. W. G. WHITE and L. W. BROWN: Some measurements of the reflection coefficient of the ionosphere for wireless waves. The Breit and Tuve technique for ionospheric investigation is employed, the sender-receiver system being calibrated so that the reflection coefficient may be determined for a wave of any frequency within the range 2.80–6.50 Mc/s, from the relative amplitudes of the direct and the singly reflected atmospheric waves. Examples of measurements, made at noon during the period November 1934–May 1935, show that the total absorption suffered by the waves is very much dependent upon the critical phenomena at the transition of reflection from one region to another. The influence of the absorbing regions is estimated from the results. Estimates, based upon Appleton's theoretical formula, of the collisional frequency of the electrons with gas molecules in the F_2 ionised region of the upper atmosphere, are made. The collisional frequency is of the order 5×10^3 per second at a height of approximately 250 km. above the surface of the earth. J. P. GOTT: The electric charge collected by water-drops falling through a cloud of electrically charged particles in a vertical electric field. Measurements were made of the charge collected by a large water drop falling through a jet of the cloud containing equal numbers of positively and negatively charged cloud particles in a vertical electric field maintained between two horizontal field plates. When the upper plate was positive, the drop collected a negative charge, and when the upper plate was negative the drop collected a positive charge. This is in agreement with a theory proposed by Wilson in connexion with the mechanism of thunder-clouds. The quantitative agreement is as close as could be expected from the experimental arrangement. The experiments also afforded a test of the mechanism suggested by Elster and Geitel. If any charge was collected by the operation of this mechanism, it was too small to be observed.

PARIS

Academy of Sciences, October 14 (*C.R.*, 201, 629–692). CHARLES ACHARD, AUGUSTIN BOUTARIC and JEAN BOUCHARD: The comparative action of ordinary alkaloids and genalkaloids on the fluorescence

of uranine solutions. The genalkaloids are alkaloids in which the amino group has been converted into an amino-oxide, and, while possessing the same therapeutic actions as the original alkaloids, are less toxic. The alkaloids examined have an inhibiting effect on the fluorescence of uranine solutions, but the genalkaloids do not possess this property. The authors regard the marked attenuation of the toxic effects of the genalkaloids as due to the disappearance of their antoxygen properties. PIERRE DE VANSSAY : General bathymetric map of the oceans. CLAUDE CHEVALLEY : The theory of bodies of classes. JEAN BRAITZEFF : The generalisation of preceding results relating to Dirichlet series. F. MARTY : The role of the idea of the hypergroup in the study of non-Abelian groups. NICOLAS LUSIN : A new method in the theory of descriptive functions. ANDRÉ CHARRUEAU : Remark relating to a thin circular rod, articulated at its two extremities and submitted to a normal and uniform pressure. BERNARD LAFFAILLE and FLORIN VASILESCO : The *flambage* of thin cylindrical plates. S. SLOSINE : The question of the plane movement of heavy fluids. WILLEM UYTERHOEVEN and CORNELIS VERBURG : The effects of the periodic variation of the concentration of the neutral atoms of the vapour in a sodium lamp with alternating current. An oscillogram is reproduced showing the variation of the current, electromotive force and intensity of the yellow light. A theoretical explanation is given accounting for the observed facts. RAYMOND ZOUCKERMANN : The explosive potential of hydrogen with high-frequency current. A discussion of the effects of impurities in the hydrogen, especially mercury vapour, on the explosive potential and appearance of the discharge. FÉLIX TROMBE : The paramagnetism of metallic gadolinium above its Curie point. The ferromagnetic Curie point of gadolinium is 16° C., the paramagnetic Curie point is 29.5° C. The paramagnetic moment of the metal is 39.28 Weiss magnetons, practically identical with the moment calculated from the oxide by Cabrera, 39.25. LÉON BLOCH, EUGÈNE BLOCH and CHOONG SHIN-PIAW : The absorption spectrum of selenium dioxide. A description of a new series of absorption bands in the ultra-violet. V. KUNZL : A new method of localisation in spectrography with X-rays. MME. THÉRÈSE GRIVET-MEYER : The absence of notable gamma emission in the collision of rapid neutrons with protons. F. BOURLON and MME. O. HUN : The cryoscopic determination of the total hydration of the ions of sodium nitrate. M. BOBTELSKY and MME. R. COHEN : The conditions of formation of trivalent manganese chloride in hydrochloric acid solutions and on its decomposition in the presence of complex catalysts. RENÉ DALMON, JEAN CHÉDIN and LOUIS BRISSAUD : The nitration of cellulose by nitric anhydride. Nitrogen pentoxide in organic solution (carbon tetrachloride) is capable of nitrating cellulose to the maximum (14.1 per cent nitrogen) with a very good yield. ADOLFO T. WILLIAMS : The absorption spectra of metallic and organic colloidal solutions and the absorption of metallic films. For organic substances, the structure of the absorption spectra in colloidal solution is much the same as in true solution. EDMOND BAUER and MICHEL MAGAT : The Raman spectrum of liquid heavy water. The frequency 170-176 is nearly the same in H₂O and D₂O, but the bands 350-500 cm.⁻¹ and 500-700 cm.⁻¹ are clearly displaced towards the lower frequencies. JACQUES LEFOL : The hydrates of monocalcium silicate. RAYMOND ROHMER : The system, water-sul-

phuric acid-nickel sulphate. ROBERT VANDONI : The disengagement of nitrogen monoxide during the decomposition of the nitrocelluloses. The gases arising from various modes of decomposition of nitro-cellulose contain nitrous oxide in important proportions, usually higher than the proportion of free nitrogen. JULES JARROUSSE : The oxidation of diphenylpyruvic acid. JEAN GRARD : Cellulose triacetate. Details of method of preparation. ALEXANDRE DAUVILLIER : The determination of atmospheric ozone. A comparison of the spectrographic and chemical methods. The results by the two methods, while not identical, agree fairly well, considering that the collection of one sample is local and that the concentration of ozone near the soil may vary rapidly. PIERRE CAPPE DE BAILLON : A new strain of *Baculum artemis*. GUILLAUME VALETTE : Study of the fixation of quinine on *Paramecium* by means of the microscopical examination of the fluorescence. Cells of *Paramecium caudatum* show a maximum quinine absorption in the neighbourhood of the digestive vacuoles. EMILE CESARI, JEAN BAUCHE and PAUL BOQUET : A strain of *Vipera aspis* with white venom. GILBERT RANSON : The determinism of the seasonal fixation of *Navicula fusiformis*. Its experimental culture in ostreaculture. GASTON RAMON : The favourable effect of certain lipid substances on the immunising action of antigens. MAURICE DOLADILHE : Contribution to the study of the globulins of the blood in relation with its alexic power. ALEXANDRE BESREDKA, ISRAËL MAGAT, PIERRE LAVAL and PIERRE BESNARD : Intracutaneous vaccination against Pearce-Brown epithelioma.

CAPE TOWN

Royal Society of South Africa, September 18. I. DONEN : Studies in deciduous fruit (3). The chemical changes in Kelsey and Gaviota plums during growth. The life of the Kelsey and Gaviota plum on the tree may be divided into three stages. During the first stage the growth of the stone predominates over that of the flesh. The rate of growth, and of increase of all constituents of the flesh, except alcohol-insoluble residue, is comparatively slow. The concentration of total solids, alcohol-insoluble residue and nitrogen falls rapidly during this period, but acid concentration remains high. Starch is present in the plum at the beginning of this stage only. The second stage of growth commences when the stone is fully developed. It is characterised by a rapid rise in the rate of growth of the plum and in the rate of increase of total solids, sucrose, nitrogen and acid per fruit. These rates of increase finally reach a maximum value at the end of this stage. The third stage of growth is a period of maturation. The rate of accumulation of constituents per plum falls rapidly. Sucrose and nitrogen accumulate in the flesh so long as the plum remains on the tree. D. G. HAYLETT : Studies on dropping-berry in Waltham Cross grapes (*Vitis vinifera*). J. L. B. SMITH : Some interesting new fishes from South Africa. Two noteworthy additions, one of a genus, the other of a family, new to the South African marine ichthyofauna list are described and figured. *Scymnus brevipinnis*, n.sp., is a shark from deep water off Algoa Bay. Species of this genus have hitherto been recorded only from the North Atlantic and from Japan. *Taeniolabrus marleyi*, n.sp., recently obtained at Durban, is a member of the little-known family Trichonotidæ, hitherto recorded only from the Indo-Australian region.