

Science News a Century Ago

The Ashmolean Society

IN Oxford, on February 6, 1837, at a meeting of the Ashmolean Society, "Mr. Holme of C.C.C. read a paper on the formation and habits of the British aquatic coleoptera, which are included in the sections *Hydradephaga* and *Phillydrida* of Macleay, and exhibited specimens which showed the voracity of some specimens of the genus *Dyticus*, and concluded by drawing attention of the members to the question whether the mole cricket is able to swim, which Mr. Curtis thinks probable, from the resistance which the thorax and elytra offer to water. Mr. Duncan read a paper, in which he gave an outline of the progressive development of animals from their embryo to their perfect state especially of the frog—of one species of which, the *Rana paradoxa*, he exhibited a specimen in the tadpole state, nearly transformed." (*Athenæum*.)

Of the individuals mentioned in this note, one was presumably Alexander Macleay (1767–1848), F.R.S., the entomologist and colonial statesman, another Philip Bury Duncan (1772–1863), keeper of the Ashmolean Museum in 1826–55, and a third John Curtis (1791–1862), the author of "British Entomology" (1824–39).

Lieut. Wellsted's Exploration of Arabia

AT a meeting of the Linnean Society held on February 7, 1837, the chairman, A. B. Lambert, spoke of the researches of Lieut. Wellsted in Arabia Felix, and said that this traveller had added much to the knowledge of the natural history of the district. He had ascertained the tree producing myrrh, and also the dragon-tree. He had surveyed the northern coast of the Red Sea, where he had many opportunities of confirming the descriptions of Bruce, whom he considered the most accurate traveller in those regions who had ever returned to Europe. Mr. Lambert also exhibited some specimens of manna brought by Lieut. Wellsted from Mount Sinai, considered to be the produce of a tamarisk, which was supposed to be identical with that on which the children of Israel fed in the wilderness.

Aylmer Bourke Lambert (1761–1842), well known for his botanical writings, was an original member of the Linnean Society, while James Raymond Wellsted (1805–42) was an officer in the service of the East India Company.

The Properties of Electricity

ON February 7, 1837, F. W. Mullins, M.P., sent a communication to the *Philosophical Magazine* (10, 281) entitled "On the Development and Action of Electricity in Voltaic Combinations". In his concluding paragraph he said: "I believe light, as well as heat, to be a property of electricity, else, how account for its existence in its *purest form in vacuo*, where electricity is the only agent? But I shall refer to these subjects again and at greater length when I have more leisure than I have at present, merely adding that I do not believe my views to be irreconcilable with Mossotti's theory, and that I am quite satisfied that though chemical action may be supposed to develop electricity, still electricity is the prime mover; electrical and material attractions and repulsions, when brought into play by certain arrangements of elements, inducing and creating all chemical phenomena. . . ."

Heat Transfer in Locomotive Boilers

AT a time when the caloric theory of heat still held sway, Jacob Perkins, on February 7, 1837, read a paper to the Institution of Civil Engineers entitled "On Locomotive Engines and the means of Supplying them with Steam". The practical defects of the existing system of locomotives arising from the furring up or burning out of the tubes of the boiler, he considered, could be overcome through the medium of steam surcharged with caloric. If a tube hermetically sealed be filled to a sixtieth of its contents with water, the steam arising from the water will not acquire sufficient elastic force to burst the tube; but will have a remarkable property of transferring heat. The steam in the vertical tube being saturated with heat, becomes a medium through which the heat ascends by its own levity, so that the tube would become red hot were it not immersed in water.

Perkins, who was born in America in 1766 and died in London in 1849, was a pioneer in the use of high-pressure steam, and had before 1837 constructed boilers and engines working at pressures of 800–1,600 lb. per sq. in.

Science News in the *Athenæum*

IN its issue of February 11, 1837, the *Athenæum* gave the following notes of scientific interest.

French Academy of Sciences. M. Becquerel is elected vice-president of the French Academy of Sciences for 1837, by a large majority of votes; and M. Magendie, the last vice-president, passes on to the presidency. The Minister of the Interior has commanded a bust of the late celebrated botanist, M. de Jussieu, to be executed for the Academy, by the skilful hands of M. David.

Acoustics. MM. Cagniard Latour and Demonferrand have invented an instrument which they propose naming the Acoustic Pyrometer, and which will emit sounds according to the temperature in which it may be placed.

M. Melloni. The able and celebrated philosopher, M. Melloni, who was exiled from Italy, has been recalled by the Duchess of Parma: M. Arago appealed to Prince Metternich on his behalf, at the same time laying before His Highness an analysis of his merits, and his beautiful discoveries. The Prince submitted this statement to the Duchess and interceded, and consequently M. Melloni is now at liberty to return to his native country.

Societies and Academies

London

Royal Society, January 28.

R. D. PRESTON and W. T. ASTBURY: The structure of the wall of *Valonia ventricosa*. The cell wall of *Valonia ventricosa* has been studied in detail by means of X-ray diffraction photographs and the polarizing microscope. It consists of layers in which the cellulose chains in any one layer are inclined to those in the preceding and subsequent layers at an angle which is on the average rather less than a right angle. The chains of one set of layers form a system of meridians to the wall, while those of the other set build a system of spirals closing down on the two 'poles' defined by the meridians. The development of the rhizoids is associated with regions of the wall adjacent to the poles of the spiral. The plane of spacing, 6.1 Å., of the cellulose crystallites is, roughly

speaking, confined within an angle of about 60° to the wall surface. The path of the cellulose spiral is that of a logarithmic (equiangular) spiral described on the surface of a sphere or prolate spheroid.

W. D. WRIGHT: The foveal light adaptation process. A further series of observations on adaptation phenomena have been recorded by the binocular matching method, in which effects induced by light-adapting the right eye are measured relative to the constantly dark-adapted left eye. For white adaptations, the sensitivity of the red and green responses is inversely proportional to the adaptation intensity, and the recovery curves for these responses are linear; for the blue, the response is reduced to a less extent than for the red and green, and the recovery curves are non-linear. They may indicate a monomolecular or bimolecular reaction, whereas the red and green processes appear to recover at a constant rate. With red adaptations, the green recovery is linear and the red non-linear, but while the red sensitivity is inversely proportional to the adaptation intensity, the green is reduced to a relatively less extent as the adaptation is increased. With green adaptations, the reverse occurs. The application of the method of observation for clinical purposes is suggested and the relation of the results to illuminating engineering problems emphasized; in particular, an 'adaptation factor' should be measured in heterochromatic photometry, if the true visual efficiency of light sources is to be found.

W. S. STILES and B. H. CRAWFORD: The effect of glaring light source on extrafoveal vision. The smallest difference of brightness between a test object and its background such that the presence of the object can just be detected (the liminal brightness increment) is in general raised if there is an unshielded light source in the field of view. If the light source produces an illumination E ft. c. at the eye and is located at a point θ° from the test object, then for foveal vision of the test object the increase in the liminal brightness has been found to be equal to that which would be produced in the absence of the light source by raising the background brightness from its original value B to the value β , where $\beta = B + kE/\theta^n$ and k and n are constants having values approximating to 10 and 2 respectively. Tests were made to see if a similar formula applies when the test object is viewed by extrafoveal vision. Four extrafoveal points situated at approximately 5° , 10° , 25° , and 50° from the fovea in the temporal, lower, upper, and nasal meridians respectively, were studied for two subjects. The formula was found to be true, in general, as an approximation, and for k and n the values 16 and 2 respectively were derived as representative for extrafoveal vision.

Dublin

Royal Irish Academy, December 14.

J. J. NOLAN and P. J. NOLAN: Atmospheric electric conductivity and the current from air to earth. Measurements were made at Glencree of the field and air-earth current by C. T. R. Wilson's method. Hence the conductivity at the earth's surface was determined. Simultaneous observations of the concentrations of positive and negative ions were made. The mean mobilities of the ions were determined. Values of the total conductivity calculated from the results found exceeded by only about ten per cent the values derived from the Wilson experiment.

Edinburgh

Royal Society, January 11.

F. FRASER DARLING: Observations on animal sociality. Animal sociality is difficult to define because of widely differing foundations and the existence of different types within one species. Red deer show closely-knit female groups, loose stag companies and, at the breeding season, harem formations superimposed on the hind groups. The matriarchal system emerging is an evolutionary advance on small patriarchies in grazing herds. Flocking of birds is found outside or within the breeding season. Flocks on a traditional family basis are rare. Observations on herring gull colonies showed that egg-laying was earlier and time taken less in the larger colonies. This was reflected ecologically in the higher survival rates in larger groups.

H. S. RUSE: The geometry of Dirac's equations and their expression in tensor form. Associated with Dirac's equations for general relativity, as obtained from the theory of two-component spinors, are four null vectors which may be regarded as defining the vertices of a skew quadrilateral upon a quadric surface in a three-dimensional projective space. A study of this simple geometrical configuration throws light upon the relationships of the various tensors associated with the Dirac theory, the whole of which can be thrown into a tensor form not explicitly involving spinors.

Moscow

Academy of Sciences (*C.R.*, 4, No. 2; 1936).

J. DUBNOV and N. EFIMOV: Pairs and bundles of grids.

M. M. GUREVIČ: Change in the brilliancy of a bundle of rays on refraction.

N. IVANOVA: Route of the particles comprising the showers of ultra-penetrating rays.

W. A. OSIPOV-KING: A new mode of construction of polarization prisms.

L. M. SCHAMOVSKIJ: The elementary photographic process in ion crystals.

F. M. ŠEMJAKIN: The question of periodic reactions.

A. POLESICKIJ: The lower limit of the formation of mixed crystals of a new type.

W. A. DEVJATNIN: A chemical method for the determination of vitamin B₁.

O. E. ZVIAGINCEV and E. L. PISARŽEVSKAJA: Action of sulphide minerals on solutions of gold and platinum salts.

A. I. ZUITIN and V. V. IVANOVA: Some data on the structure of the testes in hybrids of yak and cattle.

M. CH. ČAJLACHJAN: New facts in support of the hormonal theory of plant development.

A. L. BEHNING: Caspian Peracaridæ in the Manytch basin.

E. M. KROCHIN and F. V. KROGIUS: The lake form of *Oncorhynchus nerka* from Lake Kronotsk, Kamchatka.

G. M. RALL: Character of the propagation of certain rodents as a factor of their numbers in Nature.

N. V. NASSONOV: (1) Influence of various factors on morphogenesis following homotopical subcutaneous insertions of cartilage in the axolotl. (2) Morphogenesis following heterotopic and heteroplastic insertions of cartilage under the skin of the axolotl.