Science News a Century Ago

Mitchell's Exploration of Eastern Australia

AMONG the many explorers of the interior of Australia was Major (afterwards Sir) Thomas Livingstone Mitchell (1792–1855), who in 1828 became Surveyor-General to New South Wales. In the third of his expeditions, he proved the junction of the River Murray with the Darling, and struck the Glenelg, which he followed to the sea. A report written from a camp "West of Harvey's Range", dated September 4, 1835, to the Colonial Secretary, was read at a meeting of the Royal Geographical Society on March 28, 1836. This described a journey of some 300 miles down the left bank of the Darling. His party met with considerable difficulty owing to the opposition of the natives, and in one passage he wrote: "The conduct of these tribes was very extraordinary. To conciliate them was quite hopeless, but not from any apprehensions on their part. On the contrary, the more we endeavoured to supply their real wants, and show good will towards them, the more they seemed to covet what was utterly useless to them, and the more they plotted our destruction. Some of their ceremonies were different from those of any other aboriginal tribes near the Colony, such as waving the green bough, first setting it on fire, with furious gestures at us; throwing dust at us *with their toes*, and spitting at our men. They behaved thus just after they had received presents, and while we endeavoured by sitting in the dust, to conform to their manners and customs." During the four winter months just past, said Mitchell, "no clouds gathered to any particular point of the horizon, no rain has fallen, neither has there been any dew, and the winds from the west and north west, hot and parching, seemed to blow over a region in which no humidity remained".

Death of the Chimpanzee at the Zoo

ON March 31, 1836, *The Times* said: "On Saturday morning last the Zoological Gardens lost their chief attraction for the season by the death of the chimpanzee. For four hours preceding the death of this singular link in the animal kingdom, he would not be separated from the keeper's wife, for whom he had formed an attachment as nearly approaching to the filial as expression can define. A gentleman who was present until within a very short period of the creature's death describes all the changes that took place, and the exhibitions of apprehension and lamentation made by him as but scarcely differing from the sufferings and sorrowings of a human being."

The *Beagle* at the Keeling or Cocos Islands

ON April 1, 1836, the *Beagle* arrived at the Keeling or Cocos Islands, where she remained until April 12. With Captain FitzRoy, Darwin visited several of the islands, and his "Journal" contains a sketch of the natural history of them. On April 6 he described a visit to an island at the head of the lagoon. "When we arrived at the head of the lagoon, we crossed a narrow islet, and found a great surf breaking on the windward coast. . . . The ocean throwing its waters over the broad reef appears an invincible, all-powerful enemy; yet we see it resisted, and even conquered, by means which at first seem most weak and inefficient. . . . It is impossible to behold these waves without feeling a conviction that an island, though built of the hardest rock, let it be porphyry, granite, or quartz, would ultimately yield and be demolished by such an irresistible power. Yet these low, insignificant coral-islets stand and are victorious: for here another power, as an antagonist, takes part in the contest. The organic forces separate the atoms of carbonate of lime, one by one, from the foaming breakers, and unite them into a symmetrical structure. Let the hurricane tear up its thousand huge fragments; yet what will that tell against the accumulated labour of myriads of architects at work night and day, month after month? Thus do we see the soft and gelatinous body of a polypus, through the agency of the vital laws, conquering the great mechanical power of the waves of an ocean which neither the art of man nor the inanimate works of nature could successfully resist."

The Cornwall Polytechnic Society

IN its notes "Our Library Table", the *Athenæum* of April 2, 1836, says: "Report of the Cornwall Polytechnic Society 1835.—The report is ably drawn up, and the accompanying papers very creditable. We are of opinion that some valuable hints might be gathered from this work, by the Directors of many local Societies."

Societies and Academies

LONDON

Royal Society, March 19. D. F. MARTYN and O. O. PULLEY: The temperatures and constituents of the upper atmosphere. Radio measurements of the heights and electron densities of the ionised regions indicate considerable cooling of the upper atmosphere during the night. The absolute temperatures between the E and F regions of the ionosphere are found, from consideration of the electron collision frequencies, to reach values of the order 1,000° K. in both summer and winter daytime. From the observed rate of cooling at night, considerable water vapour is present in the ionosphere, an average concentration being one part in 6,000 by volume. The high temperatures found are attributed mainly to ozone, in concentration of 1 part in 10^4. The ionisation densities in the E and F regions are correlated directly, and the height of the F region indirectly, with the barometric pressure at the ground. This correlation is attributed to the temperature changes in the ionosphere occasioned by changes in ozone concentration. The attachment of electrons to neutral particles is the main process by which free electrons are removed from the ionised regions. As regards temperatures below 100 km., a maximum is found at 60 km., and a minimum of 160° K., at 82 km. Noctilucent clouds are found to be formed of ice crystals. P. I. DEE and C. W. GILBERT: The disintegration of boron into three α-particles. The common mode of disintegration is into two particles which proceed at angles of 150° to 180° relatively to one another, the third particle receiving little energy. A theoretical picture of the process, involving the existence of an unstable $^8_4$Be nucleus, of very short life, explains the main features of the distribution of energy among the particles emitted in this process and also in the similar three-body disintegration of boron under deuteron bombardment. The value $8{\cdot}7 \pm 0{\cdot}2 \times 10^6$ e.v. was obtained for the total energy release in the first reaction.

EDINBURGH

Royal Society, March 2. KATHLEEN B. BLACKBURN: A reinvestigation of the alga *Botryococcus braunii*, Kützing. The alga was studied in search of an explanation of its preservation as boghead and in peats. The cellulose walls, green chloroplasts and starch production reveal it as a member of the Chlorophyceæ with affinity near Dictyosphaeriaceæ. The general matrix of the colony is gradually secreted through cup-like cutinous outer cell membranes, and is of a fatty nature. This is a mixture of fatty acids, fats, etc., which becomes gradually more insoluble and is thus preserved in fossil form. A thin outer sheath of pectic mucilage is secreted by the non-cutinised exterior part of the cells. B. N. TEMPERLEY: A critical study of the problem of boghead coals and of the organisms involved. A description is given of the morphology of the 'yellow bodies' which form the essential constituents of the boghead coals. The composition of parrot coals and oil shales is also discussed. Their structure is shown to agree in all significant features with that of the living oil-bearing alga *Botryococcus braunii*, Kützing, and there is similar polymorphism of the colonies, together with other apparent variations caused by varying states of preservation. The views of Edgeworth David (1888) and Bertrand and Renault (1892) as to the algal nature of these coals is thus confirmed. Zalessky (1914) first made the correlation with *Botryococcus*, but did not supply adequate details. Thiessen (1925) also described the alga which is now forming similar deposits (coorongite) in Australia, but failed to identify the organism as *Botryococcus*. J. ALLEN: Some experiments having particular reference to the flow of water along short capillary tubes connecting two reservoirs with free surfaces. The paper describes experiments made with capillary tubes of various ratios of outside to inside diameters between 1·59 and 4·31, and various ratios between 28·8(7) and 155·2. An empirical formula is given for tubes having sharp ends and for conditions within a wide range of Reynolds number, R, defined in the paper. This formula is of the type

$$\frac{2gh}{v^2} = \alpha + \beta \frac{l}{d} \cdot \frac{1}{R},$$

where α and β are functions of l/d. The losses of energy may be reduced somewhat by grinding the ends to a bell-mouthed shape.

PARIS

Academy of Sciences, February 17 (*C.R.*, 202, 525–600). ALFRED LACROIX: The mineralogical composition of the volcanic rocks of Easter Island. ERNEST ESCLANGON: Talking clocks and the diffusion of the time. An account of the results obtained by connecting the telephone system of Paris with an automatic apparatus giving the exact time. JEAN TILHO: Extract from a letter concerning the expedition to French Equatorial Africa. LUCIEN DANIEL: The appearance again of *Pirocydonia Danieli*. CHARLES CAMICHEL was elected a non-resident member, in succession to the late Charles Flahault. ARNAUD DENJOY: A formula of Gauss. GUSTAVE JUVET: A decomposition of d'Alembert's equation. PAUL LÉVY: Integrals with independent uncertain elements and stable laws with n variables. E. BATICLE: The problem of dice and its application to the theory of means. GEORGES TZITZÉICA: A deformation of higher order. SERGE FINIKOFF: The transformations of Calapso. AL. PANTAZI: Certain networks of Terracini. JULIUS WOLFF: The generalisation of a theorem of Carleman on a series of rational fractions. LUCIEN BULL and PIERRE GIRARD: A new cinematographic arrangement for recording very rapid phenomena. An application of the principle suggested by Henriot and Huguenard, in which the rotating part, without axis, is driven and supported by compressed air. 50,000 images per second have been obtained and are perfectly clear and distinct. EDMOND BRUN and ROBERT LECARDONNEL: The heating of a body placed in a rapid current of air. GUSTAVE ANDRÉ MOKRZYCKI: Coefficients of longitudinal equilibrium in aeroplanes. JULES GÉHÉNIAU: The true mass of the photon and the electromagnetic tensor. W. H. BENEDICTUS: The photonic interpretation of the Maxwellian field. MLLE. ARLETTE TOURNAIRE and ETIENNE VASSY: Comparison of the continuous molecular spectra of hydrogen and deuterium. The deviation between the intensities of the two spectra is negligible for the shortest waves studied, increases as the visible spectrum is approached, passes through a maximum at about 4100 A. and then diminishes slightly. JEAN WEIGLE: The width of the $K\alpha_1$ line of molybdenum. BERNARD KWAL and MLLE. ANNE RIEDBERGER: The periods of natural and artificial radioactive bodies, the existence of layers and the classification of atomic nuclei. ROBERT CASTAGNÉ and MLLE. DOROTHY OSBORNE: The radioactivity of the mineral springs of the Cachat d'Evian group. PIERRE DAURE, ALFRED KASTLER and HENRI BERRY: The Raman effect in ammonia. ANDRÉ MORETTE: The constitution of vanadium carbide. By reducing vanadium pentoxide with an excess of carbon at a high temperature, the vanadium carbide produced has the composition C_3V_4. MLLE. ELLEN GLEDITSCH and TH. F. EGIDIUS: The mercurous amides. MLLE. M. PERNOT: The system mercuric iodide, cæsium iodide, water. ALFRED LEMAN: Comparative acetylation of the naphthols. In acetic acid solution the hydroxyl of β-naphthol is more reactive than that of α-naphthol: in pyridine solution the reverse is the case. GILBERT MATHIEU: The application of the law of posthumous folds to the dislocations of Poitou. Some relations between the primary massifs of Vendée and of Limousin. MME. LOUISE NOUVEL: A mode of regeneration of locomotive appendages peculiar to *Crangon crangon*. PAUL CHABANAUD: The special situation of the nadiral nasal organ of the unsymmetrical teleosteans of the family Achiridæ. MLLE. CLAUDETTE RAPHAËL: The localisation of hæmoglobin and its derivatives in some Aphriditians. JEAN RÉGNIER, RAYMOND DELANGE and ROBERT DAVID: The influence of the acid combined with the base on the anæsthetic power of different salts of *p*-aminobenzoyldiethylaminoethanol (the base of novocaine). Novocaine resembles cocaine in that its activity as an anæsthetic varies considerably with the nature of the acid with which the base is combined: some acids increase the action, others destroy it. The phenylpropionate and isobutyrate are found to possess the following advantages: good anæsthetic properties, preservation of its activity after sterilising and keeping, slight toxic action, absence of irritating action on the tissues, good solubility in water. YVES LE GRAND: Vision in directed light. LOUIS MAILLARD and JEAN ETTORI: The estimation of titanium in the organism by extraction and photometry. The method described is capable of determining titanium with an accuracy of 0·0001 mgm. Titanium has been found in the muscle of man and other mammals and in blood. AUGUSTIN BOUTARIC and JEAN A. GAUTIER:

The antoxygen properties of medicines used as febrifuges. Most febrifuges used in medicine behave generally as negative catalysts with regard to oxidations produced by free oxygen. FERNAND ARLOING, ALBERT MOREL and ANDRÉ JOSSERAND: New researches on the soluble organo-metallic complex compounds of dehydrascorbic acid. Increase of their effects on cancers by varying the metal.

VIENNA

Academy of Sciences, January 23. J. JURIŠIĆ: Glandular hairs on the adventitious roots of kalanchoë. GÜNTHER LOCK and GÜNTHER NOTTES: Some halogen derivatives of metaoxybenzaldehyde. ALOIS WAGNER: Differences in the counting of protons by electrical and scintillation methods. Simultaneous records of counts by tube and scintillation methods showed that many observers found a 60–70 per cent excess of scintillations with respect to the electrically recorded particles. This can only be explained on physiological and psychological grounds. W. WIRTINGER: A special result in potential theory. W. J. MÜLLER and E. LÖW: Theory of the *Sperrschicht* in aluminium. The behaviour of passive aluminium electrodes of great purity in a saturated solution of sodium bicarbonate is discussed.

January 30. A. WAGNER: Theory of diurnal changes of the winds. Discussion of variations in force and direction. OTTO REDLICH and WALTER STRICKS: Raman spectrum of deuterobromoform. ERNST SPÄTH and ALEXANDER F. J. SIMON: The root of *Heracleum sphondylium*, L.

WASHINGTON, D.C.

National Academy of Sciences (*Proc.*, 22, 1–80, Jan. 15). A. J. WATERMAN: Experiments on young chick embryos cultured *in vitro*. Chick blastoderms from an early primitive streak to the head process stages, and a medium consisting of agar, serum and chick embryo extract were used. A median sagittal cut from the anterior part of the streak to the germ wall led to duplication of notochord, brain, etc., even at this late stage. A certain amount of differentiation occurred after removal of Henson's node. Thyroid and a pituitary extract did not affect development. FROELICH G. RAINEY: A new prehistoric culture in Haiti. Five aboriginal dwelling sites in north Haiti contained flint and other tools, but no pottery, and represent a culture as yet unrelated to others in the West Indies. Six other sites produced abundant pottery, two types of decoration being represented at different sites, stone and shell tools, but no flint implements. A tentative sequence of culture horizons in the West Indies in relation to those of Puerto Rico is drawn up. HARLOW SHAPLEY: Summary of investigations of variable stars. The topics discussed include the distribution of a thousand new variables in the Small Magellanic Cloud, periods of super-giant Cepheids in the Cloud, new faint Milky Way variables and high latitude variables in relation to the thickness of the galaxy. F. L. WHIPPLE, T. E. STERNE and D. NORMAN: Prismatic deviation as a function of cosmical observation. A rigidly constructed 2-prism astronomical spectrograph was mounted with its optical plane parallel to a horizontal turntable. Between the light source (a mercury arc) and the slit was a mirror with six clear spaces 0·5 mm. in width and 1 mm. apart which could be shifted 0·5 mm. parallel to the slit. An exposure with the 'grating' up gives six segments of a spectral 'line'; another exposure with the 'grating' down gives six complementary segments. Any change of refractive index of the system between the two exposures, due to rotation and observation at various sidereal times, would be shown by displacement of the complementary 'lines'. The refractive index was found to be constant to 5×10^{-6}. ALEXANDER HOLLAENDER and B. M. DUGGAR: Irradiation of plant viruses and of micro-organisms with monochromatic light. (3) Resistance of the virus of typical tobacco mosaic and *Escherichia coli* to radiation from λ3000 to λ2250 A. The destruction spectra are compared: at λ2250 A. the energy required to destroy half the virus in 1 c.c. is one fifth of that required at λ2600 A., whereas for inactivation of the bacteria more energy is required at the shorter wave-length. H. C. SHERMAN: Calcium as a factor in the nutritional improvement of health. Moderate increases of calcium intake for rats on an adequate diet hasten growth and development, induce higher vitality and improve the expectation of life of adult and young. These results seem to be paralleled, at least in part, in children. JACK SCHULTZ: Variegation in *Drosophila* and the inert chromosome regions. Variegations are associated with abnormal configurations of salivary gland chromosomes caused by aggregation of inert regions to a chromocentre; the addition of *Y*-chromosomes seems to decrease the frequency of variegation. W. T. MARTIN: Special regions of regularity of functions of several complex variables. MAX ZORN: Discontinuous groups and allied topics (1 and 2). W. V. QUINE: Concepts of negative degree. H. M. MACNEILLE: Extensions of partially ordered sets. DENIS L. FOX: Further studies of the carotenoids of two Pacific marine fishes, *Fundulus parvipinnis* [Pacific killifish] and *Hypsypops rubicunda* [garibaldi or goldfish], and of a marine annelid, *Thoracophelia* sp. The annelid contains exclusively carotenes; the 'goldfish' has a single pigment of the xanthophyll group; and the killifish, whether fed on either of these, stores only a xanthophyll similar to, or the same as, that in the 'goldfish'. G. H. PARKER: Colour changes in Elasmobranchs. Whereas in the smooth dogfish, *Mustelus canis*, cutting the nerves at the base of the fins or faradic stimulation causes contraction of melanophores and therefore blanching of the parts of the fish affected, neither operation had any certain effect on the small shark, *Squalus acanthias*. Pituitrin, pituitary extracts and also blood from dark specimens of this shark, however, caused blanching, showing that melanophore pigment in *Squalus* is dispersed by a blood-borne pituitary neurohumour. DAVID I. MACHT: Experimental and clinical study of cobra venom as an analgesic. Cobra venom in physiological saline produces death in the cat by paralysis of a vital centre in the hind brain (medulla). Solutions of venom were standardised in mouse units; an average therapeutic dose (5 mouse units) produced very favourable results in 65 per cent of 115 clinical cases so far as relief of pain was concerned, and had the further advantage that increasing doses were not required as with morphine, etc. This pain-relieving effect seems to be due to action in the cerebrum. With the dilute solutions used, it does not have a local anæsthetic effect. ERNST CLOOS and H. GARLAND HERSHEY: Structural age determination of Piedmont intrusives in Maryland. Measurement of cleavage planes in the area, and examination of thin sections of inclusions within the intrusives, lead to the view that the intrusives are of Palæozoic age rather than pre-Cambrian, as hitherto believed.