Science News a Century Ago

Pentland's Travels in Peru and Bolivia

AT a meeting of the Royal Geographical Society on March 25, 1839, extracts were read from a paper by Dr. Bowring "On the Geography of the Country around Cuzco", and an account was given by Joseph Barclay Pentland (1797–1873), H.M. Consul-General in Bolivia, of his travels in Bolivia and Peru during the preceding two years. With the exception of General Miller, it was believed Dr. Bowring and Pentland were the only persons who had visited Cuzco with a scientific object. During his stay in the city—the ancient capital of the Incas—Pentland made plans of the ancient and modern city, and examined the remains of Peruvian architecture. In his paper, he dwelt upon the extraordinary style of cyclopean construction of the ancient Peruvians, which was no less remarkable for the care shown and the remarkable size of the stones, some of which exceeded 150 tons in weight. In the course of his journey, he determined by astronomical observation the position of nearly forty places and he determined their height by barometric measurements. He also referred to a canal cut across a pass of the Western Cordillera into the valley of the Tacna. This was planned by an Englishman named Scott and undertaken chiefly by British merchants. At one point it was 14,652 ft. above sea-level.

A Sawing Machine for Iron Rails

ON March 26, 1839, Joseph Glynn, F.R.S. (1799–1863), described to the Institution of Civil Engineers a "Sawing Machine for Cutting off Railway Bars", which had been erected at the Butterley Iron Works, Derbyshire, for cutting rails for the Midland Counties Railway. The machine had two circular saws each of them being 3 ft. in diameter and $\frac{1}{8}$ in. thick. They were mounted in headstocks which could be moved at right angles to the rails. They revolved at 1000 revolutions per minute between two disks of cast-iron faced with copper, and dipped into water. The rails were sawn while hot, it taking 12 seconds to saw through the ends of a 78 lb. rail.

Audouin's Advice to a Naturalist

A FRENCH naval officer, M. Lefebre, about to travel in countries bordering the Red Sea, solicited instructions as to what objects he should study. Among those he appealed to was the French entomologist Jean Victor Audouin (1797–1841). In the *Athenæum* of March 30, 1839, appeared extracts from Audouin's remarks. "The Gulf of Suez", the article said, "is extremely rich in mollusca, zoophytes, crustaceæ and annelidæ and it is very desirous that the fugitive colours of the Doris, Bursatella, Orchidia, and Tritonia, etc., should be delineated. The animals of several of the shells, also found in the Red Sea, are hitherto unknown; for instance the Anatola, and the same may be said of the zoophytes, concerning which it would be highly important to possess the particulars of form as well as colour, both of which alter so quickly; those of the polypi with flexible stems would be particularly interesting. . . . It is supposed that many new spiders may be found in Abyssinia, and the genus Lycosa, to which the Tarantula belongs, should be especially examined. It is, however, chiefly the class of insects which may be enriched by a journey to Abyssinia."

Societies and Academies

Paris

Academy of Sciences (*C.R.*, **208**, 545–608, Feb. 20, 1939).

H. COLIN and MLLE. M.-M. CHOLLET: Formation of inulin in annual plants. Conditions for formation of inulin are more easily realized in the Campanulaceæ than in the Compositæ.

G. MALÉCOT: Correlations between related individuals, in the hypothesis of homogamy.

V. A. KOSTITZIN: Compatibility of stable singular points of differential equations.

H. CARTAN and S. MANDELBROJT: Solutions of Carleman's problem for a finite interval.

D. BELORIZKY: Imaginary triple collisions in the plane problem of three bodies.

R. JAMIN: Theorem relating to the isentropic flow of perfect gases.

J. BETHENOD: Determination of the range in which an alternating current arc functions.

F. CARBENAY: Propagation of high-frequency oscillations on networks for the transport of electrical energy.

T. KOFMAN: Action of visible and ultra-violet light on periodic reactions.

G. REBOUL and E. THIBAUD: Emission of ionizing radiations by salts of ordinary metals.

J. SOLOMON: Splitting of radioactive nuclei by neutrons. It is suggested that the action is analogous to 'predissociation' of molecules.

H. VON HALBAN, JUN., L. KOWARSKI and M. MAGAT: Intensity of the neutrons in cosmic radiation. Radio-element $^{80}_{35}Br$ was produced by cosmic ray neutrons, the intensity of which was much greater at a height of 9,500 metres in an aeroplane than on the ground in Paris.

MME. T. GUILMART: Absorption in the ultra-violet of oximes in the solid state. The bodies exist in two forms with different spectra.

Y. DOUCET: Principles of cryoscopy and the construction of a cryoscopic apparatus.

C. DUVAL and G. MAZARS: Micro-estimation of halogen ions; acid-alkali test.

G. WÉTROFF: Reaction with chlorine of some derivatives of the phosphonitrile radical.

MLLE. M. MURGIER: Preparation of soluble molybdic acid.

MME. Z. SOUBAREW-CHATELAIN: Constitution of molybdic acid in dilute aqueous solution.

R. PAUL: Opening of hydrofuranic and hydropyranic cycles by acetic anhydride.

W. S. REICH: A new series of esters of the oses, the azoyl-esters.

J. LUGEON: Instantaneous determination, without calculation, of any altitude of a *radio-sonde*.

P. GAVAUDAN, MME. N. GAVAUDAN and J.-F. DURAND: Effect of some hydrocarbons and their derivatives on mitosis and on cytodieresis.

A. TOURNADE and G. CHARDON: Mechanism of post-depressive hypertension observed after temporary insufflation of the lungs.

G. UNGAR and J.-L. PARROT: Influence of bleeding on the power of the plasma to destroy histamin.

H. MUNTZ: Fundamental laws of hæmodynamics.

MLLE. V. DEUTSCH: Sedimentation constant and molecular weight of syphilitic reagin.

S. METALNIKOV, A. YAKIMACH and O. YADOFF: Action of radioactive radiations on microbes.

Dublin

Royal Irish Academy, Feb. 27.

J. M. O'CONNOR: The significance of monomolecular layers of fatty acids in the control of animal oxidation. The influence of temperature from 0° C. upwards on the oxygen consumption of the frog was examined. It is found to show sharp increases between 6° and 14° and between 21° and 30° and at 15°. These changes correspond in position and in extent to the expansion of a monomolecular layer of myristic and palmitic acid in the proportions in which they occur in the frog, and to the melting of palmitic acid.

A. AUSTIN MILLER: River development in South Ireland. The rivers of South Ireland originated as south-flowing consequent streams on a plane above the summits of the present mountains. Later, the rivers have, by repeated captures, extended along the east-west synclines of soft carboniferous rocks until many of them flow in this direction from source almost to mouth, turning south only in the last few miles of tidal estuary. For some time the sea-level stood 800 ft. above that of to-day and cut a broad beach, backed by a line of cliffs, at that height on the southern slopes of the Knockmealdowns and other mountain groups. The sea-level declined by stages to 400 ft., then to 200 ft., then to the level of the pre-glacial raised beach a few feet above Ordnance datum, then to about 100 ft. below present sea-level, returning only quite recently to the present position, drowning the estuaries.

Vienna

Academy of Sciences, January 12.

W. J. MÜLLER, E. LÖW and F. STEIGER: Difference in the rate of corrosion of pure and commercial aluminium in alkaline solutions. The E.M.F. of the local voltaic couples causing the corrosion is the same for both kinds of aluminium; the higher velocity of corrosion of commercial aluminium is due to the lower resistance of the surface film, brought about probably by the inclusion of metallic impurities.

J. LINDNER and B. ZAUNBAUER: Synthesis of quinoline by tetralylamines. 7,8-tetramethylenequinoline.

J. LINDNER, F. SCHMITT and B. ZAUNBAUER: Hydrindene derivatives (2). Simple substitution products.

A. SKRABAL: Continuity of the kinetics of bleaching solution. The various kinetics of bleaching solution are all derived from a single law involving two velocity coefficients.

J. KISSER: Frequency of abnormalities of the leaves of *Juglans regia* due to a late frost.

January 19.

M. STARK: Stages in the development of crystalline schists of the Radstädter chalk beds in the Arltal and Gasteintal.

M. TOPERCZER: Theory of earthquake disturbances. The motion of the ground is assumed to be of the form $x = At^n e^{-at} \sin \omega t$.

O. PAULSEN: Studies of the Raman effect (97). Poly-substituted benzols.

J. BRUNNER: New find of Hipparion fauna at Veles in Macedonia.

A. ERDELYI: Series involving products of Laguerre polynomials.

Washington, D.C.

National Academy of Sciences (*Proc.*, 25, 1–54, Jan. 15, 1939).

W. J. ROBBINS and MARY B. SCHMIDT: Vitamin B_6, a growth substance for excised tomato roots. Slow growth has been maintained over a period of more than two years in a solution of mineral salts, pure cane sugar and thiamin. Growth is improved by substituting a light brown sugar for the pure cane sugar, due apparently to presence of vitamin B_6. Probably the roots synthesize sufficient vitamin B_6 for slow growth in solutions containing thiamin.

W. J. V. OSTERHOUT and S. E. HILL: Chemical restoration in *Nitella* (3). Effects of inorganic salts. Irritability disappeared after two to six days in distilled water but can be restored by 0·01 m. sodium chloride or sulphate in five minutes. This is considerably longer than is required with organic salts, suggesting a different mechanism.

E. DERSHEM: Photomicrographs of thin bone sections by the use of fluorescent X-radiation. A radiator containing an element the K emission lines of which are a little shorter in wave-length than the K absorption wave-length of the principal element of the specimen is used. This radiator (scandium oxide for photomicrographs of bone) is irradiated with an ordinary X-ray tube, and emits radiation heavily absorbed by the specimen. The 'camera' must be evacuated.

G. D. SNELL: Induction by irradiation with neutrons of hereditary changes in mice. Both X-rays and neutrons produce translocations and sterile F_1 males, but both fail to produce detectable numbers of recessive mutations.

D. BODENSTEIN: Imaginal differentiation inaugurated by oxygen in *Drosophila* pupæ. The presence of oxygen, rather than a differentiation hormone in the anterior part, seems to be necessary for differentiation of the abdominal ectoderm.

H. C. SHERMAN, H. L. CAMPBELL and C. S. LANFORD: Experiments on the relation of nutrition to the composition of the body and the length of life. Contrary to the classical view that the chemical composition of an organism is rigidly specific, it is found that rate of calcification in the normally developing body can be varied by adjusting calcium intake within the normal range, without departure from full health. The higher intake seems to be permanently advantageous. High intake of vitamin A has improved length of life and vitality of offspring.

E. B. WILSON and JANE WORCESTER: Resolution of tests into two general factors.

W. R. MILES: Steady polarity potential of the human eye. Electrodes are placed on the skin near the eyes and the body potential balanced out. The potential of the eyeball is closely proportional to the sine of the angle of rotation of the eye.

O. STRUVE: Physical state of the interstellar gas clouds. A theoretical discussion leads to the view that there is a high abundance of hydrogen atoms in interstellar gas; roughly, hydrogen atoms to calcium atoms are as 10^6 to 1.

G. A. MILLER: Groups of degree n in which the largest degree of a substitution is a minimum.

E. T. BELL: Euler's concordant forms.

S. LEFSCHETZ: Mapping of abstract spaces on polytopes.

J. W. TUKEY: Intrinsic metric of a polytope.

J. W. ALEXANDER: Concept of a tological space.