

## Exploration of the Mississippi

*The Times* of December 30, 1836, quoting the *St. Louis Enquirer* of November 14, said: "The distinguished French astronomer and mathematician, Mr. J. N. Nicollet, now engaged in a tour of scientific observation through the different states and territories of the Union, has recently visited the northern regions of the United States, and succeeded in penetrating further into the interior, with a view of making the discovery of the true source of the great 'Father of Waters' than has even been before accomplished. Mr. Nicollet left Port Snelling, mouth of the St. Peter's, about three months since, and at great expense and trouble transported his splendid set of astronomical and other instruments through a country offering obstacles at every step, taking advantage of every opportunity to ascertain latitudes, longitudes, the magnetical variation and dip, the intensity of the force of gravity, geological and mineralogical examination, and indeed every other observation connected with the science, which might be considered useful, not only to himself and the various scientific and literary societies in Europe and the United States, to which he belongs, but to the whole scientific world. . . ."

"It is laid down and established by Mr. Nicollet that the true source of the 'Father of Waters' is to be found in five different rivers, an extension of the waters of which forms La Beasch Lake. Thus has the honour of this discovery so long contended for by many travellers and writers, been reserved for Mr. Nicollet, and we sincerely hope he may succeed (as no doubt he will) in the establishment of his superior claims to the distinction."

## Dutrochet's Experiments in Vegetable Physiology

In the *Athenæum* of December 31, 1836, under the heading "The Breathing of Vegetables" was a reference to the latest researches of the French physiologist and naturalist Rene-Joachim-Henri-Dutrochet (1776-1847). M. Dutrochet, said the *Athenæum*, has recently laid before the Paris Academy of Sciences some further information on his experiments on vegetable physiology. Having observed that the pneumatic organs in different parts of *Nymphaea lutea* contained an air in which there was less oxygen in proportion as these parts were distant from the leaves, it struck him, that the leaves were the sources whence these organs derived their oxygen, and that this oxygen was disposed of by the breathing of the plant, as in animals. After stating his observations at length, M. Dutrochet said: "The results of these experiments are, that the oxygen produced by the leaves under the influence of light is first poured into the pneumatic cavities: into these it is pressed by continued accumulation, and escapes to the outer surface by means of the tracheæ, the orifices of which are situated in the air, and on the leaves. Most of the aquatic plants have these orifices so contrived as not to be entirely closed when in contact with the water, but a few are without these mouths, and then the oxygen is crowded into the pneumatic canals of the footstalks, and from thence is pressed into the stem, which accounts for the enormous quantity of water contained in some of the aquatic plants". Dutrochet re-published the most important of his researches in his "Memoires pour Servir à l'histoire anatomique et physiologique des vegetaux et des animaux" in 1837.

## Societies and Academies

## Dublin

Royal Dublin Society, November 24, 1936.

H. H. DIXON: The convection of heat and materials in the stem of a tree. When heat is applied locally to the stem of a tree, it is conducted and conveyed both upwards and downwards. The convection is brought about by the movement of material. By means of suitably devised and controlled arrangements, the velocities and the times of these movements may be ascertained and recorded. Movements quite distinct from the movement of water upwards from the roots to the leaves have in this way been observed. They take place in winter, spring and autumn, as well as in summer. They may be found when the tree is bare of leaves and in the darkness of night. While the water from the soil moves upward in the wood, the bark is indicated as the channel for these movements.

J. H. J. POOLE: A new method of measuring the radioactivity of rocks. The powdered rock is heated in a carbon boat carrying a current of about 400-500 amperes in a water-cooled vacuum furnace. The gases evolved, including the radon from the radium present, are then pumped into a previously exhausted ionization chamber, where the number of alpha particles due to the radon and active deposit is counted by means of an amplifier of the Wynn Williams type and an oscillograph. The results so far obtained agree reasonably well with previous measurements made by other methods. An account was also given of some measurements of the radium content of specimens of basalt from the bottom of the Indian Ocean, made by the usual furnace method. The results are appreciably lower than those for surface specimens of basalt.

G. T. PYNE and J. J. RYAN: Investigations on a molecular constant for soured milks. An application to soured milk of the method previously described for the determination of the cryoscopic constant of fresh milk from measurements of its refractive index, chloride content, and soluble phosphate content.

## Paris

Academy of Sciences, November 30 (*C.R.*, 203, 1105-1192).

EMILE BOREL: The problem of chances.

HENRI DOUVILLÉ: The shell of the Ostreides, of the group of *Ostrea cochlear*, genus *Pycnodonta*, and the shell of the Rudists.

RAZIUDDIN SIDDIQI: The theory of non-linear partial differential equations.

J. FAVARD: The approximation of periodic functions by trigonometrical polynomials.

V. A. KOSTITZIN: The asymptotic solutions of biological differential equations.

EDMOND BRUN: Study of the friction of a solid moving in water. When an ebonite disk is rotated at a high velocity in water, there is a measurable temperature difference between the solid and the water; this difference is a function of the distance from the axis of rotation, and is proportional to the square of the velocity of rotation.

JEAN CHAZY: Certain laws of gravitation corrective of Newton's law.



**HENRI CAMICHEL**: The spectrum of Nova Lacertæ observed with the large telescope at Meudon. The results are in general agreement with what is known about novæ, but there are certain peculiarities. Nova Lacertæ differs from Nova Herceulis: its light curve is of the rapid evolution type, its emission lines are wide and badly defined, and it shows lines of interstellar sodium.

**BERNARD KWAL**: The spatio-temporal fixing of positions and relations of uncertainty in quaternion quantic mechanics.

**PHILIPPE TONGAS**: A new empirical expression for the specific volume of super-heated steam.

**DAVID RAISKY**: A new musical string instrument, the bass violin. The instrument described has the range of a violoncello with dimensions approximating to those of a violin.

**GEORGES FOURNIER**: A geometrical theory of matter.

**DOUCHAN AVSEC and MICHEL LUNTZ**: Electro-convective vortices. In an electrostatic field, formed in oil between two plane parallel electrodes, cellular vortices of the Bénard type are formed. It is suggested that the existence of these electroconvective vortices may explain a large number of physical, meteorological, astrophysical and crystallographic phenomena.

**AUGUSTIN BOUTARIC, LOUIS FERRÉ and MME. MADELEINE ROY**: Spectro-photometric researches on the colour of wine.

**TIEN KIU**: Photographic plates sensitized with sodium salicylate. Treatment with sodium salicylate solutions increases both the contrast and sensibility in the visible spectrum. The action of this reagent is more complex than was at first supposed: the fluorescence theory is insufficient to cover the whole of the facts.

**EMILE SEVIN**: Zeeman's phenomenon.

**ROBERT J. WALLEN and MAURICE E. NAHMAS**: Research on the negative proton and some artificial radioactivities.

**MARCEL PRETTRE**: The laws governing the initial acceleration of slow combustion and delay in inflammation of mixtures of pentane, oxygen and nitrogen.

**GABRIEL VALENSI**: The mechanism of diffusion through protective oxides and the influence of pressure on the velocity of oxidation of nickel.

**GEORGES CARPÉNI**: The dissociation constants of reductinic acid and its product of oxidation by iodine. As might have been predicted from its constitution and chemical properties, reductinic acid is, from the point of view of electrometric titration, in every way analogous with reductone and with ascorbic acid. This also applies to its oxidation product with iodine.

**MAX BOBTELSKY and MME. LJUBA BOBTELSKY-CHAJKIN**: The influence of added catalysts on the catalytic decomposition of hydrogen peroxide in the presence of bichromate.

**HUBERT FORESTIER and FRANCIS REDSLOB**: Decomposition of cadmium ferrite. Study of the conditions under which cadmium ferrite acquires ferromagnetic properties: these properties are shown to be due to the ferric oxide in an unstable ferromagnetic form.

**HENRI GUÉRIN**: Combined action of hydrogen and heat on the arsenates of the alkaline earths.

**SÉBASTIEN SABETAY**: A method for the rapid diagnosis and approximate estimation of the primary alcohols, in the presence of secondary and tertiary

alcohols, by the formation of tritylic esters. The reagent proposed is triphenylchloromethane, which gives esters with primary alcohols of the type  $(C_6H_5)_3COR$ .

**A. VILA**: Application of distillation in a cathodic vacuum to the definition of pitches and bitumens.

**PIERRE CHATELAIN**: Study of parazoxyanisol in the solid anisotropic liquid, and isotropic liquid states.

**FERNAND JACQUET**: The southern side of the Tindouf synclinal in the regions of northern Mauritania.

**LOUIS DUBERTRET**: The stratigraphy of the regions covered by the green rocks of north-west Syria.

**MAURICE HOCQUETTE and LÉON ARSIGNY**: The mode of formation, action and destiny of the pre-haustorium of *Cuscuta epithymum*, var. *trifolii*.

**RAYMOND HAMET**: The botanical origin of the drugs known in Brazil under the name of 'catuaba'.

**RENÉ COUTEAUX**: The bacteroids of worms and their relations with sarcocystis.

**JEAN JACQUES BOUNHIOL**: The limits of ecebration of the larvæ of Lepidoptera compatible with nymphosis.

**PIERRE NICOLLE**: Researches on the role of the hormones in the physiological variations of the reticulocytary ratio in the rabbit.

**GABRIEL GUIGNON**: The influence of sunlight on the flight of the diurnal Lepidoptera.

**ALBERT VANDEL**: The mode of distribution of the sexes in *Trichoniscus (Spiloniscus) provisorius*. The heredity of monogeny.

**A. H. ROFFO and A. E. ROFFO, jun.**: Ionization of air by irradiated cholesterol. The irradiation of cholesterol by ultra-violet light is accompanied by ionization phenomena.

## Official Publications Received

### Great Britain and Ireland

Ministry of Agriculture and Fisheries. Agricultural Statistics, 1935, Vol. 70, Part 1: Acreage and Production of Crops and Number of Live Stock in England and Wales. Pp. 99. (London: H.M. Stationery Office.) 1s. 6d. net. [812]

Royal Technical College, Glasgow. Annual Report on the One Hundred and Fortieth Session, adopted at the Meeting of Governors held on the 27th October 1936. Pp. 92. (Glasgow: Royal Technical College.) [812]

Thirty-fourth Annual Report, 1935-1936, of the Imperial Cancer Research Fund. Pp. 44. (London: Imperial Cancer Research Fund.) [1012]

Broadcasting. Drafts of (1) Royal Charter for which the Postmaster General proposes to apply for the continuance of the British Broadcasting Corporation; and (2) Licence and Agreement between His Majesty's Postmaster General and the British Broadcasting Corporation. (Cmd. 5329.) Pp. 26. (London: H.M. Stationery Office.) 4d. net. [1112]

### Other Countries

Department of Scientific and Industrial Research: Cawthron Institute. Pasture and Soils Research Publication No. 35: The Importance of Cobalt in the Treatment of certain Stock Ailments in the South Island, New Zealand. By H. O. Askew and J. K. Dixon. Pp. 73-92. (Wellington, N.Z.: Government Printer.) [812]

New Zealand: Department of Lands and Survey. Annual Report on Scenery-Preservation for the Year ended 31st March 1936. Pp. 8. (Wellington: Government Printer.) [812]

New Zealand State Forest Service. Bulletin No. 8: *Diplodia pinea* in New Zealand. By T. T. C. Birch. Pp. 32. (Wellington: Government Printer.) 1s. 9d. [812]

Union of South Africa: Department of the Interior, Bureau of Archaeology. Map of Prehistoric Paintings and Engravings. Scale of 1-014 in. to 40 Statute miles=1:2,500,000. 36½ in. x 28½ in. (Pretoria: Government Printer.) [812]

British Honduras. Report of the Forest Trust for the Year ending 31st December 1935. Pp. 28. (Belize: Government Printer.) [1012]

Western Australia. Annual Progress Report of the Geological Survey for the Year 1935. Pp. 44. (Perth: Government Printer.) [1012]