

the *Racemosa*. In the course of his travels in Syria, Nubia, Dongola, the Red and Caspian Seas, etc., M. Ehrenberg has had an opportunity of examining a number of organised beings, and has continued his microscopic researches since that period; but he only offers his table as a sketch capable of perfection, and successive developments."

Christian Gottfried Ehrenberg was born in 1795 and died in 1876. His first travels, lasting from 1820 until 1826, were made with Hemprich, and it was in 1829 that he set out with Humboldt to visit the Ural and Altai mountains. His great work "Infusions-thierchen" appeared in 1838.

Goodyear and India Rubber Manufacture

QUOTING from the *New York Journal of Commerce, the Mechanics' Magazine* of December 26, 1835, said: "A discovery has recently been made by Mr. C. Goodyear, by which India-rubber, after having been dissolved, can be restored by a cheap process to its original whiteness, and the pure grain formed into a fabric to be used instead of cloth, leather or parchment, and can be moulded into almost any form; and can also be combined in a variety of ways with cloth, cordage or leather. Being first made white, it admits of every shade of colour, worked in, and as durable as the rubber itself. A variety of fine specimens are now being exhibited at the Mechanics' Institute at Castle Garden, which will give an idea of the general utility of the invention."

Charles Goodyear (1800-60) first turned his attention to rubber in 1834. His work of 1835 was only partially successful, but four years later he accidentally discovered the process of vulcanising. He has been called "the Palissy of the rubber industry".

Societies and Academies

LONDON

Royal Society, December 12. F. C. COURTICE and C. G. DOUGLAS: The effects of prolonged exercise on metabolism. In the normal postabsorptive subject, there is a striking fall of the respiratory quotient during rest subsequent to work which may last for hours. This is accompanied by ketosis and a progressive slow fall in the carbon dioxide combining power of the blood. Ketosis can readily be prevented by taking a carbohydrate rich diet on the previous day, but still occurred with great frequency when either an ordinary breakfast or a quantity of sugar was ingested shortly before beginning the experiment, the main effect in the latter case being apparently increased utilisation of carbohydrate during the work. The fall of respiratory quotient is attributed mainly to a reduction of the ratio of carbohydrate to fat oxidised owing to depletion of stores of available carbohydrate during the work, but in addition there may be some conversion of fat into stored glycogen, though only to a small extent. During post-exercise rest there is reduced sugar tolerance, and the possible influence of endocrine secretions on carbohydrate metabolism during muscular work is discussed. W. L. FRANCIS: The surface membranes of muscle fibres. Using Osterhout's methods as a guide, the following results have been obtained. The pH of fresh muscle brei is found with a quinhydrone electrode to be 7.1, in agreement

with estimates by other workers of the pH of resting living muscle. The pH after 24 hours is 6.7. The composition of an aqueous solution resembling brei in its inorganic content is discussed. The stumbling block is the phosphate, which can only be made 1/5 as concentrated in aqueous solution as in the muscle fibre. The diffusion potentials between brei and various electrolyte solutions were measured. They point to the mobility of anions being very low in brei compared with their mobilities in aqueous solution. The vapour pressure of brei is found by Barger's method to be equivalent to 1.06 per cent sodium chloride. The effects of cut muscle, brei and various experimental solutions on the resting potential are investigated with the view of finding what the 'asymmetry' potential of the surface membrane would be if the media on both sides were the same. The value would be 10-20 mv. reckoned inwards. The diffusing substance need only saturate the interfibrillary spaces in order to produce its full effect on the potential at the fibre surface.

PARIS

Academy of Sciences, November 18 (*C.R.*, 201, 917-996). ABRAHAM WALD: The curvature of surfaces. P. RACHEVSKY: A dual metric geometry, based on generalised Cartan spaces. A. KHARADZĒ: A functional operator and the generalisation of Legendre polynomials. GEORGES GIRAUD: Problems of the type of Dirichlet and Neumann in certain cases where the data are discontinuous. PIERRE BOOS: The characteristic properties of certain analytical surfaces. PAUL FLAMANT: Two functions attached to a function capable of summation, and their application to the limit of Lebesgue integrals. F. LEJA: A harmonic function connected with any closed ensemble of points of space. LEON BESCHKINE: The equations of equilibrium of thin surfaces. ANTOINE MAGNAN and CLAUDE MAGNAN: Making evident small differences of the refractive index in liquid media. Application to the study of the movements of water such as that produced by the motion of a fish. The apparatus records the motion of the water on a kinematograph: six photographs are reproduced. PIERRE ERNEST MERCIER: The characteristic functions of a cantilever wing (resistance in bending). JACQUES VALENSI: Study of the flow of air round the wing of an aeroplane: marginal phenomena. Results obtained by a photographic method: two photographs are reproduced. DANIEL BARBIER: The colour temperatures of the stars. PAUL SOLEILLET: The coherence of vibrations in optical resonance. JEAN ROULLEAU: The determination of the contact resistance metal-cuprous oxide. JEAN MERCIER: Contribution to the study of the synchronisation of oscillators. CHARLES DEGARD: The diffraction of electrons by chloroform, and the structure of the molecule: the Urbain model and the tetrahedral model. The Urbain formula (the co-ordinative formula $\text{CCl}_2 \cdot \text{HCl}$) and the usual tetrahedral CHCl_3 both agree with the experimental results. Experiments on electronic diffraction cannot decide between the two formulæ. PIERRE JACQUET: The practically instantaneous action of certain colloids on the electrolytic deposit of copper. During the electrolysis of copper sulphate solutions, it was found that only the proteins (gelatine, serum albumin) have a marked action during the first moments of electrolysis: the gums act much more slowly. HENRI BIZETTE and TSAÏ BELLING: The magnetic double

refraction of nitric oxide. Experimental results obtained with the large electromagnet of the Academy of Sciences, the nitric oxide being under pressures of 80 and 100 atmospheres. M^{lle}. ARLETTE TOURNAIRE and ETIENNE VASSY: The continuous spectrum of deuterium. Comparisons of the spectra of deuterium and hydrogen show slight differences. The curves of the two gases coincide at about 4000 Å., and then deviate very slightly as the wave-length diminishes. The continuous spectrum of deuterium is a little more intense than that of hydrogen. PAUL GOLDFINGER, WLADIMIR LASAREFF and BORIS ROSEN: The energy of dissociation of carbon monoxide. Among the different possibilities deduced from the CO spectrum, only the value for the dissociation energy 9.1 v.e., giving 123.6 kcal. for the heat of sublimation of carbon at 0° K., is not in contradiction with the thermo-chemical and spectroscopic data. LÉON GUILLET, JR.: The modulus of elasticity of the copper-beryllium alloys. Beryllium increases the modulus of elasticity of copper: the alloy with 15 per cent of beryllium has a modulus equal to that of steel. MARCEL PRETTRE: The influence of the gases adsorbed by the wall of the vessel on the chain reaction of mixtures of hydrogen and oxygen. JEAN AMIEL: Some organic cupritetrachlorides and cupritetrbromides. JEAN LOISELEUR: The formation of protein thioderivatives with the aid of carbon disulphide. Carbon disulphide transforms casein, gelatine and egg albumin into thio derivatives, probably by forming thiosulphocarbamic groups with certain amine groups. These substances are soluble in organic solvents. YVES VOLMAR and BJØRGE HANSEN: The alcoholysis of olive oil. By fractional distillation under pressures below 1 mm., methyl palmitate, oleate and methyl arachidate were isolated. ALFRED SILBERSTEIN: The crystalline parameters of the double bromide of copper and ammonium. This double salt, like the corresponding chloride, is quadratic. The parameters resulting from an X-ray study are given. JACQUES BOURCART: The quaternary in the Meknès (Morocco) district. SIVASUNDEN DEB: The discovery of nummulites in the nummulitic grits of the Alpes-Maritimes, and on the origin of this series of strata. G. DENIZOT: The distribution of the lower alluvia in the Loire valley. FRANCK BOURDIER: The stratigraphy of the quaternary ante-Wurmian alluvia of the Grésivaudan and of the Chambéry valley. RAYMOND DECARY: The Mahajamba River of Madagascar and its temporary captures by the Kamoro. Details of the five changes of course of this river since 1864, conditioned by changes in the rainfall in this region. DENIS BACH and JEAN FOURNIER: The assimilation of oxalic acid by *Aspergillus niger*. ANDRE BOIVIN, MAX MARBE, M^{me}. LYDIA MESROBEANU and PETRE JUSTER: The existence in *Bacillus tumefaciens* of an endotoxin capable of causing the formation of tumours in plants. JOSEPH MAGROU: The immunity and hypersensibility of the *Pelargonium* towards reinfections by *Bacterium tumefaciens*. J. ANDRE THOMAS: A new mode of direct cellular multiplication. Meroamitosis. PIERRE LESNE: Certain faunistic relations between Madagascar and south-eastern Africa. LEON BINET and G. WELLER: The liver and glutathione. JACQUES PARROT: The formation of hydrocyanic acid, starting with some organic compounds, in the presence of ammoniacal copper sulphate. This appears to be a general property of reducing sugars. Carbon monoxide and formaldehyde give no hydrocyanic acid under the same conditions.

LENINGRAD

Academy of Sciences (*C.R.*, 3, No. 4; 1935). P. K. RASHEVSKIJ: Metric duality in Finsler's two-dimensional geometry, particularly on an arbitrary surface. J. SEKERZH-ZENKOVICH: On the theory of currents. V. M. CHULANOVSKIJ: The rotation structure of the nitrogen molecule in the Schumann region. S. A. ARZYBYSHEV: Note on the paper "On the electrolysis of copper in rock salt" (*C.R. Acad. Sci.*, 4, 25; 1934). A. ZHUCHOVICKIJ: A new method of solution of variation problems of quantum mechanics. N. A. PREOBRAZHENSKIJ, A. M. POLIAKOVA and V. A. PREOBRAZHENSKIJ: Alkaloids of the leaves of jaborandi (6). Synthesis of racemic homopilopic acid. M. M. KATZNELSON and M. I. KABACHNIK: Amination with sodium and potassium amides. (4) Nitration of α -amino-anabasine. A. E. FERSMAN: The periodic system of energy coefficients. V. A. DEVIATNIN and V. M. DOROSHENKO: A chemical method for determining vitamin C. F. LOEWINSON-LESSING: The chemical composition of tectites. A. M. DJAKONOV: New Ophiurans from the Sea of Japan (1). S. A. CHERNOV: New data on the distribution of the Indian snake *Lycodon striatus*, Shaw, in Soviet Middle Asia.

Forthcoming Events

[Meetings marked with an asterisk are open to the public.]

Saturday, December 28

ROYAL INSTITUTION, at 3.—Dr. C. E. K. Mees: "Photography" (Christmas Juvenile Lectures. Succeeding lectures on December 31 and January 2, 4, 7 and 9).

Official Publications Received

Great Britain and Ireland

Department of Scientific and Industrial Research. Report of the Water Pollution Research Board for the Year ended 30th June 1935; with Report of the Director of Water Pollution Research. Pp. iii+51. (London: H.M. Stationery Office.) 1s. net. [3011
Centenary of the Birth of Andrew Carnegie. The British Trusts and their Work, with a Chapter on the American Foundations. Pp. x+155+29 plates. (Dunfermline: The Carnegie United Kingdom Trust.) [212
University of London: University College. Calendar, Session 1935-1936. Pp. xcii+578+26. (London: Taylor and Francis.) [212
Anniversary Address delivered before the Royal Society of London by the President, Sir Frederick Gowland Hopkins, November 30th, 1935. Pp. 26. (London: Royal Society.) [212

Other Countries

Union of South Africa: Fisheries and Marine Biological Survey. Report No. 12: For the Year ending December 1934. By Dr. Cecil von Bonde. Pp. 120+3 plates. (Pretoria: Government Printer.) [412
Publications of the Dominion Observatory. Ottawa. Vol. 12: Bibliography of Seismology. No. 7: July, August, September, 1935 (Items 2723-2841.) By Ernest A. Hodgson. Pp. 141-156. (Ottawa: King's Printer.) 25 cents. [412
Tectonic Lines of the Philippine Islands. By the Rev. W. C. Repetti. Pp. 57-71+1 plate. (Manila: Bureau of Printing.) [912
U.S. Department of Agriculture. Leaflet No. 109: Eliminating Bats from Buildings. By James Silver. Pp. 5. (Washington, D.C.: Government Printing Office.) 5 cents. [912
Commonwealth of Australia: Council for Scientific and Industrial Research. Bulletin No. 66: The Influence of Growth Stage and Frequency of Cutting on the Yield and Composition of a Perennial Grass—*Phalaris tuberosa*. (Report on Co-operative Investigations at the Waite Research Institute.) By Dr. A. E. V. Richardson, H. C. Trumble and R. E. Sharper. Pp. 35. (Melbourne: Government Printer.) [912
Ingeniørvidenskabelige Skrifter. A, Nr. 41: The Plate-Jet. By Jul. Hartmann. Pp. 108+19 plates. (København: G. E. C. Gad.) 15.00 kr. [912
The Indian Central Cotton Committee: Its Objects, Activities and Achievements. Second edition. Pp. 27. (Bombay: Indian Central Cotton Committee.) [912