

graphs of these fringes is described.—On the freezing of meat by cold liquids, by M. Th. Schloesing. A new method for freezing and preserving large quantities of meat is described.—The active elasticity of muscle, and the energy used in its creation, in the case of dynamic contraction, by M. A. Chauveau.—On linear differential equations, by M. Cels.—Method of measuring the difference of phase of the rectangular components of a refracted light-ray, by M. Bouasse.—On the measurement of the vapour-tension of solutions, by M. Georges Charpy. The author uses the condensation hygrometer to determine indirectly the tension of the vapour above the solution employed.—On the laws of Berthollet, by M. Albert Colson.—Researches on the double nitrates of rhodium, by M. E. Leidié. Double nitrates of rhodium and potassium, sodium, ammonium, and barium respectively are described, methods of preparation and properties of each salt being given.—On some combinations of camphor with phenols and their derivatives, by M. E. Léger. Many of the compounds obtained yield crystals of definite form and constant composition, and are hence proved to be true compounds.—On mannite hexachlorhydrin, by M. Louis Mourgues. The method of preparation and properties of this body are given; its analysis indicates that it possesses the formula $C_6H_8Cl_6$, Raoult's method gives its molecular weight as 278; the writer is of opinion that its constitution corresponds to $CH_2Cl(CHCl)_4CH_2Cl$.—On some new derivatives of β -pyrazol; a contribution to the study of the nitric ethers, by M. Maquenne.—Researches on the division of the embryonic cellules among the Vertebrata, by M. L. F. Henneguy.—On the colouring reagents of the fundamental substances of membrane, by M. L. Mangin. The author compares the action of colouring matters of membrane with their chemical composition, and establishes the results furnished by the colouring reagents by chemical analyses of the tissues.—On the expansion of silica, by M. H. Le Chatelier. The experiments show that amorphous silica expands very little between $600^\circ C.$ and $1000^\circ C.$ Quartz expands regularly up to nearly 600° , and then reaches a point where increase of temperature causes contraction. Calcined chalcidony expands slowly up to 200° , then the coefficient of expansion is enormously increased for a time, but finally it returns to the original value. Tridymite behaves much like chalcidony, expanding slowly up to about 120° , when an abrupt change takes place; the slow expansion then returns again, and finally contraction takes place with increase of temperature. Thus the change in the coefficient takes place at a higher temperature in the minerals of high density (quartz, chalcidony) than for those of lower density (tridymite and calcined chalcidony).—Analysis of the menilite of Villejuif, by M. Auguste Terrell.—On the prediction of storms by the simultaneous observation of the barometer and the higher atmospheric currents, by M. G. Guilbert.

AMSTERDAM.

Royal Academy of Sciences, June 28.—Prof. van de Sande Bakhuizen in the chair.—Dr. Beijerinck described experiments relating to the culture of *Zoöchlorella*, Lichen gonidia, and other lower Algae in a pure state.—The same speaker treated of the artificial infection of *Vicia Faba* with *Bacillus radicolica*. Twelve pots filled with sterilized river-sand, which was rendered very poor in nitrogen by washing with distilled water, were divided into four sets, each of three. On April 25, a well-sterilized seed of *Vicia Faba* was planted in each pot. The pots were of such a construction that the dust of the air was wholly excluded from the sand, and the watering could also take place under perfect dust-exclusion. The first set was watered with a mixture of 0.1 monopotassium phosphate, 0.03 calcium chlorate, 0.06 magnesium sulphate, pro 1 litre distilled water; the second set with the same mixture; the third set with the same mixture, to which was added 0.2 gr. calcium nitrate; the fourth set with the same mixture, to which was added 0.2 gr. ammonium sulphate. When the plants had developed their second leaf, the three pots of the first set, and one single pot of each of the three latter sets, were infected with a gelatine culture of *Bacillus radicolica* var. *fabae*, cultivated in 1889 from the tubercles of *Vicia Faba*, and since that time kept in successive cultures. The bacteria wherewith the infection took place were mixed with sterilized common water. On June 20 there was found on one old cotyledon a *Penicillium*, and therefore the experiment was not further continued. All the plants were taken from the pots, and their roots well washed and examined; every single one of the six in-

fecting plants bore many tubercles, whilst no single one of the six remaining not infected plants showed the least sign of tubercles. The presence or absence of nitrogen as nitrate or as ammonium is therefore indifferent with regard to the practicability of the infection. By another set of experiments it was shown that gelatine cultures of *Bacillus ornithopi*, cultivated in 1889 from the tubercles of *Ornithopus perpusillus*, had no power to infect *Vicia Faba*. But negative results are not equal to positive in value.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

Evolution of Photography: J. Werge (Piper and Carter).—Higher Geometry, W. J. Macdonald (J. Thin).—Zoological Types and Classification: W. E. Fothergill (J. Thin).—Principles of General Organic Chemistry: Prof. E. Hjelt, translated by J. Bishop Tingle (Longmans).—Philosophy of Tumour Disease: C. Pitfield Mitchell (Williams and Norgate).—Diseases of Crops and their Remedies: A. B. Griffiths (G. Bell and Sons).—Principles of Economics, vol. i.: A. Marshall (Macmillan and Co.).—Elementary Text-Book of Heat and Light: R. Wallace Stewart (W. B. Clive and Co.).—Quarterly Review, July (Murray).—The Forum, July (New York).—Electrical Engineer's Pocket-Book: H. R. Kempe (Lockwood).—Monograph of the British Cicadæ, Part III.: G. B. Buckton (Macmillan and Co.).

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