

the depression of the freezing point of a strong solution of calcium chloride is more than five times as great as that calculated from the number of ions present in the solution. Each ion appears to appropriate no less than 9 molecules of water. The factor $a=9$ gives a very good approximation to the freezing-point curve, as far as the uncertainty of the data permit. When $N=an$, the vapour-pressure would be reduced to zero, according to the formula, but the formula ceases to apply when the vapour-pressure of the compound molecules themselves becomes equal to that of the solution. At or before this point the molecules will dissociate with the formation of lower hydrates. Many analogous phenomena are already known, and a more complete study of the vapour-pressures of strong solutions may be expected to throw additional light on the subject.

The essential point of the theory here sketched is that the equilibrium existing in a solution is one between definite chemical compounds and the solvent, giving rise to a simple vapour-pressure relation by means of which the phenomena may be studied and elucidated. There is a great deal of work to be done before such a theory can be regarded as established, but in the meantime it may serve very well as a working hypothesis for correlating experimental results and suggesting new lines of investigation. Regarded in this light, the vapour-pressure theory may serve a useful purpose, and, judging by the experimental data at present available, I think I may fairly claim to have made out a good *prima-facie* case for the theory.

NOTE.—The vapour-current indicator is a development of the old smoke-jack. A light spiral vane with a mirror attached is suspended in a tube, which nearly fits it, by means of a quartz fibre. Joule (Proc. Phil. Soc., Manchester, vii., 35) employed a wire spiral suspended by a silk fibre for indicating air currents, but does not seem to have adapted it for purposes of exact measurement. The instrument shown in the lecture gave a deflection of 30° (500 mm. at 1 metre) for a velocity of air current 0.01 cm./sec. The sensitiveness might easily have been increased, but the above amply suffices for most purposes.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

REUTER'S Agency states that the Hong Kong and Shanghai Bank has made a donation of about 4500l. to the Hong Kong University.

PROF. W. OSLER, F.R.S., will deliver the inaugural address of the winter session of the London School of Tropical Medicine on Tuesday, October 26.

MR. W. H. HADOW, fellow and tutor of Worcester College, Oxford, has been appointed principal of Armstrong College of Durham University at Newcastle-on-Tyne, in succession to Sir Isambard Owen, who has accepted the Vice-Chancellorship of Bristol University.

WE learn from *Science* that the College of Agriculture of the University of the Philippines, situated at Los Banos, opened on June 14 last with about sixty students. Prof. E. B. Copeland is dean and professor in botany; Prof. H. Cuzner, professor of agronomy; Prof. E. M. Ledyard, professor of zoology; and Prof. S. B. Durham, professor of animal husbandry.

A CORRESPONDENT asks us to mention that a man with a science training and degree is wanted for a vacant post in an advanced mission college in South China. The Chinese are eager to acquire the secrets of Western power, and a teacher with the science qualifications required would have a fine opportunity of assisting to make history in that great land.

WE learn from the *Pioneer Mail* that on July 14 the Governor of Madras opened a new agricultural college and research institute at Coimbatore. The building is designed both for teaching and research work. A special set of rooms is set apart for chemistry, botany, entomology, and mycology. A physical laboratory is provided, as well as ample accommodation for the Madras herbarium

and a library. The cost of the new institution, including the surrounding farm, has been eight lakhs. The Governor, during the course of his remarks, said that as the demands of scientific agriculture grow and the necessity for expansion arises, the Government will not hesitate to increase the capacity of the institution.

SOCIETIES AND ACADEMIES.

PARIS.

Academy of Sciences, August 9.—M. Bouquet de la Grye in the chair.—The thermal effects of moistening soils: A. Müntz and H. Gaudechon. Certain dry soils, when moistened, give out an appreciable amount of heat, and it is possible that this thermal phenomenon may have an effect on the growth of plants. Measurements with different soils gave an evolution of heat varying from 0.9 to 6.6 calories per kilogram, and a systematic levigation showed that the finest particles caused nearly all the heat evolution.—Magneto-anodic phenomena: M. Gouy. The phenomenon described accords to a certain extent with the theory of M. Fortin, which regards the magneto-kathode rays as formed of spirals of electrons.—Discontinuous singularities of uniform analytical functions: A. Denjoy.—Tides and the crust and the elasticity of the terrestrial globe: Ch. Lallemand. The author has shown in a previous note that the principal modes of determination of the rigidity of the globe lead to different results. The theory developed in the present paper removes this anomaly.—The different species of asymmetrical intensities, observed for the magnetic components, polarised circularly, of the absorption bands of uniaxial crystals: Jean Becquerel.—The decomposition of carbon dioxide by the ultra-violet rays: H. Herchefinkel. The decomposition of carbon dioxide into oxygen and carbon monoxide by the action of the ultra-violet rays has been proved; a similar result has been obtained with the radium emanation, confirming the observations of Ramsay and Cameron.—The intervention of osmotic pressure in dyeing: M. Rosenstiehl.—A method for the rapid estimation of metallic aluminium: E. Kohn-Abrest. The metal is heated to 300° C. first in hydrogen, and then in pure hydrochloric acid gas, followed again by hydrogen. The aluminium is volatilised as chloride, and the metal determined indirectly by a determination of the chlorine.—Attempts at benzidination in the diphenyl, diphenylamine, and diphenylethane series: H. Duval.—The ethyl acetal of tetrolic aldehyde: P. L. Viguer. Dibromo butyric aldehyde was obtained by the addition of bromine to crotonaldehyde; the application of Claisen's method to this aldehyde gave, not the tetrolic aldehyde desired, but its ethyl acetal.—Some parasitic diseases of *Cinnamomum zeylanicum* of Ceylon: D. Bois and C. Gerber.—Vaccination of cattle against tuberculosis: M. Rappin. The bacilli used in these injections were modified by the action of sodium fluoride; it has been shown that the resistance of the animal to tuberculous infection is increased by the treatment almost to the point of immunisation.—The glucoses of the urine: F. Landolph. Each species of glucosuria or diabetes corresponds, in the urine, to the presence of mixtures of several kinds of sugars, and it may be supposed that these differences correspond to diseases of different organs.—The preservation and increase of digestibility of distillery pulps and of green ensilage by a rational fermentation by inoculation: J. Croibois.—The suprarenal capsules and their exchanges between the blood and tissues: J. Athanasiu and A. Gradinesco. The experiments on a dog and a cat described lead to the conclusion that the death of animals deprived of the suprarenal capsules is due to the arrest of the exchanges between the blood and the tissues.—Contribution to the study of urinary indosis in diabetic subjects: H. Labbé and G. Vitry.—The variation of an oxidising enzyme during metamorphosis in *Limnophilus flavicornis*: Xavier Roques.

CAPE TOWN.

Royal Society of South Africa, June 16.—Dr. R. Marloth in the chair.—Some points in the morphology and biology of a new species of Haworthia: Dr. S. Schönland. The author gives a full description of the only species of Haworthia with strictly distichous arrangement

of leaves. The leaves are to a large extent underground, the exposed parts resembling small pebbles, so that this plant may be classed amongst the so-called "mimicry-plants." The structure of the leaves is adapted to the peculiar mode of life of the plant. The truncate apex is without chlorophyll, thus forming a "window," through which light can reach, by way of the central transparent tissue, the assimilating tissue which extends to the underground basal parts of the leaves.—The absorption of water by the aerial organs of some succulents: Dr. S. Schönland. The author describes numerous experiments, from which he has drawn the following conclusions:—*Mesembrianthemum barbatum* and *Anacampseros flamentosa* cannot absorb any appreciable quantity of water through their aerial organs. *Crassula cymosa* can do so to a small extent, which, however, cannot be of any practical importance under natural conditions. The marginal papillæ of this species are certainly not water-absorbing organs.—Note on an abnormal seedling of *Widdringtonia cupressoides*: E. P. Phillips, and a brief account of the vascular system of the normal seedling: H. S. Morrie.—Some new South African succulents, part ii.: Dr. R. Marloth. Among the succulents described in this paper are a few with a very peculiar structure of their leaves. Last year the author exhibited a species of Bulbine with window-leaves, pointing out that such a structure had not been observed as yet on any other plant. The very succulent, nearly egg-shaped leaves of the plant remain embedded in the ground, hence the blunt apex only becomes visible. Here the green tissue is absent, being confined to the sides of the leaf. As the sides are surrounded by soil, the light cannot reach them in the ordinary way, but only by entering through the window at the apex, illuminating the leaf from within. Since then the writer found five other species of plants with such window-leaves. They are all stemless succulents, their leaves remaining embedded in the ground, and showing only the flat or convex apex, which is entirely devoid of green tissue. Hence, as in the case of the Bulbine, the light can reach the green tissue of the leaf only through the window, illuminating the leaf from within. It is considered that this structure is principally a contrivance for the protection of the green tissue against the destructive action of too severe sunlight.

NEW SOUTH WALES.

Linnean Society, June 30.—Mr. C. Hedley, president, in the chair.—Studies on Tunicata, No. 1: H. L. Kesteven. One genus allied to *Polyclinum* and *Sidnyum* (*Polyclinidae*), and three species referable to the genera *Corella*, *Molgula*, and *Dendrodoa*, from Tasmania or New South Wales, are described as new, and detailed descriptions are given of *Ciona intestinalis*, var. *sydneiensis*, Stimpson, and var. *diaphnea*, Quoy and Gaimard.—Second supplement to the "Revision of the *Cicindelidae* of Australia": T. G. Sloane.—The hexone bases of egg-white: Dr. J. M. Petrie and Dr. H. G. Chapman. This paper deals with the separation and estimation of the hexone bases among the products of the hydrolysis of the proteins of egg-white. By the method of Kossel and Patten, arginin, histidin, and lysin were isolated and identified from egg-white digested with 25 per cent. H_2SO_4 . The amounts of lysin, histidin, and arginin present in 100 gm. protein of egg-white were:—lysin, 3.19 gm.; histidin, 0.66 gm.; and lysin, 2.39 gm. Certain improvements in the method of separation are also described.—Notes on the native flora of New South Wales, part vii., eastern Monaro: R. H. Cambage. The general botany of the area lying chiefly to the east of Cooma and Nimitybelle is reviewed. The absence of forest growths on the Monaro plains, which are largely basaltic, is a striking feature, and it is suggested that the rigid winter climate, dry summer atmosphere, moderate rainfall (being less than 20 inches annually at Cooma), together with the basic nature of the rocks, in view of the low rainfall, all contribute to hinder the growth of large trees. Where the formation contains a high percentage of silica forest trees are found, and this is thought to be possibly owing to physical properties rather than to chemical constituents, resulting in capillarity being induced by the siliceous particles in the soil, thereby enabling it to supply moisture in dry times better than the soils formed from

the basic rocks. The unexpected occurrence of a rare species of *Eucalyptus*, *E. pulviger*, first discovered by Allan Cunningham nearly ninety years ago at Cox's River, and now known to occur only in three localities, was of interest. The abrupt change in the flora, where the eastern and western aspects meet on the Main Dividing Range near the head of the Kybean River, is commented upon. Description of a new species of *Eucalyptus* from the Monaro district, N.S.W.: R. H. Cambage. This species, for which the name *Eucalyptus parvifolia* is suggested, has so far only been found near the head of the Kybean River, on eastern Monaro. It frequents the flats in company with *E. stellulata*, attaining a height of from 20 feet to 30 feet, and having a smooth gum-tree bark. Its most remarkable feature is that it retains a large percentage of the juvenile foliage until the trees are nearly full-grown, the length of these leaves being rather less than 1 inch.

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