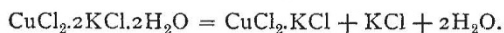


to coincide with the Tertiary period, is pushed back farther and farther into the Secondary; a flora in the United States, otherwise Jurassic in facies, containing no less than seventy-five species, or more than 20 per cent. of Phanerogams, according to Lester Ward. In England the mysterious Wealden, which from analogy should preserve rich fossil floras shedding light on the origin of Angiosperms, yields little but tubers and stems of Equisetum, scraps of ferns and conifers, and a unique liliaceous stem; while our Greensands, Gault, and Chalk afford little or nothing from which the existence of flowering plants during their deposition could be inferred. The veil which has proved absolutely impenetrable in our country, and has so long enshrouded the dawn of dicotyledonous vegetation, seems, however, about to be lifted, and we wait with the utmost interest the publication of the infra-Cretaceous floras of the Potomac by Prof. Fontaine, and of the oldest European Dicotyledons, from the beds of Gault age in Portugal, by Saporta. Though, however, the forms will be revealed, a long time must probably elapse before we can hope to rightly interpret them.

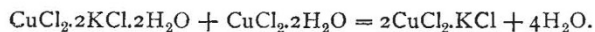
J. STARKIE GARDNER.

ON THE INFLUENCE OF HEAT ON COPPER POTASSIUM CHLORIDE AND ITS SATURATED SOLUTION.¹

THE blue crystals of copper potassium chloride, $\text{CuCl}_2 \cdot 2\text{KCl} \cdot 2\text{H}_2\text{O}$, when heated to upwards of 100° , change their colour, and a closer investigation proves such is due to the formation of a new brown salt, $\text{CuCl}_2 \cdot \text{KCl}$, according to the equation—



This same new substance can be obtained at lower temperatures, on heating the blue double salt in presence of copper chloride; it then results according to the following symbols—



Both transformations are reversible—*i.e.* the primitive substances are obtained anew on cooling, and both take place at definite temperatures, 93° and 56° respectively, which temperatures can be accurately determined in studying the abrupt change of volume which accompanies that of chemical composition.

The temperatures of 56° and 93° are, moreover, characterized by an intersection of three curves of solubility in each case, *viz.*—

1. At 56° the following three will meet—

- (a) That of the system $\text{CuCl}_2 \cdot 2\text{KCl} \cdot 2\text{H}_2\text{O}$; $\text{CuCl}_2 \cdot 2\text{H}_2\text{O}$.
- (b) That of the system $\text{CuCl}_2 \cdot 2\text{KCl} \cdot 2\text{H}_2\text{O}$; $\text{CuCl}_2 \cdot \text{KCl}$.
- (c) That of the system $\text{CuCl}_2 \cdot \text{KCl}$; $\text{CuCl}_2 \cdot 2\text{H}_2\text{O}$.

2. At 93° —

- (a) That of the system $\text{CuCl}_2 \cdot 2\text{KCl} \cdot 2\text{H}_2\text{O}$; ClK .
- (b) That of the system $\text{CuCl}_2 \cdot 2\text{KCl} \cdot 2\text{H}_2\text{O}$; $\text{CuCl}_2 \cdot \text{KCl}$.
- (c) That of the system $\text{CuCl}_2 \cdot \text{KCl}$; ClK .

Lastly, those same temperatures are characterized also by an intersection of four vapour pressure lines at each, *viz.*—

1. At 56° those of the above-mentioned three saturated solutions, and that of the dry blue salt, mixed with copper chloride, meet.

2. At 93° those of the other three mentioned above and that of the dry blue salt, mixed with potassium chloride.

J. H. VAN'T HOFF.

¹ Abstract of a paper read at the Leeds meeting of the British Association.

THOMAS CARNELLEY.

BY the death of Prof. Carnelley the science of chemistry in this country has suffered an irreparable loss. It appears that some little time ago Dr. Carnelley had been suffering from an attack of influenza, and it was whilst returning to Aberdeen after a journey to the south, made with the object of recruiting his health, that he was seized with sudden and severe illness, which was due, as his medical attendants discovered, to the formation of an internal abscess. Surgical aid proved unavailing, the patient's strength gradually gave way, and Dr. Carnelley passed away at mid-day of August 27, at the comparatively early age of thirty-eight.

Prof. Carnelley was a native of Manchester, the son of Mr. William Carnelley, Chairman of the directors of Messrs. Rylands, Limited, of that city. His early education was received at King's College School, London, and it was during this period, whilst attending the evening classes at King's College, that Carnelley began the study of that science with which he in after life identified himself. In 1868 he entered the Owens College, Manchester, gaining one of the Dalton Entrance Mathematical Exhibitions. During his career as a student, an exceptionally brilliant one, he busied himself not only with the study of the many subjects required of graduates in science of the London University, but found time to devote special attention to his favourite science, and carried out an original investigation on the vanadates of thallium, for which he received in 1872 the Dalton Chemical Scholarship. In this year also he obtained the degree of Bachelor of Science of the University of London, gaining at the final examination for this degree marks qualifying for the scholarship in chemistry, in consequence of which he held the Dalton Chemical Scholarship for an additional year. During the next two years he acted as private assistant to Prof. Roscoe, and commenced his career as a teacher by giving lectures in connection with the evening classes of the Owens College. During the year 1874-75 he continued his studies at the University of Bonn under Profs. Kekulé, Zincke, and Wallach; and on his return to England in 1875 was appointed Demonstrator and Assistant-Lecturer in Chemistry in the Owens College under Prof. Roscoe. During the time that he held this appointment he also acted as Principal of the North Staffordshire School of Science at Hanley, where his teaching proved eminently successful. In 1879 Carnelley, who had taken the London degree of D.Sc., was appointed to the newly-founded chair of chemistry in the Firth College, Sheffield, and, after three years' successful work in this institution in fitting up the chemical laboratory and inaugurating the teaching of chemistry in this College, he passed on to the then recently endowed University College of Dundee. Here ample means were placed at his disposal, and he had the satisfaction of superintending the erection of a block of buildings in which are located the chemical laboratories, lecture-rooms, &c., which he had designed and carefully planned. Under his guidance the Chemical Department of the Dundee College rapidly developed; his enthusiasm, his forgetfulness of self, his unstinted energy, and his ability and zeal as a teacher, all combined to make his department the most important one in the new College and to endear him to his students. Signally successful as was Carnelley's career in Dundee as a professor of chemistry, he also in many other ways conferred lasting benefits on the town and its inhabitants, amongst whom he spent six years, perhaps the most active of his life, and his acceptance of the appointment to the chair of chemistry at the University of Aberdeen in 1888 caused universal regret in Dundee.

Amidst his many duties, first at Owens College, then at Firth College, and afterwards at University College, Dundee, where he conducted both day and evening