ALLEGED DIMERIC CONSTITUTION OF ETHYLENE DIAMINO CUPRIC CHLORIDE

CUPRIC CHLORIDE is known to give with ethylene diamine three types of salts to which the formulæ Cu en cl_2, Cu en_2 Cl_2 and Cu en_3 Cl_2 are usually given. In a recent paper[1] F. N. Chattaway and H. D. K. Drew observe that the supposed ethylene diamino cupric chloride Cu en Cl_2 is in reality a dimeric substance *bis*ethylene diamino cupric cuprichloride [Cu en_2] Cu Cl_4. The proof given for the dimeric structure is that it forms, according to their observation, the copper compound [Cu en_2] Pt Cl_4 with an aqueous solution of potassium chloroplantinite. The reaction has been supposed to take place in the following manner:

$$[\mathrm{Cu\ en_2}]\mathrm{Cu\ Cl_4} \xrightarrow{\mathrm{K_2\ Pt\ Cl_4}} [\mathrm{Cu\ en_2}]\mathrm{Pt\ Cl_4} + \mathrm{K_2\ Cu\ Cl_4}$$

Grienberg previously prepared this chloroplatinite from Cu en_2 Cl_2 and potassium chloroplatinite and described it as a violet red substance. Chattaway and Drew on the other hand observe it to be lilac pink in colour. The latter investigators represent the yellow substance obtained by Grossmann by the action of hydrochloric acid on ethylene diamino cupric chloride by the formula [en H_2] Cu Cl_4. They also attribute a dimeric constitution to the isobutylene analogue of the supposed *bis*-ethylene diamino cupric cuprichloride.

The present author first tried to find out whether propylene diamino cupric chloride obtained as a greenish blue precipitate from a molecular proportion of aqueous cupric chloride dihydrate and a molecule of propylene diamine, could be given the dimeric formula [Cu pn_2] Cu Cl_4. The monohydrate (m.p. 120°) dissolved in water and with hydrochloric acid gave the double chloride Cu pn H_2 Cl_4. It did not however form the chloroplatinite [Cu pn_2] Pt Cl_4 which was readily obtained from the deep purple aqueous solution of *bis*-propylene diamino cupric chloride Cu pn_2 Cl_2 and potassium chloroplantinite. The chloroplatinite [Cu pn_2] Pt Cl_4 was lilac pink and was also easily formed by the unstable *tris*-salt evidently by its decomposition to the *bis*-salt. It was noted that with excess of Cu Cl_2, the chloroplatinite of *bis*-propylene diamino cupric chloride yielded a greenish product, apparently the same substance which was produced by the action of potassium chloroplatinite on propylene diamino cupric chloride. It was difficult to separate the green substance from solution by filtration. Whether it is propylene diamino cupric chloroplatinite [Cu pn] Pt Cl_4 or not has yet to be ascertained. It may also be mentioned that ammonium chloroplatinate which is sparingly soluble in water readily formed a violet red chloroplatinate [Cu pn_2] Pt Cl_6 both from *bis* and *tris* propylene diamine salts of cupric chloride but not from the product obtained by mixing equimolecular proportions of cupric chloride and the diamine. The lilac pink chloroplatinite and the violet red chloroplatinate are precipitated only when there is more than a molecular proportion of propylene diamine for a molecule of the copper salt. Having failed to obtain any proof of the diameric structure in case of propylene diamino cupric chloride, experiments were performed with ethylene diamino cupric chloride. But the results obtained were exactly similar to the above. The present author therefore does not think that there is sufficient reason for giving a dimeric formula to ethylene diamino cupric chloride. It may simply be represented as the mono compound Cu en Cl_2.

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[1] *J. Chem. Soc.*, 1937, 947.

TWO NEW GENES FOR COROLLA COLOUR IN *CICER ARIETINUM* L.

AN extensive survey of morphological variability in *Cicer arietinum* L., has shown the occurrence of plants with various coloured petals. These are usually found to be white, greenish-white, blue and pink.[1,2] Variations among the pink types have also been noted.[2] The genic analysis of petal colours in gram, however, has so far revealed only the presence of four genes, W, B, P and C.[3,4,5] According to Ayyar and Balsubramaniam,[5] the genes B and C are complementary and produce blue colour in petals. In the presence of C, the gene P converts blue to pink, thus it is considered as a supplementary gene. White petals result in the absence of any one of the three genes either alone or in combination except when B and C are together. The gene W suppresses greenness changing greenish-white standard to white. Its relation to other genes is not known.[3]

While working for the genetic improvement of gram in Bombay the writers have found in local material pink and white flowered plants. So far neither local nor hybridized material in gram with us has shown the presence of blue-flowered plants. We have, however, found two distinctly new petal colour types which do not seem to have been reported so far. One of them has light salmon coloured petals and is easily distinguishable from the normal pink type. This type originates from a solitary plant discovered in a field of local gram at the Cereal Breeding Station, Niphad, in the year 1932. The other type has very light purplish petals but dark purple veins. This was discovered in a local sample obtained from Chikodi, Belgaum District, and grown at Niphad in the season of 1936.

Crosses of the salmon type with a normal pink type, showed the dominance of the latter in the F_1 and a monogenic segregation in the F_2 (57 pink : 19 salmon). When crossed with a white-grained and white-flowered type the F_1 showed pink flowers, and in F_2 a ratio of 9 pink : 3 salmon : 4 white flowers (actual numbers 45 : 13 : 19) was obtained. The F_3 confirmed the F_2 behaviour. We may, therefore, consider the salmon type to be due to a distinct gene. We propose to designate this gene as Sa.

Only one cross involving the purple-veined type is available. This consists of a white-flowered and yellow grained type. The F_1 was purple-veined and in F_2 a monogenic ratio of the two colours (actual numbers 34 and 15) was obtained. Its relation with other types is under investigation but it may be concluded that the purple-veined flowers are caused by a distinct gene, which we have designated as Pu.

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January 21, 1941.

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ADVENTITIOUS ROOTS OF RAGI (*ELEUSINE CORACANA*, GAERTN.)

It is a well-known fact that in all grasses there is a ring of root-meristem at the base of each node. From this region the roots are induced to grow and function as normal ones whenever the nodes come in contact with the humid soil. The stems when broken can establish themselves as new plants. This capacity to form the roots at the nodes may be considered as one of the chief causes for the rapid multiplication and spread of the grasses and also the dominant position they occupy to-day in the plant kingdom.

This quality has been since very early times made use of in the propagation of some of the cultivated grasses as sugarcane. In the cultivated sorghums also, the adventitious roots are developed to a greater or smaller extent in all the nodes (Ayyangar, G. N. R., and Rao, V. P.[1]). New plants of sorghum have been successfully raised by setts as in the case of sugarcane (Thomas, R., and Venkataraman, T. S.,[2]