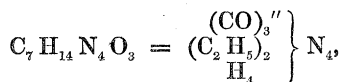
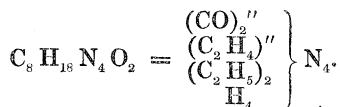


If we endeavour to form an idea regarding the constitution of this compound, it is obvious that it may be referred to four molecules of ammonia,

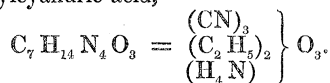


when it presents itself as a tetramine, as a urea of a higher order, and becomes in a measure analogous to some of the ureas of diatomic bases lately studied by Dr. Volhard\*, more especially to ethylene-diethyl-urea,



The latter compound differs from the crystalline substance produced by the action of cyanate of ethyl on urea by the presence of the diatomic molecule  $\text{C}_2\text{H}_4$ , in the place of the diatomic molecule CO.

The formula of the new compound represents also the ammonium-salt of diethylcyanuric acid,



The substance, however, is not an ammonium-salt *proprement dit*. Acids separate no diethylcyanuric acid; the alkalis in the cold evolve no ammonia; dichloride of platinum produces no precipitate in the aqueous solution.

The mother-liquor, from which the new compound has been deposited, contains cyanurate of ethyl and ethyl-urea, the formation of which substances requires no special explanation.

#### XI. "Notes of Researches on the Poly-Ammonias."—No. XIII.

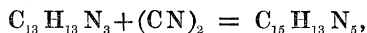
Derivatives of the Phenyl-Series. By A. W. HOFMANN, LL.D., F.R.S. Received May 24, 1861.

Some years ago I pointed out the existence of a peculiar class of bases, which are formed by the union of the aromatic ammonias with cyanogen. Only two of these compounds, cyaniline and dicyan-melaniline, have as yet been more particularly examined. I have of

\* See previous notice.

late had occasion to return to the study of these bodies, and to make an observation which I beg leave to communicate to the Royal Society.

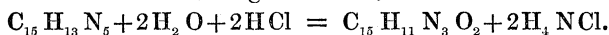
The product which is formed by the union of one molecule of melaniline and one molecule of cyanogen, the compound known as dicyanomelaniline,



has feebly basic properties; it dissolves in acids, and may be reprecipitated from these solutions without change. It cannot, however, remain in contact with acids without being entirely altered. After a few minutes the limpid solution becomes turbid, and deposits an indistinctly crystalline body containing

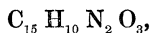


an ammoniacal salt remaining in solution,

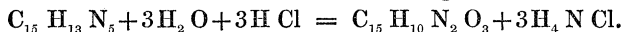


I have described this substance as *melanoximide*; it may be considered as the primary oxalate of melaniline *minus* 2 molecules of water, which are capable of being assimilated again under the influence of the alkalis, oxalic acid and melaniline being reproduced.

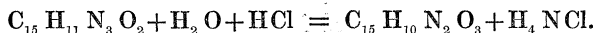
Dicyanomelaniline, when submitted in alcoholic solution to the action of acids, undergoes a perfectly different change. The boiling solution deposits on cooling splendid needles of an indifferent body of the composition



an ammoniacal salt, also in this case, remaining in solution,



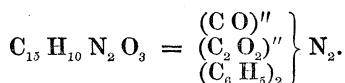
Melanoximide, occupying by its composition a place between dicyanomelaniline and the new compound crystallized in needles, is likewise readily converted into the latter substance. When boiled for a short time with a mixture of alcohol and hydrochloric acid, melanoximide furnishes a solution, which, on cooling, solidifies to a mass of beautiful needles,



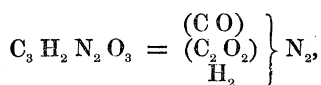
The new compound is insoluble in water, but dissolves easily in alcohol and ether; it is decomposed by boiling with potassa, giving rise to the formation of a carbonate and an oxalate with reproduction of phenylamine,



By this transformation the substance is characterized as the diatomic ammonia-derivative of phenylic alcohol, carbonic and oxalic acids, as *carbonyl-oxalyl-diphenyl-diamide*,

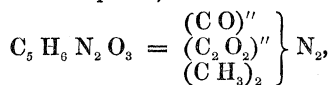


The new substance, both by composition and transformation, is closely allied to some compounds already known. The action of oxidizing agents on alloxan, and even on uric acid, has furnished to Liebig and Wöhler the substance known as *parabanic acid*,



which, by the action of alkalis, is converted into a carbonate, an oxalate and ammonia.

At a later period Stenhouse and Rochleder, when examining the products of decomposition of caffeine under the influence respectively of nitric acid and of chlorine, observed a crystalline compound (nitrotheine, cholestrophane),

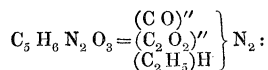


which, under the influence of alkalis, yields methylamine\* together with a carbonate and an oxalate, and may be viewed as *dimethylated parabanic acid*.

The compound which forms the subject of this Note, accordingly may be considered as *diphenylated parabanic acid*.

The transformations of dicyanomelaniline have suggested to me the study of the action of cyanogen upon some compounds having a composition somewhat analogous to that of melaniline. Thus the action

\* According to Rochleder, this compound, when boiled with potassa, yields *ammoniacal vapours*, in which he suspects the presence of *ethylamine*. The formula of the substance also represents an ethyl-compound,

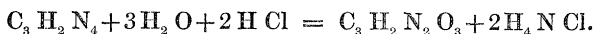


in this case ebullition with potassa should disengage a mixture of ethylamine and ammonia. But the fact that caffeine, when boiled with an alkali, evolves methylamine, renders it more probable that the caffeine-derivative is a methyl-compound. Experimentally the question remains undecided.

of cyanogen upon *cyanamide* might have yielded the compound



which, by acids, should have been converted into parabanic acid,



Cyanamide is, in fact, capable of fixing the elements of cyanogen, being converted into a yellowish amorphous powder, which, when heated with acids, furnishes a beautiful crystalline compound, difficultly soluble in water, and deposited from the boiling solution on cooling in long slender needles.

Cyanamide being very prone to molecular changes, when submitted to the action of chemical agents, I have not yet been able to procure a sufficient quantity of these crystals for a more minute examination. In their properties they entirely differ from parabanic acid.

## XII. "Notes of Researches on the Poly-Ammonias."—No. XIV.

Diagnosis of Diamines. By A. W. HOFMANN, LL.D.,  
F.R.S. Received May 24, 1861.

In former parts of this inquiry I have had repeated opportunities of discussing the features of distinction between the monamines and diamines. I have shown that the study of the genesis and of the transformations of an ammonia, and the observation of its boiling-point supply most valuable data for the elucidation of this question; and that the most reliable inferences may be drawn from the determination of its vapour-density.

In continuing my experiments upon this subject, I have been led to the discovery of a class of salts, the formation of which decides the question in an equally satisfactory manner.

Let us imagine an ammonia of uncertain origin, the composition and degree of substitution of which has been experimentally determined. It is obvious that as long as the boiling-point, and more particularly the vapour-density, remain unascertained, it is left doubtful whether the molecular value of the new compound is represented by

