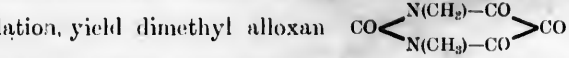
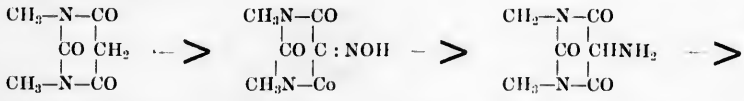
reagent. Now theophyllin has a methyl group less than caffein, and, as both on oxidation, yield dimethyl alloxan  it is clear that the third methyl group does not belong to the alloxan ring; so that theophyllin must be represented by formula VI., in which chlorine is replaced by a methyl group.

Theophyllin can be changed to caffein by the action of methyl iodid on its silver salt. This is one of the prettiest examples of a compound being synthesised by purely scientific considerations. The following formulæ show the relation between the different compounds which led up to it:

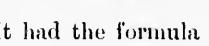


I. Dimethyl alloxan. II. Dimethyl violuric Acid. III. Dimethyl uramil.

IV. Dimethyl pseudo uric acid cyanate. V. Dimethyl uric acid.

VI. Chlortheophyllin. VII. Caffein.

Partial Synthesis.

Atropin—The synthesis of atropin has not been a complete one, yet much successful work has been done in this direction since Liebig determined that its formula was $C_{17}H_{23}NO_3$. Ladenburg, after Kraut and Lossen had split it into two of its components, tropin and atropaic acid, combined these two to form the alkaloid. Investigating the latter product, he found it had the formula  and determined it thus to be α phenyl hydracrylic acid, and the first synthesis of this acid, starting from acetophenon, was due to these observers working in conjunction with Rügheimer. They treated phenyl methyl ketone with phosphorus penta chloride, obtaining the ketone chloride, this treated with alcohol and potassium cyanide the compound  which on saponification after the well-known method with baryta water yields a saturated acid, atrolactic acid, the äthyl ester of which, with strong sulphuric acid, splits off