

## THE DEFENSIVE ACTION OF PRODUCTS OF METABOLISM WITH SPECIAL REFERENCE TO GLYCOCOLL

BY GRAHAM CHAMBERS, B.A., M.B., TORONTO.

Among the products of metabolism of the animal body there are substances which, in addition to their role in nutrition, act as a means of defence against certain poisons of exogenous or endogenous origin. These defensive agents may be said to act in a chemical manner, as they combine chemically with the poisons forming salts, esters, etc., the toxicities of which are less, as a rule, than the free poison. The conjugated poison is excreted usually in the urine. For instance, in acid poisoning (acidosis) ammonia, in place of being converted to urea, tends to neutralize the acids forming ammonium salts, which are excreted in the urine. Thus the amount of ammonia in the urine may be taken as a rough index of the acidosis. Again, in poisoning by phenol, part of the phenol appears in the urine as phenol sulphate, a compound of little toxicity. For the time being the inorganic sulphate may disappear from the urine, the phenol sulphate being formed at its expense. The total sulphate is not increased. In other words, there is no increase in the production of sulphuric acid in carbolic acid poisoning. The amount of sulphate present is dependent on protein metabolism. It would appear as if nature had so arranged that the sulphate of normal metabolism can act as far as it goes as a chemical antidote to poisoning by carbolic acid. I may add that tissue sulphate is also a defensive agent of greater or less potency, against poisoning by many other aromatic compounds such as naphthol, naphthalene, thymol, indoxyl, skatoxyl and pyrogallol.

Glycocoll and glycuronic acid are other products of metabolism which combine chemically in the tissues of the living body with a number of poisons. Reasoning from analogy, one should expect the conjugated to be less toxic than the free poisons. Tentatively I shall assume this as true in order that I may construct a table illustrating the defensive action of these substances as well as of ammonia, and of sulphates.