

metabolism. This leads us into a very difficult field of study, *i.e.*, the study of protein metabolism. In this connection I shall only mention observations which have a bearing on the origin of glycocoll and the formation of salicyluric acid.

1. Howell found amino acids in small quantities both in the blood and lymph.

2. Jacoby and others have shown that every tissue possesses the power of self-digestion, *i.e.*, proteolytic ferments are present in every cell of the body. In this digestion amino acids, glycocoll, alanin, leucin, tyrosin, etc., are formed.

3. Schultze and Winterstein have isolated from growing seedlings glycocoll, leucin, tyrosin and many other amino acids.

4. Parker and Lusk have shown that hippuric acid is formed in a starving rabbit taking benzoic acid, *i.e.*, there is an endogenous source of glycocoll.

5. Salomon showed that hippuric acid was formed in the liver, muscle and kidney of a rabbit.

6. Schmideburg and Bunge showed that in a day benzoic acid and glycocoll were synthesized to hippuric acid in the kidney.

These observations show that glycocoll is found during cellular metabolism, and they suggest that salicyluric acid may be formed in muscle, liver, kidney and other tissues of the body.

The most important point to determine is whether it is formed in the kidney. If it is altogether formed in the kidney then the union of salicylic acid and glycocoll just at their exit from the blood serum should have very little influence on the pharmacological action of salicylic acid. On the other hand, if its formation takes place in an earlier stage of metabolism, then one should expect the potency of the action of salicyluric acid formed. One should also expect that glycocoll given subcutaneously or intravenously to increase the proportion of salicyluric acid and thereby diminish the action of salicylic acid. This last proposition appears to be supported by experiments described in the following division.

#### (c) SUBCUTANEOUS INJECTIONS OF GLYCOCOLL AS AN ANTIDOTE TO POISONING BY SALICYLIC ACID.

The lethal dose of salicylic acid, given subcutaneously, was determined to be not more than 2 grams for rabbits weighing less than 2 kilograms. Then 3 grams of salicylic acid neutralized by caustic soda and 3 grams of glycocoll, both dissolved