

12. In the severer forms of permanent glycosuria the disturbance of katabolism frequently becomes aggravated. B-oxybutyric acid, and diacetic acid, and probably other acids, appear in the blood. This condition is known as acidosis, and has an etiological relationship to diabetic coma.

13. In the acidosis condition, acetone, diacetic acid, and B-oxybutyric appear in the urine.

These are some of the more important facts bearing on the subject of glycosuria. When one studies them one is not surprised that no acceptable theory for diabetes has been propounded. Some have suggested that it may be a functional disease of the pancreas; and I feel that there is much to be said in favor of this suggestion. If I were asked to formulate a theory of diabetes mellitus I would say that probably most cases were due to a functional disease of the pancreas caused by hereditary weakness, nervous disturbance, or hyperalimentation. The small minority of cases are probably due to organic disease of the pancreas.

I shall now report some observations and make a few remarks on subjects bearing on the etiology and treatment of glycosuria.

#### THE CAUSE OF THE COMPLICATIONS OF DIABETES MELLITUS.

Diabetes is a disease characterized by many complications. Of these, some of the most important are, coma, neuritis, cataract, retinitis, gangrene, eczema and diminished immunity, as illustrated by the frequency of boils, carbuncles, and pulmonary tuberculosis.

The coma of diabetes is, no doubt, principally due to the acidosis condition of the blood.

Of most of the complications one thinks of two etiological factors, namely, hyperglycemia and the condition of the tissues which gives rise to the hyperglycemia.

Excess of sugar in the blood is probably present in all cases of glycosuria in man—glycosuria from increased permeability of the kidneys alone, similar to that produced by phloridzin, has not been definitely recognized. Indeed the glycosuria supervenes as a consequence of the hyperglycemia. In a series of twelve cases Naunyn found excess of sugar in the blood in all. He also found a slight degree of hyperglycemia in patients in whom, through restricting the quantity of carbohydrate in the food, the sugar had disappeared from the urine. This is, I think, a very important observation, as it suggests