

in ether. He consequently concluded that it was closely related in its characteristics to such other well-known secretions as adrenalin, iodothylin, and secretin. An interesting feature is that an excess of this pancreatic product hinders, and when present in large quantities, absolutely prevents, carbohydrate combustion. Cohnheim suggests two explanations for this remarkable finding. The first is, that the pancreas produces two substances, one of which favors and the other hinders sugar combustion. For various reasons he sets this aside as a possible explanation. The second is based on the observation of Neisser and Wechsberg, that the destruction of bacteria by a bactericidal serum is due to the combined action of amboceptors and complement, and that an excess of amboceptors destroys the bactericidal action of the serum. By analogy, he suggests that by adding an excess of pancreas juice to a mixture of glucose solution and muscle juice, an over-abundance of amboceptors is provided, thus destroying the glycolytic action of the two juices.

Cohnheim's work seems to have pretty well withstood the attacks of various workers up to the present time. The claims of Claus and Embden that the sugar destruction was due to the effect of bacterial contamination seems to have been amply disproved. Rahel-Hirsch has confirmed Cohnheim's research. His observations would seem to show that tissues other than the muscles, for example, the liver, yield a substance which can be rendered active by the pancreas juice and then cause rapid destruction of glucose.

Cohnheim's researches undoubtedly have gone a long way toward solving the problem of the ultimate disposal of the carbohydrates in the normal individual. In combination with Opie's investigations they seem to afford a satisfactory explanation for the occurrence of the hyperglycaemia in diabetes. There seems little doubt but that the activating agent produced in the pancreas is a product of the islands of Langerhans. When these are destroyed, as they are in such a large percentage of diabetic patients, the substance produced by the muscles, and possibly other tissues, is not converted into the form which is necessary for it to be capable of burning up the glucose in the muscular tissues. Consequently, a hyperglycaemia, with more than 0.2 per cent. of glucose in the circulating blood occurs, and a transitory or permanent glycosuria ensues.

Although these investigations have thrown a flood of light on normal carbohydrate metabolism, as we shall later see, the problem is not a simple one, as the other ductless glands have been shown to have a marked influence on the warehousing of the carbohydrates in the system.