

In $\frac{1}{2}$ hour 5-10 times as much acid proteid as natural proteid had passed into the duodenum. In two hours twice as much had passed.

The appearance of acid at the pylorus was tested by a cannula in the antrum upon mashed potato mixed with dimethylamido benzol coincident with X-ray observation. This showed that the appearance of a pink colour (free acid) in the cannula fluid corresponded with a discharge of contents through the sphincter.

In an excised stomach suspended in Ringers sol., hydrochloric acid caused relaxation of the sphincter, while sol. NaHCO_3 failed to do so.

The second part of the theory, namely, that "Acid in the Duodenum retards Gastric discharge," was tested by ligature of the pancreatic and bile ducts, which presented the normal alkaline reaction in the duodenum.

As compared with the normal animal, the passage through the sphincter was excessively delayed.

Applying the theory to the known time of stay in the stomach of the various food elements, it is found that proteid remains for a considerable time and emerges slowly, which may be explained by the union of acid and proteid, which delay a pronounced free acid reaction.

Carbohydrates leave the stomach rapidly, as not uniting with acid, and thus early acidity at the pylorus occurs.

Fats are long retained as they inhibit the secretion of HCl , and after entering the duodenum form fatty acids which, in turn, stimulate the sphincter to contraction.

Some observations on human chyle were made in *J. Phy.*, Dec. 1906, by J. M. Hamill. He was fortunate in observing a young man of 20 in the London Hospital, with a congenital chylous fistula in the groin. He found an average sample to have the following composition:

Total solids 3.87, ash .83, fat 1.3 gm. (variable). Total N. 36.4, extractions N. 0.112, lecithin 4.2 per 100 gms., ether extract cholesterin 5.2 per 100 gms.

In colour from bluish white to yellow, alkaline, sp. G. 1.007, it clotted readily, but its coagulation was prevented by drawing into oxalate solution.

The rate of flow was 4 litres in 12 hours. No reducing sugar was found.

Amylose was found by taking two tubes of filtered chyle, boiling one and not the other, and adding to each, boiled starch, and standing for 4 hours at 37°C ., when the unboiled tube gave well marked Fehling test, the boiled no reduction. Lipase was found by similarly heating two tubes and adding to olive oil, when in the unboiled tube the acidity increased to 1cc. NaOH . Concerning the fat content, it was found this was at its maximum 6 to 8 hours after the chief meal of the day.