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Demonstration of a Dog Maintained for Sixteen Weeks Solely by Jejunal Alimentation in the Presence of Loss of Gastric Juice.

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In order to answer certain questions relative to the general problems of gastric secretion and intestinal obstruction, some method of maintaining dogs indefinitely by jejunal alimentation was desired. Also, the clinician is not infrequently confronted with the question of the proper method and pabulum to use in certain jejunostomy cases. The difficulty that is generally encountered in attempting to feed animals and man via a jejunostomy is that diarrhea and enteritis are so likely to occur.

Obviously, such a method should consist, first, of a bland, non-irritating, easily digested pabulum containing all the essential food elements and, second, it should be administered slowly, simulating the manner of emptying of the stomach. It might be thought that the pabulum should be predigested with gastric juice and pancreatin and glucose added. We have tried this a number of times, but have found that such a mixture was irritating to the bowel.

After considerable preliminary experimentation on jejunal fistula dogs, a pabulum was found by one of us (H. G. Scott) which was bland and non-irritating. It consists of the following elements: water, 3000 cc.; whole milk, 3000 cc.; flour, 300 gm.; cane sugar, 150 gm.; peptone, 100 gm. The mixture is cooked, giving attention to certain details which will be given in a later, more complete paper (pH 6.0). Four hundred cc. of the mixture is fed 3 to 5 times in 24 hours diluted with 200 cc. of tap water.

When the jejunal feedings are first started the intestine will not tolerate 600 cc., but smaller quantities must be given more frequently. To each feeding 1 gm. of pancreatin is added. From 6 to 10 gm. of salt are added per day to maintain a normal level of blood chlorides. To the various feedings are added daily, but not to every feeding, 10 cc. cod liver oil emulsified in bile (if not emulsified in bile it is likely to cause diarrhea), 2 drops viosterol, one egg-yolk, "yeast foam" and carrotin. The mixture is introduced by gravity into the fistula at a slow rate of from 2 to 5 cc. per minute. If introduced at a more rapid rate, nausea and vomiting are likely to be

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initiated. When introduced properly the dog uniformly falls to sleep.

The dog demonstrated has a pouch of the entire stomach with vagi intact and a jejunal fistula. The pylorus was cut across, the duodenal end closed and the gastric end brought to the outside. The jejunal fistula was made prior to this operation. This animal has been fed solely through the jejunal fistula for 18 weeks and has been losing all gastric juice (400-600 cc. daily) for a period of 16 weeks. He has received nothing subcutaneously or intravenously except 1½ gr. ferric citrate subcutaneously during the past 3 weeks every other day because he became somewhat anemic. His blood is now normal. The blood chloride level can be varied at will by removing or adding sodium chloride to his diet. The dog now weighs as much as he did prior to operation (24 pounds). At 2½ months a stomatitis with ulcers appeared, which disappeared as vitamins were added to the diet and the mouth was washed daily with lemon juice.

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Studies on the Specificity and Behavior of Blood and Tissue Lipases.

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It has long been known that the lipase normally present in the blood will not split true fats,[1] and that the pancreas contains much greater amounts of a true fat-splitting lipase than do any other organs. A search of the literature has failed to reveal any report of the appearance in the blood of a fat-splitting lipase in experimental pancreatic injury, although it is well known that such injury increases the blood diastase.

We have studied the blood lipases of 5 dogs with experimental pancreatic injury; in one of these animals, the pancreatic ducts were ligated, in one the tail of the pancreas was doubly ligated and severed from the body, and in the remaining 3 the body of the pancreas was removed, leaving the head and tail free in the mesentery. The blood lipases were followed in these animals, using olive oil and ethyl butyrate as substrates. In making determinations on olive

[1] Oppenheimer, C., *Die Fermente und ihre Wirkungen*, Leipzig, 1925, 5th ed., 489.