production is not solely specific for the pancreas though the pancreas would appear to be the main producer of this hormone.

In the present study on 6 normal and 10 depancreatised ducks, we found that immediately after the pancreatectomy, the blood sugar level was definitely elevated but that it gradually returned to within normal limits of variation within a week or 10 days, and that 2 months after the pancreatectomy, the liver and muscle tissue gave a positive iodine test for glycogen. We found that extraction of liver, kidney and muscle tissue of normal ducks by the Fisher[7] modification of the Doisy, Somogyi, Shaffer[8] method of insulin preparation yielded a substance which lowered the blood sugar of fasted normal rabbits, but that similar extracts from depancreatised ducks did not.

Quantitative studies are now being made to ascertain the nature of carbohydrate metabolism in depancreatised ducks.

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Experimental Intestinal Obstruction.

HILGER P. JENKINS. (Introduced by L. R. Dragstedt.)

From the Department of Surgery, University of Chicago.

To determine the rôle of biliary, pancreatic, and duodenal secretions in the rapid death of acute intestinal obstruction an experiment was devised which permitted these three secretions to be short circuited into the bowel below the point of obstruction. This was done by operations on dogs in 2 and 3 stages, the latter giving the better results. Before producing the obstruction which was done as the last stage, the jejunum just beyond its junction with the duodenum was sectioned and the proximal portion anastomosed to the ileum. Then a pylorectomy was done and the distal portion of the jejunum was anastomosed to the stomach. In this way the duodenum emptied into the ileum, and the stomach into the jejunum.

Following this procedure the animals often lost weight, had a diarrhea, became progressively weak, and died of exhaustion or bronchopneumonia. Two developed chronic ulcers of the jejunum. Those which survived and were in good condition were obstructed by sectioning the bowel above the anastomosis in the ileum and invaginating the stumps with a purse string suture. Six dogs

[7] Fisher, N. F., *Am. J. Physiol.*, 1923, lvii, 57.

[8] Doisy, E. A., Somogyi, M., and Shaffer, P. A., *J. Biol. Chem.*, 1923, lv, 31.

with obstruction produced in this manner lived from 12 to 33 days. With the obstruction 1 foot from the stomach the dog lived 12 days. At 20 inches the duration was 29 days. At 2½ feet the duration was 17 and 33 days. Three feet from stomach was lethal in 27 days. At 5 feet it was 17 days.

The behavior of these animals was not at all like ordinary obstructed animals which die in 2 to 7 days. They were quite lively, would walk and sometimes run. The average intake was 200 to 400 cc. of water a day to which glucose and sodium chloride were often added. Vomiting occurred about every second to third day. The urine output averaged 100 to 250 cc. per day. Small black or brown stools were passed on the average of every fourth or fifth day. The weight of these dogs gradually decreased to half the original weight, the average loss being 0.24 to 0.37 kg. per day. Studies of the blood chemistry showed a marked fall in the chlorides, an increase in CO_2 capacity, and rise in non-protein and urea nitrogen which became very marked just before death. It is interesting to note that the N.P.N., Urea N., and CO_2 decreased during the first week of obstruction in some cases. When autopsied death was found to be due to some complication in half the dogs. In one bronchopneumonia was found, in another intussusception with perforation and general peritonitis, in another intussusception and obstruction of the ileum which produced a condition identical to a closed duodenal loop. In all cases the obstructed jejunum was very noticeably distended especially at its distal end.

Conclusions: These experiments seem to show that the biliary, pancreatic, and duodenal secretions have a very important rôle in the rapid death of acute intestinal obstruction. One explanation is that in these dogs the pancreatic, duodenal, and biliary secretions do not flow into the obstructed loop and there produce a toxin which is absorbed in ordinary cases of obstruction. Or another explanation is that these secretions are reabsorbed in the ileum, a process which is necessary for life.