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Concerning the elimination of dextrose into the gastro-intestinal canal.By **I. S. KLEINER.**

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Our experiments have reference to statements in literature, some of which, for a better understanding of our results, may be here quoted very briefly. On the basis of analyses of the contents of the gastro-intestinal canal of seven rabbits, Fischer and Moore make the statement that "the small intestine of the rabbit contains no sugar, when an animal is killed shortly after having consumed several hundred grams of carrots and carrot tops or cabbage." J. B. MacCallum reported that in a few experiments with intravenous injection of sodium chloride which, as is well known, produces glycosuria he found some dextrose in the stomach and intestines the quantity of which was slightly increased when, previous to the infusion of the sodium chloride, both kidneys were ligated. MacCallum thought that the presence of glucose in the intestines under these circumstances is due to the hyperglycemia and looked upon it as a sort of "intestinal diabetes"; he believed further that in the absence of the kidneys the intestines assume a supplementary excretory function. Fischer, on the other hand, draws the conclusions from some experiments that hyperglycemia alone does not lead to a secretion of glucose into the intestines. This occurs only, he maintains, when the infusion of sodium chloride is administered to hyperglycemic animals as was the case in MacCallum's experiments on account of the use of morphine.

In our experiments the rabbits had been fed for some time on hay and cabbage. The dextrose determinations were made by Pavy's method and controlled in some instances by Allihn determinations. Various series of experiments were carried out. Only the average figures of each series will be given here. In one series of six normal animals the contents of the stomach and intestines were analyzed some hours after they were fed. The small intestines as well as the stomach contained in each case small amounts of reducing substance. The averages

are: for the intestines 0.05 g. and for the stomach 0.1 g. In a second series six animals received by intravenous infusion 7 grams dextrose per kilo body-weight (in about molecular concentration). The average duration of the infusion was about half an hour; fifteen minutes later the animal was killed, the intestines were washed out and the stomach removed. The averages were: for the intestines 0.16 g. = 1.4 per cent. and for the stomach 0.13 g. = 1.1 per cent. of the injected dextrose. During the period between the beginning of the infusion until the animal was killed for the purpose of washing out the intestines an average of 39 per cent. of the injected dextrose was eliminated in the urine. In a third series of six rabbits only 4 grams of dextrose per kilo were injected (in about 0.6 molecular concentration). The average of this series amounted for the intestines to 0.11 g. = 1.9 per cent., and for the stomach 0.08 g. = 1.1 per cent. of the injected dextrose. Through the urine 23 per cent. of the injected dextrose was eliminated. In the fourth series of rabbits double nephrectomy was performed and on the following day 7 grams of dextrose per kilo were infused. The averages of this series are as follows: for the intestines 0.24 g. = 2.1 per cent. and for the stomach 0.15 g. = 1.3 per cent. of the injected dextrose. Finally in a series of only three nephrectomized rabbits the stomach and the intestines were examined on the following day without a preceding infusion of dextrose. Only a mere trace of dextrose could be discovered in these instances. These animals partook of very little food after nephrectomy.

Our experiments have shown that the stomach and especially the small intestines of rabbits contain measurable quantities of dextrose even when the food is poor in easily convertible carbohydrates; that an intravenous injection of dextrose increases perceptibly the gastro-intestinal dextrose even without the aid of a simultaneous infusion of sodium chloride, and that nephrectomy indeed increases the elimination of infused dextrose. However, considering the high elimination of the injected dextrose through the urine, the comparatively insignificant increase of elimination into the gastro-intestinal canal after nephrectomy can hardly be looked upon as a functional assumption of the activities of the kidney, as a vicarious phenomenon.