

organ as a reservoir. Our results show very clearly from the average rate of absorption per hour for the various periods that the rate of glucose absorption is greatest during the first hour after giving the glucose and decreases each hour thereafter. For at least the first 4 hours after administering the glucose this fall in the absorption rate cannot be due to any lack of glucose for absorption. Since there is no absorption from the stomach the amount of glucose available for absorption each hour is that which reaches the intestine plus any unabsorbed during the preceding hours. There is a tendency for a relation in a general way between the absorption rate and the amount of glucose available for absorption. That this is not more clear-cut may be due to the fact that not only is the amount but also the concentration of glucose leaving the stomach becoming less each hour.

These results in so far as they are comparable confirm similar experiments on the rat.¹ The results in both species coincide well in many aspects with the experiments of Ravdin *et al.*⁵ on the rate of glucose absorption from isolated intestinal loops in the dog.

Summary. The rate of absorption of glucose from the intestinal tract of the rabbit decreases with time after the glucose is administered. This is apparently related to the decreasing amount of glucose entering the intestine from the stomach each hour for there is a relation between the rate and amount of glucose available for absorption.

7664 P

Observations upon Hypophysectomized-Depancreatized Cats.

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Houssay and Biasotti,¹ Barnes and Regan² and others have demonstrated the prolongation of life and amelioration of the diabetes that follows total pancreatectomy in the hypophysectomized dog. During the last few months observations have been made upon 2 cats in which total pancreatectomy was performed 2 weeks after hypophysectomy. There was no loss of weight in the period be-

¹ Houssay, B. A., and Biasotti, A., *Endocrinology*, 1931, **15**, 511.

² Barnes, B. O., and Regan, G. F., *Endocrinology*, 1933, **17**, 522.

tween the 2 operations. One animal died in hypoglycemia on the 35th day after pancreatectomy, the other was killed on the 85th day while still in good health for liver glycogen determination (0.8 g %). Neither of these animals received insulin at any time. Both of the animals lost almost 50% of their body weight during the periods noted. They were somewhat apathetic in their behavior and showed considerable muscular flaccidity although capable of ordinary activity with no apparent distress. Their appetite was capricious but their food intake was usually ample for the caloric requirements of normal animals.

In 9 control animals the average length of life after pancreatectomy or withdrawal of insulin was 4 days (range 2-7 days). The glycosuria averaged 5-10 gm. daily in spite of the fact that the animals usually refused food after the second day.

Cat I (lived 35 days) had had the right adrenal removed prior to the hypophysectomy. After total pancreatectomy it consumed 50-150 gm. of raw pancreas and liver daily. The glycosuria was about 2 gm. daily with occasional sugar free days. The maximum glucose excretion at any time was 4.8 gm. No ketonuria was noted (Rothera's test), although observations upon this were only made at infrequent intervals. The fasting blood sugar ranged from 59-314 mg. % while the terminal blood sugar was 15 mg. %, the urea N 32 mg. % and the plasma CO₂ 56 vol. %.

On the 17th day of life the animal developed a subcutaneous abscess which burst spontaneously and healed. No exaggeration of the diabetic condition developed during the course of this infection.

At autopsy no pituitary or pancreatic tissue was found and histological examination of the testes, thyroid and remaining adrenal revealed the characteristic changes associated with hypophysectomy.

Cat II (survived 85 days) ate larger quantities of food than Cat I and showed a much greater degree of glycosuria ranging from 2-17 gm. daily. The daily urine volumes were 150-200 cc. in contrast to Cat I which averaged about 60 cc. A few observations on ketonuria were negative. As this cat was observed over the summer vacation only 8 determinations were made on the fasting blood sugar. They ranged from 225-302 mg. %.

As stated above, this animal was sacrificed for glycogen determinations. At autopsy a small piece of pituitary, chiefly posterior lobe, was found. Such anterior lobe tissue that was present was undergoing degenerative changes but nevertheless may have been responsible for the differences between the animals. The usual changes were observed in the ovary, thyroid and adrenal.

The first point of these experiments is the extension of the effects of hypophysectomy upon experimental diabetes to another species.

The second point is the prolongation of life of depancreatized cats, a species in which this operation alone is so uniformly and rapidly fatal. These control animals developed severe acidosis and ketosis about 48-72 hours after removal of the pancreas. In both of the doubly operated animals, so far as our observations go at present, neither acidosis nor ketosis was a prominent feature. The other characteristics of diabetes—glycosuria, polyuria and marked loss of weight, were present in varying degree.

7665 C

A Note on the Relationship of Pellagra to Pernicious Anemia.

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Pellagra and pernicious anemia are now regarded as special types of deficiency diseases. They have in common such clinical manifestations as achylia gastrica, glossitis, peripheral neuritis, and central nervous system changes. Goldberger and his associates^{1, 2} believe that pellagra is caused solely by a diminished intake of some specific food substance ("vitamin G"). Rolph,³ Turner,⁴ and others have described cases developing secondary to lesions of the gastrointestinal tract. While it has likewise been suggested that in certain instances the lack of some substance in the diet may cause pernicious anemia, it usually follows the lack of the essential secretion ("intrinsic factor") in the gastric juice which changes food into an anti-anemic substance.⁵ A short time ago Spies and Payne⁶ produced remissions in 2 patients with pernicious anemia, by giving an incubated mixture of beef muscle and achylic gastric juice from acute

¹ Goldberger, J., and Wheeler, G., Bull. 120, Hygienic Laboratory, Washington, 1930, 120.

² Goldberger, J., Wheeler, G., Lillie, R. D., and Rogers, L. M., *U. S. Public Health Report*, 1926, **41**, 297.

³ Rolph, F. W., *Canad. M. A. J.*, 1916, **6**, 323.

⁴ Turner, R. H., *Am. J. Trop. Med.*, 1929, **9**, 192.

⁵ Castle, W. B., Health, C. W., Strauss, M. B., *Am. J. Med. Sci.*, 1931, **182**, 741.

⁶ Spies, T. D., and Payne, W., *J. Clinical Invest.*, 1933, **12**, 229.