between the capillaries, and in their walls and those of arterioles. From the periodic-acid-Schiff staining of this material and its removal with hyaluronidase *in vitro* it was inferred to be a mucopolysaccharide complex, probably attached to protein, as usually occurs in ground substances and basement membranes.

For the formation of nodular intercapillary glomerulosclerosis in the human kidney other factors are apparently necessary, the chief of which is a part of or accompanies diabetes mellitus. Whether this influence is attributable to hyperglycemia, general changes in the body mucopolysaccharides, hyperlipemia, fat emboli, or various steroid abnormalities in human diabetics is not evident from the present study. Additional information is anticipated from the delicate lipid staining possible with carbowax embedded frozen-dried tissues. Also it is hoped that a pathologic study of the endocrine glands from diabetics with glomerulosclerosis might show some other evidences of the cortisone hypersecretion postulated.

Summary. In the glomerular stroma and arterioles of non-diabetic persons treated with cortisone an abnormal substance was found with ultraviolet absorptive properties indistinguishable from those of the nodules of intercapillary glomerulosclerosis. Histochemical properties of the material suggest that it is a mucopolysaccharide complex. The evidence is considered that implicates cortisone as one factor in the development of human diabetic intercapillary glomerulosclerosis.

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Loss and Repair of Glucose-Disposal Mechanism in Dog Fed Fructose As Sole Dietary Carbohydrate.* (22233)

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Normal rats lose, to a considerable extent, their capacity to utilize glucose when they are fed for several days a diet containing 58% fructose as *sole* carbohydrate. The site of defective glucose utilization in the fructose-fed rats was localized by studying the metabolism of C^{14}-glucose, C^{14}-fructose, and C^{14}-acetate in various tissues of rats previously fed a diet containing either glucose or fructose as sole carbohydrate. The liver was the only tissue in which an altered metabolic pattern was observed after fructose feeding, and this alteration was manifested by a decreased capacity for converting glucose to glycogen, fatty acids, and CO_2. This altered metabolic pattern in the liver was apparently not the result of an insulin-lack, for insulin injections before the fructose-fed rats were sacrificed failed to restore the ability of their livers to utilize glucose(1).

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TABLE I. Dietary Feeding of Each Dog.

Diet fed	Days fed	Glucose-tolerance done on:	Glucose-tolerance curve in Fig. 1
A	First 7	A.M. of 8th day	I
B	8-15	16th	II
C	16-23	24th	III
B	One meal, P.M. of 24th day	25th	IV
B	Two meals during 25th day	26th	V
D	26-32	33rd	VI

Craig *et al.*(2) failed to observe, in man, an altered tolerance to glucose following the feeding of 250 g of fructose per day (for 3 days) as the sole dietary carbohydrate. It therefore became of interest to determine whether this response to fructose was limited to the rat and also whether another hexose, galactose, would also affect the liver's capacity for utilizing glucose. Experiments designed to test these two points are reported here.

Methods. Three adult male beagle dogs (9.8, 9.2, 11.6 kg) were maintained on Purina pellets before start of experiments. Experimental feeding periods were arranged consecutively so that each dog served as its own control. The general plan of the experiment is given in Table I, and the composition of experimental diets is given in Table II. The animals' tolerance to glucose was determined in the following manner. The last portion of a specified experimental diet (A, B, C, or D) was fed at 4 p. m. on the day before the glucose-tolerance test was carried out. At 9 a. m. on the following morning, initial blood samples were withdrawn from the femoral artery, and immediately thereafter the dogs were fed a test meal consisting of 4 g glucose/kilo body weight, mixed with a few grams of ground horse meat. At hourly intervals for the next 3 or 4 hours, blood samples were withdrawn from the femoral artery. Plasma reducing value was determined by the method of Somogyi(3) as modified by Nelson(4). Plasma fructose was measured by the method of Roe(5). Plasma galactose was estimated by the difference in reducing value before and after yeast fermentation.

TABLE II. Composition of Diets.

Constituent	Amt (g)/day/kilo body wt*			
	Diet A	Diet B	Diet C	Diet D
Horse meat	47	35	35	35
Glucose	0	18	0	0
Fructose	0	0	18	0
Galactose	0	0	0	18

* Daily food allotment was divided into 2 equal portions; one portion fed at 9 a.m., the other at 4 p.m. In addition each dog received daily an adequate vitamin and salt supplement(6).

Results. Dogs fed a diet containing either no carbohydrate or glucose as sole carbohydrate. Results of the glucose-tolerance tests are given in Fig. 1. Each curve presents the average values obtained with 3 dogs. The dogs fed the diet containing no carbohydrate (diet A) for 7 days suffered the most severe loss in ability to dispose of exogenous glucose (curve I); the average plasma glucose values rose to 220 mg % 2 hours after administration of the glucose test meal and were still considerably higher than the initial level at 3 hours. In contrast, the average plasma glucose value after the dogs were fed the glucose-containing diet for 7 days reached a maximum of 120 mg % 1 hour after administration of the test glucose, and by the third hour had returned to the starting level (curve II).

Dogs fed fructose-containing diet. The average plasma glucose curve of dogs fed the diet containing fructose (diet C) for 7 days as the sole carbohydrate was similar to that obtained when the dogs were fed no carbohydrate (diet A); the highest plasma glucose value was 190 mg % at 2 hours, and the plasma glucose level was still elevated at the third hour after administration of the glucose test meal (curve III).

The feeding of one glucose-containing meal (diet B) after the 7-day period, in which fructose was the sole dietary carbohydrate, had no appreciable effect on the response of the plasma glucose to the glucose test meal, the average plasma glucose curve reaching a value of 180 mg % at 2 hours and 140 mg % at 3 hours (curve IV). However, after the third meal of diet B was fed, the average plasma glucose response was similar to that observed in the animals fed diet B for 7 days (curve V).

Dogs fed the galactose-containing diet. Feeding a diet containing galactose (diet D)

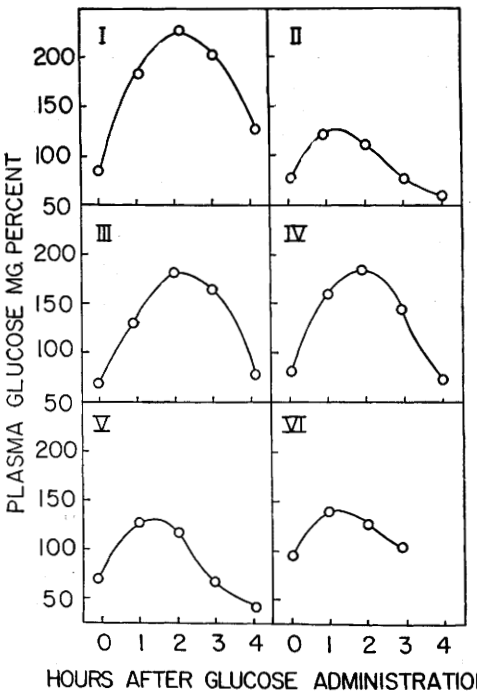

FIG. 1. Glucose tolerance tests of dogs after feeding of diets containing glucose, fructose, or galactose.

as the sole carbohydrate for 7 days produced a glycemic response to the glucose test meal similar to that observed after feeding diet B for 7 days (curve VI). In the galactose-fed dogs, the average plasma glucose level reached a maximum of 140 mg % 1 hour after administration of the glucose test meal, and returned to the initial level in 3 hours.

Summary. 1. Our earlier observation in the rat, that the feeding of fructose as sole carbohydrate results in a considerable loss in the animal's capacity to dispose of ingested glucose, is confirmed in another species, the dog. It is also shown that galactose is not the equal of fructose in bringing about impairment in glucose-disposal mechanism. 2. Feeding of a single meal containing 18 g of glucose/kg body weight failed to restore to normal the glucose-disposal mechanism once it was impaired by fructose feeding. A normal capacity for glucose disposal was observed after the dog had ingested 3 glucose-containing meals.

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Attempted Fractionation of Purified Bovine Growth Hormone.* (22234)

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By any of 3 isolative procedures(1-3) growth hormone (GH) can be obtained from bovine anterior pituitary glands as an apparently homogeneous protein of molecular weight about 47,000. The activity of such preparations does not depend on the presence of alanine and phenylalanine at the N-terminal ends of the 2 peptide chains(4), nor is the activity lost after partial digestion of the free-carboxyl end of the molecule with carboxypeptidase(5-7). It may be noted also that material with growth-promoting activity can, according to an unconfirmed claim (8), pass through a dialysis membrane.

This paper reports briefly an exploration of

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