and cabbage succumbed to a dose of 0.4 gm. of the salt per kilo when given by subcutaneous injection. Suppression of urine was usually observed on the first day and death occurred in six to seven days. In starvation, slightly smaller doses were fatal to some rabbits. The resistance was increased considerably when the diet was changed to carrots. Such animals stood 1.0 gm. per kilo by subcutaneous injection, while 1.2–1.5 gm. per kilo were toxic. A moderate degree of tolerance for tartrates was induced in animals which were fed oats and cabbage. By gradually increasing the dose, a large proportion (6 out of 9) of rabbits survived 0.8 gm. per kilo which is twice the fatal dose. Rabbits which were receiving carrots did not acquire tolerance for tartrates. Sodium tartrate was much less toxic when given by mouth. 5 gm. per kilo was found to be the minimum fatal dose.

EXPERIMENTS ON CATS.

Amounts which have been found to be fatal for rabbits did not produce any symptoms in cats. Subcutaneous injection of one gm. per kilo produced a slight diarrhea in some individuals, and had no effect whatever in others. 1½ gm. per kilo proved fatal to one cat but was without action in another. Out of four cats which received 2 gm. per kilo three died, one survived. When sodium tartrate was given by mouth vomiting frequently occurred. In one case, however, when ten gm. per kilo were fed diarrhea was the only effect observed.

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The influence of pancreatic and duodenal extracts on the glycosuria and the respiratory metabolism of depancreatized dogs.

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Several dogs completely depancreatized by Hedon's method and eliminating glucose and nitrogen in Minkowski's ratio were treated by intravenous injection of pancreatic extract prepared by Knowlton and Starling's method.[1] The urines collected in twenty-four hour periods exhibited an increase in the D: N ratio

[1] Knowlton and Starling, *Journ. of Physiol.*, 1912, XLV, p. 146.

on the days immediately following. When the urine was collected in short periods after injection, a marked fall in the sugar output was witnessed lasting from four to ten hours but this was followed by a compensating rise which, in some instances, augmented the total for the twenty-four hour period, in others raised it only to the previous level.

Much greater effects were obtained with a double extract of dog's pancreas and duodenal mucosa. The following experiment (No. II) is typical. The effect, however, cannot be ascribed to the organic extract from either the pancreas or the duodenum for the same Ringer's solution in which the tissues were extracted when made alkaline to about the same extent with Na_2CO_3 gave an identical effect.

DOG "*Q.*" OPERATED APRIL 17.

Exp. II.

Date.	Time.	Vol. urine, c.c.	Glucose, gm.	Nitrogen, gm.	D : N.	Glucose per hour.	Nitrogen per hour.	Blood sugar, per cent.
4/21/13	12.15– 2.15	30	2.41	0.95	2.52	1.20	0.47	0.128
	2.15– 4.15	50	2.40	1.09	2.20	1.20	0.54	
	5.00– 5.30	150 c.c. of pancreas and duodenum from 2 normal dogs inj. intravenously						
	4.15– 6.15	30	1.30	0.67	1.93	0.65	0.35	
	6.15– 7.15	25	0.28	0.33	0.87	0.28	0.33	
	7.15– 8.15	26	0.41	0.45	0.89	0.41	0.45	0.148
	8.15– 9.15	26	0.59	0.48	1.21	0.59	0.48	
	9.15–10.15 P.M.	22	0.51	0.39	1.28	0.51	0.39	
4/22/13	10.15– 6.00		18.66	6.99	2.68	0.93	0.35	
			Exp. III.					
4/24/13	2.19–4.19	22	1.65	0.54	3.08	0.82	0.27	
	4.26–5.15	150 c.c. Ringer's Sol. +1% Na_2CO_3 injected intravenously						
	4.19–6.19	60	1.65	0.64	2.55	0.82	0.32	
	6.19–8.19 A.M.	24	0.46	0.52	0.88	0.23	0.26	
4/24–25	8.19–1.19	90	2.41	0.59	1.62	0.48	0.29	

The similarity in these two experiments on the same dog indicates that it is not a hormone which is responsible for the reduction in the sugar, and the increase in the percentage of sugar in the blood indicates that the reduced sugar elimination is in reality due to a change in the permeability of the kidney, as Wohlgemuth[2] has found it after ligation of the pancreatic ducts.

That there is no effect on the combustion of sugar attending

[2] Wohlgemuth, *Berl. klin. Woch.*, February 24, 1913, p. 339.

the reduced elimination of that substance is proved by the following experiment on another dog place in the respiration calorimeter.

DOG "*S.*" OPERATED May 6.

Date.	Time.	Glucose in urine per hour.	Nitrogen in urine per hour.	D:N.	CO_2, gm.	O_2, mg.	R. Q.	Heat produced.	Temp. of dog.
5/9/13	9.45–10.45				8.62	9.22	0.68	21.73	38.6
	10.45–11.45				9.97	10.55	0.69	27.12	38.6
	8.50–11.55 P.M.	1.74	0.56	3.08					
	12.35– 1.05	150 c.c. exts. of pancreas and duodenum from 2 normal dogs injected intravenously. 20 gms. glucose given per os.							
	11.55– 1.05	1.07	0.39	2.70					
	1.55– 2.55				13.60	14.13	0.70		39.6
	2.55– 3.55				11.84	11.78	0.73		
	3.55– 4.55				10.16	10.71	0.69		39.9
	1.05– 5.05		0.45						

Already in the first hour's urine, including the period of injection, a marked decline in the sugar elimination is seen, showing that the typical effect on the excretion of sugar would have been produced, if glucose had not been fed. With 20 grams of glucose available, however, none, or an extremely small quantity at the most, was burned. The increase in respiratory metabolism the first two hours was due to restlessness of the dog.

Other experiments after injection of pancreatic extract alone and after injection of normal dog's blood likewise showed no effect on the respiratory quotient.

Incidentally it has been found in the single experiment in the respiration calorimeter that the heat production in the depancreatized dog was from 30 to 50 per cent. higher than the normal on the same dog determined one month earlier. This confirms the observations of Benedict and Joslin in severe cases of human diabetes.[1]

[1] Benedict and Joslin, Carnegie Institution of Washington Publication No. 176.