

*celery, dandelion, lettuce, and parsley* all contain noteworthy amounts of vitamin-B. The details of the investigation will be published elsewhere.

130 (1877)

**An experiment on the absorption of glucose given by rectum.**

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For many years it has been accepted by clinicians that glucose given by rectum is absorbed immediately into the blood, and surgeons constantly use such a procedure as a part of their post-operative therapy. Because of the difficulties attending the procedure there are comparatively few controlled experiments on the effect of glucose so administered in the literature. The effect of carbohydrate feeding on acetonuria has been clearly demonstrated by many experiments during the past few years, and it was determined to test the rectal absorption of glucose by studies of the effect produced upon experimental acetonuria.

The subject of the experiment (one of the authors, D. C. W.) was a man 5 ft. 9 $\frac{1}{4}$  in. tall who weighed 165 pounds, and whose basal metabolism, as measured by the portable Benedict calorimeter was 1700 calories. He received the diet recently discussed by Hubbard and Wright<sup>1</sup> for four days. This diet furnished 2,142 calories—twenty per cent. more than the basal requirement—and consisted of 54 grams of protein, 54 grams of carbohydrate, and 190 grams of fat. Ten per cent. of the calories in this diet are furnished by protein, ten per cent. by carbohydrate, and eighty by fat<sup>2,3</sup>. The total food intake was probably not sufficient for the needs of the subject.

Acetonuria developed gradually as shown in Table I, and on the fourth day of the experiment, before the acetone excretion had reached its highest level, an enema consisting of 300 c.c. of a 5 per cent. glucose solution was given. Table II shows figures for the morning of the day before the enema was given, for the speci-

<sup>1</sup> Hubbard, R. S. and Wright, F. R., *J. Biol. Chem.*, 1922, 1, 361.

<sup>2</sup> Zeller, H., *Arch. Physiol.*, 1914, p. 213.

<sup>3</sup> Shaffer, P. A., *J. Biol. Chem.*, 1921, xlvi, 449.

men collected just before the enema was given, and for the specimens which corresponded to the period during which the enema was retained. Both tables show that there was a decrease in the concentration of acetone plus acetoacetic acid caused by the glucose, while the  $\beta$ -hydroxybutyric acid did not show the increase which is usually caused by such diets.<sup>1</sup> The decrease was not as great as that caused by similar amounts of glucose when taken by mouth. Shaffer<sup>2</sup> has recently advocated the theory that the failure of acetoacetic acid to burn completely in the absence of glucose is responsible for the appearance of increased amounts of the acetone bodies in the urine. The observation that the aceto-

TABLE I.

Date, 1921.	Urine.					Alv. CO <sub>2</sub> mm.
	Vol. c.c.	Acetone.		$\beta$ -hydroxy.		
		$\frac{\text{mg.}}{100 \text{ c.c.}}$	gms.	$\frac{\text{mg.}}{100 \text{ c.c.}}$	gms.	
15-16 <sup>3</sup> . . . .	910	1.1	0.010	1.7	0.015	40
16-17 . . . . .	780	3.6	0.029	2.7	0.021	36
17-18 . . . . .	770	7.8	0.060	3.4	0.026	..
18-19 . . . . .	852	25.2	0.215	11.9	0.101	32
19-20 . . . . .	628	18.7	0.118	15.2	0.096	..

300 c.c. 5 per cent. glucose at 9:30 A.M. on December 19.

Results of the determinations of the acetone bodies are expressed in terms of acetone. Under acetone the results of the determination of acetone from acetone plus acetoacetic acid are given.

TABLE II.

Date, 1921.	Time, A.M.	Urine.				
		Vol. c.c.	Acetone.		$\beta$ -hydroxybutyric Acid.	
			$\frac{\text{mg.}}{100 \text{ c.c.}}$	gms.	$\frac{\text{mg.}}{100 \text{ c.c.}}$	gms.
12/18 . . . .	8:30 to 11	102	19.2	0.020	13.3	0.014
12/19 . . . .	8:30 to 9:30	40	13.0	0.005	5.5	0.002
12/19 . . . .	9:30 to 12	108	7.8	0.008	4.6	0.005

300 c.c. of 5 per cent. glucose given by rectum at 9:30 A.M. on December 19.

<sup>1</sup> Hubbard and Wright, *loc. cit.*

<sup>2</sup> Shaffer, *loc. cit.*, p. 433.

<sup>3</sup> Day before the diet was taken.

acetic acid shows a decrease in these experiments, while the  $\beta$ -hydroxybutyric acid only fails to show the "expected increase" seems to be in accordance with this view.

The experiment shows that glucose is absorbed rapidly by rectum, and is taken into the blood in sufficient quantities to decrease the excretion of acetone produced by a diet high in fat.

## 131 (1878)

**Effect of dilution on the precipitation reaction for syphilis  
proposed by author.**

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Lansing, Michigan.]

One of the important differences between the precipitation reactions of Meinicke, Sachs and Georgi, Dryer and Ward and that proposed by the author<sup>1,2</sup> is that in the last reaction, the amount of normal salt solution is reduced to a minimum. It was early observed, when adding given amounts of serum and antigen to a series of tubes and subsequently adding increasing amounts of normal salt solution to that series, that the degree of

TABLE SHOWING DELAYING EFFECT OF PHYSIOLOGICAL SALT SOLUTION ON PRECIPITATION REACTION FOR SYPHILIS PROPOSED BY AUTHOR.

	Tube No.					
	1	2	3	4	5	6
Syphilitic serum, c.c.....	0.1	0.1	0.1	0.1	0.1	0.1
Antigen, c.c.....	0.025	0.025	0.025	0.025	0.025	0.025
Salt solution, c.c. .	....	0.1	0.2	0.4	0.6	0.8
Results after 1 hour incubation in water bath.....	Marked Precipitation.	Moderate Precipitation.	Doubtful Precipitation.	Negative.	Negative.	Negative.

<sup>1</sup> PROC. SOC. EXPER. BIOL. AND MED., 1922, xix, 182. The preparation of antigen is briefly described in this paper. It should be cholesterinized to 0.4 per cent. before diluting with salt solution.

<sup>2</sup> Arch. Derm. and Syphil., 1922, v.