

jejunum investigated was not clearly related to the hunger which the man experienced. It is a significant fact, however, that patients with high intestinal fistula occasionally complain of constant hunger despite the frequent intake of food in liberal quantities.

The most important and definite observation brought out in the study of this patient is that a sensation interpreted by man as normal hunger which is relieved by the ingestion of food may occur following complete removal of the stomach.

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"True" Glucose Tolerance in Forty-two Normal Individuals.

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Glucose tolerance in 18 women and 24 men, all in excellent health except 2, who were subjects of acute coryza, and who were students or faculty members of the University of Minnesota or physicians in practice in the Twin Cities, was investigated.

The subjects were fasted approximately 12 hours, beginning at 7 o'clock on the evening before the test. Blood samples were drawn at the end of the fast period, and then 50 gm. of glucose and the juice of one half lemon in 125 cc. of water were administered orally. Additional samples were drawn at the half hour, hour, and 2-hour periods, following the glucose. Incidental glycosuria was not investigated.

Protein removal was effected by the Somogyi zinc precipitation method.¹ Sugar determinations were made in duplicate by the improved copper-iodometric titration of the Shaffer-Hartmann method. This was demonstrated at the Thirteenth International Physiological Congress in Boston, in 1929, and directions were distributed at that time.

TABLE I.
Glucose Tolerance Data in Normal Individuals.

	Mean (mg. %)	Standard Deviation	Coefficient of Variation
Fasting	83.12±0.56	5.38±0.40	6.5
Half Hour	123.77±1.69	16.25±1.20	13.1
One Hour	109.10±2.39	22.99±1.69	21.1
Two Hours	72.37±1.71	16.44±1.21	22.7

¹ Somogyi, M., *PROC. SOC. EXP. BIOL. AND MED.*, 1929, **26**, 353.

The data have been analyzed by the usual statistical methods. The means, standard deviations, and coefficients of variation are presented in Table I.

The means are shown graphically in the following curve:

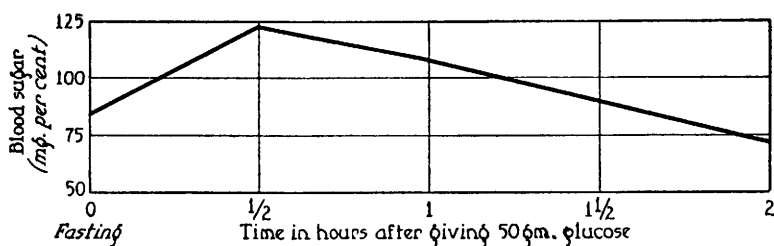


FIG. 1.

These data show a glucose value 15-20 mg. % lower than that obtained by other methods. Somogyi has shown that non-sugar reducing substances of the blood, which consist of glutathione, ergothioneine, and uric acid are not present in zinc filtrates.¹

The highest glucose level obtains at the half-hour, the next highest at the hour, and at the end of 2 hours the glucose value is lower than the fasting value, showing that following stimulation of the pancreas the amount of insulin secretion is greater than the residual.

The authors are greatly indebted to all those who helped to make this investigation possible.

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Distribution of the Blood Sugar Between Plasma and Corpuscles in Man.

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In recent publications the suggestion that the blood sugar is unevenly distributed between corpuscles and plasma, and that the ratio of cell sugar to plasma sugar in blood of normal persons and of persons with diabetes is different, has been revived. Johns¹ has expressed the opinion that the corpuscles of the blood of persons with diabetes are less permeable to glucose than those of the blood of

¹ Johns, H. J., *J. Lab. and Clin. Med.*, 1930, **15**, 713.