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:

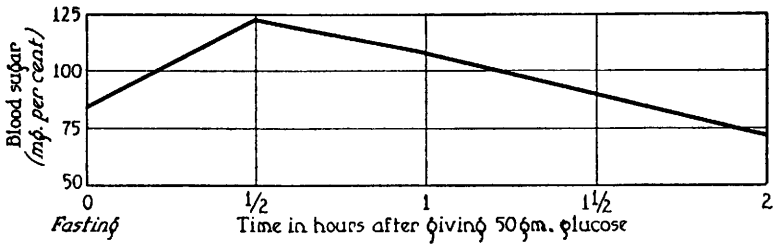

FIG. 1.

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. Johns[1] 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.

normal persons. Folin and Svedberg,[2] on the other hand, have found evidence by the analysis of unlaked blood filtrates that the corpuscles of persons who have diabetes are slightly more permeable to glucose than the corpuscles of normal persons. The average ratios reported by Folin and Svedberg are 0.59 for normal persons and 0.69 for persons with diabetes, and are to be considered as representing the distribution of fermentable reducing substances. These values, indicating that the corpuscles contain less sugar than the plasma, are much lower than those obtained in a recent study in this laboratory, in which the well-known laked blood[3] filtrates were analyzed by the modified Shaffer-Hartman method.[4] With the object of investigating the rather large differences, a series of comparative analyses of the filtrates from laked and unlaked blood has been carried out.

The experimental procedure was designed particularly to avoid initial loss in the cell sugar by glycolysis and will be described in detail elsewhere. Unlaked blood filtrates were prepared with the mixed sodium sulfate-sodium tungstate reagent recently described by Folin.[5] Heparin was used as the anticoagulant. All results were corrected for nonfermentable reducing materials as determined by a modification of the technic of Somogyi,[6] and are reported here in terms of fermentable reducing substances. A modification of the Shaffer-Hartman reagent, a description of which has not been published, was used for the analyses. Blood was obtained from normal persons, either in the fasting state, or 2½ to 3 hours after breakfast.

In 14 experiments the distribution ratios calculated from the analysis of laked blood averaged 0.86. Unlaked blood filtrates prepared at the same time contained on the average 6 mg. for each 100 cc. of blood less fermentable reducing substances, corresponding to an average of 13 mg. for each 100 cc. less in the cells. The ratios of cell sugar to plasma sugar are thereby rather markedly depressed averaging 0.72.

A slight modification in the preparation of the unlaked blood filtrates has enabled us to obtain somewhat higher values, approximating closely the analyses of laked blood. This modification consists in cooling to 0°C. the sulfate-tungstate reagent into which the blood is measured for the extraction of sugar, and the maintenance of this low temperature during the period of extraction until the

[2] Folin, Otto, and Svedberg, Andrea, *J. Biol. Chem.*, 1930, **88**, 715.

[3] Folin, Otto, and Wu, Hsien, *J. Biol. Chem.*, 1919, **38**, 81.

[4] Somogyi, M., *J. Biol. Chem.*, 1926, **70**, 599.

[5] Folin, Otto, *J. Biol. Chem*, 1930, **86**, 173.

[6] Somogyi, M., *J. Biol. Chem.*, 1928, **78**, 117.

addition of acid to complete precipitation of protein. The increase in the blood sugar in filtrates prepared by this device averaged about 4 mg. in each 100 cc. in 12 experiments. The differences, although negligible from the practical standpoint, and well within the ordinarily accepted limits of analytic error, are uniformly in one direction and indicate that the glucose content of our unlaked blood filtrates, as usually prepared, was too low. If the values for sugar in unlaked blood be increased by the amount indicated, the corrected distribution ratios will average about 0.80. This also represents approximately the ratio of the water content of the cells to that of the plasma, and suggests that the blood sugar tends to be distributed in equal concentrations in the water of the cells and of the plasma. The average distribution ratio found from the analyses of laked blood in these experiments, 0.86, is not in serious disagreement with this view, but may, however, imply that the cells tend to contain slightly more glucose relative to the plasma, rather than less, as found by Folin and Svedberg.

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Effect of Rattlesnake Venom on Flexner-Jobling's Carcinoma in the White Rat (Mus Norvegicus Albinus.)

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Since the venom of the rattlesnake is known to cause severe injury to normal animal tissues we were interested in determining its effect on the Flexner-Jobling carcinoma in the white rat. It was considered possible that intravenous injections of this venom would inhibit the development or possibly destroy the tumor in this animal. Therefore, the tumor was transplanted subcutaneously into 50 rats. Tumors subsequently developed in 29. Twelve of these were selected as controls, and 15 were selected for intravenous injections of the venom. The dose employed was 0.1 to 0.3 cc. of 2% crotalin, the average dose being about 0.2 cc. Larger doses proved fatal.

The injections were made once a week for 6 successive weeks and measurements were taken at the time of the injection. The results were entirely negative. The tumors of the injected rats grew just as rapidly as the control tumors.