Ca deficiency 38.2 mg. per 100 cc. Ca added	Fibrin formed	Ca deficiency 33.9 mg. per 100 cc. Calcium added	Fibrin formed
1.9	0.024	8.3	.1584
3.8	.020	16.6	.3844
7.6	.053	24.9	.3456
11.4	.052	33.3	.3128
15.2	.049	49.9	.5664
19.1	.046	66.7	.6408
22.8	.064		
26.6	.092		
30.4	.358		
34.2	.580		
38.2	.603		
41.8	.716		

It is seen from the above that the relationships of calcium are by no means simple. That the conversion of fibrinogen into fibrin can take place in the absence of inorganic calcium is certain. When inorganic calcium is added to decalcified plasma the decalcified thrombin can compete at first against potassium oxalate for the possession of the calcium and active thrombin is formed. The active thrombin exerts its action for some time even in the presence of oxalate until it is again inactivated by the loss of calcium. Loucks and Scott[2] showed it takes some time for oxalate to destroy the activity of thrombin. (It is extremely difficult or impossible to destroy it by dialysis.) The regeneration of thrombin, when inorganic calcium is added, is however immediate.

Attention is called to the similarity of the calcium and kephalin in regard to thrombin. Mills[5] showed that thrombin passes into metathrombin because the kephalin goes over to the other blood proteins. Metathrombin may be converted to thrombin by the addition of kephalin and it will pass into metathrombin again as it loses it kephalin to the other proteins again.

7437 C

Glucose Tolerance.

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Joslin[1] states that diabetes is hereditary in 25% of the cases. In view of this, the authors were interested in determining whether or not a tendency toward, or an early indication of, diabetes mellitus

[5] Mills, C. A., *Am. J. Physiol.*, 1926, **76**, 651.

[1] Joslin, E. P., *Diabetic Manual*, 1929, 4th edition, **145**.

could be noted by some slight abnormality in the response to the glucose tolerance test in relatives of diabetics. A preliminary study[2] left the authors unsatisfied, so the work was continued for a time.

In conducting the test, each subject was asked to eat a balanced diet during the previous week, as the diet may markedly influence the results.[3] The conditions were not ideal, since the term "balanced diet" is interpreted in various ways; however, it was impossible to keep the subjects on a known diet before the test. A 12 to 14 hour fast preceded the test. The sugar was determined in the fasting blood, then one gram of glucose per kilogram of body weight was given in the form of lemonade. The blood sugar was determined again one-half hour, one hour, 2 and 3 hours after the ingestion of the glucose. The sugar was determined in duplicate by the Shaffer-Somogyi method.[4]

The subjects included 35 women and 18 men with maternal diabetic relatives, 20 women and 14 men with paternal diabetic relatives, and 8 women and 1 man with diabetic brothers or sisters. Of the entire group, diabetes mellitus had occurred in parents and grandparents in 9 women and 6 men; in 8 women and 1 man diabetes mellitus had occurred in both maternal and paternal relatives.

The results are presented in Table I; the glucose values are expressed as mg. %.

TABLE I.

	Fasting	½ hr.	1 hr.	2 hr.	3 hr.
Maternal diabetic relatives					
35 women	85	127	103	79	76
18 men	82	123	106	76	75
Average for above group	84	125	104	78	75
Paternal diabetic relatives					
20 women	81	124	97	79	73
14 men	81	130	108	76	68
Average for above group	81	126	102	77	71
Diabetic brothers or sisters					
8 women and 1 man	83	107	85	73	74
Diabetic parent and grandparent					
10 women and 5 men	89	131	124	82	80
Maternal and paternal diabetic relatives					
8 women and 1 man	82	133	100	73	73

It is evident that no striking abnormalities are present in the subjects studied. The differences between the group with maternal diabetic relatives and that with paternal diabetic relatives are unimportant.

[2] Greisheimer, E. M., and Goldsworthy, E., *Am. J. Physiol.*, 1933, **105**, 40.

[3] Greisheimer, E. M., Goldsworthy, E., and Thomas, G., PROC. SOC. EXP. BIOL. AND MED., 1933, **30**, 1426.

[4] Shaffer, P. A., and Somogyi, M., *J. B. C.*, 1933, **100**, 695.

The group with diabetic brothers or sisters shows a flat curve; 4 of these subjects were members of one family. Although no pertinent information could be had by questioning, it was suspected that this family tended to eat more carbohydrate food than the balanced diet permits. Obesity was present in these siblings.

The group with diabetic relatives in the past 2 generations showed a slight delay in the fall, as evidenced by the higher value in the one hour sample than in the other groups.

On the whole, no abnormalities appear constantly in the glucose tolerance in subjects who have maternal diabetic relatives, paternal diabetic relatives, diabetic relatives in the 2 preceding generations, or in those who have both maternal and paternal diabetic relatives.

The present study indicates that one cannot predict a diabetic tendency nor see an early indication of diabetes mellitus by constant abnormality in glucose tolerance in those whose relatives are known to have diabetes mellitus.

7438 C

Effect of Deuterium Oxide on Rat Sarcoma R-39.

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The work of Lewis[1] on the inhibiting effect of deuterium oxide (heavy water) on the germination of tobacco seeds and the investigations of Barnes[2] showing the suppression of cell division in spirogyra by dilute solutions of deuterium oxide led us to study its effects on tumor tissue. Recently Woglom and Weber[3] reported that 0.40 to 0.42% deuterium oxide had no demonstrable effect on the growth of mouse sarcoma 180 or mouse carcinoma 63. Unaware of the above work we have been studying the effect of deuterium oxide on rat sarcoma R-39 for the past few months.

The deuterium oxide was obtained and analyzed by one of us (S. Y.) through the courtesy of Dr. Lloyd H. Reyerson of the Department of Chemistry. It was refluxed with acid dichromate, dis-

1 Lewis, G. N., *J. A. C. S.*, 1933, **55**, 3504.

2 Barnes, T. C., *J. A. C. S.*, 1933, **55**, 4332.

3 Woglom, W. H., and Weber, L. A., *J. A. M. A.*, 1934, **102**, 1289.