yeast to a marked degree. This experiment has shown that the impurity in cane sugar can be practically eliminated after one recrystallization from alcohol and that the yeast growth promoting property of cane sugar is not likely to be in the ash. Our work has shown that cane sugar, purified either by fullers earth, by recrystallization from alcohol or by combination of both methods, is devoid of vitamine D.

We have also made some experiments on the influence of the medium on the subsequent growth of yeast. Yeast grown on a medium poor in vitamine D, as medium O, and then used for inoculation, gives a growth amounting to 0.4 mm.; while that grown on an agar-malt medium amounts to 2.25 mm. We can conclude therefore that the yeast which we, at least, have been using is unable to grow on a medium devoid of vitamine D. When growth does take place, it is invariably due to two factors: firstly, the amount of vitamine D introduced with the seeded cells, depending on the type of medium used; and secondly, the vitamine-like impurity found in cane sugar.

This impurity in cane sugar should be taken into account in any subsequent work on this subject. The strain of bakers' yeast that we have been using is unable to grow without vitamine D and hence is unable to synthesize vitamine B in the absence of vitamine D.

153 (2113)

Calcium in the blood.

By WM. C. THRO and MARIE EHN.

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In our continued investigation of the calcium in the blood we have paid particular attention to furunculosis and to diabetes. The results here published are part of over 225 determinations made on human beings with the method described by Kramer and Tisdall.[1] They state the normal is 9.2—11.1 mg. in 100 c.c. of blood.

[1] Kramer, Benj., and Tisdall, F. F., *Jour. of Biol. Chem.*, 1921, xlvii, 475.

In a previous paper[2] we showed that in a few patients with furunculosis the calcium in the blood was low. We can now add to this record the following confirmation of our former results. (The figures represent milligrams in 100 c.c. of blood). 10.8, 10.6, 10.2, 9.9, 8.7, 8.5, (J. H. 7.9), (E. B. 7.1).

In patient E. B. who had had over forty boils and who at the time the blood was taken had a large boil on the arm the calcium content was 7.1. The patient was given 0.1 gram of parathyroid per day and up to the present time an interval of five weeks, there has not been a recurrence. The calcium content was 10.3 after ten days of parathyroid therapy.

In J. H., at the time the blood was taken, there were two acute boils present on the body. After about seven days of parathyroid therapy there is an improvement in the condition.

These findings confirm those of Grove and Vine[3] who record good results from the use of parathyroid in chronic infections.

We have made determinations of the calcium in the blood of children with pneumonia for Dr. J. D. Lyttle and obtained results varying from 5.8 to 10.9. Dr. Lyttle informed us that the amount of calcium so far as he could see had no relation to the prognosis.

Our results from cases of tetany are 8.9, 6.3, 6.4, 11.9, 8.4, 5.6, 7.1, 5.7, 8.1, 7.0, 10.3, 8.4, 12.5, 11.8, 5.6, 7.0. Some of the patients from which these estimates were made also had rickets.

Mendel and Benedict[4] from experiments on animals conclude that if the carbohydrate intake is decreased the calcium excretion is increased, the larger part being eliminated in the feces.

Thayer and Hazen[5] state that in a human subject when the patient was put on a green diet the calcium excretion is increased. Mendel, and Thayer and their associates did not determine the amount of the calcium in the blood.

Below we give the results of the determination of the calcium in the blood of patients in the Physiatric Institute on admission

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2 Thro, W. C., and Ehn, M., PROC. SOC. EXP. BIOL. AND MED., 1921, xviii, 189--191.

3 Grove, W. R., and Vine, H. W. C., *Brit. Med. Journ.*, 1922, I, No. 320, 791; *Brit. Med. Journ.*, 1921, II, 687.

4 Mendel, L. B., and S. R. Benedict, *Am. J. Physiol.*, 1909-10, xxv, 25.

5 Thayer, W. S., and Hazen, *Jour. Exp. Med.*, 1907, ix, 7.

and also after the carbohydrate diet had been decreased. The blood was obtained through the kindness of Dr. Sherrill.

DETERMINATIONS OF CALCIUM IN BLOOD OF DIABETES BEFORE AND AFTER REDUCED CARBOHYDRATE DIET

	Before			*After*	
Patient	Date	Calcium	Sugar	Date	Calcium	Sugar
McS	3-28-22	5.9	0.367	5-18-22	6.4	0.157
Miss L.	- -22	7.0	0.375	4- 3-22	7.1	0.112
F. R.	3- 1-22	9.0	0.577	5-18-22	5.6	0.129
R.	2-22-22	10.5	0.441	3- 7-22	8.6	0.159
B.	2-16-22	5.7	0.652	2-27-22	6.4	0.341
R.	2-11-22	8.1	.....	3-11-22	8.1	0.166

Calcium determination of the blood of a patient, Mrs. A. G., with osteomalacia.

February 8, 1922. (Had been treated with calcium lactate) 10.1 mg.
February 16, 1922. 9.4 mg.
February 24, 1922. 11.5 mg.
March 1, 1922. 11.6 mg. in uterine blood.

CONCLUSIONS

In some patients with systemic furunculosis, if the blood is tested at the time an acute boil is present the calcium content is found to be below normal.

The calcium is below normal in many young children who have pneumonia.

Not all of the patients with tetany had low calcium.

The placing of diabetic patients on a low carbohydrate diet did not affect the blood calcium in any definite manner.

One patient with osteomalacia had a normal amount of calcium in the blood.

154 (2114)

The genesis of gall stones in the dog.

By PEYTON ROUS, P. D. McMASTER, and D. R. DRURY.

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In dogs permanently intubated for the collection of bile, gall stones not infrequently develop despite the absence of infection, stasis and gall bladder activity. The character of the stones has already been discussed.[1] They are always discrete to begin with,

[1] Rous, Peyton and McMaster, P. D., *Jour. Exper. Med.*, 1921, xxxiv, 47.