The possibility, further, suggests itself that the *d* agglutinin and the precipitin in a typhoid serum are identical.

33 (125). **"The effect of alcohol on hepatic glycogenesis": WILLIAM SALANT.**

In view of the current tendency to regard alcohol as a food it seemed desirable to make a study of its effect on hepatic glycogenesis, for if alcohol can replace the carbohydrates in food it might spare the carbohydrate radicals of the tissue proteins. An accumulation of glycogen in the liver after exclusive feeding with alcohol might therefore be expected. Indeed the work of Nebelthau,[1] who found 1.34 to 3.51 per cent. of glycogen in the liver of the hen after the administration of 10 c.c. per kilo of 96 per cent. alcohol on the seventh day of fasting, lends support to this view.

This suggestion was put to an experimental test. The investigation was carried out on rabbits which were fed exclusively on alcohol for periods of 4 to 6 days. Alcohol (30 or 60 per cent.) was given per os by means of a stomach tube in amounts varying between 3 to 9 c.c. per kilo daily. Control rabbits were subjected to the same preliminary treatment, but were given water instead of alcohol by stomach tube. At the expiration of 4 to 6 days the rabbits were killed under ether anesthesia and the livers examined for glycogen according to Pflüger's[2] shorter method. The amount of dextrose obtained by hydrolysis of the glycogen was determined by Allihn's method. Later in the course of the investigation, for reasons of economy of time, the amounts of copper were determined volumetrically by the iodin method instead of gravimetrically as originally recommended by Allihn.

The results at this stage of the investigation show that in rabbits fed exclusively on alcohol (10 c.c. of 30 per cent. alcohol per kilo or 12 c.c. of 60 per cent. alcohol per kilo daily for four or five days) there is no accumulation of glycogen in the liver, which shows that glycogen is not formed in the livers of rabbits when they are fed on alcohol alone. Previous to fasting or alcohol administration, these rabbits were fed on oats, hay and cabbage. As the for-

[1] Nebelthau: *Zeitschrift für Biologie*, 1892, xxviii, p. 146.

[2] Pflüger: *Archiv für die gesammte Physiologie*, 1902, xciii, p. 163.

TABLE I. — AMOUNTS OF GLYCOGEN IN THE LIVERS OF CONTROL RABBITS.

Exp. No.	Rabbit Wt.	Liver Wt.	Food Before Fasting.	Fasting Period.	Treatment During Fasting.	Hepatic Glycogen Per cent.
1	820 gms.	22 gms.	C. H. O.[1]	4 days	Water given by Stomach Tube.	None
2	1320 "	41 "	" " "	5 "		"
5	1230 "	27 "	Carrots 3 days	5 "		0.139
6	970 "	22 "	" "	5 "		0.148
8	1370 "	42 "	" "	6 "		0.043
10	1265 "	38 "	" "	4 "		0.127
11	1470 "	53 "	" "	4 "		None

TABLE II. — AMOUNTS OF GLYCOGEN IN THE LIVERS OF RABBITS AFTER ADMINISTRATION OF ALCOHOL.

Exp. No.	Rabbit Wt.	Liver Wt.	Food Before Fasting.	Fasting Period.	Alcohol Per Kilo. Daily.	Hepatic Glycogen Per cent.
1 A	1120 gms.	48 gms.	C. H. O.[1]	4 days	10 c.c. 30 per cent.	None
2 A	1100 "	35 "	" " "	5 "	10 c.c. "	"
5 A	1100 "	44 "	Carrots 3 days	5 "	10 c.c. "	0.8
6 A	1300 "	48 "	" "	5 "	10 c.c. "	0.28
9	1280 "	47 "	" "	6 "	10 c.c. "	Trace
7 A	1500 "	53 "	" "	6 "	10 c.c. "	0.083
9 A	1270 "	43 "	" "	6 "	10 c.c. "	Trace
10 A	1470 "	53 "	" "	4 "	10 c.c. "	0.018
11 A	1350 "	54 "	" "	4 "	10 c.c. "	0.148
17 A	1800 "	66 "	Carrots 4 days	3½ "	12 c.c. 60 per cent.	None
18 A	1130 "	45 "	" "	4 "	15 c.c. "	None
19 A	800 "	35 "	C. H. O.	4 "	12 c.c. "	Trace

mation of glycogen *de novo* does not take place, under the influence of alcohol, a number of experiments were carried out to ascertain whether alcohol retards the disappearance of glycogen from the liver during fasting.

To test this point rabbits were brought up to a maximum of glycogen accumulation by feeding carrots for 3 days. Alcohol (10 c.c. of 30 per cent. per kilo) was then given in the way already stated, for 4, 5 or 6 days. As may be seen on inspecting Table II the results were negative. In one experiment only was an appreciable amount of glycogen found. In the rest of the experiments the amounts of glycogen obtained in alcohol fed rabbits were about the same as in the controls. In this connection it might be mentioned that the amount of glycogen found in rabbits killed after feeding carrots for three days varied between 4 and 7 per cent. Larger quantities of stronger alcohol were then tried. The administration of 12 to 15 c.c. of 60 per cent. alcohol per kilo daily for 4 days, after bring-

[1] C. H. O. — Cabbage, Hay, Oats.

ing the rabbits up to a maximum of glycogen accumulation by feeding carrots, was not accompanied by a retardation of the disappearance of glycogen from the liver. In the two rabbits examined the liver was glycogen free. It is safe to conclude, therefore, that alcohol when given in large amounts to healthy rabbits neither causes the formation nor retards the disappearance of glycogen from the liver.

34 (126). **"The viscosity of the blood during fever and after injection of phenylhydrazin": RUSSELL BURTON-OPITZ.**

The author had previously shown that cold water and hot air baths produce an increased viscosity and warm water baths a decrease of the viscosity. In this communication the question was considered whether similar changes occur when the temperature of the body is raised by bacterial activity.

The experiments were performed upon three dogs during experimental peritonitis (*Staphyl. pyog. aureus*). The determinations were made at times when the temperature ranged from 38.7 to 39.5° C. and gave figures which were slightly above the average value of the viscosity of dog's blood. Its specific gravity, on the other hand, was invariably lower than normal, indicating thereby that, in spite of the loss in solids incurred during the inflammatory processes, the blood had retained a high viscosity.

In another series of experiments the viscosity was tested after subcutaneous injection of phenylhydrazin. The specific gravity of the blood was very low in all cases, the viscosity, on the other hand, very great. It may be regarded as proved, therefore, that these two factors need not preserve a direct relationship to one another. As in the previous work, the blood of these animals lost a large part of its solid matter but retained, nevertheless, a high viscosity.