TABLE I
Temperature change after 1 hour in cold box.

Type of Rat	No. of cases	Body temp. at room temp.	Temp. of cold box	Fall in body temp. in cold box	Diff. from original body temp. after 1 hr. at room temp.
		°F.	°C.	°F.	°F.
Control	2	98.0, 98.4	4, 5	3.6, 5.9	—1.0, +1.4
Partial suprarenalect.	1	96.5	5	3.5	+1.7
Transplant	6	97 to 99.2	4 to 10	0 to 5.2	
Normal	3	97.4 to 98.4	—6 to —9	7 to 7.6	—0.2 to —3.3
Partial suprarenalect.	4	96.6 to 99.8	—5 to —10	6.6 to 8.8	+2.2 to —1.8
Transplant	3	97.8 to 98.4	—3 to —10	6 to 8	0 to —2.2

made by Hartman[2] with regard to the importance of voluntary activity in the rat.

The absence of any difference in behavior with regard to the maintenance of body temperature between normal rats and those lacking the suprarenal medulla but having cortical tissue, in this and in previous researches, indicates that evidence of the operation of the primary line of defense, *i. e.*, medulli-adrenal secretion, in heat loss must be sought by other means. It is possible that loss of the medulla is compensated for by the activity of the rest of the sympathico-adrenal system in heat regulation in this animal. The importance of the suprarenal cortex in the secondary line of defense appears to be well established.

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Cholesterol Ester Percentage in Diabetic Plasma.*

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Since the advent of insulin there has been a marked change in the relative causes of death in diabetics. Whereas formerly 15% of the patients died from arteriosclerosis and 60% from coma, now 47% die from arteriosclerosis and only 20% from coma. Insulin has rescued the diabetic from death by coma only to have him die

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from arteriosclerosis.[1] Concerning non-diabetic arteriosclerosis, Aschoff[2] believes that an increase in the cholesterol content of the plasma is the initial step in its production. He states that with increased amounts of cholesterol more and more deposition takes place, mainly in the form of cholesterol esters. These esters are then broken down, the cholesterol crystallizing out and the fatty acid combining with calcium to form soaps which later are changed over into inorganic salts. Schönheimer[3] finds that in sclerotic arteries there is a deposition of cholesterol much as it is in the blood, i. e., 50-60% esterified and 25-26% free, and that this ratio remains constant. Since he finds that the ester content of calcified arteries is as high as in the uncalcified, he is not in agreement with Aschoff that esters change to calcium salts. Knudson found that feeding cholesterol or cholesterol esters with a fat-free diet resulted in increased total cholesterol but no increase in esterified cholesterol.[4] On the other hand feeding fat without cholesterol resulted in no increase of total cholesterol but an increase in esterified cholesterol,[5] that is, cholesterol takes part in fatty acid absorption by the formation of cholesterol esters. Bloor and Knudson[6] found in plasma of unselected diabetics that there was no increase in the percentages of cholesterol esters even though the total cholesterol was in some cases 4-5 times normal.

However, diabetic patients with the most advanced arteriosclerotic changes might show the most marked changes in cholesterol. Because of the evident importance of cholesterol esters in arteriosclerosis the percentages of these substances were studied. The methods used were the colorimetric procedure of Bloor and Knudson and for comparison the Windaus digitonin precipitation method as adapted by Okey.[7] It may be said that while the colorimetric values obtained were about 25-30% higher, the ratio of free to bound cholesterol is practically the same by the 2 methods. Fifteen patients from the Diabetic Clinic of this medical school were selected.

Group A consisted of 9 patients with such severe arteriosclerotic changes in the lower extremities that gangrene had resulted and

[1] Joslin, Treatment of Diabetes, 1928.

[2] Aschoff, L., *Beiheft z. Med. Klinik*, 1908, **1**.

[3] Schönheimer, R., *Zts. f. Physiol. Chem.*, 1926, **160**, 61.

[4] Knudson, A., *J. Biol. Chem.*, 1921, **45**, 255.

[5] Knudson, A., *J. Biol. Chem.*, 1917, **32**, 337.

[6] Bloor, W. R., and Knudson, A., *J. Biol. Chem.*, 1917, **29**, 7.

[7] Okey, R., *J. Biol. Chem.*, 1930, **88**, 367.

rendered necessary amputation of a toe, foot or leg. The duration of the diabetes varied from 1 to 18 years, the ages from 42 to 75 years. Five were of sufficient diabetic severity as to require insulin. The diets were at low maintenance levels and the percentage of fat calories in the diets averaged 58%.

Group B was composed of 6 patients with advanced arteriosclerosis in the lower extremities showing evidence of impending circulatory insufficiency but not having actual gangrene. In these, diabetes had existed from 1.5 to 19 years and the ages ranged from 38 to 70 years. All but one required insulin for diabetic control. Diets were low maintenance and the percentage of fat calories averaged 62%.

For controls, 12 normal individuals with an average age of about 32 years were studied.

In all instances samples of blood were obtained after an overnight fast or after a fat-free breakast.

TABLE I.
Average of Results.

	No. Cases	No. det.	Digitonin Method			Colorimetric Method			Blood Sugar	% Fat in Diet	Cal.	Av. Age
			Total	Ester	Ester %	Total	Ester	Ester %				
Group A	9	34	229	158	69	293	216	72	181	58		60
Group B	6	15	199	148	70	250	186	75	163	62		65
Normals	12	12				235	147	62		34		32
Normals K & B	26	26				200	116	58		34		

Summary: The total and esterified cholesterol values were found to reach their highest levels in the group with the most advanced sclerosis (Group A). The percentage of esterified cholesterol in both groups with arteriosclerotic changes was found to be 10-15% above that of normal averages. These results suggest a probable relationship of high percentage of cholesterol-ester in blood plama to the development of athermatous changes in diabetic patients. The possible relationship of the high percentage of cholesterol esters in these patients to the high fat diet is not excluded and is now being investigated.