occurring with patient's serum by that with the control serum. It is probable that the minimum significant difference by this method is 0.5. Therefore, with the possible exception of case III, the changes are not noteworthy.

Summary. Diathermy did not produce a significant change in complement concentration nor in opsonic index within the limits of this investigation. It is apparent that a complete report can come only from a large number of cases with frequent tests at selected times.

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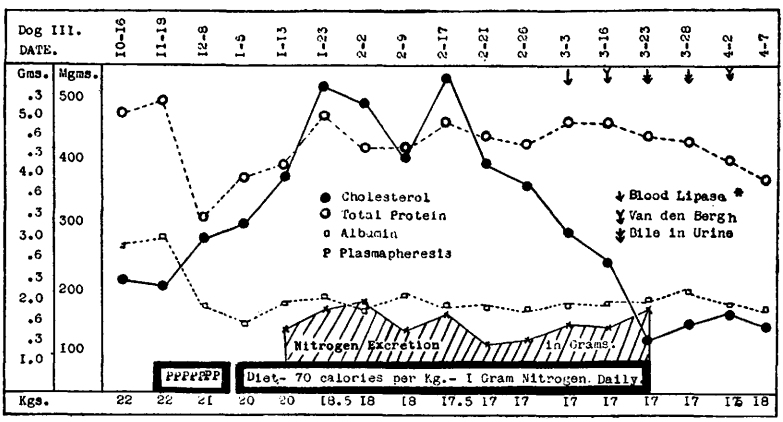
Cholesterol and Bile Pigment Changes Incident to Diets Low in Protein.

M. HERBERT BARKER. (Introduced by A. C. Ivy.)

From the Departments of Physiology and Medicine, Northwestern University Medical School.

Variable elevations of blood cholesterol have been observed during the past 5 years both clinically and experimentally where nitrogen balance was disturbed. In order to determine the possible importance of nitrogen balance on cholesterol levels, 6 dogs were placed on diets adequate in regard to minerals, vitamines and calories, but deficient in nitrogen. The nitrogen was limited to 1 gm. per day per animal. On this diet the urinary nitrogen excretion



* Olive oil lipase.

CHART 1.

ranged from .99 to 2.2 gm. per day; so that a negative nitrogen balance was established and could be maintained for any desired period.

All dogs placed on this diet showed striking elevations in their total blood cholesterol and a gradual loss of weight. After 2 to 5 weeks on the low nitrogen diet, blood cholesterol began to increase gradually. It increased from the control readings of 125-225 mgm. to 450-550 mgm. after 4 to 12 weeks. If the diet was discontinued, a very slow return of cholesterol to the normal level was observed after many weeks. If the low protein diet was continued, the wasting became marked and a gradual drop in blood cholesterol began. After the cholesterol had dropped near to or below normal, blood lipase[1] (olive oil lipase) ordinarily appeared in increasing amounts. Later the Van den Bergh reaction became positive, soon bile appeared in the urine and the animal would refuse to eat. Cautious feeding of milk followed by a gradual return to the general ration would restore the animal only after several months. Realimentation with liberal amounts of meat was associated with a peculiar toxic state and resulted in the death of one animal not unlike that seen with meat feeding in cirrhosis of the liver in dogs. Total serum proteins and serum albumin fell 1½ to 2% but failed to reach the critical levels for edema formation. A reduction of the total serum protein by plasmaphaeresis showed a return to near normal levels even though a severe negative nitrogen balance was maintained. (See chart.) Edema was noted in one animal on realimentation and this edema persisted for 6 weeks.

Many details of this work are being followed and will be reported later but cholesterol has been regularly elevated from 200 to 400 mg. in the dogs on a diet adequate except for nitrogen. Prolonged diets deficient in nitrogen seemed to produce liver damage first indicated by a fall in blood cholesterol. This would support recent observations on cholesterol in parenchymatous liver damage in man.[2] Marked wasting of the body fat and muscle occurred and total serum proteins were slightly reduced, but edema did not appear except in one instance and that occurred on realimentation. There was no relation between cholesterol and total protein levels or the state of water balance.

[1] Crandall, L. A., and Cherry, Ian S., PROC. SOC. EXP. BIOL. AND MED., 1931, **28**, 572.

[2] Epstein, Emanuel Z., *Arch. Int. Med.*, 1931, **47**, 82.