(3) Of the several sugars tested, sucrose seems to be the most easily utilized, though in some cases it was without effect. (4) Similar results were obtained from glycerol, lactic, malic, tartaric and citric acids. These compounds are more often beneficial than the carbohydrates.

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The Mechanism of the Lipemia of Bleeding.

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(Introduced by I. N. Kugelmass.)

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It has been known since the work of Boggs and Morris[1] that repeated and copious bleeding of rabbits produces a high grade lipemia. Similar lipemia may occur in humans following severe hemorrhages (Feigl[2]). Boggs and Morris[1] believe it possible that "the great loss of tissue proteins might have some influence on the abnormal fat metabolism" and that "lowered oxidation following a great loss of red cells plays a part." Sakai[3] and Horiuchi[4] think that the decrease in blood lipase may be the cause of the lipemia. Bloor[5] believes that nothing definite can be said as to the cause of the fat mobilization.

To further elucidate the mechanism of lipemia of bleeding, having in mind certain analogies with the lipemia observed in human nephrosis, we produced lipemia in 9 rabbits by bleeding, and compared the changes in total fats and cholesterol of blood with the alterations in the blood proteins, certain inorganic constituents and red blood cells. The animals were kept on the usual laboratory diet of cabbage, oats, and bread. The blood was obtained by incision of the rabbit's ear. About 35 cc. daily were removed, omitting a day occasionally when the animal seemed very weak.

The results in all 9 animals were essentially the same, and are illustrated in Table I.

TABLE 1.
Rabbit No. 4. Daily Blood Samples.

Blood drawn cc.	Sugar mg.%	NPN mg.%	Total Prot. gm.%	Alb. gm.%	Glob. gm.%	A/G	Chol. mg.%	Total Lipins mg.%	R. B. C. millions
33	150	30	6.37	4.09	2.28	1.8	161	479	4.5
35	140	30	6.50	4.06	2.44	1.7	152	552	3.5
25	115	33	6.15	4.10	2.05	2.0	181	482	2.5
30	120	29	6.28	4.16	2.12	1.98	149	621	1.8
29	122	31	6.55	4.04	2.51	1.6	165	581	2.0
20	124	30	5.905	3.881	2.03	1.91	157	672	2.5
26	124	30	5.55	3.71	1.84	2.01	191	821	1.9
30	115	30	5.43	3.59	1.84	1.95	184	721	2.0
26	112	27	3.94	2.61	1.33	1.99	254	1250	1.2
25	115	30	3.33	2.01	1.32	1.52	297	2157	1.2
30	140	30	4.03	2.21	1.82	1.21	382	2870	1.8
15	125	29	3.72	1.96	1.76	1.11	309	3120	1.5
26	123	30	3.80	1.84	1.96	0.94		3860	1.75
35	122	27	3.23	1.54	1.69	0.91	320	4120	1.4
35	110	29	3.40	1.71	1.69	1.01	354	3890	1.34
35	105	30	4.03	2.12	1.91	1.11	402	3540	1.1
15	115	42	3.33	1.69	1.64	1.0	408	3710	0.9
20	129	44	3.97	2.12	1.85	1.13	403	3140	0.65

Exitus 8 P. M. 6/21/27.

It is seen that as the protein content of the plasma diminished, the total lipins and cholesterol increased. During the first few days the drop in protein was slight, as was the rise in cholesterol and total fats. But when the proteins dropped notably there occurred a tremendous rise in total lipins and a moderate one in cholesterol. It is further seen that the red blood cells diminished in number from the very start. But the correlation of the rise in fats with the fall in red blood cells is not nearly so close as with the fall in proteins, for during the first few days the red blood cells decreased abruptly while the cholesterol and total lipins showed comparatively little change. In one rabbit (rabbit 8) which had an initially low blood protein content, though a normal red cell count, severe lipemia was present after only 4 days of bleeding.

Table II shows the initial and lowest protein concentrations and the concentrations of total lipins and cholesterol on the same days.

It is evident that the rise in total lipins is much greater both absolutely and in proportion to the initial value than that in cholesterol. This is also true of human lipemia as encountered in diabetes and nephrosis.

TABLE II.

Rab. No.	Initial T.P.	Alb.	Glob.	A/G	T.L.	Chol.	On day of lowest protein T.P.	Alb.	Glob.	A/G	T.L.	Chol.
4	6.37	4.09	2.28	1.8	479	161	3.23	1.54	1.69	0.91	4130	320
5	5.91	3.96	1.95	2.03	530	111	3.56	2.28	1.28	1.18	3450	380
7	5.30	3.67	1.63	2.25	390	109	3.10	2.09	1.01	2.1	3200	309
8	4.1	2.75	1.35	2.1	870	139	2.32	1.27	1.05	1.2	2400	301
9	5.75	3.75	2.0	1.85	580	106	2.2	1.15	1 05	1.1	4120	310

Table II also shows that the drop in albumin is greater than that in globulin, resulting in a decrease in the albumin/globulin ratio, once even in inversion. This is presumably due to the rapid regeneration of globulin as previously demonstrated by Kerr, Horowitz and Whipple.[6] The drop in colloid osmotic pressure of the plasma is thus greater than would be anticipated from measurements of the total proteins only, for a given concentration of albumin exerts a greater colloid osmotic pressure than an equal concentration of globulin. In fact, it has been shown by direct measurement that the colloid osmotic pressure per gram per cent of plasma protein is proportional to the albumin-globulin ratio.

The rise in plasma fats and lipoids more closely correlated with the fall in plasma proteins than with the diminution in the number of red cells. It seems highly probable that the lessened protein content of the plasma is intimately concerned in the lipemia of bleeding. It is possible that the accompanying lipemia is to be viewed as a compensatory mechanism, the organism mobilizing fatty acids, cholesterol and lecithin in an effort to make up for the diminution in colloid osmotic pressure that results from the loss of plasma protein. If this view is correct, lipemia is a manifestation of the organism to maintain the colloid osmotic pressure of the plasma, as various other devices are used to keep other physical and chemical properties of the blood near a constant level.

The fats are mobilized not only from the food but also from the fat depots. Thus, though some of our animals lost comparatively little weight during the experiments (from 2040 gm. to 1870 gm. after 15 days of bleeding), the fat depots of the body (subcutaneous, retroperitoneal, etc.) were almost completely devoid of fat. Nor was there any notable fatty deposition in the liver, kidneys, adrenals or other viscera. The animals become lipemic even if they receive almost no fat in the diet, though more slowly than when they are given fats.

No edema was noted at any time despite the drop in plasma proteins. However, the fact that some of the animals lost little weight

despite the disappearance of the fat tissues quite possibly indicates that water was retained, though not sufficient to produce demonstrable edema.

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Effect of Radium on Pharmacological Properties of Mercurochrome.

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The effect of various radiations from radium on Mercurochrome was studied by irradiating both the solutions and the solid crystals of the drug. The action of alpha and beta radiations was studied by crushing glass globules containing radium emanation in doses of 4 to 10 millicuries directly under solution of 2% Mercurochrome in water and immediately stoppering tightly the 10 cc. vials of the solution. The effect of gamma rays was studied by placing vials of Mercurochrome solution in juxtaposition to large quantities of radium. The irradiations of solid Mercurochrome crystals was performed in the same way. The pharmacological and bacteriological properties of the solid crystals after irradiation were studied by making a 2% solution of the same. Bacteriological studies were made in the following manner: Cultures of *B. typhosus* were used; the method of studying germicidal action was the so-called Hygenic Laboratory method. The temperature of medication was 20°; the proportion of culture and disinfectant used for making dilutions were 0.1 cc. in 5 cc. Subculture medium was also that of the Hygenic Laboratory method. Quantity used in each tube was 10 cc. Temperature of the incubator was 37°. Various dilutions of the drugs were employed. Time of exposure of the culture to the action of the disinfectant was in one series of experiments 5 minutes and in a second, 15 minutes. Control experiments with unradiated Mercurochrome solutions from exactly the same stock were made in