

The effects of struggle were then taken up. With struggle, as others have shown, the lymph flow increases sharply in amount for a few minutes. With this the author found a corresponding increase in cell content, an increase marked in "cell concentration" per c.mm. of lymph and in the total number of elements passed. Specimens taken at short intervals showed that the curve of increase in cell concentration was not coincident with that of the lymph flow, but was somewhat retarded, the greatest cell increase often existing in the few c.c. of lymph obtained in the quiet immediately following muscular exertion. That a transient flushing out of cells was not responsible for the main results, was shown by the data from long-continued struggle. The cell content and concentration remained high throughout, even when the rate of lymph flow had lessened to that seen previously during quiet. In an instance in which struggle was prolonged to 35 min. slightly more than twice as much lymph was voided, and over four times as many cells, as in the 35 min. of quiet immediately preceding. Following such prolonged exertion the lymph was for a time poorer in cells than previous to it.

An additional conclusion reached was that, for a given individual, the lymph glands seem "set" to produce cells at definite rate. This rate has a wide range for reasons unknown. The cell increase with struggle comes from the peripheral lymph system rather than from sedimented cells in the receptaculum chyli, and is probably dependent on another factor besides increased lymph flow (a supposition upheld by later experiments with lymphagogues). The facts elicited have a bearing on the "physiological mononucleosis" of the blood observed in man following active exercise, on the disappearance of this following prolonged exertion (25 mile run), and the absolute decrease in mononuclears sometimes seen.

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A lipolytic form of hemolysis.

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The varieties of hemolysis hitherto described imply the direct action of certain chemically-defined bodies, acids, alkalis, glucosides,

— which attack and destroy the integrity of the red corpuscles, and other chemically undefined bodies, — bacterial hemolysins, which act in the same manner, and the more indirect action of certain complexes defined as intermediary body and complement. I have shown previously that certain soaps and fatty acids — of the oleic series, chiefly — can play the part of complements in hemolysis. The experiments based upon this fact led me to the study of the ferment lipase as the direct or indirect cause of hemolysis. I found in the course of this study that lipase is, under some conditions, an efficient hemolytic agent which acts, however, not directly upon the red corpuscles, but indirectly through the liberation from available fats of the active fatty acids. Neutral fats, the higher glycerides, are not hemolytic, but they become so under the influence of lipase.

If one drop of triolein, or a corresponding amount of fat from the dog or guinea-pig, or a small quantity of tripalmitin or crotin, is added to 2 c.c. of a 5 per cent. suspension of washed red corpuscles and 1 c.c. of the lipase solution be added, hemolysis will occur. Neither the lipase nor the fats alone are lytic. Lecithin cannot replace the fats mentioned. The hemolysis is non-specific. Serum of the dog and the guinea-pig, and, to a less extent, of the ox are rendered non-specifically hemolytic by the action of lipase.

Potassium cyanide and sodium fluoride in 1 : 10,000 solution inhibit the action of lipase on the fats, and calcium chloride removes the lytic agent from an active mixture. Since the bile salts are known to increase lipolysis, the effects of the sodium salts of cholic, glycocholic and taurocholic acids in 1/500 *N* solutions were tested on lipolytic hemolysis. The rate of hemolysis was accelerated.

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On the mechanism by which water is eliminated from the blood capillaries in the active salivary glands.

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1. There is a spontaneous flow of lymph from the quiescent parotid gland of the horse. The quantity is never great but it was