in one direction and then slowly in a directly opposite direction. The explanation for this will be given in a subsequent paper.

Polarized light with compensator (Red, first order) gave no definite evidence that the refractile nodules and beads were anisotropic.

More than 2 fibrin filaments may anchor a red corpuscle; many times a red corpuscle more or less crenated may be seen with 3 and even 4 actively vibrating, rotating and even lashing fibrin flagella. The action of these flagella or even of a single one imparts a tremulous quiver to the red corpuscle which undoubtedly heretofore has been interpreted as Brownian movement.

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Formation of Macrocytes and Microcytes from Normal Red Blood Corpuscles.

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The technique employed and the optical equipment were the same as those noted in my preceding communication on the contraction of fibrin.[1] The blood was obtained from man, dog, rabbit and guinea pig.

The red corpuscles of all the species examined are round or slightly oval, show a della, and vary somewhat in size. In the human subject the diameter measurements varied between 7.8-9μ; in dog between 7-7.8μ; in rabbit 6-7.8μ; in guinea pigs 6-7.8μ.

The formation of macrocytes occurred as follows in all species: Immediately after the hanging blood-drop is made, laking of red corpuscles begins in the periphery. If 2 corpuscles are touching each other, the area of contact slowly becomes greater until the 2 reds form an oval mass with an encircling median groove. In the middle of this groove a whitish line is seen which represents the opposed or fused surfaces of the 2 corpuscles. When this common septum disappears the 2 corpuscles form a round or slightly oval macrocyte measuring 10μ+ in diameter. As long as the septum exists the macrocyte shows a slight indentation in its outline. (See Fig. 1.) The hemoglobin content is usually the same as that of a normal red corpuscle, which shows that the thickness of the macrocyte is not appreciably greater than that of a normal erythrocyte.

[1] Auer, John, PROC. SOC. EXP. BIOL. AND MED., 1930, xxvii, 618.

No della was ever observed in a macrocyte, nor was this structure seen in sideview.

Macrocytes may also be formed by the fusion of 3 corpuscles or by fusion of a macrocyte with a normal corpuscle. Fusion of component red corpuscles is not always complete; this is readily betrayed by the presence of septa and by the shape.

After formation, the macrocytes sooner or later begin to pale without obvious change in size and finally a macrocytic blood-shadow larger than that of the average blood-shadow is formed. The whole process varies in duration from 10 to 30+ minutes.

Microcytes were observed in the process of formation in all the species of blood examined. There are two general methods: (a) A red corpuscle has been changed to a spindle-shaped structure by the shortening of 2 anchoring fibrin-threads. This spindle cell is stretched and relaxed repeatedly by a shortening of the anchoring fibrin threads and their subsequent lengthening; during this process a few crenations may appear on a small area of the spindle red. Suddenly one or the other of the anchoring fibrin-fibers snaps and the red darts across a portion of the field changing during observation into a coarsely crenated red corpuscle, the crenations being broad at the base and blunt at their tip; attached to this crenated corpuscle one now sees a long vibrating, rotating flagellum and on another part a refractile nodular mass representing the fibrin-thread which tore off and contracted. This crenated corpuscle quivers, due to the motility of the attached flagellum, and the crenations slowly

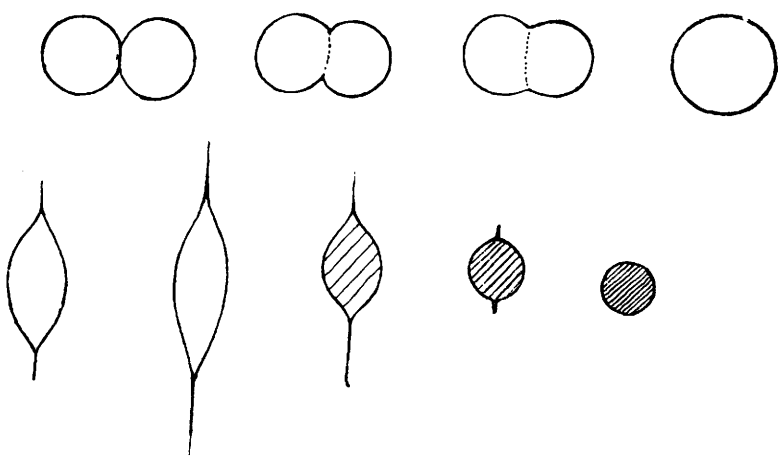

FIG. 1.

(a) Formation of a macrocyte. Sketches represent the same cells throughout.
(b) Formation of a microcyte. Sketches represent changes observed in the same cell.

change, becoming narrower at the base and more pointed. Within a shorter or longer period the crenated corpuscle becomes rounded and smaller, the crenations become thin and slender and the hemoglobin tint is definitely deeper than in the coarsely crenated stage. At this stage the refractile nodule has disappeared and the vibrating, twisting flagellum may or may not be present. Finally, the needle-like spicules disappear from the cell and a perfectly round, smooth microcyte 5μ in diameter without della and with dense hemoglobin has been formed.

(b) The other method observed is as follows: A spindle red corpuscle is observed slowly growing smaller, remaining apparently motionless during the process, while the anchoring fibrin-threads become more prominent and definitely thicker at their point of attachment to the corpuscle. The hemoglobin tint deepens, the cell becomes rounder and finally a typical microcyte with dense hemoglobin content, and without della appears. In this method the non-hemoglobin constituents have been wrung out of the corpuscle by the twisting of the anchoring fibrin threads which tear, contract and disappear at a certain time. See Fig. 1.

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Effect of Various Anterior Pituitary Preparations on Basal Metabolism in Guinea Pigs.

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Loeb,[1] and later Loeb and Bassett,[2] and Silberberg[3] studied the effects of various anterior pituitary preparations upon the thyroid gland; the former investigators also correlated the changes in the thyroid thus produced with those that take place in the sex organs under the influence of anterior pituitary preparations.[4] It was found that various preparations have different effects. Intraperitoneal injections of acid and alkaline extracts of fresh cattle glands cause a

[1] Loeb, Leo, *J. Med. Res.*, 1920, xli, 481.

[2] Loeb, Leo, and Bassett, R. B., PROC. SOC. EXP. BIOL. AND MED., 1929, xxvi, 860.

[3] Silberberg, Martin, PROC. SOC. EXP. BIOL. AND MED., 1929, xxvi, 166.

[4] Loeb, Leo, and Bassett, R. B., PROC. SOC. EXP. BIOL. AND MED., 1930, xxvii, 490.