

effect, however, is not directly due to the inhibition of the coagulation of the blood, but probably to changes in the blood which will still have to be determined.

23 (115). "**Granula and ameboid movements in the blood cells of arthropods**": **LEO LOEB.**

If one observes a drop of blood of *Limulus*, or of other arthropods, under the microscope immediately after it has left the body, an interesting phenomenon is seen. The large majority of the cell granula become smaller and soon disappear. The cells which were at first oval become round and send out hyalin protoplasm and pseudopodia. Movements of the protoplasm may be observed for a long time, but ultimately they cease, when the cells are spread out entirely and in this condition the cells gradually die.

It has been the author's aim to determine the conditions which inhibit or accelerate this apparently spontaneous dissolution of the cell granula. From the results of these investigations, which cannot be given here in detail, it follows that the fate of the granules of arthropod blood-cells depends upon certain mechanical conditions, and that the apparently spontaneous dissolution of cell granula can to a large degree be inhibited by preventing certain mechanical irritations of the cells. The changes taking place in the granules are very fine indicators of certain mechanical or chemical alterations in the environment of the cells. Such changes are determined by the character of the foreign bodies with which the cells come in contact, lipoid substances being especially favorable for the preservation of the granules. Temperature, osmotic conditions and the reaction of the medium in which the cells are suspended, influence the granules in a definite way. Furthermore, the presence of certain electrolytes is necessary for the preservation of the granules in isotonic, hypotonic, and, with the exception of sugar solutions, also in hypertonic solutions. The cell granules are dissolved in isotonic solutions of non-electrolytes. Different electrolytes exert different, specific influences.

We see, moreover, that certain substances may dissolve cell granules without enabling the protoplasm to carry out ameboid movements, but in the large majority of cases a certain parallelism is observed between the fat contents of the granules and the ameboid

movements of the cells. Whether this parallelism is due to a direct or merely to an indirect causal relation cannot at present be determined with certainty. It seems not unlikely that the amoeboid movements, the spreading out of the cells and the dissolution of the granules are caused by certain metabolic changes which are induced in each instance by similar conditions. (The blood-cells of *Limulus* are a favorable object for demonstrating the effect of mechanical conditions upon blood cells leading to thrombosis and they can be used to advantage in courses of experimental pathology such as is given by the writer at the University of Pennsylvania.)

24 (116). "**On a course on the pathological physiology of the circulation,**" with demonstration of instruments, specimens, etc.: **W. G. MACCALLUM.**

In general in the teaching of pathology the anatomical alterations produced by disease are dwelt upon, and little attention is devoted to the detailed study of the alterations in function produced by these diseases. A course was arranged during the past year at the Johns Hopkins University to cover this ground and half of the new laboratory of experimental medicine was planned to give facilities for this work.

The aim of the course was to reproduce experimentally such diseased conditions as are seen by the students in the wards of the hospital so that they might be studied with the aid of any or all of the methods at the command of the physiologist and of the pathologist. The study of the anatomical changes which are usually found in such conditions was carried on together with these experiments.

It was planned to attempt the study of only a limited portion of the subject each year, and during the past term the diseases of the circulatory system have occupied the attention of the class. Next year it is intended to study the digestive system in a similar way.

Only those lesions were produced of which experimental study was certain to be of value — thus in the case of the pericardium, while various infections might have been used to give rise to an exudate, the blood-pressure relations, changes in heart-beat, heart-sounds, etc., were studied during the distention of the pericardium with water.