

bone also in thyroidectomized young guinea pigs. Lack of thyroid gland does not, therefore, prevent the effect of the extract in this respect; on the contrary the phenomena are even more distinct than in normal animals injected with anterior pituitary extract. We may furthermore conclude that anterior pituitary extract exerts its influence on bone and cartilage without the mediation of the thyroid gland.

8448 P

A Comparison of Lipid Composition with Differential Count of the White Blood Cells.

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During the course of a previous investigation, Boyd and Wilson¹ demonstrated that leucocytes from the blood of the umbilical vein and artery contained only about one-half the concentration of certain lipids contained in the white blood cells of adults. It was suggested that the relative lymphocytosis of fetal blood was responsible for the differences observed. The inference was made that in all probability the polymorphonuclear cell contained a higher percentage of lipids than the lymphocyte. The present study was instituted with the purpose of further investigation of this suggestion.

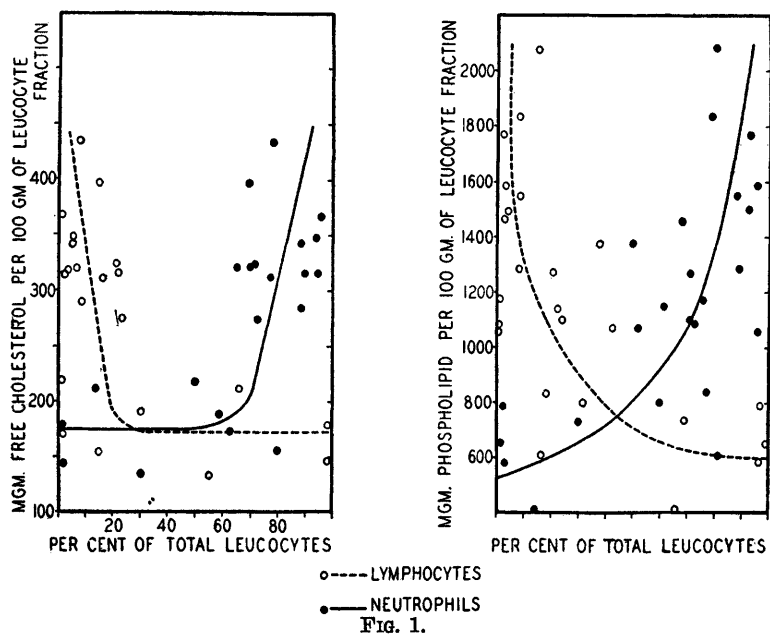
Samples of blood were taken by venapuncture from a group of 25 patients of the Strong Memorial and Rochester Municipal Hospitals. Subjects were selected only with a view to obtaining a wide range of variation in the differential count. The leucocyte fraction ("buffy layer") was isolated and analyzed for its lipid content by a method previously described.² Platelets, the lipid content of which is not known, were included in the leucocyte fraction, but comprised only a small part of the total volume of the buffy layer. The following lipid values were determined: total lipid, neutral fat, total fatty acids, total cholesterol, ester cholesterol, free cholesterol and phospholipid. Lipid values were expressed in milligrams per 100 gm. of the leucocyte fraction, rather than in terms of a given number

¹ Boyd, Eldon M., and Wilson, Karl M., *J. Clin. Invest.*, 1935, **14**, 7.

² Boyd, Eldon M., *J. Biol. Chem.*, 1935, **110**, 61.

of cells or amount of blood. In each instance, total white blood cell and differential counts were made. By comparing the lipid composition of the leucocyte fraction with the differential leucocyte count, it was anticipated that chemical differences in the white blood cells might be demonstrated.

As might have been expected, none of the 8 lipid fractions showed any correlation with variations in the total white blood cell count. Of the various types of white blood cells differentiated in the leucocyte counts, only the neutrophils and the lymphocytes showed variations over a wide range. Phospholipid and free cholesterol content of the leucocyte fraction were found to vary roughly in proportion to the percentage of neutrophils (Fig. 1). Although there were wide variations in the other lipid values, they exhibited no such apparent correlation with the differential count.



It is apparent from Fig. 1 that the higher values for phospholipid and free cholesterol were encountered in those leucocyte fractions which contained a relatively high percentage of neutrophilic leucocytes and a low percentage of lymphocytes. This observation has been interpreted as indicating that the neutrophils contain relatively large amounts of free cholesterol and phospholipid. If the platelet content of the leucocyte fraction is disregarded, the phospholipid content of the neutrophils may be placed at approximately

1500 mg. per 100 gm., the free cholesterol at approximately 350 mg. per 100 gm. These figures are subject to considerable variation. Similarly the phospholipid content of the lymphocyte appears to be in the neighborhood of 600 mg. %, the free cholesterol about 150 mg. %.

The parallelism between free cholesterol and phospholipid adds another bit of evidence to support the hypothesis that these 2 substances are closely related in the vital economy of the cell. Since phospholipid and free cholesterol vary in amount according to the predominating type of cell, it would appear that, for the most part, these 2 lipids serve in the *structural* make-up of the cells. On the other hand, the remaining lipid fractions are apparently present in varying amount in both types of cells, suggesting that they are transitory or metabolic in nature.

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Experimental Pulmonary Edema.*

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The frequent occurrence of pulmonary edema as one of the characteristic pathological findings in experimental shock, and following the shock syndrome in human cases, suggested methods by which it might be reproduced. Widespread congestion and petechial hemorrhages predominate as visible changes in rapidly developing shock while in cases in which the shock syndrome develops more gradually there are few petechiae, and edema is more marked.¹

Hemo-concentration is recognized as a constant feature in shock. It results from the transudation of the plasma through vascular walls. Krogh,² Lewis,³ and Landis⁴ support the generalization

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¹ Moon, V. H., and Kennedy, P. J., Pathology of Shock. *Arch. Path.*, 1932, **14**, 360.

² Krogh, A., Anatomy and Physiology of the Capillaries. 2nd ed. 1929, Yale Univ. Press.

³ Lewis, Thos., Blood vessels of the Human Skin and Their Responses. 1927, Shaw & Sons, London.

⁴ Landis, E. M., Capillary Pressure and Capillary Permeability, *Phys. Rev.*, 1934, **14**, 404. Micro-injection Studies of Capillary Permeability, *Am. J. Physiol.*, 1927, **82**, 217.