

pronounced in capillary spaces. Conversely calcium chloride, which causes an aggregating effect on soap films raises surface tension and tends to diminish the permeability of emulsion systems to water, would tend to diminish the permeability of the structure as a whole to an even greater extent when functioning in capillary spaces.

The above data correlates admirably with the well-known fact that alkalis, salts of sodium, potassium, etc., promote the permeability of tissues while salts of calcium, magnesium, and other di- and trivalent cations exert the reverse effect. Also with the observations of Beebe and the writer regarding the high K content and low Ca content of rapidly growing tumors and the low content of K and high Ca content of slow-growing or stationary tumors.

The experimental data on which this paper is based together with a full development of the theoretical aspect of the case from the standpoint of surface tension and tissue permeability will shortly be published.

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The relationship of the leucocyte count and bone-marrow changes in acute lobar pneumonia.

By **ROBERT A. LAMBERT** and **S. S. SAMUELS.**

[From the Pathological Laboratory of the Presbyterian Hospital, New York City.]

It is well recognized that the leucocyte count in lobar pneumonia may vary within wide limits. The majority of the cases which end fatally show either a very high or relatively low count, while those with favorable outcome most often have counts between these extremes.

For the low leucocyte count, at least two explanations have been suggested: (1) the bone marrow fails to react, either as the result of some previous injury (chronic alcoholism, for example), or on account of a paralysis of the blood-forming elements from overstimulation by the pneumococcus infection itself; (2) a rapid spread of the pneumonic process takes the leucocytes out of the blood faster than they are thrown into the circulation from the bone-marrow, therefore, the number of circulating leucocytes may

be normal or slightly increased, even though the output of the bone-marrow factory may be far above normal. Still another possibility must be conceived, namely, that leucocytes may be formed in some other organ than the bone marrow, for example, the spleen. Dr. F. A. Evans, working in our laboratory, pointed out several years ago that the gray, acute splenic tumor of lobar pneumonia contained large numbers of cells of the myeloid series, as indicated by the oxydase reaction, and suggested that the spleen might be the source of certain of the cells of the pneumonic exudate.

In the present study, an attempt has been made to correlate the bone-marrow changes and the blood picture in twenty fatal cases of lobar pneumonia, which have come to autopsy. In nearly all of the cases, several leucocyte counts were made. In the majority, there was a record of a count on the last day of the patient's life. Specimens of bone marrow were taken from the upper third of the femur in all cases, and paraffin sections studied after hematoxylin-eosin and Giemsa stain. The result of the study may be summarized as follows:

A close parallelism in the leucocyte count and the degree of hyperplasia of the marrow was found in only about half of the cases. A few showed a relatively inactive or aplastic marrow, with a leucocyte count well above normal. On the other hand, there were several cases in which the leucocyte count was consistently low during life, but in which a markedly hyperplastic marrow was found at autopsy.

To explain aplastic marrow in the femur (a condition probably common to all the long bones in these cases) associated with a leucocytosis, we may assume either a hyperplasia of the marrow of the flat bones only, or a formation of leucocytes outside the marrow, most probably in the spleen. The second explanation we consider the more plausible. The cases of marked hyperplasia of the marrow with low leucocyte count are not easily interpreted. We could not find evidence in these cases of such rapid spread of the lesion as would account for a low leucocyte count through an excessive draining of these cells out of the circulation.