opment of prepyloric lesions on the smoother diets indicates that mechanical irritation can not very well account for them. Our opinion is that the bulky diets gave rise to craters in the pyloric region and prevented ulceration in the prostomach by shifting the acid burden in the stomach toward the pylorus. The opposite took place with starvation, as a result of which the prostomach was always most severely ulcerated. The effect of white bread was probably largely a consequence of the gastric retention which it tends to initiate. In all these cases there seemingly was an excessive exposure of the ulcerated regions to acid gastric juice and often the state of nutrition of the tissues was seriously impaired.

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Correlation Between Number of Leukocytes and Percentage of Phagocytosis.

RUTH WESTLUND JUNG. (Introduced by A. A. Day.)

From the Department of Bacteriology, Northwestern University Medical School.

Interpretation of percentages obtained in phagocytic tests on patients undergoing treatment (in this instance, diathermy) is made difficult by the facts that the total leukocyte count in such patients varies and the concentration of leukocytes used in the test sensibly affects the percent of phagocytosis. To evaluate this variation it was necessary to devise a phagocytic test in which the leukocytes would be subjected to the least possible manipulation. Two cc. of heparinized salt solution (containing 1 mg. of heparin per cc. of 0.9% NaCl) are put into a test tube and about 9 cc. of blood added. In a second dry tube about 1 cc. of blood is collected and allowed to clot. The heparinized sample is centrifuged and the cells are washed once with salt solution, then divided into 2 portions. Portion A remains untreated, portion B is deleukocyted by a modification of the method of Fleming.[1] A U-tube is prepared of glass tubing with a constriction in one limb into which absorbent cotton is packed tightly. The other limb is connected to the vacuum apparatus, a little salt solution is drawn through the cotton, and finally the cell suspension B is sucked through 3 or 4 times and is thus rid of most of its leukocytes. By mixing this filtered suspension in various proportions with portion A, a series of blood samples is obtained hav-

[1] Fleming, *Brit. J. Exp. Path.*, 1926, **7**, 281.

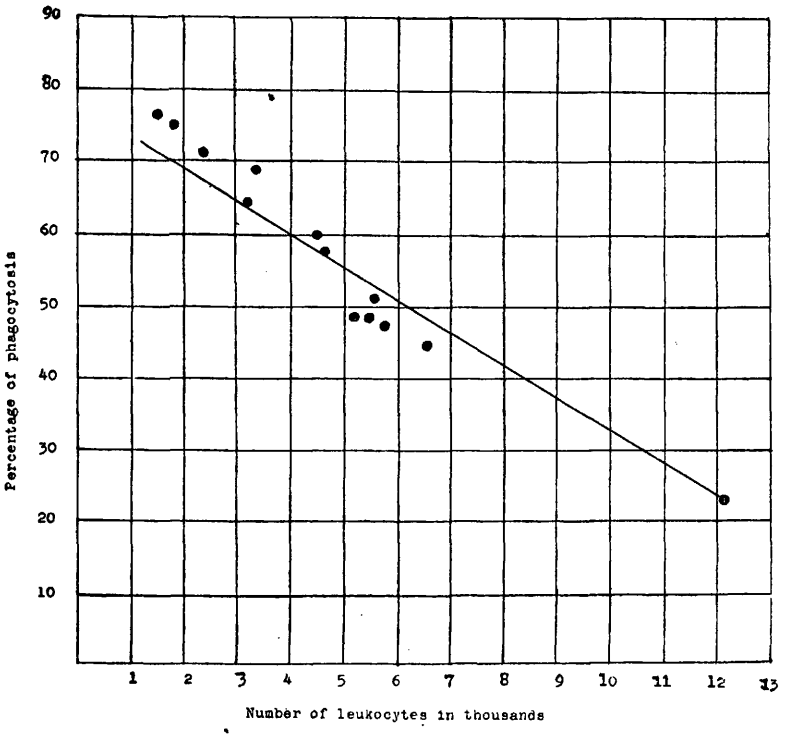
ing the same number of erythrocytes but different numbers of leukocytes.

Phagocytic tests were then run. Two volumes of the blood containing leukocytes are drawn into a bent capillary pipette, followed by one volume each of a suspension of a heat-killed culture of streptococcus and serum from the clotted blood. These substances are mixed by drawing back and forth in the pipette, the end of which is then sealed in the flame and the mixture incubated at 37°C. for 15 minutes. Smears are then made on slides, stained by Wright's method and 50 leukocytes on each edge of the smear counted. The number of leukocytes per 100 containing bacteria is noted and this constitutes the percentage of phagocytosis.

On plotting leukocyte concentrations as abscissae and percent phagocytosis as ordinates, it was clear in every case that the 2 quantities were related. Fifty-six determinations on 10 normal male adults were done on leukocytes collected at one time; a correlation coefficient of —0.83 was obtained. The tests on No. 10 were carried out at varying intervals since the leukocytes from this individual were used as normal leukocytes in opsonic tests on patients undergoing diathermy treatments. The relation appeared to be linear so that for a given subject the data could be represented by a line whose slope m was equal to $\frac{y_2-y_1}{x_2-x_1}$ where x = the number of leukocytes and y = the % of phagocytosis. This slope is negative: its mean average for 10 individuals tested was —0.006 and the extremes were —0.012 and —0.002. We thus have a quantity which is independent of the absolute value of the leukocyte count existing at the moment and which can be applied at different times in the same patient. The chart is of a representative case and illustrates the method used in obtaining the slope m.

After setting up the phagocytic tests leukocyte counts are made on the samples of blood used in the test. The ordinary white blood cell counting pipette is used and the number of leukocytes per cmm. obtained. The usual acetic acid solution cannot be used as a diluting fluid. The erythrocytes are not entirely dissolved and appear in clumps holding many of the leukocytes in their midst. The same is true when the blood is collected in an excess of citrate solution. By adding a small amount of $CaCl_2$ this difficulty is obviated. A solution of 1% acetic acid and 0.8% $CaCl_2$ made up in distilled water is found to be satisfactory.

Conclusions. (1) The percentage of phagocytosis obtained in phagocytic tests diminishes as the concentration of leukocytes used is increased. The 2 quantities are inversely proportional. Within the



range from 1500 to 12,000 their relation is practically linear, *i. e.*, represented graphically by a straight line with a negative slope. This slope is a measure of the phagocytic power of the individual's leukocytes. (2) The proportionality constant obtained can be used as a basis for comparing values obtained in the study of phagocytic functions of leukocytes of patients undergoing treatment in which the number of leukocytes is changed.

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A Purified Protein Antigen for the Complement Fixation Test in Gonorrheal Infection.*

ARCHIBALD MCNEIL. (Introduced by W. H. Park.)

From the Department of Health Research Laboratories, New York City.

The gonococcus antigen used by Schwartz and McNeil in 1910-11 was a simple suspension of 18 to 24 hours old gonococcus cultures

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