

*Summary.* Pregnancy caused the thymi of young mice to undergo involution, both grossly and microscopically. With one exception out of 20, the degree of thymic involution varied between 45% and 80% as measured by gland weights. At parturition, the post-partum mice generally weighed more than their litter-mate controls.

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### Permeability of Red Blood Cells to Sulfathiazole.\*

JOHN G. REINHOLD, LEON SCHWARTZ, HARRISON F. FLIPPIN, AND SHLOMITH BETHLAHMY. (Introduced by D. Wright Wilson.)

*From the Committee for the Study of Pneumonia, Philadelphia General Hospital.*

Differences in permeability of cells to sulfanilamide and its derivatives promise to be of some importance in the investigation and application of these compounds. Sulfanilamide has been shown to penetrate red blood cells and tissue cells readily.<sup>1</sup> Sulfapyridine, according to Hansen,<sup>2</sup> is found in higher concentrations in plasma than in blood cells to an extent greater than could be explained by differences in water content. We have found that sulfathiazole shows a similar though more marked disproportion between concentrations in cells and plasma when analyzed by the method of Bratton and Marshall.<sup>3</sup> In 13 convalescent patients the mean ratio of whole blood-free sulfathiazole to serum-free sulfathiazole was  $0.74 \pm 0.09$  standard deviation. Ten patients treated with sulfapyridine showed a ratio of  $0.89 \pm 0.07$ . Comparison of the means by the method of Student for small samples indicates that this difference between the drugs is highly significant.

When the concentration of sulfathiazole in the blood cells was calculated, the ratio to the concentration in blood plasma was  $0.437 \pm 0.19$  as compared with  $0.645 \pm 0.18$  for sulfapyridine, likewise a significant difference. Individual variations in the distribution of both drugs between cells and plasma were marked. Ad-

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<sup>1</sup> Marshall, E. K., Jr., Emerson, K., Jr., and Cutting, W. C., *J. Pharm. and Exp. Therap.*, 1937, **61**, 196.

<sup>2</sup> Hansen, L., *J. Lab. Clin. Med.*, 1940, **25**, 669.

<sup>3</sup> Bratton, A. C., and Marshall, E. K., Jr., *J. Biol. Chem.*, 1939, **128**, 537.

ministration of the drug was continued for 2 days. No difference in distribution between cells and plasma could be detected on the second as compared with the first day.

A similar comparison of the acetylated fractions of both drugs of the same patient showed an average ratio of  $0.755 \pm 0.30$  of acetylated sulfathiazole in whole blood to that in serum while that of sulfapyridine was  $0.973 \pm 0.48$ . However, this difference is not statistically significant. Low concentrations of acetylated drug made the error of analysis appreciable and the failure to demonstrate a difference may be explained by this fact.

Sulfathiazole treated patients have shown considerably lower concentrations of drug in whole blood than patients treated with equal amounts of sulfapyridine. This difference between the drugs is explained in part by the smaller amount of sulfathiazole present in blood cells. The use of plasma or serum for relating drug concentration to therapeutic activity thus is to be preferred.

Our observations are in accord with those of Sadusk, Blake, and Seymour<sup>4</sup> who found in cerebrospinal fluid less sulfathiazole than sulfapyridine when equivalent amounts of drug were administered. It appears, therefore, that other types of cells besides red blood cells are likewise less permeable to sulfathiazole than to sulfapyridine.

*Summary.* Sulfathiazole is present in human red blood cells in lower concentrations than is sulfapyridine employed under identical conditions.

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### Carbon Dioxide Tension and its Relation to the Quiescence of Spermatozoa *in vivo*.

L. B. SHETTLES.\* (Introduced by N. J. Eastman.)

*From the Department of Obstetrics, the Johns Hopkins University and Hospital.*

It is generally agreed (Hartman,<sup>1</sup>) that spermatozoa are immobile within the male generative tract. Hartman found the tubules of

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<sup>4</sup> Sadusk, J. F., Jr., Blake, F. G., and Seymour, A., *Yale J. Biol. Med.*, 1940, **12**, 681.

\* Fellow, National Committee on Maternal Health.

<sup>1</sup> Hartman, C. G., Ovulation, fertilization and the transport and viability of eggs and spermatozoa, Chapter IX in Allen's *Sex and Internal Secretions*, 1939, p. 630.