lymphoid tissue are sufficient to account for the numbers of new cells necessary to produce the monocytosis; there is no such increase in numbers in any of the fixed cells. When the spleen is removed and india ink injected into the portal vein—these procedures eliminating much of the defense of the rabbit against the intravenous injection of the bacteria—the lymphocytes in the lymph nodes and in the bone marrow (h·mocytoblasts) develop neutral red rosettes and, in sections, have markedly constructed nuclei. In this case the lymphocytes show evidences of turning into monocytes before they leave the organs in which they are made and before reaching the blood stream.

I am indebted to Dr. Murray for his kindness in sending me several strains of *B. monocytogenes*.

[1] Murray, E. G. D., Webb, R. A., and Swann, M. B. R., *J. Path. and Bact.*, 1926, xxix, 407.

[2] Simpson, M. E., *J. Med. Res.*, 1922, xliii, 77.

[3] Sabin, F., Doan, C. A., and Cunningham, R. S., *Carnegie Inst. Contrib. to Embryol.*, 1925, xvi, 125.

[4] Maximow, A., *Beitr. z. path. Anat. u. z. allg. Path.*, Suppl. v, 1902; *Klin. Wochnschr.*, 1925, iv, 1486; 1926, v, 2193; *Bindegewebe und Blutbildende Gewebe. Handb. der mikr. Anat. of v. Moellendorf*, J. Springer, Berlin, 1927.

[5] Downey, Hal, and Weidenreich, F., *Arch. f. mikr. Anat.*, 1912, lxxx, 306.

[6] Jordan, H. E., *Am. J. Anat.*, 1925, xxxv, 105.

[7] Carrel, A., and Ebeling, A., *J. Exp. Med.*, 1922, xxxvi, 365.

[8] Lewis, M. R., and Lewis, W. H., *Carnegie Inst. Contrib. to Embryol.*, 1926, xviii, 95.

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Preparation of Blood-Free Tissue Proteins.

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It is well known that perfusion and other methods of extraction have hitherto failed to free organs from blood, and for that reason it has been impossible to study the specific proteins in the various tissues or to prepare antisera for them which were not also specific in high dilutions to blood proteins.

In a previous report[1] it was shown that under certain conditions blood-free proteins could be found in the urine which gave precipitin reactions in high dilutions with antisera prepared against liver proteins. It was also suggested[2] that in the early stages of certain nephritides, the liver leaked its proteins into the blood stream and

that they were then excreted, as it is well known that the kidneys are permeable to foreign proteins. With these points in view attempts were made to secure larger quantities of this liver protein by animal passage. Solutions containing proteins extracted from dog livers were prepared and freed of non-protein material by dialysis as previously described.[1] This solution contained 0.16% protein. It was injected intravenously into dogs and large amounts of protein were passed in the urine which gave no reactions to blood antisera undiluted, but reacted to liver antisera in dilutions up to 1/100,000.

Injections up to 200 cc. of this solution can be used. Larger amounts tend to produce a blood protein excretion. The proteinuria is slow to begin, reaches its maximum in 12 to 24 hours and subsides after 48 to 69 hours. Reinjection of the same animal will produce a blood proteinuria.

[1] Loc. cit., 1927, xxv, 102.

[2] *Arch. Int. Med.*, 1927, xi, 548.

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Passage of Living Bacteria Through the Intact Intestinal Mucosa.

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A canula was placed in the thoracic duct of dogs under local anesthetic. Lymph was collected for 5 to 10 minutes. The duodenum was exposed through the anterior median line incision in the abdominal wall after local anesthetic had been applied. Forty cc. of solution containing suspended bacteria were injected with proper care and precautions into the lumen of the duodenum. Lymph was collected continuously and divided at 5 minute intervals in separate sterile tubes. The duodenum was immediately replaced and the small incision closed. The experiment was continued for 2 hours. Autopsy was performed to exclude injured duodenal mucosa. Phosphate buffered solutions (pH 8.0) and normal salt solutions were used. Fresh egg white, dog's serum and bile were added to these solutions to make a 10% concentration. *B. prodigiosus* and *B. coli* were suspended in these solutions. The table gives results of experiments with 40 dogs, approximately 5 dogs for each set of experiments.