

gram of beef serum protein. This result would yield a value of 14 mg. % for the protein-bound non-diffusible calcium in a serum with a protein concentration of 7.2%. This figure harmonizes with a previous deduction of Greenberg and Gunther<sup>3</sup> that with increasing calcium ion concentration the protein-bound calcium increases only by a moderate amount. From the value of B in equation (2) the equilibrium constant of the mass law relationship is found to have the value of  $10^{-2.75}$  when expressed in units of mols per liter. This is of the same order of magnitude as the value of the equilibrium constant found by McLean and Hastings for human blood serum.

The degree to which the experimental data fit the equation given is indicated by the results in the last column of Table I, under the heading, "Protein Bound Calcium, Calculated." From a comparison of the figures calculated according to equation (2), which are given in this column, with the experimentally obtained values, it is seen that the agreement is satisfactory. The results which are presented appear to favor the viewpoint that the colloidal calcium phosphate found in blood serum has the composition of the tertiary salt and that the equilibrium between the protein-bound and the ionized calcium conforms to the mass law.

## 7802 P

### Kidney Glomerulus of Hypertension Produced Experimentally by Pituitary Excess.

RAYMOND F. BLOUNT. (Introduced by C. M. Jackson.)

*From the Institute of Anatomy, University of Minnesota.*

That the thickened basement membrane of glomerular capillaries in hypertension is primarily due to the hypertension itself has not been definitely shown and the suggested relationship of the pituitary to hypertension has been based upon insufficient clinical evidence. The present experiments have produced in the amphibian a condition paralleling hypertension in the mammal with vasoconstriction, slowed heart rate, thickened ventricular wall and edema (Blount<sup>1</sup>). This has been accomplished by the transplantation of additional pituitary anlagen in the embryo (Blount<sup>2</sup>) which develop and give

---

<sup>3</sup> Greenberg, D. M., and Gunther, L., *J. Biol. Chem.*, 1930, **85**, 491.

<sup>1</sup> Blount, R. F., *Anat. Rec.*, 1933, **55**, Suppl. 7.

<sup>2</sup> Blount, R. F., *J. Exp. Zool.*, 1932, **63**, 113.

a constant excess of hormone secretion bringing about the results described. The constant secretion is indicated by pigmentation changes and vasoconstriction which are maintained. Since this takes place during the development of the structures involved there is an adjustment which tends to establish a balance at the high pituitary level.

The glomerulus of the mesonephros in all the 15 triple pituitary animals examined shows certain changes which are characteristic of the hypertensive glomerulus in man. As shown by either Mallory's stain or by azocarmine the basement membrane of the capillary tuft of the normal animal is roughly 1 to 2 micra thick while that of the triple pituitary animals may exceed 8 micra. This membrane may exhibit lighter areas which appear to be small cracks or pores and is similar to that of hypertension in man especially when associated with lipoid nephrosis. Many of the capillaries are closed. The glomerulus is small in respect to the capsule which it does not fill to the normal degree. There are accompanying changes in the tubules which are associated with glomeruli that are most affected. These changes are progressive with age. The degree of involvement is directly proportional to the amount of pituitary excess as measured by the degree of response in such characters as pigment increase.

This is the first time the basement membrane change has been produced experimentally and shows that here hypertension is the cause and not the result of the thickening as it develops early. In these animals the hypertensive glomerulus is definitely associated with pituitary excess. An attempt is being made to produce similar changes in the metanephros of the mammal by the administration of posterior pituitary hormone.

### 7803 P

#### Vitamin C Content of Tissues of Laboratory Animals Under Various Pathological Conditions.

E. HARDE AND HELEN RIVKIN BENJAMIN. (Introduced by W. H. Park.)

*From the Department of Health, Research Laboratory and Department of Bacteriology, New York University.*

We have studied the vitamin C content of the adrenals of laboratory animals injected with bacterial toxins, or viruses, or dying from spontaneous infections, using a silver nitrate solution or the