4 (936)

Studies on so-called protective ferments. IV. The Abderhalden test is rendered negative by the addition of serum-antitrypsin.

By J. BRONFENBRENNER.

[*From the Pathological and Research Laboratories of the Western Pennsylvania Hospital, Pittsburgh, Pa.*]

The view which regards blood serum as a digestive fluid is not a new one, and the importance of the mechanism regulating the activity of the ferments of the blood while in the body has recently been clearly detailed by Dr. Victor C. Vaughan.[1] The study of these ferments was lately taken up by Jobling and Petersen[2] who showed that the non-saturated fatty acids of the serum are in a way responsible for the inactivity of the proteolytic enzymes in the blood.

The experiments have shown that—as I expected—serum extracted with chloroform gives up dialyzable substances reacting with Ninhydrin; I further ascertained that the addition of non-saturated fatty acids in form of soap or in form of large excess of normal serum reëstablished the antitryptic properties of the treated serum, thus stopping the appearance of dialyzable protein substances. I then tried to see if the same procedure would also stop the auto-digestion of the serum exposed to its own ferments through the action of kaolin or starch on the one hand, and of the antigen-antibody combination on the other. The experiments confirmed the expectations in every case completely, and I am therefore in a position to say that by the addition of the excess of whole normal serum as well as by the addition of saponified fatty acids of the serum, the Abderhalden reaction is invariably rendered negative, evidently through the arresting of the self-digestion of the serum.

The study of this question is not completed as yet, but even now it is possible to say that not only fatty acids, but also the serum-albumin tends to retard auto-digestion, while the addition

[1] *Jour. A. M. A.* 1914, Vol. 63, p. 365.

[2] *Jour. of Exp. Med.*, Vol, 19, 1914, p. 239.

of serum globulin seems to promote the appearance of dialyzable substances, probably on account of the digestion of the globulin by the serum ferment.

5 (937)

Studies on so-called protective ferments. V. The serum is the source of dialyzable substances.

By J. BRONFENBRENNER.

[*From the Pathological and Research Laboratories of the Western Pennsylvania Hospital, Pittsburgh, Pa.*]

In the experiments related above I have shown that the serum of a pregnant individual, placed in contact with placenta at 0° temperature and separated from the placenta by subsequent centrifugation, is capable of giving up dialyzable substances if placed in the incubator. Assuming that the cells of placenta were centrifuged down, the only explanation for the appearance of amino acids and polypeptids in such a serum was that the serum acquired the ability to digest itself. The fact that the addition of fresh placenta to such serum does not increase the degree of dialysis on the one hand, whereas on the other addition of serum globulin increases it very markedly—points toward the correctness of this assumption.

Some experiments conducted in my laboratory at present with placenta as well as with bacterial substrata will prove definitely that the substratum is not the source of dialyzable substances in the Abderhalden test. While these experiments are still in progress, I tried also to see if my assumption of the auto-digestion of serum in the Abderhalden test will hold good in the case of syphilis, for if the dialyzable substances should appear in this case, there will be no doubt as to their source, as the substratum in this case is not of protein nature.

As it was to be expected, the sera of syphilitics, when brought into dialyzing thimble with suitable amount of pure lipoid, often gave positive Abderhalden test, while sera of normal individuals, treated in similar way gave most often negative results. The adjustment of the amount of lipoid to be used in this test is very