

no antigen. If precipitates produced by the combination of horse serum, or egg albumen, and their respective antisera, be treated with salt solution, or with 1 per cent. sodium carbonate, the resulting extract always contains antigen. It also contains passively sensitizing antibody, but no precipitin.

If such a precipitate be treated with trypsin, or with rabbit's leucocytes, both antigen and precipitin are present in the extract. Sensitizing antibody is also demonstrable.

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Studies on so-called protective ferments—IX. Antitryptic index in its relation to the clinical manifestations of anaphylaxis.

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The convulsions in eclampsia and epilepsy, as well as the respiratory failure in asthma have been repeatedly considered as an expression of anaphylactic reaction, though no definite proofs were offered for such a view. The theory of specific parenteral digestion of Vaughan, as applied by Abderhalden and his pupils to diagnosis of different pathological conditions, brought forward new possibilities of investigation in this direction.

According to results obtained by means of Abderhalden reaction many authors concluded that the patients, suffering from the conditions mentioned above, show active specific parenteral digestion of different tissues, as evidenced by the presence of specific proteolytic ferments in their blood.

As I have shown it elsewhere,¹ this conception of the mechanism of parenteral digestion is not correct. The results obtained by means of the Abderhalden reaction are nevertheless of value as they show that at certain specific changes have taken place in the blood² of the patients, by means of which the specific parenteral

¹ Bronfenbrenner, these PROCEEDINGS, 1914, XII, p. 3, and 1915, XII, p. 137; also *Journ. Exp. Med.*, 1915, XXI, p. 221.

² According to investigations conducted in this laboratory and confirmed elsewhere, the changes consist in the appearance in the blood of specific antibodies (in this case autolytic in nature) and not specific ferments.

digestion is made possible through the liberation of normal proteolytic enzyme.

We have shown in another paper³ that the products of such digestion may be toxic and if produced in vivo may cause anaphylactic symptoms. Considering the close outward resemblance between the anaphylactic shock and the symptom complex in epileptic or eclamptic convulsions and asthmatic attack, we were interested to see if these phenomena depend on actual parenteral digestion and production of anaphylatoxin in the same measure as does anaphylactic shock.

We have called the attention to the rôle of antitrypsin in the question of activation of normal proteolytic ferments of the blood.³ We have suggested that the combination of antigen with its antibody is followed by the diminution of antitryptic properties of the blood serum and resulting autodigestion of the serum.¹ We have shown moreover, that the degree of active digestion depends on the amount of antitrypsin present.⁴

Assuming that the phenomena observed in eclampsia, epilepsy, asthma and in similar conditions are due to formation of anaphylatoxin in vivo through the combinations of antigen with the circulating antibody, we attempted to measure the amount of antitrypsin in the blood during and between the acute symptoms of the disease and thus see if there is any connection between the morbid symptoms and parenteral digestion. During the last eighteen months⁵ we made a study of a number of cases of epilepsy, eclampsia, asthma, and idiosyncrasy to certain foods, and our findings convinced us of the causative relations existing between the parenteral digestion and the morbid phenomena. We found moreover that this relation can be measured in the values of antitryptic index. We shall publish the protocols of actual experiments in the near future.

³ Bronfenbrenner, *Penn. State Medical Journ.*, Oct., 1914; also *Journ. Exp. Med.*, 1915, XXI, p. 480.

⁴ Bronfenbrenner, these PROCEEDINGS, 1914, XII, p. 6; also Bronfenbrenner, Mitchell and Titus, *Bioch. Bull.*, 1915, No. 13, p. 86.

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