is, therefore, of relatively slight importance as compared with the presence of antigen in the cells. Therefore, it may be said that just as the presence of antibody in the serum is ineffective in making a guinea-pig hypersensitive, so, too, it fails adequately to explain the mechanism of immunity and of anti-anaphylaxis. The latter phenomenon, likewise, is predominantly cellular, and is due to the presence of antigen in the cell.

### CONCLUSIONS.

1. The presence of antibody in the circulating blood alone does not make a guinea-pig hypersensitive. Such a result is achieved only by the presence of antibodies in the cells of the body.

2. The presence of antibody in the blood of the desensitized or of the immunized guinea-pig is only a subsidiary part of the mechanism of protection against anaphylactic shock. The presence of antigen within the cell is the effective factor, which so lowers the reactivity of the cellular antibody that additional antigen fails to produce the characteristic anaphylactic response.

3. By means of a special technique, the coëxistence of antigen and antibody within the same cellular tissue is demonstrated.

50 (867)

## On the clinical value of the serum skin test in tuberculosis.

By **J. BRONFENBRENNER.**

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In the work on Intraperitoneal Lysis of Tubercle Bacilli reported to this society last year by Dr. Manwaring and myself,[1] the conclusion was reached that tubercle bacilli injected in the peritoneal cavity of tuberculous guinea pigs undergo rapid destruction, due to the specific activity of peritoneal tissue cells which apparently did not depend on circulating antibody. In the experiments taken up this year, with the purpose of studying more closely the changes in the blood of tuberculous guinea-pigs, several interesting phenomena were found, to be reported in detail else-

[1] *Centrbl. f. Bact. Ref.*, Bd. 59, No. 12, p. 371, and *Journ. of Exp. Med.*, 1913, Vol. XVIII, no. 6, p. 601.

where, the main point of interest being that the subcutaneous injection of a mixture of the fresh blood of tuberculous guinea-pigs with exudate resulting from the intraperitoneal lysis of tubercle bacilli into a normal guinea-pig caused the appearance of a definite local reaction. Upon the analysis of the phenomenon, it was found that the peritoneal exudate could be replaced by a crude tuberculin, and the serum of tuberculous guinea-pigs could also be replaced by human tuberculous serum, and in this form it proved to furnish a very good method for early diagnosis of tuberculosis, the technique of which is as follows: Subcutaneous injection into a normal guinea-pig of 0.05 c.c. of a mixture of fresh tuberculous blood serum of human or animal origin (1 c.c.) with tuberculin (crude diluted—1 to 10—0.1 c.c.) left at room temperature for 2–3 hours, causes in 24 hours a local reaction similar in its aspect to a tuberculin reaction. The controls injected in similar way with the mixture of normal serum and tuberculin show no reaction. The property on which this serum skin test depends, appears in the blood of tuberculous guinea-pigs sometimes as early as the end of the first week after injection. When used as a diagnostic method with human sera, this test can be applied in all the stages of tuberculosis as long as the circulating antibodies exist free in the blood. I proved experimentally that tuberculous guinea-pigs within the last week or two of life fail to give this reaction, which finding seems to be true also for very advanced human cases. As compared with other skin tests used for diagnosis in tuberculosis, namely, one suggested by Schurmann,[1] who injects suspected material under the skin of guinea-pigs and subsequently tests them by regular tuberculin test, or the test suggested by Baureisen,[2] who injects suspected material under the skin of guinea-pigs made tuberculous two or three weeks previously, it seems that the method described by me covers better the different kinds of conditions in which the diagnosis may be called for. For the skin test described by Schurmann, it is necessary to have material containing virulent tubercle bacilli, which is not on hand in all cases of tuberculosis coming for diagnosis. The technique adopted by Baureisen has the dis-

[1] Schurmann, cited from *Z. f. Bakt.*, Vol. 59, p. 653.

[2] Baureisen, *Centr. f. Gyn.*, 1913, No. 23, p. 848.

advantage that it is necessary to keep on hand a number of tuberculous guinea-pigs; in addition the test was found non-reliable, as in case of sputum, for instance, the injection of a tuberculous or even normal sputum under the skin of a normal guinea-pig caused the appearance of a local reaction very similar to one appearing in a tuberculous guinea-pig. By the method described by me,[1] not only the serum of a patient, but also all kinds of pathological material can be examined by previously injecting it in a normal guinea-pig and subsequently examining the blood of this guinea-pig by the serum skin method described.

51 (868)

## A preliminary communication on complement fixation test in tuberculoses with Besredka's antigen.

By J. BRONFENBRENNER.

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At the suggestion of Professor M. Besredka and through his kindness in sending the tuberculin prepared by him as described in his communication before the Academy of Sciences,[2] I started a series of blood tests in tuberculosis. As the antigen contained egg yolk it was decided to carry in each case a control with a pure lipoid antigen (Noguchi).[3] In the first hundred cases I found a surprising number giving positive tuberculosis as well as positive Wassermann reaction. A special study of the possible coëxistence of the two diseases was made, and a solution of the problem was attempted by the following several ways. (1) Seven patients giving both W. R. and T. R. positive were subjected to a rigorous anti-syphilitic treatment, and at present five of them have lost the W. R., tuberculosis reaction persisting. (2) The presence of the two antibodies was proven by independent titration of each with five units of corresponding antigens. (3) It was found that the inactivation of serum containing both antibodies did not affect

[1] At the meeting of American Society of Bacteriologists, Montreal, January, 1914.

[2] *Comptes Rendus de l'Acad. des Sciences*, t. 156, p. 1633.

[3] Noguchi and Bronfenbrenner, *J. of Exper. Med.*, Vol. XIII, No. 1, 1911, p. 43.