bacilli when it was somewhat diluted. (2) After the inoculation with sterilized typhoid cultures, the serum, from the sixth day, acquired agglutinant properties in cases in which it had not formerly possessed any, or else these properties increased considerably in cases in which they had existed before. (3) The injections provoked a local and general reaction the duration of which did not exceed from twenty-four to forty-eight hours.

In a second series of experiments M. Lévy sought to ascertain if any connection existed between the agglutinant properties and the bactericidal properties of typhoid serum. For this purpose he made an estimate of the quantity of the normal serum (of man or of the guinea-pig) or of agglutinant serum (of immunized goats or guinea-pigs) which was necessary to neutralize the effects of a mortal dose of typhoid cultures in intra-peritoneal injections in guinea-pigs.

These investigations showed that the normal serum of the guinea-pig, which possessed an agglutinant power of one in one, neutralized the effects of the intraperitoneal injection of a fatal dose of virulent typhoid cultures when given in doses of eight cubic centimetres. For the non-agglutinant serum of the normal man eight cubic centimetres were insufficient. The serum of the immunized guinea-pig, which possessed an agglutinant power of five hundred, had no action, except when it was injected in a quantity exceeding five cubic centimetres. In regard to the serum of the other guinea-pigs, the agglutinant power of which was respectively one hundred and three hundred, the quantity necessary was more than a cubic centimetre for the first, and more than three cubic centimetres for the second. As for the goat's serum, the agglutinant power of which was one thousand, the necessary quantity was five cubic centimetres.

Concerning three individuals, who had had typhoid fever three or four months before, whose serum had, respectively, an agglutinant power of one hundred, three hundred, and one hundred, the quantities necessary were five, six, and three cubic centimetres. Finally, for a subject with a mild form of typhoid fever, in whom the serum had an agglutinant power ranging from one hundred to three hundred, the amount of twenty-five cubic centimetres was not sufficient to preserve the guinea-pig from the effects of an intraperitoneal injection of a fatal dose of typhoid cultures.

Concerning the nature of the agglutinant reaction, the author thinks that it is rather an immunizing reaction. He observed, notably in his first series of experiments, that the agglutinant reaction was shown in the serum of guinea-pigs that were inoculated only from the beginning of the sixth day after the injections; that is to say, four days after all the reactional symptoms of the infection had disappeared. In the second place, clinically, in typhoid-fever patients the agglutinant reaction appears sometimes late, on the twenty-second day, according to Widal; during the eighth week, according to Breuer; toward the end of the second week, according to Stern; on the sixteenth and seventeenth days, according to Kolle; and on the thirteenth day, according to Pick.

The author thinks, however, that if the agglutinant reaction is one of immunity, it cannot, nevertheless, be identified with the other manifestations of this immunity; for instance, with the formation of antitoxic substances to which the specific serum owes its bactericidal properties. These two phenomena, he says, cannot be coincident, and present themselves separately, without connection with each other; that is to say, man or animals may be strongly immunized and possess a very agglutinant but not bactericidal serum, or, inversely, a very bactericidal, but not immunizing, serum.—*N. Y. Med. Jour.*