

only small doses are necessary, 750 to 1,500 units, while later three or four times this dose must be given. The only objection he has to giving it on first seeing the case is the pain and expense. In his cases the membrane always stopped spreading and disappeared promptly.

Allen, in a paper read at the meeting of the American Medical Association, and published in the *Journal* of the society, October 13th, 1900, discusses the advances made in studying the disease by bacteriologists. First, taking up the diagnosis of diphtheria, he says that "the disease cannot be considered as present unless the K. L. bacillus is discovered. A clinical diagnosis should not content one, as other bacilli can cause the membrane. The K. L. bacillus has a distinct position as the cause of diphtheria, but it is very difficult to recognize it positively, as the variations as to shape, size and arrangement are many, and also the fact that the bacilli of the pseudo group are indistinguishable from the true. However, the disease presents a definite clinical picture, even if the organisms do vary." This difficulty in recognizing the bacillus has given and does give objectors to the serum treatment an opening.

Coming to the questions of immunity and serum treatment he says: "Ehrlich's theory that no animal can be inoculated with a disease unless it has in its body-cells a substance capable of combining with the toxins. The act of union between this substance in the cells and the toxins gives rise to the fever and other symptoms. Apply the theory to diphtheria—the toxins of the disease combine with this cell-substance and give the symptoms of diphtheria intoxication. If the toxins are in too large amounts death results, the cells being damaged beyond possibility of further physiologic function. If in less amount the cells are only stimulated to further effort to produce more of this substance to combine with the toxins. This is overproduced very soon, and is taken up by the blood, and can come in contact immediately with the toxins being produced at the focus of the disease and recovery takes place. This same substance, the combination of which in the cells with the toxin, gives rise to the symptoms of diphtheria, if taken up by the blood acts as an antitoxin and is the antitoxin. The injection of ready-made antitoxin does the same thing as regards the limitation and cure of the disease as it is taken up by the blood, and acts as the toxins at the time of formation. Antitoxin is not antitoxin until it gets into solution in the blood, and can have no effect on toxins already combined with the cells, nor can it repair cells overdamaged, hence use it early. Cases still die, as we must expect, considering this theory. Use large doses, use a reliable article and use it early. It does no harm of itself, but may if it is not pure.