

cal with the typical Loeffler bacillus may be regarded for diagnostic purposes as virulent diphtheria bacilli, if the cultures have been made either from throats containing exudate, or from those of persons who have been in contact with true diphtheria; for investigation has shown that over 95 per cent. of such bacilli are virulent. Bacilli, on the other hand, which resemble the pseudo-diphtheria type must be subjected to both cultural and animal experiments before their nature or virulence can be judged.

(7) All bacilli which are identical with the virulent Loeffler diphtheria bacillus, morphologically, biologically, and in staining by re-agents, should be classed with the diphtheria bacilli, whether they have much, little, or no virulence when tested on guinea-pigs. Bacilli which have entirely lost their virulence rarely, if ever, regain it. They probably are incapable of causing diphtheria, for the twenty-four cases in which they were found by us never developed any lesions, nor were they the origin of any case of diphtheria, so far as could be ascertained.

(8) The name pseudo-diphtheria bacillus should be regarded as applying to those bacilli found in the throat which, though resembling the diphtheria bacilli in many respects, yet differ constantly in others equally important. These bacilli are rather short, and are more uniform in size and shape than the typical Loeffler bacillus. They stain equally throughout with the alkaline methyl-blue solution, and produce alkali in their growths in bouillon. They are found in about 1 per cent. of the healthy throats in New York City, and seem to have no connection with diphtheria. They are never virulent.

(9) One or more varieties both of streptococci and of other forms of cocci exist in the great majority, and possibly in all, of the healthy throats in New York City. Cultures from the throat in cases of pseudo-diphtheria contain more cocci, especially more streptococci, than those from healthy throats, but otherwise do not seem to differ.

(10) The investigations of the health department have given striking evidence of the marked difference in mortality between true and pseudo-diphtheria, for while it was 27 per cent. in diphtheria, it was under 2 per cent. in pseudo-diphtheria.

(11) The combined clinical and bacteriological investigation of over 5,000 cases has demonstrated clearly the fact that many of the less characteristic cases of diphtheria are so similar in appearance, symptoms, and duration that it is impossible to separate them, except by bacteriological examinations. In the more severe cases, and after the disease has fully developed, cultures are less necessary, although their systematic use is desirable.

(12) Persons who have suffered from diphtheria

should be kept isolated until cultures prove the bacilli have disappeared from the throat, for, not only are the bacilli which persist in the throat virulent, but they are not infrequently the cause of diphtheria in others. Where cultures cannot be made, isolation should be continued for at least three weeks after the disappearance of the membranes, for our experience has shown that it is not unusual for the bacilli to persist that length of time.

(13) In pharyngeal cases in which thorough irrigation of the nostrils and throat with 1 to 4000 bichloride of mercury solution has been practised every few hours, the bacilli have not remained in the throat for as long a time after the complete disappearance of the pseudo-membrane as when no antiseptic has been employed. Other antiseptic and cleansing solutions may also be useful.

(14) Inflammations of the mucous membrane due to streptococci, either alone or associated with other cocci, are usually mild in character. These inflammations may be more serious when the lesion is located in the larynx, or when they are complicated by scarlet fever or measles.

(15) While the streptococci, and perhaps other forms of cocci, may be considered as the primary etiological factor in pseudo-diphtheria, yet, in the majority of cases at least, certain predisposing factors, such as exposure to cold or other deleterious influences, or the presence of certain infectious diseases, appear to be of great importance in determining the occurrence of the disease. The streptococci which, under these conditions, apparently cause the disease are probably those which had for a long time existed in the throat, and not those freshly derived by communication with other cases of pseudo-diphtheria. In a small number of cases, indeed, the histories suggest a direct communication, but the causation may be equally explained by the supposition that the second case shared with the original one the same predisposing cause.

(16) The slight mortality and the usual mildness of the cases of pseudo-diphtheria do not warrant us in enforcing isolation, even if further investigation produced positive proof that this disease is communicable. With the results of these investigations before us we can appreciate the difficulty of exterminating diphtheria from a city like New York. On the one hand, we have cases of diphtheria scattered all through the city, many of which are so mild as to be unrecognized, and, on the other hand, we have the crowded tenements with their ignorant and shifting population, where proper isolation of the patient from other members of the family, or of the family from other inmates of the building, is usually impossible, unless harsher measures are adopted than are now customary.—*Univ. Med. Mag.*