

may be uniform in shape, size, arrangement, and diagrammatic staining, while other specimens exhibit wide differences in all respects; presenting extremely long rods, with wide interruptions; or clavate, fusiform, or even pyriform organisms, of the most bizarre description. It is thought that these are involution forms; or, according to Klein, that they represent a relationship to a mycelial fungus. The variations are, however, very interesting, and invite further study.

*Relation between the Length of the Bacillus and its Virulence.*—The results of Park and Beebe are not in accord with some others, who hold that the longest bacilli are the most virulent. The observations of the above-named authors show that the greatest mortality occurred in those instances in which the rods were shorter than the average, while there was a diminished death rate with the long forms, and a still lower rate with the evenly-stained short forms, with badly marked characters. Ample opportunity was afforded by the records of the Isolation Hospital for learning the clinical history of the cases there, and, from a comparison of such data with those obtained from the bacteriological examination, the conclusion to be formed is in accord with that arrived at in New York, viz.: that the size of the bacilli affords little on which to base a prognosis, but, if anything, the longer rods produce less fatal results than those of average dimensions.

*Relation between the Pseudo and True Bacillus.*—In view of the uncertain state of knowledge in regard to this point, and also taking into consideration the fact that the work at the Isolation Hospital was designed to be of a practical character, free from risk, no advantage was taken of the differentiation of these forms. All cases were treated as diphtheria in which an organism was found possessing the ordinary recognized characters. The results obtained have fully justified this course, and any observations, or statistics, given in this paper, must be understood as being subject to this condition.

It may be noted that a bacillus, identical in most of its characters with the true bacillus, but not possessing virulence, or at least not producing disease in the individual in whose throat it is found, and incapable of proving virulent to animals, has been detected in the throats of a considerable proportion of healthy persons. Hoff-

man, who identified these forms, was unable to decide whether they were merely attenuated diphtheria bacilli, or ordinary harmless saprophytes. The experiments of Roux and Yersin pointed to the former conclusion, but Escherich leans to the latter view, and the work of Park and Beebe, which included cultures from 330 healthy throats, showed the presence of bacilli of three kinds: 1. Virulent diphtheria bacilli, characteristic in growth, producing acid in bouillon (8 cases). 2. Bacilli identical with Loeffler's bacillus in cultural and acid-forming power, but non-virulent (24 cases). 3. Bacilli not having all the characteristics of the true organism, producing alkali in bouillon, and non-virulent (27 cases). These were all furnished in dispensary or hospital practice in New York, and in which there was no history of direct contact with diphtheria.

A further set of experiments, on cultures from the throats of persons belonging to fourteen families in which there had occurred diphtheria, revealed the fact that the true bacilli were found in 50 per cent. of the cases, and 40 per cent. developed, later, to a greater or less extent, the lesions of diphtheria. The examination included 45 children. These experiments have an important bearing on isolation, and this must be my excuse for a digression in a direction in which I have nothing original to offer.

*Persistence of the Bacilli in the Throats of Patients.*—Some observations have been made on this point. The shortest period for the disappearance of the bacilli, after the patient's admission to hospital, was five days, and the longest 42 days. A somewhat interesting case was that of patient No. 1820, an adult, in which, by the thirteenth day, the bacilli had entirely disappeared, and recovery was progressing rapidly. On the thirteenth day after this, and within one day of the termination of the stipulated period of convalescence, reinfection occurred, as evidenced by the clinical signs of the disease, and confirmed by bacteriological test. By the thirteenth day the bacilli had again disappeared and the discharge of the patient followed shortly after. This was a clear case of reinfection, and, taken in connection with the ascertained variability in the persistence of the bacilli, shows conclusively that a definite time limit cannot be placed to the period of convalescence, and that though a detention of fourteen days after the