

exercises its power, and the bacilli clump once more. This would appear to indicate that true clumps are not so coherent as is supposed, and that the agglutinative action is paralysing and not killing. 5. The exposure to light may be excessive. It is laid down by most observers that clumping after a certain lapse of time is unreliable and a time limit of half an hour has been fixed by Gruber, Grünbaum, and others. This seems a reasonable limit if the specimen is removed from the microscope between each examination. I am of opinion, however, that this false clumping is caused by the strong rays of light from the condenser acting on the vitality of the bacilli, and if the specimen is kept on the stage all the time half an hour is too long. If, on the contrary, it is removed and examined once every five minutes for half an hour it is a reasonable time. If an emulsion without added serum is kept on the stage for half an hour clumps will occasionally be seen to form. Clumps that form after half an hour's exposure may therefore reasonably be considered quite unreliable.

Little need be said about the best method of collecting blood. Capillary glass tubes should be sterilised by heating them in a steriliser or an oven. Their ends should then be sealed. After washing the skin with alcohol the finger is pricked with a sterilised needle and the tube opened. The first drop of blood should be wiped off with the needle and the next drawn into the tube, which is then sealed. The specimen will in most cases be sterile, and may be kept for days. One or more cover-glass films of blood should be made at the same time for examination for malarial parasites. The serum will separate from the clot in the tube in about six hours and may be blown out on a slide practically free from corpuscles. The cases given in the table on p. 1037 have been selected principally with the view of illustrating the practical value of the reaction, and are a fair sample of general results in an examination of over 100 suspected cases. It will be seen that the diagnosis made before the test was applied has been recorded, as well as the evidence, confirmatory or otherwise, of its accuracy that was obtained by subsequent developments, and in some cases by post-mortem examinations. The view that enteric fever is very rare in adult natives of India has so lately as last August been endorsed by Surgeon-Major Freyer.² He explains this alleged exemption by a theory that natives gain a comparative degree of immunity in adult life from an almost universal and unsuspected prevalence of enteric fever in children. Whatever may be the state of affairs in India, I can only say that his theory is not supported by the results of blood examinations in the Straits Settlements, where the sanitary condition of Chinese and other races is little better than it is in India. Numerous control experiments have shown that if the necessary precautions are observed healthy blood serum, from whatever race it is obtained, has no agglutinative action on a fresh culture of the bacillus.

Penang.

² Brit. Med. Jour., Aug. 7th, 1897.

ON THE CONVEYANCE OF DIPHTHERITIC INFECTION BY APPARENTLY HEALTHY INDIVIDUALS.

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THE following case is an excellent example of the conveyance of diphtheritic infection by an apparently healthy individual. It also furnishes an illustration of the importance under certain conditions of the bacteriological examination of the throat in those who have been exposed to the risk of diphtheritic infection, but have not themselves contracted the disease.

A pupil at a good preparatory school in the country, aged twelve years, was one amongst several boys who were attacked during February, 1896, with a form of tonsillitis, and in his case the symptoms appeared on the 13th of that month. On March 6th a "swab" taken from his throat was examined bacteriologically and reported on as being free from the diphtheria bacillus. The boy was shortly afterwards sent down to the seaside; he was suffering at the time from some difficulty in deglutition and from an attack of erythema nodosum, but the mucous membrane of his throat appeared to be quite healthy. He returned to school in May presumably well. During July of the same year a second outbreak similar to the former occurred at the school. The boy was not affected, but a swab from his throat was again examined and found to be free from the diphtheria bacillus. In the following November yet a third outbreak of the same nature occurred, and on the 30th of that month all the apparently healthy boys, the one under observation amongst them, were sent to their homes. During the three outbreaks there were altogether 43 cases, all amongst the boys, no one else being attacked. Two deaths occurred, both due to heart failure. On the school being broken up the boy did not return to his own home; as he had a younger and very delicate sister it was thought well to put him in quarantine elsewhere for a time. On Dec. 8th a swab taken from his throat was examined by one of us at the British Institute of Preventive Medicine and a pure culture of the Klebs-Löffler bacillus was obtained from it. This culture was of active virulence. A guinea-pig inoculated with it died in less than forty-eight hours. On the 13th a second swab was examined and the specific bacillus was again found. On the same date, his sister meanwhile having been sent away, the boy went to his home. Swabs subsequently examined on Dec. 15th and 20th, 1896, and Jan. 20th, 1897, were found to be free from the bacillus of diphtheria. On his return home the boy was more or less isolated from the rest of the household with the exception of a servant who alone attended on him. On Dec. 21st this maid showed obvious signs of an attack of diphtheria, and the Klebs-Löffler bacillus was cultivated from a swab taken from her throat on the same day. She was at once removed to a hospital, where she remained for six weeks. No other members of the household were attacked, and swabs taken from the throat of each of them proved to be free from the diphtheria bacillus. As regards the case of the maid no possible source of infection other than the obvious one could be suggested.

The Klebs-Löffler bacillus may be found in the throat of an apparently healthy individual under two sets of conditions. Of these the cases of more frequent occurrence are those in which the bacillus persists in and about the throat for a more or less lengthened period after complete convalescence from an attack of diphtheria. The other class of cases comprises those in which the bacillus exists in the throat of an individual, such as a nurse, who has been exposed to the risk of infection, but has escaped an actual attack of the disease. Cases which come within the first class are not by any means rare. But it is difficult to know the precise value to be attached to any figures bearing on the subject unless one at the same time knows the treatment which has been adopted in the various cases, since the persistence of the

ASSOCIATION OF REGISTERED MEDICAL WOMEN.—

The opening meeting of the session of 1897-98 was held in the Library of the New Hospital for Women on Oct. 5th, at 8 P.M., Miss Cock, M.D. Brux., President, being in the chair. There was a large attendance of members, including some home on furlough from India and China. After some preliminary business had been transacted the following papers were read: 1. A Fatal Case of Meningitis, probably Tuberculous, Lasting Four Months, by Miss Anderson, M.D. Lond., of Manchester. (The paper was read in her absence by the secretary.) The patient was a child, aged three and a half years, and was not seen for a month after the beginning of the illness, so that no notes of the early symptoms were obtainable and no post-mortem examination was allowed. The diagnosis had therefore to be made from the clinical aspect of the case only and the significance of the various signs and symptoms observed was discussed. 2. A Visit to Aix-les-Bains, by Miss Helen Webb, M.B. Lond. Miss Webb gave a detailed account of the properties and uses of the waters at Aix-les-Bains, and dwelt specially on the excellence of the arrangements made in connexion with the administration of the baths and on the attention paid to the comfort of patients in many important respects. The paper was illustrated by photographs and charts prepared by Dr. Forestier, showing the changes produced in renal secretion by the different forms of treatment.

Bacillus is without doubt largely influenced by the method of local treatment adopted during the acute stage of the disease and afterwards. The most striking instance recorded is a French case in which the bacillus was still to be found in the throat at the end of fifteen months. But so prolonged an infection as this must be quite exceptional. Out of some 4000 bacteriological examinations in cases of diphtheria or of suspected diphtheria which have been carried out at the British Institute of Preventive Medicine, the case in which the longest duration of the bacillus has been noted is one in which it was found by Dr. Hewlett at intervals during twenty-two weeks. In this case, as in ours, the virulence of the culture was proved by experimental inoculation. Cases, again, in which the bacillus is still present three weeks or so after convalescence are in the experience of the Institute of not infrequent occurrence. With reference to this matter the following statistics lately issued by the New York Health Department may be quoted. They give the result of the bacteriological examination in 605 cases of diphtheria. In 304 cases the specific bacillus had disappeared within three days; in 176 cases it persisted for seven days; in 64 for twelve days; in 36 for fifteen days; in 12 for three weeks; in 4 for four weeks; in 4 for five weeks; and in 2 for nine weeks. The case above described, however, belongs, we think, to the second class; that is to say, we look upon it as a case in which the bacillus was found after exposure to the risk of infection in an individual who happened, whether because of a previous infection or not, to be for the time immune against the disease. That the bacillus had persisted in his throat for the forty-three weeks which elapsed between the commencement of the attack in February and the bacteriological examination in December is rendered improbable by the fact that two previous examinations in March and July had given negative results. During the three outbreaks at the school a very careful medical supervision was exercised over all the boys, and from the time when he left school on Nov. 30th up to the time when the bacillus disappeared from his throat a fortnight later the boy was under medical observation daily. It is therefore practically certain that he did not have a second slight attack of diphtheria in November, which might perhaps have otherwise passed unnoticed. As regards recent exposure to infection we ascertained that the boy was in the same class, but not in the same dormitory, as three of the boys who were attacked during the November outbreak. We are also informed that a bacteriological examination of the throat had been made in the case of several other boys from the school. In one case the diphtheria bacillus was found in the throat of a boy under very much the same conditions as those of the one under notice. Four other boys who had suffered from either tonsillitis or pronounced diphtheria in November were found to be still harbouring the Klebs-Löffler bacilli when their throats were examined between Jan. 20th and 30th. In three of these latter cases the bacilli were still present as late as the middle of February.

The treatment of such cases as these is usually satisfactory if thoroughly carried out. It is not sufficient to confine one's attention to the disinfection of the fauces and pharynx. The nasal fossæ also must be douched or sprayed with a germicidal lotion. The nasal fossæ appear to afford a habitat particularly favourable to the growth, or at any rate to the prolonged existence, of the bacilli. This view is supported by the results lately obtained by several bacteriologists who have shown that a bacillus identical both morphologically and in its pathogenic action on guinea-pigs with the Klebs-Löffler organism is to be found in certain cases of chronic rhinitis which had not hitherto been considered as of a diphtheritic nature. In those somewhat rare cases of prolonged diphtheria, too, in which after an acute onset a chronic membranous pharyngitis associated with the presence of the Klebs-Löffler bacillus persists, it may be for months, we believe that an affection of the nasal fossæ also has usually been present. In the case described the nasal fossæ were douched with a solution of sulphurous acid, with which the pharynx also was sprayed. This treatment was commenced on Dec. 10th, and five days later the bacilli had disappeared. A 1 in 2000 solution of mercuric perchloride will efficiently serve the same purpose, but must, of course, be used with a little discretion. This treatment has been recommended when advice has been sought at the British Institute of Preventive Medicine with regard to cases in which the bacilli have persisted in the throat after recovery from an attack of diphtheria, and in the cases in which it has been

carried out and in which the results could be ascertained has been very successful.

The recognition of these cases is, it is scarcely necessary to say, of extreme importance from the public health point of view. They explain, for example, that recrudescence of diphtheria which is sometimes coincident with the re-opening of schools. They explain also the occurrence of a series of outbreaks with irregular intervals at schools, such as the instance we have more particularly referred to. And in passing it may be pointed out that it is such outbreaks as those mentioned which, in the absence of obvious evidence of the conveyance of infection from one patient to another, led in the past to the belief in the intimate causative relation between defective drainage and diphtheria—a belief now discarded because of the greater exactness in tracing causation which we owe to bacteriology. Medical men generally are now quite aware of the necessity for a bacteriological examination before a convalescent diphtheria patient can for the sake of others be safely released from isolation, however perfect the recovery may appear to be clinically. To this a further rule might with advantage be added: that after a school has been closed temporarily because of an outbreak of diphtheria no scholar should be re-admitted without a bacteriological examination of the throat, whether there is a previous history of diphtheria or not.

THOMSEN'S DISEASE: A FAMILY HISTORY.

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IN January, 1896, I was called to attend a man, aged thirty-three years, who was suffering from hæmoptysis. The symptoms and physical signs led to the diagnosis of phthisis. On inquiry into his past condition he mentioned being subject to a "family complaint," and I elicited the following history. At different intervals during the past twenty years he had been subject to attacks of transient paralysis, which generally affected his arms and legs, rendering him perfectly helpless. At times the muscles of the neck and head were included. He became affected about the age of thirteen years (puberty), and the other members of the family who were so affected were between the ages of thirteen and eighteen years when the disease first developed. Dampness and cold predispose to an attack—or, perhaps, to speak more correctly, are exciting causes. The attack begins by a peculiar sensation of clumsiness or uselessness in the hands and feet, which gradually increases until there is complete loss of power of motion. If, however, the patient, when he perceives these symptoms, walks for two or three hours he can abort the on-coming paralysis. Should he during one of these walks happen to fall he cannot get up without assistance, but when placed on his feet can go a long distance without fatigue. When the patient was younger these attacks came on every three or four weeks, but of late years three or four months may elapse between them and they are not nearly so severe. If an attack comes on during sleep, and he happens to have his arms and legs flexed, on awakening he is unable to extend them without assistance. In his father's case the muscles of the neck, head, and trunk have occasionally been involved in addition to the extremities, causing complete paralysis of the entire body.

The following information has been obtained from the patient's father, who stated that his mother had the disease and was the only one in a family of seven so afflicted. He was unable to state whether his mother's parents were affected. He had one brother, T— (who had three children who were not affected), and one sister, M— (who had no family), older than himself not affected. Two of his (the patient's father's) four children were affected. J—, the next brother, did not have it, nor any of his eight children. The next brother, J—, had it, and had a family of eight, only one of whom, the eldest son, had it. E—, a sister, had it when young, but seems to have grown out of it. She was not married. F—, a brother, had it, and died during an attack at the age of thirty-eight years. He was being carried downstairs when he "fainted" and died.