

tube, no rule can be laid down. Sometimes, owing to obstructions lower down, it requires to be removed on the second or third day, but if all goes well and there is no evidence of increased respiration or pulse, generally about the fourth day will suffice.

When there is obstruction in the pharynx, sufficient to interfere with respiration, from great abundance of membrane, enlarged tonsils, etc., surgical treatment might be required in such cases, but I propose to restrict my remarks to that which may be called for in the laryngeal complication. The points which seem to me to require some consideration are: (1) When should one of these operations be performed in a case of diphtheria? (2) Which operation should be chosen? (3) I shall refer to some points in after treatment, particularly of intubation, and, lastly, a word as to the time of removal of the tube. The usual condition which gives rise to the necessity for an operation is the deposit of false membrane in the larynx, but, on the other hand, it may remain in with safety even seven, or eight, or ten days. One must judge from each individual case. If the child can swallow fairly well there need be no hurry in removing the tube, provided always that the breathing is free. There are also cases when, owing to great difficulty in swallowing, it is judicious to remove the tube every day for a few hours to allow of considerable nourishment being taken, when, if the dyspnoea recurs, the tube may be again inserted.

TREATMENT OF DIPHTHERIA.*

BY W. J. GREIG, M.B., TORONTO.

In entering on the discussion of the treatment of diphtheria, it will be necessary to say a few words in reference to etiology. The previous speaker has told us that the disease is due to the presence in the throat of the Klebs-Loeffler bacillus. In this connection, with a view to intelligent treatment, I desire to call attention to a few facts.

(1) The bacilli do not enter into the tissues and circulate through the blood, but live in the mucous membrane. They will live on any mucous surface, and even on an abrasion of the skin.

(2) The action of the bacilli on the mucous membrane results in the production of a very powerful toxic substance which is absorbed at the seat of its production by the glands and vessels and circulated through the system. It is among the most deadly poisons known. Roux and Yersin stated that $\frac{1}{10}$ of a milligramme injected hypodermically will kill eight guinea pigs. When injected under the skin it produces all the changes which are found to occur in the different organs of the body in diphtheria. This is the agent which produces the most important of the symptoms and sequela of the disease. Chemically, it is not a ptomaine or toxin, but it is a proteid substance and allied to the albumins.

(3) In this disease, many other varieties of bacteria are found in the throat, the chief of which are the pseudo diphtheritic bacillus and the pus-producing micrococci, viz., streptococcus pyogenes and staphylococcus pyogenes. The pseudo-diphtheritic bacillus resembles very closely the genuine bacillus, but is innocent in its results. The micrococci are absorbed into the tissues, causing several of the complications and assisting to produce sepsis. They cause the swelling, œdema, and the occasional suppuration of the glands of the neck. They also cause the ulcerative endocarditis, the erysipelas, and the serous inflammation which sometimes occur. In the act of inspiration they may be sucked into the ultimate lobules of the lung and produce lobular pneumonia.

(4) The pseudo membrane is thrown out by the tissues as a result of the irritation produced by the bacilli. As the membrane increases in thickness, the bacilli are carried outwards, so that on microscopical examination, the external layers contain in its meshes large numbers of the bacilli, while none are found in the deeper layers or in the subjacent tissue.

(5) A lesion of the mucous membrane, while not necessary for an attack of diphtheria, strongly predisposes to it. It gives the bacilli a foothold and affords the better opportunities for the absorption of the toxic element. Thus, those suffering from catarrh, sore throat, or hypertrophied tonsils, are more apt to take the disease. These facts are very important from the point of view of treatment as we shall see later.

*A paper read before the Toronto Medical Society.