minutes at this temperature. The thermal death-point is between 65° and 70° C.

Resistance to Glycerine.—An important feature, and one which can be put to practical use, as already noted, is the resistance of the organisms to the action of 50 per cent. glycerin. It is not of the same degree in all instances. In the case of polyneuritis, encephalitis, and rabies the organisms remain viable in glycerin for some months. The virus of trench fever resists its action for about three months. On the other hand, the organisms of influenza and nephritis show a feeble resistance, at the most three or four weeks being the viable period.

CONCLUSION.

Such, then, is a brief account of certain filter-passing organisms. In three of the diseases—*influenza*, *trench fever*, *trench nephritis*, and possibly in *encephalitis*—microscopical examination is sufficient for the purposes of clinical diagnosis. In *polyneuritis*, and in most cases of *encephalitis*, blood during the febrile stage is the only means of diagnosis.

As far as can be determined these organisms are definite entities—that is, they are not stages in the life-history of a more complex organism. No evidence could be obtained that they were mere products of the breaking down of larger cocci, as suggested by Rosenow.

In rabies no naturally acquired cases have come under review, nor has there been time to go into the microscopic distribution of the virus in the tissues.

REFERENCES.

- ¹ Flexner and Noguchi, *Journ. Exp. Med.*, 1913. ² Noguchi, *ibid.*, 1911.

ULCERO-MEMBRANOUS LARYNGITIS OF STREPTOCOCCIC ORIGIN.

BY

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During October and November, 1918, a series of cases of laryngitis was admitted to No. 3 Canadian General Hospital, Boulogne, both from the front and base areas, presenting unique features both in their laryngeal pictures and in the almost complete absence of general symptoms. No attempt will be made in this brief report to trace their connexion with any of the influenzal or other streptococcic infections prevalent at that time.

Similar conditions of the larynx were not seen in patients suffering from influenza in hospital at that time, nor has the condition been noted in any reports of necropsies following death from influenzal infection that I have seen.

Colonel Haven Emerson, M.R.C.U.S.A.¹, has classified eleven diseases as respiratory infections among members of the American Expeditionary Force, but, while mentioning acute pharyngitis and tonsillitis, he does not include laryngitis, yet of the cases observed 30 per cent. were seen in American troops. Fifty cases were observed in this hospital.

Symptoms and Course.

Onset.—There is usually a feeling of malaise or vague chilly sensations, headache, and pains in limbs. The temperature reached its maximum in from forty-eight to sixty-two hours, and in ten cases rose to 102°. Twenty-five cases had no elevation of temperature, and in fifteen the temperature varied from 99° to 101°, subsiding within forty-eight hours. Nearly all cases were admitted as walking cases, and complained only of the laryngeal discomfort.

Laryngeal Symptoms.—Cough, hoarseness, or aphonia appeared in from one to five days. Aphonia at some stage of the disease was present in forty cases, ten being hoarse only. Cough was uniformly present and was spasmodic and unproductive. Recovery was complete in from eight to twenty-five days, the average being seventeen days. Functional aphonia followed in eight cases.

Objective Signs.—The fauces might present no changes, but were usually somewhat red and engorged; the epiglottis was not involved. The vocal cords showed ulcero-membranous changes, usually the middle third of the cords was involved, and in this respect the picture resembled that of traumatic laryngitis from gas. The greyish translucent membrane lay symmetrically on both cords, and might involve as much as two-thirds of the upper surface and free edges of the cords. This membrane may be removed with difficulty by grasping with forceps or briskly rubbing with cotton tightly rolled on an appli-

cator. Its removal leaves a raw bleeding surface, which is quickly covered by the re-forming membrane. After the third or fourth day the edges of the membrane are seen to be curling up, or may have been removed, and a shallow ulcerated surface is exposed. The free edges of the cord were invariably involved, and very early showed thickening, and later a "mouse nibbled" appearance.

Oedema of the glottis, supra-glottic or infra-glottic tissues was not observed, and the arytenoids and ventricular bands were not involved in any way. Aphonia, at first due to mechanical disturbance, thickening or ulceration of the cords, may continue as a functional condition.

Treatment.

Treatment consisted of three factors, which we have arranged in the order of their importance: (1) Voice rest; (2) no smoking; (3) inhalations of medicated steam.

Inhalations may relieve the cough, but probably have no influence on the course of the ulcero-membranous process. Abstinence from smoking, especially army cigarettes, probably relieves irritant symptoms. Voice rest is most important and should be complete. It is evident that the greatest possible quietude of the vocal cords is essential, and even whispering was prohibited. Not only is recovery hastened by voice rest, but the patient is not likely to adopt a whispering voice after the cords have healed, which frequently leads to a condition of functional aphonia, as has often been seen after enforced or permitted whispering during the course of laryngeal disease.

The cases of functional aphonia generally yielded quickly, at the first treatment, to *persuasive* suggestion as used in pure functional aphonia cases seen among soldiers, and as opposed to the "*peremptory*" suggestion treatment.

After the disappearance of the membrane the cords were red, injected, and somewhat thickened or roughened on the edges. In a few cases recovery was hastened by the daily application of some astringent to the cords. Partial rest of the voice was enjoined for a convalescent period of a week or ten days. Those patients who might have to use the voice in giving or transmitting commands to troops were detailed to duties not entailing the use of a loud voice for such time as would permit the cords to resume their normal appearance. Too early use of the voice appeared likely to lead to a subacute or chronic laryngitis with permanent damage to the cords.

Bacteriology.

Cultures were taken from the cords by three methods. An attempt was made to adapt an applicator moving in a curved glass tube, as in taking smears from the nasopharynx; this was not successful. Some of the smears were made by indirect laryngoscopy, care being taken to reach the larynx without contaminating the sterile cotton on the applicator. Other smears were made by direct laryngoscopy through a short laryngoscopic tube.

Out of 50 cultures, 35 showed streptococci in almost pure growth; 10 showed the same as the prevailing organism, and the remainder were indefinite. Of the 35 streptococcic growths, 25 were classified as *Streptococcus haemolyticus* and 10 were *Streptococcus viridans*. Further subdivision of these groups was not attempted owing to difficulty in securing carbohydrate media.

REFERENCE.

- ¹ U.S. Army Medical Bulletin, December, 1918.

SHELL WOUND OF LEFT SIDE OF NECK: INJURY OF GREAT VESSELS AND DIVISION OF VAGUS NERVE:

RECOVERY AND RETURN TO FIRING LINE.

BY

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THE following case appears to be worthy of record on account of the nature and severity of the injury, and as an example of recovery after complete division of the vagus. Owing to the additional injuries to the great vessels, necessitating ligature of the left common, external and internal carotid arteries as well as of the internal jugular vein, the fact that the man recovered sufficiently