ludicrously inept, for deafness is by no means a necessary corollary to very definite and permanent ear disease. The recruit may have polypi or granulations in his external auditory meatus, extensive perforation of the membra tympani, or ankylosis of the ossicles, without resulting deafness. Further, chronic naso-pharyngeal inflammations may occlude the Eustachian tube on one or both sides, and yet a recruit, by watching the medical officer’s lips, can satisfactorily answer to the tests. An examination with Brunton’s auriscope, or speculum and head mirror and band should be made in every case. Extensive disease of the middle ear can co-exist with very slightly impaired hearing, and in many cases entire destruction of the drumhead with protrusion of granulations from middle ear would not be suspected if hearing were the only test. As mentioned above, ankylosis of the ossicles may co-exist with only slight impairment of audition.

Lastly, the patency of the Eustachian tubes should be always tested by making the patient give a forced expiration with nose and mouth closed, while one end of the otoscope is retained in the patient’s external auditory meatus and the other end is retained in that of the medical officer. Also a very rapid examination will detect the existence of naso-pharyngeal adenoids.

A NOTE ON THE STAINING OF SPIROCHÆTE PALLIDA.

By Captain D. Harvey.
Royal Army Medical Corps.

In view of the great interest excited by the discovery of a spirochæte in syphilitic lesions, the Editor of our Journal has asked me to write a short note on the methods of examination and staining necessary to demonstrate these organisms.

The Spirochæte pallida has been found in primary sores, but in these they are exceedingly minute and difficult to make out. To begin with, it is better to use smears made from mucous papules, as in these lesions the spirochætes are larger and more easily demonstrated.

Schaudinn has also found the same spirochæte in spleen juice taken by splenic puncture from a case of secondary syphilis; and French observers have found it in the blood from a case of congenital syphilis, and also in the organs post mortem. Large numbers of the same organism were found in the fluid taken from bullæ of pemphigus in a case of hereditary syphilis. So far, the only material I have been able to examine was from a case of secondary syphilis.

The smears were prepared by Major Eckersley, R.A.M.C., at Woolwich, from a moist papule on the thigh. This was well cleaned with sterile water, the surface scraped with a sharp spoon, and films made from the deeper layer thus exposed. The films should be as thin
as possible, otherwise the densely stained groundwork obscures the spirochaete. Fix the films in absolute alcohol for ten minutes, then wash them well in distilled water.

Giemsa's stain is a modification of Romanowsky's stain, containing azur in place of methylene blue; the solvent is methyl alcohol with neutral glycerine, equal parts. This stain can be obtained from Messrs. Baker and Co., High Holborn, made up and ready for use. We find, however, that it does not give such good results now as it did when fresh, so have written to Messrs. Baker to procure from Grüber the original ingredients. We would be glad to send small quantities of this stain to anyone wishing to do work on the subject.

The method used by us for staining films was to put the slides in a moist chamber; this consists of a Petri dish with damp filter paper on the floor, the slides resting on two matches. Two cubic centimetres of distilled water are poured on to the surface of the film, and to this six drops of stain are added, and the fluids well mixed by means of a glass rod. The stain, if put on one afternoon, should be allowed to act till the following morning. The slides are then removed from the Petri dish and well washed in distilled water for about a minute. Another method, which is perhaps preferable, is to make the films on cover-slips and to stain, film side downwards, in a staining pot. This obviates to a certain degree the deposit which sometimes occurs in the first method.

In searching for the spirochaete a good twelfth objective is necessary with a high eye-piece—a No. 6 was used by us, but a No. 4 is sufficient. Select a portion of the film in which bacteria or red blood corpuscles are seen, otherwise much time may be lost in searching through fields consisting of stain deposit only. Focus very carefully up and down, altering the light from time to time by moving the mirror slightly; the curves of the spirochaete, if present, will be the first thing to catch the eye; as a rule they are stained a reddish colour. It is better to spend five minutes over one field than to pass quickly over several fields.

We have also tried staining by Leishman's method by thionin blue and by carbol fuchsin, but could find no spirochaete. Some of these same films were washed out and restained by Giemsa's stain, when numerous spirochaete were found. S. pallida, which is believed to be the specific organism, differs from S. refringens (which is found in smegma and on the surface of syphilitic sores) in that S. refringens stains by ordinary stain, such as carbol-fuchsin, whereas S. pallida, so far, has only been stained by the method described above. Also S. refringens is thicker and therefore more easily seen. S. refringens is undulating rather than twisted, resembling the spirillum of relapsing fever, and may have from three to five curves in its length, whereas S. pallida resembles a corkscrew, and may have as many as thirteen minute turns in its length of 18 m.
Some of the opponents of the truth of Schaudinn's contention have raised a curious objection, namely, that as Giemsa's stain contains dextrose, it is an excellent medium for the growth of spirilla, hence their presence in films stained by that method. This, of course, would not account for the presence of spirochaetae in fresh unstained juice from lymphatic glands. This is another method of examination which is to be recommended. The spirochaetae are very actively motile and move with either end foremost indifferently.

In a paper just received, Giemsa describes a more rapid method of staining the spirochaetae. The proportions of the ingredients of the stain are as follows:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Quantity</th>
</tr>
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<tbody>
<tr>
<td>Azur II, eosin</td>
<td>3 grs.</td>
</tr>
<tr>
<td>Azur II</td>
<td>0.8 gr.</td>
</tr>
<tr>
<td>Glycerine (Merck chemically pure)</td>
<td>250 cc.</td>
</tr>
<tr>
<td>Methyl alcohol</td>
<td>250 cc.</td>
</tr>
</tbody>
</table>

Fix the films in absolute alcohol fifteen to twenty minutes, add one to two drops of stain to one cubic centimetre of distilled water. Pour on to the films and stain for one hour. Then differentiate by washing in distilled water for one to five minutes. He also recommends adding to the water, before mixing with the stain, one to ten drops of a 1 in 1,000 solution of sodium carbonate.

**ANOTHER METHOD.**

In the *Deutsche Medizinische Wochenschrift* for June, Huscheimer and Hübner describe a still simpler method than that of Giemsa's azur eosin stain for the demonstration of the *Spirochaete pallida* in the secretions of syphilitics.

A 1 in 1,000 solution of either Nile blue B. R., or of Capri blue, allowed to act on a smear for sixteen to twenty-four hours, gives satisfactory results, the organisms in the former case being stained a dark blue, and in the latter, grey. In making the examinations it was found that considerable practice was necessary to recognise the almost transparent spirochaete, but out of fifteen cases which clinically were undoubtedly syphilitic, the organism was found in all but one, though frequently only after hours of search. In two doubtful cases the organism was not found. In two instances the observers were able to demonstrate a single spirochaete in sections of tissue. In order to disprove the allegation which has been made to the effect that the spirochaete were organisms developing in the staining fluids, the authors searched through a series of covers on which the solution had been allowed to dry, but without finding any spirochaete. Motile spirochaete were also discovered in hanging drop preparations.—[Ed.]