THE DIAGNOSIS OF TYPHOID FEVER IN INOCULATED SUBJECTS.

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(A preliminary account of a research carried out, under the direction of Professor Delépine, at the Public Health Laboratory, Manchester University. The expenses in connexion with this research were defrayed by a grant made by the Medical Research Committee.)

SOME observations made whilst working with a certain strain of the *Bacillus enteritidis* (7160)* suggested that this bacillus might be of use in the diagnosis of typhoid fever in inoculated persons. In such cases the usual Widal test affords little or no help to a rapid diagnosis.

During the period January to June, 1915, quantitative agglutination tests, more than 1,000 in all, were made with the *B. enteritidis* 7160 and with the *B. typhosus* with blood obtained from the following classes of persons:

CLASS 1.—Persons who had been inoculated with typhoid "vaccine," and who, as far as could be ascertained, were not suffering and had not suffered from any illness resembling typhoid fever—50 cases. In none did the blood give a positive reaction with the *B. enteritidis* 7160. The blood of nearly all these cases caused agglutination of a typical *B. typhosus*; the reaction was very marked in most cases. In a small percentage the result of the test was negative.

CLASS 2.—Persons who had not been inoculated with a typhoid "vaccine," and who were suffering from typhoid fever—50 cases. The blood of all these persons caused agglutination of a typical *B. typhosus*. In 44 a positive result with the *B. enteritidis* 7160 was obtained at the first test. In 6 a negative reaction with this bacillus was found on a first examination, but on testing a second sample of blood in 5 of these 6 cases, each gave a positive reaction. From the sixth case a second specimen of blood has not yet been obtained.

These results showed beyond doubt that active typhoid infection confers on the blood a power of clumping the *B. enteritidis* 7160, which is not produced by injection of dead typhoid bacilli. They afforded strong presumptive evidence that an inoculated patient whose blood gives a positive reaction with the *B. enteritidis* 7160 is infected with the *B. typhosus* or a near ally.

CLASS 3.—To test these conclusions, 14 cases of suspected typhoid fever in inoculated men were investigated. Each case gave a positive Widal reaction. In 7 the clinical evidence decidedly favoured a diagnosis of typhoid fever, and in each case the blood was found to give a positive reaction with the *B. enteritidis* 7160. From 4 of these cases the *B. typhosus* was isolated, in 3 from the stools, and in 1 from the blood. From none of these cases was the *B. enteritidis* or a *B. paratyphosus* isolated. The other 7 cases, clinically, were much more doubtful. In none was a positive reaction with the *B. enteritidis* obtained. Careful bacteriological examinations of the blood and excreta failed to discover the *B. typhosus*, the *B. paratyphosus*, or the *B. enteritidis*.

CONCLUSIONS.

1. A positive reaction with the *B. enteritidis* 7160 is due to something more than previous antityphoid inoculation, and hesitation in diagnosing typhoid (or paratyphoid) infection should be occasioned only by the necessity of excluding infection with the *B. enteritidis* itself. The symptoms associated with *B. enteritidis* infection are, however, generally clear enough to make the distinction easy.

2. A single negative test with the *B. enteritidis* 7160 does not exclude a diagnosis of typhoid fever, though, if obtained late in the course of an illness, it would constitute good evidence against typhoid infection. Repeated negative tests are much more conclusive, and should be of value in deciding the nature of doubtful cases. The time required, however, is a hindrance to rapid diagnosis, which is absent in the case of a positive reaction.

A full account of this research is in course of preparation, and will be published later.

* A bacillus recently isolated by Professor Delépine from the spleen in a fatal case of food poisoning.

CHEAP ABSORBENT DRESSINGS FOR THE WOUNDED.

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1. Pinewood Sawdust.

IN the BRITISH MEDICAL JOURNAL for October 17th, 1914, I published a short note on the value of pinewood sawdust as a cheap material from which very efficient absorbent dressings for surgical work can be easily made. In the following number of the JOURNAL favourable opinions of this material were expressed by Professor Rushton Parker and by Mr. F. D. Bennett, and on May 26th of this year an instructive paper on "Pinewood Sawdust as a Surgical Dressing," by Professor Rushton Parker, was published in the *Clinical Journal*. To these recent papers and letters your readers may be referred for information as to the value of pinewood sawdust.

My present reference to the subject will be limited to an indication of some recent improvements in the method of preparation.

Instead of a fairly open muslin we now use one with a close mesh, which has 70 by 50 threads to the square inch. This retains the finer particles of wood in the bags and renders the use of a No. 40 sieve unnecessary. It costs 2½d. a yard of 40 in. wide. A No. 8 riddle or sieve is used as before to exclude the larger fragments of wood, and all that passes through it is employed for the dressings.

The bags are now made of three sizes—namely, 12 by 8 in., 10 by 6 in., and 7 by 5 in. The same sizes are used for the other two materials recommended in this paper. The method of tearing the muslin and sewing the bags is described in one of the leaflets to be afterwards referred to.

Besides sawdust, however, there are two other substances—both also home products—which are better absorbents than cotton-wool, and are available under present circumstances at a very low cost. These are *fresh sphagnum moss*, and moss becoming peat, which for short we may call *peat moss* or *moss peat*.

2. Sphagnum Moss.

The following particulars are taken from an article contributed to the *Scotsman* on November 17th, 1914, by Professor I. Bayley Balfour and the present writer:

Bog moss or sphagnum is the only moss which in nature has a far-reaching influence upon the surface of the earth as a soil-forming agent, and it is the only moss which has proved itself as yet to be of economic value to civilized nations. Its formative influence and its economic value respectively depend upon the peculiar construction of the plant. Its smooth stem is densely beset with leaves, and emits a branch at every fourth leaf; often these branches are turned downwards, and apply themselves more or less closely to the stem. At the periphery of the stem are one or more layers of fine colourless chambers, known as capillary cells, whose thin walls have big perforations, and are strengthened against collapse by a thickening band running spirally or in rings around the inside. The leaf is formed of a single layer of chambers or cells. Some of them, narrow and green, form a network of feeding cells, in the meshes of which are larger, broader, colourless cells, perforated and thickened after the fashion of those of the peripheral layers of the stem. The whole construction results in a system of delicate capillary tubes, having the effect of a very fine sponge. The perforated cells readily take in water and hold it firmly. The water can be squeezed out of them but they do not collapse, and are ready to take in water again.

In life the plant takes all its water from the atmosphere. It is not dependent on soil water, and from top to bottom is laden with the water retained in its delicate chambers. By its mode of branching the plant forms compact cushions. These have a bulging centre, and as the older parts die off below and pass into the condition of peat, the tops constantly and vigorously elongate and branch so long as the precipitation of moisture from the atmosphere suffices. While the older cushions are thus growing new cushions are being formed by lateral extension, and thus there is formed what is known as "High Moor." By gradual extension at the periphery the