should be drawn from a vein by means of a sterile syringe. It is then spread over the surface of agar or other medium and incubated. If rigid aseptic precautions are observed the margin of error is very small.

Of 19 cases examined by me organisms were present in the blood in 5. We may exclude from these 5 one case in which the blood was taken in capillary vaccine tubes with every probability of contamination. The 4 remaining cases were briefly as follows:

1. *Puerperal Sepsis*, which terminated fatally; the organism present was the staphylococcus pyogenes albus.
2. *Ulcerative Endocarditis*.—Streptococci were found in the blood on three different occasions. The case terminated fatally.
3. *Ulcerative Endocarditis*.—The staphylococcus albus was found in the blood. The patient died.
4. *Pneumonia*.—The pneumococcus was present in the blood. The case terminated fatally.

Of the 14 cases in which no general blood infection could be demonstrated 2 died, and the subsequent history of some few others I have been unable to trace. Amongst these 14 were cases of puerperal fever, pernicious anæmia, ulcerative endocarditis, cerebro-spinal meningitis, and enteric fever.

The noteworthy point is that all the cases showing general blood infection terminated fatally, illustrating the fact that from the point of view of prognosis this method of bacteriological research is of the highest importance.

In the case of blood examinations failure to detect micro-organisms cannot be accepted as proof of their absence, for the quantity of material examined is relatively small. The chances of error with a positive result are, however, small, and depend solely on the care and attention bestowed upon the sterilisation of the syringe and skin.

TUBERCULOSIS.

In 200 consecutive specimens of sputa examined bacteriologically, tubercle bacilli were detected in 50 per cent.

Whilst the finding of the bacillus may settle the question of diagnosis, failure cannot be taken as evidence of the absence of tuberculous infection. In early stages of phthisis and in the acute disseminated variety, tubercle bacilli may not be present in the expectoration, there being as yet no breaking down in the lung. Success in finding the bacillus is the reward of patience and perseverance, and depends upon several factors: (1) the nature of the sputum chosen; (2) the number of cover slips prepared; (3) the time and care spent in examining the films. Students often fail because they prepare too few specimens, and examine these too superficially. Agitation of the sputa with carbolic acid and subsequent sedimentation is useful in as far as it gets rid of the stringy mucus, but I do not find that I get better results by this method than by examining in the fresh state. In a case presenting the ordinary clinical features of phthisis, I should require a large number of negative reports to convince me of its non-tuberculous nature. One such case in a diabetic patient I have under my care at the present time.

For many and obvious reasons it is impossible to gauge the severity of the disease by the number of bacilli in a given specimen; but, on the other hand, if the patient's sputum be systematically examined at definite periods during the illness, the progress towards recovery will be seen to be marked by a steady diminution of the tubercle bacilli. These, however, remain long after the excess of other micro-organisms has abated. This in my experience is the case especially with patients undergoing the so-called Nordrach treatment.

In the examination of serous fluids, pus, or sections of tissues the margin of error is very great if reliance be placed on negative results. A positive result is, of course, conclusive, but this can seldom be arrived at without inoculation experiments. Even if inoculation be resorted to, the possibility of error is not eliminated, for the quantity of centrifuged material inoculated into a guinea-pig is very small.

In actual practice the only bacillus which is likely to be mistaken for the tubercle bacillus is the smegma bacillus, and this has recently been shown to have a wider distribution than was formerly thought. For this reason the examination of urine for tubercle organisms is useless unless the water be drawn off with aseptic precautions, and unless the films be (subsequent to decolorisation with acid) allowed to soak in alcohol for at least thirty minutes.

SOURCES OF ERROR IN METHODS EMPLOYED.

Error in bacteriological diagnosis is frequently due to the fact that cultures only are taken and no films prepared. For example, an abscess is incised and some of the pus inoculated on culture tubes; no growth results, and the pus is regarded as having been sterile, whilst in reality it has been caused by an organism which does not grow on ordinary media, or which only grows under anaërobic conditions. Whenever possible, therefore, films should be prepared and stab cultures made in glucose media. From neglect of these precautions I have more than once failed to elucidate the cause of lesions which were probably due to such organisms as the *B. tuberculosis* and *B. capsulatus aërogenes*. Some organisms, too, such as the diplococcus of Fraenkel, are far easier to recognise in fresh films than in cultures.

It has not been my purpose in the foregoing remarks in any way to disparage bacteriological methods of diagnosis, which I believe to be invaluable. It is necessary, however, to receive all bacteriological findings with caution, and to regard them merely as useful adjuncts to clinical observations.

THE PROTECTION OF THE OBSERVERS IN CASES OF INFECTIOUS SORE THROAT.

By ERNEST WAGGETT, M.B., B.C.,
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I BELIEVE that nothing is so difficult as to induce a surgeon to take habitual precautions for the safety of his own health, and the much-lamented death of Dr. Lewis, a young and promising surgeon, affords an instance which adds weight to this conviction. It is now more than a year ago since he succumbed to an attack of malignant scarlet fever, contracted while examining the throat of an infectious patient; and yet I do not think that any of his many friends—and I include myself—have since that time practised any special precaution.

Celluloid or talc screen for infectious cases.

The subject was again brought forcibly to my mind recently. During the demonstration of throat cases at the Great Northern Hospital a student was looking over my right shoulder in the usual way. A sickly child with a sore throat came up for examination, and, prompted by the appearance of the patient, I warned my friend to stand aside. The moment I introduced the tongue depressor a flake of diphtherial membrane was coughed straight across the space occupied by the student's face a few seconds before. Since this occurrence I have felt it a duty to afford some less fortuitous protection to the students who work with me. Every throat department is no doubt furnished with a glass screen or some device of the kind, but no one thinks of using it; it is cumbersome and needs a hand to hold it. What is required is some light contrivance which can be picked up and grasped along with the tongue depressor. The little arrangement shown in the sketch answers these requirements exactly, weighing little more than an ounce, and readily adjusting itself to any form of tongue depressor. Costing a few pence to purchase and two minutes to make, it can be constantly renewed if it does not prove very durable. A 6-inch square of thin mica sheet or talc can be bought at most ironmongers, and when fixed in a handle made out of a piece of copper wire in the manner indicated in the sketch furnishes an efficient transparent screen. Talc is not very durable, and I have found it better to employ fairly thick sheets of perfectly transparent celluloid. I fancy that the latter is not easy to purchase retail in this country, but it can of course be procured by the instrument makers.

If this device is to serve any practical purpose three small points must be attended to:

1. It is very undesirable that the screen should be in any way attached to the tongue depressor, an instrument which, above all others, should during the working hours in hospital stand in the steriliser or antiseptic solution. The handle of the screen must be moulded so as to fall into place, and practically form one with the handle of the tongue depressor when grasped by the surgeon. The wire stalk must also be conformed to the shape of the latter instrument.

2. The screen itself must be tilted forward out of the vertical plane, otherwise a reflection of the forehead mirror obscures the view of the observer.

3. The instrument must always lie at the surgeon's right hand, so that he can permit himself no excuse for neglecting its use when a suspicious case comes forward. It is only from the habitual use of some such instrument that any valuable protection will ensue.

No doubt it will be said that the cases of infection through expectoration are so few and far between that it is absurd and pedantic to ensure against their repetition. A similar argument may be employed with regard to the washing of hands, a habit to which, I fancy, the hardest surgeon will raise no objection. This habit, he may say, is part of our natural observance of cleanliness and decency, and existed prior to the antiseptic era. If this be the case a glance at the spots on the forehead mirror at the end of an afternoon's work at the hospital is enough to convince the least particular that there is no alternative between constant washing of the face and the use of some shield.

The point, however, which I venture to press, is this: it is the duty of teachers in throat surgery to protect their pupils against infection through particles expelled by the mouth, and I think that such protection is afforded over a maximum of space and with a minimum of trouble by means of a screen held close to the mouth of the patient.

Since writing the above my attention has been called to the somewhat similar instrument introduced by Dr. Dowding.¹ The fact that so ingenious and valuable a device has not come into general use in hospital practice seems to emphasise the necessity of again drawing attention to the subject of protection. I venture to hope that the extreme simplicity of the screen I have described and its complete separation from the tongue depressor will induce teachers of throat surgery to make use of it.

REFERENCE.

¹ BRITISH MEDICAL JOURNAL, November 5th, 1895.

A Chair of Hygiene is to be established in the University of Harvard, which has received a gift of 156,000 dols. for this purpose.

TWO CASES OF TYPHOID FEVER, WITH ABSCESSSES OF LUNG AND EMPYEMA.

By SIDNEY PHILLIPS, M.D., F.R.C.P.,

Physician to St. Mary's Hospital; Senior Physician to the London Fever Hospital.

The following cases appear worthy of record:

CASE I.

History.—J. S., aged 4½ years, was taken ill with headache and diarrhoea on November 21st, 1900; on the 22nd there was sore throat and enlargement of the glands of the neck; on November 24th he took to bed, and on November 25th became delirious; diarrhoea ceased after November 26th. He came into St. Mary's Hospital under my care on November 29th.

Condition on Admission.—He was terribly emaciated, with dry tongue, distended abdomen, and temperature of 105°; he lay on his right side in a drowsy condition, occasionally crying out; there was intense hyperæsthesia over the whole surface of the body, and he shrieked loudly when touched, and violently resisted attempts to examine him; there were signs of general bronchial catarrh, with dulness on percussion and loud tubular breathing indicating pneumonia at the right base; the pulse was very feeble. No typhoid spots or enlargement of the spleen were detectable.

Treatment and After-History.—He was ordered liquid diet, occasional hypodermic injections of strychnine, and sponging when the temperature rose to 103°. On December 2nd there were physical signs of resolution of the pneumonia, and the temperature fell gradually to 99°, rising again the same night suddenly to 105°; it fell again to 99° by the next morning. The general condition now improved slowly, the tympanites lessening, the tongue becoming clean, and the mental condition improved, so that he answered questions, but the intense hyperæsthesia of the skin persisted, and the temperature rose each evening to 101°, and on the 9th and 10th to 102°; on the 11th it rose to 105.8°, and the respirations, which had dropped to 30, re-rode to 40 per minute, and the pulse became very feeble; on the 12th the temperature was 104°, the pulse 144; vomiting came on, and death occurred on the same night.

Necropsy.—The post-mortem examination by Mr. Plimmer showed several healed and several healing typhoid ulcers in connection with Peyer's patches and the solitary follicles. One mesenteric gland was very much enlarged. There was a large soft mass of recent vegetations on the anterior cusp of the mitral valve. The left lung was rather collapsed. In the right pleural sac were about 8 ounces of thick pus, and on the surface of the right lung a thickish layer of soft recent lymph. The right lung itself was compressed by the empyema, and was deeply congested and recovering from pneumonia. In the lower lobe of the right lung were several small abscesses close beneath the pleura, the largest of which was the size of a bean. The pus in the pleura showed only the streptococcus lanceolatus.

CASE II.

History.—W. S., aged 3 years, brother of the previous patient, became ill on November 19th with headache, succeeded by sore throat, vomiting, and diarrhoea, and became delirious on November 24th.

Condition on Admission.—He was admitted to St. Mary's Hospital on the same day as his brother, November 29th, and in an almost identical state. There was the same lethargic condition, with occasional cries of distress; the same emaciation and distension of abdomen; and the same intense hyperæsthesia over the whole body surface. There were signs of pneumonia and friction over the base of the left lung; there was no typhoid spots and no enlargement of spleen in either case.

Treatment and After-History.—On November 30th the temperature was 104.4°, and on December 3rd 105°, and severe diarrhoea came on, checked by bismuth salicylate. Some slight improvement and a fall of temperature to 100° occurred during the next three days, but on December 7th the temperature rose again to 105°, notwithstanding cold sponging. The signs of resolving pneumonia in the left side were followed by persistent dulness which a hypodermic needle showed to be due to pus; and on the 15th an incision into the left pleural sac was made, letting out about 8 ounces of pus, and a drainage tube was inserted in the wound. The temperature, however, rose again to 105° on the 16th, and the child died on December 17th.

Necropsy.—The post-mortem examination showed many typhoid ulcers nearly healed in the small intestine; the liver and spleen were dark and soft; both lungs were studded with patches of consolidation, and at the posterior border of the lower lobe of the left lung were several small abscesses. There was an empyema of the left pleura which had been opened by operation and pus also in the anterior mediastinum above the roof of the left lung.

In both these cases there appears to have been typhoid fever, with pneumonia, pulmonary abscesses, and empyema resulting therefrom, and it is a singular coincidence that both brothers should have suffered from the same sequence of events somewhat uncommon in typhoid fever; but, as Murchison remarked, there is often a striking similarity in the cases of typhoid fever occurring in the same house. In neither of the cases was there any meningitis.

Probably both children received a double infection, both getting sore throat and cervical gland enlargement at the onset of their illness as well as the ordinary symptoms of invasion of typhoid fever. Both had, as the necropsies proved, almost recovered from the typhoid fever, but succumbed to the effects of septic infection. The hyperæsthesia of the surface of the body was a marked feature during life in both cases. It was due possibly to peripheral nerve changes. The vegetations on the mitral valve in the first case were quite recent and probably resulted from septic infection.