A SIMPLE METHOD FOR THE CULTIVATION OF ANAEROBIC ORGANISMS.

BY

LYN DIMOND, M.B., LIEUTENANT R.A.M.C.,
BACTERIOLOGIST; BRITISH EXPEDITIONARY FORCE, FRANCE.

THE large number of wounds in the present campaign contaminated with anaerobic organisms has brought into prominence the different methods for the isolation and culture of these organisms.

A simple method for obtaining anaerobic conditions is the following, and I have found that by its employment large numbers of these organisms can be investigated with regard to their cultural characteristics, their carbohydrate reactions, etc., with comparative ease, and the laborious technique involved in carrying out many of the methods in common use avoided.

The sole apparatus required are test tubes of two different sizes for cultures on solid media and three different sizes for liquid media.

The diameters of the test tubes which I have found most convenient have been 1.5 and 2.5 cm. for the first method and 1, 1.5, and 2.5 cm. for the second method.

1. For Solid Media.

The test tubes, 1.5 cm. in diameter, are prepared, plugged, and sterilized with the sloped medium, such as glucose agar, in the usual manner. After inoculation of these media, a corresponding number of the 2.5 cm. test tubes are half filled with a solution of pyrogallic acid;

when liq. potassae has been added the plugs of the culture tubes are removed, and they are inserted, with their upper ends downwards, into the alkaline pyrogallate solution contained in the 2.5 cm. tube. The contained air in the tube containing the culture medium prevents the pyrogallate solution from passing up into the tube for more than a few millimetres, and the inverted tube, by virtue of its contained air, floats upon the pyrogallate solution. A few cubic centimetres of liquid paraffin are then poured upon the surface of the pyrogallate solution, thus

preventing it from becoming inert through absorbing the oxygen of the external air.

This method, which I have now used some hundreds of times, has invariably given excellent results. After incubation is completed the culture tube is lifted out of the pyrogallate solution, wiped with sterile wool, and plugged, after which the culture can be investigated in the usual manner.

2. For Liquid Media.

The smaller 1 cm. diameter test tube is prepared with its liquid medium in the usual way. After inoculation it is inserted into the large 2.5 cm. test tube containing alkaline pyrogallate solution, and after removal of its wool plug the 1.5 cm. test tube is inverted over it until its margin dips into the alkaline pyrogallate solution. A few cubic centimetres of sterile paraffin are then poured upon the surface of the pyrogallate solution, between the wall of the medium-sized tube and that of the larger tube.

For the investigation of the carbohydrate reactions, gas formation, etc., of anaerobic organisms, I have found this an extremely simple and reliable method.

The diagrams give a general idea of the arrangement of the test tubes in the two methods.

THE TREATMENT OF WOUND INFECTIONS BY ANTISEPTICS.

BY CHARLES A. MORTON, F.R.C.S.,

PROFESSOR OF SURGERY IN THE UNIVERSITY OF BRISTOL.

I SHOULD like to be allowed to say something in support of the view that antiseptics are of value in the treatment of infected wounds. Sir Almroth Wright tells us that they are not necessary because the resistance of the tissues is sufficient to deal with the infection, if the wound is kept by the surgeon in a favourable condition, by adequate drainage and other means; and that, although antiseptics have the power to kill micro-organisms in the laboratory, they cannot act efficiently in contact with the tissues of the body. He tells us that, in judging of the value of antiseptics, we must be guided by laboratory methods, and not by clinical experience, because its results are not "brilliantly successful" or the reverse. He considers that because clinical results do not almost invariably prove the utility of antiseptics we are not to be guided by them, but by laboratory experiments. But is this reasonable? If we have evidence from the use of a drug in a sufficiently large number of cases to enable us to really judge of its action, are we to refuse to believe in its efficacy because it is not "brilliantly successful"? Are we not to judge of the value of vaccine treatment by its clinical results? They can hardly be said to have been "brilliantly successful" for all the various morbid conditions for which they have been used. Why should we not refuse to judge of the value of vaccine treatment because it is not always "brilliantly successful," if we are to refuse to judge of the value of antiseptics on such grounds? There is, indeed, no reason why we should replace antiseptics by vaccines in the treatment of infected wounds, as Sir Almroth Wright says we should do.

And are his laboratory experiments really convincing that antiseptics can do no good in infected wounds? He says they cannot do good at the time of infection because they cannot penetrate "the solid barriers of albuminous substance, provided in the early stages of the wound by exposed muscles and connective tissue." But may they not reach the organisms lying outside these barriers, if applied early enough? Cannot millions of microbes be destroyed by the antiseptic before they have begun to penetrate into the tissues? Even if contact with the albuminous material in the wound reduces the power of the antiseptic by the chemical change which it produces, if sufficient antiseptic is used, and if it is frequently changed and used for a prolonged period, it is not likely to be efficient. If the "barrier of albuminous substance" is formed by the exudation on the surface of the wound, bathing the organisms lying there, and then coagulated into an impenetrable layer by the antiseptic, then it would certainly seem impossible for the antiseptic to destroy the organisms. But it seems to me that we ought to require very strong proof that this was what happened before we abandoned the antiseptic treatment of wounds.

Judging by the results of Dr. Alexis Carrel's work at the hospital at Compiègne,* it seems to me that the clinical results of the treatment of infected wounds with an antiseptic have been most encouraging, and should certainly lead to a wide adoption of his thorough methods. With the result of Carrel's work before us, I venture to think Sir Almroth Wright is not in the least justified in stating that the antiseptic treatment of wounds has completely broken down. In the instances it has done so this has happened probably because the surgeon had no chance of dealing with the wound for many hours after it was inflicted, or used an antiseptic in an imperfect way—perhaps just douched the wound with it, and then washed it away at once with saline for fear of its supposed injurious action on the tissues. In cases in which the wound has been well cleaned, and the antiseptic of sufficient strength, and freely and for a sufficient time applied, within a few hours of the injury, experience both in civil and military

* See abstract of his paper in BRITISH MEDICAL JOURNAL, October 23rd, 1915, p. 609. The investigations which resulted in the use of sodium hypochlorite as an antiseptic were carried out by Professor Lorrain Smith and others at Edinburgh (BRITISH MEDICAL JOURNAL, July 24th, 1915, p. 129) and by Dr. Dakin in France (BRITISH MEDICAL JOURNAL, August 28th, 1915, p. 318), and were subsidized by the Medical Research Committee of this country.