

that the hypersensitiveness is at that part. Probably it is, as has been previously observed, central in the main. Silver nitrate solution suggested itself because it is commonly used in irritative conditions of the higher parts of the respiratory apparatus, and because it leaves a coating of silver chloride or albuminate, and so its action is prolonged.

A fairly acute reaction follows the application, as would be expected, and the breathing is somewhat laboured for a day or two, during which the patient is kept in bed.

From the short notes of the cases treated, which are appended, it will be seen that the method is worthy of an extended trial. Indeed in several of the cases, and those severe, the results have been surprisingly good—quite, I am bound to say, beyond my expectation.

CASE I.

Male, aged 44. Severe spasmodic asthma of many years' duration. Has had various forms of treatment, including residence abroad, but without benefit. Lately the attacks have been more frequent and very severe, occurring every night and often requiring morphine. He came under my care two years ago. He was then treated by the method described and the treatment was repeated on four occasions, the last being over ten months ago. At that time he reported that he had not had such a good year for years. Now he reports that he has been practically free from asthma for the past year. He is busily engaged in Government work, and once he had to pass through a workshop where there were gas fumes, and, as a result, he had a slight attack of asthma, which is the only one he has had in the period. His general appearance reflects the improvement in his asthma.

CASE II.

Male, aged 53. Frequent asthmatic attacks, especially in frosty weather. He was treated on one occasion eighteen months ago. The interesting point in his case was the discovery of a web formation in the shape of a firm band at the entrance to the right bronchus. He reports that his asthma has not benefited.

CASE III.

Male, aged 10. Bronchial asthma. This boy had severe bronchial asthma for several years. There was no nasal or nasopharyngeal abnormal condition. Treated under chloroform more than a year ago. The mucous membrane of the bronchi, especially of the left, was oedematous. There was trouble with the anaesthetic and the applications of the silver nitrate were not so systematically carried out. For some time afterwards the breathing was better and he had no definite asthmatic attack, but now the asthma has returned. His father was advised to bring him back to have the treatment repeated, but has failed to do so.

CASE IV.

Male, aged 35. This man, a railway employee, had suffered from severe spasmodic asthma for years. He had been treated in various ways, by nasal cauterization among others, but without benefit. Lately he had become so much worse that he was rendered unfit for work for about a week every month and was in danger of losing his post. More than a year ago he was treated by this method, the applications being made on two occasions with an interval of a week. He reports that with the exception of one attack, which kept him away from work for a day, he has been quite free from asthma. He certainly looks much improved in health.

CASE V.

Female, aged 24. First seen August 18th, 1916. During the previous four months she had had an attack of severe spasmodic asthma every fortnight. Treated September 15th. She reports that she has been quite free from asthma since.

CASE VI.

Female, aged 53. Bronchial asthma of some years' duration. Successfully operated on for right maxillary antral disease, but without benefit to the asthma. Treated September 15th. This was followed by a somewhat prolonged, though not severe, bronchial attack. She reports that she has been free from asthma for months.

CASE VII.

Female, aged 24. Spasmodic asthma and paroxysmal sneezing for two or three years. Four severe asthmatic attacks recently, lasting for some hours. Treated September 19th. A small warty growth was seen on the wall of the left bronchus low down. She reports that she has had several asthmatic attacks during the winter, but for the past two months has been free.

CASE VIII.

Female, aged 18. Has suffered from severe spasmodic asthma since four years of age. Lately the attacks recurred about every second week and left her unfit for work for a day or two. Her tonsils, which were enlarged, were enucleated without benefit to the asthma. Treated by the application of silver nitrate with the aid of the bronchoscope on January 19th, 1917. She reports that she has been quite free from asthma since and quite well in health.

A NEW CULTURE MEDIUM FOR THE GONOCOCCUS.

(Preliminary Note.)

BY CAPTAIN D. THOMSON, R.A.M.C., M.B.,
CH.B. EDIN., D.P.H. CANTAB.

THE following work was carried out in the laboratory of the Military Hospital, Rochester Row, London, S.W., under Lieut.-Colonel L. W. Harrison, D.S.O., R.A.M.C., and I wish to express here my keen appreciation of his encouragement and help.

There has been a great need recently for a satisfactory culture medium for the gonococcus, not only for diagnostic purposes, but also for the manufacture of gonococcal vaccines. The media chiefly employed so far, namely, trypsinized pea extract and blood agar, have the following defects:

1. The growth is by no means profuse.
2. The medium is not clear and transparent, the trypsinized pea extract being yellowish and opaque, and the blood agar opaque and dark red. The whitish and translucent gonococcus growth is not seen clearly on such media.
3. For vaccine purposes blood agar is very unsatisfactory because the water of condensation at the bottom of the tube contains a dark brown debris of broken-down red cells. The gonococcus emulsion mixed with this water of condensation is in consequence coloured and full of debris, which renders it difficult to standardize.
4. The emulsion obtained from the trypsinized pea extract cultures, though yellow in colour, is quite satisfactory from this point of view. This culture medium, however, does not appeal to me as a natural one, and it is possible that after frequent subculture the gonococcus may lose its antigenic properties and become less potent for vaccine purposes. At any rate, it seems reasonable to suppose that the best medium would be one which was as natural as possible.

My first attempt was to remove the great disadvantage of the blood agar (a natural medium) by using human blood minus the red corpuscles—that is, plasma. It was found that the gonococci grew as well on plasma agar in the proportion of 1 of plasma to 4 of agar as they did when the corpuscles were present.

The growth, however, was, as in the case of the blood agar medium, not profuse, but after some further experiments very strong growths were obtained with a similar medium made up as follows:

1. Prepare nutrient agar (2.5 per cent.) in the ordinary way with bouillon and Witte's peptone (1 per cent.), and render it +6 acid.
2. Instead of adding to this 0.5 per cent. sodium chloride as is usual, add all the salts natural to the human blood (as in Ringer's solution)—namely: Sodium chloride 9 grams, calcium chloride 0.25 gram, and potassium chloride 0.42 gram per litre.
3. Add glucose 2.5 per cent. This addition in some manner renders the growth much more profuse.
4. The nutrient agar with salts and glucose is then tubed, about 4 c.cm. being added to each test tube.
5. The sterile tubed agar is melted in boiling water, and after allowing it to cool to about 50° C., add 1 c.cm. of human plasma to each tube and mix thoroughly by rolling the tube between the palms. Allow the medium to solidify in a sloping position. For plating, the contents of three tubes may be added to a Petri dish.

Method of Obtaining Human Plasma.

In all venereal hospitals blood is frequently drawn off from the veins of syphilitic* patients into test tubes for the Wassermann test. In consequence, the source of human plasma is always available.

When a supply of plasma is required, draw off three-quarters of a test-tube-full of blood with all sterile precautions. Have a sterile centrifugal tube ready, containing 2 c.cm. of a 2 per cent. solution on sodium citrate. Fill up this centrifugal tube with the freshly drawn blood. Plug it with a sterile cork (keep the corks in alcohol and burn off the alcohol before plugging) and centrifugalize. When the corpuscles are driven down, pipette off the supernatant plasma with a sterile 10 c.cm. pipette and add 1 c.cm. to each tube of agar as indicated above. If the test tube of blood is three-quarters full there is sufficient left for the Wassermann test after filling the centrifugal tube.†

The medium is therefore as easy to prepare as the blood agar itself, and it is certainly less trouble to make than the trypsinized pea extract. It has none of the disadvantages mentioned above. It is beautifully clear and transparent,

* It is immaterial whether the patient is being treated or not with arsenic or mercury.

† I usually get 6 to 7 c.cm. of plasma from each centrifugal tube.

and it is as natural as possible. The growth is very profuse, even after eighteen hours, and the emulsion obtained is white.

When counting a vaccine, a culture not more than one day old should be used, since after this time many of the gonococci begin to autolyse, and the count would be too low. After making up standard emulsions of, say, 1,000 and 500 million gonococci per c.cm., the strength of other emulsions can be estimated directly by diluting and matching them with the standard.

I hope to publish later results showing the antigenic power of vaccine prepared on this medium.

A NOTE ON THE VALUE OF BRILLIANT GREEN AS AN ANTISEPTIC.

BY

CAPTAIN C. H. S. WEBB, M.S., F.R.C.S., R.A.M.C.

THE comparative novelty of the use of brilliant green as an antiseptic for the dressing of wounds is the excuse I submit for the following notes.* Since May, 1916, I have been using and observing the effects of a solution of brilliant green in the treatment of wounds that have passed through my hands at a casualty clearing station. On the whole, I am favourably impressed with the good results obtained from its use.

The brilliant green is dissolved in normal saline solution in the strength of 1 in 1,000. At this strength it can be used as a lotion, and gauze soaked in it can be applied to the wound as a dressing. It is non-irritant to the tissues, and I have applied it to the peritoneum, the meninges, the synovial membranes, and practically all other varieties of tissue without harmful effects. The less vascular tissues are stained green by its use—for instance, the cuticle of the skin, the edges of fascia or aponeurosis, and sometimes bone. But where it has been in contact with the more vascular muscle or subcutaneous tissue no staining occurs. Dead and necrosed portions of muscle are stained green, and this fact is sometimes of use in distinguishing such necrotic tissue.

After being in contact with the tissue, the dye gradually becomes transformed into a leuco-derivative, and the hitherto green-dyed gauze in contact with the wound becomes white to the depth of several layers. Granulation tissue rapidly forms in the wound, and to emphasize this statement I believe that the formation of granulation tissue is more rapid and more "virile" in character under the influence of a dressing of brilliant green than with other antiseptics—for example, eusol.

The most striking results are seen in the cut surfaces of muscle. The muscle rapidly becomes bright red, and the formation of a highly vascular granulation tissue takes place. In thirty-six to forty-eight hours the muscle may be covered with firm, "dry," bright red granulation points, which present none of the shreddy, sodden look of the granulations under a eusol dressing. The surface of the wound is drier, and the pus formation is smaller in amount and thicker in consistency, than in a similar wound dressed with eusol.

At a casualty clearing station it is almost impossible to formulate other than approximate conclusions concerning the merits or demerits of any antiseptic. The obstacles against obtaining any exact judgement are as follows:

1. The cases have been handled before, and other antiseptics have been applied—that is, at the field ambulance.

2. The cases do not stay long enough for any extended observation, before being transferred to the base.

3. Those cases that do stay and on which more lengthy

* The potent antiseptic properties of brilliant green were drawn attention to by Browning and Gilmour (*Journ. Path. and Bact.*, vol. xviii, 1913, p. 144), and this substance was first employed as an antiseptic in the treatment of wounds by Leitch (*BRITISH MEDICAL JOURNAL*, February 12th, 1916); its action under clinical conditions has also been very favourably reported on by Ligat (*BRITISH MEDICAL JOURNAL*, January 20th, 1917), and Hodgson-Jones (*BRITISH MEDICAL JOURNAL*, 1917, i, p. 455) has recorded excellent results in the rapid healing of indolent ulcers under the use of an ointment of 1 to 2 per cent. brilliant green in paraffin. Further investigations by Browning, Gulbransen, Kennaway, and Thornton (*BRITISH MEDICAL JOURNAL*, January 20th, 1917) have shown that concentrations of brilliant green which are highly bactericidal for organisms, such as staphylococci, in the presence of serum, do not interfere with the process of phagocytosis; in this respect brilliant green is much superior to mercury perchloride.

observations can be carried out, are of the more severe type, many having mortal wounds.

4. The difficulty of obtaining news of the subsequent history of the case after it has left the casualty clearing station.

However, by a method of comparison of selected cases, as nearly as possible similar in nature and extent of injury, it is possible to estimate the relative merits of two or more antiseptics, as judged by clinical standards. By such means I have tried to compare brilliant green with eusol, and I believe that the green is the better antiseptic of the two.

Latterly I have been using the green in conjunction with "salt" tablets. It has been my experience that the usefulness of the "saline pack" is enhanced by the inclusion of some antiseptic in the dressing. The combination of the "saline pack" with the green solution during the first few days of the wound has, I think, given better results than the use of one or other alone. It can also be used after the method of Carrel— $\frac{1}{2}$ oz. to 1 oz. of a 1 in 1,000 solution being syringed down a tube or series of tubes leading into the depths of the wound. It is not so irritant to the skin edges as the hypochlorite solution.

SUMMARY.

1. Brilliant green is undoubtedly an active and efficient antiseptic.
2. It is non-irritant.
3. It acts well in the presence of serum.
4. It possesses very definite "auxetic" properties.
5. It stains dead tissue green, and in this way may aid the surgeon in determining what to excise.
6. As it is soluble in "saline" it can be used in conjunction with the "salt pack."
7. It can be used after the method of Carrel.

FLIES AND BACILLARY ENTERITIS.

BY

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IN view of the rapidly approaching summer campaign, it seems advisable to draw attention again to the ever-present dangers from flies during the "season." So much has been written on the subject that it might seem almost invidious to direct attention again to our commonest and most familiar domestic pest.

The matter has received thorough treatment by the Local Government Board, and has been taken up to some extent by independent observers. By far the most comprehensive series of observations is that by Graham Smith,¹ extending over a number of years. In his *Flies and Disease* we have the nucleus around which to group further incidental observations and theories.

The limit of the house-fly's potentialities as a disease carrier has not yet been ascertained, and it might with some degree of safety be affirmed that the spread of almost every disease with which is associated an infectious discharge or exudation of one sort or another may be furthered and accelerated by house-flies. Such diseases are common, and not a few of them are well known to reach their maximum incidence at or about the height of the fly season. On the other hand, in no case has the house-fly been definitely proved to be the exclusively specific carrier of any particular disease. In the majority of cases it is merely the most assiduous and most effective. So far as I am aware, the house-fly is not in any case the actual "intermediate host" of any disease-producing organism occurring in man. It appears, however, to be a true intermediate host of at least one parasite of the horse (*Habronema muscae*).

During the course of my tenure of the Ernest Hart Fellowship, I was able to show² that flies had considerable potentialities as disseminators of parasitic worms, and I was led to make investigations on the bacterial flora associated with flies, and in particular on the occurrence of certain organisms pathogenic to man.

In a recent paper (1917) I published the results of a series of experimental investigations on the relation of