The operation is a simple one and can be performed under local anæsthesia.

The disease has also been treated by means of diathermy and *x*-ray exposures, in England and in other countries; and I remember a colleague in India treating cases with magnesium sulphate ionisation. The results, however, have not been very conclusive.

Among a large number of ointments and other substances employed locally in the treatment of the disease, the only one which needs a consideration is tartrate of antimony ointment. The sores are first cleared of secondary sepsis, if any, by ordinary surgical dressings; and if covered with scabs, the same are first got rid of by applications of boric acid and starch poultices, before applying the ointment. It is used in a 2 per cent. strength and is applied daily over the sore for 3 or 4 days or longer till an ulcer is formed and the induration has disappeared. It is then dressed daily with sterilised vaseline or boric ointment, taking all the necessary aseptic precautions. Some people advise the application of a dressing of cheese freshly prepared from milk curds, after previous treatment with the tartrate of antimony ointment. I have not discovered any advantage of this over the boric ointment dressing.

Reference may be made here to the fact that some few cases of this disease are also treated by the Indian barber, who still exists in our midst as a relic of the surgeon of the Middle Ages. He trades in a large number of combinations of herbs suspended in oil or grease, for local applications. And, it is claimed that by these he "cures" the sufferers of oriental sore. What we do know, however, is that some of these cases come to the surgeon afterwards, to undergo an operation of some kind or other.

Conclusions.

The conclusions we arrive at are as follows:—

1. The diagnosis should be made early by examining the exudate or scrapings of the tissues taken from the edge of the sore.

2. For purposes of treatment, it is advisable to recognise different types of the sore, according to the severity of the infection, extent of inflammatory processes, presence or otherwise of secondary sepsis, and the number of sores present on the body.

3. Sepsis and acute inflammation, if any, should be treated first before specific treatment is commenced.

4. In the absence of auto-inoculation, i.e., when sores on the body are not multiple, treatment with berberine sulphate gives the most satisfactory results. Early cases with a single or two small sores on the body yield equally satisfactorily to treatment by applications of carbon dioxide snow.

5. When auto-inoculation accompanied by multiple sores on the body is present, intravenous injection of tartar emetic solution combined with some form of local treatment gives the best results.

THE VALUE OF THE "SERGENTS' METHOD" FOR DETECTING MALARIAL INFECTION IN MOSQUITOES.

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THE usual method adopted for the detection of Plasmodium sporozoites in anophelines has of course been the rather laborious dissection of the salivary glands of the mosquito, an operation looked upon as the acme of finesse, a technique almost necessitating the use of an expensive dissecting microscope, the taking up of considerable time,* and the waste of a proportion of the mosquitoes being examined.

Neither Ross's wonderful discovery that the sporozoites burst their way out of the oöcysts into the hæmocœle, the "body-cavity," of the mosquito, and find their way into the salivary glands, nor the results of the researches by Mayer (1921) and Mühlens (1921) who noted that all the organs of the body except the ovaries, and particularly the musculature of the palps and scutellum, become crammed with the parasites, have been of any practical value until recently.

Lately, however, a method, based on the realisation of the facts and elaborated by Drs. Edmond and Etienne Sergent, has been brought to our notice by Professor Dr. Schüffner while touring India with the Malaria Commission of the League of Nations, and in response to our request Dr. Edmond Sergent has since given us the following information concerning the method.—

"Je vous adresse ci-joint des indications sur notre technique pour la recherche rapide et commode des sporozoites dans le corps des Anophèles.

Dissection des glandes salivaires d'un anophèle. On commence par enlever les pattes et les ailes de l'anophèle; puis, le thorax étant fixé par une épingle, on saisit avec une pince fine la tête du moustique et on l'arrache. On voit deux petites gouttelettes brilliantes à la partie postérieure de la tête arrachée: ce sont les glandes salivaires de l'anophèle; il suffit d'en faire un frottis sur une lame porte-objet, ou l'on recherchera les sporozoïtes. Si les glandes salivaires ne restent pas du côte de la tête, saisi le thorax avec une pince: à la pression, une gouttelette formée de liquide et de tissus thoraciques broyés fait hernie du côté

* One of us has dissected and examined an average of 40 mosquitoes *per diem*.

du cou. Faire un frottis figurant une ligne quelconque (en forme d'S ou de Z, par exemple) pour permettre d'explorer facilement toute la préparation avec l'objectif à immersion, ce que l'on n'obtiendrait pas si le frottis formait une tache."

He also kindly sent us a copy of their "*Vingt-cinq années d'étude et de prophylaxie du paludisme en Algérie*" (1928) in which a figure supplements the recommended technique. This figure is here reproduced (Fig. 1).

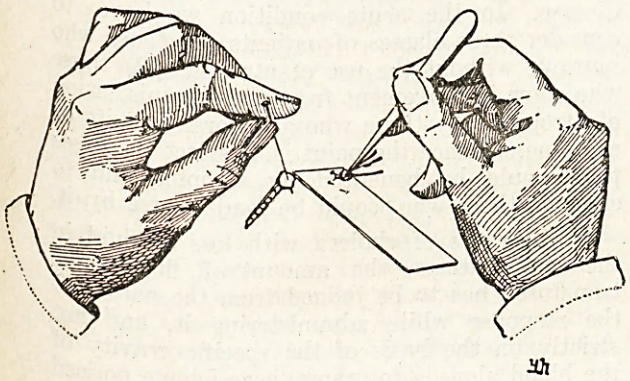


Fig. 1.—(After Sergent and Sergent).

We now give in this paper the results of our tests of the method or rather of the principle underlying it, and we have the honour, in view of the circumstances related above, to name it "the Sergents' method."

In the first instance we have followed literally the technique as advised with but slight modification. After the evulsion of the legs and the wings, the mosquito is placed on a glass slide and the head decapitated by a sharp-edged needle. A blunt needle is then placed across the thorax, and gentle pressure is applied, so that some "body fluid" exudes through the cut end of the neck into a minute drop of normal saline, previously placed upon the slide: the smaller the drop of saline into which the hæmocœlic fluid escapes, the more quickly one finds the sporozoites, for a smaller area has to be searched. A cover-glass is then applied and the preparation examined under a 1/6th inch objective with a No. 8 ocular.

We have confirmed all our findings with the oil immersion objective although this would not be necessary for routine as the sporozoites measure about 14 μ long, and in fresh specimens look either straight, a little curved, sickle or S-shaped, and are feebly motile (Fig. 2).

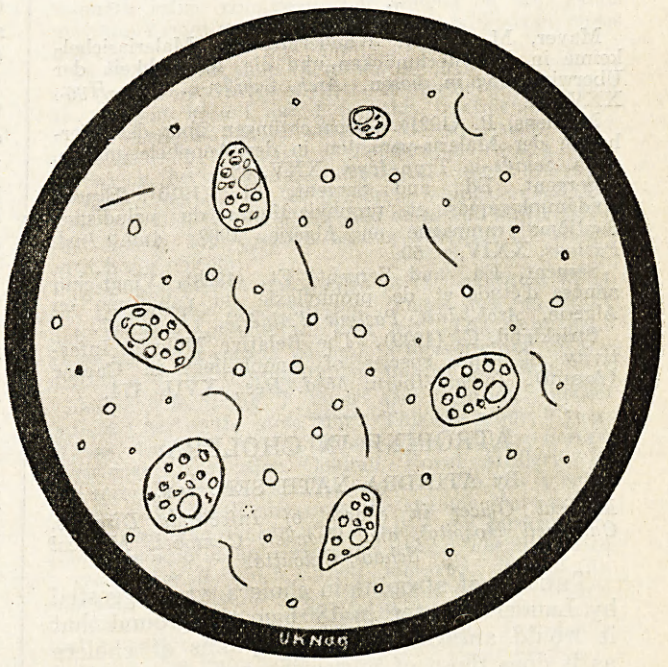
Subsequently we have tried the technique of pulling off the coxæ of the legs and pressing the body-juice out through the rent caused in the body wall. But the former method is the more convenient.

In all our mosquitoes we first of all looked for the sporozoites by the above method, and then, whether we had found them or not, we dissected out the salivary glands, in order to compare this method with the standard method of looking for the parasites. *In no case, when the salivary glands were found infected, had we not already observed the sporozoites in the hæmocœlic fluid.* On the other hand in no case in which we had found the hæmocœlic fluid infected did we find sporozoites absent from the salivary glands.

We used *Anopheles stephensi;* out of a total of 78 fed (on different occasions) on gametocyte-carriers sporozoites were detected in 57, and in 21 they were not found, and as already stated the examination of the salivary glands in no case reversed the finding.

As a control we dissected a dozen mosquitoes bred out from the same batches that we had used for purposes of infection and in no case did we find the sporozoite-like bodies.

The method technically then is 100 per cent. efficacious, and it has moreover many advantages over the standard method. In the first place, the skilful worker at dissection can be dispensed with, one might even say that every stage except the examination of the preparation under the microscope could be carried out by a menial servant, while a laboratory assistant could be taught to look for the parasites under the 1/6th inch objective. Secondly, the technique can be carried out under the naked eye, no expensive dissecting microscope being necessary. Thirdly, the loss of a proportion of the mosquitoes being examined, or rather



× 600.

Fig. 2.—(Eyepiece 6 ×, Objective Oil Imm. 1|12).

the failure to dissect out their glands, is obviated, because if the parasites are in the mosquito they will be found in 100 per cent. of them by the new method. Fourthly, there is the gain of much greater rapidity.

Regarding the last point we have made 24 negative preparations in one hour without the operator having any assistance, the whole technique as described above being carried out by one of ourselves. This is equivalent to the examination of about 200 mosquitoes by one man per diem. This may be compared with the 40 mosquitoes per diem examined by dissection of the salivary glands (*vide supra*). If, however, the more mechanical items of the technique be carried out by assistants sitting beside one, greater efficiency and a diminution of expenditure ought to result.

So much for sporozoite-negative specimens. Positive specimens would lead to even greater rapidity as one can see at a glance if infection be present.

If one appreciates the desirability of examining the sporozoite-rate as a routine measure when investigating the malariology of a locality, the Sergents' method is the most efficacious. Taking for the moment the examination of 100,000 mosquitoes as an advisable number for providing reliable infectivity rates of the species—one of us (C. S.) has already shown that even as few as 10,000 is apparently sufficient to submerge the errors of random sampling—the cost of an establishment for that purpose should be very small in view of our experience of the efficacy of the Sergents' method.

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ATROPINE IN CHOLERA.

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THE use of atropine in cholera was suggested by Lauder Brunton in 1894 on the ground that it would antagonise the symptoms of cholera as it does those of muscarine poisoning. Muscarine is an alkaloid of unknown chemical composition derived from the poisonous mushroom *Amanita muscarina*. In muscarine poisoning there is profuse secretion of saliva and tears, nausea, vomiting, pain in the abdomen, and violent movements of the intestines with profuse watery evacuations. The seat of action of muscarine is the myoneural junction (Cushny).

The action of atropine is just the reverse as it is found to paralyse the myoneural connections. The involuntary unstriped muscle fibres of the stomach, intestines, etc., but not those of the arterial walls are affected in this paralysis.

Sir Leonard Rogers was the first to try atropine in cholera and he recommended its routine use from the earliest stages of the disease. In the acute condition we have to consider three classes of patients (1) those who improve without the use of atropine, (2) those who show improvement from the administration of atropine, (3) those who get worse in spite of atropine. Hence the point is to select the cases that would be benefited by atropine and to expunge those who would be made worse by it.

In all cases of cholera with loss of fluid in the acute stages the amount of fluid to be transfused has to be judged from the nature of the response while administering it, and not strictly on the basis of the specific gravity of the blood alone. In many cases I have noticed an entire absence of response after transfusion of fluids. I mean, the pulse did not become perceptible or, if it did, it was very feeble, dwindling to nothing in less than an hour. The transfusion did not maintain the blood pressure owing to loss of tone in the peripheral arterioles—very rarely to cardiac asthenia. If the loss of tone in the musculature of the peripheral arterioles is alone the cause, then in my experience the administration of adrenalin chloride fails to improve the pulse. It seemed to me that the function of the nervous mechanism was disordered. I have found that these patients often develop tympanitis, slight or great, from the acute stage of collapse, or within 2 or 3 hours after transfusion. The movements of the intestines cannot be seen at all and the intestines appear in the extreme cases as if they were paralysed. If there was tympanitis in the acute stage before transfusion, a complication usually augmented by the transfusion, or if there was a tendency to tympanitis as a result of transfusion, I invariably found that the tympanitis was doubly enhanced if atropine were given, the patient very often going downhill rapidly. With the management in these cases I hope to deal in a subsequent paper.

Again, with improved circulation after transfusion and probably from greater absorption of toxins from the bowels, the temperature invariably rises. It is a known fact that atropine does cause a rise of temperature and in the susceptibles in cholera cases, I noticed that a small dose of even 1/100 grain was enough to cause a definite rise. Moreover there are cases, whether with or without loss of fluid, who show a high rise of temperature with a tendency