DISEASE IN MACEDONIA.

By ROBERT A. FLEMING, M.D., Major, R.A.M.C.(T.).

I have been asked to write a short account of the medical diseases which we met with in Macedonia.

After an experience of eighteen months in Salonika one learns an enormous amount about the tropical diseases peculiar to that region, and, what is more important, the best methods of keeping oneself and others in a state of health.

I purpose, referring to the more important diseases met with and to offer the conclusions which experience taught us.

DYSENTERY.

We saw comparatively few cases of amœbic, and many cases of bacillary, dysentery. While there were undoubtedly endemic cases of amœbic dysentery, the bulk of our amœbic patients appear to have contracted the infection in Gallipoli or Egypt.

The Army term "dysentery" is a very wide one. It means the presence of blood and mucus in the patient’s stools, and obviously only a small proportion of such cases are due to any of the recognised organisms of bacillary dysentery.

The following statistics, covering 1000 cases, may be of interest. Almost all of these were examined in the hospital laboratory during the months of November and December 1917. In November 8.2 per cent. were due to the Shiga organism, 10.4 per cent. were due to the Flexner organism, while 42 per cent. were marked as “Clinical Dysentery.” In December 1917 6.9 per cent. were due to the Shiga organism, 11.3 per cent. to the Flexner, and 0.8 per cent. were due to one or other Morgan organism, while 44.7 per cent. were described as “Clinical.” The balance of these percentages during November, amounting to 38.8 per cent., and in December 33.2 per cent., were simply cases of “diarrhoea” in which no blood and mucus were found. It is certainly true that the Shiga cases vary somewhat with the time of year, but the whole of our experience during 1916 and 1917 shows that there were invariably a larger number of cases of Flexner than Shiga. It was also the rule that Shiga cases were more severe than Flexner, and this was borne out by the deaths we had from the 11th November 1917 to the last day of December of the same year. Four were due to Shiga, two were due to Flexner, and one to a combination of the two organisms, while two were
the result of "clinical dysentery," one was a death from miliary tuberculosis and another from chronic interstitial nephritis; one death only was the result of amoebic dysentery.

In amœbic dysentery the chief site of pain is in the right iliac region, undoubtedly because the cæcum and ascending colon are chiefly affected, while in bacillary dysentery the descending colon and the splenic and hepatic flexures are the usual parts of the large intestine which are involved. Sometimes a small part of the ileum is affected in bacillary dysentery, but this is rare.

I do not propose to discuss amœbic dysentery, because we had so few cases, although I may refer later to the treatment we adopted in these cases.

In bacillary dysentery the worst cases were either those in which long-standing and severe ulceration had occurred, or cases complicated by malaria.

It is only necessary to see one post-mortem of a severe case of chronic dysentery to realise how absolutely hopeless complete recovery must be. The bowel is enormously thickened, especially in the region of the descending colon and right down in the rectum, while the flexures also suffer. One felt that if such a case had been treated vigorously enough at an earlier period this hopeless chronic stage, with its risks of perforation, generally causing hæmorrhage and not peritonitis, would never have occurred. In any case where dysentery is fairly protracted the experience of a few post-mortems help one to appreciate the long-standing ill health which must inevitably follow as a result of the disease.

It was a really serious complication in any form of dysentery to have a superadded attack of malaria, and any attempt at treatment of the dysentery was without avail until a sufficient amount of quinine had been administered by muscle or vein to arrest the malaria. Even a "clinical dysentery" was rendered much more severe as regards dysenteric phenomena if malaria supervened. The malarial attack appeared to increase the diarrhœa, to render more pronounced the typical dehydration so constantly seen in cases of severe chronic dysentery, and to add greatly to the risk of hæmorrhage. One does not, as a rule, see a high temperature in dysentery, and it is therefore easy to recognise a malarial rigor, and a blood examination should be made without delay. The reader is directed to the remarks under the head of "Malaria" on the importance of repeated blood examinations in cases of the subtertian type and the significance of a differential leucocyte
count. It is absolutely futile to give quinine by the mouth where even trivial diarrhoea is present, and we usually found that either intramuscular or intravenous injections in doses of 10 to 20 grs. proved most efficacious.

In the examination of patients' stools for dysentery, whether amœbic or bacillary, it is most important to supply the bacteriologist with a fresh stool. In cold weather a stool which has been frozen or has not been kept at a reasonably warm temperature after being passed is useless for examination, and an arrangement with the bacteriologist to receive specimens at almost any time during the working day greatly aided a rapid diagnosis. Where a tented hospital is in use it is well to have some temporary arrangement for keeping the stools passed by patients at a suitable temperature if they cannot be examined immediately.

Perhaps there is nothing more difficult than to distinguish between amœba coli and amœba histolytica, but sooner or later cysts will be passed by the patient and a diagnosis can then be readily made. The part of the stool of greatest value in any kind of dysentery is the mucus, generally stained with blood, which the patient passes, and in examining dysentery carriers a preliminary dose of castor oil often aids in clearing up the case by producing a liquid stool with mucus.

Probably the best guide to the physician in deciding whether a dysentery patient is doing well or not is the examination of the pulse. When there is little diarrhoea, and possibly no temperature at all, a jerky pulse always spells danger, and we found that the actual number of stools could not be taken as a satisfactory indication of improvement or otherwise, because many dysenteric stools simply consist of a tablespoonful of blood-stained mucus. It is, however, a good sign when the stools become tinged with faecal matter, even if mucus still persists in considerable amount, and it is extraordinary how, with sodium sulphate, a stool rapidly becomes faecal.

There is no question of the great value of the sodium or magnesium sulphate method of treatment, either giving 1 drm. an hour for six or eight hours, or 1 drm. every two hours until six or eight doses have been administered. The appalling tenesmus is speedily relieved, although for the time being the stools increase in number. Towards night the patient was given a hypodermic of heroin, which procured sleep and arrested the diarrhoea.

In all severe cases we used antidysenteric serum, generally given subcutaneously in doses of 20 c.c. but sometimes
administered by the vein. When the patient proved responsive to the sodium sulphate treatment, and where there was no excessive pain, we did not in every case risk anaphylaxis; but there is no doubt that if serum is to be given at all, it should be given at once, and in a very bad case it is well worth the risk. After three or four days the serum treatment should be stopped.

We found the diet of the patient all-important, beef-tea with absolutely no milk being the principal item; but the kind of clear soup may be varied, chicken or rabbit being equally good, and as soon as possible meat or chicken jelly may be added. Several of our medical officers gave many different jellies, etc., at intervals of one to two hours. In some cases this meant an increased tax on the nursing staff and certainly on the quartermaster's department without, perhaps, any very great necessity, but in a really bad case there was no question of the benefit.

All our patients were given large quantities of barley water or rice water to drink, and, in fact, to counteract the dreaded dehydration no reasonable limit should be placed on the amount of fluid which the patient may drink. Where malaria is present, sickness and vomiting are very frequent, and in such cases champagne, generally iced, proved of special value.

Lavage of the bowel was a method of treatment to which in our experience we could not give unqualified praise. When one remembers that, although in bacillary dysentery the descending colon and rectum suffer chiefly, the hepatic flexure and the ascending colon may also be affected, it is easy to understand the limitations of lavage— with a funnel and soft oesophageal tube it is difficult to ensure that the solutions ever reach beyond a small part of the descending colon. Some of us who had considerable experience in the treatment of dysentery gave up lavage almost entirely, and, to my mind, it should only be used where it at once proves of benefit and causes no pain. Where it produces great distress it should be stopped.

The initial abdominal pain, so distressing to the patient, is best relieved by the application of heat.

It should never be forgotten that a case of dysentery which seems to be cured may yet mean the presence of ulcers from which haemorrhage may occur, and a haemorrhage rapidly proving fatal. One is wise, therefore, in travelling up the dietetic ladder, to do so slowly, and, once out of hospital, to give the patient very light work until he has completely recovered.

The treatment of amoebic dysentery is essentially the use of
emetine hydrochloride, which was given in courses lasting for ten to twelve days, 1 gr. being administered intramuscularly, in one or divided into two doses, per day. It is most essential during these periods of administration to remember the effect of emetine on the heart, and we gave, in the majority of cases, 5 to 10 minims of tincture of digitalis thrice daily during each course. The courses have to be repeated sometimes twice, occasionally oftener, depending on the result of bacteriological examination.

The dietetic and other treatment is practically the same as for bacillary dysentery.

We had several discussions with our surgical colleagues as to the propriety in both types of dysentery, amoebic and bacillary, of having appendicostomy performed and the bowel washed out with a suitable antiseptic, such as permanganate of potash, but, as a general rule, surgical opinion appeared to be against such procedure.

I have made no reference to flagellate or other forms of dysentery than amoebic or bacillary. We had several cases in which lamblia were found as the apparent cause of the diarrhoea. In one of these cases lamblia cysts persisted for a long time, the patient apparently doing well, as far as the control of the diarrhoea was concerned, unless there was some indiscretion in diet. On one occasion this patient ate about half a pound of chocolate almonds, and on another, through some inadvertence, he secured and ate a four-course dinner intended for another patient and totally unsuitable for him. On both occasions a severe relapse of diarrhoea occurred, but the remarkable fact was that, although by means of suitable diet, lavage, and occasional doses of thymol internally, his diarrhoea ceased and his motions became formed, lamblia cysts were found right up to the end of his stay in hospital, which was over six weeks.

The prophylaxis of dysentery is essentially the destruction of flies, the disinfection of the water supply, and the elimination of dysentery carriers from a military camp. It was found to be equally essential to protect all food from flies during the warmer weather, and to prevent flies from becoming infective by protecting and destroying the stools of patients suffering from dysentery.

Fly destruction provided an interesting and useful occupation for the convalescent soldier, while those confined to bed watched with interest the various fly traps which we possessed, one of the best types being a Japanese invention that went by clockwork.

Among our experiences in Salonika was the discovery that in one of the kitchens of the hospital there was working a dysentery
carrier. There is an unfortunate rule in the Army that a soldier who is unfit for any other work is at least fit to be a kitchen assistant, and to this pernicious idea it is probable that not a few cases of dysentery may be traced during war time. Our watchful medical superiors gave strict orders that no man who had suffered from dysentery of any kind should be allowed to work in connection with the patients' food, either in the kitchen or in the quartermaster's department.

There was, further, a great risk of infection in dysentery wards, because a patient suffering from one kind of dysentery was naturally susceptible to another, and the greatest care was taken not merely to attempt to segregate cases of the different types of dysentery, but also to inculcate careful washing of the patients' hands after stool, and the cleansing of bed-pans with a 5 per cent. cresol solution.

**Malaria.**

In Salonika we saw the most malignant forms of malaria which appear to exist anywhere, and these were invariably subtertian in type.

An attack of benign tertian malaria has the advantage of being readily cured, but relapses occur for a long time afterwards, and it is difficult to know just when a patient is finally and completely cured, because exposure to cold and wet, excessive fatigue, and especially fatigue during great heat, may bring on such relapses months, or even years, afterwards. In subtertian malaria the trouble is that the attack persists for an indefinite time, often causing great anæmia and debility, but, once really cured, the risk of relapse is over. The difficulty in this type is to say when the termination of such a subtertian case had actually been reached. In the benign tertian type between the attacks the patient is generally perfectly well.

We always dreaded cases of subtertian malaria in which the spleen remained much enlarged and tender. In them mere absence of temperature did not imply the termination of the disease, and some of our worst cases of subtertian malaria with head symptoms had extraordinarily little pyrexia.

Just as in our experience of typhoid and paratyphoid fever, we looked in vain for the typical text-book temperature which, in our cases of subtertian malaria, should have been "recurrent."

It is generally easy to find the parasite of benign tertian malaria, because either rings, sporulating or sexually mature forms, are found in the peripheral circulation, but it is a different
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matter with cases even of severe subtertian malaria, and often many examinations had to be made in well-marked instances of the disease before the parasites were recognised. Apparently, although in very large numbers in the circulation, they may be limited to the internal organs, and particularly to the spleen and bone-marrow. In more than one fatal case the brain capillaries were packed with parasites, although the usual blood examination conveyed no conception of their enormous numbers.

We found the greatest assistance in all cases of malaria from the examination of the blood. A leucopenia, with a relative increase of mononuclear leucocytes, is typical of malaria, and the tender, if not enlarged, spleen is also a helpful clinical feature.

It seems hardly necessary to describe the malarial attack, with its typical rigor during the cold stage, the characteristics of the hot stage and the sweating stage, or to refer to the constant headache, the frequent sickness with vomiting, or a feature commonly noted, namely, frequency of micturition. There was, however, in not a few of our cases, a remarkable herpes, certainly best marked on the lips, as in pneumonia, but peculiar, inasmuch as isolated herpetic spots were frequently found dotted over the face, and were responsible, in a small percentage of cases, for corneal ulcers which proved extremely intractable to treatment.

I have not attempted to describe the many forms of subtertian malaria which may be met with in Macedonia, but it may be interesting to refer briefly to two special results or types of such malaria.

Pathologically, there is no question that cerebral malaria of comatose type is due to an enormous number of parasites blocking the cerebral arteries, but there is evidently some connection between cerebral malaria and the exposure of the infected patient to a long railway journey or a drive in a stuffy ambulance car during intense heat, and every effort was made to treat severe cases of malaria as near the Front as possible, and with satisfactory result in the way of limiting the number and severity of cerebral cases. It is a curious fact that men over 35, and specially men who had passed middle life, were more apt to die from cerebral malaria than younger men, and possibly one might assert that a subtertian malaria was more apt to become cerebral in type in the older man. We found, on the other hand, that dysentery was apt to be much more severe in younger patients, and the majority of our fatal cases occurred in soldiers under 25.

It was, in the second place, remarkable how many cases of
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insanity in the Salonika army were due to malaria, always of subtertian type, and practically always eventually resulting in complete cure. In these cases the effect of intramuscular quinine was most striking, and the mental symptoms cleared up in a marvellous way.

We had relatively very few cases of quartan malaria, but some of these were of very severe type, and several were associated with marked jaundice.

Captain Logan, our bacteriologist at Salonika, made some researches into the question of the cause of diarrhoea in malarial patients. He proved that the majority of cases were really dysenteric, and similar work was done by other bacteriologists in the area of our Army. The point was of very great importance, because it enabled us to segregate dysenteric malarial patients and to prevent the spread of dysentery, and it also gave us an indication for the suitable treatment of such patients.

The Army order for the treatment of malaria with quinine was a week or ten days with 30 grs. daily in three doses, for the next week 20 grs. daily in two doses, and for the third week 10 grs. a day, and then, until a period of 3 ½ months had elapsed from the date of the last attack, 30 grs. a week at least. This was, of course, oral administration and was intended to be given in solution. Iron and arsenic were ordered during the period of convalescence after a severe attack of malaria. Our Italian colleagues gave red wine freely as a tonic and considered it very beneficial.

We always preferred to give intramuscular quinine into the gluteal muscles, about 2 ins. or thereby below the iliac crest, and 10 to 20 grs. of quinine bihydrochloride were thus administered once or twice a day.

In some hospitals intravenous quinine was the stock treatment, using the same salt diluted with normal saline solution, and was preferred to the intramuscular method. Concentrated quinine solution has a distinct effect on the heart and should not be used without due care.

For the comatose cases, intensive intramuscular and intravenous treatment was often the only method likely to save life, and up to 80 or 100 grs. in twenty-four hours were given in doses of 20 grs. at a time.

The preventive treatment for malaria exercised us not a little, and at a discussion on the subject held under the auspices of the Salonika Medical Association, at which the writer had the honour of making an introductory statement, there were several
absolutely diametrically opposed opinions expressed with regard to the methods which should be adopted.

There were those who pled for a quinine parade for all troops exposed to infection, the dosage being 5 or 6 grs. a day, or 10 grs. twice a week, while others of much experience expressed themselves strongly with regard to the futility of such a measure. The impression left on one's mind was that quinine did not act so well if the soldier was even partially saturated with it, and that it rendered treatment, when the disease did occur, much more difficult.

An antimalarial mixture, the constituents of which were not communicated to the soldiers, was administered to certain units with the idea of finding out whether it helped as a preventive measure, either for a first infection or recurrent attacks, but when the writer left Salonika no statement had been made as to the benefit obtained. It was an open secret that quinine formed the staple ingredient of this secret remedy.

Needless to say, every one favoured all available methods for destroying the mosquito breeding-grounds, and the use of mosquito repellants, gloves, veils, mosquito nets, etc. Theoretically, a full dose of quinine ought to kill the young parasites and so prevent lodgment in spleen or bone-marrow, but it is hard to believe that cases in which quinine failed to protect patients could be explained by the soldier in question failing to swallow the quinine ordered. Another argument against the quinine parade is, of course, the enormous consumption and possible waste of the drug which the parade necessitates, and if it is really wasted it renders efficient treatment of the malarial patients difficult, should there be any limitation to the amount of quinine available.

It is difficult to give statistics with regard to quinine amblyopia. Considering the enormous quantities of quinine used in Macedonia, and the large doses administered, it seems almost incredible that at one of the largest eye centres for the Salonika army one saw so few cases of blindness due to quinine. It is a fair assumption that, just as in alcoholic neuritis there is some other agent than alcohol responsible for the condition, so in quinine amblyopia there must be another factor at work, although, of course, special susceptibility to the drug may explain the extremely small number of men who were afflicted.

One interesting prophylactic measure in cases of malaria was the prevention of uninfected anopheline mosquitoes from getting access to the malarial soldiers and so spreading the disease to
others. Our orders were to segregate all malarial patients in certain wards and to have the patients in bed and under the mosquito net at sundown. The joy of the cool evening, to which everyone looked forward, rendered this order a most unpopular one, and an evening visit to malarial wards usually caused an unseemly scurry to cover!

**Sand-Fly Fever.**

One of the very common, though less serious, fevers which we had to treat was sand fly-fever. It came on in summer and during the hottest weather.

The sand-fly or the phlebotomus papatasii is a minute mosquito-like insect with a very hairy body, and about the size of a midge. It had a curious spring resembling a flea, and which can be well studied when one is writing or reading under a lamp in the open air, as the fly often settles on the paper. The blood-sucker is the female, and the parasite of the fever is an ultra-microscopic organism not yet isolated. The sand-fly breeds in any old ruin or wooden shed where there is a certain amount of moisture, and the difficulty is to induce those who are exposed, to sleep under mosquito netting fine enough to keep out the fly; the ordinary mosquito repellant will keep off the attack on face and hands, but the ankles require protection by mosquito boots.

The fever has a sudden onset, sometimes with a rigor, and lasts for only three days, the temperature falling the third day to normal. Hence the term "three-day fever" often applied to it. The chief characteristics of the attack are the "mad dog eyes," pain in the eyeballs and head, frequent sickness often leading to vomiting, and a feeling of languor more correctly described as a sequel. There is generally a leucopenia.

The great remedy is certainly opium, and 10 grs. of Dover's powder with 10 grs. of aspirin form an admirable combination for the relief of the condition.

**Enteric Group.**

We had a number of cases of typhoid and quite a number of paratyphoid "A" and "B." As practically all our soldiers had been inoculated with T.A.B. within the preceding one or two years, the Widal reaction proved almost useless. By far the best method was to obtain a blood culture, but this demands promptitude, because a blood culture, to prove successful, must be taken with a temperature of at least 102° F. and within ten days of the
onset of the fever. We noticed the rash in cases of paratyphoid as a rule was much more diffuse and the spots much larger than in true typhoid.

Many cases of the enteric group were remarkable for their very atypical temperature charts. The "staircase" temperature, with which one is familiar at home, was rarely seen in Macedonia, but the most useful diagnostic points were, in the first place, the slow pulse, in the second, the enlarged and tender spleen, and lastly, the rash towards the end of the first week which was almost always present.

Our chief difficulty was the dietetic one, because milk was almost unobtainable except in the form of tinned milk, and the patients had to be fed on beef-tea, chicken-tea, rabbit-tea, jellies, and similar foods. One learned in the treatment of all our patients to get on without a milk diet, except in cases of Bright's disease, and certainly the results proved that the milk diet so commonly used for a fever patient at home could be perfectly satisfactorily superseded by beef-tea diet.

Among other diseases which we met with in small numbers were dengue, relapsing fever, epidemic cerebro-spinal meningitis, smallpox, and the ordinary infective fevers which one sees at home. We had the usual periods of influenza, and plenty of "myalgia" and disordered action of the heart. Of all troubles to the M. O. "myalgia" is one of the worst. It is a favourite means of going sick. There is no outward evidence of a muscular pain. Many patients, fed up with their particular work, find their way into hospitals at home and abroad suffering from this abominable "disease." That there are genuine cases goes without saying. Perhaps one of the best methods of treating either a genuine case which has resisted other measures or a case which is believed to be imaginary is to adopt a plan stated to have been devised by the Chinese. It consists in introducing acupuncture or any sterile needles into the specially painful muscles. The pain produced by the treatment frequently has a marvellous effect in abolishing "myalgia," and certainly genuine cases not infrequently benefit when all other methods have failed.

While I am alone responsible for this paper I have to acknowledge much assistance in acquiring the data referred to in it. Captain Fowler, Captain Carruthers, Major Mathewson, Major Carmichael, and Captain Logan are a few of my colleagues to whom I am indebted.