play an important part in the process of healing it is important to discover at this stage what compound will secure the best progress.*

Prevention of Sepsis.

Special attention is directed to two further points—first, the possibility of preventing sepsis by the use of flavine compounds in early wounds at a period before the evidence of infection has developed. It may be doubted whether it is advisable to practise immediate suture of war wounds in the fashion which has been so successful in civil practice after thorough surgical cleansing and pouring in as much acriflavine 1:1,000 as the tissues will contain; possibly an interval of some days should be allowed before suturing, and if success follows this procedure the time may be shortened. It may be noted here that there is every indication that proflavine will be at least as harmless to the tissues as acriflavine when injected subcutaneously and between muscle planes.† Secondly, attention is directed to the promising results which have attended the use of flavine compounds with the purpose of preventing recrudescence of acute septic manifestations when operating in an area already infected, for example, in secondary amputations.

The Importance of Preliminary Operative Procedure.

It must be emphasized again that the usual surgical procedures are an essential preliminary to the use of flavine or brilliant green, in order that these antiseptics may be enabled to act effectively. As we have stated in our previous communication in connexion with the necessity for procedures which shall combat or prevent septic infection, "there is a great measure of agreement that the removal of dead tissue and the conversion of the wounded area into a free surface by incision and excision are essential factors"; and, again, in relation to the prophylactic application of flavine, "of course such treatment is to be used in addition to operative procedures." No quantity of flavine bodies, nor of any other feasible antiseptic so far available, seems likely to prove efficacious when there is failure to remove considerable portions of necrotic tissue or foreign bodies. Intimate contact of the antiseptic with the infected tissue must be secured.‡ The fact should not be overlooked that in our first publication we expressly emphasized such considerations. On the other hand, it would require the greatest optimist to assert that operative procedures in themselves achieve all that could be desired in the treatment of infected wounds. Thus, there is little doubt that the appropriate employment of efficient therapeutic antiseptics, combined with operative measures, can effect an almost incalculable saving; such benefit will be especially evident if the antiseptics may be applied simply and quickly.

It has been the purpose of our work thus far to examine certain little-known antiseptics, like brilliant green, or substances like the flavine bodies, whose almost unique characters as potent bactericides do not seem even to have been suspected. Laboratory tests as well as clinical trials have demonstrated, *inter alia*, that these compounds are devoid of harmful side-actions which might prejudice their use. Accordingly, we venture to urge most strongly their employment on an extensive scale, as we believe that their outstanding properties can be utilized practically to great advantage, and will lead to general recognition of the fact that they constitute a notable addition to the treatment of infected wounds and other accessible localized infective lesions. Work is in progress with a view to the development of substances suited for special uses, and it is hoped that further advance may be effected if those interested in special clinical aspects will formulate the requirements which they desiderate in substances to be employed for their particular purposes.

SUMMARY.

1. Flavine compounds and brilliant green are antiseptics which exert a slowly progressive bactericidal action.

* In certain cases the prolonged application of flavine dressings to the skin has caused the appearance of a vesicular eruption, which has rapidly disappeared on interrupting the treatment.

† The absorption of flavine compounds is followed by an appearance of green fluorescence in the urine, but no toxic action has been found to result therefrom. Observations on intravenous injection will be recorded elsewhere.

‡ Several clinical observers have applied flavine compounds incorporated in a paste with a view to securing "dépôt" action (see Bond, BRITISH MEDICAL JOURNAL, July 7th, 1917).

Concentrations of these substances which at first inhibit and finally kill bacteria, are without harmful effect on phagocytosis or on the tissues locally or generally; hence they are specially suited for therapeutic purposes in infected wounds. Flavine compounds may be applied to the peritoneum with safety.

2. Flavine compounds (acriflavine and proflavine) are enhanced in their bactericidal potency by the presence of serum; brilliant green, in common with most other antiseptics, is reduced in its activity by serum.

3. The most suitable method of application of an antiseptic for therapeutic purposes must depend very greatly on its behaviour in the presence of serum. When the antiseptic is inactivated by serum, frequent renewal of the watery solution is indicated as in Carrel's procedure; this, of course, is only permissible provided that the substance is not in itself toxic.

4. Brilliant green satisfies the requirements for application by repeated irrigation, as a powerfully bactericidal solution (1:2,000) in water is practically innocuous to the tissues. On the other hand, since flavine compounds are most bactericidal in serum, the indication is to arrange the wound dressing so that these antiseptics may act in a serum medium; also, since these bodies are not rapidly thrown out of action by serum accumulative deposit should be prevented by avoiding too frequent additions of considerable quantities of the antiseptic solution. Clinical experiences have substantiated these conclusions, and the evidence at disposal points to the application of flavine bodies by means of gauze packing or some appropriate modification of this procedure as likely to yield the best results. Thus there is evidence that, by taking full advantage of the properties of flavine bodies, a relatively simple technique may be followed.

5. The application of the flavine compounds especially for the purpose of preventing the onset of septic manifestations in early wounds is emphasized; also their use for preventing exacerbations after operating in areas already infected.

6. Operative measures are an essential preliminary to the effective use of therapeutic antiseptics in wounds, since the antiseptic can act only when brought into intimate contact with the infected tissues.

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MEDICAL AND SURGICAL NOTES FROM MESOPOTAMIA.

BY

G. GREY TURNER, MAJOR R.A.M.C.(T.).

PART II.*

HEAT-STROKE.

THE cases coming under the heading "Effects of Heat," though interesting, were depressing and disappointing, for so very often treatment was unavailing. I shall not soon forget the streams of patients in June and July who were hurried to the bath-house, nor the occasion when nearly a dozen stertorous patients lay in the open air along the side of the creek, many of whom went to make up the sixteen funerals that left our hospital the next day. These men were not weaklings, but often big strong fellows who might be expected to be the last to go under. Nearly every case illustrated the importance of prophylaxis and of early treatment, and those that developed in hospital often recovered as the result of prompt measures to reduce the temperature. But the heat regulating centres are so much deranged that relapses are common, and there can be no

* Part I was published on July 14th, page 33.

doubt that anybody who has suffered from a severe attack should be sent out of the country. *Post-mortem* examination in these cases was disappointing, the appearances were not uniform or characteristic and there was much less cerebral or meningeal mischief (to the naked eye) than we expected. The congestion of the internal viscera which we always found was, I am sure, only a consequence of the slow process of dying from coma. There is a great deal of work to be done on these cases, and until their minute pathology and chemico-pathology is better understood the methods of treatment must be empirical and haphazard. Prophylaxis is the most important thing, and the responsibility for the transport and care of troops coming fresh to a moist hot climate like Basra in May, June, and July, must always be great. Every detail must be attended to, and the soldiers must be tended like ignorant children, and no point is too small or trivial to be neglected.

As a result of conversations with men who had suffered from the effects of heat in its various forms, I am satisfied that those who tolerate heat badly at home should not be sent to this climate. New troops, and especially their officers, coming to tropical countries should be educated as to the precautions necessary. New-comers revel in the sun and suffer; they should be taught that the sun is an enemy to be avoided, that the head and back of the neck should be covered, and that advantage should be taken of every little bit of shade. But it takes some time before one instinctively walks at a funereal pace and seeks the most trivial of shades. Men should never leave camp without their water-bottles, and every care should be taken to avoid exhaustion.

JAUNDICE.

In May and June many men suffered from jaundice, and one medical officer in charge of 62 beds had as many as 25 cases under his care at one time. I doubt if this jaundice was really of the epidemic type, and we all thought that at least some of the cases were malarial in origin. Many different factors were probably at work, but in the absence of adequate laboratory facilities at that time we were unable to examine them by blood culture, etc. Two cases died, and at the *post-mortem* examination I found all the appearances which we associate with delayed chloroform poisoning, and which must have been the result of some profound toxæmia. In another case, a coloured subject, my colleague, Lieutenant F. G. Thomson, found catarrhal pancreatitis, but in that instance the symptoms were largely abdominal pain and distress.

Being interested in the question of infection of the gall bladder, I examined many of the cases with this in view. In several the liver was enlarged and tender, and in a smaller proportion the tenderness was limited to the region of the gall bladder, but there was no case of cholecystitis requiring operation, though, as will be mentioned later, I had several of the latter following enteric group infections.

DYSENTERY.

The dysenteries formed a large proportion of the medical cases admitted. The bacillary varieties were the more common, but the amoebic variety occurred also, and for them emetine is almost specific; indeed, if it fails, it suggests either a mixed infection or that the diagnosis must be revised. I had an admirable illustration of its value in the case of a patient who was admitted to hospital for the closure of an appendicostomy, which I did by removing the remains of the appendix. This man told me that he developed dysentery in India and in this state went on leave to England, where he was medically treated for some weeks without benefit. He then consulted a surgeon, who arranged a series of treatments by ionization. After eight applications he was no better, and was taken into a nursing home, where appendicostomy was performed. He remained in the home for a month, living only on light diet, and having daily irrigations of the bowel. While following this regimen he was very well and had no symptoms of dysentery, but as soon as he went out and began to take ordinary food and exercise all his troubles returned, and he passed large quantities of blood and mucus. He then went to a practitioner with a large experience of tropical medicine, who prescribed emetine. At the end of a month he was perfectly well and had never had any recurrence in spite of hard campaigning both in France and Mesopotamia. In the bacillary variety the effect of the antidyenteric serum

is often very remarkable, but if it is going to be successful it produces its good effects promptly. Many of the cases that reached us were too far advanced for treatment by this means, and in October we had quite an epidemic of fatal cases. In a few patients I tried appendicostomy without success, but one very severe case made an excellent recovery as the result of caecostomy. This operation combines all the advantages of appendicostomy without any of the disadvantages and disappointments, and if the patient recovers the subsequent operation for closure is a small matter in comparison with the benefit derived.

Liver Abscess.

The classical complication of liver abscess is far from common considering the large amount of dysentery, but I saw over a dozen cases. Three were discovered in the *post-mortem* room, and in all of these the final cause of death was rupture of the abscess into the peritoneal cavity. Others were merely suspected and cleared up under treatment by emetine; seven cases required operation for drainage. In all the interesting feature was the absence of any history or symptoms of well-developed dysentery, and in at least two there was no history of bowel trouble whatever.

The classical descriptions must have been founded on old-standing cases, for as a rule most of the symptoms described are absent. Pyrexia with slight local pain and tenderness on pressure over the right hypochondrium with slight enlargement of the liver upwards have been the suggestive symptoms, the diagnosis being confirmed by the elevation and immobility of the right wing of the diaphragm as demonstrated by x-ray examination and made absolute with the exploring needle. All my cases were treated by open incision and drainage through a lower intercostal space, the diaphragm being stitched to the parietes before being incised. In the one case that died after operation there were multiple abscesses in the liver, with empyema and pericarditis. The amoeba was never found in the pus evacuated at the time of operation, but was usually demonstrated about the fourth day. A course of emetine (one grain daily for a week) was always given after operation. In no class of case was the co-operation of physician and surgeon more helpful, and in nearly all my patients I was indebted to my medical colleague Lieutenant F. G. Thomson for valuable help in diagnosis.

Other Surgical Complications.

Other surgical complications of dysentery were perforation of the colon and acute peritonitis without perforation. In one of the cases of the former complication an inflammatory mass formed in the right iliac region simulating an appendix abscess. There was a large slough in the caecal wall with localized peritonitis, and though the appendix contained a dysenteric ulcer it was not the cause of the symptoms. I also saw cases of local thickening of the pelvic colon following dysentery, and on two occasions the condition very closely simulated a new growth in the bowel. Several of the chronic cases developed symptoms suggestive of appendicitis, and I was once or twice led to operate only to find a normal appendix. These patients may have definite attacks of abdominal pain, but the history and the diffuse tenderness over the caecum and ascending colon, and often over the sigmoid as well, enabled a diagnosis to be made.

BERI-BERI.

We had one or two cases of "beri-beri," and any number of men suffering from so-called "debility." These were to me a most interesting group, for, as I have already said, I am sure the debility of active service is some type of nutritional disease probably allied both to scurvy and beri-beri.

"P.U.O."

A diagnosis of "P.U.O." (pyrexia of uncertain origin) used to be very frequently made, but it became less and less so as the facilities for laboratory investigation increased, a large number of the cases turning out to be enteric group infections.

PAROTITIS.

When I first arrived at Amara in July I was astonished at the large number of cases of parotitis under treatment in the wards; I have certainly seen many more than I

have previously met with in the whole of my experience. I have notes of twenty-three of these cases, but many occurred when I was occupied with administrative duties and was not able to find the time to record them. The type is quite different from what one is accustomed to see at home, for they nearly all suppurate early, and form abscesses which discharge abundantly. In one patient there was enormous destruction of the tissues overlying the parotid, giving an appearance very like cancerous oris. Many of the earlier cases proved fatal, but I believe the primary disease was the real cause of death. At first I was inclined to think that the infection might be specific, but though Captain Stevenson, I.M.S., kindly examined several specimens of the pus for me he only found a coccal infection. Probably the organisms gain access to the gland along the duct, and the only common factors were that the patients had almost without exception been under treatment for some disease requiring milk diet, and that no special attention had been paid to the hygiene of the mouth. They nearly all came from field ambulances where there were no nurses, and just at a time (July and August) when the vitality of every one was at its lowest ebb, and the personnel of those units was taxed to the utmost. But even with scrupulous attention to the mouth this complication did arise among patients under treatment in our own hospital, but with, I think, two exceptions it was only in cases in the later stages of exhaustion from typhoid or dysentery.

When the cases came under my observation the proof of infection of the duct was usually evident, but whether *post* or *propter* I am unable to say. The papilla was reddened, and quite often pus could be squeezed from it, and sometimes in abundance. At a later stage the normal flow of saliva was absent, only a little thick glairy mucus being obtained on pressure. The destruction of the gland was very widespread, and it would be interesting to know what the ultimate effect on the salivary function will be. The abscesses often burst spontaneously into the external auditory meatus, or pointed near the angle of the jaw. In some of the slighter cases the question of mumps cropped up, but there has really been nothing to support the suggestion, for the swelling is usually unilateral, and nearly all suppurated; there has never been orchitis, and the condition has never spread among the other patients in the ward. As showing the care necessary in opening these abscesses, and the importance of employing Hilton's method, I may refer to a case which had previously been operated upon, and which was admitted to our hospital with complete facial paralysis. As he said, before the operation he could not open his eye because of the swelling of the face, but since he had never been able to close it. Though I never saw facial paralysis as a complication of the condition, it developed in one of my patients some days after the evacuation of pus. In this case the onset of the parotitis was preceded by herpes of the area of the fifth nerve on the same side. The paralysis was clearing up when the man was evacuated down the line three weeks after the incisions had been made.

The following is a summary of the cases of which I have notes. The series does not represent the true mortality, because, as I have said, some of the worst cases occurred at a time when I was not able to keep records:

Parotitis.				
Total number of cases	...	...	...	23
Primary disease:				
Enteric group infections	...	...	...	16
Dysentery	...	...	...	3
Jaundice	...	...	...	1
Pyrexia of unknown origin	...	...	...	1
Nephritis	...	...	...	1
Parotitis	...	...	...	1

Four cases did not suppurate, and all recovered; 19 cases suppurated, and of these 4 died. Of the 23 cases, 11 affected the left side, 6 the right, and 6 were double.

GALL BLADDER INFECTIONS.

The most interesting complications were the gall bladder infections, and they were not at all uncommon. The cases that came to operation were particularly interesting, because they supplied a clue to those that did not require surgical interference, and because in them it was possible to establish the identity of the infecting organism. I operated on six cases. In two the gall bladder condition was frankly a complication of an enteric

infection on the down grade. In one the enteric infection had presumably occurred three months previously; during convalescence there were attacks of colic followed by a distended gall bladder, and numerous gall stones were found in the acutely inflamed viscus. In the other three cases the gall bladder infection and the enteric were concurrent. In four of the cases paratyphoid A organisms were obtained in pure culture from the bile, in one the organism was not quite typical, but was probably of this nature, and in the remaining case it was not possible to have a bacteriological examination made. All the cases recovered as the result of drainage.

The cases I saw in which an operation was not necessary usually came on some weeks or months after an illness that might be interpreted as an enteric group infection. They had acute attacks of pain followed by marked tenderness over the gall bladder and sometimes palpable enlargement. But they were not very ill, and the attacks grew less frequent and less severe, so that I did not consider it necessary to operate. The future will show whether these infections are followed by the formation of gall stones in such a proportion as to suggest a causal relationship.

RENAL COLIC.

As the weather began to get cooler we had several cases of renal colic, and though they very closely simulated calculus, in no single instance was I able to demonstrate a stone. In all the cases there was an excess of oxalate crystals in the urine, and I believe that the irritation caused by the passage of these crystals down the ureter was the correct explanation of the symptoms. When on the right side appendicitis was very closely simulated, and the diagnosis was often a matter of anxiety. An abnormally slow pulse, and the fact that the rigidity was strictly limited to the middle line, together with deep tenderness over the kidney, were all in favour of ureteric origin. At the early stage, when the diagnosis was in question, there were no urinary symptoms, and beyond the presence of oxalate crystals urinary examination did not give much help. At a later stage a trace of albumin, with large numbers of hyaline casts and a few blood and pus cells, established the diagnosis. Most cases cleared up quickly, but some were not free from pain for several weeks. A mild infection arising in this way probably explained the several cases of perinephritic abscess which also cropped up about this time.

In one case a paratyphoid infection of the kidney began so acutely as to simulate appendicitis, and it was probably an oxaluria which determined the site of infection in this instance.

THE WOUNDED.

Until the middle of December, when we began to get some wounded, the surgical cases had only represented a very small proportion of the total admissions.

I saw something of the wounded from the Kut relief force in April of 1916, but after the gallant garrison had to surrender at the end of that month the stream of wounded ceased. All through the summer months there were occasional casualties due to snipers, the attentions of Arab marauders, and to the accidents which always attend an army in the field. In December the wounded were of the ordinary types. Taken as a whole the wounds were not seriously infected, though there were occasional exceptions, but I never saw a case of tetanus nor of gas gangrene, and even in the hot weather, when resistance was at its lowest ebb, the accidental wounds healed remarkably well. Apart from recent wounds there have been a few relic bullets to be removed, and I am more impressed than ever with the wisdom of extracting missiles when it can be done without running unjustifiable risks. The cases I speak of all illustrated the importance of general methods of examination, for I was able to find the bullets and cut down on them with precision, relying on clinical signs only. They had previously escaped the surgeon's knife because the estimate of their depth by x-ray methods was supposed to have shown them in inaccessible positions. An x-ray apparatus without an expert in charge is not much use, for anything but extremely accurate localization is worse than useless. Our unit was fortunate in having Captain McCabe Dallas in charge of this department. Talking of x-rays reminds me to mention the need of other diagnostic instruments, such as cystoscopes, sigmoidoscopes, etc., which in a big station are almost as necessary as at home.

OPERATIONS OF ELECTION.

At Basra I did several operations of election for herniae, hydrocele, interval appendicitis, haemorrhoids, etc., and two very typical cases of torn cartilage, but as the weather got hotter I had to give it up because the patients so frequently developed jaundice, or malaria, or enteric group infections, or some trouble during convalescence more serious than the original disability. At Amara, with better climatic conditions, I again operated on any case that called for interference; all operation wounds healed perfectly. My only anxiety was the dust, which finds its way into everything, and I was afraid would spread the sort of minor infection which I had found to be so prevalent. However, I took the precaution of using my instruments out of antiseptic, and of having a carbolic towel near the operation area, and relying on mops used directly out of a solution of mercury perchloride 1 in 4,000, and this technique proved most efficient. Emergencies and minor surgery had, of course, always to be dealt with, and I had a few cases of acute appendicitis, but never a ruptured ulcer or strangulated hernia. It is rather surprising that there were so very few dislocations and fractures, for we drew our sick from some thousands of troops.

ANAESTHETICS.

At first we used nothing but chloroform, and although the patients took a good deal, or appeared to do so, for there was probably a lot of evaporation from the mask, they went under its influence most quietly, and there was practically none of the struggling we so commonly see at home. I am sure that this is due to the absence of alcohol and the very moderate use of tobacco—in fact, the only patient who did struggle hard was under arrest for drunkenness, a very rare crime where alcohol is not easily obtained. After a death from delayed chloroform poisoning, I threw tradition to the winds, and used ether with the greatest success. With a room temperature of 110° F. we found it answered splendidly, even when given by the open method; certainly a lot of ether was consumed, but the Ormsby or the Clover were equally successful and very little more extravagant than when used at home. At Amara we used nitrous oxide, which is the greatest possible convenience. Infiltration anaesthesia and spinal anaesthesia are both very useful, and the former I have frequently employed.

DENTAL CASES.

Among soldiers septic teeth and their complications cause a great deal of misery, as well as no inconsiderable disability, and I am satisfied that every hospital should have at least one dentist for every 1,000 beds. There is always a lot of extracting to do, but so many teeth can be saved by simple stoppings, and dentists can do so much to allay discomfort and lessen disability by the repair of dentures, etc., that their services are highly important. One general hospital had a dentist on the staff with a proper outfit and two mechanics, and in a very short time the department proved itself invaluable.

EYES.

Surgeons with ophthalmic experience are also indispensable in every general hospital, or even nearer the front if communications are long, because there are so many questions which may involve the sight of one or both eyes that can only be decided by those with special training.

THROAT, NOSE, AND EAR.

In the field of throat, nose, and ear surgery there is certainly less need for experts, but someone in each station that could be called upon in a consultative capacity is most useful. Impaction of cerumen, furunculosis of the auditory meatus, and trouble from old running ears were all common. The two former can easily be dealt with, and in my opinion the latter need not unfit a man for military service. Much can be done to relieve an old otitis, and even if not suitable for the fighting line there are many opportunities for employing such men at the base. At our hospital at Amara the "permanent base men" proved themselves invaluable as general duty orderlies at a time when our own staff was very much depleted by illness.

MILITARY SERVICE AFTER OPERATION.

I saw many cases illustrating active service after operations, and I am glad to be able to give the lie to those pessimists who state that our military hospitals are crowded with men who have been unsuccessfully operated upon for hernia, hydrocele, varicose veins, etc. Of course there are recurrences, and also men who complain as bitterly of their scars as of their original disability, but these are the exceptions. I was long enough at the hospital to see many of the patients on whom I had operated return wounded and without any complaint about the result of their previous operation. And it is the same out here; and, on the whole, I am surprised that men can undergo so much after even quite serious operations.

CONCLUSION.

The medical side of the hospital was always well employed, and, indeed, the campaign has furnished great opportunities for physicians. It has also shown the need for most liberal laboratory accommodation, and a first-rate pathologist with a good staff could be fully and profitably employed at every hospital.

We have followed the admirable plan of making *post-mortem* examinations whenever possible, and in all doubtful cases. I have usually made the examinations myself, and am able to say that if anything they are less unpleasant than similar investigations at home. Of course we make them as soon after death as possible, usually only a few hours, and never longer than twelve. Six in the morning is the best time, but I have often had to do them at three in the afternoon, and even with the thermometer at 110° and higher they have "not been too bad," to use a common service expression.

To many of us the life of the army is repellent, and will provide a great incentive to the promotion of something like a lasting peace. But from the medical point of view there are some compensations, and the war will at least have taught many men the great advantage of an unstinted appeal to laboratories and x-ray departments, and also the advantage of the very free consultations which can always be had for the asking in military hospitals. These lessons will not be lost, and must have an effect on civilian practice after the war.

On the whole, both patients and staff have kept very cheerful. There were a few cases of suicidal cut-throat, but always in men who were exceedingly ill. The hospitals are very nice, and the wards being light, airy, and cheerful the patients are very well off, though it would be ridiculous to say that they have all the luxuries which they enjoy in France or at home; yet at Christmas it would have been difficult to detect any difference. They are all glad to get into such comfortable quarters after their experiences at the front. The nursing orderlies are very good, and have worked splendidly, but the addition of sisters to the personnel has been a great advantage in every way; they greatly add to the welfare and comfort of the patients, and relieve the responsibilities of the medical officers. In the hot weather the great difficulty was to provide adequate change and recreation, both for patients and personnel. The services of regimental bands were available from September onwards at Amara, and were not only much appreciated but of great help in keeping men interested and amused. Pianos and gramophones were also very useful in relieving the monotony, and the concert parties which toured the stations during the autumn were most enjoyable. At all times the Y.M.C.A. provided entertainment and change, and every one acknowledged the extreme value of their services.

I must not forget to mention the great psychological value of the mail day. Baths and bathing are useful agents, provided they are taken at the proper time of day. Fishing can be indulged in towards evening, and provides relaxation for its devotees. Officers fond of shooting could always get sand grouse and often partridge, and there are duck and snipe, though further afield. Others enjoyed polo, and horse exercise was very popular.

From October to the end of December the evenings were cool enough for active games, and tennis, cricket, football, and hockey were indulged in and greatly appreciated after the long hot season.

The Amara Clinical Society was a great success. The idea originated with Lieut.-Colonel S.F. St. D. Green when A.D.M.S. Our first meeting was mainly devoted to the

subject of scurvy, a series of cases among Indians being shown by Major Connor and Captain Kamat, I.M.S. Subsequent meetings were held fortnightly, when subjects such as enteric, dysentery, wound treatment, and secondary haemorrhage were discussed, and at other meetings cases and specimens were shown. Weekly inter-hospital clinics between an Indian general hospital and a British general hospital were also held and were of mutual help, especially in the direction of keeping up the interest of medical officers.

I would plead for the establishment of schools for officers at all medical reinforcement camps, so that not only may the time of waiting be usefully employed, but the overwhelming monotony relieved. In this connexion I would like to add my testimony to the excellence of the Sanitary Museum at Makina. Similar museums for the exhibition of the newer splints and surgical appliances might be started at the big bases and be combined with a reference library of the literature of the war.

I am much indebted to Colonel W. H. Starr and Lieut. Colonel H. J. Bond for the facilities afforded to me and for the invariable interest which they took in my work.

A CASE OF ACHOLURIC JAUNDICE.

BY

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On April 25th, 1917, the following case was sent to Queen Alexandra Military Hospital. The patient had been seen previously by Surgeon-Colonel Culver James, H.A.C., who, not being satisfied with the diagnosis (spleno-medullary leukaemia), referred him to the laboratory for an examination of his blood.

A preliminary examination of a blood film was sufficient to dissociate the patient's condition from spleno-medullary leukaemia, so he was admitted into Queen Alexandra Military Hospital, and placed under the care of Captain H. J. S. Morton, R.A.M.C., to whom I am indebted for the following notes of his history and condition, together with the notes from the patient's mother.

The patient, Pte. —, complains of no definite symptoms. He states that "as long as he can remember" he has noticed that "the whites of his eyes have occasionally been yellow." Almost ever since he joined the army he has noticed shortness of breath, palpitation and pain over the heart on exertion, and stitch in the side. These symptoms were slight, and he paid no attention to them. Fourteen weeks ago, during an inspection in France, the medical officer noticed that he was "jaundiced," and he was sent to hospital, where he has remained. He had never reported sick, and complains of nothing now. He states that he is much yellower some days than others, and that it was only discovered seven weeks ago that his spleen was enlarged.

Past History.—He was ill when 8 years old with "abdominal trouble and jaundice." Since then he has been very healthy. He had never been abroad except to France (one week).

Family History.—Father and mother both suffer from heart trouble. Brothers and sisters healthy, except youngest brother, who suffers from anaemia and weakness. No other member of the family has ever suffered from jaundice.

Present Condition.—The patient is a healthy well-made boy, 22 years of age; skin lemon tint; conjunctivae yellow with distinct jaundice, especially around the periphery. No pyrexia; tongue clean; digestion and appetite good. No haematemesis or bleeding from the gums.

Heart and Chest: Normal; pulse 80; slight pulsation of carotids and subclavians.

Abdomen: Liver felt two inches below the costal margin; edge palpable, but not hard. Spleen very large, hard, and firm. Dullness on left side of chest behind from the eighth rib downwards in the scapular line, and continuous with the splenic dullness.

There is slight enlargement of glands in the groin, but no other glands appear to be enlarged. Teeth very good, no foci of suppuration discovered; no digestive troubles; no stigmata of congenital syphilis. There is a definite jaundice tint on the soft palate.

April 30th, 1917. Jaundice of conjunctivae not so marked to-day.

The patient's mother supplied the following interesting facts (I quote her own words):

Between the age of 3 and 4 years my son (the patient) had a very bad attack of jaundice, which lasted for three weeks or longer, and for which he was attended by a medical man. Not being satisfied with the doctor attending, another doctor was

called in and he found him to be suffering from a growth on the spleen. He was taken to the local hospital and detained five months. He came out of hospital in fairly good health, but two years after he had another attack of jaundice, and has had it on and off ever since. I have another son, aged 13 years, who is also yellow. I have also a little girl, aged 11 years, who is delicate and bloodless. I have had one miscarriage, and my husband is now in hospital suffering from blood poisoning resulting from ulcerated legs. This is the fourth time he has been in hospital for this disease.

From this history and from the weak positive Wassermann return of the patient's serum I think we are safe in concluding that there is a strong syphilitic taint.

Examination of the Patient's Blood.

There was marked microcytosis and anisocytosis. These two characteristics were so striking at the preliminary examination made when first seen as to at once call attention to his urine and conjunctivae. Polychromasia, poikilocytosis, and punctate basophilia were also present, together with a few microblasts. No myelocytes were found.

Total count:		
Red blood corpuscles	...	5,600,000 per c.mm.
White blood corpuscles	...	5,000 "
Differential count:		
Polymorphs	...	65 per cent.
Large lymphocytes	...	20 "
Small lymphocytes	...	8 "
Hyalines	...	6 "
Basophiles	...	1 "
Haemoglobin	...	65 "

The blood serum was decidedly yellow, and gave an indefinite reaction for bile with strong fuming nitric acid. The serum was not haemolytic to the red cells of another patient.

The fragility of the red cells was tested with different strengths of salt solution, and at the same time controlled by blood taken from the laboratory orderly. The result is appended:

Saline Solution.	Patient's Blood.	Orderly's Blood.
1 per cent. ...	No haemolysis	No haemolysis.
0.9 " ...	Partial haemolysis	No haemolysis.
0.8 " ...	Total haemolysis	No haemolysis.
0.7 " ...	Total haemolysis	No haemolysis.
0.6 " ...	Total haemolysis	No haemolysis.
0.5, 0.4, and 0.3 per cent.	Total haemolysis	No haemolysis.
0.2 per cent. ...	Total haemolysis	Slight haemolysis.
0.1 " ...	Total haemolysis	Total haemolysis.

A Wassermann test gave a weak positive reaction.

Urine.—Examined on several occasions, it was at no time high coloured, nor could any bile be detected chemically. When examined by the spectroscope, the characteristic absorption band of urobilin was seen at the junction of the green and blue.

Faeces.—Dark-brown in colour, and free from blood.

Many cases of acholuric jaundice have been recorded since Minkowski in 1900 accurately described the condition. Clinically they may feature hypertrophic biliary cirrhosis, splenic anaemia, Banti's disease, Addison's disease, or congenital syphilis with enlargement of the spleen and liver, but the characteristic blood changes of the former are said to be sufficiently definite to differentiate them. In making a diagnosis it is well to keep in mind one or two points—namely:

1. The blood serum of the above-mentioned diseases may contain bile.
2. Marked enlargement of the liver has been noted in cases of acholuric jaundice. In most cases, however, very little permanent enlargement is found.
3. The urine, although usually free from bile in acholuric jaundice, is on certain occasions, particularly when the jaundice is more pronounced than usual, distinctly bile coloured.

Nowadays there is a tendency among clinicians to divide cases of acholuric jaundice into familial and acquired, and in the latter group syphilis appears to be a potent factor. Whether it produces the characteristic