

S. Lyle CUMMINS

Kala-Azar in the Anglo-
Egyptian Sudan. pp 99-106

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KHARTOUM

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KALA-AZAR IN THE ANGLO-EGYPTIAN SUDAN

BY

S. LYLE CUMMINS, M.B., B.CH., B.A.O., R.U.I., R.A.M.C.

Historical

Kala-azar has been known to exist in North Africa since Laveran described a case from Tunis¹ in 1904. In the same year Dr. Sheffield Neave² proved its existence in the Anglo-Egyptian Sudan, reporting the discovery of the Leishman-Donovan body in the spleen of a Sudanese boy, under treatment in Omdurman Hospital.

In August, 1904, Dr. L. Phillips³ called attention to certain cases observed in Kasr-el-Ainey Hospital, which he considered to be kala-azar. Two of them had contracted their illness in Arabia, while two would appear to have acquired it in Egypt.

In 1906, Captain R. B. Black reported a case of splenomegaly with continued fever, from a village near the River Dinder; stating that it seemed to him to resemble kala-azar. Being without microscopic appliances of any kind, he was unable to settle the diagnosis. This case gains importance owing to the subsequent discovery of the disease in this neighbourhood.

First case of
present series

The series of cases which are dealt with in the present article began with the post mortem discovery of the Leishman-Donovan body in the spleen of an Egyptian soldier, dying of a disease, diagnosed "malaria," in Abbassieh Hospital. Colonel Leishman, to whom I submitted my specimens, to put the matter beyond doubt, very kindly examined them and confirmed my observation. A short note on this case and certain others appeared in the *Journal of the Royal Army Medical Corps*⁴ of February 1st, 1908. Details of the cases mentioned therein form part of this article, but I venture to recapitulate the main facts.

The illness was proved to have commenced at Senga, on the Blue Nile. Enquiries were instituted as to the presence or absence of cases resembling kala-azar in the man's own Egyptian village; a medical officer of the Sanitary Department being sent for this purpose through the kindness of Sir Horace Pinching, K.C.M.G., at that time Director-General of the Egyptian Sanitary Department. No such cases were found, and it was concluded that the disease must have been contracted where it commenced, at Singa.

All Egyptian soldiers who had lived in the barracks with the man, while at Senga, were now examined. They were found to be in good health, with one exception. This case was under treatment for "malaria" in Khartoum Hospital. Captain F. F. Carroll at once carried out splenic puncture, and proved the case to be one of kala-azar. Within a short time another Egyptian soldier arrived from Kassala, and was found to be suffering from the same disease. His illness was traced to Mafaza, on the Rahad, a tributary of the Blue Nile. Enquiries were at once instituted, through the authorities of the Kassala and Blue Nile districts, with the following results:—Captain R. B. Black reported two suspicious cases in Arab policemen on the Blue Nile. Specimens were sent for examination to the Gordon College, and Dr. Andrew Balfour confirmed the diagnosis in both cases.

Mafaza an
apparent
centre of
disease

Both these men were found to have contracted the disease during a visit to Mafaza.

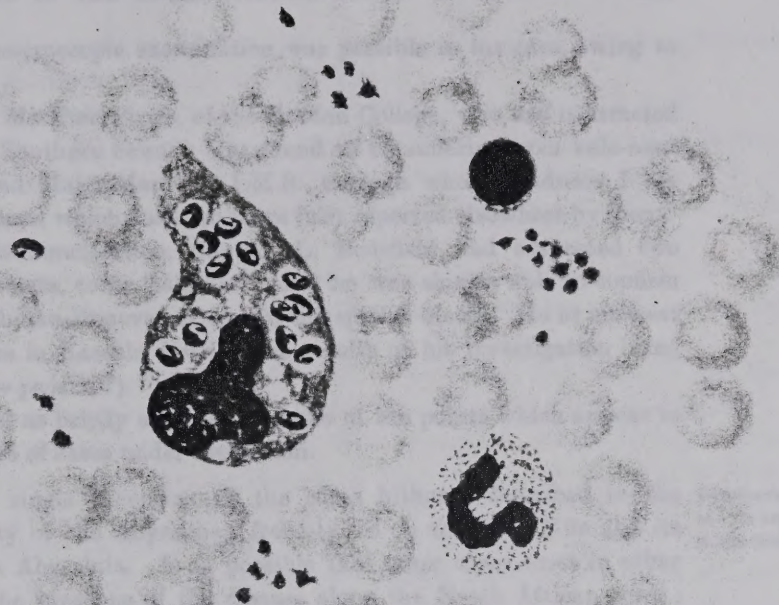
A third Arab policeman died in the Southern Sennar district; the description of his illness, as given by the medical officer who attended him, making it almost certain that he too died of kala-azar. *He had come from Senga, and reported sick shortly after reaching*

¹ Laveran, A. *Bulletin de l'Académie de Médecine*, March 23rd, 1904.

² Neave, Sheffield. *British Medical Journal*, May 28th, 1908.

³ Phillips, Llewellyn. *Journal of Tropical Medicine*, August 1st, 1904.

⁴ Cummins, S. L. *Journal of the Royal Army Medical Corps*, February, 1908.

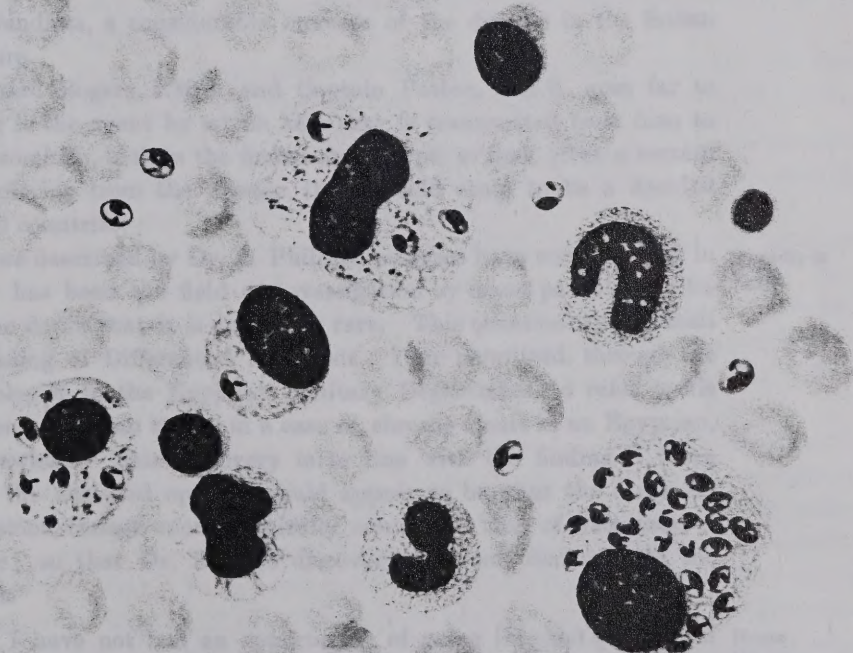


R. D. Muir

KALA-AZAR. FILM FROM SPLEEN. CASE B

Leishman Stain

× 1000 diam.



R. D. Muir

KALA-AZAR. SCRAPING FROM SPLEEN. CASE A

The Leishman-Donovan bodies are seen free and in the large mononuclears

Leishman Stain

× 1000 diam.

Kaili, in Southern Sennar. No microscopic examination was possible in his case, owing to lack of appliances.

At about the same time, Dr. MacTier Pirrie, of the Gordon College, who had contracted a chronic fever while working in Southern Sennar, was found to be suffering from kala-azar by Dr. Gulland, of Edinburgh, and Major Marshall, I.M.S., through whose kindness I am able to append short notes of the case, which has been more fully reported elsewhere by them.¹

Previous to receiving my communication, Captain L. Bousfield had suspected two cases, coming to his notice at Kassala, to be kala-azar; and he was shortly able to confirm his suspicion by finding the Leishman-Donovan bodies in the splenic blood. He at once set to work to investigate the disease in Kassala district, the results of his investigation being appended in a separate report (*see page 107*).

I will now proceed to discuss, as briefly as possible, some of the points which appear to me to merit attention in the series of cases under discussion.

DISTRIBUTION. With a single exception all the cases hitherto described in the Sudan have arisen in the vicinity of the Abyssinian frontier, or on the Blue Nile and its tributaries—rivers which rise in Abyssinia. It is possible that other cases exist in other parts of the Sudan, in view of the presence of the disease along the North African coast; but it is remarkable that none have hitherto been described. The sudden discovery of a considerable number of cases, all traced to the Abyssinian border or its vicinity, gives colour to the suggestion that the Sudan owes this disease to cases imported from Abyssinia. The high proportion of cases actually occurring among Abyssinians, taken in conjunction with the recent increase in trade and communication between that country and the Sudan, strengthens this probability, while the very slow growth of this communication during the early days of the Anglo-Egyptian regime may perhaps account for the previous rarity of the disease in the Sudan.

Distribution
of kala-azar
in the Sudan

Unless this theory is groundless, a considerable increase of the disease in the Sudan may be anticipated in the future.

The work of Major Leonard Rogers, I.M.S., and Captain Patton, I.M.S., goes far to demonstrate that the bed-bug is the agent by which kala-azar is transmitted from man to man. These insects are very common, both in the Sudan and Egypt, so that, given a certain number of imported cases suffering from the disease, there would seem to be a decided danger of its spreading in both countries.

With the exception of those described by Dr. L. Phillips, no cases have come to light in Egypt, although this country has been the field of investigation by many pathologists for many years; so there seems no doubt that it is extremely rare. This question will be dealt with more fully under the heading of Differential Diagnosis. I am permitted, through the kindness of Dr. Bitter, Pathologist to the Egyptian Sanitary Department, to refer to his recent observation of Leishman-Donovan bodies in a case of chronic ulcers in an Egyptian, which he intends to report elsewhere. This discovery is in line with the finding of these bodies in "Delhi Sore," and the accepted opinion would appear to be, that the organism producing these cutaneous lesions, though morphologically similar to that of kala-azar, is essentially different in nature; so that Dr. Bitter's discovery does not demonstrate the presence of kala-azar in Egypt.

Its rarity in
Egypt

HOUSE INFECTION. I have not had an opportunity of going into the question of house infection on the spot, but the matter is discussed by Captain L. Bousfield in his paper.

House
infection

The two cases in Egyptian soldiers from Senga, arose in men occupying the same

¹ *Lancet*, August 15th, 1908.

barracks, but apparently no further cases occurred among the remaining twenty soldiers of the Works Department living in this building.

A much more interesting and significant series is as follows:—

Detail of cases

1. Nafr. Mohd. Ibrahim Osman, Medical Corps, while stationed at Mafaza, lived in a grass hut which formed part of the "Police Huts" in the Zaptea Compound. He fell sick in July, 1906, and was relieved some time afterwards, leaving for Kassala in November or December, 1906.

2. Two Arab policemen, from the Blue Nile district, lived in Mafaza during May, 1907, presumably occupying the police huts. Both these men subsequently died of kala-azar.

3. An Arab policeman, from Kassala, Idris Adam, had lived in the Mafaza police huts from January, 1907, to January, 1908. He died of kala-azar in Kassala.

4. It should be noted also that a Wakil Ombashi, of the Medical Corps (Case II., Bousfield) passed three days at Mafaza in May, 1907, and is stated to have lived with the resident Medical Corps Tumergi, who, no doubt, occupied the same police hut as that of his predecessor, Ibrahim Osman. This Wakil Ombashi was found to be suffering from kala-azar in 1907; and, in my opinion, contracted the disease at Mafaza. In view of the present ignorance of the life-history of the Leishman-Donovan body, it is impossible to calculate the probability of a house remaining infected, or to judge how long the infection may last.

Dogs and kala-azar

Assuming the bed-bug to be the alternative host, it is possible that the infectivity may last through more than one generation, as occurs with the spirillum of Relapsing Fever.¹ Or, on the other hand, the observation of M. Nicolle,² that dogs are subject to the disease, taken with the domestic habits of these animals, may, perhaps, explain the occurrence of a series of cases, arising at long intervals, in the same building.

At any rate, the police huts at Mafaza would seem to have a fair claim to be considered infected during 1906-1907.

Bed-bugs, sent for classification to the Gordon College from the districts where kala-azar has occurred, are reported to be, in all probability, the *Cimex lectularius*.

The question of diagnosis

DIAGNOSIS. The disease has been so ably described,³ that it is superfluous to repeat the points which enable a diagnosis to be made; but the following brief description may assist laymen to recognise cases in their districts:—

Kala-azar is a continuous fever, sometimes lasting for many months, accompanied by enlargement of the spleen and liver, and, finally, by great loss of strength. The feet and legs often swell, and the skin of the face may show dark pigmentation. It is resistant to quinine, and has a much greater tendency to kill its victim than has chronic malaria.

Any cases found to resemble the above should be suspected and the nearest doctor informed.

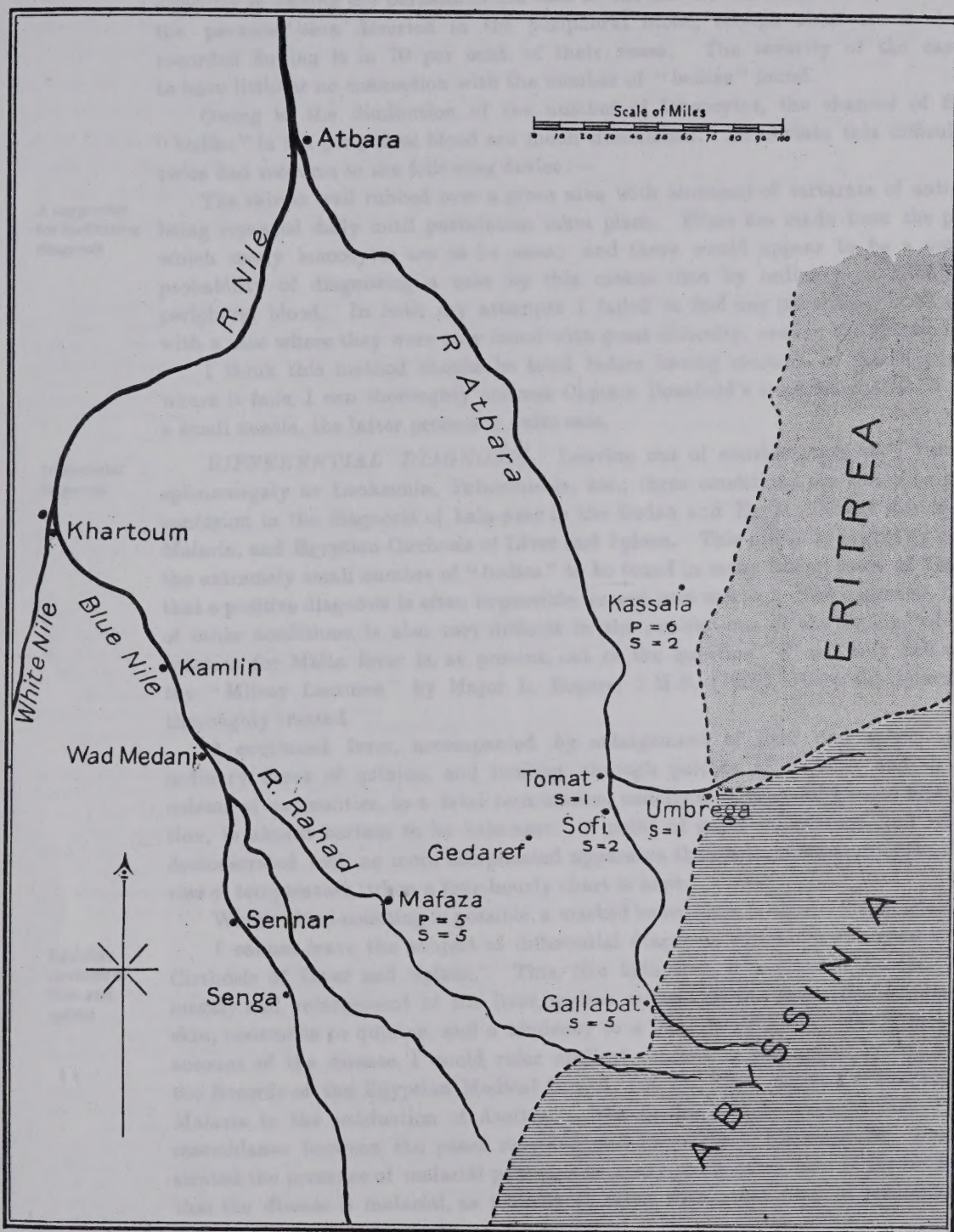
Frequent paucity of the parasite

Of course, to the doctor no case can be considered as definitely diagnosed until the Leishman-Donovan body has been found; but this leads me to a point, brought out clearly by the appended cases, that the failure to find the parasite, even on several attempts, does not finally exclude the disease. In some of the cases recorded, the parasites have been most difficult to find. In this connection, I may say that I searched through very many slides sent me by Captain F. F. Carroll from his case at Khartoum, without success, and only found, at last, one group of Leishman-Donovan bodies. The same point was noted by

¹ Dutton and Todd. Koch, *vide* leading article, *British Medical Journal*, February 24th, 1906.

² Nicolle, C. *La Semaine Médicale*, April 24th, 1908.

³ Rogers, L., I.M.S. *Milroy Lectures*, 1907. See also Review Supplement to this Report.



L. BOUSFIELD

Fig. 25.—MAP SHOWING PROVED AND SUSPECTED CASES OF KALA-AZAR IN KASSALA PROVINCE

Red Type indicates Towns and Villages in Kassala Province

P = Definitely diagnosed cases

S = Suspected cases

Captain L. Bousfield in several of his cases, while Major Marshall, I.M.S., had great difficulty in finding the parasite in the case of the late Dr. MacTier Pirrie. In no case has the parasite been described in the peripheral blood, though observers in India¹ have recorded finding it in 70 per cent. of their cases. The severity of the case appears to have little or no connection with the number of "bodies" found.

Owing to the diminution of the number of leucocytes, the chances of finding the "bodies" in the peripheral blood are much diminished. To obviate this difficulty, I have twice had recourse to the following device:—

A suggestion
for facilitating
diagnosis

The skin is well rubbed over a given area with ointment of tartarate of antimony, this being repeated daily until pustulation takes place. Films are made from the pustules, in which many leucocytes are to be seen; and there would appear to be a much greater probability of diagnosing a case by this means than by ordinary examination of the peripheral blood. In both my attempts I failed to find any parasites; but I was dealing with a case where they were only found with great difficulty, even in the splenic blood.

I think this method should be tried before having recourse to spleen puncture, but where it fails, I can thoroughly endorse Captain Bousfield's experience, that, if made with a small needle, the latter process is quite safe.

Differential
diagnosis

DIFFERENTIAL DIAGNOSIS. Leaving out of consideration such rare causes of splenomegaly as Leukæmia, Tuberculosis, etc., three conditions are likely to give rise to confusion in the diagnosis of kala-azar in the Sudan and Egypt. These are Malta Fever, Malaria, and Egyptian Cirrhosis of Liver and Spleen. This difficulty is greatly enhanced by the extremely small number of "bodies" to be found in many Sudan cases of kala-azar; so that a positive diagnosis is often impossible, except post mortem. The diagnosis, by exclusion of other conditions, is also very difficult in the out-stations of the Sudan, where Widal's reaction for Malta fever is, at present, out of the question. I can only call attention to the "Milroy Lectures" by Major L. Rogers, I.M.S. (1907), where the question is most thoroughly treated.

A continued fever, accompanied by enlargement of liver and spleen, resistant to ordinary doses of quinine, and tending, through periods of wasting and debility, with œdema of extremities, to a fatal termination, usually determined by some septic complication, is almost certain to be kala-azar. A point of great importance, and which can be demonstrated with no more complicated apparatus than a thermometer, is the double daily rise of temperature, when a four-hourly chart is kept.

Where blood-counting is possible, a marked leucopænia is almost diagnostic of kala-azar.

Egyptian
cirrhosis of
liver and
spleen

I cannot leave the subject of differential diagnosis without a reference to "Egyptian Cirrhosis of Liver and Spleen." This, like kala-azar, is a chronic disease, with splenomegaly and enlargement of the liver, ascites, œdema of the lower limbs, pigmentation of skin, resistance to quinine, and a tendency to a fatal termination. For a most interesting account of the disease, I would refer medical readers to the paper by Dr. L. Phillips, in the Records of the Egyptian Medical School, Vol. II., 1904, entitled, "The rôle played by Malaria in the production of Ascites." The reader will be at once struck by the close resemblance between the cases recorded and kala-azar. Although Dr. Phillips demonstrated the presence of malarial parasites in many of his cases, this is far from being proof that the disease is malarial, as malaria co-exists with everything in countries where it is prevalent.

It is curious, too, that in the Sudan, where malaria is more severe than in Egypt, these cases do not occur; or, at least, have not been noted, except occasionally in Egyptians.

¹ Patton, W. S. (1907). *Scientific Reports of Government of India.*

Of all the blood-counts given, not one is like that of malaria. On the other hand, none of the blood-counts at all resemble kala-azar, and I am informed by Dr. Alec Fergusson, who has examined very many pathological spleens at Kasr-el-Ainey Hospital, that he has never yet seen the Leishman-Donovan body in spleens examined by him.

On the whole, there seems to be good reason to consider this cirrhosis of liver and spleen as *sui generis*, but it must be admitted that the patients usually present a picture most similar to kala-azar, and a close study of a number of cases, with enquiry as to origin, and an investigation into such points as house infection, is required before it can be assumed that the two conditions are not identical.

My own opinion, formed on admittedly incomplete evidence, is that Egyptian Cirrhosis is a disease apart; and that kala-azar, if present at all, is exceedingly rare in Egypt.

CASE A

Cases

No. 2406. NAFR. FADL NADI HAFEZ, DEPARTMENT OF WORKS

PREVIOUS HISTORY. Enlisted May 15th, 1905. Was sent to Khartoum and thence to Senga, arriving at the latter station about April, 1906. His first admission to hospital was for "intermittent fever" on September 20th, 1906. From that date until December, 1906, his medical history sheet shows four separate admissions for intermittent fever. He was then sent to Khartoum, where he was at once admitted to hospital for "malarial fever," remaining thirteen days under treatment. He was then discharged, but was again admitted on February 25th, 1907, and then sent, by sick convoy, to Cairo, for change of air. On arrival he was granted a month's sick furlough, after which he returned to hospital very ill. He died on May 16th, 1907.

He first came under my personal notice on admission to hospital after his sick furlough.

GENERAL CONDITION. On April 7th, 1907, I found this man to be in a very serious condition. The temperature rose to 104° F. on that evening; the lower extremities were oedematous, the patient greatly wasted. The spleen was enlarged to the umbilicus; and the liver to about two finger-breadths below the costal margin. The temperature continued "spiky," but no four-hourly chart was kept. No malarial parasites were found. During the first week in May he began to suffer from septic diarrhoea, which was very hard to control, and which led to his death on the 16th of May. Spleen smears made after death showed numerous Leishman-Donovan bodies.

CASE B

No. 1993. NAFR. SAID ABDUL WAHID, DEPARTMENT OF WORKS

PREVIOUS HISTORY. The patient was in good health when he was sent to Senga in the summer of 1906. For some eight or nine months he was in good health at that station, but during the last three months has suffered constantly from fever, which has brought about his transfer to Khartoum Hospital.

PRESENT CONDITION, JULY 2nd, 1907. Patient is very weak and anæmic. He has a constant rise of temperature, but no nightly sweats or cough.

Diarrhoea has been constant during the past three weeks, and appears to be uninfluenced by drugs.

The motions are liquid, normal in colour, and never contain blood. The liver is enlarged and tender. The spleen projects downwards and inwards to the level of the umbilicus. It can quite easily be seen through the wasted abdominal walls; and is very hard, but not tender to the touch.

Patient has been taking quinine for a long time without much benefit, and he is obviously going down hill.

(The larger doses of quinine, recommended by L. Rogers, were subsequently tried, but the patient was too far advanced to derive any improvement from them.)

On splenic puncture, Leishman-Donovan bodies were found in very small numbers, after prolonged search.

The patient died on July 2nd, 1908, the death being caused by diarrhoea and exhaustion.

The above notes were kindly furnished by Capt. F. F. Carroll, R.A.M.C.

CASE C

No. 1128. NAFR. MOHAMMED IBRAHIM OSMAN, MEDICAL CORPS

PREVIOUS HISTORY. This soldier left the M.C. Dépôt in Cairo on August 23rd, 1905, being at that time in excellent health, and proceeded to Kassala. On arrival at Kassala he spent seven days in hospital as the result of a chill contracted on the journey. When discharged he was at once sent to Mafaza, where, for about ten months, he enjoyed good health.

At the end of that time (*i.e.* in July, 1906), he was suddenly taken ill with fever, which continued to be severe during the next few months, the temperature rising every day in spite of quinine. In November he was transferred to Gedaref, still very ill, and remained in hospital there for twenty-five days, before transfer to Kassala.

After seven days in Kassala Hospital he was discharged to duty; but after attempting to work for about a week, he was re-admitted, and remained under treatment for about two months. He was at first thought to be suffering from enteric fever, but was finally invalided to Cairo, diagnosed "Malaria." While at Mafaza he lived in a grass hut in the Zaptea, adjoining the huts of the Arab police, in the same compound, but he was in sole possession of his own hut. He admits that he patronised the Arab prostitutes, but he declares they were all in good health.

CONDITION ON ADMISSION. The patient is wasted and weak. The spleen is enlarged to half a hand's breadth below the costal margin. The liver is, apparently, about normal. No oedema of legs. Bowels normal. The appetite is enormous, to an extent that strikes me as pathological. The skin of the face is darkly pigmented. The temperature shows a *double* rise in the twenty-four hours.

Blood is free from malarial parasites:—

Red corpuscles	...	...	...	...	...	...	...	5,000,000
White	"	...	...	...	...	...	...	872

On splenic puncture the Leishman-Donovan parasite is found in small numbers; chiefly free in the blood, but a few in leucocytes.

The stools were frequently and carefully examined. On one occasion they were found to contain very numerous organisms of a peculiar kind, small disc-shaped bodies, slightly larger than a red corpuscle, and apparently ciliated, being very actively motile through the agency, apparently, of some lashing organ, as surrounding particles were thrown into motion by it. These were only found on one occasion; subsequent careful search proving negative. I have since found somewhat similar bodies co-existing with *Amœba coli*, in a case of acute dysentery.

PROGRESS. The temperature continued to show an irregular double daily rise, until at the end of June, the patient was put on very large doses of quinine, fifty grains a day. The result was a great improvement, the temperature falling to, and remaining at, normal a few days later. This improvement lasted about three weeks, the patient gaining in weight and looking much better. Splenic puncture, at the end of that period, was normal; and the leucocyte count had risen to about 3000, the red corpuscles being about 4,800,000. Some weeks later, the temperature had recommenced (August 5th). On enquiry it was found that, owing to the patient's complaints, the medical officer in charge had stopped the quinine about a week before. Sharp attacks of diarrhoea from time to time. Patient looking very ill. No parasites to be found in peripheral blood. Careful search in films of leucocytes, made from artificially produced pustules, proved to be negative. Splenic puncture again shows Leishman-Donovan bodies, though in very small numbers. Quinine resumed.

CONCLUSION. The patient had been recently exempted from military service on legal grounds, and no longer belonged to the army. He now insisted, against all advice, on leaving the hospital (20th of August).

His death occurred at his village a week later. No post mortem possible. Duration of illness thirteen months. The remarkable improvement of this patient under vigorous quinine treatment (fifty grains daily) was most striking. I was at one time almost prepared to see him recover; but he found the large doses of quinine difficult to tolerate, and succeeded in getting the drug stopped. Whether the recurrence would have come in any case, it is impossible to say.

CASES D AND E

ARAB POLICE NAFR. ABDALLAH AHMED	} Sennar Province Staff
" " " ABD EL WAHAB	

PREVIOUS HISTORY. These two men had spent most of their police-service together in Sennar District. They were in good health when they proceeded to Mafaza in May, 1907.

Both were recalled to Senga early in July, and both reported sick with fever towards the end of that month, being admitted to Senga Hospital. They were diagnosed "malaria" by the medical officer in charge, but thought to be unusually bad cases. In transferring them to Wad Medani for change of air and further treatment, he calls attention to their peculiar temperatures, and to his failure to influence them by quinine.

ON ARRIVAL AT WAD MEDANI. Both patients were extremely ill, the temperature being of the high intermittent type, while there was great emaciation, slight diarrhoea, cough, and sometimes delirium. The spleen was considerably enlarged in both cases, and the liver to a less degree. No malarial parasites could be found.

On September 12th, Nafr. Abdallah Ahmed developed a sore mouth and œdema of the face and neck, which declared itself as "gangrene of the cheek" on September 14th. He died on the morning of September 16th. The post mortem examination showed that the heart, lungs, kidneys and gastro-intestinal tract were normal; the liver enlarged, but of normal colour and consistence; the spleen greatly enlarged, purplish in colour, and soft and grumous.

Nafr. Abd el Wahab, after a few days, also suffered from gangrene of the face, commencing at the upper lip. He died on the morning of September 18th, 1907. The post mortem report closely resembles that of Abdallah Ahmed.

The close similarity in the history of these two men is most striking, in view of the fact that they were probably infected by the same strain of parasite and at the same time.

These notes are furnished by Mulaziem Awal A. E. Kamar, Medical Corps, who diagnosed them kala-azar, the diagnosis being confirmed by Dr. A. Balfour, Gordon College, Khartoum, from spleen smears sent for examination.

CASES F AND G

Two cases of kala-azar have hitherto come to light in British officials in the Sudan. The late Dr. MacTier Pirrie, who returned to England suffering from a chronic fever contracted south of the Blue Nile, was diagnosed as kala-azar by Dr. Gulland, of Edinburgh and Major Marshall, I.M.S., the diagnosis being confirmed post mortem by the discovery of the Leishman-Donovan bodies in spleen smears.

The case is to be published elsewhere by the gentlemen who observed it, and through whose kindness I have been enabled to mention it.¹

A British officer of the Egyptian Army, who returned to England ill, after having been stationed at Gallabat, has now been found to be suffering from kala-azar.²

This discovery was made by Sir Patrick Manson, K.C.M.G., who has kindly made me aware of the confirmation of the diagnosis by the finding of the parasites in blood withdrawn from the liver.

A remarkable fact is that in both the above cases a positive reaction to Widal for enteric was given at one period of the disease.

¹ *Lancet*, August 15th, 1908.

² Unhappily this case has also terminated fatally.



