

## PAPPATACI FEVER AT KAMPTEE, C.P.

BY LIEUTENANT-COLONEL C. H. HALE, D.S.O.

*Royal Army Medical Corps.*

IN June, 1911, when Senior Medical Officer at Kamptee, C.P., I found that we were getting a considerable number of cases of fever of short duration with very great similarity in the symptoms; several of the cases were followed by a short relapse. The cases were evidently not malarial fever, and from the short duration enteric fever was negatived.

I asked Captain J. E. Ellcome, R.A.M.C., who was in charge of the medical wards, to take careful notes of all these cases; the notes of the following twenty cases, which all occurred in June, are extracts from Army Hospital Book 2. I thought the cases were more likely to be sand-fly fever, and on reading Lieutenant-Colonel Aldridge's pamphlet on "Pappataci Fever," published and distributed by the Government of India, I felt convinced that this was the correct diagnosis. I started a careful search for sand-flies, and the first day found a large number on the walls behind doors and windows and in the bathrooms of my bungalow. On microscopic examination we found some typical *Phlebotomus pappatasi* and other specimens which were subsequently proved to be identical with a control sand-fly sent us from Calcutta, by Mr. F. M. Howlett, the Government Entomologist, thus agreeing with the statement made by Lieutenant-Colonel C. Birt in his article on "Sand-fly Fever in India," in the JOURNAL of August, 1910, p. 146, that, "F. M. Howlett says that at least two species of phlebotomus are found almost all over India and form the bulk of the pest known as sand-flies."

We had a meeting of all the medical officers and assistant-surgeons, at which we examined the flies under the microscope, read Lieutenant-Colonel Aldridge's pamphlet and discussed the symptoms of the cases in hospital, with the result that a unanimous verdict of pappataci fever was passed.

I then sent some sand-flies to Mr. Howlett, who kindly examined them and reported the presence of two varieties, *Phlebotomus minutris* and *Phlebotomus argenipes*.

On looking back through the admission and discharge book for three years the following figures were obtained for June, July and August:—

	1909			1910			1911			Pappataci fever
	M.T.	B.T.	Negative	M.T.	B.T.	Negative	M.T.	B.T.	Negative	
June .. ..	—	1	23	—	—	39	—	—	—	35
July .. ..	—	2	47	—	—	10	—	2	1	22
August ..	—	4	14	2	6	3	6	8	—	2

From the above figures it seems a fair inference that these cases of pappataci fever were in 1909 and 1910 returned as malaria (blood-negative), and one medical officer here states that last year the cases with symptoms exactly similar to those of this year were returned as malaria.

In July, up to the 19th, eighteen cases had been admitted and then an active campaign against sand-flies was undertaken in all barrack-rooms, bath-rooms, wash-houses, &c. The flies were pointed out to all N.C.O.s. and men, and in each barrack-room men were told off to go round morning and evening and kill all they could; we probably killed millions, and this certainly seems to have had a good effect, as during the remainder of the month we only had four more admissions for pappataci fever.

I only propose to give notes of twenty cases, as I consider that number sufficient to show the great similarity of the symptoms, duration of fever, relapses and other points worth noting. In every one of these cases a blood smear was carefully examined for malarial parasites, with a negative result.

*Case 1.*—Colour-Serjeant F. Admitted June 3 with fever (100° F.) of sudden onset, severe frontal headache and pains in loins and front of thighs. Bowels very constipated and tongue covered with a thick white fur. The temperature remained about 100° for twenty-four hours, and then dropped to 99°.

The headache and pains gradually decreased. The temperature remained between 98·6° and 99·8° for two days, and then again rose to 103·4° with severe headache but no other pains, and tongue still dirty; the temperature remained up till the following day and then fell to normal, the tongue rapidly became clean and the headache ceased. Recovery was marked by a good deal of prostration.

*Temperature.*—June 3: a.m., 100°; p.m., 100°. June 4: a.m., 99°; p.m., 98·6°. June 5: a.m., 99°; p.m., 99·8°. June 6: a.m., 99°; p.m., 103·4°. June 7: a.m., 101°; p.m., normal. June 8:

a.m., normal; p.m., normal, and continued normal. He had malaria in June, 1909.

*Case 2.*—Private McC. Admitted June 8, with fever of sudden onset ( $101^{\circ}$ ), severe frontal headache and slight pain in loins, constipation, and white furred tongue.

The fever, &c., subsided in forty-eight hours and he was soon well again.

*Temperature.*—June 8: a.m.,  $101^{\circ}$ ; p.m.,  $100.8^{\circ}$ . June 9: a.m.,  $100^{\circ}$ ; p.m., normal, and continued normal. No record of malaria.

*Case 3.*—Private D. Admitted June 9 with fever ( $100^{\circ}$ ) and complaining of frontal headache and severe aching over the loins. The bowels were very constipated and his tongue very dirty. The temperature fell to  $99^{\circ}$  next day, and his fever lasted forty-eight hours. Recovery was marked by considerable weakness.

*Temperature.*—June 9; a.m.,  $100^{\circ}$ ; p.m., normal. June 10: a.m.,  $99.4^{\circ}$ ; p.m.,  $99^{\circ}$ . June 11: a.m., normal; p.m., normal, and continued normal. No record of malaria.

*Case 4.*—Lance-Corporal S. Admitted June 9 with fever ( $101.6^{\circ}$ ), complaining of frontal headache and fairly severe pain in loins. Bowels constipated, tongue dirty. The evening temperature was  $100^{\circ}$ , and next morning normal, but it again rose to  $100^{\circ}$  in the evening. On June 11, temperature was normal, but the tongue remained coated with a thick white fur. After remaining normal for about seventy-two hours it rose to  $102^{\circ}$  in the morning, and remained for twenty-four hours between that and  $99.4^{\circ}$ , and the headache recurred, but not the loin pains. At the end of twenty-four hours all symptoms vanished, and he was soon well again.

*Temperature.*—June 9: a.m.,  $101.6^{\circ}$ ; p.m.,  $100^{\circ}$ . June 10: a.m., normal; p.m.,  $100^{\circ}$ . June 11: a.m.,  $98^{\circ}$ ; p.m.,  $98^{\circ}$ . June 12: a.m.,  $97.8^{\circ}$ ; p.m.,  $98^{\circ}$ . June 13: a.m.,  $97^{\circ}$ ; p.m.,  $98^{\circ}$ . June 14: a.m.,  $102.4^{\circ}$ ; p.m.,  $100^{\circ}$ . June 15: a.m.,  $99.4^{\circ}$ ; p.m., normal, and remained normal. No record of malaria.

*Case 5.*—Private W., admitted June 11 with sudden onset of fever ( $101^{\circ}$ ), severe frontal headache, and pains across loins. Bowels constipated and tongue thickly coated with a white fur. The temperature in the evening and next day varied from  $100^{\circ}$  to  $102^{\circ}$ . On the third day it was normal, but though free of pains the tongue remained dirty. After remaining normal for seventy-two hours the temperature rose to  $100^{\circ}$  with a return of the headache, but no lumbar pains. After twenty-four hours it became normal, and all symptoms cleared up.

*Temperature.*—June 11: a.m., 101°; p.m., 102°. June 12: a.m., 100°; p.m., 102°. June 13: a.m., normal; p.m., normal. June 14: a.m., normal; p.m., normal. June 15: a.m., normal; p.m., normal. June 16: a.m., 99·2°; p.m., 100°. June 17: a.m., normal; p.m., normal, and continued normal. No record of malaria.

*Case 6.*—Private R., admitted June 11 with fever of sudden onset (101·2°), acute vomiting, severe frontal headache and pains across loins. The vomiting soon stopped after admission, but he was almost prostrate with headache and loin pains. Bowels constipated, and tongue thickly coated with white fur. Evening temperature 100°, and 99·8° next morning, falling to normal that evening with cessation of headache and pains.

*Note.*—Bradycardia had not been looked for in the above cases, but reading that it was a rather common occurrence during convalescence the symptom was watched for in the later cases.

*Temperature.*—June 11: a.m., 101·2°; p.m., 100°. June 12: a.m., 98·8°; p.m., normal, and continued normal. No record of malaria.

*Case 7.*—Private B., admitted June 11 with fever (102°), frontal headache and severe pains across loins: bowels constipated, and tongue covered with thick white fur. Evening temperature 102·6°, and lumbar pains apparently agonizing on the slightest movement, as in severe lumbago. Temperature 100° next morning, dropping to normal by evening, and the other symptoms subsiding. The pulse, after subsidence of fever, remained for forty-eight hours between 50 and 60 per minute.

*Temperature.*—June 11: a.m., 102°; p.m. 102·6°. June 12: a.m., 100°; p.m., normal, and continued normal. He had malaria in February, 1910.

*Case 8.*—Private B., admitted June 11 with fever (101°), frontal headache, and pains across loins, bowels constipated and tongue dirty. The temperature rose to 103° in the evening, and next day kept between 101·8° and 99°, dropping to normal on the third day with clearing of other symptoms. Pulse-rate between 50 and 60 per minute after subsidence of fever.

*Temperature.*—June 11: a.m., 101°; p.m., 103°. June 12: a.m., 101·8°; p.m., 99·6°. June 13: a.m., normal, and continued normal. No record of malaria.

*Case 9.*—Private F., admitted June 12 with fever of sudden onset (100°), severe frontal headache and slight lumbar pains, bowels constipated and tongue coated with thick white fur. The

temperature dropped to normal the same evening, and the headache was much less. The temperature remained normal for about seventy-two hours, and then rose to  $101.6^{\circ}$ , and in the evening to  $103^{\circ}$ , with a return of the headache but not of the lumbar pains; it fell to normal in twenty-four hours. It was noted that during the period of apyrexia the tongue remained very dirty, and made no attempt to clean until after the relapse. After the relapse the pulse-rate was between 50 and 60 per minute.

*Temperature.*—June 12: a.m.,  $100^{\circ}$ ; p.m., normal; June 13: a.m., normal; p.m., normal. June 14: a.m., normal; p.m., normal, June 15: a.m., normal; p.m., normal. June 16: a.m.,  $101.6^{\circ}$ ; p.m.,  $103^{\circ}$ . June 17: a.m.,  $99^{\circ}$ ; p.m., normal, and continued normal. No record of malaria.

*Case 10.*—Private Y., admitted June 12 with fever of sudden onset ( $100^{\circ}$ ), frontal headache and very severe lumbago pains; bowels constipated, and tongue coated with thick white fur. The temperature fell to normal the same evening, and headache and pains vanished. After about seventy-two hours the temperature rose to  $102.6^{\circ}$  with frontal headache but no lumbar pains. The tongue during the relapse was slightly furred. After the relapse the pulse-rate was between 50 and 60 per minute.

*Note.*—This man was admitted to hospital for tachycardia, varying from 88 to 160 per minute on the day after discharge, and this did not improve with rest and treatment. A sequela of the pappataci fever?

*Temperature.*—June 12: a.m.,  $100^{\circ}$ ; p.m., normal. June 13: a.m., normal; p.m., normal. June 14: a.m., normal; p.m., normal. June 15: a.m., normal; p.m., normal. June 16: a.m.,  $102.6^{\circ}$ ; p.m.,  $101.6^{\circ}$ . June 17: a.m.,  $100^{\circ}$ ; p.m., normal, and remained normal. No record of malaria.

*Case 11.*—Private L., admitted June 13 with fever of sudden onset ( $101.6^{\circ}$ ), severe frontal headache and severe pains across loins; bowels constipated and tongue coated with thick white fur; evening temperature  $100.4^{\circ}$ , next morning  $99^{\circ}$ , and normal that evening, with clearing of symptoms. Pulse 100 during fever, and 50 to 60 for twenty-four hours after fall of temperature.

*Temperature.*—June 13: a.m.,  $101.6^{\circ}$ ; p.m.,  $100.4^{\circ}$ . June 14: a.m.,  $99^{\circ}$ ; p.m., normal, and remained normal. No record of malaria.

*Case 12.*—Bombardier M., admitted June 13, with fever of sudden onset ( $100^{\circ}$ ), severe frontal headache and pains across loins; bowels constipated and tongue foul. Evening temperature  $101^{\circ}$ ,

next morning 99°, and falling to normal at night with cessation of symptoms. No bradycardia.

*Temperature.*—June 13: a.m., 100°; p.m., 101°. June 14: a.m., 99°; p.m., normal, and remained normal. No record of malaria.

*Case 13.*—Private G., admitted June 15 with fever of sudden onset, vomiting, severe frontal headache and severe pains across loins. Bowels constipated and tongue coated with white fur. Evening temperature 102·6°, next morning 101·2°, falling to 99° in the evening with relief of symptoms; next day normal. Pulse during convalescence 54 to 60 per minute.

*Temperature.*—June 15: a.m., 100·8°; p.m., 102·6°. June 16: a.m., 101·2°; p.m., 99°. June 17: a.m., normal; p.m., normal, and remained normal. No record of malaria.

*Case 14.*—Private W., admitted June 16 with fever (101·2°) of sudden onset, severe frontal headache and slight pains across loins; bowels constipated, and tongue coated with thick white fur. Evening temperature 100·2°, and normal next day. Pulse 50 to 60 per minute during convalescence.

*Temperature.*—June 16: a.m., 101·2°; p.m., 100·2°. June 17: a.m., normal; p.m., normal, and remained normal. No record of malaria.

*Case 15.*—Private D., admitted June 17 with fever (101·4°) of sudden onset, vomiting, severe frontal headache and pains across loins; bowels constipated, and tongue coated with white fur. Evening temperature 102°, next morning 99°, and remained at 99° for twenty-four hours, but though headache and pains disappeared the tongue remained dirty. After being normal for three days the temperature rose to 102° in the morning and 103° at night, falling to normal in twenty-four hours.

The duration of the initial attack was forty-eight hours, followed by seventy-two hours apyrexia, and then by a relapse lasting twenty-four hours. Pulse during convalescence 56 to 76 per minute.

*Temperature.*—June 17: a.m., 101·4°; p.m., 102°. June 18: a.m., 99°; p.m., 99°. June 19: a.m., normal; p.m., normal; June 20 and June 21: normal. June 22: a.m., 102°; p.m., 103°. June 23: a.m., normal; p.m., normal, and remained normal. No record of malaria.

*Case 16.*—Lieutenant T., seen on June 17 with fever of sudden origin (102·6°), accompanied by vomiting, very severe frontal headache and pains across the loins, he also complained of giddiness when sitting up. Bowels constipated and tongue very dirty. Evening temperature 102·8°, next morning 100°; it fell to normal

that evening. He complained of feeling very weak, but the other symptoms vanished.

The next two days the temperature was normal, but on the third day it rose to  $101.2^{\circ}$  with severe aching about the eyes; no lumbar pain. In twenty-four hours temperature was normal, and he was left feeling very weak.

No bradycardia. Convalescence was much protracted.

*Temperature.*—June 17: a.m.,  $102.6^{\circ}$ ; p.m.,  $102.8^{\circ}$ . June 18: a.m.,  $100^{\circ}$ ; p.m., normal. June 19 and June 20: normal. June 21: a.m.,  $101.2^{\circ}$ ; p.m.,  $101^{\circ}$ . June 22: a.m., normal; p.m., normal. No record of malaria.

*Case 17.*—Private E., admitted June 17, a typical case; the pulse remained 50 to 54 for three days after fever had gone.

*Temperature.*—June 17: a.m.,  $101^{\circ}$ ; p.m.,  $102^{\circ}$ . June 18: a.m.,  $102^{\circ}$ ; p.m.,  $99.6^{\circ}$ . June 19: a.m., normal; p.m., normal, and remained normal. No record of malaria.

*Case 18.*—Private P., admitted June 21; a mild but typical case lasting twenty-four hours, and followed by a pulse of 48 to 50 per minute for four days.

*Temperature.*—June 21: a.m.,  $101^{\circ}$ ; p.m.,  $100^{\circ}$ . June 22: a.m., normal; p.m., normal, and remained normal. No record of malaria.

*Case 19.*—Dr. S., admitted June 22; a typical case lasting twenty-four hours, the fever reached  $103.4^{\circ}$ , and for the following two days the pulse was 48 to 50 per minute.

*Temperature.*—June 22: a.m.,  $103.4^{\circ}$ ; p.m.,  $101.8^{\circ}$ . June 23: a.m., normal; p.m., normal, and remained normal. No record of malaria.

*Case 20.*—Private R., admitted June 13; a typical case; the fever lasted forty-eight hours, and was followed by seventy-two hours apyrexia, and then by a relapse which lasted about forty-eight hours.

Severe bradycardia set in and lasted for four days, the pulse varying from 36 to 50 per minute.

*Temperature.*—June 13: a.m.,  $102.4^{\circ}$ ; p.m.,  $100^{\circ}$ . June 14: a.m.,  $101.4^{\circ}$ ; p.m.,  $100^{\circ}$ . June 15 to June 17: normal. June 18: a.m.,  $102.4^{\circ}$ ; p.m.,  $102.6^{\circ}$ . June 19: a.m.,  $100.6^{\circ}$ ; p.m., normal, and remained normal. No record of malaria.

#### NOTES.

(1) *Relapses.*—(a) Relapses occurred in seven cases, No. 4, 5, 9, 10, 15, 16 and 20.

(b) The tongue did not clean in the interval of apyrexia when a relapse occurred.

(c) The lumbar pains did not recur in the relapses.

(d) In most cases the period of apyrexia preceding the relapse lasted about seventy-two hours.

(2) *Leukopenia*.—Not having a hæmocytometer we could not determine the presence of leukopenia, which is reported as characteristic of the fever.

(3) *Drugs*.—(a) Aspirin, though quite useless in some cases, gave great relief to both headache and lumbar pains in other cases.

(b) Quinine seemed undoubtedly to aggravate both these symptoms, and was only given in two cases.

(4) *Sand-fly Bites*.—These leave most irritating wheals which persist for days if untreated. On interrogating the men in different barrack-rooms they seemed to know that they were not being bitten by mosquitoes, and it was rather curious how many of them were quite convinced that they were being bitten by mango midges.

Strong Scrubb's ammonia has not the slightest effect, though in a few minutes it relieves the irritation of mosquito bites. After a good deal of experimenting I found that painting with tinct. iodi. B.P. gives rapid relief and causes early disappearance of the wheal. This opens two questions, viz:—

(a) Would early painting with tinct. iodi. prevent the onset of the fever?

(b) Would the internal administration of iodide of potassium relieve the symptoms? I shall certainly try the latter if we get any more cases.

(5) *Prevention*.—Sand-flies unfortunately can pass through an ordinary mosquito curtain, but I have found that they cannot face camphor, and during June and July I have not been bitten once in my mosquito room, and the only two sand-flies I saw inside the curtain dropped in a dazed state on to my book and were easily killed. I keep four squares of camphor on my bed night and day, and the mosquito curtain is always left down. Just before getting into bed I pulverize a few small bits of camphor and sprinkle the bed with it. The smell of the camphor seems to cling to the mosquito curtain and can be smelt from the outside quite well if the curtain is put close to the nose. This camphor plan seems absolutely reliable, as I have for weeks slept with merely a flannel vest on and no sheet over me, but on rising in the morning I have found my bedroom walls covered with numerous sand-flies, yet not once have I been bitten.

(6) Most of the cases admitted had more or less conjunctival redness, but as this is present in this station in nearly all cases of fever no allusion was made to this symptom in the notes.