Great Britain and Holland in 1795, Chinsurah was captured, and Kiernander taken prisoner by the English, amongst whom so many years of his life had been spent. So he again settled in Calcutta, but the following year he had the misfortune to fracture his thigh while attempting to rise from his chair. Kiernander lingered on in suffering and in reduced circumstances till almost the close of the century, and died in Calcutta in 1799 at the age of 88 years. The bulk of these particulars are taken from that quaint book, Holmes' *Obituary*, and my excuse for quoting them is to do honour to the forgotten architect and contractor of the Presidency General Hospital.

(*To be continued.*)

EXPERIMENTAL INOCULATION OF MALARIA, WITH A RELAPSE AFTER EIGHT MONTHS.

BY C. F. FEARNSIDE,
MAJOR, I.M.S.

IN the *Scientific Memoirs* for Medical Officers for the year 1901 a series of cases of malarial fever, caused by infected mosquitoes, was described. A number of anopheles mosquitoes, in whose salivary glands the sporozoites of Spring-tertian fever were shewn to exist, the mosquitoes having been previously fed on infected blood, were made to bite eight persons, seven of whom developed Spring-tertian ague. One of these was the writer, and he now proposes to outline his case, which has not been fully described previously. Infected mosquitoes were made to bite his arm on 12 separate occasions and after an incubation period of 17 days he developed Spring-tertian ague. Observations were recorded daily of his condition, and the following are selections from his diary:—

January 10th.—Feeling out of sorts, with a severe headache every day and a dry feeling of the skin in the afternoon, but no rise of temperature.

January 11th—12th.—Feeling worse, but no fever. Blood healthy.

January 13th.—In a similar state but worse in the afternoon. Blood healthy.

January 14th.—Unable to take any dinner, so retired to bed early. Temperature at 8 P.M., was 99·6, but much higher during the night. Blood examined in the morning gave negative results. Fingers felt numb with cold.

January 15th.—Temperature normal and no parasites in the peripheral blood. Felt too ill, however, to do any work.

January 16th.—Temperature (evening) 99°F., skin dry, and spleen very heavy on left side. No parasites visible in blood.

January 17th.—No fever, feeling better this morning. Blood normal.

January 18th.—Again ill, unable to eat; temperature was normal at 3 P.M., when a blood examination was made with the following results:

(1) Pigmented Spring-tertian spheres; (2) numerous pigmented leucocytes; (3) young hyaline plasmodia. Temperature at 4-45 P.M., was 100°F. Urine high coloured with a trace of albumin. Temperature at 9 P.M. was 102·6.

January 19th. — Temperature sub-normal. Blood examination: (1) Flagellated sporules exceedingly numerous; one seldom sees so many in the blood of injected persons; (2) Spring-tertian spheres; (3) young plasmodia.

January 20th.—Pigmented sphere in phagocyte and pigment in leucocytes. Doses of quinine, 20 grains daily, being taken. Spleen very painful and swollen. No fever.

January 21st—28th.—Fairly well; no parasites in blood as shewn by examination on 21st, 23rd, 25th and 28th.

February 1st—7th.—Still feeling unwell, and there is mucus and slime in the stools. Blood examination on 3rd and 4th gave negative results.

February 16th—27th.—Still mucus in the stools, and there is considerable malaise resulting from the flatulence and catarrh of the bowel. Blood normal and no parasites visible in the peripheral blood. Small doses of quinine being taken.

February 28th.—Bad colic, which culminated in a choleraic-like attack. Felt feverish for the most of the day. Blood healthy.

March 1st—15th.—Motions now healthy and blood normal as shewn on 1st, 5th, 10th and 15th. Lost 10lbs. in weight since the fever began.

March 19th.—Blood contains Spring-tertian parasites. Temperature 100° F.

March 20th.—Feeling out of sorts.

March 21st.—Ill. Temperature 102·2° F.

March 22nd.—No fever.

March 23rd.—Became cold and chilly while doing office work. Severe pain over the lumbar region and spleen. At 4 P.M., cold and shivering began again, and the temperature rose. At this hour the blood contained (1) Flagellates; (2) Numerous, Spring-tertian spheres and young plasmodia; (3) pigmented leucocytes.

March 23rd.—Slept from 6 to 8 P.M., when sweating took place and the temperature fell from 104·6°F. to 100°F.

March 25th—31st.—Slightly better, lost 14lbs. since illness began. Temperature 99·6 F. on 25th.

April 1st—8th—More or less ill and felt at times as if fever were going to recur. The quinine appears to have some difficulty in restraining sporulation, for parasites are still occasionally to be found in the peripheral blood. Spleen and joints are giving considerable trouble.

April 9th.—Mucus in stools. Taking small doses of Magnes. Sulph. along with the quinine.

April 10th—25th—Convalescing.

April 26th.—Left for England.

May 20th.—Arrived in England; no fever again, appetite returning and bowel's normal.

July 15th.—Felt as if an attack of ague were going to recur; but checked by a few doses of quinine.

RELAPSE OF AGUE.

November 11th.—Feeling unwell and had a slight rise of temperature in the evening, *viz.*, 99°F.

November 12th.—Unwell, pain over left side and back.

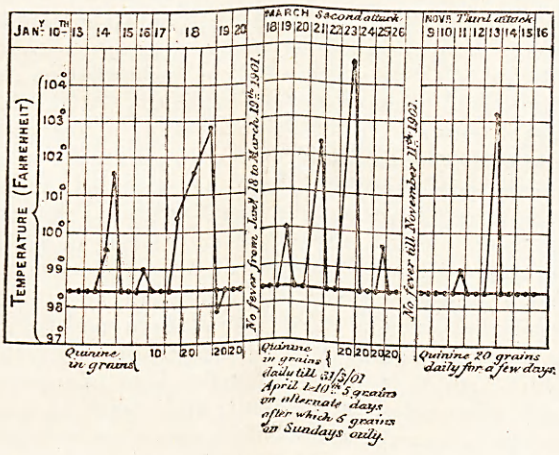
November 13th.—Sharp attack of fever. Temperature 103·2°, with shivering and perspiration. A few parasites in peripheral blood (spring-tertian).

November 14th.—Felt my spleen very heavy in my side. Dosing myself with quinine, 20 grains daily.

November 16th.—Better to-day, but still pain over spleen.

November 25th.—Pain in spleen still perceptible.

November 30th.—Convalescent.



The experiment caused considerable discomfort and inconvenience, and proves conclusively that the anopheles mosquito was the carrier of the infection. The writer was induced to try the experiment in order to discover whether there was any chance of his most severe attack of Summer-autumn fever, complicated by hæmoglobinurea, 10 years previously, had produced any immunity to malarial fever. Although Celli contends that immunity is possible, this experiment is opposed to any acquired immunity.

A remarkable feature is the absence of fever between January 21st and March 19th, and coincident with this, the absence of the parasite in the peripheral blood during the same period. Although no parasites were detected in the interval after repeated blood examinations, it is impossible not to conclude that the hæmamœbœ were quite busy enough to cause all the malaise and discomfort during the month of February.

The fresh outburst of fever on March 19th shews them breaking out into still greater activity and the rise of temperature is co-temporaneous with the re-appearance of Spring-tertian endoglobular parasites in the blood. The spring-tertian parasite, like its fellow, the summer-autumn, is able to remain unobserved in the internal viscera, spleen, liver, capillaries of the intestine, leading up to dysentery and chronic catarrh of the bowel in neglected cases.

Eight months elapsed ere the third attack of fever occurred in November, during which period the parasite remained quiescent, though by no means dead, in some organ or in such small numbers as not to be detected in the peripheral blood. There was no possibility of a fresh inoculation. The late Dr. Thorburn Manson, after a similar experiment, had a relapse of ague in the same town in Scotland where the writer also had a recurrence of the fever.

The hæmamœbœ may therefore remain latent for months, why not for years, in which case, where anopheles exist, he is a danger to the community. The crusade against malaria is indeed a difficult one.

REMARKS ON THE DIFFERENTIAL COUNT OF THE LEUCOCYTES IN MALARIAL AND OTHER FEVERS OF INDIA.

BY S. P. JAMES, M.B.,

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On Special Duty.

WITHOUT wishing for a moment to minimise the value of the results of the differential leucocyte counts which Captain Rogers has lately published in the *Indian Medical Gazette*, I should like to refer briefly to the subject of the differential count of the leucocytes in malaria, as this method of diagnosis has aroused considerable interest since it was introduced into India by Drs. Stephens and Christophers.

Captain Rogers says, in the *Indian Medical Gazette* for November, page 430 :—"I am so convinced of its great value (that is the value of a differential count of the leucocytes) as a *simple* and *rapid* method of diagnosis between malarial and other fevers of the tropics, that I have come to regard the search for malarial parasites, at any rate in cases which have already been dosed with quinine, as almost a waste of time as a purely diagnostic measure *in ordinary clinical work*."

This means that in ordinary clinical work Captain Rogers regards it almost as a waste of time to search for malarial parasites, because there is in the differential count of the leucocytes a more simple and rapid method of arriving at a diagnosis of malaria. It is not my object in