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File S. $\frac{D}{1}$

Nos. 6-7.

Report on the working of the Bengal Malaria Enquiry
Office.

बिहार सरकार
मंत्रिमंडल सचिवालय विभाग
(बिहार राज्य अभिलेखागार निदेशालय)

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REPORT ON THE WORKING OF THE BENGAL MALARIA ENQUIRY
OFFICE.

[Nos. 6-7.]

[FILE S. $\frac{D}{1}$ 30.]

No. 6704, dated Calcutta, the 18th November 1909.

From—LIEUT.-COL. F. C. CLARKSON, I.M.S., Sanitary Commissioner for Bengal,
To—The Secretary to the Government of Bengal, Municipal Department.

I HAVE the honour to submit herewith, for the information of Government, the report drawn up by Assistant Surgeon Mithilesh Ghose on the working of the Bengal malaria enquiry office, now abolished, from April to September last.

It will be seen that the enquiry was carried on in the Kaliganj, Kumarkhali and Kushtia thanas of the Nadia district on the same lines as those initiated by Captain Forster, I.M.S. Altogether 253 villages were visited, and 18 cases of *kala-azar* were diagnosed in the Kaliganj thana and two each in Kushtia, Kumarkhali and Krishnagar (Sadar) thanas, but in only one case was the diagnosis confirmed by microscopical examination of the blood, as, for prudential reasons, I did not consider it advisable to empower the Assistant Surgeon to perform spleen punctures, the only satisfactory method by which the clinical diagnosis of *kala-azar* can be confirmed.

In 214 out of 218 cases of fever the blood was examined, and in 101, or 47.5 per cent., it was found to contain the malarial parasite; 70 of these are classified as Malignant Tertian, 28 as Quartan and three as Benign Tertian.

With regard to the accuracy of registration as to cause of deaths it may be noted that 22 cases came under observation prior to death; 7 of these were reported as due to fever, of which 1 was ascertained as being due to *kala-azar*, and 3 to malaria. The numbers are too small to draw any deductions from.

In 20 cases (11.8 per cent.) out of 169 in which the blood of children was examined the malarial parasite was found, and out of 189 children examined, 120 had enlarged spleen, of which 16 only were classed as No. II (the enlargement extending below the umbilicus). The enquiry was peremptorily stopped just as the fever season was commencing, but the Assistant Surgeon augurs a very malarious season from the large proportion of infected children. One case of black-water fever was ascertained to have occurred, and other cases have been reported.

He considers that as remedy to the existing state of affairs drainage is impracticable, though improved sanitation of villages may effect much good. He recommends the administration of quinine and the education of public opinion and draws attention to the work of the anti-malarial league established under the auspices of the Medical Club.

The report does not increase our knowledge of the disease, but is useful in that it adds to a moderate extent to our statistical knowledge, and shows that though *kala-azar* is present, it is malaria of the Malignant Tertian variety that is primarily responsible for the great unhealthiness of those areas.

Dated Medical College, the 18th October 1909.

From—ASSISTANT SURGEON M. GHOSH,
To—The Sanitary Commissioner for Bengal.

In accordance to your office No. 1076 D., dated the 18th September, I have the honour to submit herewith a report of the work done.

On the 20th of April this office received Government letter No. 826 Medl., sanctioning retention of staff for continuing this enquiry. In the meantime we were kept busy in drawing up statistics for Captain Forster's report. Immediately on receipt of that letter the enquiry was commenced on the lines as laid down by Captain Forster in his No. 299, dated the 22nd March, that is to ascertain the prevalence of *kala-azar* in the district of Nadia.

That *kala-azar* is prevalent in Nadia was made evident to us during our enquiry in the Murshidabad district. On examination of spleen films of an imported case from that district we found Leishman Donovan bodies, the particular protozoa responsible for that disease. He hailed from a village within Kaliganj thana. It was therefore that the enquiry was directed to that thana first. Other places in the district where the enquiry was made were villages within Krishnagar, Kushtia and Kumarkhali.

A very great difficulty was experienced in spotting out cases of *kala-azar* for reasons noted below:—

- (1) could not get any information from village headmen or country practitioners because they were ignorant of the presence of the disease;
- (2) from the sporadic nature of the disease;
- (3) and a vast area to be covered by the limited staff.

Had not the District Magistrate, Mr. J. A. Ezechiel, kindly issued a general notice to the village panchyats, it would have been very difficult for us to carry on the enquiry, for which I am very grateful to him.

The total number of villages covered by visit was 253. As per order from Lieutenant-Colonel F. R. Ozzard, I was forbidden to puncture spleen for Leishman Donovan bodies of *kala-azar*. I therefore did not attempt it. For the diagnosis of *kala-azar* we trusted to the characteristic clinical symptoms of—

- | | |
|--------------------------------|--------------------|
| (i) history of chronic fever ; | (iii) emaciation ; |
| (ii) splenomegaly ; | (iv) blood count. |

I could not take as many blood counts as were possible, because I was not allowed to take the microscope out of the laboratory. It belonged to the Physiological Department, and Captain McOay kindly lent the use of it in his laboratory. Soon after I could procure microscopes for ourselves the enquiry was stopped.

So far in the area visited I must say that the disease is present, but not in an epidemic form. Besides evidence of blood count and clinical features I found Leishman Donovan bodies in the peripheral blood of a case at Kumarkhali, which proved beyond doubt the presence of the disease. Its distribution here is not governed by any law. The striking features about it that struck me were—

- (i) all the cases except one of Aziz were sporadic ;
- (ii) most of them were isolated cases not only in a family, but also in a village and in persons who had never been outside the village in their life ;
- (iii) absence of that darkening of the skin that had given the nomenclature to the disease ;
- (iv) the disease did not run a fulminating course, so there was never an epidemic of it the virulence of the parasite being attenuated.

I give a table below of the cases of *kala-azar* I met with in the area visited :—

No.	Name of village.	Name of patient.	Result of peripheral blood examination.	Result of blood count.	Thana
1	Minha	Satya Charan	No parasite found.	{ Red 3,460,000 White 4,800	Kaliganj.
2	Do.	Shoshi	Ditto	Not made	
3	Panghatta	Jugal Shaik	Ditto	{ Red 2,730,000 White 3,600	
4	Palassy	Sosi Hazra	Ditto	Not examined	
5	Do.	Khudiram	Ditto	Ditto	
6	Do.	Panchananda	Ditto	Ditto	
7	Do.	Sathon	Ditto	Ditto	
8	Bathurgacha	Jatindra	Ditto	Ditto	
9	Ditto	Balai	Ditto	Ditto	
10	Ditto	Bhanda Paramanik	Ditto	Ditto	
11	Kaliganj	Purnananda	Ditto	Ditto	
12	Jurunpur	Pranballav	Ditto	Ditto	
13	Kharodbegia	Maloti	Ditto	Ditto	
14	Debagram	Parbati	Ditto	Ditto	
15	Hatgocha	Hari Bagdi	Ditto	Ditto	
16	Barokulberia	Poran	Ditto	Ditto	Kushtia.
17	Ditto	Dijapada	Ditto	Ditto	
18	Kushtia	Liladhar Thakur	Ditto	Ditto	
19	Kalua	Aziz	Ditto	{ Red 1,070,000 White 2,300	Ditto.
20	Do.	Pravat	Ditto	Not examined	Krishnagar.
21	Do.	Jahar	Ditto	Ditto	Ditto.
22	Talberia	Udit	Ditto	Ditto	Kumarkhali.
23	Batkamari	Rajan	Leishman Donovan bodies found.	Not made	Ditto.
24	Palassypara	Nityananda	No parasite found.	Kaliganj.

For peripheral blood examination I tried Major Donovan's method of making blood films in *kala-azar* cases, but was not successful in finding any parasite. In the case of Aziz there had been two more deaths from the same disease in the family.

By the time the enquiry was taken up at Kushtia and Kumarkhali the season for malaria set in, and so it was being conducted on the lines adopted last year during fever season. This consisted in (1) collection of blood films from all fever cases met with in the

villages, (2) their examination under the microscope, (3) and the examination of spleen of children under 12 years for endemic rate, (4) and examination of their blood films to determine the endemic index for the area visited, (5) and lastly to record deaths occurring within the area as far as practicable to determine definitely the percentage of deaths from true malaria.

In this thana 133 villages were visited. It is situated on the river Gorai. At this season of the year the greater portion of it was under waters. The water came from the overflowing of the Gorai and the Padma. It is a very rich jute-growing area and also of that kind of paddy which grows in water, called "aman" in vernacular. This fact has got a very important bearing in the causation of malaria in such an epidemic form here. I think it is a problem for the whole of Lower Bengal, because the conditions are inseparably bound up with Bengal village life and also with the malaria epidemic.

From the table in Appendix I it will be found that altogether 216 films of fever cases were examined, and from the results obtained it will be seen that 47.5 per cent. were real malaria. It will also show that the most common variety of the parasite was Malignant Tertian. With such a high percentage of malarial fever there can be no doubt this will claim a very great proportion of the total mortality. While so employed at Kumarkhali, opportunity was afforded for recording 22 deaths. Though very few deaths could be recorded, considering the time, however, the number could be expected to be more. The deaths recorded were those that occurred within our knowledge and whose blood were subjected to microscopical examination. From the table below it will be evident that out of 7 cases, in which deaths were assigned to malaria, 3 were really malarious, and one death was from *kala-azar*. Of course from the few deaths recorded no probable percentage of mortality from either malaria or *kala-azar* can be deduced; but this, when coupled with the history of some of the cases given below, will prove the severity of the disease here:—

Total number of deaths recorded	...	...	...	22
Number of deaths attributed to malaria	...	...	...	7
Number corroborated by blood examination	...	...	...	3
<i>Kala-azar</i>	...	...	...	1
Typhoid	...	...	...	4

Case No.	VILLAGE.	Name.	Age.	Sex.	History of illness.	Result of blood examination.
1	Kalitolla	Chandra Kanta	15	Male	History of fever, two days with delirium.	Malignant rings.
2	Nandalalpur	Nafiruddin Shaik	45	Do.	Ditto	Ditto.
3	Muralipur	Ram Sunderi Dassi	70	Female	Fever seven days, delirious.	Not examined.
4	Molait	Wife of Loca	...	Do.	Fever two days, first delirious.	Malignant rings.
5	Mat-Molait	Kastha	20	Male	Ditto	Not examined.

The cases recorded above were cerebral type of the disease, a type very fatal in its effect. (In treating such cases it is a point of interest to know that quinine, unless injected, will have no effect.)

In this thana 189 children were examined for spleen rate and endemic index. It will be evident from the table given in Appendix II that 120 in all had enlarged spleen, *i.e.*, 63.4 per cent. This number includes both No. I and II spleens.* The most striking thing that will be noticed from the table was the comparative dearth of No. II spleen. The two most important diseases causing splenomegaly in Bengal are—

I. Malaria.

II. *Kala-azar*.

For the areas where both the diseases are present percentage of No. II spleen may be taken as an index to show the prevalence of *kala-azar*, *i.e.*, the higher the percentage of No. II spleen the more probability there is of *kala-azar* present.

One hundred and sixty-nine blood films from children were microscopically examined to determine endemic index, and 29 of them gave positive evidence of malaria. When figures are worked up, it comes to 11.8 per cent. With such a high percentage of children in which the parasite is latent, it is no doubt that with the advent of fever season the disease will break out in an epidemic form.

During the time that I was so engaged at Kumarkhali I came to know from an old and experienced practitioner that cases of blackwater fever, *i.e.*, fever with haemoglobinuria, were to be met with at times. I also got the information that in a village named Talbaria, the wife of one Kisto Mohan Kundu was suffering from haemoglobinuric fever. The case proved fatal before I could clinically examine her, but there was a very definite history pointing to the same. It has been observed by Captain Cristopher and Bentley in their scientific series No. 35 that this fever is to be met with in very malarious areas, and it is

* Spleen enlarged, but not extending navel is No. I, to navel and beyond are II.

also responsible for the production of that "haemolysin" (not isolated yet) which produces the haemolysis in haemoglobinuric fever.

The prolonged rain, high endemic index and the results already obtained from the examination of blood films from fever cases augur a severe epidemic this year in these parts.

The enquiry was so very abruptly stopped that I could not touch upon many things necessary for a finished report with every details.

Now as the enquiry is stopped, as per Government order conveyed in letter No. 1076 D, I take this opportunity to record my experience as to how to meet with the situation that is causing such a havoc here. This privilege I claim only because I had the opportunity of studying it in the execution of my duties in connection with Bengal malaria enquiry for over one year. Moreover, during this period by my travels in the villages in some of the most malarious districts I have gained a very intimate knowledge of the condition of affairs existing in the villages and of village life and also the peculiar prejudices of our villagers. This puts me in a position to speak of remedies which will be suitable for Bengal environments.

This enquiry has always been conducted with a view to "afford a basis for remedial action" for the disease as per Government letter No. 572/T.—San., dated the 2nd July 1908. Remedies we know consist in :—

- (1) the extirpation of anopheles, a species of Dipteræ responsible for the transmission of the disease from one infected person to another ;
- (2) immunising people against infection by quininisation ;
- (3) curing infected person by the use of same drug.

Now to extirpate anopheles we are either to kill them when bred or to prevent them from breeding by removing their breeding places. For small municipal areas it is possible to carry this out by organizing mosquito brigades of Professor Ross, as was done at Mian Mir by Major James, but for the method to answer well, when dealing with a vast rural area, with a population with very little public organization in the matter, is, I believe, a matter of speculation. Again so long the Delta of Lower Bengal is under formation, the bed of rivers, the natural drainage of the area, are bound to shift, effective artificial drainage is impracticable. This and other causes under operation have brought about the silting up of the Gorai at its mouth, thus making Kumarkhali so very unhealthy. The matter had been thoroughly dealt with by the drainage committee, and it is unnecessary for me to say anything. Apart from this it is possible that much good may be obtained by improving village sanitation, but it has been observed that "the absence of strong local organization" and "the apathy of popular opinion" stand in the way of efficient drainage of village sites which otherwise is practicable. The root cause of this want of organization and apathy is ignorance on the part of the vast number of people who suffer the most and whose co-operation if enlisted will do some real progress in the matter.

The end in view can be obtained if public opinion is educated by means of free distribution of pamphlets in easy vernaculars to those who can read and write and ventilating the knowledge through newspapers. At the suggestion of the Inspector-General, the subject of malaria is included in the syllabus of primary education, but for its effect to fructify will take time.

The most efficient and speedy means of educating public opinion is I think by means of lectures made interesting with magic lantern demonstrations to the school and college boys. Calcutta, the centre of University, with a great number of student population, will afford a suitable place for such demonstrations. From the rate at which education is spreading in no distant time the knowledge will filter out to the masses and shape their ideas on the lines of our combating the disease.

In the matter of free quinine distribution by itinerant Civil Hospital Assistants to which Government have given their full sanction and which is one of our best possible methods of combating the disease, I must draw attention to the result obtained by the blood examination. It would be evident from that, that *kala-azar* is a disease which has been met with wherever the enquiry has been conducted in Nadia district, viz., in Kaliganj, Krishnagar and Kumarkhali thanas. Though the disease is not raging in an epidemic form, it still must be one of the causes in raising the mortality under the head of "Fever." With our present knowledge we know this disease is not amenable to any known treatment. Quinine has got little or no effect on it. Such cases when treated with quinine have shaken the faith in quinine in several instances amongst the villagers. It has also given an opportunity to the village quacks who hold considerable influences on the scruples of the villagers to dissuade people from the use of quinine though they will not scruple to use it under a different name in pills and mixtures. In distributing quinine one has therefore to discriminate cases.

And lastly to profit by pushing on the prophylactic use of quinine will be at a discount for some time to come unless steps are taken to modify their ideas. Healthy people have a strong aversion to the use of quinine as a prophylactic measure against malaria.

In this connection I beg to mention here before concluding of a league started on the 9th September 1908, under the auspices of the Medical Club. The league is named Anti-malarial League. The object of the league is mainly diffusion of knowledge among the people, about the way how malaria spreads, and how it can be prevented in the light of recent experience. I append here the printed literature published by the league for free distribution. I am indebted to Assistant Surgeon G. C. Chatterji, Assistant Bacteriologist, who is the Secretary of the league, for the information and the printed pamphlets.

APPENDIX I.

Table showing result of blood examination of fever cases.

NAME OF THANA AND VILLAGE.	Number of fever cases examined.	Number of slides examined.	Number showing parasites.	NUMBER SHOWING DIFFERENT KINDS OF PARASITES.			
				Q.	M. T.	B. T.	
KALIGANJ.							
Radhakantapur ...	1	1	...	...	...	...
Hatgacha ...	1	1	...	...	...	...
Motherpara ...	1	1	1	...	1	...	
Mitri ...	1	1	...	...	...	...
Plassy ...	1	1	...	...	...	...
Panghatta ...	1	1	1	...	1	...	
Gobindapur ...	1	1	...	...	...	...
Juranpur ...	1	1	...	...	...	...
KUMARKHALI.							
Bhabaniganj ...	1	1	...	...	...	...
Hogla ...	7	7	4	2	1	1	
Chopaigachi ...	2	2	1	...	1	...	
Moilat ...	1	1	...	...	...	...
Santoshpur ...	1	1	...	...	...	...
Kajibari ...	17	17	10	4	6	...	
Gopalpur ...	6	6	2	...	2	...	
Ghaskhal ...	5	5	4	2	2	...	
Durbashpur ...	27	27	17	7	10	...	
Nandigram ...	1	1	...	...	...	...
Gopalpur ...	6	6	1	...	1	...	
Sherkandi ...	14	14	8	1	6	1	
Kumarkhali ...	41	40	19	5	14	...	
Elangi ...	2	2	1	...	1	...	
Durgapur ...	7	6	3	1	2	...	
Taharia ...	4	4	2	...	2	...	
Agrakundu ...	1	1	1	...	1	...	
Hashimpur ...	3	3	2	1	1	...	
Batkamari ...	18	16	2	4	7	1	
Sadarpur ...	1	1	...	...	...	...
Mulorehar ...	3	3	1	...	1	...	
Chorambaria ...	1	1	...	...	...	...
Kantagora ...	2	2	...	...	...	...
Talbaria ...	7	7	2	...	2	...	
Alangi ...	8	8	...	...	...	...
Mirpur ...	4	4	1	...	1	...	
Kanchanpur ...	1	1	1	...	...	...
Jialgora ...	3	3	1	...	1	...	
Dharampara ...	1	1	...	...	...	...
Boralia ...	8	8	3	1	2	...	
Alangi Ochangi ...	3	3	2	...	2	...	
KUSHTIA.							
Kushtia ...	2	2	...	...	...	...
Talbere ...	1	1	1	...	1	...	
Sadarpur ...	1	...	...	...	...	...
Total ...	218	214	101	28	70	3	

Q. = Quartan.

M. T. = Malignant Tertian.

B. T. = Benign Tertian.

APPENDIX II.

Table showing spleen rate and endemic index of Kumarkhali Thana.

NAME OF VILLAGE.	Number of children examined.	Number with enlarged spleen.	NUMBER SHOWING KIND OF ENLARGEMENT.		Number of slides examined.	Number showing parasite.
			I	II		
Kumarkhali ...	19	7	6	1	19	2
Durgapur ...	32	21	20	1	26	2
Alangi Ochangi ...	13	11	9	2	13	1
Shidil Batkamari ...	12	8	8	...	9	1
Tabaria ...	14	4	4	...	10	0
Batkamari ...	34	30	22	8	32	7
Boralia ...	34	20	19	1	30	3
Sherkandi ...	14	7	6	1	13	2
Alangi ...	17	12	10	2	17	2
Total ...	189	120	104	16	169	20

Spleen rate, 63.4.

Endemic index, 11.8.

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8

MUNICIPAL DEPARTMENT.

SANITATION.

FILE S. $\frac{D}{1}$

K.-W.—A PROCEEDINGS FOR DECEMBER 1909, Nos. 6-7.

Report on the working of the Bengal Malaria Enquiry Office.

(30) From the Sanitary Commissioner, No. 6704, dated the 18th November 1909.

THIS report is a continuation of that submitted by Captain Forster, the enquiry having been carried on by the establishment employed under him. As in the case of Captain Forster's report, it may be kept pending the receipt of the report of the Simla Malaria Conference.

E. H. P.—15-12-1909.

H. T. CULLIS—18-12-1909.

THE report need not be kept pending. No orders are required on it, and it may be filed.

H. WHEELER—24-12-1909.