

## **Dr. Rogers' report on kala-azar / [A. Stephen].**

### **Contributors**

Stephen, A.

Rogers, Leonard, 1868-1962. Report of an investigation of the epidemic of malarial fever in Assam, or kala-azar.

### **Publication/Creation**

[Place of publication not identified] : [publisher not identified], 1897.

### **Persistent URL**

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DR. ROGERS' REPORT ON KALA-AZAR

S. STEPHEN

Indian Medical Gazette, 1897 32



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same districts in accordance with seasonal causes, usually excess or deficiency of the rainfall, is well-known. If two unhealthy years succeed each other something approaching to local epidemic of malarial fever may occur. Is it then surprising that three or more successive unseasonal years, such as could only very seldom occur may produce a spreading epidemic, or that the succession of five out of six years of greatly deficient rainfall in the early seventies should have started the Rangpur-Assam epidemic which is still actively spreading up the Brahmaputra valley, or that a rapid silting up of the main river of such a district as Jessore might originate a similar epidemic? Such epidemics have doubtless occasionally occurred for centuries past. The difficulty of proving by direct evidence the introduction and spread of an intensified and infectious form of malarial fever into a notoriously malarious district by human intercourse is necessarily well nigh insuperable, but that a malarial fever may be introduced into an island previously free from it by means of human intercourse and may there spread in the form of an epidemic is proved by the case of Mauritius and Réunion. Up to 1865 malarial fever was unknown in these islands, and is still unknown in the neighbouring island of Rodrigues. At the date mentioned it was introduced by coolies from India, and such a fearful epidemic ensued, that one-third of the inhabitants of the islands are said to have died in the course of four years, while in 1867 alone there were 31,920 deaths out of a population in the area affected not exceeding 130,000. Moreover, the disease remains there to the present day but in a milder form. It is worthy of note that this epidemic took place at the very time that the "contagious malarial fever" was raging in Burdwan, and although I have not yet been able to ascertain whether any of the Indian coolies, who are said to have carried the disease to Mauritius, actually came from the infected areas in Bengal, yet I venture to suggest that this was very likely the origin of the Mauritius outbreak. This proposition is to some extent supported by the following opinion recorded by Dr. French when writing in 1871 of the Burdwan epidemic, "it appears to me to be identical with the epidemic fever of the Mauritius of 1866-67."

It must be carefully noted that I do not say that all malarial fevers are infectious, but only that, under extraordinary circumstances, malarial fevers may be intensified until they become so, and may then be spread by human intercourse to places situated on a suitable soil. This explains all the facts of both the Lower Bengal and Rangpur-Assam outbreaks. Unfortunately it is incapable of scientific demonstration as long as we are unable even to cultivate the malarial organism, but it derives much support from recent bacteriological work on other germ diseases. Leaving on one side all the instances

in which the germs of disease have been artificially intensified, let us take the case of pneumonia, which ordinarily is not an infectious disease, yet every now and then it becomes so, and attacks whole families, or large numbers of a regiment, as occasionally happens on the North-West Frontier of India, where instances have occurred of sick attendants over other cases being struck down by the disease, which has in sometimes only been eradicated when the troops were placed under canvas. The relation of Pestis minor to true plague appears to be a similar instance.

In the same way I maintain that in the case of travelling epidemics of malarial fever, the germs of the disease have become intensified, as it were in Nature's laboratory, by conditions unusually favourable to their vitality, until they attain to the power of being communicated from one person to another either directly through the air, or indirectly after passage through the soil. I shall not attempt to give here my views as to the exact way in which the infection takes place, as I hope to do so in another place, and this paper has already exceeded the limits I had intended.

The hope of being able to throw any light on the vastly important subject of the Lower Bengal malarial fever epidemic must be my excuse for raking up such a much discussed, but now partly forgotten, subject.

#### DR. ROGERS' REPORT ON KALÁ-ÁZÁR.

THE following is an abstract of remarks by Surgeon-Colonel A. Stephen, M.B., Principal Medical Officer and Sanitary Commissioner, Assam, in a letter forwarding the above report to the Secretary to the Chief Commissioner of Assam:—

Leaving Calcutta on the 16th of April 1896, Dr. Rogers visited Dhubri, Gauhati, Shillong and Tezpur, in order to learn the views of the Civil Surgeons of those places on the disease which he was about to investigate, and in due course arrived at Nowgong, the capital of the district in which the disease was at that time most prevalent, and which he was requested to consider as, for the time being, his head-quarters. He spent the next five months in the Nowgong District in investigating the disease. During these months he studied the cases of the disease which he met in the Nowgong dispensary and jail, and in a large number of infected places in that district, including a considerable number of tea-gardens. In October he proceeded to Shillong in order to study the minute pathology of the organs of persons who had died of *kalá-ázár* in the Nowgong District, and on whom he had performed *post-mortem* examinations. He afterwards visited Sylhet to study cases of ordinary chronic malarial fever there, and to notice the differences, if any, between them



and *kálá-ázár*. After leaving Sylhet, he paid a short visit to the Garo Hills, and then made tours in the Nowgong district, in the Mangaldai and Tezpur subdivisions of the Darrang District, and in the Golaghat subdivision of the Sib-sagar district, and in March 1897 he proceeded to Shillong to complete his report.

In the first section of his report, Dr. Rogers gives a short history of *kálá-ázár*. The disease was first described in the Assam Sanitary Report for 1882, in an appendix to which it is stated that the attention of administrative officers became directed to it in the Garo Hills as far back as 1869. The disease gradually spread up the Brahmaputra river, especially on its south bank, and, when Dr. Rogers commenced his investigations, it had reached the eastern portion of the Nowgong district, and was beginning to make its appearance in the Bishnath portion of the Darrang district. Dr. Rogers points out that for several years after the disease was first described in 1882, medical officers were of opinion that *kálá-ázár* was of malarial origin, and that it was not contagious. In 1889 Dr. Giles was appointed to enquire into, and report on, the cause or causes of *kálá-ázár* and *beri-beri* of Ceylon, and in October 1890 he published his report. In this report he gave it as his opinion that the increased mortality in the districts invaded by so-called *kálá-ázár* was due to *anchylostomiasis*. It was afterwards ascertained, especially through the investigations of Dr. Dobson, that *anchylostomata* were found in the majority of healthy people in Assam, and that the worm was present in persons not suffering from *kálá-ázár* in as great numbers as in those affected with that disease. At the time when Dr. Rogers was appointed to enquire into the nature of *kálá-ázár*, the majority of medical officers were of opinion that the disease in most respects resembled chronic malarial fever, but, as there seemed to be evidence that it was contagious, they considered that there might be some other factor in it besides malaria. All medical officers, with one exception, believed that the disease was quite distinct from *anchylostomiasis*.

In the third section of his report Dr. Rogers gives a clinical description of *kálá-ázár*. He defines it as a chronic and relapsing form of fever of an intermittent or irregularly remittent type, very resistant to treatment, producing progressive anæmia, great wasting, and, in many cases, dropsy, and terminating either in a final attack of fever or in asthenia, often accompanied by diarrhoea or lung complications. He states that the disease usually attacks several members of a household, and spreads slowly in a wave of increased fever mortality, and dies out in about six years from its commencement. He is of opinion that the disease may last from two months to three years, and that its usual duration is from four to nine months. From what

he saw on tea-gardens, he came to the conclusion that the number of cases begins to increase in April, that the disease is most prevalent during May, June and July, and that the months of minimum prevalence are December, January and February. He states that this seasonal incidence agrees closely with that of ordinary malarial fevers, except that it is more extended. He found that the disease attacked persons of all ages, but that children were, on the whole, more liable to be attacked than those of a more mature age. Both sexes suffer equally from the disease, and all classes are attacked by it, though, in his opinion, the mortality is greater among the poorer classes. He had reason to believe that opium-eaters did not suffer so much from the disease as those who were not addicted to that habit.

He found that the principal symptoms of the disease were the following:—

(a) *Fever* is the most constant feature of the disease, and is of an intermittent or irregularly remittent type. The fever usually relapses several times during the course of the illness, and a marked characteristic of it is that, after two or three attacks, the patient is often not aware that he is suffering from fever, though his temperature may be as high as 103°.

(b) The *spleen* is enlarged in every well-defined case of *kálá-ázár*, and in most cases it is very much enlarged.

(c) The *liver* was found to be enlarged in 93 per cent. of 70 cases examined, and in about one-quarter of the cases the enlargement was very great.

(d) *Anæmia*, as shown by the pallor of the conjunctiva, was present in 93 per cent. of the cases examined, and was markedly present in 62 per cent. of the cases.

(e) *Dropsy* was met with in about one-third of the cases. In some cases there was slight œdema of the feet, and in others there was marked swelling of the lower extremities. Œdema of the face was found to be very rare. This is a marked contrast to the œdema of *anchylostomiasis*, which is most frequently seen in the eyelids and cheeks.

(f) The *heart* was found to be smaller than normal, chiefly due to the general wasting of the body. Cardiac and venous murmurs were very rare. In *anchylostomiasis* hæmic murmurs are frequent.

(g) Changes in the *nervous system* are very slight.

(h) *Pneumonia* and *diarrhoea* are frequently met with in the later stages of the disease, and often play an important part in bringing about a fatal result.

These symptoms are very similar to those of chronic malarial fever, and, in order to observe cases of chronic malaria in a place in which *kálá-ázár* was not known to exist, Dr. Rogers visited Sylhet, and the Civil Surgeon of that station,

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after several days' search, was able to collect six well-marked cases of that disease. Dr. Rogers found that the symptoms were almost identical with those of *kalá-ázár*, but he found that in Sylhet chronic malarial fever required as many years to develop the extreme form of malarial cachexia as *kalá-ázár* produced in as many months.

Dr. Rogers found that the mortality from *kalá-ázár* was very great. He was of opinion that in villages in Nowgong and Mangaldai the death-rate was over 90 per cent. and in a severe outbreak in a garden in the Nowgong district he found that 96 per cent. of those attacked died. This is a marked contrast to the mortality form *anchoylostomiasis*, in which disease the death-rate is stated not to exceed 8 per cent.

In pages 57—76 of the report he gives the notes of 12 cases of *kalá-ázár*. These notes give a clear idea of the symptoms of the disease as observed by him. Opposite page 57 there is a photograph of ten persons who were suffering from *kalá-ázár* in the Nowgong dispensary, in August, 1896. This photograph shows in a very graphic manner the general appearance of advanced cases of *kalá-ázár*.

In section IV Dr. Rogers compares the blood changes found in *kalá-ázár* with those observed in *anchoylostomiasis*. As he was under the impression that the blood of healthy natives of Assam differed from the European standard, he first made experiments in order to find the standard of ordinary natives of the country. By a series of experiments he found that the average composition of the blood in healthy natives and in cases of *kalá-ázár*, chronic malaria, and *anchoylostomiasis* was as under:—

*kalá-ázár*. On the other hand, the blood in *anchoylostomiasis* contained twice as many white corpuscles in a cubic millimetre as *kalá-ázár* blood did. Hence Dr. Rogers formed the opinion that, by examining the blood, a diagnosis can be at once obtained between cases of *kalá-ázár* and *anchoylostomiasis*. He observes that in *anchoylostomiasis* blood is sucked by worms, and all the elements of the blood are equally lost. In *kalá-ázár*, on the other hand, red corpuscles are destroyed by the plasmodia, but the other elements of the blood are not directly affected, and the colouring matter of the red corpuscles is converted into pigment, which is deposited in the spleen, liver and other organs.

In section V Dr. Rogers discusses the pathology and nature of *kalá-ázár*. In the beginning of the section he states that he was not able to devote as much time to the microscopic part of the work as he should have liked to do. It is unfortunate that he was not able to devote more time to this portion of his work, especially the bacteriological portion of it. The microscopic pathology of *kalá-ázár* was already well-known, and a principal reason why the services of an expert were asked for was that, from the microscopic examination of the blood and organs of the body, and more especially from a bacteriological examination, the nature of *kalá-ázár* might be once for all determined. Had Dr. Rogers, in addition to what he did find out after careful examination, determined that there was no specific bacterium in *kalá-ázár* which could produce the disease, he at the same time stating the methods which he resorted to with a view to determining the presence of such bacterium, with diagrams showing the principal

	Amount of hæmoglobin.	Number of red corpuscles in a cubic millimetre.	Hæmoglobin value.	Number of white corpuscles.	Proportion of white to red.	Specific gravity.
1	2	3	4	5	6	7
Healthy natives ...	62 per cent.	4,734,000	·65	7,325	1 to 684	1,054
<i>Kalá-ázár</i> ...	33·45 "	2,462,000	·65	2,600	1 " 1,170	1,048
Chronic malaria ...	31·6 "	2,000,000	·73	1,600	1 " 1,400	1,042
<i>Anchoylostomiasis</i> ...	15·16 "	1,145,000	·31	5,338	1 " 524	1,034

The averages for chronic malaria were obtained from five cases, too small a number to be of much value. As far as they go, the experiments show that blood in chronic malaria was, on the whole, very similar to that in *kalá-ázár*, except that in chronic malaria the number of white corpuscles was very much less, and the specific gravity of the blood was considerably lower than in *kalá-ázár*. The character of the blood in *anchoylostomiasis* and in *kalá-ázár* was, however, found to be very different. The blood in *anchoylostomiasis* was found to contain about half as much hæmoglobin and half as many red corpuscles in a cubic millimetre as *kalá-ázár* blood did, and the hæmoglobin value was only half that in

micro-organisms detected, and had he demonstrated that the only plasmodium found in the blood in *kalá-ázár* was identical with the plasmodium malarie, which is usually believed to be the specific cause of malarial fever, diagrams of the plasmodium detected being also given, he would have succeeded in absolutely demonstrating that *kalá-ázár* was nothing more than a modified form of malarial fever. On making a microscopic examination of sections of the liver, spleen and kidneys, he found deposits of pigment distributed in a similar manner to that figured by Kelsch and Keiner in cases of chronic malaria examined in Algeria. He sent portions of the liver of five cases to Calcutta for deter-





mination of the amount of iron contained in them. Unfortunately, the *anchoylostomiasis* case was complicated with malarial fever, and three of the four *kalá-ázár* cases were complicated with *anchoylostomiasis*. The results obtained were thus of little value, and the liver in the *anchoylostomiasis* case was found to contain more iron than the liver of the three *kalá-ázár* cases complicated with *anchoylostomiasis*.

He states that he detected the plasmodium malarie in nearly all the more advanced typical cases of *kalá-ázár* during the presence of the fever, and that the forms found included most of those figured by Italian authors as typical of quotidian fever, but he does not give diagrams of the forms determined. In the notes of the cases of *kalá-ázár* given in pages 57 to 76, he states that the micro-organism was observed in five of the twelve cases.

In the second portion of section V Dr. Rogers states that the facts given prove incontestably that, whatever *kalá-ázár* may be, it is not *anchoylostomiasis* and that *anchoylostomiasis* is not an essential factor in its production, and I quite agree with him in that opinion. He goes on to say that the facts given in the clinical and pathological portions of his report prove that *kalá-ázár* is nothing more than a very intense form of malarial fever. As the bacteriological portion of his investigation was incomplete, he, in my opinion, fails to prove that there is not something in addition in the disease, causing its characteristic spread and excessive mortality, which he has failed to discover.

In the first portion of section VI, he gives an account of the ravages caused by the disease in the Goalpara, Kamrup and Nowgong districts, partly from the decrease in the population in affected tracts in 1891, as compared with the population when the census was taken in 1881, and partly by the decrease in the amount of land under cultivation. He also discusses the monthly mortality of the disease, which is illustrated by a chart. He remarks that the seasonal distribution was the same as in ordinary malarial fevers, except that it was a more extended one. I found that there was considerable difference in the monthly distribution of the diseases in 1896, as determined by the registered mortality in places in which *kalá-ázár* was prevalent in that year. From the statistics it appeared that *kalá-ázár* was most prevalent in May, June, and April; and that February and January were the months of minimum prevalence. Only 10.07 per cent. of the deaths occurred in May, the month of maximum prevalence, and as many as 7.33 per cent. of the deaths occurred in February, in which month fewest deaths were registered. The months of maximum mortality from fevers, other than *kalá-ázár*, were June, May, and July, and fewest deaths were registered in April, September, and October; 12.44 per cent. of the deaths occurred

in June, in which the largest number of deaths were registered, and 7.17 per cent. in each of the months of April, September, and October, the months of minimum prevalence. He notes that in the Nowgong district *kalá-ázár* was not most prevalent in *terai* lands, but in the villages on both sides of the Kullung river, and he also notes that the sanitary condition of that district, including drainage and water-supply, was certainly not worse now than it was before *kalá-ázár* made its appearance.

In the second portion of section VI, Dr. Rogers has very clearly indicated the distribution of the disease, especially in the Nowgong and Darrang districts, noting that the disease has generally travelled along the principal lines of traffic. There are, however, exceptions to this rule, as may be seen in the case of Silghat and the villages beside it. Silghat is situated on the bank of the Brahmaputra, is 32 miles from Nowgong, and is in daily communication with it, and yet the disease is only beginning to appear in Silghat, though it was prevalent in the town of Nowgong in 1891. I agree with the summary of the broad facts relating to the spread of the disease given in pages 145 and 146, except that the seasonal distribution of malarial fevers and *kalá-ázár* in 1896 was not the same. In that year, the mortality from *kalá-ázár* was comparatively high in the months of minimum mortality from malarial fevers.

The communicability of *kalá-ázár* is discussed in section VII. The facts given in this section are very interesting, and Dr. Rogers walked hundreds of miles, in a very difficult country, in places in which the disease had recently broken out, in order to find out the circumstances under which the disease had appeared in individual villages. The facts ascertained by him tended to prove what was already held by many medical officers who had considerable experience of the disease, that *kalá-ázár* appears to be frequently conveyed from one village to another by human intercourse. That communication is frequently not readily effected is shown by portions of villages remaining unaffected for months after other portions of them have been severely affected, when all intercourse between the affected and non-affected portions of villages could not have been prevented. Silghat, on the bank of the Brahmaputra, is at present only slightly affected, though Nowgong and Puranigudam, with which it is in daily direct intercourse, were severely affected in 1891.

In the beginning of section VIII, on the origin of *kalá-ázár*, Dr. Rogers states that he is of opinion that *kalá-ázár* could not have appeared in epidemic form in the Garo Hills before 1875, as up to that year the revenue had always been collected in full. He, however, states that the greater part of the country was not taken over till 1871-72, so that the revenue registers could

In fact in which the largest number of cases were registered and 7.7 per cent in the months of April, September and October the number of minimum prevalence. It is that in the New York district that has the most prevalent in total number and the on both sides of the Kallay river and the report that the sanitary conditions, including drainage and water supply, were not worse now than it was before they made its appearance.

In the second portion of section VI the data has very clearly indicated the distribution of disease especially in the New York and other districts noting that the disease has been travelled along the principal lines of communication. There are however exceptions to this rule. It may be seen in the case of Shigella and other species. Shigella is situated on the coast of the Chesapeake, is 52 miles from New York and is in daily communication with it and the disease is only prevalent in the town of Shigella though it was prevalent in the New York district. I agree with the statement of the head (200) relating to the spread of disease given in pages 145 and 146 that the actual distribution of disease is not the same in 1895 was not the same in 1896. The mortality from disease was not greater in 1895 in the matter of minimum mortality from intestinal fever.

The communicability of disease is discussed in section VII. The data given in this section is very interesting and Dr. Kallay's analysis of it is a very difficult one. It is in fact in which the disease had recently been out in order to find out the conditions under which the disease had appeared in the first village. The data was collected by the head of the village who had been in contact with many medical officers who had been in contact with the disease. It is interesting to note that the disease was first reported by a woman in the village who had been in contact with the disease. The communicability of disease is discussed in section VII. The data given in this section is very interesting and Dr. Kallay's analysis of it is a very difficult one. It is in fact in which the disease had recently been out in order to find out the conditions under which the disease had appeared in the first village. The data was collected by the head of the village who had been in contact with many medical officers who had been in contact with the disease. It is interesting to note that the disease was first reported by a woman in the village who had been in contact with the disease.

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give little information regarding the state of matters, in the district, as a whole, previous to 1871. That the disease had committed great ravages in portions of the Garo Hills previous to 1875 is shown from what the Sanitary Commissioner states in an appendix to the Sanitary Report for 1882, that as far back as 1869 the attention of administrative officers had been directed to *kalá-ázár*, which had decimated, and, in some instances, almost depopulated, numerous villages in the district. Dr. Rogers gives no proof that the outbreak which was prevalent in 1875 was different to what was observed in 1869. Further on, in this section Dr. Rogers attempts to prove that the outbreak of *kalá-ázár* in the Garo Hills, which appears, from information given by Colonel Maxwell as quoted in page 169 of the report, to have been very fatal in one portion of the Garo Hills soon after 1872, if not in that year, and to have been so prevalent in 1875 as to cause a deficiency of revenue in that year, was produced by malarial fever spreading by contagion from Rangpur to the Garo Hills district. Malarial fevers were very prevalent in Rangpur during the years 1872-77. From the extracts from the sanitary reports of this district, it appears that in 1873 and 1874 the fever in that district was of the character usually seen in severe outbreaks of malarial fever, the majority of the population (in 1874, 80 per cent. of them) having been prostrated by the disease. This is very different to the incident of *kalá-ázár* as seen in Nowgong and Mangaldai, where the inhabitants of many villages remained in a normal state of health long after the disease was very prevalent in neighbouring villages. In 1875, the fever mortality in Rangpur was about the same as it was in 1874, but the remittent type of the disease seems to have been more prevalent than it was in the previous year. The fever mortality in that district was very high in 1876 and 1877, and began to fall in 1878. No one seems to have questioned that this prolonged excessive mortality in Rangpur was due to ordinary malarial fever of a severe type, and was ascribed to scantiness of rain and excessive heat, which intensified and concentrated the marsh poison. As the mortality from *kalá-ázár* in the Garo Hills was sufficiently great to produce a reduction of revenue in 1875, the disease was probably prevalent in 1874, and, from what Colonel Maxwell says, was possibly very fatal in certain places in 1872. I cannot, therefore, see how this outbreak of a type of fever, the symptoms of which are so characteristic that, when several cases occur in a village, the ordinary native at once recognises them as *kalá-ázár* and as quite different to ordinary malarial fever, could have been caused by persons crossing the Brahmaputra from Rangpur to the Garo Hills, suffering from a fever which, up to 1874 at any rate, was ordinary malarial fever, and which appears

never to have been considered by medical officers in Bengal to have differed in any respect from severe outbreaks of ordinary malarial fever.

In pages 182 to 192 of the report, Dr. Rogers gives the resemblances between Burdwan fever and *kalá-ázár*. The distribution of the two diseases seems to have been in many respects similar, but the character of Burdwan fever appears to have been very different from that of *kalá-ázár*. Many cases of Burdwan fever suffered from severe head symptoms, which are not seen in *kalá-ázár*, and death in those cases often occurred after an illness of from three to ten days. *Kalá-ázár* is essentially a chronic disease, and death rarely occurs under a period of two months.

In section IX, while discussing the communicability of malarial fever, Dr. Rogers quotes as an analogous case the outbreak of fever in the Mauritius in 1865. It is certainly the case that a very severe outbreak of what was generally believed to be malarial fever occurred in Mauritius in that year, and that some people were of opinion that the disease was introduced by coolies from India.

In order to show that there is nothing inherently improbable in the view that the poison of malarial fever may become so intensified as to become communicable, he brings forward the fact that pathogenic bacteria can be artificially intensified, and he notes that some persons are of opinion that pneumonia, and perhaps the plague, may have two types, a contagious and non-contagious one. These diseases are believed to depend on the presence of vegetable micro-organisms, and, therefore, it is scarcely logical to draw any analogy between them and malarial fever, which is supposed to be caused by an animal micro-organism.

In section X Dr. Rogers makes certain recommendations, which, if carried out, he believes, would put a stop to *kalá-ázár* in affected places, and would prevent the disease spreading to places in which it has not appeared up to date. The recommendations are the following:—

(a) In affected tracts of country, he recommends that the people of affected villages should be encouraged to remove their houses from affected to new sites, which need not be more than 200 yards from the old ones, during the cold weather months when the disease is at a minimum. To encourage them to do this, he recommends that they should be obliged to pay rent for only one site for the year during which the change is made. As the sites of villages, which have been in existence for some time, are usually in a very insanitary condition, this recommendation might, when practicable, be carried out. Too much should not, however, be expected from the change, as Dr. Rogers has shown that *kalá-ázár* frequently breaks out in previously-unaffected villages when single cases of *kalá-ázár* take up their residence in them, and the



inhabitants of affected villages, when they make the change, must take their sick along with them. Though the mortality from *kalá-ázár* is at a minimum during the cold-weather months, the death-rate even then is very little below the average of the year. In 1896, 23.21 per cent. of the *kalá-ázár* deaths occurred during the months of December, January and February.

(b) He recommends that means should be taken to prevent the entry into tracts, not affected with the disease, of persons suffering from the *kalá-ázár*, and with a view to giving effect to this proposal, he suggests that the provision of the lately-passed Epidemic Diseases Act, which renders this action possible, should be put in force. It is certainly the case that *kalá-ázár* has usually been checked when it reaches a broad belt of uninhabited country, and there have been many examples of outbreaks of the disease in villages soon after the arrival in them of persons suffering from *kalá-ázár*, but as, in order to be effectual, the provision would have to be in force for a considerable time, and as even medical men can with difficulty recognise single cases of the disease, I am very doubtful whether the provision of the Epidemic Diseases Act referred to should be put in force for this purpose. The inhabitants of non-affected villages might, however, be encouraged to prevent people, believed to be suffering from the disease, visiting their villages.

(c) Appendix II attached to this report is a note on the spread of *kalá-ázár* and how it may be checked. Dr. Rogers recommends that this note should be translated into the languages of the inhabitants of the Upper Assam Valley, and distributed gratis to the heads of villages in both the affected and threatened tracts of country. I strongly recommend that this suggestion be given effect to.

Dr. Stephen then expresses his concurrence with the prophylactic measures suggested by Dr. Rogers to prevent outbreaks among coolies working on tea plantations, and concludes by alluding to the energy and zeal which Dr. Rogers had evidenced in the course of his observations. He adds that he considers Dr. Rogers has proved that: (1) the disease is distinct from ancylostomiasis, thus confirming the long-held and almost universal opinion of other medical officers in Assam; and that he has (2) shown the close alliance between malarial fevers and *kalá-ázár*; but that he has failed to prove its identity with malarial fever, and that the disease was carried by human intercourse from Rangpur to Assam, or that it arose from an intensification of the ordinary malarial fever of that district.

## SOME REMARKS ON THE POSITION OF CERTAIN REMITTENT FEVERS HITHERTO FREQUENTLY CLASSED AS MALARIAL, WITH ILLUSTRATIVE CASES AND TEMPERATURE CHARTS.

BY SURGN.-MAJ. J. H. TULL-WALSH, I.M.S.

ALL authors admit that the *remittent fevers* vary very much in type, and years ago Norman Chevers wrote concerning them as follows:—“*Remittent fever* is not in my opinion modified or aggravated *intermittent fever*.” So far as many of the cases are concerned I quite agree with this opinion, as do a great number of medical men in this country. *Remittent fevers* classed under *malaria* seem to fall into two main groups.

- (a) Ordinary *remittent fevers* presenting in the blood ‘crescents’ or other forms of the *plasmodium malarie*. The attacks are not very severe, lasting generally a week, or at most 15 to 35 days. Cases I and II and charts taken from my note-book are given as examples for comparison.
- (b) Severe or ‘pernicious’ *remittent fever*.—A serious form of fever with many symptoms resembling those of *typhoid fever*, and lasting from 30 to 70 days or more—Case III and chart. There are strong reasons for thinking that many of the ‘fevers’ classed by custom under this ‘heading’ should be removed entirely from the catalogue of *malarial* diseases.

There is further a diagnostic test in the way many *remittents* react to quinine, and Osler believes that where we find no benefit from quinine we are not dealing with *malaria*. Many of these cases present no signs of the *plasmodium malarie* in the blood. They do, however, present certain features which would lead one to regard them as in some way clinically allied to the *typhoid fever* class. Up to within the last few years all *remittents* occurring in malarial areas (not markedly *typhoid* or owing other accepted origin) have been included under the ‘heading’ *Malaria*. It is, I admit, often very hard to distinguish many of these anomalous cases from ordinary *malarial remittents*, and perhaps this difficulty has given rise to the term “*typho-malaria*” as used by some writers. It only requires a little thought to convince us that, having accepted the *plasmodium malarie* as the active cause of true *malaria*, we cannot possibly have a disease, which, from an etiological standpoint, is a ‘cross’ between *typhoid fever* and *malarial remittent fever*. The two diseases might, of course, exist together, and many prolonged *remittents* present, as we have seen, certain symptoms, hæmorrhage, etc., which occur also in *typhoid fever*. Further, men of any experience know that we meet with very curious and *atypical* cases of *typhoid fever* (Case IV and chart). A somewhat similar case



SOME REMARKS ON THE POSITION OF CERTAIN REMITTENT FEVERS EITHER TO FREQUENTLY CLASSIFIED AS MALARIAL WITH ILLUSTRATIVE CASES AND TEMPERATURE CHARTS

BY ROBERT-WALSH, M. D., TULL-WALSH, ILL.

All authors admit that the remittent fever is very much in type and very much in form. Querys wrote concerning them as follows: "Remittent fever is not in my opinion modified or aggravated intermittent fever." So far as many of the cases are concerned I quite agree with this opinion, as do a great number of men and women in this country. Remittent fevers classed under malarial seem to fall into two main groups.

(a) Ordinary remittent fevers presenting in the blood 'malaria' or other forms of the pneumo-malarial malarial. The attacks are not very severe, lasting generally a week or at most 10 to 15 days. Cases I and II and charts taken from my note-book are given as examples for comparison.

(b) Severe or 'pernicious' remittent fever—A various form of fever with many symptoms resembling those of typhoid fever and lasting from 30 to 70 days or more—Cases III and chart. There are strong reasons for thinking that many of the 'fevers' classed by authors under this heading should be removed entirely from the category of malarial diseases.

There is further a diagnostic test in the way many remittent fevers to quinine and other believes that where we find no benefit from quinine we are not dealing with malarial. Many of these cases present no signs of the parasitism malarial in the blood. They do, however, present certain features which would lead one to regard them as in some way clinically allied to the typhoid fever class. Up to within the last few years all remittents occurring in malarial areas (not malarial typhoid or owing other acquired origin) have been included under the 'heading' malarial. It is I admit often very hard to distinguish many of these anoxic cases from ordinary malarial remittent, and perhaps this difficulty has given rise to the term 'typho-malarial' as used by some writers. It only requires a little thought to convince us that having accepted the pneumo-malarial malarial as the active cause of this malarial, we cannot possibly have a disease which from an etiological standpoint is a 'new' between typhoid fever and malarial remittent fever. The two diseases might of course exist together and many prolonged remittents present in which even certain symptoms hemorrhage, etc. which occur also in typhoid fever. Further, men of any experience know that we meet with very few and typical cases of typhoid fever (Case IV and chart). A somewhat similar case

inhabitants of affected villages when they make the change, most take their sick along with them. Through the mortality from this is at a minimum during the cold-weather months the death-rate even then is very high below the average of the year. In 1898, 2221 per cent. of the sickly deaths occurred during the months of December, January and February.

(c) He recommends that means should be taken to prevent the entry into the country of persons suffering with the disease of persons suffering from the malarial, and with a view to giving effect to this proposal, he suggests that the provision of the lately-passed Epidemic Diseases Act which renders this action possible should be put in force. It is certainly the case that malarial has usually been checked when it reaches a good belt of uninfected country, and there have been many examples of outbreaks of the disease in villages soon after the arrival of persons returning from malarial, but in order to be effectual the provision would have to be in force for a considerable time, and as even medical men are not difficult to distinguish cases of the disease, I am very doubtful whether the provision of the Epidemic Diseases Act referred to should be put in force for the purpose. The inhabitants of non-affected villages might, however, be encouraged to prevent people believed to be suffering from the disease visiting their villages.

(d) Appendix II attached to this report is a note on the spread of malarial and how it may be checked. Dr. Rogers recommends that this note should be translated into the language of the inhabitants of the Upper Assam Valley, and distributed gratis to the heads of villages in both the affected and uninfected parts of the country. I strongly recommend that this suggestion be given effect to.

Dr. Rogers then expresses his concurrence with the prophylactic measures suggested by the report to prevent outbreaks among coolies working on tea plantations and concludes by alluding to the report and that which Dr. Rogers had reviewed in the course of his observations. He adds that he considers Dr. Rogers has proved that (1) the disease is distinct from malarial malarial, thus confirming the long-held and almost universal opinion of other medical officers in Assam, and that he has (2) shown the close alliance between malarial fever and malarial fever; but that he has failed to prove its identity with malarial fever, and that the disease was carried by human intercourse from Assam to Assam, or that it arose from an introduction of the ordinary malarial fever of that district.

