Thesis.

"Remittent Fever as observed"

"in Assam."

Symptoms, Treatment, Cases.

by Andrew James Elliot M.B., C.M. 1873.
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The province of Assam constitutes the North East limit of British India. It occupies the valley of the Brahmaputra and lies between longitude 90° and 97° and latitude 26° and 28°. This valley rises so gradually that the top of it, although some 500 miles from the sea, is not 500 feet above the sea level. It is traversed throughout with dense forest, interspersed with grass plains, lagoons, and swamps.

Soil. This is a dark alluvial, of an open porous nature and several feet in depth.

Temperature. This ranges from 42° to 96° in the shade. It is lowest in January and highest in July or August. The mean temperature is 66°.

Rainfall. The rainfall a-

- mounts in the average to 90 inches yearly, and this, with the exception of 1 or 2 inches, takes place during the hot season.

Seasons. The cold season extends from the beginning of October to the end of March; the hot and rainy season from April to the end of September.

Population. According to the Government return for 1882 the population (including Cachar and Sylhet) amounts to 4,784,046.

Area. This amounts to 21,414 square miles.

From this brief sketch it will be seen that in Assam we have the conditions that conduce to the production of malarial Fevers viz. a tropical temperature, a porous swampy soil, water-logged for six months of the year, a luxuriant vegetation, (with what that implies) the correspond-

-ing decay, and a heavy rainfall resulting in a steamy atmosphere. Under this combination of circumstances, accordingly, we find that Malaria extensively prevails in Assam, and all the diseases attributable to it.

In this paper I shall not venture an opinion on the vexed question "What is Malaria?" but shall proceed at once to describe what is known as "Assam Fever," indicating its leading symptoms and the line of treatment I have systematically observed. during the latter period of a residence of thirteen years in the province.

It is during the rainy season that Malarial Fevers prevail, the most severe forms at the end of it, when the marshes and wastes are drying up.

My experience of it has been

confined to one of the larger districts of what is known as Upper Assam, and limited chiefly to the tea-gardens, which are worked by imported Bengali labourers and a sprinkling of others brought up in the province, known as Assamese. It is only in estates more recently opened-out that the most severe forms of malarial poisoning are met with, for, generally speaking, the older the estates are the more healthy are the employés, as far as malarial disease is concerned.

Intermittent fever or Ague, of every type, is of frequent occurrence, but in this paper I have only to do with that form of malarial poisoning which I have referred to as "Assam Fever."

"Assam Fever." This is a form

of Remittent Fever,- caused by marsh miasms. It is a specific non-contagious disease and has no period of complete apyrexia.

Incubation. The period of incubation varies from 24 hours to 15 days, according to the intensity of the poison, and the susceptibility of the System to its action

hours determine

Diagnosis. It differs (a) from Intermittent Fever because there is only a remission, and not an intermission, by the presence of gastric irritation and bilious vomiting and by the absence of a distinctly marked cold Stage.—

(b) From Enteric by its paroxysmal character, by the absence of eruption, by the gastric irritation and by the character of the Stools, which

are dark and bilious, the history of exposure to Malaria, and the power of Quinine in controlling the fever. —

(c). From Cholera. Very severe forms of Assam Remittent, of the malignant type, are accompanied with profuse vomiting and purging, and closely resemble Cholera. But attention to the character of the stools, that they are dark and bilious instead of being rice-watery, and that the vomited matters contain bile and perhaps blood, and are not rice-watery in appearance, together with an appeal to the thermometer, should prevent a mistake in diagnosis.

(d) From Insolation. I have seen one case, a rapidly fatal one, which, from its history, I now believe to have been a case of

Malignant Remittent, in which the patient (a native) was overwhelmed with the poison. All the symptoms of Insolation were present in this case, and it was treated by me as such; but on further consideration, after reading some of the cases quoted in "Fayrer on Indian Fevers", I came to the conclusion that it had been a case of Malignant Remittent. The diagnosis in such a case is almost impossible, and the only guide is a history of exposure to Malaria, or otherwise.

Prognosis. This is favourable, if the case is uncomplicated and the disease assumes neither the markedly Sthenic nor the adynamic form; but even in such cases, the Patient usually recovers if the case is seen

and treated early.

Favourable Signs. These are such as nausea and sickness diminishing, headache becoming less intense, remissions lengthening; the skin acting freely during the remission. etc.

Unfavourable Signs. These are no diminution of gastric irritability, remission shortening and fever assuming the continued form, failing pulse, collapse, haemorrage from any mucous surface, coma, deep icteric tint of skin, complications.

Types. I recognise three distinct forms of Assam Remittent Fever

(a) The Sthenic
(b) The Adynamic
(c) The Malignant.

Symptoms. An ordinary case of "Assam fever" (see case 1.)

presents the following symptoms; the leading premonitory ones being malaise, uneasy feeling at the epigastrium, frontal headache, chilliness, muscular and bone pains, and anorexia. These symptoms increase in intensity and after a variable period, one, two or three days, are followed by strong fever, with nausea and vomiting. Constipation is invariably present, and the urine is scanty and gives rise to a scalding sensation on being passed. With the onset of the fever the headache becomes more severe, and at this early stage delirium is by no means uncommon. In all cases of Assam remittent, mild as well as severe, insomnia is a prominent feature and is a source of much distress to the patient. It is when the disease is at this

stage - the onset of fever - that the medical man is usually called in to see the case for the first time. The temperature at this point is usually found to be from 104° to 106°, the skin dry and pungent to the touch, but I have witnessed cases of the adynamic type in which the skin is bathed in cold sweat, and yet the thermometer (in the mouth) may register 104° or even 105°. In a sthenic case the pulse will be found quick and hard. In adynamic cases it is small, compressible and frequent. Tongue is coated with a yellow, sometimes brown, fur. There is almost continual sickness, and the vomited matters contain bile. The patient complains of a bitter taste. The Conjunctiva is injected and yellowish. Urine diminished in amount,

of high Specific Gravity, intensely acid and but seldom contains any trace of albumen. There is a marked tenderness over the liver and stomach, ~~but seldom~~ rarely over the spleen. A dull lumbar pain is generally present, but the greatest discomfort is caused by the headache, which the patient describes as "most intense". This state continues all night, and usually towards early morning a remission takes place, the thermometer showing a diminution of temperature of 2° or 3°, sometimes more. The duration of the remission is variable, and, according to my experience, seldom lasts more than three to four hours. when all the symptoms are renewed in a more intense form. In neglected cases the remission becomes more

and more indistinct, and the fever assumes the continued form. This period of remission is of the greatest importance as regards treatment, and so it must be carefully watched for and promptly taken advantage of.

Complications. Those which I have seen most frequently are, dysentery, hepatitis, jaundice, pneumonia and in children, convulsions.

General remarks. In robust Europeans the disease usually assumes the Sthenic form, and amongst natives of inferior physique, the Adynamic. I have met with several cases in which the symptoms seemed to point to a combination of Enteric and Remittent, what is known as Typho-

- malarial, but in none of these cases have I been able to confirm my diagnosis by post-mortem examination.
The cases appended Nos. 1 & 2 were treated in my own bungalow and were consequently under close supervision.
In the event of my compulsory absence for a few hours, a qualified native medical man was in constant attendance, who recorded and reported any change in the aspect of the case.
The residences of Europeans are usually built from seven to eight feet above the surface of the ground, so that the inmates may live and breathe, especially at night when malaria is more prevalent, above the malarial level.

Treatment. Immediately on

identifying an ordinary case of "Assam Fever" I prescribe and administer a 10 grain dose of Calomel, unless, as seldom happens, there be diarrhoea present. The drug should be placed on the back of the tongue, and washed down by a teaspoonful or two of water, iced, if ice is obtainable. If much water is allowed, or the Calomel administered in the form of a pill, the medicine is more likely to be rejected than retained in the system. In cases where nausea and vomiting are less marked, or absent, the following powder is useful, and I have ~~often~~ occasionally prescribed it,

℞.

Pulv. Jalap. Co. gr. 60.

" Hydrarg. Subchlor. gr. 3.

M.D.

To be taken at once in water. In other cases, chiefly native females, which might be described as subacute in character, I prescribe the following -

℞.

Pulv. Hydrarg. Subchlor. gr. 9.
" Antimon. gr. 15

M.

Divide into three powders, one to be given every four hours. This Powder is found to act well in such cases: it reduces the frequency of the pulse, and induces a free action of the skin, in addition to its effect as a cholagogue cathartic. But in the case of a strong adult, male or female, and when the disease is of the sthenic type, I prefer and advise the full dose of Calomel.

Headache. For the relief

of headache, an evaporating lotion should be applied, and, in addition, a hand pumkah be vigorously plied immediately over the head, to assist its action. In cases where the face is flushed and the eyes are markedly congested, I recommend cold affusion, followed by the application of the ice bag (if ice is available). In such cases the hair should be first removed.

Nausea ~~and sickness~~ vomiting. This I treat by the application of a sinapism to the epigastrium, and small frequent draughts of pyretic Saline in an ounce or two of water, and to which 2 or 3 minims of Acid Hydrocyanic dilute, may be added with advantage, especially if the sickness and retching be severe. To relieve the irritability of the stomach, and allay

thirst, we have no remedy equal to ice, small pieces of which may be placed in the mouth of the patient at short intervals. Ice, however, is seldom to be had in small outlying stations, and in only one or two instances have I been able to procure it in Assam for use in cases of this kind.

Insomnia. Sleeplessness, a marked feature in Assam remittent, is always difficult to allay. In ordinary cases I prefer Bromide of Potass in 30 grain doses. When this is not sufficient I have obtained good results from a combination of the Bromide with Hydrate of Chloral - 15 grains of each. In some of the most troublesome cases, and after failure with the Bromide, either alone or combined with

~~into~~ Chloral, I have found 30 minims of Liq. Morphia Hydrochloratepro duce the desired results. Still, after an interval of two hours, it may be found necessary to administer a second dose of 15 minims to induce sleep.

High temperature. Should the skin be markedly pungent and the thermometer show a temperature of over 104°, I am accustomed to use the wet sheet pack; and this is found to be most agreeable to the patient. I apply it in the ordinary way, being careful to continue the cold application to the head at the same time. In other parts of India, where ice is procurable, a rapid diminution of temperature has been induced by rubbing the surface of the body with lumps of ice, and

this without any untoward result, ~~otherwise~~. In cases of high temperature associated with Tropical Fevers, a medical confrère has lately used cold means with uniform success. Douching is also a means employed in order to lower a dangerously high temperature, and one which I myself have frequently adopted.

Lumbar and Hepatic pain should be treated, in the first instance, by fomentations. But if the latter be acute and there be marked tenderness on palpation, by a blister. Hepatitis is one of the most frequent complications of Assam Remittent.

The effervescing saline should be continued every half hour or oftener, until there is free action of the bowels.

This having taken place and there being still no sign of a remission, a simple diaphoretic mixture may be administered with advantage, provided the irritated stomach is able to retain it, and this is generally the case only in subacute cases, when I usually prescribe the following mixture -

℞. Liq. Ammon. Acet. ℥ fs
Sp. Ether. Nitrosi ℥iii
Aquam Camph. ad ℥viii

M.D.

Dose.

1/6th part every two hours, while the skin acts freely.

The nausea and vomiting that accompany the ordinary and more severe cases prohibit the use of this mixture. We find in practice that these distressing symptoms only begin to yield after the system comes under the influence of quinine. The aid of the clinical thermom-

etes is invaluable in this disease, and quinine is the sheet anchor of the practitioner, who is called upon to treat Assam Remittent, but experience has taught me that its full power of controlling, cutting short, and allaying Malarial Fevers can only be expected when its use is preceeded by an active purgative. During its use in full doses, whether given by the mouth or injected under the skin, the bowels should be kept acting two or three times in the twenty-four hours. If attention were given to this direction, I am persuaded we should more rarely hear of the failure of quinine to control and cure Malarial Remittent. Arsenic, so useful in Ague, is inadmissible here, on account of the gastric irri-

-tation which invariably accompanies ~~its action~~ this disease. I recommend the hypodermic use of Quinine in all cases, but more particularly in those of an acute type, when the stomach is quite unable to tolerate the drug. In subacute cases I frequently prescribe the internal use of quinine in doses of 10 to 12 grains, to be given during a remission, and repeated at next remission. In such cases it has been my custom to follow up the larger dose by 5 grain doses three or four times a day, until the temperature reaches the normal standard, and to continue its use in 2 or 3 grain doses, for a few days longer. Larger doses than 12 grains I do not recommend and have seldom recourse to, except in cases of what might be termed Malignant Remittent,

where the rapid saturation of the system with Quinine seems to give the only hope of saving the patient's life.

In an ordinary case of Assam Remittent, my practice is to begin to inject Quinine hypodermically as soon as the first remission takes place, believing, contrary to the opinion of some, that there is no risk in this use of the drug, always provided due care and attention be given both to its preparation and injection.

I would advocate attention to the following points: 1. that a fresh solution be prepared daily and always filtered; 2. that the needles and the hypodermic syringe be kept absolutely clean; 3. that the needle be passed some distance into the subcutaneous tissue before injecting the contents of

the syringe; and 4. that the injection be made slowly, and the needle slowly withdrawn. When attention is paid to these details, I have never witnessed any untoward result, such as ulceration, abscess, tetanus, etc.

During a long residence in India, many hundred cases of Ague and Remittent fever have been treated by myself in this way, and I have been witness to the effects of this treatment by members of the native medical staff, but in no instance have I seen or heard of any more serious consequence than a slight thickening or hardening of the skin round the point where the needle happened to be inserted, and this I have invariably found to pass off in a day or two without treatment & give rise to no inconvenience whatever to the patient

The solution I generally use is that recommended in Tanners Index of Disease, ~~and~~ made up with Sulphate of Quinine and Dilute Sulphuric Acid and water ää q.s. I have also used the Tartaric Acid solution, as advised by Dr Scriven of the Indian Medical Service. But whatever solution is adopted should be carefully filtered before it is used.

In an ordinary case of Assam fever, I give 3 to 5 grains of quinine by injection, and I consider this to be equivalent to from 6 to 10 grains or more, given by mouth. The dose should be repeated two or three times a day, independently of the remission, until the patient shows signs of having become cinchonised, to keep up which state smaller doses will be sufficient. When this effect is

produced, the nausea usually passes off, vomiting becomes less frequent and ultimately ceases altogether, simultaneously with which, amelioration of all symptoms is observed, while the fever lessens in intensity and finally disappears.
The irritability of the stomach having also ceased, I now recommend the internal use of Quinine, and that chiefly in deference to the patients objections to the prick of the hypodermic needle. The remission lasts for a variable period, at the termination of which the fever comes on again, generally in a ~~the~~ more intense form.
At this stage I continue the use of the saline, ad libitum, until the bowels act freely, my aim in inducing and keeping up free action, being to relieve the tendency ~~to~~ of congestion of abdominal organs, and prepare the system for Quinine.

By the judicious use of such means an ordinary case of Assam Remittent is controlled and ultimately cured, although the desirable result is seldom achieved under from 7 to 14 days. Convalescence is always slow; and it is advisable still to continue the use of quinine in small doses either alone or combined with other tonics. The Citrate of Iron and Quinine, in 6 grain doses, I consider a most valuable tonic to use and I combine it with a bitter infusion, adding a few minims of Liq. Strychnia to each dose.

Diet. In an ordinary case of Assam Remittent, the diet should consist of easily digested food, administered in moderate quantity, at intervals of two hours or thereabouts. ~~Gilroo essence of chicken, Brandi essence of~~

I adhere to the use of Soups, as being the form of nourishment most easily assimilated in the weakened state of the digestive powers, and bearing in mind the tendency there is in this disease to congestion of the internal organs, more especially those associated with the process of digestion.

Gillons essence of Chicken, Brands essence of beef, Chicken broths, milk and Soda water, are each and all most useful. The essences named are particularly so, in a Country where it is often difficult to prepare a suitable Soup for an invalid. As the case advances towards convalescence, after the fever has disappeared, the tongue becomes clean and the secretions normal. At this stage only is it permissible to allow improved diet in the shape of more solid food, jellies and light puddings, followed

after a day or two by fish and boiled chicken. Convalescence being tedious, the appetite must be tempted by carefully prepared and suitable food. In the case of Europeans, at an early stage I allow champagne in moderate quantity, combining Brandy with it where prostration during the remission is a marked Symptom. I use brandy freely in all Adynamic cases, using it from the very outset. Champagne is greatly relished by Convalescents from Assam Remittent; & a good change to which there can be no objection, is bitter ale. In convalescent cases the stimulant should be administered with the food, none being permitted at other times.

Many patients require a change of scene and even climate before they pick up strength again.

In Assam the most convenient short change is got by a river-trip on one of the mail steamers running on the Brahmaputra.
Then the hill station of Assam, Shillong, is within a two days journey of the most distant part of the valley. It is fully 5000 feet above the sea and surrounded by open hilly country. It is said to be free from malaria, and altogether suitable to convalescents from Remittent Fever, contracted in the plains. Cases are met with, in which it is deemed judicious to order the patient off to sea, and perhaps home to England, with as little delay as possible, after the fever has been arrested. It is impossible to lay down any hard and fast line as to the circumstances which call for the medical officer's decision between a temporary residence at a

hill station or a short trip to sea, ~~and~~ the expensive and serious undertaking of a trip to England, which entails lengthened leave and perhaps the loss of a valuable appointment. Before deciding on the latter course, it is well, if possible, to consult with a brother medical officer, a course I invariably follow myself.

In my experience the more severe forms of Assam Remittent (see case 3) - those approaching what have been termed Malignant Remittent - present the following symptoms - Temperature often 106°, 107° or more (107° being the highest I have seen), low delirium, great depression with weak pulse, and rapid cardiac action, dry brown tongue, subsultus, often marked tenderness over the liver, conjunctiva yellow, icteric tint of skin, profuse dark-coloured

foul-smelling motions passed involuntarily; incessant retching, skin bathed in cold sweat, and extremities cold and clammy. Haemorrhage from the mucous surfaces occasionally occurs.

I recollect the case of a native that proved fatal at a comparatively early stage, in which, besides the symptoms just mentioned, blood was present in the urine, and this is by no means uncommon. The treatment of such a case is attended with many difficulties, but two remedies must be instantly applied viz. Quinine and Alcohol. The former I use in full doses - as much as 6 to 60 grains being injected 3 or 4 times in the course of 24 hours. Alcohol must at the same time be administered in the shape of frequent doses of Brandy. Strong soups. such as Brand's Essence of beef,

and Gileon's essence of beef, should also be given hourly in small quantities. By the prompt employment of such special means, in addition to the methods of treatment already described, we may hope to combat successfully many, but not all, cases of Malignant Remittent.

Case 1. A. B. a teaplanter (Scotch) age 25, who had been five years in Assam was brought for treatment to my bungalow from an outlying garden, on the 5th September 1885.

History. A.B. had resided in the district during the time specified and consequently I had the opportunity of knowing his medical history for the previous five years. During this period he had suffered from mild attacks of Intermittent, and one sharp attack of Remittent in

1883 - otherwise he had enjoyed good health, and was a man of temperate habits. He was a keen Sportsman, often spending a day in the forests and plains in pursuit of game. This attack followed one of these jungle expeditions, which had been undertaken three days before his illness commenced. He Stated that he first felt out of Sorts two days previously, and mentioned the ordinary precursory symptoms of Remittent Fever. He was carried to my bungalow in a dooly, a distance of Several miles, arriving, during my absence, about 8 a.m.. On my return home about 11 a.m. I found the patient in bed, and on examination noted the following symptoms.

Present Condition. Temperature - 102°.3. Pulse full and bounding 105. Tongue covered with yellow

Date September. 1885

Day of Disease	5th		6th		7th		8th		9th		10th		11th		12th		13th																			
Temp. F.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.
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Remarks.

Name A.B. Occupation Tea-planter Residence Assam

Age 25 {S / M} Disease Remittent Fever (Ordinary type) Termination Recovery

fur, but moist. Conjunctiva yellowish. Bowels constipated, not having acted for two days. Considerable gastric irritation, and vomited matters contained bile. Epigastric uneasiness, with slight tenderness on pressure over the liver. Spleen normal. Urine diminished in amount and high coloured, sharp acid reaction, no albumen.

Treatment. 10 grains of Calomel were placed on the tongue, and the hair having been cut short, an evaporating lotion was applied to the head, and a sinapism to the epigastric region.

Evening (6 P.M.) temperature 104°.3 pulse 116, stomach very irritable, nausea intense and vomiting frequent. Prescribed small doses of pyretic saline - half hourly, when awake. Bowels acted very freely at 7 p.m. Diet. Chicken Soup.

6th Sept. At 5 a.m. Temperature 101°, pulse 100, stomach still irritable with nausea and vomiting of bile-stained fluid. Bowels acted twice during the night. The Servant in attendance reported that A.B. passed a restless night, and had not slept for more than a few minutes at a time. Administered a 6 grain dose of Quinine hypodermically.
Evening (6 p.m.) temperature 104°.4 pulse 118. Since 10 a.m. there had been strong fever with marked increase in intensity of Symptoms. Continued Saline all afternoon - bowels acted twice. During afternoon the wet Sheet pack was applied, as at 3 p.m. I had found the temperature to be 105°. Sickness less marked, but patient very restless and irritable. At 9 p.m. gave a draught containing 30 grains of Bromide of Potass, which the patient managed to retain

with difficulty. Diet, Chicken Soup.

7th.

Morning temperature 101°2, pulse 104, repeated hypodermic dose of Quinine. Patient slept for short periods during last night but was very restless. Sickness rather less. Repeated hypoder-mic dose at midday.
Evening temperature 104° - pulse 112 - sickness and vomiting decidedly less. Bowels acted twice during the day, dark bilious motions. Urine scanty and gives rise to scalding on being passed. As patient asked for a change of Soup, Gillon's essence of Chicken was ordered, to be taken cold.

8th.

Morning temperature 100° and skin noticeably moist, pulse 98. Quinine repeated.
Midday. Quinine repeated. Patient said that he felt de-

ciddly easier, headache and sickness less, but complained of ringing in the ears (cinchonism).
Evening - temperature 103°.2. Pulse 108. Bowels acted three times during last twenty-four hours. Tongue clearing. Urine still fines rise to pain on being passed.

9th.

Morning temperature 100°. pulse 96. Quinine repeated, profuse sweating.
Evening temperature 101°.3. Pulse 102.

10th. Morning temperature 99°.2 - pulse 90. Quinine repeated in 3 grain dose, internally.
Evening temperature 100°.2 - pulse 98. Quinine repeated in 3 grain dose internally.

11th 99°.
100°.

12th normal
99°.1.

Diaphoresis continued all day, necessitating several changes of flannel. Appetite returning.

tongue clearing, urine more ~~ab~~ abundant, of a lighter Colour and giving rise to no irritation.
From this date steady improvement followed; and on the 12th temperature was normal, rising to 99.1 at 10 p.m.
13th. Patient allowed improved diet, with Champagne, and to take the following tonic as he is considerably reduced.

℞.

Citrat. Ferri et Quiniae	gr. 30.
Liq. Strychniae	min. 30
Infus. Calumbae	℥vi.

M.

1/6th part three times a day and a 3 grain Quinine pill to be taken every morning for a week. He went for a river trip of ten days, returning quite restored to health.

Case 2.

Although a little irregular in type and mild, this case I consider as an instance of the adynamic form.

B.M. (English) an engineer and general assistant on a tea plantation, age twenty eight. He was careful of himself, of temperate habits, but delicate physique. He had been two and a half years in Assam, at Sea for two or three years previously, and was carried into my bungalow for treatment on the 3rd July 1887.

During his residence in Assam B.M. had frequently been under treatment, having suffered from the following affections, Ardent fever, Intermittent fever, and a mild attack of dysentery in 1886. Convalescence in each instance had been slow, owing to sluggish recuperative power. He had

been ill for the last three days, and gave the usual history of the early symptoms of a malarial attack, but added that he had had slight fever on the previous night, for the first time. No distinct history of more than usual exposure to malaria. B.M. lived on a garden of 300 acres, which is surrounded on all sides by dense forest. At this place, which I visit weekly, the coolies suffer in a marked manner from the effects of malaria, although coolie lines, both as regards position and buildings, are much in advance of those of the more healthy estates in the district. Water good, quite up to the average quality, and is supplied from deep brick wells.

3rd July. Evening, 7 p.m.

Condition. Temperature 101°, pulse

Small and soft- 115, tongue covered with thick yellow fur. Much nausea and vomiting, and patient complained of marked epigastric oppression and a feeling as if the stomach were loaded with some heavy matter. (this symptom continued throughout the illness), liver dulness not increased, but tenderness on pressure. Icteric tint of skin, spleen slightly increased in size, but soft. Breathing somewhat hurried. Nothing abnormal detected on examining the chest. Urine of deep yellow colour, acid reaction and no albumen. Patient apathetic and drowsy. Headache described as "intense", no lumbar pain. Bowels acting freely, five or six times to-day - the last motion is of watery consistency, dark bilious colour and foul-smelling.

Treatment. Hair cut short.

Date July 1887

Day of Disease	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18						
Temp. F.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.
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Remarks.

Name B. M. Occupation Engineer Residence Assam

Age 28 {S / M} Disease Remittent Fever (adynamic type) Termination Recovery

and evaporating lotion applied. 6 grains of Quinine were administered by the hypodermic method. A Sinapism applied to the epigastrium, and 3 minims of Chloroform given in a little cold water.

Diet. A soup of Brand's essence of beef in small quantities, half an ounce every hour.

4th July. morning. Temperature 103·2 - pulse 120. Was very restless all night and got little or no sleep. Two bilious stools during the night. Vomiting was less incessant, but marked epigastric oppression still present, tendency to slight delirium during the night. Champagne ordered. At midday the quinine was repeated. Evening. Temperature 103°.1, patient very irritable and complaining of hemicrania (left). Bowels acted twice during the

day:- Quinine repeated.
Diet. Brandy essence and chicken soup alternately, & Continue the Champagne. 25 minims of Liq. Morphia Hydrochlorate administered at 10 p.m., as patient was very restless and unable to sleep.

5th July. Passed a fair night, sleeping off and on. Patient still apathetic. Temperature 101°, pulse 110, skin seemed slightly moist. All Symptoms rather improving. Quinine 5 grains, administered internally, in deference to wish of patient. Cinchonism in moderate degree was present.

Evening. Temperature 101°.4. Pulse 110. Quinine repeated and given in Combination with 15 minims tincture of opium as bowels have acted four times since morning. Champagne and Soups Continued.

6th July. Slept fairly well last night.

Temperature 100°.3, Pulse 104.
Two motions during the night rather slimy in character.
Skin acting freely, but extremities feel cold to touch, and pulse was quick and weak. Patient said that he felt much better. Quinine repeated internally. To continue the use of the champagne, to each glass of which a little Brandy was added.
Evening. Temperature 101°.2, pulse 104. Quinine repeated in combination with tincture of opium tonight.

7th. Morning. Temperature 100°.3 pulse 96. evening temperature 101°. Diarrhoea checked, no sleeping draught given.

8th. Allowed jelly to-day in addition to Soups - to continue Stimulants.

Patient continued in much the same state, but was rather irritable on the evening of the 14th.

and on the morning of the 15th. the temperature registered was 103° (See Chart 2) falling in the evening to 100°, when considerable diaphoresis took place. I was quite unable to trace any cause for this increase of temperature. Bowels were acting regularly and every care was being taken as regards diet.

On the 14th the temperature was found to be normal, and beyond one evening increase of less than 1°, remained so. Patient slowly convalesced and was sent away for a sea trip as soon as he had regained a moderate amount of strength.

Case 3.

S. was an Assamese, age about 35, and a charcoal burner.

Admitted into hospital 9th July 1884.

His relations give the following history of the case. S. had taken ill five days previously, with strong fever and delirium, vomiting and purging. For some weeks prior to the attack he had been constantly engaged charcoal burning in the depth of the forest.

Condition. (11 a.m.)

Body well nourished. Skin dry and pungent, temperature in axilla 105°.2, pulse weak and compressible - 128. Patient could only be roused with difficulty from state of semi-coma. Stertorous respiration, but not very marked. Conjunctiva yellow and injected. Urine drawn off by catheter - 3 ozs., high colored and of acid reaction, no albumen.

Treatment. - Cold lotion to head after moderate douching. 10 grains of Quinine injected

hypodermically, in two doses, with an hour between each.
Diet. - Strong Soup; made from Brand's essence, to be given every two hours, Brandy ~~to~~ in half ounce doses every two hours.
Surface of body Sponged with tepid water. Warm bottles applied to feet, as they were cold and clammy to the touch.
6 p.m. Continued to be in much the same state. Treatment continued and Quinine (5 grains) repeated. He was fed with difficulty. Temperature 104°3. Sponging repeated. Pulse 120.
10th July. Morning. Temperature 104°. Pulse 126 - weak and compressible. Had passed a bad night, very restless, three motions during the night, apparently passed involuntarily, but Patient could still be roused out of state of Semi-Coma. Tongue brown and dry. Urine drawn off

by catheter (4 ozs.) and contains blood. Sordes appearing on the gums. 10 grains of Quinine administered in the same way as yesterday. Strong Soups and brandy repeated and a mixture of bark and Ammonia prescribed. Back of neck blistered.
Evening. No improvement, pulse and temperature same as in the morning. — Low muttering delirium.
11th July. Morning. Still in same state, but pulse weaker, uncountable and thready in character. 4 ozs. bloody urine drawn off. High temperature (104°.2) is persistent, no signs of even a slight remission. All symptoms pointed to a speedily fatal termination.
Patient died at 10 a.m.

Remarks. Assured that this

was an instance of exposure to Malaria, in an intense form probably. I had no difficulty in ~~assuming~~ arriving at the conclusion that I had to deal with a case of Malignant Remittent. My treatment therefore was regulated so as to support the General Strength, and, with as little delay as possible, to induce Cinchonism, so as to neutralise, if possible, the Poison absorbed by the System, and reduce the temperature. From the first there was marked Cardiac depression, which called for free stimulation. But the diarrhoea being mild in Character and infrequent, no special treatment was adopted for this.

The presence of haematinia, in addition to the other severe Symptoms, gave small hope of a Satisfactory result.

The disease had gone on for five days before the man was brought in from his village for treatment. And all this time, beyond a few small doses of opium to control the diarrhoea and relieve irritability, nothing had been done. From the time of his admission into hospital, vomiting was never a troublesome symptom, although it had been very marked before patient was brought in.
A post-mortem examination was refused by the friends.

In conclusion, it will be observed that I advocate free action of the bowels before commencing the use of Quinine, and, further, that regular action be maintained during

its use.
The rapid progress of Remittent fever - in some cases hours rather than days determine the result of a case - will explain the object I have in view in quickly inducing cinchonism. The two-fold action of Quinine in this disease, to neutralise the poison, and lower the temperature, seems to me to be best attained by the hypodermic method, which I consider is attended with little or no danger, provided moderate care and attention be devoted to the preparation and application of the remedy.
Cases of Hyperpyrexia I treat with the wet Sheet pack and general douching, and these, in a country like Assam, will be found more convenient than the European method of cold baths. A large

bath is not always procurable, but having stripped a patient, and laid him on a cane bed, free douching is a successful means of reducing temperature, and one I largely employ in hospital practice.

By attention to the methods referred to, and the timely administration of stimulants and nourishment, a satisfactory result may be hoped for in the great majority of cases.

The object of this paper has been to point out the forms of Assam Remittent, and it will be seen that I have not attempted to deal with the complications incidental to an extraordinary case. These, indeed, would comprise many forms of tropical disease, and would entail a dissertation much beyond the limits of this paper.