A THESIS

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A Thesis on Dysentery as it is found among the Coolie populations of the Tea Gardens of Upper Assam. With special reference to Aetiological Factors, Clinical Types and Treatment.

In submitting the following Thesis upon Tropical Dysentery, it will be well for me to point out to commence with, upon what grounds I base my statements and from what experience I draw my conclusions. My clinical knowledge of the disease has been gained during a residence of nearly five years in Upper Assam. As Medical Officer to various Tea Companies I have seen a very large number of cases of Dysentery, and the Clinical Material has been almost unwieldy in amount. Long distances have to be covered daily, and in most cases each Hospital can only be inspected once a week. For notes on the progress of any individual case, reliance must be placed on the case books of the Native Doctor in charge.

1.
The annual Death Rate on the Tea Gardens of Upper Assam among the indentured coolie population, varies from 3% on the healthiest gardens to 10% on the most unhealthy. Malaria and Anchylostomiasis cause the largest number of deaths at any rate primarily; but Dysentery which comes third as a primary cause of Death, comes easily first as a secondary cause. The Dysentery Ward of a Coolie Hospital is rarely untenanted, acute cases may be absent, but year in and year out it will be occupied by sad wrecks of humanity drifting slowly downhill from the chronic forms of the disease.

From the economic standpoint no disease is so important as Dysentery. The efficiency of a Labour Force depends not so much upon the amount of Malaria as upon the amount of Dysentery. The great proportion of the daily outpatients are suffering from Malaria in one or other of its forms, but Dysentery will
account for the largest number of Inpatients and for the very great majority of unprofitable derelicts who must be fed housed and clothed.

Seen under the conditions of a Tea Garden Hospital no disease is so difficult to manage or so disheartening, and no disease in my experience tends more to imbue the mind of a Western Practitioner with the fatalistic creed of his Eastern confreres and patients.
Dysentery as is well known is a disease limited to
to no particular geographical area; it occurs both
in its epidemic and sporadic forms in every portion
of the inhabited globe. Speaking generally the
conditions which favour the development of
Malaria favour also the development of Dysentery, viz
High temperature, Water logged soil, and dank
vegetation. In the Tea Gardens of Upper Assam we
find all the conditions necessary for the development
of the disease. The climate is subtropical with a
hot rainy season lasting from April to October and a
colder dryer season from November to March. The
ground temperature however rarely falls below 40 F
even in the coldest weather. The rain fall is
large from 100 to 120 inches per annum, and is fairly
evenly distributed throughout the hot months. The
Tea Gardens are situated in the Alluvial Plains which
lie on each side of the Brahmaputra; Plains for
the most part covered by Forest and Jungle of all
kinds, and intersected in all directions by slow
flowing rivers and streams. The Country is flat
almost to the foot of the boundary hills, marshes and
swamps abound and in the rainy season much of the
Country is inundated. The Tea Gardens themselves
are for the most part clearances of recent years,
and in many instances the Estate is bounded on all
sides by dense forest and tropical jungle.
Passing from the more general considerations of
physical geography and climate we shall find that all
the necessary conditions are present for the
development and dissemination of such a disease as
Dysentery, conditions which will be best studied
under their appropriate headings.

WATER SUPPLY.

In almost all instances the source of drinking water
for the Garden Coolies is from surface wells situated in or near the Coolie lines. The best type of Well is built of bricks set in Portland Cement, about six feet in diameter and averaging about 25 feet in depth, at which depth water is generally found even in the dryest months; in the rains water is often only three or four feet below the surface, or even less. Many wells however are very faulty in construction, built of poor bricks and very little or no Cement, and from the nature of the soil and the amount of surface water it is extremely difficult to prevent even the best wells from cracking. In some Gardens tube wells either of earthenware or iron are used but they are generally unsatisfactory owing to the silting up of the tube with sand. The water is generally pumped direct into cement or galvanized iron tanks from which it is drawn by the Coolies; in some instances various filtering media have been tried, in my
experience without any conspicuous success owing to the want of proper supervision. I have made many examinations of these well waters and have generally found a high percentage of nitrites and free ammonia and also a large amount of organic matter in solution; they are sometimes palatable but tend to become turbid during the rainy season.

**ORDURE.**

The proper disposal of foecal matter is a problem still to be solved for Tea Garden Coolie populations. Any system of latrines has been proved again and again to be impracticable owing to ignorance, apathy and caste prejudice. The Coolies pass their stools in the area of ground immediately surrounding their houses, generally among the Tea bushes. When one considers that the population of a Tea Garden varies from one thousand to five thousand souls, all living in row after row of low houses known as lines, the
foecal contamination of the ground immediately surrounding the lines may well be imagined. As far as practicable the actual area in which lines are placed is kept clean and well drained; the area also surrounding the wells is kept as free as possible from contamination, but the distance is at most only a few yards from ground impregnated with foecal discharges.

OVERCROWDING.

Judged from European standards all Coolie lines are overcrowded. A Coolie his wife or wives and family occupy generally a single room from twelve to fourteen feet square, the room being again subdivided by the Coolies themselves into compartments. Ventilation is also deficient, the Coolie having a rooted objection to fresh air in his dwelling room. The houses are generally fairly well constructed of brick or a species of wattle and daub with roofs of galvanized
iron or thatch.

AETIOLOGICAL FACTORS.

1. Physical Geography. Dysentery is of more frequent occurrence in gardens surrounded by and cleared from forest jungle than it is in gardens surrounded by grass jungles; this is an undoubted fact in my experience; the comparative healthiness of gardens surrounded by grass jungles is also well marked in regard to malaria and Anchylostomiasis.

2. Influence of Seasons. Epidemics of Dysentery occur at all times of the year, but I have found that cases are slightly more numerous at the beginning and the end of the rainy season.

3. Water. The disease being endemic it follows that the aetiological factor is constantly present. From
what I have seen of the disease I am strongly of opinion that it is waterborne in at any rate the vast majority of cases; from what I have said in the Introduction it will be seen that the water supply is never above suspicion. The more carefully however the water supply is watched the fewer will be the cases of Dysentery. Careful attention to the construction of the wells, prevention or at any rate mitigation of surface contamination, cleanliness of storage tanks, etc, is invariably repaid by a diminution in the number of cases of Dysentery. I have also often noticed that out-breaks are more frequent on gardens where a stream or river runs close to the Coolie lines. Drinking from such a stream is generally strictly but vainly prohibited, as the Coolie has often great faith in the medicinal value of the water of these streams, a faith too often repaid by an attack of Dysentery or Cholera. An
Epidemic of Dysentery is frequently liable to occur after the first heavy fall of rain, when the water of all wells becomes turbid and charged with organic matter; in fact any sudden alteration in the level of the ground water is often followed by an increase in the number of cases.

4. **Improper Food.** Any food which tends to set up a catarrhal condition in the intestines is liable to produce Dysentery, the mucous membrane being thus rendered less resistant to the attacks of the specific organism.

**Rice.** Tea Garden Coolies, (imported labor from Bengal) are almost invariably rice eaters; about 1½ pounds a day being the average allowance for a healthy adult. The quality of the rice supplied is of the utmost importance; I have seen several outbreaks of Dysentery brought about by the introduction of Burmah
rice from motives of economy. This, although a good rice when properly cooked is more difficult to prepare as it contains much more water than the red Bengal rice and requires prolonged steaming which the Coolie is unable to do with his often scanty supply of fire wood and short time for cooking, the result being that he fills his stomach with a half cooked mass of rice, which acts as an irritant causing in time catarrh of the stomach and intestines and later inevitably Dysentery. Several times on one garden I have seen severe outbreaks of Dysentery brought about by this Burmah rice and only checked by its withdrawal from circulation. The older and wiser Coolies avoid this rice if possible as they have learnt to know the consequences of its consumption. Bengal rice of inferior quality or rendered unsound by age or improper storage, is also a source of great danger. The inspection of samples of the rice in circulation
is, or should be, one of the routine duties of the Medical Officer.

Other foods. Sun dried rotten fish of which the Coolies are very fond is often the predisposing cause of Dysentery and stringent regulations have to be made at certain times of the year to prevent its being sold in the lines. Bread Fruit is also productive of Dysentery when partaken of freely and in many Gardens its sale is prohibited on that account.

5. OTHER DISEASES. Malaria and Anchylostomiasis, two diseases endemic in Upper Assam, are in themselves important predisposing factors in the production of Dysentery. The Confirmed Opium Eater also, more commonly seen among the Indigenous Assamese than among the Bengal Coolies is especially prone to a most intractable form of chronic Dysentery.

6. INFLUENCE OF RACE. Tea Garden Coolies are drawn from many parts of India, and comprise many races.
A large majority are recruited from the various provinces of Bengal. Hindus of various castes from the vast plains of the Central provinces and Aboriginal Hillmen from Chots Nagpur and the Sonthal Parganas. Many also come from the North West Provinces, nowadays however in decreasing numbers as they stand the climate very badly. Nothing is so striking as the varying resistance to disease of the different races. The Plain dweller from the Central Provinces is perhaps the least resistant and in some of the more unhealthy gardens the importation of this class of labor is prohibited. Many Tea Companies have learnt by bitter experience the false economy of importing labour of this class to newly cleared Forest lands. The mortality from Dysentery Malaria and chronic Anchylostomiasis sometimes exceeds 10% per annum in my own experience. The best class of labour is undoubtedly the Hillman
either Sonthal from the Sonthal Parganas or Mundhari from Chota Nagpur. Dark skinned, clean limbed and muscular, they are cleanly in habits, uninfluenced as to their diet by caste laws. This subject of the varying resistance to disease among the various types of Coolie labour is one of great interest and importance from the economic point of view. Broadly speaking in my experience the lighter the skin and therefore the more nearly approaching the pure Aryan type the less the resistance to the prevalent diseases of Upper Assam. Conversely the darker the skin and the more nearly approaching the Aboriginal type the greater the resistance to disease.

7. INFLUENCE OF SEX, AGE & OCCUPATION. Dysentery is in my experience equally common in both sexes, & at all ages, children and even infants often suffering from most acute attacks.

8. FAMINE. This is a most important and interesting
Aetiological Factor. During years of scarcity and famine in Bengal many Coolies are often imported from famine stricken districts to the Tea Gardens. They are often several weeks upon their journey and are frequently fairly well nourished and healthy looking upon arrival. The sudden change however from scarcity or actual starvation to plenty and comparative affluence puts often too great a strain upon a much weakened digestive system. These Coolies from famine districts are most especially prone to Dysentery especially during the first few weeks after their arrival and special care should always be taken for some time to guard them against dietary indiscretions or excesses.

9. GEOPHAGY. The eating of earth and fragments of sun baked bricks is a perverted appetite terribly common on some Gardens and especially among a certain class of Coolie from the Central Provinces of Bengal. It is
a perversion of appetite which is also most infectious, and most disastrous in its results. "Earth Eaters" as they are called, even by their fellow Coolies, are most prone to Diarrhoea and Dysentery, and when attacked have little or no resisting power. This habit is also one of the most potent factors in the causation of Anchylostomiasis. This perversion of appetite is I believe due primarily to the craving for an alkali to relieve the acute flatulent dyspepsia which is so common among rice eaters.
CLINICAL VARIETIES OF THE DISEASE.

Definition. Manson. "A group of diseases whose principal pathological factor is inflammation of the Mucous Membrane of the colon, and whose leading symptoms are, pain in the abdomen, Tenesmus, and the passage of frequent small stools, containing mucous and blood. In some instances communicable".

Clinical Varieties.

1. Acute Dysentery occurring among previously healthy individuals.

2. Chronic Dysentery supervening upon number 1.

3. Dysentery which is chronic from the commencement.

4. Chronic Dysentery superadded to the Cachexias of Malaria and Ankylostomiasis.

1. Acute Dysentery occurring among previously healthy individuals.
The clinical features of this disease are ably described in any of the standard text books on tropical diseases. I have only to call attention to certain points of special interest.

(a) The Suddenness of Onset. This in many cases is most striking especially during bad epidemics; a man is at work in the morning and in the afternoon is lying prostrate in hospital passing perhaps six or eight dysenteric stools in an hour. In bad cases also the collapse is often extreme; I have seen many cases with a facies resembling that of cholera after twelve hours of acute Dysentery.

(b) Pain and Tenesmus, although two of the classical symptoms, vary very much in amount. Especially among certain races I have frequently known a man to continue hard work while passing twenty to thirty Dysenteric stools a day, and I can remember men who have refused to abandon work until compelled to by
muscular weakness and collapse. This does not refer to chronic cases in which pain is often absent altogether, but to cases which are typically acute in onset and course except for the almost entire absence of pain.

(c) Fever. In my experience generally absent in ordinary acute cases. Malaria may be and often is superadded, either quotidian tertian, or quartan. But I do not think that uncomplicated acute Dysentery is generally accompanied by a rise of temperature, or at most the rise is a slight one, not above 100 F.

(d) Character of Stools. At the commencement of an attack the motions consist of watery faecal matter and are frothy, very soon mucus and blood make their appearance and the faecal matter disappears entirely from the motion. The Mucus is generally thinner and less glairy in chronic cases. The blood varies very much in amount; in some cases the stools consist
almost entirely of blood which is bright and arterial looking when passed, in others only a small amount of dark clot is passed with each motion. Towards the end of an attack thin foecal matter makes its reappearance and the abnormal constituents of the stool gradually disappear.

(e) Physical signs. The abdomen is generally slightly retracted even in the earlier stages of the disease, and gets more so as the disease progresses. On palpation in almost all cases points of maximum tenderness can be made out, very generally over the coecum or over the descending colon, indicative, I believe, of the areas of maximum inflammation in the large intestine. Prolapse of the Rectum is common in children suffering from the disease, & I have seen large prolapses in adults even during the acute stage.

(f) Prognosis and Mortality. The mortality in an
Epidemic of acute Dysentery varies considerably according to the class of Coolie attacked. The mortality during the acute stage is not generally high, but the ultimate mortality is unfortunately considerably higher owing to the number of cases which drift slowly into the Chronic form of the disease. Amongst children the mortality is much higher than it is among adults.

SPECIAL FORMS OF ACUTE DYSENTERY.

Gangrenous Dysentery. This is a very terrible form of the disease, and is fortunately not common but I have seen a certain number of cases. The case generally starts as an ordinary acute case, gradually the stools begin to get very offensive, foul smelling muco-pus, and large sloughs of mucous membrane make their appearance, and the haemorrhage is also generally increased. Pain and tenesmus are generally severe, the patient is soon desperately
ill; rigors occur and the temperature runs high. The
odour from these cases is indescribably offensive.
Death is generally ushered in by a period of low
muttering delirium. These cases are invariably fatal
in my experience.

Haemorrhagic Dysentery. In these cases the
Haemorrhage is the outstanding feature, and the
patient dies from loss of blood. In the few cases
that I have seen the result has been invariably fatal.

2. Chronic Dysentery supervening upon the acute
attack.

Cases of this class are only too common among the
Coolie population. An acute attack is apparently
cured and the Coolie is discharged from Hospital, a
month later he is back again with a subacute attack;
he gives the history that a few days after his
discharge from Hospital mucus has reappeared in the
stools, but with no pain or constitutional disturbance.
and perhaps two or three motions daily; another stay in Hospital and the stools are apparently normal, he is discharged only to return again in a few weeks. Gradually the case drifts into the chronic form of the disease, and in the large majority of cases death ensues inevitably although months may have elapsed since the original attack. This is the typical history of many hundreds of cases in my experience, and no cases are so difficult or so disheartening at any rate with the means at ones disposal in a Tea Garden Hospital.

Special features in this class of case.

(a) Character of stools. The stools vary very much in amount, anything from three or four to twenty per diem. Mucus is always present, sometimes mixed with fecal matter, sometimes alone, generally very tenacious and glairy. Blood is not always present
or only in sufficient quantities to tinge the Mucus pink.

(b) Pain and Tenesmus. In some cases these are entirely absent, in others the pain is almost constant and severe.

(c) Physical signs. The emaciation is extreme in any case of long standing. I know of no disease in which such extreme emaciation is compatible with life. The skin is harsh and dry, the tongue generally clean red and shining; the abdomen is retracted, and in many cases that I have seen the large intestine can be distinctly felt as a long sausage-shaped tumour.

(d) Fever, in many cases is generally absent unless Malaria is superadded.

3. Dysentery which is chronic from the commencement. This in my experience is an uncommon clinical
variety of Dysentery and I have seen few cases in which one could not get a history, although possibly a vague one, of an initial acute attack.

4. Chronic Dysentery superadded to the Cachexias of Malaria and Anchylostomiasis.

This form of Dysentery is the most fatal of all and is by far the most frequent cause of death among Tea Garden Coolies. It is the closing scene in the long drama of illhealth caused by the malarial parasite or the Anchylostomum Duodenale, or by the more common Dual Infection. The following illustrative history is a typical one and would serve for many hundreds of cases which occur yearly in Upper Assam.

A Coolie is first brought under treatment for Anaemia; he is put into a special sang and the stools examined for Anchylostoma. If this be found he is treated with Thymol in the
routine manner followed by daily dosing with Iron & Quinine; he is put to special light work and an extra allowance of food given. Week after week he is inspected by the Medical Officer, and as his turn comes round his stools are examined again and Thymol given if necessary. The anaemia persists in spite of treatment, and Dropsy and Subcutaneous haemorrhages make their appearance. In spite of everything that can be done the case drifts down hill. Then one day Mucus is found in the stools and the fight is pretty well over. The Mucous diarrhoea gets worse and worse, the patient becomes bedridden and dies. In almost all these cases the Malarial parasite plays an almost equal part with the Anchylostomum as is shewn by the enlargement of the spleen and the frequent but irregular paroxysms of fever. Special features in this class of case.

(a) Character of Stools. These in naked eye
appearances very much resemble those of chronic Dysentery supervening upon the acute attack. Blood is not generally present except in small amounts. The mature Anchylostomum is not generally to be found in these last stages of the disease, but the ova are almost always present. The stools are not generally so numerous as they are in ordinary chronic Dysentery.

(b) Fever. A low remittent or hectic type of fever is sometimes present, in others the temperature is sub-normal throughout.

(c) Physical Signs. These are of course primarily those of the Cachexia which ushers in the Dysentery. Many patients are Dropsical when the Mucous discharge commences; in some the oedema gradually disappears as the end approaches, in others the Patient gets more and more water logged in spite of the Diarrhoea.
The Mucous Membranes are blanched to the extraordinary whiteness which is so typical of Anchylostomiasis, and subcutaneous haemorrhages are common. The emaciation is hardly ever so extreme as in cases of ordinary chronic Dysentery. In these cases I have never been able to feel the thickened large intestine nor have I ever seen signs of local peritonitis. Both liver and spleen are frequently enlarged. The condition of the buccal cavity in these cases is extremely interesting, in almost all cases there is Pyorrhoea Alveolaris and the gums are generally very much retracted; submucous haemorrhages on the dorsum of the tongue are also very frequent. In the earlier stages of the disease I have always laid great stress on the treatment of this pyorrhoea and I believe with some benefit to the patient. The cardiac signs are those which will be found in any case of severe anaemia; viz, Haemic bruits and later
Dilatation of all the cavities. Oedema of the Lungs is very common in the later stages. There are no signs pointing to any organic change in the Nervous System, thus differentiating these cases from Beri Beri. Not many years ago these cases were very often diagnosed as Beri Beri until the important role of the Anchyllostomum Duodenale was pointed out. This disease also must not be confounded with Kala Azar, a disease which has played havoc in some parts of Lower Assam and which is considered by many who have studied it to be a form of Anchyllostomiasis. As far as I know it has not however visited the Tea Gardens of Upper Assam at any rate in its typical epidemic form.

(d) Prognosis and Mortality. The Mortality from this form of Dysentery is terrible. The Mucous discharge is almost impossible to check; sometimes it may be stopped but a relapse is unfortunately the rule rather than the exception.
COMPLICATIONS & SEQUELAE OF DYSENTERY.

Perforation and Acute general Peritonitis.

Acute general Peritonitis I have never seen as a Complication of Dysentery, and although it is mentioned in the Text books I imagine it must be extremely rare. Small perforations followed by localized Peritonitis I have seen fairly frequently and the adhesions and thickening can be felt long after the attack in some cases.

Liver Abscess.

Liver abscess is extremely uncommon among Tea Garden Coolies. I have seen several thousands of cases of Dysentery but I have only twice seen abscess of the Liver. In one or two other cases I have suspected the presence of an abscess, but as is so often the case have not been allowed to verify my diagnosis by operation or Post Mortem. The infrequency of Liver
Abscess has I know been noted by other Medical men working among Tea Garden Coolies.

Malaria.

This is a very frequent and important Complication of an attack of acute Dysentery. A very large number of cases are complicated during their course by one or two malarial paroxysms, and a certain number are most adversely influenced by a severe double Tertian or Quotidian, running parallel with the attack of Dysentery.

Scorbutus.

Coolies with the Scorbutic Taint are fairly numerous in some Gardens, and these cases generally do badly when attacked by Dysentery and regain strength very slowly.

Acute Hepatitis.

This is I believe a fairly common complication in Europeans suffering from Dysentery; I have not often
seen it among Coolies. Both in Malaria and Dysentery, the Coolie is certainly less liable to Hepatic complications than the European, which is due I believe largely to the large excess of Carbohydrate over Nitrogenous Foods in the Native dietary.

Synovitis.

I have in a few cases noted painful and swollen joints associated with acute Dysentery. This complication occurs generally during severe attacks of Dysentery and towards the end of an attack.

Postdysenteric Constipation.

This is an uncommon sequela amongst Coolies, although fairly common and extremely troublesome in European cases. Constipation is very infrequent in people adopting a vegetable diet, and even in health the Stools of a Coolie are rarely fully formed.
TREATMENT.

1. Acute Dysentery. Many drugs have been used in the treatment of this disease, and many specifics have been vaunted from time to time. I have thought it best, to take the drugs I have used in order and to give briefly my experience of each of them.

Ipecachuanha. This drug is in my experience extremely useful in some cases, but very often unreliable and disappointing. In my hands I have always found it do best in strong, previously healthy, sthenic cases, and frequently to fail completely in its action in relapsing cases and in cases occurring in weakly debilitated Coolies. I have not found it satisfactory with children as a rule. It should be given on an empty stomach preceded by a full dose of Laudanum. I have generally in adults, had the best results by giving 60 grains twice daily, for two days.
if after two days the Stools do not change in
character I have generally adopted other methods of
treatment, as I consider it to be valuable time lost
to continue. Complete rest is essential for several
hours after the dose is taken and a mustard poultice
should be applied to the abdomen.

Aperient Sulphates. I am most strongly of opinion
that the treatment by Aperient Sulphates is the most
generally successful in cases of acute Dysentery.

This treatment was entirely new to all the native
Doctors in charge of Coolie Hospitals in my first
District, and I had great difficulty in persuading
them to give up their routine treatment, of Ipecac
Quinine and Opium combined in a bolus. The results
of treatment however convinced me and them that the
saline method was superior to the older method, and
in all hospitals under my charge I have always made it
the rule that the saline treatment should be the routine method employed. Ipecachuanha in suitable cases and when given properly is more rapid in its action but is much more difficult to administer properly under the conditions of a Coolie Hospital. The Salines are more easily administered and I am convinced that the tendency to relapse is less marked in a case which has been treated by salines from the commencement. Magnesium or sodium sulphate should be used; I have generally given half an oz every morning in 1 oz of peppermint water, if this is not sufficient to produce a purgative effect small doses may be given during the day. This treatment should be persisted in until all blood and mucus have disappeared from the Stools, and even then the salts should be given for several days in diminishing doses.

Mercury.

Calomel I havenot given in a sufficient number of cases
to warrant my criticising this method of treatment. I have however frequently used Liquor Hydrargyri Perchloridi in doses of \( \frac{1}{2} \) to 1 drachm three times a day. It is often extremely useful especially when the stools are very offensive. Using smaller doses I have generally found this drug most useful in the acute Dysenteriess of young children and infants, and have used it in preference to Salines or Ipecachuanha in these cases.

Salol.

This drug is sometimes extremely useful in the Dysenteries of children but I have not found it do much good in adult cases although I have tried it thoroughly in a number of cases.

Izal & Carbolic Acid.

Carbolic Acid in one minim doses and Medical Izal in two to five minim doses are I believe often useful
especially as an adjunct to the aperient sulphate treatment.

Opium.

Opium or one of its derivatives must be given in most cases to allay the pain. As in Cholera I am however convinced that it should only be given when needed urgently for the relief of pain and only in doses just sufficient for that purpose. I am strongly against its routine administration. I have observed frequently that cases treated throughout with large doses of Opium are much more liable to relapse and drift into the chronic form of the disease.

Bismuth.

This drug is extremely useful in the later stages of the disease but is of no use during an acute attack until Mucus and Blood have disappeared from the Stools.
Simaruba and Cinnamon I have also tried in acute 
Dysenteries but without good results.
Poultices or hot fomentations to the Abdomen, Starch 
and Opium Enemata, and Irrigation of the large bowel 
without boracic Acid solution are useful measures in 
many cases, and help to relieve the pain and Tenesmus.
Rest.
Complete rest is most important and most difficult 
to obtain in Coolie Hospitals where the patient insists 
on going out to stool as long as he is able to move, 
Bed pans are practically unknown and would not be 
used if supplied. In severe cases the motions are 
passed through the string bed into an iron pan below.
In treating European cases where proper nursing has been 
obtainable, the value of complete rest is easily 
estimated.
Diet.
This should be as unirritating as possible. In Coolie
Hospitals small quantities of well cooked white Curry rice are given, thin Arrowroot gruel and milk, Brains Essence of Beef and Bovril are also given. One of the best foods in all cases of Dysentery, I have found to be the flour made from a species of Banana which is common in many parts of the jungle; it is cut into slices, sun dried, and pounded into a coarse flour, this is lightly baked into thin cakes or made into gruel with milk. I have found this more nutritious than rice or Arrowroot and quite unirritating; it is in my opinion the best of all foods in cases of chronic Dysentery. The return to ordinary diet should be most gradual after an attack of Dysentery. It is a common experience to find that the obstinate nature of the case has been due to the kindly administrations of friends of the patient who have smuggled in savoury and indigestible articles of food for his consumption. Stimulants are rarely needed.
in my experience and should only be used as a last resource in severe cases. Plenty of water should be allowed and I have always given it slightly acidulated with dilute sulphuric or citric acids.

(2) Treatment of Chronic Dysenteries.

In the treatment of Chronic Dysenteries more even perhaps than in Acute Dysentery a host of remedies may be and will be tried by anyone who has a large number of such cases under his care. I shall mention only those remedies which I have myself found to be of service.

Nitrate of Silver Injections.

The injection into the Bowel of large quantities of a weak solution of Nitrate of Silver (1/2 to 1 grain to the oz) is considered by the majority of writers on tropical diseases to be the best remedy in Chronic Dysentery. I am also of opinion that it is one of the best remedies that we have, but in Coolie Hospitals
in Upper Assam, it is a procedure which it is most difficult to carry out properly, and I have had many disappointments. The giving of the injection has in almost all instances to be intrusted to the Doctor Babu in charge of the hospital, and he in his turn most probably delegates it to an ignorant Coolie dresser, failure is not to be wondered at as it is a procedure which wants considerable care and skill to carry out. Distilled water is always very difficult to obtain in sufficient quantities to make the required solution.

Caster Oil.

Small repeated doses of Caster Oil I consider one of the best routine measures at ones disposal. I have generally given it in drachm doses three times a day to adults, and five to fifteen minims three times a day to children. A few days of this treatment is often sufficient to improve greatly the character.
of the stools and to diminish their frequency.

Bael Fruit.

I have given the freshly prepared Decoction of Bael Fruit in a large number of cases and I consider it to be of considerable service, at any rate as an adjunct to other methods of treatment.

Bismuth.

I have tried this drug in many forms and sometimes in very large doses, up to two ozs daily of the Subnitrate. I have tried it generally in very bad cases which were drifting down hill and in some cases I have seen considerable improvement at any rate for a time, but massive doses must be given to be of any service.

The vegetable astringents Catechu, Kino, Haematoxylon, Phatany, Hammamelis, Tanic, and Gallic Acids, have all a certain repute in the treatment of Chronic Dysentery; I have found them unsatisfactory as a class, though
they are useful in sometimes checking initial
diarrhoeas, or when mucus and blood have disappeared
from the Stool, but I have found them to exert very
little influence in checking mucous discharges.

Of the Metallic Astimgents, the Acetate of Lead is
undoubtedly useful, and given in full doses combined
with Opium will sometimes effect a cure.

The Perchloride of Iron given in full doses of the
Tincture, I have found one of the best remedies in the
Dysenteries superadded to the Cachexias of Malaria
and Anchyllostomiasis. In all cases of Chronic
Dysentery general Tonic remedies should not be
neglected. Quinine and Arsenic are both of service,
but in very debilitated subjects only very small doses
will be tolerated.

Diet.

In Coolie Hospitals is it easy to formulate many
rules for the dietary of Chronic Dysentery patients,
but in all probability every rule is broken daily except at the weekly inspection of the Medical Officer, when all things are in order and diet charts are carefully filled in. Plaintain flour as described under Acute Dysentery is in my opinion one of the best foods; fresh vegetables should be allowed, but shall a species of dried pea should be forbidden. Bovril and Brand's Essence are of undoubted value. Any of the Acid fruits Oranges Limes &c may be allowed. Patients with Chronic Dysentery suffer very much from cold especially in the damp misty nights of the cold weather, they should always be given an extra allowance of firewood and blankets.
CONCLUSIONS.

The separation of Dysentery into the Amoebic and Bacillary forms, seems now to be an accepted fact by recent workers at the pathology of the disease. I have constantly endeavoured to differentiate the two forms clinically, but have never been able to do so satisfactorily, and much routine bacteriological work is rarely possible under the conditions of life of a Tea Garden Medical Officer, post mortem examinations are also very rarely possible owing to the prejudices of the Coolies. The rarity of Tropical Abscess of the Liver as a Sequela, would, I think, lead one to believe that the majority of cases of Dysentery are of bacillary origin in the districts of which I am writing. Epidemics vary very much in severity, but I have never found any particular clinical feature to be constant throughout an epidemic, and a case of the most
virulent gangrenous type may occur at any time during the course of an epidemic otherwise mild in character. The more highly malarious the district the more generally Dysentery will be complicated by Fever, and epidemics tend to be more severe in character for this reason.

Sporadic cases of Acute Dysentery are fairly frequent, and may be of the most virulent type, they are interesting in that it is very often impossible to discover anything which may have caused the attack, other than causes which have operated also upon other members of the community. Some workers at the disease consider that Sporadic Dysentery is due to a different Bacillus to that of epidemic Dysentery, and clinical experience would certainly support this theory. Clinical experience would also point to the fact that in a district where Dysentery is endemic, the organisms causing the disease are constantly present in the
Intestine, and that an attack or even an epidemic is precipitated by either an overdose of these organisms, or else, and I think more commonly, by any cause which weakens the resistance of the Intestinal mucosa to the attacks of the specific organisms.

We have then in Dysentery not a specific disease due to a specific organism, but a group of symptoms and signs which give clinical evidence to a more or less acute inflammation and ulceration of the large Intestine whatever may be the cause. The symptoms would also point in many cases not only to a local process of inflammation and ulceration but also to a more or less severe Toxaemia; it cannot be too strongly insisted upon that in Dysentery the constitutional symptoms are often out of all proportion to the severity and extent of the Local Lesion; conversely in other cases extensive ulceration may occur in the Large Intestine without any grave constitutional disturbances.
In cases of Chronic Dysentery superadded to the Cachexias of Ankylostomiasis and Malaria, the aetiology and pathology are entirely distinct. In Ankylostomiasis there is primarily a catarrh of the small intestines due to the action of the parasite, in cases of long standing this catarrhal process spreads downwards to the large intestines, and gives rise to the Dysenteric symptoms. In the few post mortem which I have been allowed to make on cases of this kind I have found large areas of both small and large intestines denuded of mucous membrane, the walls of the Intestine are also thinned and atrophied. There are no typical Dysenteric ulcers either of the acute or chronic variety.