History

I have selected Leprosy as the subject of this thesis, as the affection is one that is seldom or never seen at home, yet is observed every day in the streets of Madras, where there are ten lepers to every 10000 inhabitants, and where I held an official medical appointment. It would be too tedious a task to attempt, even if I had the power, to trace the history of Leprosy since its advent among the human family all down through the ages. Suffice it to say that the disease has been endemic in Egypt from the earliest time of which there is any record, perhaps over 3000 years, and that it lingers in that country up to the present time. In India, where this

paper is written. It has also had a home since the remotest ages, and no doubt the Lepers we see in the Leper Hospitals of India and in the streets of her cities, is descended in an unbroken line from the same disease which has been traced back into those dim and distant centuries. From Asia the disease gradually spread into Europe before our era, and obtained a footing in Greece about the beginning of that era, and its spread was no doubt favored by the practice at that time indulged in by large numbers of people, of making pilgrimages from one place to another. It travelled slowly, and it is not quite clear when it reached England. It was, however,

very common in England during the 13th century. It was so prevalent that laws were enacted inflicting certain disabilities on persons afflicted with the disease and numerous leper houses were provided for the shelter and treatment of the poor victims of the disease. In France Louis VIII in 1226 left legacies to no less than 2000 leper houses, which shows how rampant the disease was at that time. A little later it spread to Scotland and leper houses were set up on all sides, and at one period there were about 100 leper houses scattered all over England and Scotland. Fortunately Leprosy began to disappear in Europe about the 14th century completely in some parts, partly in others but there is unhappily no cessation of

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As virulence in India and some other Eastern Countries up to the present time. The diminution has gone on increasing so that in Western Europe at the present time people live in entire ignorance of the disease, knowing nothing whatever about it except what they may chance to hear when the lessons are read at Church on Sunday. That is a remarkable change, considering how in the middle ages every circumstance connected with the disease was securely bound up with the common people of that time. The leper houses stopped the disease, for the patients being regarded with disgust and horror, were shut up in these leper houses, and so cut off with health people being prevented the disease rapidly disappeared.

Kinds of Leprosy

Two Kinds of Leprosy have always been described, by Tubercular Leprosy and Anaesthetic Leprosy. The latter being sometimes called trophic-neurotic or nerve Leprosy. Indeed there is a so called third Kind designated "Mixed Leprosy" in which Tubercular and Anaesthetic Leprosy are manifested simultaneously on one patient. The third Kind is the one which is most frequently seen in India, then the anaesthetic, while the Tubercular comes last in frequency. The anaesthetic variety usually developes tubercles subsequently, whereas the tubercular form generally presents itself simultaneously with anaesthetic patches, though a few cases of the pure tubercular variety are met with. Tubercular Leprosy is the most loathsome and repulsive form of the disease. In it the skin is the part chiefly affected,

while in the anaesthetic variety it is the nerves which are destroyed giving rise to anaesthesia in parts of the skin. Just as it depends on the idiosyncrasies of individuals, whether a man in this country, exposed to cold and rain, becomes the subject of pneumonia or malarial fever, so it depends on the idiosyncrasies of persons whether a case of leprosy is to be one of the tuberculer or Roman variety. If the parasite of Leprosy finds a suitable nidus in the skin of its victim, then the case will develop into the tuberculer type, but if it cannot develop there and finds a suitable soil in the nerves of the

arms + legs and face. Now the case will become one of anaesthetic leprosy.

Tuberculer Leprosy

In the tuberculer type of leprosy the bacillus gets a footing in the skin, and sets up a process, which produces certain premonitory symptoms before any change can be detected in the skin. These early symptoms are debility and malaise. The patient is likely to have slight rigors, pains in the extremities and stiffness in walking. Swimming in the head is a constant symptom and the patient is indolent and depressed and disinclined to exert himself in any way. He has no craving for food and has occasional sickness, even vomiting. Fever of an intermittent type pervades the body with much sweating and the extremities are cold warm now

Early Symptoms

comfortable. After a longer or shorter
period the parasites in the skin increase
in number, and a vasomotor paralysis
of the parts is established, giving rise
to a rash here and there on the skin.
And This rash consists of spots of various
sizes varying from ½ to 3" dia. It
is a distinctly erythematous rash for
it disappears under pressure. The
spots have sometimes a distinct and
sharp outline, at other times they are
not so sharply defined. The skin
by this time feels thickened and
sometimes has the appearance of
being swollen. These blotches or
spots do not remain out long, perhaps
a week or two, and then they disappear,
but at some irregular interval other
blotches make their appearance. After
the spots have kept coming out going

like this for some time, they become more persistent, and if they do appear subside, their disappearance is followed by stains of a brownish colour, which do not disappear under pressure, or the skin may have an unnatural colourless appearance over the cicatricial area of the blotches. The patient is much relieved of this depression on the occasion of the rash, but the improvement is only of short duration. All this time it would be difficult to diagnose the case as one of leprosy. "At time" it would be almost impossible to diagnose the disease up to the point as one of Leprosy as the affection is so rare, but the medical observer on a case being presented to him, would be entirely off his guard. He would probably consider the case as one of Psoriasis or acne and treat it accordingly. In this country, a rash which keeps

appearing and subsiding in this way on the surface of the skin would be looked upon with the greatest suspicion, while the possibility of its being Leprosy would always be present to the medical man's mind. Indeed, so conversant are even laymen in this country with the symptoms of Leprosy, that an ordinary untutored native would not fail to suspect the disease to Leprosy in an early stage. In the same way, owing to the great prevalence of malarial fever, laymen in India are very familiar with its symptoms, and they have an intimate knowledge of temperatures. I never remember seeing a clinical thermometer in a private house at home, but in India most families possess them and know how to take observations. After some time the signs become

mouth & Kabala. For the specific phenomena of Leprosy now begin to manifest themselves, and these phenomena vary according as the corium of the skin is attacked or the nerves. The skin and nerves may be attacked simultaneously, giving rise to a case of mixed Leprosy, or they may be implicated the one after the other. Or the morbid processes may be strictly limited to one or other tissue and for this reason the disease is described as having the two types already mentioned of tubercular and anaesthetic.

Nodule

In tubercular Leprosy the nodules develop in the substance of the skin very closely and usually over the seat of the clothes which have been described. The nodules are found on all parts of the body except the scalp. They are small in size at first but some of them,

coalesce to form little masses, and these masses vary in size from a hazel nut to a walnut. They may be flat or prominent or even pedunculated, according as they are subjected to pressure or not. They are usually flat on the back and chest owing to these parts being liable to pressure, but on the face and arms they are often prominent owing to an absence of pressure. Their color is usually of a dusky reddish hue, and owing to the epidermis over their centre being shed, they are given a smooth, shiny, varnished appearance. Their development as stated is slow, and is not attended by any pain or uneasiness, but during the intermittent attacks of fever they become more or less tender and swollen. This swelling usually appears

with the face and the tubercles become flatter than before. They occur at first mostly on surfaces which are exposed to the air as the face, hands and feet, but by and by they form on the trunk, and on the extensor aspects of the limbs. In some cases there may hardly be a bit of sound skin on the body. So widespread is the tubercular development. The development of the tubercles is accompanied by changes in the hair over the seats of the tumors.

Hair falls. The hair becomes thin and dry, loses its color, and finally drops off entirely. This loss of hair is particularly common and noticeable in the eyebrows, and is one of the very distinct signs of leprosy. This usually that part of the face called the mask - which the tubercles develop eyebrows, eyelids, nose, lips and lobes of the ears. The infiltration

and thickening of the eyebrows and contiguous parts of the forehead give a peculiar morose expression to the appearance of the patient. When in addition the nose becomes thickened and flattened like a negros, and the lips become everted, the patient resembles a lion in appearance. The disease is therefore sometimes called Leontiasis or Leontina, and when the face assumes this appearance there is no longer any possibility of doubt about the disease, as no other disease induces such symptoms.

Ulceration of nodules

After the tubercles have fairly developed they become indurated, and may remain in that condition a long time, when they begin to get soft and become dusky grey in color, the epidermis gives way and a thick dark colored pus is discharged. That is the way in which the tubercular

Ulceration

ulcer is formed, and while some are mending
under treatment, others are breaking out. Some
of the ulcers become gangrenous, and the bones
are laid bare, and all the structures and
tissues about the joints may be destroyed
and lead to the dropping off of parts of
the limbs, especially the fingers and toes.
This mutilation does not often extend
beyond the fingers and toes, probably
because the parts nearer the trunk, being
better nourished, offer a more effectual
resistance to the destructive processes,
and may only present a wasted
appearance. In course of time, and long
before the period of ulceration, the constitution
becomes very much undermined and there is
considerable debility. In time tubercular
deposits occur in internal organs, especially
the lungs, liver and kidneys. When this takes place

Mutilation

Complication

in the lungs. The conditions resulting are very similar to those of tubercular phthisis: when in the kidneys albuminuria and general dropsy follow: if in the mucous membrane of the bowels uncontrollable diarrhoea or dysentery supervenes, and death rapidly closes the scene. Occasionally the cicatricial deposit of tubercles takes place in the liver, causing jaundice and ascites, and in the brain or its meninges, rendering the patient comatose or imbecile if he lives. The tubercular leper does not last nearly so long as the anaesthetic one, and the fatal result is sometimes hastened by amyloid degeneration of liver and kidneys.

Deposits in mucous membranes

But the disease does not limit itself to the skin and subjacent tissues. For even the mucous membranes of the nose, mouth, and larynx become affected.

The affection of the mucous membrane is similar to that of the skin. Tubercles form on the mucous membrane, small at first, but liable to increase in size, and ulcerate, coalescing and forming flattened ulcerations. These tubercular patches disintegrate more readily and rapidly than those which form on the surface of the skin. The softening at the same ulceration, the nostrils becoming clogged with hard crusts, and finally the septum ulcerates away and the nose falls in. When the mucous membrane of the larynx is affected the patient becomes the subject of a peculiar cough and hoarseness of voice which are esteemed pathognomonic of the disease.

Eye affection

The eye does not escape the disease, the conjunctiva becomes red and fiery looking, and thickening form on the sclerotic. The eyelids swell and the eyelashes fall out, while later the cornea becomes invaded by the blood

and the anterior chamber gets filled by tubercular matter. The whole eye is ultimately becomes a hopeless tubercular mass, and the sight is entirely destroyed.

anaesthetic variety

I shall now go on to refer to the other type of Leprosy viz anaesthetic leprosy, that type in which the bacillus leprae finds a nidus in the nerves, especially the smaller branches, where it first inflicts and destroys the connective tissue which separates individual nerves, and isolates them in different strands. The nerves themselves are not much inflicted at first, but sooner or later, the elements of the nerves themselves become involved and undergo degeneration. The first efforts of the poison are the same as those first noticed in tubercular leprosy, viz certain prodromal phenomena such as shivering, fugitive pains in the limbs, lassitude, weariness, and general depression,

Premonitory Symptoms

Leprosy. This profound
stage lasts longer and comes on
more insidiously than does that of Tuberculous
Leprosy. The symptoms too may be so slight
as to be hardly noticeable by the patient,
and indeed they are often entirely overlooked
by him or her. The first thing to attract
attention being some impairment or change
of sensation or some loss of power,
preventing the patient from grasping
articles readily. Certain macules or macules
spots or bullae may appear early,
and give the first danger signal to
the patient that he has become the
subject of Leprosy. There is no regular
order known in the appearance of the
signs. In one case a given sign first appears,
in another case some other symptom is
first noticed, while in a third case
all the early signs may appear simultaneously.
When the spots appear they are of a

reddish color, disappearing under pressure, and they are slightly elevated above the surface of the skin. They are often the seat of a combination of hyperaesthesia and anaesthesia. Some spots having no sensation at all while others are excessively tender and give rise to a burning or tingling sensation. The spots vary in size, and may be as small as a penny or as large as the hand. They are small at first and gradually increase in size, and their color in the course of time departs from the original reddish tint to that of a dark brown. But the centre of the spots lose their pigment and their sensation more or less also, while their margins become both hyperchromic and hyperaesthetic. When the spots have fully come out, the patient may enjoy comparatively

good health and the disease may remain quiescent for many years even twenty years, during the patient is unconscious and very little uneasiness or discomfort whatever. Possibly some fugitive neuralgic pains may be felt but except for these and perhaps some hyperesthesia or pareta of the skin, the leprous victim may enjoy very good general health. The hair loses its color but does not fall out as in the case of tubercular Leprosy. The rule in Nerve Leprosy is for these stats to appear, but they are not to be seen in every case. Sometimes a case of nerve Leprosy runs its course from beginning to end without the spots ever manifesting themselves, and the first symptom to be noticed is some diminution of sensation in the upper or lower extremities.

Pains

Hair loses color

It is very usual for Bullae to make their appearance after the premonitory symptoms have passed away, and they

Bullae

usually come out one at a time although several may appear simultaneously. They may be as large as an egg and contain a light green fluid. When they disappear they leave behind a cicatrix, and they may keep coming and going like this for many years, before any other symptom of Nerve Leprosy is developed. The patient up to this time feels comparatively well, but after the bullae stage has been fully established, symptoms of neuritis begin to show themselves. These symptoms consist of severe hyperaesthesia, and the increased sensibility may be confined to certain parts of the skin, or they may involve the extremities. The patient is compelled to remain in bed, as movement causes him such violent pains that he cannot walk about. The general

Hyperaesthesia

health becomes affected from the resulting loss
of sleep, and the deterioration goes on progressively
for some years possibly, when at last anaesthesia anesthesia
manifests itself. The affection begins in the little
finger but soon spreads to other parts, and when
the feet become affected, the patient does
not feel the ground in walking, and so has
to use his eyes to see to touch the ground.
His gait is therefore seen to be clumsy, like
that in locomotor ataxy, and he feels it
almost impossible to walk in the dark.
So profound is the anaesthesia sometimes, that
incisions may be made into the affected parts
without the patient wincing. But severe
headache worse at night may be complained of,
and the patient passes sleepless nights and may
endure this agony for years. At length the
symptoms abate, and his health improves, but
this marks the onset of signs of degeneration
of the nerves through malnutrition shown by
atrophy and absorption in the anaesthetic patches atrophy of
with loss of fingers and toes. absorption

Contagion

The evidence which has been collected to elucidate this question, undoubtedly shows that leprosy is contagious. It is not infectious as the terms that fevers are, but there is no doubt it is contagious. It is however not so eminently contagious as Syphilis, resembling tuberculosis more in the degree of its contagiousness. It is possible to associate very intimately with Syphilitic patients, and also with those the subject of tuberculosis, and yet the healthy person does not become affected by those diseases. It does not on that account follow that those diseases are not contagious, for sometimes a medical man attending a Syphilitic woman in labour, may be inoculated with Syphilis through a small abrasion in the skin of a finger. I have known a woman occupy the same bed as her husband for eight years, while he was the subject of chronic phthisis, and bear him three children during the period of his illness and yet she remained healthy, and does so still, although her

widowhood has now extended to 14 years. For all that the disease may be readily communicated in other cases, an instance of which recently came under my notice. A healthy country girl, robust and well colored, the daughter of healthy parents in whose family tubercular disease was never known, married a young man of a distinctly phthisical family. She died within six months, of acute phthisis and her husband whose brothers and sisters almost all died of tubercular disease in attaining manhood and womanhood, followed her shortly after a victim to chronic phthisis. In the same way it may be possible to mix freely for years with lepers and not contract the disease, yet in other cases the disease is quickly transmitted in a few months possibly, from a leper to a healthy person who has associated with him. In the Leper Hospital of this city (Madras) there are at the present time eleven servants who have worked there for many years some as many as 14 years, and whose duties bring them into intimate connection

with the persons, clears discharges, excretions and secretions of lepers, and yet those servants show no tendency to acquire the disease although absolutely reckless as regards precautions. On the other hand there is a case on record of a young Scotsman whose parents had never been out of their own country associating freely with a leper woman, and contracting the disease in ten months. A case reported in Dublin in 1877 ✗ strongly points to the undoubted contagiousness of the disease. A man contracted Leprosy in the West Indies after a long residence there. He returned to Ireland and lived with his brother who had never been out of Ireland, and that brother contracted the disease. Evidence of that kind is not easily contested, for here a man comes to a country in which the disease did not exist, from a country where it is endemic, and communicates the disease to a healthy person. I think that is clear evidence of contagion, and Leprosy may be taken as a contagious disease. It is the long period of incubation and the insidious and indefinite character of the onset of the disease that

✗ Reference wanted here

has rendered the solution of the question of contagion somewhat difficult.

The Heredity of Leprosy is not so clear as its contagiousness for if children are removed early enough from their leper parents they do not as a rule develop the disease. Children are never born lepers, but are affected later on between their 10th and 25th year, and possibly by contagion. So that heredity in Leprosy cannot be admitted as an absolute fact. I subjoin a table showing the ages in quinquennial periods at which Leprosy appeared in the 400 inmates of Madras Leper Hospital Heredity

Class of patients	5 yrs & under	6 - 10 yrs	11 - 15 yrs	16 - 20 yrs	21 - 25 yrs	26 - 30 yrs	31 - 35 yrs	36 - 40 yrs	41 - 45 yrs	46 - 50 yrs	51 - 55 yrs	56 - 60 yrs	61 - 65 yrs	66 - 70 -	
European	2	3	14	6	7	2	1	1	1		1				
Natives	12	25	36	57	67	36	44	47	22	18	16	5	1	1	
Criminals		1	3	4	4	4	4	3	2		1				

It will be seen from the above table how late Leprosy is in developing, so that it is difficult to say whether a given case is the result of heredity or

contagion. There is a leper asylum at Cuttack in Orissa and most of the inmates are natives of the hill districts, a fact of circumstance in connection with the inhabitants of that asylum would appear to contradict the idea that leprosy is hereditary. Of the leper inmates 57 were married and 98 children had been born, 72 before the appearance of the disease in the parents and 26 afterwards. Three only of the whole number developed the disease and these strange to say were born before the disease manifested itself in one or both of the parents. Thus it would appear that leprosy is not necessarily hereditary, but it does not of course follow that the germs are not latent in the offspring of lepers merely because the disease does not develop and exhibit itself outwardly till after the 10th year. However it would appear from some cases I have investigated in the Madras Leper Hospital that heredity is a very important factor in the transmission of the disease by

of 16 young leper inmates aged from 6 to 14 years there is the following family history in 11 cases

3 fathers lepers — {2 now in hospital / 1 was do

3 mothers lepers { 1 now in hospital
2 died do

1 maternal uncle leper died in hospital

3 brothers lepers { 2 now in hospital
1 died in hospital

1 sister leper now in hospital

Again as regards adult leper inmates, I have enquired of many of them as to their family histories, and I append some of the results to show that the idea of heredity is not to be thrown aside, with a light heart.

An Eurasian mother (Mrs M) and son (C) both with tubercular leprosy are inmates of the hospital; several other members of this family are also affected, or have died lepers.

An Eurasian woman (R) with anaesthetic leprosy now attending as an out patient had a son with tubercular leprosy who died in the hospital three years ago.

An Eurasian woman (L) with anaesthetic leprosy, has been an inmate for the long period

of 25 years, had the following leprous relatives who died in the hospital: his sister maternal uncle and cousin; mother's leper cousin died outside.

Two Eurasian males (TP + TP) first cousins are both inmates with tuberculer leprosy: one has a leper brother outside.

An Eurasian male (B) anaesthetic leprosy, four years in hospital: had a leper sister who died in the hospital.

An Eurasian male (B) anaesthetic leprosy, 14 years in hospital: his brother is a leper outside.

Two adult muselman brothers (29 & 25) farms, inmates, are both suffering from advanced tuberculer leprosy.

A Hindu male inmate (29) with anaesthetic leprosy had a leper sister in the hospital.

Two adult Hindu brothers (9 & 7) both with tuberculer leprosy are inmates.

A Hindu male inmate (P) with tuberculer leprosy: his father died a leper in the hospital.

A Hindu male inmate (P) with anaesthetic leprosy: his father died a leper in the hospital.

A Hindu male inmate (S) with tuberculer

leprosy: his daughter is a leper in hospital: his wife and son who are not inmates, are lepers.

A Hindu male inmate (P) with anaesthetic leprosy: his maternal uncle died in the hospital with leprosy.

A Hindu female (a) inmate with anaesthetic leprosy: her cousin was in the hospital with leprosy.

A native Christian female inmate (P) with anaesthetic leprosy: her daughter aged 10 is also a leper inmate: her paternal aunt died in the hospital with leprosy.

Two native Christian females, cousins (m & a) are inmates: one with the anaesthetic form, the other tubercular.

A Hindu female inmate (m) with tubercular leprosy: her husband son and daughter died in the hospital all with tubercular leprosy.

A Hindu female (a) with tubercular leprosy died recently in the hospital: her daughter aged 8 is a leper inmate: her paternal uncle died a leper.

As a contrast I give on the other side instances where two or more children

were lepers but their parents healthy.

Class of patients	number of cases
European	6
Natives	18
Criminals	1

When criminals are referred to this those patients who are sent from jails to be subject of leprosy and they are detained in the hospital as prisoners.

Prognosis

Leprosy is usually considered to be incurable, the prognosis is unfavorable as regards absolute cure, and the tendency is towards a fatal result. The disease is remarkably insidious in its incidence, and chronic in its progress lasting for several and even many years. An Eurasian died in Madras Leper hospital three years ago, who had been an inmate for thirty years. Two Europeans have been inmates for twenty five years, one

for nineteen years and several for 10 to 12 years. Europeans and Eurasians remain in hospital continuously, whereas as soon as they improve, leave the hospital, and return again and again through long periods. From cases that have come under my notice, I am led to the conclusion that the progress of the disease may be checked by certain drugs, when systematically administered, and persisted in in cases not far advanced; and I have seen cases in the Leper hospital here in which under treatment the manifestations have so far disappeared that at the time of discharge the patients were to all appearance cured and could not be adjudged lepers; but being lost sight of, it cannot be asserted that the symptoms of leprosy would not recur — these cases.

Leprosy is very analogous to Syphilis in many ways and especially in the fact that the symptoms become ameliorated under the influence of certain drugs but recur when the action of those remedies is suspended.

the drugs I refer to in the treatment of Leprosy are Oleum Gynocardiae odoratae, (Chaulmoogra oil) and Oleum Hydnocarpus wightiana, (Jungle almond oil)

Treatment

Above are the only drugs that appear to have any influence in ameliorating the disease, but there is a great want of unanimity among medical men, as to what are the best measures to adopt in dealing with that loathsome disease leprosy. In some obscure cases of illness, medical men resting from combat, at times, help purging the changes, that is to say, they give a dose of Potassium or Mercury or arsenic on the chance of some one of them doing good. That process has been tried with leprosy and with some apparent success too, for these remedies excepting mercury were found to work remarkably well. Salicylate of Soda taken internally and used for external application has been found very useful in some cases. Chaulmoogra oil referred to

above, used internally and externally is perhaps the most popular remedy, and the one that has been of most decided utility. The oil is taken in 6 to 12 minim doses at first but can be pushed up to 60 minims. In the Madras Leper Hospital, this oil, and Jungle almond oil, are the two that are relied upon in treating all cases. The two oils belong to the same natural order: both are indigenous drugs, and non-officinal: the Gynocardia odorata grows in the Himalayas as far west as Sikkim, and also in the Malay peninsula, while the Hydnocarpus wightiana grows in Malabar: the oils expressed from the seeds are mixed, and both are procured locally in Madras. Chaulmoogra oil is reddish brown, with a peculiar and nauseous smell and taste: while Jungle almond oil is of a pale straw color, with no particular odor or taste: the dose of both is the same viz from 5 drops to a drachm or more, but the former being nauseous is not so easily borne in the larger doses as the latter; moreover the Chaulmoogra oil sometimes causes

gastro-intestinal disturbance and diarrhoea; and from its nauseous taste it is difficult to induce patients to persist in its use. These oils are best administered floating on water or milk or in the form of emulsion. The procedure is to commence with doses of 5 or 6 drops twice daily as already stated gradually increasing until the full dose can be tolerated, which then should be continued for a lengthened period of two years or even two years, with occasional intervals. The Chaulmoogra oil is also used as a local application in leprous ulcers, and tubercles, in the form of an ointment or the oil may be painted in over the whole surface of unhealthy skin.

These two oils above described do certainly exercise a curative influence when administered in suitable cases, in sufficiently large doses, and if persisted in for a prolonged period, varying according to the stage and severity of the case from six months to a couple of years; and like as in the exhibition of Mercury and Potassium Iodide in the analogous disease Syphilis, so in leprosy frequent repetition

of these oils after intervals must be had recourse to. Unfortunately the Chaulmoogra oil (from one species of the tree) is very nauseous, the native lepers regards this disease usually with hopelessness, & this lack of perseverance, all which circumstances combine to make it difficult to induce the native to take the medicine for a sufficient long time & with the necessary regularity. I have found in Madras, that given suitable cases in which it has been possible to administer these drugs (especially chaulmoogra oil) in a satisfactory manner, distinctly curative results have been noted, leprous ulcers heal, tubercles flatten down and disappear (this is particularly noticeable in tubercles of the ears and face); the greasy, glossy, unnatural looking skin assumes a healthy appearance, psoriasis and other frequently complicating skin affections are removed, and a general wholesome condition is restored, but for what length of time this

improvement is maintained after the patient has left hospital cannot be guaranteed any more than one can assert that in an apparently cured Syphilitic patient no manifestations of Syphilitic disease will subsequently show themselves. It is a notable circumstance that during last year, several instances of cure or marked improvement amongst European males were noted, but not one amongst European females. This result is coincidental with, and is no doubt due to, the fact that the latter cannot be induced to take the unpleasant Chaulmoogra oil in the large doses, and with the persistent regularity required and so they do not reap the full benefit to be derived from it.

As already mentioned the jails of the Presidency send their Leper prisoners to Madras to be confined in the criminal Leper ward of the Madras Leper Hospital. It is quite noticeable that these native prisoners derive much greater benefit from the Chaulmoogra oil treatment than the free natives of the hospital

as the former are under more control and discipline, and treatment is enforced during their captivity, often for long-drawn periods, whilst in the case of the latter, it is frequently found impossible to press the drug sufficiently. The oil being nauseous the patients avoid it as it may get track of being in hospital and cause further their condition is only partly relieved. Some long-standing cases, I believe, are not anxious of cure readily, as they are comfortable in hospital, whereas would be followed by discharge ~~from~~ therefrom.

In many chronic and advanced cases I have seen in the Madras Leper Hospital, although actual cure does not take place (which is impossible where there is deformity with contracted muscles and altered structure) yet there is evidence of the arrest of the further spread of the disease. Such cases have been noted among ~~st~~ European and Eurasian lepers who have been for many years inmates of the hospital, and who bear testimony to the arrested

influence of these drugs.

Naturally the most successful results may be anticipated when the disease is treated during early stages, before the bacilli have become widely deposited, and before structural changes have occurred but unfortunately lepers, especially natives, seldom seek relief until the disease is far advanced, and when they themselves have become hopeless of cure.

A curious circumstance has been noticed in the Leper Hospital viz that in a considerable proportion of early cases of leprosy, the appearance of a crop of prominent tubercles on the skin quickly follows the administration of Chaulmoogra oil, but that these tubercles subsequently flatten down and disappear on pushing the exhibition of the drug.

Milk Rose in some instances in Madras that both in out patients at the Leper hospital are beginning to gain confidence in treatment by Chaulmoogra and simple almond oils. This is particularly shown

amongst out patients for whereas last year the out patients average daily attendance was 15.48, in 1894 it was 8.39 and in 1893 as low as 0.50 which fact indicates that the treatment afforded is considered worth coming for.

Gynocardia acid, the active principle of chaulmoogra oil (dose gri to gr iij subcutaneously) has also been used in the Leper Hospital here internally for Leprosy with good results: it has the advantage of not producing gastric irritation, but it is an expensive oil for hospital use.

Below are given brief histories of cases I have investigated at the Madras Leper Hospital which have improved under chaulmoogra oil treatment.

I (S.H) Eurasian male

Date of admission	23 June/72
Date of discharge	still under treatment
Time in hospital	23½ years
Age on admission	10 years
Previous duration of disease	since infancy

Form of disease — nisoid

Family history — Younger brother affected

Symptoms — Large tubercles on the ears and nose: tuberculous thickening of the skin of the face: brown patches on the chest and back: hands are swollen, fingers are stiffened and contracted: large tubercles in the right knee and over dorsi of the feet: toes are shortened and thickened: ulcers in hands and feet: skin of hands and feet anaesthetic.

Treatment — Chaulmoogra oil in gradually increasing doses

Results — The tubercles have subsided and the covering skin has relaxed: no fresh crop of tubercles has appeared: ulcers on hands and feet have healed: sensation not restored in hands and feet

Remarks — Disease checked is keeping good health for the last five years: previously he had frequent exacerbations of tubercles and fever.

II (7.6.7) Eurasian - male

Date of admission	28 4 94
Date of discharge	still under treatment
Time in hospital	1½ year
Age on admission	16 years

Previous duration of disease 2yrs
Form of disease Tuberculous
Family history
Cases affected

Symptoms – Skin of face thickened and tuberculated: tubercles on ears and skin: nose flattened: nipples thickened: tubercles on chest and abdomen: Skin generally dry and cracked: deep leprous ulcer on left sole: toes ulcerated: Skin of hands and feet hyperaesthetic.

Treatment – Chaulmoogra oil gradually increased to full dose 3i,

Results – all the tubercles have subsided, but the thickening of the skin continues: the deep ulcer of left sole and the ulcers of the toes have healed. Sensations generally throughout is normal.

Remarks – Disease checked and the patient has continued in good health for the past four years.

III (H.C.P) Tuberculosis male

Date of admission	18 Feb/92
Date of discharge	Still under treatment
Time in Hospital	4 years
age on admission	17
previous duration of disease	6 m/s
Form of disease	Tubercular
Family history	Is cousin of Casper T.B. Case II. Has a brother also affected

Symptoms — Tubercles on chin and right cheek tubercular thickening of skin of face generally: coppery anaesthetic patches on cheek and abdomen: skin of extremities shiny: fingers thickened: anaesthesia over lips and right elbow: a large tubercle about the size of a small lime on the back.

Treatment — Chaulmoogra oil to full doses (3i)

Result — Tubercles on chin and cheek have disappeared leaving slight thickening of skin: coppery anaesthetic patches have disappeared leaving skin normal: sensation is returning over lips and right elbow: large tubercle on back has disappeared leaving slight thickening of skin: [illegible]

IV (93) Turnman, male

Date of admission	27 may 1893
Date of discharge	28 any 1895
Time in hospital	2 2/12 years
age on admission	19 .
Previous duration of disease	2 .
Form of disease	mixed
Family history	nil

Symptoms - Tubercles on ears; minute tubercles on skin: tubercular thickening of skin of face generally mixed light anaesthetic patches on skin of chest and back: shining and scaly appearance of skin of hands and extremities fingers thickened skin of right foot anaesthetic.

Treatment. - Chaulmoogra oil to full dose.

Results. - Tubercles on ears and skin have disappeared leaving slight thickening of skin. The mixed anaesthetic patches on chest and back have disappeared leaving the skin normal fingers are of normal size. The shiny and scaly condition

of skin of trunk and extremities has disappeared leaving skin normal: is gaining sensation in right foot.

Remarks - Disease checked. He was discharged on 28 Aug 1895 much improved.

V (C S) Eurasian male -

Date of admission	7 May 1895
Date of discharge	8 June 1895
Time in hospital	1 month
Age on admission	21 years
Previous duration of disease	1 month
Form of disease	mixed
Family history	nil

Symptoms - Tubercular thickening of the skin of the skin nose, and forehead: small brown raised spots over the trunk and extremities: is gradually losing sensation in hands and feet.

Treatment - Chaulmoogra oil to full doses.

Results - The tubercular thickening of the skin of the face is gone. The raised spots have disappeared from the trunk and extremities: sensation in hands & feet

restored.

Remarks. He took his discharge on 8 June/95 apparently cured.

VI (S.L) Eurasian, male.

Date of admission	12 July/94
Date of discharge	18 Aug/94
Time in hospital	1 month
Age on admission	18 years
Previous duration of disease	3 months
Form of disease	maculatic
Family history	nil

Symptoms. This man was rejected for leprosy on presenting himself for enlistment in a regimental land: on presenting himself for treatment he was found to have a maculatic light colored patch the size of half a crown on the right cheek: general health good: no other symptoms.

Treatment. Jungle almond oil in large doses (3ij)

Results. The maculatic patch disappeared in a month. He was discharged apparently cured, and was subsequently accepted for enlistment.

VII (7) Hindu - male convict. Sentence 5 years

Date of admission	6 Dec/90
Date of discharge	27 Nov/95
Time in hospital	5 years
Age on admission	30 .
Previous duration of disease	3 .
Form of disease	mixed
Family history	nil

Symptoms - . Lobes of ears tuberculated: tuberculated thickening of skin of face generally; copper colored anaesthetic patches on chest abdomen back and anaesthetic fingers and toes thickened

Treatment - . This man was for the whole of his five years a prisoner in the Criminal Lazar and of the hospital and was therefore more under control as regards treatment than the free lepers.

He was started with Chaulmugra oil in large doses up to ten drachms for the whole period

Result - . The tubercles and anaesthetic patches entirely disappeared: the skin of the face, trunk and limbs became normal and sensation was restored throughout. at the termination of 5 years he was discharged, to all appearance quite well: this is one of the most satisfactory cases ever known in Madras as regards complete benefit from regular treatment by Chaulmugra oil in large doses

VIII (N.S.R.) Burman male convict: sentence 10 yrs

Date of admission	18 Mar/93
Date of discharge	Still under treatment
Time in hospital	2 yrs 7 mo
Age on admission	35 .
Previous duration of disease	5 .
Form of disease	mixed.
Family history	—

Symptoms on admission — Large raised tubercles closely deposited all over face, trunk and extremities: light anaesthetic patches on face and back: total loss of sensation in hands and feet

Treatment — Continued large doses of Chaulmoogra oil up to 3ii

This leper being, like the last mentioned, a prisoner, was under satisfactory control as regards treatment

Results — All the thickly spread tubercles have disappeared: the anaesthetic patches are gradually disappearing: less foaming sensation in hands and feet The results in this case also are eminently satisfactory.

IX (11) Mercadian convict - sentence 7 m/s

Date of admission	10 Aug/94
Date of discharge	27 Feb/95
Time in hospital	7 m/s
age on admission	45 yrs
Previous duration of disease	2.
Form of disease	Tubercular
Family history	nil

Symptoms on admission. - Tubercular thickening of ears, nose and skin of face: mouth - tubercles over trunk and extremities: no anaesthesia or ulceration: a strong man: general health good.

Treatment - continued full doses of Chaulmoogra oil

This man was also under full control as a convict.

Results -. The tubercular thickening of ears, nose and face, and the minute tubercles of trunk and extremities have disappeared leaving the skin healthy throughout: when discharged he was to all appearance cured.

X (a) a female, male convict, Pentonville Hospital

Date of admission	2 Sept/94
Date of discharge	still under treatment
Time in Hospital	1 yr 4 mths
Age on admission	29 .
Previous duration of disease	2 .
Form of disease	mixed
Family history	nil

Symptoms on admission:- minute tubercles on ears and near face, in clusters on skin; raised coppery anaesthetic patches on chest abdomen back and upper extremities: shiny appearance of skin generally: fingers of both hands flexed: skin of hands and feet anaesthetic.

Treatment – Chaulmugra oil in regular large doses to be 3ii.

Results – Tubercles have all disappeared. The anaesthetic patches on chest and abdomen have disappeared whilst those on back and upper extremities are disappearing and sensation is returning: The enlarged fingers have become normal in size and sensation has been restored in hands and feet: The skin generally has resumed a natural condition. The leper cannot be said to all appearance cured.

XI (P.P.) Hindu, male convict, sentence 1 yr

Date of admission	15 Sep/94
Date of discharge	20 July/95
Time in hospital	10 mos
Age on admission	23 yrs
Previous duration of disease	5 mos
Form of disease	mixed
Family history	nil

Symptoms on admission — Tubercular thickening of ears and slight thickening of skin of face: light anæsthetic patches over back and extremities. a characteristic deep perforating ulcer on right sole. is robust and general health good.

Treatment — Chaulmoogra oil in regular full doses.

Results — Tubercular thickening of the lobes of ears and thickening of the skin of the face have disappeared. The light anæsthetic patches over the back and extremities are gradually disappearing: the perforating ulcer on right sole has healed. sensation is being restored where previously lost.

XII (7) Hicks, female -

Date of admission	29 April/95
Date of discharge	15 June/96
Time in Hospital	8½ m/s
Age on admission	40 years
Previous duration of disease	1
Form of disease	Mixed
Family history	Nil

Symptoms on admission —. Tubercles on ears and cheeks: tubercular thickening of skin of face: slight maculo-atheic patches on trunk and extremities: right middle finger contracted and ulcerated: left little finger contracted: other fingers fixed in extension: second and fourth left toes ulcerated: hands and feet anaesthetic: arms and legs covered with psoriasis.

Treatment. — Chaulmoogra oil in 3j doses regularly.

Results. — Tubercles of ears and cheeks have subsided: skin of face has become natural: ulcers have healed: sensation is being restored in hands and feet. The use of the stiff fingers is being regained, the psoriasis has disappeared: and the skin of the trunk and extremities has resumed a normal condition: she is greatly improved, but left hospital before completed cure.

XIII (5) Native Christian female

Date of admission	10 May /95
Date of discharge	16 Aug /95
Time in Hospital	3 m/s
Age on admission	8 yrs
Previous duration of disease	6 m/s
Form of disease	anaesthetic
Family history	Her father is a leper in the Hospital

Symptoms on admission — a slight anaesthetic patch on right fore arm near elbow: another on back of left elbow

Treatment — Jmj Olei amygdalae in 20 drop doses.

Results — The anaesthetic patches have disappeared: the child was discharged cured. I have seen her six months later and notice no recurrence.

Other oils have earned some reputation in the treatment of Leprosy especially Gurjun oil mixed with lime water in the proportion of 2 of the former to 4 of the latter. I have no experience with any other treatment than that practised in Andaman by the free use of which much benefit has been got from a tonic treatment by iron which strengthened the constitution of the patient

Medicated baths have been used.

Whatever the constitutional remedy that is relied upon, local treatment must not be neglected. The ulcers must be kept clean and stimulated by some such application as Creolin. The patient should receive a good nourishing diet and when practicable removed to a temperate climate.

There is no doubt that if it were lawful to forcibly remove lepers to an asylum like the Madras Leper asylum and keep them isolated in such an institution Leprosy would die out as

it did in Europe in the middle ages. But the expense of providing for the immense number of Lepers of India would be very heavy and the unwillingness of families to part with any of their members afflicted with the disease would be so strong that there is little hope of compulsory segregation ever being made the law. The habits of natives of India are so filthy and their indifference to personal or domestic hygiene so deep-rooted that it appears to be a hopeless task to educate them as to the contagious character of Leprosy and to avoid lepers, although it is most easy in that direction that any chance of eradicating the disease in India is to be looked for.