Leprosy in Trinidad:
A Study

By W.Y.M. Roth.

The purpose of this thesis is giving an account of leprosy, as it occurs in the island of Trinidad, West Indies, and summarising the results of observations and research conducted at the Leper Asylum, while I had temporary charge of it. In writing this work, in the sake of concentration, and description of the disease as it occurs in other countries, save where it may be necessary for illustrating comparison.

Its Definition

Leprosy may be defined as a chronic, parasitic disease, due to a specific bacillus—the bacillus leprae. It manifests itself in three principal varieties, characterized by the appearance of tubercles, and sometimes, general infiltration and hypertrophy of the skin; the second by anaesthesia of the extremities, and limited or extensive anaesthesia of the body; the third by a combination of these two varieties, of hypertrophy and anaesthesia: it is slow but progressive in its course: it metastasises and infections.
infection, and terminate by in death by exhaustion or intercurrent disease.

Some of the points I have stated dogmatically have not yet been determined with precision, but in the course of this Thesis, I intend elaborating them, and stating the premises upon which I have arrived at my conclusions.

To Varieties,

Leprosy manifests itself in Trinidad as a disease in three forms, named respectively:

a. Tuberculated
b. Anesthetic
c. Mixed.

These three forms exist in all countries where the disease is prevalent, but local usage and local fancy may modify their names. The disease known is identical throughout the world, and the division above stated is generally accepted. Castro known distinguishes another form which he names depra.

However he considers as the initial stage of the disease which may pass into the more pronounced tuberculated or anesthetic variety. Daily observation among an average residence of two hundred and sixteen lepers in Trinidad.
Trinidad leads me to adopt a certain modification of
the three varieties, than mentioned which describe
mention is dealt further on, but will only indicate
at present. The definite hypothesis of Carter, which term
be used to indicate that characteristic Emption, is
denoted, writing the dignity of a variety. It is simply
the premonitory symptom, the early stage of the
disease and might not therefor be classed as a
variety. But I have noticed that such as Emption
as he describes, with this important reservation that
it is not an aesthetic, occurs in the aesthetic varia-
ty of the disease, and persists during the life time
of the patient. Hence the aesthetic variety may be
divided into two subvarieties: — (a) without Emption
(b) with Emption.

Then again, I have noticed the tuberculated form to
occur in three different and distinct varieties: —

(a) In the first there is diffuse hyper trophy of the
affected part.

(b) In the second, small shot like papules, (about
the size of No 6 shot) are implanted on an
hypertrophied base.

(c) Thirdly, we have the genuine tuberculate
form in which large lumps are nodular;
stand and prominently.
Of course these sub-varieties may be mixed up with one another, and in addition there may be implanted a wide a varying amount of tubercle - and from my observation, I am convinced that each exists independently, even in the standing case.

The mixed variety exists when we have an organising in a case of tuberculosis leprosy, or when we have tubercle implanted as an anesthetic case. It is really always the case that this variety, and mixed leprosy, does not exist as a separate entity from the very beginning. It usually commences as tuberculated or anesthetetic leprosy, and in course of time the other variety appears, and it implants it, or superimposed on it. An error must however be avoided, in some tuberculated cases, owing to the involvement of the superficial cutaneous, never, there is any tubercle in the affected area, i.e. in the skin over the tubercle. This is not characteristic of the anesthetic variety.

Description of the Variety.

1. Tuberculated leprosy.

In accordance with the division of this variety of the disease into sub-varieties, I will take up each of them in turn. The premonitory symptoms in Prodomata being known common to them may be described generally.

The Prodomata
The Prodromata.

As a rule the onset of these symptoms occurs at such a distance of time anterior to the manifestation of the more pronounced and diagnostic signs, that it is only with the greatest difficulty that anything reliable can be extracted from the statements of most of my patients. Here, in addition to this difficulty we have another one to make allowance for, namely, the obstinacy of the patient, and a tendency to answer according as they think the questioner wants.

Pyrexia is a common premonitory symptom, as also a sense of undue fatigue and weariness, and, at all proportions to its cause. With these there may occur vomiting and desquamation, and pains and aches about the limbs, and sometimes distinct sensory phenomena. Boeck mentions a persistent feeling of cold, and he has seen a sweat ephistaxis and an impetiginous eruption immediately precede the disease. The patient is very low-spirited and depressed, takes no interest in his surroundings, hates his work, has attacks of glycosuria, on the subsidence of which an Euphematism, a confusion like a symptom may follow. In the best cases, it may be that subjective symptom may follow some acute debilitated disease, such as, dysentery, dyspepsia, smallpox etc. A flushed, flushed appearance has been noted.
Diffuse Hypertrophy and infiltration of skin of face with slight nodulation over right cheek, left cheek, over lower part of left jaw, and base of left ear. The skin is everywhere thickened and peary. A very good illustration of this subvariety.
tubes by Carter to indicate the onset of tubercular thickening
hus Berenkap also "local tuberculosis lesions in a very small part of the skin" to appear as the first symptom.
In white races, a dirty dissemination of the lesions is also considered pathognomonic, but such dissemination is very
common among dark skinned races and cannot be accepted as a sign here.

A longer or shorter interval may elapse before a small nodule is formed which quickly forms the question of diagnosis,
to rest. Either localized tubercle, if small size appear; a small localized patch of anaesthesia (in the aesthetic variety) which the patient accidentally kisses;
else a nodule of varying size.

Coming to a description of the Tuberculated form. First describing the subvarieties, and then taking
up certain general questions connected with the variety.

(i) Diffuse Hypertrophy & Infiltration of Skin.
In this subvariety there is a
general thickening of the skin over the face, breast,
heels and legs most generally. The skin is thickened,
rough and hard to the touch, and cannot be pinched
up by the fingers. Its surface is generally glossy and
the sebaceous and sudoriferous glands are active. In
its affected skin small dilated capillaries are seen
面积约 sometimes, and the circulation can readily be
noticed.
Case of diffuse tuberculosis of skin over face.

The occurrence of small purpuric tuberculation over ears and lips, well-advanced.
present in these vessels. The infiltration and hypertrophy
is general, spreading widely over large areas, and shedding
off into the softer healthy skin without any abrupt de-
wearing. The surface is not anesthetic, and sensation
is normal. When pricked with a pin pain is felt, and
blood easily oozes out. Generally there is an increase of
pigmentation in these areas. It often times, affects the toe,
the lobe, being hardened to the feel and hanging per-
dermal, and it may affect the prehensile and neck.
The trunk likewise seems unusual unaffected. The fingers
generally are all enlarged, the skin over the dorsum of the
hands is thickened and the patient experiences difficulty
in making a fist. The pulps of the fingers are shiny,
glossy, bright in color and display dilated capillaries.
The feet are also similarly affected, being enlarged,
with skin tense and thickened. With this a condition
anesthesia may be involved in a subsequent and more
advanced stage of the disease, and the following illustrative
case shows this:

**Case I**
A case of diffuse tuberculosis with hypertrophy
of skin: Anesthesia subsequently ensuing.

Mary Ann Callepper - aged 18. Born in
Demerara. No 4 year. Cause of disease unknown.
Family history said to be good. Previous personal history
good. History of present illness stated a fever - first
appeared
appeared in little lumps in chin, and then spread to face. At the same time little lumps of both hands commenced to swell, later on the other fingers and finally the hands. The left big toe swelled, and afterwards the right.

On admission into the King Edward's Sanitarium, under date 27 Oct. 1890. Skin of forehead thickened, and tubercle on left ear was. Ear swollen and from tubercle on left ear. Small tubercle on elbow, little and ring finger of each hand thickened. Small tubercle in part of knee. Skin thickened on both sides of left big toe and inner side of foot thickened.

Present condition (a detailed examination on 27 April 1891). A diffused thickening of cheeks and forehead, skin is rougher here than elsewhere, and tending to be cadaveric (Patient is a white girl). Capillary dilatation in cheeks. Hair of eyebrows almost entirely lost. Lobes of both ears enlarged; capillaries enormously dilated, else normal. Skin tubercular, and lips thickened, with dilated capillaries in both situations. Hands — fingers all enlarged, skin thickened and shining, glossy — presenting a highly pigmented appearance, and tense, especially the pulps. Capillaries dilated all over. In the right hand there is an oedema in ring and little finger (hand supplied by the ulnar nerve), and the nails are splitting up.
up and falling away. Left hand - anasthesia on ulnar side of little finger and in dorsum of first phalanx of ring and index finger. Both median nerves are enlarged, and the left ulnar also, but to a less degree. Forearms - skin hypertrophied on extensor surface. Ticker on upper arm. Tendency to tuberculisation at elbows. legs - large coppery blotches over skin of thighs, and hypertrophy of skin over knees. Anesthesia total in left foot and leg as high as knee. Right heel is anaesthetic, and there is a band of anaesthesia three inches wide above ankle. 

Points of Interest in Case. It shows the commencement of the disease in small tubercle on ulnar, discrete at first, and progressing to diffuse hypertrophy and tuberculisation of the skin by slow degrees - in 3 years. Then anaesthesia appears in three years, limited it is true to the area of supply of the ulnar and median nerves, and also the ulnarous branch of the posterior tibial. We also note the coincidence of the story, enlarged finger with the anaesthesia, and also that in some of the fingers thus affected there is no anaesthesia. We may also note another point of interest, viz. the appearance of tubercles on points of pressure as in the elbows - there is implication.
implication of the Schneiderian mucous membrane, and the voice also is harsh and rough. The children
in the left foot may right hand is also interesting as indicative of the implication of the nervous, and also
due to pressure of the infiltrated skin. The case.
finally resolves itself into one of the mixed variety.

There is another form of infiltrated depigmen-
tion in which the same infiltration and hyperpigmen-
tation of the skin is seen, where the skin instead of feeling stiff and
heavy and conveying a feeling of constriction, becoine, loose
and baggy, and hangs down in folds and wrinkles. This
appearance is most commonly and to greatest advantage
observed on the face. The skin of the whole face is affected,
it is thickened and hypertrophied, and seems as if it
has become quite loosenes from its attachments. In conse-
quence the natural lines of the face are deepened, and
the skin hangs more in folds and wrinkles are prominent.
In this form the well-known leprosive face is to be seen.
The features are square and heavy, the wrinkles, marked,
skin hanging down in folds, eye brows hanging over the
eye, upper eye lids generally infiltrated and thickened
and thus rendering an inability to open the eyes widely
(patient suffering from this variety have the appearance
of having their eyes always half-closed). The lips are
considerably thickened, and the power of approximating
them...
them, as consequence of this thickening, is lost to a great extent; the lower lip hanging down, the pronunciation of labial and sibilant is considerably interfered with. The lobes of the ears are also partakers in this general hypertrophy of the features, hanging down to the extent of even an inch or more. When to all this is added that the skin of the forehead is in heavy folds transversely, with generally two vertical folds, deep in extent, from the bridge of the nose upwards; and then the parts which are normally covered with hair are destitute of it, a picture of hideous repulsiveness is presented which is characteristic of the face, become. The young are much disfigured when they are affected with this form; they have the appearance of being considerably aged, a boy of 12 years looking like a diminutive man of 30 or 40 years.

Together with this affection of the face other parts are affected. The skin on the extensor surfaces of the arms and legs may be hypertrophied, thickened to the feel and touch, with the sweat glands blocked up and comedones, or black spots to be seen, and the hair covering the part defective. The skin in these portions may become dry and cracked like patches of ichthyosis. The lymphatic glands in the area of supply of the affected skin are generally enlarged. Sometimes, to the size of a pigeon's egg. No anaesthesia usually exists, but sometimes there may
may be diminution in the sensibility of the skin owing to the involvement of the cutaneous nerves by the tissue infiltration.

Case II. Illustrating an extensive and general tuberculated condition of skin.

James Shipley Stewart, aged 17. Nepo. Born in Trinidad. Personal history—good. Family history—after his admission he younger sister developed tuberculated lepra and died—has been ill 6 years.

No cause assigned.

It commenced by "stains" (taches) on the left thigh, one above left knee and one in right thigh. They were light colored and painless. Then a long time afterward humps appeared in chin. He was treated with chaulmoogra oil and the humps went away. Then he stopped the oil, was sent into the Asylum and the disease spread over his face and Ears after admission (about 15 to 16 months after disease showed itself).

On Admission:—Three small tubercles over port of nose and very small tubercle in alae, size of pin's heads. Few tubercles (small) in cheeks and discoloration. Habit of Right Ear especially slightly thickened. Drop slight thickening and pallor right foot. Arms—no tubercle, no another.
Slight hairy eruption on forearm. Legs - thick hairy eruption in front; no anaesthesia.

Present condition (24 April 1871): - Face is typically leprous, has the expression of an old man. The whole extent of skin is hypertrophied and hangs down in folds over cheeks with a deep furrow running from angle of nose downwards and outwards. Perpendicular ridings of forehead over eyes and nose - lobes of ears hanging down like ear drops - lips thickened and prominent. In the furrows of the skin the infiltration is greater - the lobes of ears, hand backs are to be felt. Dark eye lids are thickened, upper lids normal. Ears enlarged. Sclerotics injected. Sight poor. Eyebrows and eye lashes are lost - a fine lump remaining on ridge of eyebrow.

Skin on both arms and legs - the extensor surfaces, is dry, harsh and slightly thickened.

Right hand - commencing contraction of little and ring fingers, joint painful on motion and both fingers numb. Says he has much pain preceding this, then swelling commence, and becomes worse. Numbness on both sides.

Enlarged and painful. Pelvic glands enlarge.

Inflamed Erytema (a patch) on back of neck.
Subcutaneous Leprosy.

Small papular tuberculation on chin, and around mouth with thins. The enlargement of preminus and finger also will seen.
Finger nails normal. Says he sweats a deal all over body. Can remember no premonitional signs.

Remarks: — A typical case of the tuberculated variety with the leonine face. Its development was in about 18 yrs as far as can be made out. Six years after he began to develop the numbing and probably the case is going to turn out one of the mixed variety. The area, the ad at present is very limited, and certainly does not depend upon pressure exerted by the tubercle, because there are none in that position. Treatment with Chaulmoogra oil seems to have effected as good as present. Physically he is robust, very active & intelligent.

(β) Sub-variety. Small Papular Form.

In this sub-variety we observe small papules about the size of No. 6, that, sometimes, slightly larger, implanted in an infiltrated and hypertrophied base. It is really a mere developed form of the former sub-variety, and not so far advanced a form as that to be described next. It may however be accepted as a distinct type, because its numerous cases remain unchanged. The papules are most frequently to be looked for on the cheeks, cheek, of ear, back of neck, chin, and extensive surfaces of extremities. Apart from the type of these papules, there is nothing characteristic of this sub-variety of the disease.
Tuberculitic leprosy.

Large flattened tubercles on face, chin, lips, nose, forehead, ears shown very distinctly.

Patient is a boy of 14; disease not advanced.
disease, and further on I shall discuss the more prominent symptoms of Tuberculated Lepra.

(3) Variety — True Tubercular.

In this form from the outset the disease shows itself in distinct nodular — hence the term "tubercular." These tubercles or nodules, at first of small size, in course of time during the progress of the disease develop to enormous size. They are generally at first isolated but sometimes are grouped near each other; in the latter case they present the appearance of clusters, like peas in a bunch as they grow, but they seldom run into each other, remaining distinct all the time. They can be taken up between the fingers and be made to rise under the skin. They are usually placed under the dermis, involving of course the epidermis, but not extending into the layer of fat underneath. The skin over the tubercle may be thickened, and the sweat ducts are enlarged and opened or sometimes even blocked, as also are the sebaceous ducts which present the appearance of a number of black pin points on the surface. When these show a tendency to ulcerate they generally become more glossy and glazed in appearance and tender to the touch. Their situation varies; they appear in the cheeks, chin, lips, ear, forehead, nose and extensive surface of arms and legs.
An advanced case of Tuberculoid Lepra in which the face is markedly affected: the arm, hand & fingers also are affected. Patient is unable to close his mouth owing to the lips being infiltrated. The lumpy bumps on forehead are noticeable.
Sometimes, in any of these sub-varieties, we may observe a hyperesthetic condition of the tubercle, and skin generally. Thus in one patient covered with tubercle, the least touch of the skin made him wince, so firm pressure he neither.

Having now described shortly the three sub-varieties, with their leading characteristics, I must point out that there is no hard and fast distinction between them - in many cases they coexist. Thus in one case the nodular form may be present in the face but in the arms general infiltration may be seen: in another general infiltration may be noticed on the face, with the papular form in the extremities, and so on. In many cases, then, these varieties may coexist, but in others each form may exist in its striking, easily definable, and characteristic.

**Parts attacked in the Tuberculatus variety**

Generally speaking, the more exposed parts of the body are those which are affected - as the eye-lids, nostrils, cheeks, chin and ears, and the areas from them as the disease progresses steadily, other parts are involved gradually. The parts affected in order of frequency are the chin, cheeks, ears, nose, forehead, then the lips, arms, and legs, and finally they may appear on the hand, palate, and the sclerotic. I have never seen the palms of the hands or the soles of the foot.
Tuberculated Lepra: showing nearly the size of some tubercles: that on the Right cheek is a characteristic example of one.
feet affected. It is noticeable, as Carter points out, that
the parts most early and most frequently affected are those
which are situated farthest from the trunk and which are
habitually most exposed to external injury, influence;
variations of atmospheric temperature, movement and
the like. They seem to appear where nerves emerge from
long canals or to the surface — on the face; on the side
of the limbs — most generally the extensor aspect;
and on the posterior surface of the trunk. They generally
come out symmetrically but there are cases also
where asymmetry is common in advanced cases,
while in Early leprosy asymmetry is the rule.
The skin is the part involved in the majority of
the disease — below the dermis: the proliferation or infil-
tration seems to extend, and thus it is easy for
the knife to separate and nodules, or patches, of affected
skin completely by a little direction, leaving the subcutaneous
fat and connective tissue free of the disease. In many
of the operations, I have performed for the removal of
isolated tubercles, I have been able to sweep from the
affected part completely, leaving only healthy substance.

Course of Tuberculated leprosy: — It is
generally slow and progressive in its course, but cases
occur where tuberculation occurs rapidly — in a time the
bodily health may not suffer — the tubercles may develop
sharply.
Tuberculated lip June: showing the cheeks, lips, nose, chin, and ear affected. The enlarged and tapering condition of the finger also shown.
slowly and almost imperceptibly without causing any disturbance of the general health, while in other cases a feverish attack may be the precursor of a crop of tubercles. But after the first rush of tubercles, as the disease progresses, fresh tubercles appear or new infiltration of the skin. The tubercles become enlarged, may cluster together, or even the infiltrated skin itself becomes papular on the spots may be observed. This condition may continue until some intercurrent disease strikes the patient. And now if the intercurrent disease becomes severe and likely to prove fatal or intractable, the swelling diminishes, the tubercles become absorbed and the thinned skin hangs down loosely. Spontaneous absorption is known to occur in such cases after a time the tubercles are absorbed altogether and the infiltrated skin seems to become thinner. Temporary arrest of the disease may sometimes be caused by ulceration of the tubercles. This is a slow and painful process. The tubercles first become tender to the touch, sometimes hot and prominent— a small focus of pus appears at the apex or more prominent part, the skin becomes thinned and breaks down, and then the tubercle, discharge fresh steadily and undergoes a proportionate diminution of size. When a number of tubercles exist they may all take up this ulcerative action, and after a more or less lengthy period when the entire mass of the tubercle has
Tuberculated leprosy showing the tubercles very clearly and distinctly.
has been discharged, the ulcer takes on healing action, and close, in from the circumference — in consequence a whitened cicatrice is left. When a wide expanse of skin has been affected, and restoration by ulceration has occurred, if on the face, the features present a characteristic appearance — a number of puckersings on the cheeks, situated in part, quite smooth and free from deposits or papillary enlargement. The cicatrical tissue can be lifted up by the fingers as it is free. This cicatrical tissue is pale of white and firm, looking in dark skinned persons. Burns the lips and mouth small tubercle may break down and ulcerate, and when healed completely the mouth is puckered up to small dimensions.

Case III. To illustrate the slow spread of the Disease, and the wild nature of the Tuberculation.

Joseph Rogers — 14 years. Negro. Born in Trinidad. Previous personal history good; but one brother died of Anæsthetic Leprosy. 1½ 2-3 years.

First appearance, small papules about size of sago peas on chin. Then it spread to face and nose. Then skin of lips became dry and ulcerated. Disease said to have come on after exposure to air.

Present state. Skin on cheek, upper lip and chin irregularly hypertrophied and resembling morocco leather; also and cartilaginous portion of nose.
Tuberculosis leprosy - the general infiltration of the skin; its thickness, and the manner in which it hangs down, giving an old-aged appearance to the body of 16 years, or more than.
Case IV. To illustrate an extensive and general tuberculosis condition of the skin.

Serge Shipley, Stewart, 17, a Negro,
Born in Trinidad. Personal history poor —
but as regards his family history, since he
admitted a younger sister developed tuber-
culosis. She palsy and died. He 6 years.

No cause assigned.

Disease commenced by starray — one on the
left thigh and one above the left knee, and
one on the right thigh. They were light colored
and painless. Then after a long time lumps
appeared on his chin. He was treated with
Chaulmoogra oil, and the lumps disappeared.
Then the oil was stopped, he was sent into
the disqualified, and the disease spread over his face and ears after his admission (which was about fifteen to sixteen minutes after the disease showed itself).

Condition on Admittance:—Three small tubercles on both of nose, and very small tubercle on chin, size of pin head. Few small tubercles on cheeks, and discoloration of skin. Ears of Right Ear slightly thickened, also the lips, which were pale, slight flush. Slight scaling eruption on face, and thick, dry, scaly eruption on feet and on anterior surface. No anæmia.

—This case has progressed steadily this admittance. Face typically bronchial, has the expression & appearance of an old man. All the skin of the face is thickened, baggy and hangs in folds, wrinkles, and creases. Lids of eyes hang like loose bag sleeves—lips thickened and prominent. The skin is irregularly hyperplastic, & this is especially marked in these parts. where it hangs, even the bases of ears, small pea-sized bumps can be felt. Lower eyelids thickened; upper normal. Ear, generally enlarged—Schleier's injected.
Right foot - hair of eyebrows and eyelashes have fallen off, and only a fine beard remains.

Skin on external surface of both arms and leg is dry, hard, and slightly thickened.

Right hand - commence contraction of little and ring finger, joint phalanges are swollen, and both fingers numb. Ulnar nerve on both sides enlarged and painful. Finger and unusual neural gland enlarged - the symptom like ringworm on scalp of neck.

Pertains a good deal over the whole body.

Remarks: — This is a typical case of the tuberculated variety with theComment
jace. Its development was in about eighteen
months. Last year (being five years after
med.) he began to develop the tuberculosis, and probably the case is going to turn
out one of the mixed variety. The onset
said at present is very limited, and
certainly does not depend upon pressure
exerted by the tubercles, because there
have never been any in that position. Treatment with Arsenious acid has
not been beneficial so far. Physically
in good condition: active and intelligent.
Tuberculated deform - the lips flattened tubercle and ridge appearance of prehensile.
Analysis of the Affections of Organs etc.

The Larynx.

The larynx is most frequently involved—
A tubercular laryngitis exists. The mucous membrane is just impinged, then it becomes thickened and edematous; and this affection involves the vocal cords as well, so that the voice becomes typically affected. It becomes weak ultimately and the patient is unable to speak above a whisper, though in the earlier stages, it is hoarse and laconic, and most discordant. The transplantation of the mucous membrane may prove to such an extent as to impede respiration, and death may occur by suffocation unless tracheotomy is performed, or laryngotomy, to relieve the patient. Pain in the region of the larynx is often first complained of and may be the earliest symptom of involvement of the larynx. The preservation of voice, in which the larynx is involved, is weak.

The Nose.

The mucous membrane of the nose is
affected in some cases by the tubercular infiltration. The first sign is usually some catarrh and stuffiness in the nose, then there is some breaking down of the tubercle, and the nostril becomes clogged with discharge. Gradually the sense of smell is lost and respiration through the nose rendered more and
more difficult, necessitating the patient's cooperation.

Through the mouth in a most characteristic manner.

The nose becomes involved in another way in this variety of the disease — and this is a somewhat common symptom of the disease has lasted for any length of time. There is gradual and steady atrophy of the septum nasi, and the base of the nose falls in until ultimately only two small orifices above the mouth indicate the nostrils. Caries and necrosis of the nasal and other bones may assist in the deformity of the nose.

The Eye.

The eye may be affected in various ways in Tuberculated Lepra.

1. Tubercle of the Eye — This is the typical tubercle which occurs in other portions. It begins as a small nodule below the conjunctiva, usually at the inner segment of, and abutting on, the cornea. This is covered by the conjunctiva and rests on the sclerotic; is of a peculiar greyish shining appearance; with numerous capillaries, causing it having some acrasia from the conjunctiva. As its growth it invades the clear corneal tissue, and occupies more or less of the cornea — sometimes indeed its whole extent standing out like a red fleshy mass, and presenting...
the appearance of a miniature cluster of grapes. At the same time it may spread outwardly and assume a considerable size, even as large as an almond. Its surface is still glistening but is irregular and hse-welled. The tubercle, or cluster of tubercles, occupying the site it does at first produces vision and finally destroys it. In its earliest appearance the attendant symptoms are those of irritation—pain in the eye, also on movement of the lids, burning, lachrymation, slight photophobia &c.

2. Another common affection of the eye seen in this variety of the disease is what is called Obscuratio Cornae. At first this reminds one of the locus senilis, but it differs in many particulars. It is a gradually progressive opacity of the cornea. It usually starts at the upper segment of the cornea, involving only, perhaps, the upper quarter circle, by a whitish, rather of pearl appearance. This seemingly is throughout the entire thickness of the cornea. Accompanying this there is, in some cases, scleritis &c. Evidence by a pink, salmon patch in the segment of cornea adjacent to it, together with pain, lachrymation, photophobia, headache, &c. The affection gradually progresses until perhaps the whole of the cornea is involved, though sometimes it may not
be quite so extensive - vision which is diminished at first, is ultimately lost. I have noticed this observation to begin in the lower corneal quadrant, though it more frequently begins in the upper.

3. Ectropium. This is generally caused by tubercles being present on the lower lid, and then by their weight turning outwards the edges of the lid; or, in another variety, by tubercular infiltration of the lower lid which becomes absorbed and so leaves the tissues thin and wasted and thus causes a condition of Ectropium.

4. Anterior Staphyloma may arise from ulceration of the cornea, or thinning of the sclerotic.

5. Shrinking of the eye ball: most probably due to tubercular deposits within the eye and their ultimate absorption leading to the shrinking, until only a small movable stump is left.

6. Rheumat:

7. Ulceration of cornea

Both due to the Ectropium.

The Nails:

are frequently involved in tuberculated deprry: most certainly so in cases where there is extensive tuberculation, or where the disease is far advanced. The earliest sign is a loss of the shining
and glossy appearance of the nail, it assumes a dull white and opaque look. Then it gradually become flattened out on the phalanx. At this time ulceration may occur under the nail in the bed of it, and the consequence, as this progress, the scale or the discharge may rise under the free border of the nail, and generally accumulate later until the nail is completely loosened by the ulceration spreading, and the discharge accumulating. Finally, the nail may have to be removed, if it does not happen to be knocked off accidentally.

Another change may often be noticed. After the loss of lustre and the flattening have taken place there commence a longitudinal ridging of the nail. There are generally three ridges, one in the centre of the nail and one on each side of this. This ridging gradually becomes elevated, until it splits; and then the nail becomes broken up into longitudinal fragments, frequently in curving, and becoming gradually bowed from their bed. The next stage is that these pieces drop off, and leave the matrix thickened, bare and irregular. In course of time this matrix contracts greatly and is quite painful and resembles a split pea placed on the dorsal surface of the proximal phalanx.
The Hair.

In Tuberculated leprosy the hair is generally much affected over all parts of the body, except the head, where strangely enough it always escapes. I have never seen a leper suffering from the tuberculated variety of leprosy with anything but a luxuriant crop of strong, coarse hair. In other part of the body the hair bulbs atrophy and the hair drops off—the eyebrows, eye-lashes, mustache, beard, and the pit Lanugo all over the body, drop off, and the features of the patient assume a peculiar and characteristic appearance. Generally this dropping off occurs where the skin of the part is involved by the tubercular infiltration. It would appear as if the defect of new material surrounds and compresses the hair bulbs and thus leads to their atrophy and falling off. The loss of hair is sometimes, curiously noticed, a tuft remaining at the outer end of the brows, for example. The hair on the pubes is not affected to any extent in my experience, but in late state, that it is apt to fall out.

The Mouth.

Masses of Tubercle are not infrequent—by seen in the hard palate, extending a far back as the soft palate. They have the same appear
An advanced case of Tubercularis Leprosy:
the tubercLEs have all become absorbed: the mouth
swollen in and contracted, the nose flattened, and
the eye disorganised.
...ance as tubules elsewhere, except that they are not subject to much pressure and are covered by a more vascular membrane. In spite of the rich supply of blood, however, the tubules in these situations do not attain large size. They run from before backwards, in the centre of the roof of the mouth, and attain the size of an almond. The surface is irregular and nodulated and the tubule is flattened. I have never seen them on the soft palate or the fauces. In the dorsum of the tongue tubules may sometimes be seen. The sense of taste is never diminished or lost.

The Mammary Gland.

Bakewell speaks of enlargement of the nipple in the male patient as being so common and frequent that he gave it the name of the "feminine nipple." My own experience however has not led me to the same conclusion, for of the sexes I have examined only a few have the true "feminine nipple." When it does exist the condition is as follows — there is enlargement and hypertrophy of the nipple to more than four or five times its normal size, most often comparable to the state of the nipple which is present in multiparae who have suckled their children. The areola is not affected, but evidently the true nipple time alone, and it preserves its usual erect position.
-perty. This is the condition in males. In the female this does not appear to be any such enlargement as I have described. In a few males, there occurs abnormal development of the mammae, but in all probability this does not depend upon the disease. I have not seen any cases in which the female mamma has been affected in its glandular substance — in some instances tubercles may develop in the skin covering the gland, or may encroach on this skin from the outside.

In one case under my care — a case of advanced Tuberculosis leprosy — the Mammae resemble that of a young girl: it is firm and prominent and lenticular, with a wide dark areola, and a large pitted nipple like that of a multipara.

**The Organs of Generation.**

In the male tubercles may develop in the Scrotum, and be of varying size.

On the body of the Penis some tubercles may appear, but not to any extent, and only infrequently.

**The Testes.** Small tumours called differentiation of the plexus inter glandular tissue take place, leading to compression and ultimate atrophy of gland.

In the female the Labia Majora are sometimes affected with tubercles.
Ulceration occurring in Tuberculated Leprosy.

Ulcers are of common occurrence in this variety, and are of different forms:

(a) Ulceration of Tubercle. When a tubercle increases to a certain size, it may ulcerate—this being the method by means of which it disappears. Generally the ulceration commences in a vesicular spot in the tubercle, owing to some irritation, or to accumulation of secretion, a small pustule forms looking like a large grain, and this in a short time increases in size, involving the tubercle more deeply and extensively until the whole of the tubercular substance is thrown off, and a ulcerus remains, varying in size and depth with the original size of the tubercle. The further progress of such ulcers is, that they take on reparative action, fill up with granulation tissue, and form generally a smooth cicatrix. It may be interesting to note here that in all these healing ulcers which I examined I have not found bacilli, while they are most frequently to be seen whilst the process of destruction was going on.

Sometimes this ulcerative process may begin by some injury to the tubercle. Its progress, however, is as described.

(b) Ulcers which occur on the limbs in their unaffected, or in cases of diffuse infiltration of the skin
Skin. Here generally some injury locally, such as a cut, a bruise, or some other slight thing may cause a steady progressive ulceration. The ulcer may be irregularly circular in outline, sometimes serpiginous, and of varying size from about the size of a finger to even as much as half the limb in extent. It has a floor reddened, shining and glazed in appearance: which secretes a slight thin ichorous discharge. Its edges are sometimes thickened and whitish, scarcely ever undermined but standing out prominently like a lip. At other times the edges are almost flush with the floor of the ulcer, thinned and reddened. There is, as a rule, very little discharge from them — and generally it is thin and bloody. They tend to spread steadily in a serpiginous manner, and may take on healing action in one part while spreading in another. When they heal the cicatrix is generally thin, translucent and yet firm, and there is much tendency to the recurrence of the ulcers in the site of the cicatrix. Sometimes hyperactive granulations spring up, highly vascular and tending to bleed on the slightest touch but flabby and indurated; and then cicatricial action is scarcely ever set up. Where the ulcers are extensive they may give rise to nocturnal elevations of temperature, and though they are generally painless they sometimes cause a great deal of suffering.
Ulceration of this kind may also arise spontaneously, and spread extensively. As an example in a case of tuberculated leprosy in a boy there was diffuse hypertrophic infiltration in both legs, and without any assignable cause, small ulcers appeared on them, about the size of a sixpenny piece, and the skin around was thickened and tender. The process rapidly spread, the ulcers running into each other, and in fact a condition of superficial gangrene arose, with much fever, until the whole of the anterior surface of the leg was, the large ulcer from the tibial tubercle to the ankle. No wound or injury could be traced as causing it. This condition frequently occurs.

(y) A superficial ulceration of the mucous membrane of the lips, I have noticed to occur with certain frequency in tuberculated leprosy. This seems to arise spontaneously, affecting only the superficial part. It spreads all round the mouth and causes a deal of pain and tenderness, rendering it difficult to open the mouth or to speak clearly; on this account it may sometimes extend to the skin of the face, but even then it does not lose its superficial character. It readily heals, without leaving any mark, except when it affects the face, when the resulting cicatric
in almost black, and in colored people it shows up like a fuzz of hair around the mouth.

(5) Ulcers, which start in the bed of the nail under the matrix, these have been already described as leading to the shedding of the nail.

**Affections of the Skin.**

Although in other places where leprosy is prevalent we have mentioned a great variety of skin disease, as commonly occurring in Tubercular leprosy, in Trinidad skin affections are not so numerous, and may be classified under a few headings.

1. Most generally we meet with a hard, dry, fissured condition of the skin: the fissure occurs in such manner as to form little squares or along areas of skin. The point of fact that is simply **Ichthyosis**. It also occurs in a modified form in places where pressure is applied, as for example along margins of the toes of the feet, where the keratin becomes hypertrophied, and is dry, horny, and papillated.

2. **Eczema**, is a condition which is not quite so far advanced, which generally occurs on the inside of the thighs. The eruptions are raised and firm. It is accompanied by much itching.
2. Scabies, is a pestilent contaminant, but in all probability bears no causal relation to leprosy.
4. Fever often is consistent.
5. Pneumonia is frequently seen.
6. Syphilides
7. A small papular eruption, like hicken, seen mostly on the anterior part of the arm and on chest and back.

Leprotic Fever.

This is the name applied to those specific attacks of pyrexia which precede and are followed by an outbreak of an eruption of tubercles. It generally appears in only a small percentage of cases. Some authorities state that this always precedes the development of new tubercles, but in my experience this is only true in those cases where crops of tubercles come on, and not when they originate singly and slowly. It is generally preceded by malaise, headache, and a sense of weakness, and sometimes, by vomiting.

A sharp attack of fever then sets in, the temperature sometime reaching 104°F to 105°F., with pain in the joints accompanying it (without any swelling however), and pains in the back: lachrymation and photophobia, and the patient takes to bed. Immediately
succeeding this the existing tubercle enlarge, become
reddened and painful, tender to the touch and hot
to the feel; and then near the old one, new tubercle,
gradually appear in chest, -- make in size at first,
hut rapidly enlarging; and they too are tender and
painful. In about two to five days the fever, which
is accompanied with much perspiration, a red tongue,
and constipation, subsides. The pain in the tubercle
become less, but the tubercle persist. Generally the
fever recurs in the same patient frequently. The skin
around the tubercle, may become tumid, hot and
tender, but this subsides with the subsidence of the
fever. The fever is usually of the continued type,
sometimes remittent in character. Sometimes, the fever
may be the precursor of the sign of a hepatic deposit
in one of the intestinal organs. In one of my cases I
noticed that the hepatic fever was induced always by
acute, intestinal derangement — the patient became
very dyspeptic, suffered from diarrhea, pain in
the liver, vomiting etc. When this irritable condition
of the stomach retribed, fever set in, followed by an
eruption of tubercle over the face, shoulders and
upper arms and back. These tubercle were copper colored,
swollen, firm and hard, intensely tender, and
hot to the feel.
Anesthetic defect: two large necrotic areas of anesthesia - one R. shoulder blade, and a smaller one on left. The sunken portion running diagonally from left to right is due to exposed bone. Small lesions, sometimes seen, are not tuberculated.
Anaesthetic Leprosy

I have at the beginning of this Thesis divided this variety of leprosy into two subdivisions, namely, (1) that form which is purely anaesthetic; and (2) that form in which Maculae Nigricantes occur in addition. In doing so I feel that I should be making the description somewhat diffuse, but the clear marking out of the two varieties warrants me in adopting it. At the outset I must draw attention to the fact that sometimes an eruption does occur in the purely anaesthetic variety. It then generally does not last for more than a few minutes, and disappears.

1. Anaesthetic Leprosy (pure variety)

In this variety the skin shows no outward change but on examination total anaesthesia of areas of varying size is found to exist. The patient in the earlier stages is so slightly affected that it is generally only by accident that he notices a small patch of anaesthesia and seeks advice for it. Or, perhaps, a small take may appear which he finds insensible to the prick of a pin.

The Premonitory Symptoms are slight and few, and as they occur a long period antecedent to the time when advice is sought it is difficult to obtain a correct account. As far as can
Anesthetic lipoma - patches of anesthesia's lighter than surrounding skin were seen.
be made out, certain subjective phenomena may precede the development of the disease—such as pain along the course of a nerve, the ulcers in the median nerve, generally, which may be of a burning or darting nature or of a burning character. Or there may be a sensation of pins and needles, or formication. There may also be a sensation of pins and needles, or cold and chilliness. These sensations may be felt in the finger tips, in the area of the back or chest. They may come often and then may disappear, the patient naturally not paying much attention to them. Then perhaps in the most accidental way he may discover the fact of the existence of anaesthesia—in lighting a pipe he may burn his finger or raise a blister without feeling any pain; or, he may run a prickler into his hand or foot and the may set up inflammation without pain; or, he may discover an ulcer on the sole of his foot caused probably by a nail in his boot which he never felt. Once he is led to seek advice, and naturally enough in questioning patients with a view of ascertaining the cause of the lesion, in often get as causes, that a thorn pricked them, or a nail ran into the foot, or the hand was burnt. Rheumatism subterraneus is sometimes a very early sign. It may appear on the elbows, knees, hand, or feet. But this is a sign consecutive to impaired
Anaesthetic depnoe - hafatc patches (of anthrax) on back: irregular distribution.
neurons influence. Sometime, pyrexia may attend the outbreak of blab. Hyperesthesia is sometime looked upon as a prodromal sign, and this is seen in the fingers and toes and varies extremely in degree from "a mere disagreeable sensation excited by pressure to very acute suffering: the man, without fear falling down their cheeks, then they run about only a few steps" (Boeck). Constitutional disturbance of a pyrexial character may also precede this variety accompanied by digestive troubles. In the late premonitory stage, a fall of temperature and a sensation of cold; albuminuria; irregular menstruation; and diminution of Erotic desire are sometime to be noted.

**Course of the Disease.** Following upon these premonitory symptoms in time to the disease fully established, with anaesthesia as the great and constant sign. The anaesthesia varies in extent; sometimes, it may be in the course of the median nerve, and its area of distribution in the fingers may be affected; or, perhaps, it may affect that portion of the fingers which is under the influence of the Radial or of the Ulnar nerve. It then gradually spreads upwards involving a larger extent of the skin, creeping upwards to slowly as scarcely to be detected, until it involves perhaps the whole extent of the arm. The anaesthesia spread upwards
from the toes and feet in a similar slow manner until
until it reaches and involves the thighs. Coincidently with
this, patches of absolute anesthesia may be present in
the back and chest in areas which are irregular and
under the influence of no particular single nerve. The
forehead, face and ears are not insignificantly involved.

Sometimes, the attention of the patient is first attracted
to a patch of discoloration of the skin: in light-colored
skins, this patch may be reddish brown, in the darker
skin it may be slightly lighter—standing out in relief:
it may occur in any part of the body. This patch is
found to be anaesthetic, and as the disease spreads by
extension of anesthesia it may disappear gradually.

While this anesthesia is becoming established there
occur various changes, of new origin, which are charac-
teristic. I refer to trophic changes. Among the earliest notio-
ns is the wasting of muscles—and as the anesthesia gen-
erally appears earliest in the fingers, so the muscles
of the ball of the thumb, and those of the hypothenar
eminence slowly waste and atrophy. A little later on
the interossei and the lumbricals also waste and
atrophy, and as a consequence the tendons of the Flex-
ors Medii and Sublimis stand out prominently like cords.
The appearance of the hand now is like that of an
Elongated Shade—a narrow thing. When the hand
and fingers are extended, the palm is broken away to the atrophy of muscles, and from prominent ridges: the phalanges tendons are observed traversing it, the flabby prominence on the radial and ulnar side are flattened out by atrophy, the first phalanx are generally extended and the second and third are flexed over on the hand. The hand is now characteristic of the early stage of Arachnoid disease: a sort of 'Main in Gripe' which is noticed in Progressio Mus. Atrophy. Later on there may be thickening and clubbing of the nails. In some cases, the hand is affected differently — the fingers assume a conical shape tapering toward the extremities; or the typical glocky finger may be present — the fingers being broken, adenomas and tense, very thin, macaesthetic, and highly vascular.

In a subsequent stage necrosis of the phalanx occurs preceded by pains referred to the bones, rocking of the finger, and abscess formation. This tends subacutely and extension of the bones occurs. The swelling and necrosis may extend upward into the palm of the hand, and I have met with many cases where suppuration has extended into the palm from the finger along the plane of the deep extensor tendons — there to form a localized abscess. The nails split up sometime, or may be incurved side to side, or longitudinally.
About this time an careful examination hyper-
trophy or thickening of the ulnar nerve may be detected
about the inner condyle of the humerus; and a similar
thickening of the median nerve just above the wrist. This
has to be sought for carefully among the numerous tendons
with which it may be easily confounded. This thickening
of the nerve, spreads in a feathery manner for some
distance along their length, though only of course the more
superficial portion can be detected.

Paralysis of anesthnesia may occur in other
situations as well; they may vary in extent; may
be perhaps irregularly distributed, though in the main
they correspond with the distribution of the superficial
cutaneous nerves. Thus, large regions on the back may
be affected, between the shoulder blades and even them;
in the small of the back; on the chest &c. Generally,
the face and forehead may be free from anesthnesia.

Later on in the course of the disease slight
paralyzes, running into paralysis of greater degree
later may occur. Among the earliest to be noticed is
paralysis of the orbicularis oculi—the patient is unable
to close his eye; when asked to do so, he shuts his eye,
the eyeball is rotated upwards leaving the sclerotic
visible through a chink between the lids. As a consequence
of this paralysis, and perhaps also the weight of the
his having some effect, there is dropping of the lower eyelid and Ectropion results together with congestion of the conjunctiva.

A more advanced stage is reached, sometime, when we meet with complete facial paralysis.

There is general wasting of the muscles of the body — few purely aesthetic lepers are of full habit; they are usually thin and emaciated. This atrophy occurs invariably in the muscles which are supplied by the enlarged and thickened nerves, and is at first confined to them — thus the elevator of the forearm may be atrophied, or the pylorus; or the muscles of the leg or of the calf.

The anesthesia is at first purely superficial, as it well seen in early cases of the disease — the prick of a pin may be felt where the pin is run deep into the substance of the tissue, and the impression of pain is delayed. But later on even this is abolished as the deeper nerve branches become affected, so that in plunging a pin deep into the tissues, no sensation of pain is felt. However the sensation of pain and the sense of feeling is not altogether abolished when we reach the innermost and deepest tissues. This I have proved repeatedly in operations — thus, in the process of excising a bone perhaps, the patient has no feeling as the knife is thrust into the tissues, but when the
Acroosteolysis. Affection of the Fingers.

On the left, the fingers are swollen, conical and glossy; the nails of the left hand are affected. The two hands on the right are more advanced; the flexion of the fingers, the deformity, and the change in position of the nails, are well shown. In the left hand, the prominence of the flexor tendons is marked.
the bone is being separated the pain is felt acutely. Again in a case where I had to perform dorsiphong - there being total anaesthesia of the skin over the neck - during the superficial incision the patient made no complaint, but when I reached to the deeper tissues he could scarcely be set to keep still, owing to the pain.

The flexion of the fingers is just due to the sustained nervous influence upon the superficial and deep flexors of the forearm, but rather to its effect upon the lumbricals, which I have proved repeatedly by demonstrating tendony of the affected flexor tendon, and then attempting to extensor the phalanges; which, however invariably relaxed into the flexed condition when the force which kept them extended was removed. In the early stage though the phalanges be flexed, they can be slight force be extended; but as soon as the force is relaxed the flexion recurs. Later on the extension cannot by any amount of force be produced. The phalanges are fixed in the new position.

In consequence of the phalanges being fixed in this flexed position changes of a trophic kind occur - some degenerative change in the ends of the bone, opposed in this unnatural position: so perhaps it might be an irritative change due to the
Anaesthetic deformy - an advanced case in which the hands are markedly affected. The fingers of the right hand are entirely lost; those of the left not so great an extent. The nails of the little fingers, the ring to the fore fingers, are all displaced.
the same cause, he consequence there occurs pain, and thickening of the joints; or there may be an eruption of serum into them: and this leads to absorption of the ends of the bone, in some instances, and to various degeneration, ulceration, and explication in others. Where absorption occurs, which may be known in an early stage, the phalanx begins slowly absorbed and shortened as it progresses, the distal end becomes approximated to the proximal end, and the wasted and atrophied finger nail is carried over to, and apparently implanted on, the end of the proximal phalanx. This may also occur in the proximal end of the last phalanx, which, remaining flexed, becomes gradually shortened by absorption, and the nail is carried over to it as it progresses. The second phalanx undergoes the same absorption and the nail is implanted on the terminal portion of the first phalanx, and finally it is carried over to the distal part of the metacarpal bones, where the process ceases. I have seen a hand wholly bereft of fingers, but the remnants of nails implanted on the end of the metacarpal bones. The metacarpal bone, however, I have never seen absorbed.

In the other case there is swelling and inflammation of the periosteum, together with caries of the bones; he its progress it sets up degenerative changes of the tissue.
Tissues surrounding, and in consequence of this, a small abscess or ulcer forms, and the bone is cast away piece meal. During this process sensation is generally acute—the least touch causes the most exquisite pain. The tissues surrounding the bone take on an inflammatory action, become hard, tense, and throbbing and last to the feel. If none an incision be not made to relieve the tension, an abscess forms and bursts violently, and piece of carious bone are extended. The accompanying pain is great even though the pain be anaesthetic.

**The Occurrence of Ulceration and Gangrene.**

Ulceration is of common occurrence in this variety of the disease, and may partaking of the chief characteristic be remembered superficially, but on pressing them deeper down are found to be very sensitive.

These common ulcers found on the men and arising spontaneously, are generally connected with a diseased bone or joint. They are lined with difficulty, and remain open during the whole life of the patient; sometimes narrowing and secreting but a small quantity of their peculiar humor, at other times enlarging and running forth a great quantity of ichor. So long as the ulcer extends
extend and plentifully secreto, so long the malady
seems at least to be arrested, and the health of the
patient is good; but if on the contrary they close up
and their secretion becomes scanty or suppressed, then
arises a general disturbance of the system: in fact,
the disease makes evident progress amidst jaundice
and other signs of general suffering: may, even death
may ensue with brain symptoms." (Danielsson).
Although I have not seen this myself, I am much for
its correctness (except the final paragraph) on the
testimony of the experience of the more intelligent patient
under my care, who objected to have chronic ulcers
operated on with a view to cure, for the reasons men-
tioned above, and who has repeatedly assured me
of the disastrous results following the suppression of
the discharges of these chronic ulcers.

Ulceration and gangrene often rapidly occur.
Large dirty ulcers form on the legs, generally the ant.
erior surface of the tibia. They present all the char-
acters of ordinary chronic ulcers—thickened white
border, with some degree of hardness around, and
sometimes having the edges undermined. The sur-
face is sometimes quite clean, irregular and reddened,
sometimes it may be dirty and exuding an ichorous
pus. The edges generally are anasthetic.

Gangrene.
Gangrene and rapid sloughing of the tissue I have often noted; especially does it come on when any small bone is exposed and not attended to in time. One patient presented the peculiarity that whenever an incision was made into any part the surrounding tissue used to slough very rapidly, and this action used to spread upwards.

These changes are doubtless due to the abstraction of nerve influence, or its diminution: aided in their origin by some local injury.

The Perforating Ulcer is of uncommon occurrence in this variety, and is looked upon as diagnostic by some authorities. It generally is the result of some injury—the action of a nail in the boot, or a splinter boring into the flesh, or treading upon a cinder, or some similar injury. In a tropical country where the majority of those affected with leprosy belong to the lower classes who habitually go about shoeless, these ulcers are very common. Due as it is to some injury to an exposed anaesthetic part. I fail to see how the perforating ulcer can be looked upon as diagnostic per se. If it were to arise in cases where no injury could possibly have been inflicted on the part, and quite spontaneously, then it might be taken as such; but under the circumstances, if any other anaesthetic
anesthetic part were to be subject to the strenuous irritation we should have similar ulcer, especially if the injury be of long and intermittent application, as in the hands or. To see it appear that the perforating ulcer is simply the result of an accident: its presence is not constant: its position dependent upon altogether fortuitous circumstances. And inasmuch as it does not arise spontaneously in a part which is free from the causative influence we can scarcely think compare it with the perforating ulcer of locomotor ataxia. The perforating ulcer is generally situated in the sole of the foot: under the great toe in the metatarsophalangeal joint, under the little toe in a similar position, under the heel, or elsewhere in the sole of the foot. It first begins as a very small ulcer with slight discharge; it gradually deepens, and has a more or less conical shape, and ultimately it deepens to such an extent that the apex of the cone reaches bare bone. The discharge from it is thin and ichorous sometimes. The bone when excavated upon sore undergoes degeneratin changes, becomes carious, and is torn off in fragments. There is generally much pain associated with it, deep-seated and continuous, boring or aching pains. Very frequently the ulcer extends in the interspace between two metatarsals.
In this stage the disease may become stationary for a long time: minor small ulcers appearing in different parts, the result of injury, and healing very rapidly. Thus, in the hands of cicatrices, thinned, whitish and anaesthetic, are always to be seen—probably caused by a burn from a match, or in cooking operations, or by a splinter remaining in etc.

But in the earliest stages one characteristic symptom does arise which, although classified by the Norwegian physicians as among the "very earliest signs of anaesthetic disease," cannot, in my opinion, be acknowledged as diagnostic for quite the same reason as I cannot accept the pruritis vulvae as diagnostic. What I refer to is a large blister, appearing, sometimes spontaneously and sometimes traceable to some accidental injury, in the derma or the dermis of the first stage, in size from a tangerine piece to perhaps a plum or a lemon. It develops quite suddenly, enlarges rapidly, is filled with serum at first, which may be reddish and turbid, and may become purulent. This fluid may be absorbed or the blister may open discharging it without ulceration, or ulceration may ensue. If ulceration ensues after the fluid is let out, the ulcer is quite superficial, with a reddened base, and sides only slightly elevated, but not angrily looking or inflammatory, and heals very quickly.
The healing time results in a slight atrophy, very fine
and anaesthetic, punctured with rancid, and glandous. The
hemorrhagic bulla is sometimes looked upon as diagnostic,
although in the still earlier stage a number of small
bullae is said to occur in various situations.

In the stationary period a patient may remain
free from all active manifestation of the disease except
pulmonary accidentally present as a result of some injury. He
may look as flesh, and be in apparently very fair condition,
and may go on in this way for years. But then, after
a longer or shorter period, or perhaps without any interval
at all the disease progresses. It insinuates rapidly: the
anaesthetic areas spread and involve larger tracts; from
skin there occur the same degenerative change, in other
bones, owing to which piece by piece the long bones of the
hands and feet come away and are thrown off, and
persistent pain is present; and septic caries, owing to
the active absorption of the pulmonic products from this
scene, unless some intercurrent disease steps in to
effect a fatal result.

The Nervous System.

Naturally we have to consider
the signs presented by the nervous apparatus most clearly,
as this is the system primarily involved, and most deeply
involved. But the earliest stage of the disease there may be
anaesthetic.
paraesthesia — variations in the normal sensibility—sensually there is, first of all, a change in the direction of hyperesthesia. The sensory parts of the cutaneous branches are involved: there may be burning pains in the extremities, along the course of a nerve; there may be pain on pressure of the nerve: "pins and needles" and paresthesia are common phenomena, as well as alterations of heat and cold. After this there ensues steady anaesthesia of the areas supplied by the nerve. This anaesthesia is at first sharply limited to the area of nerves supply—when the radial or ulnar nerve is affected we notice that the areas supplied by these nerves respectively are affected—namely in the former case, the thumb, index, middle & radial side of ring finger; in the latter back surface of the ulnar side of the ring finger and both sides of little finger. In other cases, the situation of the distribution of anaesthesia as in the back of chest, for example, seems irregular, and does not correspond to the nerve distribution—her perhaps this may be due to the existence of sensory twigs in the cutaneous branches unknown to anatomists, and demonstrated here by pathological experiment.

Following these sensory disturbances come to the next stage, in which the trophie filaments of the nerve become involved, and manifest their implication by a train of characteristic symptoms. Thus there is...
wasting of muscles. Generally we suppose that in a bundle of nerves in which fibers of the three varieties are present, sensory, trophic, and motor, that they are involved in the order stated. Even though they be enveloped in the common sheath, whether the subsequent implication of fibers of different function is merely due to the spread of the neuritis, or is a later manifestation of a simultaneous and contemporaneous affection is not known. At any rate the fact remains that in the sequence of symptoms the sensory disturbance come first, next the trophic, and finally the motor. As I have remarked before, generally the same situations where are present sensory disturbance show redder trophic disturbance; the thenar and hypothenar eminences disappear, wasting away most notably. Next, there is wasting of the lumbricals and absorption of the fat, whereby the fleece tendons of the hand stand out prominently. Then it later spreads to the muscles of the forearm and upper arm—whish all degenerate, waste, and become flaccid and flabby. The affected nerve, however, stand out prominently, much up wing to deposition of embryonic tissue in the nerve sheath, and can be rolled under the fingers quite easily at the elbow and above the wrist. The same course is followed in the lower extremities, when the nerve are affected: the affection spreading from the periphery towards the center. Next
vi the skin we have evidence of this trophic disturbance in the presence of slowly slivering fingers, when the circulation is obstructed and sluggish and the part is enlarged.

Then again we have the spontaneous formation of pemi-phlyisis bullosa over the dorsum of the foot, and sometimes, in the arms. Other skin affections—the purpurating ulcers, the appearance of eczema in the slightest cause, the presence of herpes, etc., all point to the trophic disturbance. The muscles of the face are sometimes affected—waning away to a great extent, even simulating paralysis. This is especially seen in the case of the orbicular muscle of the eye, when owing to their wasting there is Ectropion and ultimately some paralysis secondary. Carter even mentions that atrophy of the nasal nerve in some advanced cases is due to implication of the 6th cranial nerve—no fault it is accessory and adjacent to the local cause which produces it. Owing to exposure of the eye ball in the Ectropion Keratitis may occur, but Carter says it is rare to see ulceration of the cornea deep seated inflammation of the globe.

Paralysis may finally supervene. It is due to two causes: it may be due to the atrophy, or it may be initial. When it commences without any apparent cause it affects the facial muscles—the eye expression first; and all the symptoms of Bell's paralysis are
are seen superadded sometimes to ataxia. Then, there may be drooping of one cheek and side of mouth—more generally the left. The eye may be dilated widely and the patient in closing it has to turn the ball upwards. He is unable to whistle, to purse his lips, etc. I have seen a case in which sudden and rapid keratitis set in, owing to the irritation allowed by the paralysis.

After the nervous system has been deeply involved the patient adopts a curious gait—he walking he raises his foot very high from the ground, the flexion of the thigh on the pelvis being pronounced. It is the typical equine gait. It is often seen, and invariably involves both extremities. It is in my opinion so characteristic a sign that when such a gait is observed in a country where leprosy is prevalent it may safely be regarded as diagnostic. Whether this is due to the anaesthesia of the toes giving the patient inadequate support of how he steps, and so causing him to step high for safety's sake or whether it is due to nerve implication centrally I cannot say. This must be differentiated from the trembling in the foot caused by inexcitation of the feet, and partly from the lower limb becoming too heavy for the atrophied muscle. But apart from this form assumes there is a certain amount of ataxia varying in degree and primarily due to nerves.
Arthritic deformity. Joint affection in left ankle joint well seen. Joint enlarges, then bone, become absurded, there is subluxation and joint is useless. The flexion of the finger is with seen, as also the wasting of the hand.
Neural Origin.

The reflexes are involved early — the knee jerk is lost, so is ankle clonus; and these reflexes, except the organic, are lost. The organic reflexes seem never to be involved. On the loss of the knee reflex, in advanced cases it occurs, the patient as shown before becomes typically equine, and patients have experienced it to me that they have no sensation, their legs are not under their control, they cannot estimate the correct height behind to raise them, and consequently they jerk them out or walking.

**Charcot’s Disease.** I have noticed several cases in which typical instance of this disease has been seen. Sudden wrenches preceding impingement of both knees attended with slight swelling of the joint, and considerable pain and tenderness. Especially pressing the patella against the condyle of the femur, the joint subsequently becomes twisted, the organic, painful — the ends of the bone become absorbed, and the extremity becomes, frail like and useless.

**Special Sense.** The nerves of special sense are markedly involved. The sense of smell is first preserved and then lost. That of taste is also lost early and quickly, so that the patient has absolutely no idea what he may be eating. Sight may be involved secondarily.
An aesthetic deformity, the toes are entirely absorbed, & the little & great toe dislocated. The joint is narrowed & useless. The white patch on the foot indicates a cicatrix remains from ulcer.
Secondly, owing to the effect of the paralysis, if the muscle of the lid, I have never seen a case in which the sight has been involved primarily, i.e., owing to a lesion in the optic tract. I have one case of Mixed Uveitis in which a tubercle was developing in the retinæ. The patient complained of various subjective sensations, among them, of diminution of vision. He has a definite anemia of the disc but no organic change. Hearing is not generally involved. I have never seen a case yet.

From all this, it would appear that the central nervous system, the brain and the spinal cord, are not at all — or only to the very slightest extent — involved in the anaesthetic variety. But Brain & Marrow disease may coexist with Uveitis.

Among the clinical notes, there are one of a condition which simulates Carrel's disease. On page 59 I have made a short note which I will now amplify. In the disease as seen in keeping the joints of the upper extremities, are affected — most generally, the wrists and sometimes the elbows. The joints of the fingers are affected much less frequently. There occurs a rapid infiltration of serous into the joints, which are swollen, hot, painful and not tendered. After the lapse of a certain time, these organize into a sort of fibrinous material. But degenerative changes occur in the
the ends of the radius and ulna, and the carpal bones. The cartilages become absorbed, and distinct grating can be made out, and the hand droops uselessly, and is unable to be moved. Sometimes it is dislocated being drawn up and detained in its abnormal position by the tendons of flexors or supinators. The remarkable point is that the expansion into the joint is not sudden, but is gradual; and the change takes some time to develop. The hand may be dislocated also to the radial or ulnar side, or on to the flexor or extensor surfaces of the forearm. Sensibility is lost. No pain is felt on moving the impinged ends of the bones on each other. In the elbow we have the same symptoms, disorganization, and dislocation of the bones, attended by the peculiar men, swelling, and loss of sensation of the skin. This is undoubtedly a trophic change.

The loss of pigment in anaesthetic dermata may also be regarded as a trophic lesion, dependent upon altered blood supply; because most of these naked, especially noticeable in the black skins, are of much lighter color than the surrounding skin though they are so sharply marked off; and on microscopic examination the loss of pigment is most distinctly seen. Now these taches are not always anaesthetic, but as the disease progresses, they tend to become so.
In some advanced cases than noticed, especially when there is some paralysis of the muscles of the face, such as the orbicularis of the eye, a tremulousness, a fibrillary twitching of the muscles around the mouth or around the eye, other than the affected ones.

Thus, the disease after a long stationary period makes some progress at last, and generally some intermittent disease sits in to end the life of the patient. This is a subject which will be considered later on.

Anaesthetic Leprory (with tâches).

This subvariety may for all practical purposes be considered the same as the subvariety I have just described at length, and most physicians do consider it. In point of fact, in the vast majority of the cases we have tâches implanted in the former anaesthetic variety. The tâches are of varying size, perhaps from the size of a pea to patches larger than one's fist, and even attaining the size of the back of an adult, occupying the whole of the back. The tâches are generally paler than the surrounding skin, and peaked in the centre. They are irregular in shape; edges may be wavy and raised above the level of the skin, and sometimes, being anaesthetic, greatest at the centre of the patch and diminishes towards the circumference. They appear
most frequently on the trunk; then on the upper limbs and face: the buttocks; and least frequently on the lower limbs. The other features of the subvariety need not be gone into—they are the same as in the pure anesthetic, and in the illustrative cases certain characteristic points will be brought out.

Case I. Anesthetic Leprosy. No tubercles: no deformity.

Proximus. Evidence of Syphilis Conspicuous.

History. It started with a pemphigoid break on external surface of left fore arm. This broke, discharging matter. Then lumps came as small lumps and small vesicles. One large one appeared about the inner surface of left upper arm. Large open ulcers came out in skin along their whole length. This was followed by anesthetic.

Present condition:—Anesthesia in both fore arm and hands; but in upper part of fore arm and upper part of upper arm sensibility normal. Anesthesia to a slight degree in upper part of back, in legs, very slight anesthesia in some parts through stocking. Sensation of normal. White cicatrices along both thighs and on knees. Irregular nodular swellings, hard and long and paining along both thighs. Strongly suggestive of Syphilis. Through patient denies if slight anesthesia of face. Sensation.
Destruction in finger normal. The change in their shape. Nails quite intact. Sensibility in feet quite normal.

This case illustrates a slight degree of the disease, but how much the leprosy may be mixed up with syphilis is difficult to say. The results here show are highly characteristic of syphilis.

Case VI. Lepra Anaesthetica: General diminution of sensibility with complete anaesthesia of hands and feet.

Sungamur. Male, aged 62. Admitted May 1st. A superior, very well attired, who gives a very contradictory account of himself. Says he contracted the disease about five years ago: before that he had an ulcer on the left leg which was intractable, and the leg had to be amputated below the knee. The ulcer was caused by some wood cutting the leg in the high woods. Spot first appeared on the body, and then anaesthesia in fingers. Both pain is hooting and personal feeling cannot be satisfied, marked 1s.

This case is remarkable for the diminution of sensibility which exists over the whole body, in addition to mere pronounced anaesthesia.
Anaesthesia, localized. On the face he knows when he is touched, also over the head, but feels no pain when a pin is stuck into him. The left ear is completely anaesthetic, but not the right. Over the body are one or two large discoloured patches, only slightly lighter than the surrounding skin. The sensibility is diminished. Down to a little above the wrists are much wasted and show diminished sensation. He feels a pin which is inserted to the depth of an inch, but has no pain; in his hands, when the pin is worn through he has no sensation. His hands are typical. The wasting of the muscles, sparsity like condition of the palms, flexure of fingers, anaesthesia complete the picture. Only the skin is smooth, there is no ulceration or no cicatrice; nails are intact except that of the left thumb and middle finger. He has an extremity which extremity a similar condition exists on both sides—the diminution of sensibility above, and absence of its in the leg and foot. Muscles in front of right leg are much wasted, and the skin is covered by large areas of detachable epidermis like lichen. This is also to be seen on the outside of both arms, and around the wrists.
accommits. Eys are both bad. Vision lost.
Right Eys - Pannus in lower part (half) of cornea; upper part of cornea hazy and glands glair. Vasular injection. Much lacrimary mation.
Left Eys - cornea also fumed glair; but a large reddish, mulberry-like lesion in lower part; redness and looking like scurulation tonic. Pain in both Eys.
The left eye came on before the other; no history of a blow. Many intervals elapsed before the right was affected. They seem to be the result of inflammation and irritation having to paralysis of the orbiculars, which however has now passed away.
The interesting points are (1) that it is only of four year duration and its onset and spread is remarkable: (2) the difficulty of making out what relation, if any, the ulcer of leg had to the disease, (3) the condition of the eyes.

Further illuminating cases. More sirve at the end of this Thesis.

Mixed Leprosy.

I think we may safely say that no case of Mixed leprosy ever arises as such at initio. Either An.
astrostesia sets in where the tuberculatation is already
distinct.
existence: or tuberculosis is superadded to the anesthetic variety. We must be careful however not to mix up with the true mixed lesion those cases of tuberculated leprosy where there is some anesthesiæa over the tubercle, in which the anesthesiæa is due to the impingement of the peripheral nerves on the new growth. The period which elapses before the one form is superadded to the other is variable; in some cases the mixed variety is developed about a year after the onset of the one variety, in others at a much later period. When the anesthesiæa is superadded to the tuberculated variety its characteristic mark is by a feeling of numbness in the little finger generally — as one patient expressed it, "it does not feel natural to him." This anesthesiæa spreads gradually to the other fingers: very seldom do the toes, develop; but the fingers become swollen and glistening and glossy, with an oily appearance of the skin, and the nail partake of the general change due to the loss of trophic influence.

Hillis says: "Cases of the mixed form have a closer affinity to chronic syphilis than any disease I am acquainted with. In the mixed form destruction of the cartilage of the nose takes place, the cartilaginous septum entirely destructed, and the nose appears flattened. The velum has also been destroyed by ulceration, thus increasing the resemblance to chronic syphilis."
The two forms of leprosy. The development of cutaneous tubercles in a case of pure anaesthetic leprosy is seldom seen than the reverse condition. Recent discoveries by Gerlach (Untersuchungen über die Ursachen und die Bildung anaesthetischer Hautflecke von der Erkrankung zugrunde gelegene Nerven bei der lepra anaesthetica. Dreyfus, 1892) show that in anaesthetic leprosy, the primary granuloma take place in the skin around the peripherial ends of the nerves, extending afterwards up the branches to the main trunks. These observations, if confirmed, will bring the two forms of leprosy much closer together, for the mode of attack will then become the cause in both. A possible explanation of the more frequent transition of a tuberculated than of an anaesthetic into a mixed case is also advanced by Gerlach's researches. In tuberculated leprosy large flakes of skin are infiltrated with new growth containing quantities of bacilli, whereas in anaesthetic leprosy the new growth occurs in limited areas around the peripheral nerve endings, and does travel up the skin nerves, leaving the skin practically free from bacilli. For it is well known that these are never found, or only seldom, in the skin in advanced cases of anaesthetic leprosy. Now it is obvious that the risk which the nerve passing through the infiltrated areas in tuberculated leprosy run of becoming involved by extension from these areas is much greater than the risk which is incurred in anaesthetic leprosy.
leprosy, of the skin becoming infiltrated by a growth while
after the first year, i.e., practically limited to the nerve.
Meanwhile it may be accepted as a fairly accurate
statement that cases of tuberculoid leprosy are those
which have not lived long enough to become mixed.

I merely quote the following case as one illustrating
the implantation of anaesthesia in tuberculoid leprosy.

Typical Case of the Mixed Variety


History: 16 years - constant Constitutional. Historically:
stable. It came on with a stain on back of left hand, about size of a plum; yellow; irregularly
erupted. The hand felt heavy. Another spot came
on outside of left leg; much larger but of the same
characteristics. A third spot appeared on the outside of
right leg with the same characteristics. And the
last came out on right ulna. There was no
anaesthesia in any of them. Only a slight indurated
edge between the appearance of each; and
they remained for a little time. The ulcer then
appeared on inside of R. leg. Hands and feet
drewled. Small isolated tubercles now appeared
ed on face, back of legs and ears - 3 years
cap. At the beginning of this year he noticed
anaesthesia of left little finger, complete
In dreams except one terminal phalanx and progressive over the rest of the same finger. The "New York feel natural" to him like the other. Seizure occasional attacks of leprous fever.

Points of interest are:— (1) The early manifestation by these tactics which were not anaesthetic; (2) the definite account of the sequence of the tactics; (3) the appearance of tubercles a year after; (4) the rest of anaesthesia, three years after, in its favourite site; (5) the attacks of leprous fever.

**Unity of the Disease.**

Most of those who have made a study of leprosy agree in considering the different varieties as manifestations of the same disease only—a disease the cause of which the bacillus lepros—attacks via the normal or integumentary system, in the other the reverse. Some authorities, indeed, so far as to maintain that the different phases of the eruption, tubercles, and numbness are simply so many stages of the same complaint. And whether this can correctly be so regarded is uncertain because I have seen cases purely tuberculated, or purely nerves begin and persist as such till the end. Many of these cases where anaesthesia is super-added to the tuberculated variety are not quite the same.
same in their pathological aspects as those cases of pure anesthetic leprosy. Also, the form of the disease may pass into the other – may change into the other, leaving only a trace of the first or principal variety: the most frequent change is the tuberculized variety into the anesthetic; the reverse is not so common. It is to be noted that the same external agencies operate to produce in one form the tuberculized, in another the anesthetic variety; that parents attacked with one variety may yet children attacked with the other, and that the grandchildren may be attacked with the same variety as the grandparents. The one variety is not a development of the other, but both are quite distinct and independent nutrisse forms, which have a separate course, and lead to the premature death of the subject attacked.

Change of Character of the Disease.

I have mentioned above that though in all practical purposes the different varieties may be looked upon as distinct, a change may sometime, though not frequently take place, whereby the character may be altogether altered. The most frequent is the change from the tuberculized into the anesthetic variety – the reverse change only seldom takes place and indeed than never seen a case of it myself.
tubercle may persist for some time; while disturbance, then set in, accompanied by much constitutional derangement, and excessive tenderness of the limbs. The tubercle, gradually subsides, leaving the hyposthesis, which gradually ceases and passes into a condition of anaesthesia. And finally we find my patient, marking the site of the absorbed tubercle, and another seen well and characteristically developed. The change from the Anaesthetic Variety to the Tuberculated also occurs early in the history of that variety, and is ushered in by febrile symptoms, and general constitutional disturbance, followed by an outbreak of tubercles which, when they become established, soon become added to and predominant, while in the meantime the anaesthetic areas have tubercle implanted in them.

CASE III. To illustrate the change of character which may occur from Tuberculated to Anaesthetic.

Sarah Jane Lewis - F. aged 45. Born in Tobago.

Cause unknown. Family history practically unknown.

Note of condition on admission, 15th July 1886:

- Slight thickening of eyelids, of side of nose, large flat masses of tubercle over cheeks, later of ears thickened. Sensation one arm and hands and fingers normal. - Slight thickening on 4th left finger due to a burn. Skin on left leg,
legs in normal as regards sensation, but 2nd right toe is anesthetic.

The condition on examination by me in July, 1891, was as follows: there seem to have been nothing of importance recorded in the interval.

Face - Skin coarse and dark except where large patches of blanching are present, on left side of face, and on right side running down to neck.

Arms - Large patches running down its length.

Fingers - Left little and ring anesthetic & flexible.


Legs - Large patches of anesthesia.

Right foot - Toes are affected: some have dropped.

The hair is growing luxuriantly.

The patches mentioned above are light brown or creamy, sharply defined from surrounding skin, irregular in shape, anesthetic - other parts seem to retain sensibility. No subjective feeling in the patches, as if they were itching, or the skin over them were pulled up.

The interesting points to be noticed are -

(1) the complete disappearance of the tubercles,
(2) the occurrence of tache, and (3) the absence of anesthesia.
Diagnosis of the Disease.

Syphilis in its Early Stage

It has to be carefully distinguished for there are many points of resemblance — the syphilitic fever, the nature of the eruption, bright red (in the white skin) changing to dull red or brownish grey tint; syphilitic macule commonly resemble local prominence, a palpating rolling. The permanent lepra spot acquires with age a far deeper brown or yellow tint than a syphilitic spot of that age would present. The lepra spots come mostly on the face, the syphilitic patches on trunk. The hair of the scalp is uncommonly in early stage of leprosy; lastly, syphilitic symptoms of the mucous membranes and of genitals are wanting in leprosy. The manner in which the face becomes affected is peculiar; syphilis (inner side), also of nose, prehend and cheek and chin.
of ear are first affected, loss of hair as well as redness to the eye a distinctive aspect: the moist and oily character of the leprosy, skin thickening, with its reddish tint; the tubercular lymph; the hair does not fall off but is secretion lost. Although in both leprous bacilli may be present at first, in leprosy loss of feeling may follow and there is thickening of nose, ear and face. When the bones and soft tissue of the nose have been destroyed it resembles syphilis. The tubercle of leprosy exist for a very long time, seldom become greatly disorganized, and if softening does occur it is of all the tubercles at the same time.

When the disease is developed the picture presented by it cannot be mistaken. The occurrence of the tubercle: the characteristic leprosy face - keen hollow expression, skin of face thickened and hanging in folds, deep wrinkles; eye sometimes closed almost by the deposit of tubercle in the upper lid; causing swelling; ear pendulous, with deposit of tubercle; mouth contracted by cicatrices making speech indistinct; voice affected, raspy and hoarse; the effects of the fingers, which are crumpled and taking up and gripping: large, flat, deposits of tubercle near arms and legs; and general enlargement of the lymphatic glands.

Acne Estatico
Anesthetic Lepra.

In this, the early manifestations should
first be noted in countries where the disease
is prevalent—The premonitory subjective sensations,
pain and tingling along the course of some nerve—
running along the forearm or the leg; and later on
the impairment of these signs to fingers, a toe—
Then we have an early sign the development of
the puhinji and thala, solitary, or an aesthetic
base—Gradual onset of anaesthesia, and ulcer and
thickening. Sometimes the excreta first call
attention to the presence of the disease, sometimes
the penetrating ulcer. In the earlier stage, the thick
or macula may cause some difficulty. It is
rarely confused with leucoderma, in which
there is no suspicion of anaesthesia; and
in Trinidad with a variety of leucoderma called
kota, consisting of small circular white or light
coloured patches about the size of a threepenny piece
appearing most usually on the face, and sometimes
on the trunk—here too there is no anaesthesia.
A simple humming of the skin suggests Pfitzner's sign
also, but the signs are not to present difficulties
in diagnosis. Hyperesthesia erythema may sometimes
in lighter colored skins be confused with it—but in
In leprosy the spots are more persistent and there is the diminution of sensibility. Some Pariaeti the principal distinction is the anaesthesia - the soles are much tinier. The contracture and paralytic due to lead poisoning need - it is reported by some authority to be distinguished from leprosy; but the history and proper of the case will cause no difficulty. Atrophic depressions in the later stages may have to be differentiated, the constant symptoms will long enable us to do so. In the early stage of their variety, local peripheral paralysis of sensation due to peripheral neuritis may be imputed with it: here also the history and proper of the case will enable us to come to a conclusion. Finally, diseases of the brain and Spinal Marrow may simulating leprosy: such as syphilitic etiology.

A fully developed case of lepra anaestheticia is most characteristic and admits of no difficulty in diagnosis. The patient is generally of poor health and emaciated, he presents general shrinking of the muscles of the body. Paralysis of one side of the face may exist, together with Ectopion and lachrymation. There may be large irregular tachea over the back, neck, chest, and in arms, which are generally anaesthetic. Patient has a characteristic deformity of the neck.
of the fingers, many of which may be lost, and wasting of the hands. The gait is also marked—he picks his way carefully, raises his foot high and places it deliberately on the ground. The foot is also deformed, narrowed and shortened, and these are cicatrices and open ulcers of the knee. The main on the spine when it exists is also most characteristic.

**Age of Onset.**

I have prepared a table based on the examination of one hundred and fifty-three cases, chosen at random, showing the age in quinquennial periods at which the different varieties of the disease begin.

**Table to show in Quinquennial Periods the age of Onset of Leprosy (in years).**

<table>
<thead>
<tr>
<th>Variety</th>
<th>1-5</th>
<th>6-10</th>
<th>11-15</th>
<th>16-20</th>
<th>21-25</th>
<th>26-30</th>
<th>31-35</th>
<th>36-40</th>
<th>41-45</th>
<th>46-50</th>
<th>51-55</th>
<th>56-60</th>
<th>61-65</th>
<th>66-70</th>
<th>71-75</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuberculated</td>
<td>2</td>
<td>10</td>
<td>7</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Anaesthetic</td>
<td>5</td>
<td>3</td>
<td>8</td>
<td>5</td>
<td>6</td>
<td>10</td>
<td>17</td>
<td>10</td>
<td>13</td>
<td>4</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Mixed</td>
<td>6</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>2</td>
<td>23</td>
<td>16</td>
<td>7</td>
<td>9</td>
<td>13</td>
<td>21</td>
<td>15</td>
<td>15</td>
<td>6</td>
<td>8</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

**Total Number examined**

\[
\begin{align*}
\text{Tuberculated} & \quad 35 \\
\text{Anaesthetic} & \quad 90 \\
\text{Mixed} & \quad 20
\end{align*}
\]

\[\{153\]
The average age at attack, calculated on another series of cases, is as follows:

**Tuberculated**
- Males: 21½
- Females: 21½

**Anasthetic**
- 25½
- 35½

**Mixed**
- 23½
- 27

Giving a mean average of 23½ years.

It will thus be seen that cases of Anasthetic leprosy begin later than those of the Tuberculated variety and that the mixed variety occupies an intermediate position. This can be understood when we reflect on the systems principally affected in the varieties. The greatest number of anasthetic cases appears between the ages of 30 and 50; and the tuberculated between the ages of 6 and 20. There is an apparent discrepancy between the table; the first was compiled from the more recent admission, the second from the earlier years. There being cases under any age of Tuberculated leprosy in children under five years of age, and also under the age of ten. Tuberculated leprosy is essentially a disease of early life; Anasthetic of later life. I have known cases of the latter occurring in children between the ages of five and ten. When the disease, in any of its varieties, commences early it greatly checks the growth of the body, and may run a very rapid course.
Relative Frequency.

The number of patients suffering from the Aestheteic form of leprosy is greatly in Trinidad than those suffering from the Tuberculated form. From an examination of patients in the Lepre Asylum I give the following figures:

- Tuberculated: 36 per cent.
- Aestheteic: 44 per cent.
- Mixed: 20 per cent.

This contrasts with other countries, where leprosy is prevalent:

<table>
<thead>
<tr>
<th></th>
<th>Demerara (Hillis)</th>
<th>India (Carlos)</th>
<th>Norway (Danielson)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuberculated</td>
<td>21</td>
<td>9.7</td>
<td>31.6</td>
</tr>
<tr>
<td>Aestheteic</td>
<td>62</td>
<td>69.4</td>
<td>33.3</td>
</tr>
<tr>
<td>Mixed</td>
<td>17</td>
<td>21.5</td>
<td>15.1</td>
</tr>
</tbody>
</table>

Trinidad occupies an intermediate position between Demerara and Norway in respect to the number of cases of Aestheteic leprosy. In India they seem to attain a maximum percentage. The percentage is high in this island owing, as I shall point out latter, to the large number of East Indian immigrants, who contract that form and are admitted into the Asylum.

Influence of Sex.

I have prepared a table from the admissions into the Asylum during the past seven years to show clearly
The relative affection of the sexes in each variety of the disease, and also the age of admission in decennial periods of these cases.

**Table to show the Relative Affection of the Sexes; and Ages at Admission.**

<table>
<thead>
<tr>
<th>Years in Decennial Periods</th>
<th>Tuberculated M</th>
<th>Tuberculated F</th>
<th>Anaesthetic M</th>
<th>Anaesthetic F</th>
<th>Mixed M</th>
<th>Mixed F</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 to 10</td>
<td>13</td>
<td>5</td>
<td>6</td>
<td>5</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>11 to 20</td>
<td>24</td>
<td>18</td>
<td>8</td>
<td>7</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>21 to 30</td>
<td>6</td>
<td>14</td>
<td>9</td>
<td>9</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>31 to 40</td>
<td>5</td>
<td>7</td>
<td>23</td>
<td>10</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>41 to 50</td>
<td>8</td>
<td>6</td>
<td>49</td>
<td>8</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>51 to 60</td>
<td>3</td>
<td>2</td>
<td>30</td>
<td>8</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>61 to 70</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>71 to 80</td>
<td></td>
<td>52</td>
<td>131</td>
<td>47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td>52</td>
<td>131</td>
<td>47</td>
<td>29</td>
<td>14</td>
</tr>
</tbody>
</table>

Tuberculated: M 59, F 52
Anaesthetic: M 131, F 47
Mixed: M 29, F 14
Total Cases: 219 (M 113, F 113)
Grand Total: 332

From this it will be seen that in the Tuberculated variety in Trinidad the sexes are affected in almost equal proportion; that in the Anaesthetic Males are affected
affected predominantly, in the proportion almost of three to one: while in the Mixed Male are affected in the proportion of two to one.

In this table also it clearly seen the following facts: that the vast majority of tuberculated male, are admitted from the 5th to 20th year, of females from the 11th to 30th year. This contrasts markedly with the admission of the Anaesthetic cases, the majority of male, being admitted between their 31st and 60th year, and the proportion of females remaining fairly constant during the decennial periods. In Mixed leprosy, the admission of male is fairly constant in the decennial periods 21-30, 31-40, 41-50, the number of female admitted is highest between 11-20 years.

<table>
<thead>
<tr>
<th>Variety of Disease</th>
<th>M</th>
<th>F</th>
<th>T</th>
<th>M</th>
<th>F</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuberculated</td>
<td>3½</td>
<td>2½</td>
<td>3</td>
<td>65</td>
<td>25</td>
<td>90</td>
</tr>
<tr>
<td>Anaesthetic</td>
<td>5½</td>
<td>6½</td>
<td>6</td>
<td>83</td>
<td>28</td>
<td>111</td>
</tr>
<tr>
<td>Mixed</td>
<td>4½</td>
<td>6</td>
<td>5½</td>
<td>38</td>
<td>13</td>
<td>51</td>
</tr>
</tbody>
</table>

Mean average Male 4½, Female 5.
### Table of Averages (calculated on Asylum records), showing age at attack, admission to asylum, and death; and total duration of disease.

<table>
<thead>
<tr>
<th></th>
<th>Tuberculated</th>
<th>Anaesthetic</th>
<th>Mixed</th>
<th>Mean Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>F</td>
<td>T</td>
<td>M</td>
</tr>
<tr>
<td>Average Age at Attack</td>
<td>21½</td>
<td>21½</td>
<td>21½</td>
<td>23½</td>
</tr>
<tr>
<td>Average Duration on Admission</td>
<td>3½</td>
<td>2½</td>
<td>3</td>
<td>5½</td>
</tr>
<tr>
<td>Average Age on Admission</td>
<td>25</td>
<td>24</td>
<td>24½</td>
<td>31</td>
</tr>
<tr>
<td>Average Stay in Asylum</td>
<td>4</td>
<td>3</td>
<td>3½</td>
<td>5</td>
</tr>
<tr>
<td>Average Age at Death</td>
<td>29</td>
<td>27</td>
<td>28</td>
<td>36</td>
</tr>
<tr>
<td>Average Total Duration of Disease</td>
<td>7½</td>
<td>5½</td>
<td>6½</td>
<td>10</td>
</tr>
</tbody>
</table>

From this table we see at a glance the average duration of each variety of the disease: the anaesthetic variety lasting the longest time—an average duration of ten years; and those suffering from the tuberculated variety succumbing soonest—in about two and a half years; the mixed variety being as elsewhere occupying an intermediate position. As compared with the disease at St. Vincent's in the neighbouring district of Demerara we find that the Tuberculated and Anaesthetic varieties run a much more rapid course, and the Mixed a longer course. The average duration of the Disease at Demerara is:

- Tuberculated 8½ years.
- Anaesthetic 15 years.
- Mixed 6 years.
Table to show Age at Death in Trinidad
Asylum (during 10 years, 1868 - 1878).

<table>
<thead>
<tr>
<th>Age</th>
<th>M</th>
<th>F</th>
<th>Total</th>
<th>M</th>
<th>F</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td></td>
<td>3</td>
<td>1.24</td>
<td>0.00</td>
<td>1.24</td>
</tr>
<tr>
<td>10</td>
<td>45</td>
<td>17</td>
<td>62</td>
<td>18.37</td>
<td>20.73</td>
<td>19.19</td>
</tr>
<tr>
<td>11</td>
<td>49</td>
<td>18</td>
<td>67</td>
<td>20.33</td>
<td>21.95</td>
<td>20.74</td>
</tr>
<tr>
<td>21</td>
<td>57</td>
<td>16</td>
<td>73</td>
<td>23.65</td>
<td>14.51</td>
<td>22.60</td>
</tr>
<tr>
<td>21</td>
<td>59</td>
<td>10</td>
<td>69</td>
<td>24.48</td>
<td>12.19</td>
<td>21.36</td>
</tr>
<tr>
<td>31</td>
<td>21</td>
<td>15</td>
<td>36</td>
<td>8.71</td>
<td>18.29</td>
<td>11.14</td>
</tr>
<tr>
<td>41</td>
<td>7</td>
<td>3</td>
<td>10</td>
<td>2.87</td>
<td>3.65</td>
<td>3.09</td>
</tr>
<tr>
<td>51</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>0.00</td>
<td>3.65</td>
<td>1.92</td>
</tr>
</tbody>
</table>

Total 241 82 323

By this table we see that the greatest number of deaths occurs between the ages of 21 and 50, that is to say in adult life.

Influence of Race

The Liability of Different Races to the Disease.

Compared, as the population of Trinidad is, of a large collection of different nationalities, it is interesting to note the proportion in which each contributes to the whole population. I append a statistical table analysing the birthplace of those admitted during eighteen
Eighteen years into the Leprosy Asylum, together with peri-
centages calculated on the total admissions, during that
time. From this it will be seen that the largest percentage
of the leper population is made up of native of Trinidad
Viz., 43.55 per cent; while native of India, who come
out here as indentured labourers to the plantation,
also form a large percentage, namely 30.28. These two
constitute together 81.83 per cent of the total admission
while those from other countries are comparatively
unimportant, except perhaps the 0.22 per cent of
pure blooded Africans admitted, and the 6.72 per cent
of native of other West Indian islands. The other nation-
elities contribute so little to the total that they may
be disregarded. The East Indian immigrants contribute the
most reliable race percentage, being a homogenous race.
According to the Census returns, they form 30% of the total
population of Trinidad. The native of Trinidad com-
mprising the percentage are made up of various elements;
— in hare, creoles, of English, Scotch, Irish, Spanish
and French extraction: creoles, colonnes, creole & black.
We cannot arrive at, or deduce, any trustworthy con-
elusions as to the proportion in which the various sects
of creoles are affected. We can only state that people born
in, and residing in, the island, are most susceptible to
the disease, and contract it more readily than those race,
which
Which, though living in the island are not born in it.

<table>
<thead>
<tr>
<th>Birthplace</th>
<th>Number Admitted</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trinidad</td>
<td>297</td>
<td>43.55</td>
</tr>
<tr>
<td>India (East Indies)</td>
<td>261</td>
<td>38.28</td>
</tr>
<tr>
<td>Africa</td>
<td>56</td>
<td>8.22</td>
</tr>
<tr>
<td>West Indian Islands:</td>
<td></td>
<td>6.72</td>
</tr>
<tr>
<td>Barbados</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>St. Vincent</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>St. Kitts</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Martinique</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Antigua</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Dominica</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Grenada</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Montserrat</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Tobago</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Guadeloupe</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Jamaica</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Nevis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demerara</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Margarita</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Venezuela</td>
<td>4</td>
<td>7.44</td>
</tr>
<tr>
<td>China</td>
<td>10</td>
<td>14.66</td>
</tr>
<tr>
<td>Madeira</td>
<td>3</td>
<td>4.50</td>
</tr>
<tr>
<td>France</td>
<td>2</td>
<td>2.88</td>
</tr>
<tr>
<td>Cape Verde</td>
<td>1</td>
<td>1.58</td>
</tr>
<tr>
<td>Germany</td>
<td>1</td>
<td>1.58</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>682</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>
The Prevalence of Leprosy in Trinidad.

The question as to the increase of leprosy in Trinidad is interesting and merits more than a passing notice, especially as the subject of its absolute increase in the different countries of the British Empire has been so recently a question of discussion. There have been only three official enumerations of lepers since the island was added to the English - in 1815 when the question of establishing a leper asylum was considered, an official inquiry was made and the number of lepers was found to be 73. In 1875 another official inquiry was made and the number found to be 77. The next official inquiry was in 1890 and a complete one which was made as was possible; the District Medical Officers and Wardens of Districts, being ordered by the Government to help in the enumeration. There were found to be 414 lepers. Calculating percentages, we find that in 1815 lepers formed 24.2 per cent of the population, in 1875 they formed 20.6 per cent. I append a table showing the number of lepers and the parts of the island where they are resident. This would seem to be as accurate an estimate as we can possibly have. The conclusion from all this is that leprosy has not increased in this island in proportion with the population, in spite of the increase of population by immigration from the East Indies.
Table to show the distribution of lepers in Trinidad: a leper census (1871).

<table>
<thead>
<tr>
<th>Name of Place</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leper Asylum</td>
<td>166</td>
<td>44</td>
<td>210</td>
</tr>
<tr>
<td>Diego Martin</td>
<td>13</td>
<td>18</td>
<td>31</td>
</tr>
<tr>
<td>Port of Spain</td>
<td>15</td>
<td>8</td>
<td>23</td>
</tr>
<tr>
<td>Laventille</td>
<td>11</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>San Fernando</td>
<td>5</td>
<td>7</td>
<td>12</td>
</tr>
<tr>
<td>Tacarigua</td>
<td>9</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>Naparima</td>
<td>8</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Indian Walk</td>
<td>3</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Arima</td>
<td>5</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Savannah Grande</td>
<td>1</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Chaguaramas</td>
<td>4</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Couva</td>
<td>5</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Cedros</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Drapanche</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Suaracara</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Mayaro</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Span Couva</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Erin</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Toco</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>250</td>
<td>99</td>
<td>349</td>
</tr>
<tr>
<td>Locality</td>
<td>No.</td>
<td>Locality</td>
<td>No.</td>
</tr>
<tr>
<td>--------------------</td>
<td>-----</td>
<td>------------------</td>
<td>-----</td>
</tr>
<tr>
<td>Port of Spain</td>
<td>367</td>
<td>Laidley</td>
<td>890</td>
</tr>
<tr>
<td>Naparina</td>
<td>66</td>
<td>Santa Cruz</td>
<td>3</td>
</tr>
<tr>
<td>Tacarigua</td>
<td>60</td>
<td>La Brea</td>
<td>4</td>
</tr>
<tr>
<td>Mucurapo</td>
<td>69</td>
<td>Maracas</td>
<td>2</td>
</tr>
<tr>
<td>St Joseph</td>
<td>31</td>
<td>Mayaro</td>
<td>1</td>
</tr>
<tr>
<td>San Fernando</td>
<td>39</td>
<td>Blanchisseuse</td>
<td>1</td>
</tr>
<tr>
<td>Couva</td>
<td>35</td>
<td>Carapichaima</td>
<td>3</td>
</tr>
<tr>
<td>Arima</td>
<td>28</td>
<td>Cumpias</td>
<td>7</td>
</tr>
<tr>
<td>Diego Martin</td>
<td>23</td>
<td>Prince Town</td>
<td>1</td>
</tr>
<tr>
<td>Belmont</td>
<td>24</td>
<td>San Juan</td>
<td>1</td>
</tr>
<tr>
<td>Laventille</td>
<td>20</td>
<td>Tunapuna</td>
<td>8</td>
</tr>
<tr>
<td>Cedros</td>
<td>10</td>
<td>Williamsville</td>
<td>1</td>
</tr>
<tr>
<td>Arima</td>
<td>15</td>
<td>Chaca Chacaré</td>
<td>2</td>
</tr>
<tr>
<td>Carenage</td>
<td>11</td>
<td>Propenche</td>
<td>4</td>
</tr>
<tr>
<td>Chaguaramas</td>
<td>20</td>
<td>Clayton's Bay</td>
<td>2</td>
</tr>
<tr>
<td>St Ann's</td>
<td>9</td>
<td>Caura</td>
<td>1</td>
</tr>
<tr>
<td>Savannah Grande</td>
<td>14</td>
<td>Cocoriti</td>
<td>1</td>
</tr>
<tr>
<td>Arica</td>
<td>3</td>
<td>Toco</td>
<td>2</td>
</tr>
<tr>
<td>Cima Roreno</td>
<td>3</td>
<td>Turare</td>
<td>1</td>
</tr>
<tr>
<td>Maraval</td>
<td>6</td>
<td>Pargantu</td>
<td>12</td>
</tr>
<tr>
<td>Savonette</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caroni</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chaguaramas</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Montserrat</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Principe a Pierre</td>
<td>6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total: 947
From this Table it will be seen that there is no district, town or village, which is practically free from the disease. As a rule patients do not seek admission in the onset of the disease but only when it is advanced, so that they reside for some length of time in the place, and I may think be assumed that the disease is developed, if not contracted there. There is an obvious fallacy in such a deduction, but in a small island like this it loses its force. Analyzing the figures, the large number of admission from Port of Spain, the capital of the island, is apparent, whereas the number admitted from the other towns, viz. San Fernando, Arima and Caroni, is much smaller, while from the healthiest town in the island, Princes Town, there has been only one. The reason of the large number from Port of Spain is probably because of its large population, about 35,000, and because, being the Capital, sick people and invalids migrate there in the hope of support in some of the Charitable institutions. Assuming that the disease is contracted in the locality I do not think that the geological formation has any causal relation to it. The island is too small to draw general conclusions of that nature, and the geological formation of the different localities named do not differ in any great respect in degree. Judging the figures, and comparing them with the population in each place, as I first stated briefly,
briefly, that the number of lepers is in proportion to the density of the population — except in Prince. Then

Terminations of Leprosy.

The different varieties may terminate in three ways — namely (a) Resolution; (b) Subsidence; (c) Death.

(a) **Resolution**

This is the rarest termination of the disease. When the skin affection subsides, and we, or only an inconsiderable degree of anaesthesia is developed, we may consider the patient cured. Sometimes, a little anaesthesia appears early, after which it gradually vanishes, with the subsistence of a skin eruption; this however cannot be regarded as wholly or partly cured.

When the disease extends up to such a stage that new lepromatous material is no longer produced, and the signs gradually disappear, so that on careful examination there is no trace of leprosy remaining, we may assume it to be spontaneously cured; this is the same sense as Pithiri; Pulmonali may be cured or arrested. Only those cases in which there is a very mild eruption of tubercle, have any prospect of healing thus.

When a chronic eruption exists, or where there occurs frequent crops of chronic eruption, the prognostic is bad.

Sometimes, spontaneous healing may occur when acute
acute softening of the tubercle takes place leaving ulcer, by which a means of elimination is provided.

(b) Subsidence.

This mode of termination is frequently seen, and occurs in all three varieties, but more especially the anaesthetic.

(b) In Tuberculated Ulceration — After the disease has lasted a certain length of time, either by spontaneous ulceration or ulceration, which may or may not follow disease of an internal viscus or some acute constitutional disease, the tubercle disappear leaving the skin cicatrizied and puckered up. On examination of the affected areas no nodulation can be felt beneath the skin or the cicatrix— it is quite smooth, supple, of normal temperature, & may be lifted up from the underlying tissues.

(b) In Anaesthetic Variety — When the disease subsides after a certain length of time the signs and symptoms have been so pronounced that a certain amount of inflammation of the hand, and feel with be left, together with a degree of anaesthesia which is non-progressive. The patient picks up in bodily condition & no fresh signs develop.

(b) In Mixed — Least frequently do we see subsidence in this variety; generally the skin or the nerve affection is progressive, even though one of them may tend
Case IX

To illustrate blisters after Sent-

- anemia of tubercle.

Lydia Henry, 76 yrs. 12 yrs. one
brother has anasthetic leprosy.

She had tubercle of large size over face, but about
7 yrs. ago they all ulcerated spontaneously. Now the
whole face is a mass of cicatrical tissue, in some
places drawn up and almost contracted, but there
is no nodular or sheet-like feeling underneath. She
suffer no pain. Cicatrices are tense and shiny. They
are also present on external surface of preaur-
Patient was the subject of tuberculated leprosy.

Case X

Anasthetic leprosy: illustrating

stationary stage occurring shortly after苣

Chanani, M., 52 yrs. Born in India. Contracted
disease about 5 yrs. previous to examination. No family
history. No cause assigned.

Patient of average build. Le anemic.

Face, neck no anasthesia. Trunk—large
light colored patches, one right shoulder and breast
and collar bone, one left collar bone, above spine.

Scapula: both bones; between shoulder-blade and
back of shoulder joint; Arms— these patches over
shoulders.
Shoulders extend down arms, over Traps.

Patches are of irregular shape and size: some as large as a walnut, others size of palm of hand. Sharply defined but thinly overlaid is indented and are not anesthetic.

Anesthesia generally present in both hands, except in small patches in palm, extending up two inches above wrist. Also in front of lips and in feet, except the dorsum. In the most part anesthesia is superficial for when a needle is plunged deeply in tissue, he feels it, except in me a two places where it is absolute.

Hands: Right — Wasting generally, more especially of ulnar edge and muscles of thumb. All the first phalanges can be extended normally. 2nd phalanx flexed. Third phalanx — of little finger, normal; of ring, hyperextended; of middle, absorbed; of index, absorbed.

Left — wasting not so marked, slighter in ulnar edge and thumb muscles. Second phalanx — of ring, flexed; of little, flexed. Third phalanx — of index, absorbed; of middle, absorbed (old laceration; tendo tip corniculate); of ring, absorbed; of little, anchylosed.

Nails are all present; some in normal condition, others shriveled up, clubbed, or transposed to finger phalanx — a healing ulcer on middle finger.
When run enlarged, joint pain enlarged. Skin on buttocks, enflamed (? Pericarditis). Pus present, freely.
Sail characteristic, equine.

Note worthy points — The disease is stationary. No
is no evidence of recent exacerbation. Mucous
not extensive, only in hands and feet. Tuber
are more cutaneous in nature, not granulatic. To
under anaesthesia followed by contraction of fingers.

(a) Death.

The very large majority of cases of
Lepery end in Death. The reference to the Table on p.
the average duration of the disease in each of its varieties
will be seen; individual cases, however, may last much
longer — thus, one case in the Asylum was, an Anaesthetic
taper, in whom the disease has been arrested, has been
an inmate for 20 years. When the disease is extensive
death in all probability occurs much earlier in the
course of it. Death seldom ensues from leprosy spine
and simple, except we include exhaustion from the
disease and gangrene, but some intermittent affection
usually brings about death. It would seem as if the matrix
peculiar in tuberculated leprous, evidenced by extensive
abscess of emphysema tubercle, becoming absorbed causes
greater inability exhaustion and then brings about an early death.
The Etiology of leprosy

A disease which has existed almost from prehistoric times; there is nothing definite regarding the etiology of leprosy by attention to which we can diminish markedly its prevalence. In Trinidad it seems to occur, for the most part, among the labouring population, though very frequently in the cases in the higher class creole families. Hard working roadside and estate labourers are principally affected. The nature of the soil here does not, in my opinion, have much effect. It prevails in low lying, marshy, parts of the island, where Malarial fever is life; as well as in hilly and chalky districts, which are notoriously healthy. People inland are affected to quite an equal extent with dwellers by the seaside. The eating of salt fish or buttered fish, so frequently advocated as a cause by some authorities, does not, I fear, hold here for the East Indian population, never eat anything but rice and beans; and, as we have seen, the percentage of them attacked is high — nearly half our creole population. The sanitary condition, however, in which the class which is principally affected, live is such as would certainly predispose, if nothing else, to such a disease. The houses known are small, crowded together, ill ventilated (they stop up all chimneys and bars in the doors — windows are a superfluous luxury — and treat to a former roof for all the
the ventilation required) in one small room, a few square feet, inhabits a family of five or six or more people, who live in it, cook in it, and sleep in it, and find it to any use necessary. The personal habits too of the lower class are anything but clean — bathing is a luxury very seldom indulged in; their clothing is scarcely ever taken off the body until perhaps, it is to be washed and has to be renewed — and it is of the lowest description. The clothing of the lower consists of a thin cloth principally; or, an ornament they may wear a cloth cap, jacket, exposed to all weather, rain and snow, sunshine; extreme variance in the middle of the day to an almost temperate climate at night, without changing their clothes. We can understand how susceptible they are rendered to disease. Eating irregularly (their food consisting for the most part of vegetables, and some from beef) and having a hard laborious life, we can see how the black ever renders themselves susceptible to farming amidst the frightfully insanitary conditions in which they live; especially when we consider that they are much addicted to excess, both alcoholic and sexual. But there is another class of patients affected — those of respectable parentage, well-to-do and comfortably brought up. Here I believe we have hereditary predisposition stepping in as a causative factor, to be considered undoubtedly with that peculiarity genius loci which makes leprosy so widespread here—
in connection with the pathologic I propose disamina-
ning briefly two points, namely (1) Heredity; (2) Contagion.

**Heredity**

No new facts of any importance have been added
either in support of in disproportion of the theory of heredity and
shall therefore only examine what evidence I have seen and
state my own experience.
Some authorities deny that heredi-
ty is a factor in the disease. Hansen, in a paper in the
Archiv. f. Dermat. und Syphil. 1889 mentions a clit
he paid to the United States in order to examine the lepers
who had originally come from, and their descendants
born in the States. He found of the lepers who had emigrated
to America the offspring had remained free to the third
generation, and he concludes therefore that the disease is
not hereditary.

The United States Census in Venezuela states that
in the island of Maracaibo, which serves as a leper
colony, marriages are permitted among lepers. During
the last fourteen or fifteen years only two births, occurred,
both healthy children. One child has grown up and after
a careful examination by a Medical Board, who antic-
nipated him to be healthy, has been allowed to enter society.
The number of patients here is 125.

Lastly Dr. Pitka of Hawaii mentions in his
Report on the U.S. leper, the fact that of 2864 lepers examined
to a settlement, only twenty six children begotten of them were alive. Of these only two developed leprosy up to the year 1884.

Thus we see that in this disease there is a much diminished fecundity, and probably also a high rate of mortality among infants. Instances in which leprosy is manifest at birth — Congenital Leprosy — are very rare. But in the Revista Médica de Bogota, November 1, 1890, Dr. R. Navarro reports two cases of Congenital Leprosy. In 1847 he delivered a woman of a "remarkably weakly and wasted" male child, which was covered with leprosy spots over the whole surface of the skin. After two months, leprosy tubercles became developed over the face, nostrils, and knees. Soon after, the mother became affected, and another child, a girl aged eight years, contracted the disease. They all died of leprosy. In 1848 he also attended another woman who was suffering from Elephantiasis in its last stage. She gave birth to "a well formed female child, the whole of whose skin was covered with leprosy spots, and had a well developed tubercle on the upper part of the tibia of the left ear."

I have had the opportunity of examining some children recently who are the offspring of leprosy parents. Four girls were born of leprosy mothers, and one son of a leprosy father — the other parents having been
been healthy. These children are apparently quite healthy and robust, with clear skin, and free from any suspicious marks. In fact there is nothing to point to the taint in their origin. I have also under observation at present two young children, one nine months of age, whose mother is suffering from leprosy of the anaesthetic variety, and the other three months old, both of whose parents are lepers, the father having the anaesthetic variety and the mother the tuberculated. The former child seems to me, some months ago, to be intensely dwindling away and wasting, but under a nourishing regimen is regaining plumpness. The latter child is a plump, apparently quite healthy little one, and up to the present shows no signs of the disease.

I have also carefully examined the family history of 153 lepers in the asylum with a view to ascertain the proportion of them who have any members of their family diseased, and the degree of relationship. I subjoin the result:

\[\text{Tuberculated Leprosy.}\]
\[\text{Male 22, Female 60, Examined.}\]
\[\text{Males—17 cases, no member of family affected.}\]
\[\text{In 1 case no history can be got.}\]
\[\text{In 1 case father was a leper, and the disease showed itself in the patient at the age of 3 years.}\]
In 1 case a brother died of leprosy.
In 1 case the second child has the disease, the first being free.
In 1 case maternal grandmother is a tuberculated leper.

Females: — In 13 cases no member of family affected.
In 1 case an uncle has tuberculated leprosy;
another uncle did of it.
In 1 case grandmother has tuberculated leprosy.
In 1 case son died of tuberculated leprosy.
In 1 case brother is a tuberculated leper, sister died of anaesthetic variety.
In 1 case father has tuberculated leprosy.

Anaesthetic leprosy.
79 Males: 10 Females examined.

Males: — In 69 cases no member of family attacked.
In 5 cases no history to be got.
In 1 case a cousin (on mother's side) has Anaesthetic.
In 1 case a sister and an uncle dies of leprosy.
In 1 case suspicious father and brother.
In 1 case two sisters are lepers.
In 1 case a brother has the anaesthetic and the father the tuberculated form.

Females: — In 6 cases no member of family affected.
In 1 case a paternal cousin has the anaesthetic variety, he and died of it—variety unknown.
In 1 case a brother had a suspicious skin disease.
In 1 case an aunt died of the tuberculated variety.
In 1 case cousin on father's side has anaesthetic variety.

**Mixed Leprosy.**

24 Males: 5 Females examined.

**Males:**
- 21 cases no member of family affected.
- 1 case no history to be obtained.
- 1 case a sister is affected.
- 1 case a sister has suspicious yellow spots on.

**Females:**
- 3 cases no member of family affected.
- 1 case brother died of tuberculated leprosy.
- 1 case uncle in ... ...

Thus 13 out of these 150 cases relation were affected in 23 instances.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuberculated</td>
<td>5</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Anaesthetic</td>
<td>5</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Mixed</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

Total: 12 11 23

If we were to denote that case in which there is only a suspicious condition without declared disease or find that of 155 cases 22 had relation of some degree affected.
We may tabulate the percentage as follows—

<table>
<thead>
<tr>
<th>Variety</th>
<th>No. examined</th>
<th>Relative affected</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuberculated</td>
<td>40</td>
<td>10</td>
<td>25%</td>
</tr>
<tr>
<td>Anaesthetic</td>
<td>89</td>
<td>7</td>
<td>About 8%</td>
</tr>
<tr>
<td>Mixed</td>
<td>29</td>
<td>4</td>
<td>About 14%</td>
</tr>
</tbody>
</table>

Generally, the nearer degree of relationship is involved more frequently than the remote. On reference to the Table showing the ages of keeping in mind it will be noted that the period is much earlier in the tuberculated and mixed variety than in the anaesthetic variety, in which the majority of cases occur in advanced life. It is worth mentioning that the hereditary element is more marked in the former two varieties in which the disease sets in earlier in life.

Summing up my observations on the subject of heredity I lay down the following conclusions:—

1st. The fecundity of lepers is much diminished.
2nd. Instances of congenital leprosy are rare.
3rd. Lepers may beget children who show no sign of disease up to adolescence.
4th. Heredity as manifested in the direct and collateral branches plays a part in the causation of leprosy.
5th. This is next to be observed in the tuberculated variety, then in the mixed, and least in the anaesthetic.
The nearer degrees of relationship are more involved than the distant.

It seems more readily transmissible in the female line.

**Contagion**

This, it is said, it has been for years, the question of leprosy. In spite of the new views, opinions put forward by the Royal College of Physicians of London, and of the qualified opinion expressed by the recent Leper Commission, the question of the contagiousness of leprosy still remains an open one, and during the past few years several medical men have given their adherence to the view that it is contagious. The subject is, undoubtedly, a difficult one to decide, for the proofs of contagion are not many. But one or two cases have been published, the reasoning and the scientific evidence of which are so clear and convincing that in some cases, contagion undoubtedly occurs. The often quoted and celebrated case of Dr. Hardley Benson is one in point. Dr. Benson in 1872 showed to the Medical Society of Dublin an Irishman who had contracted leprosy in India, where he had lived twenty-two years. His own brother, who had never left Ireland, except for a short stay in England for six years before, slept during a year and a half in the same bed and room with his.
his brother's clothing. He became a leper. There was no leper
in the family, and the disease had not, as far as he knew, been
seen in the British Isles. Professor Cayley mentions two cases.
One, an Englishman who went out to India after he was seven
years old, contracted a contagious leprosy from his native salt.
The other case occurred in the leper ward of the jail at Bursa,
which contained thirty criminal lepers; two healthy prisoners
who had been put in charge of the leper ward were attacked
with leprosy. Sir W. Moore also quotes a case in which
the disease was contracted. Patients suffering from itch attended
the dispensary and were supplied with ointment, which
was rubbed in while they sat in the burning sun in the
yard. One of the patients employed to rub in the ointment
injured his hand. Among the patients were several lepers.
The person referred to developed leprosy, the family being
quite free from the malady, and no history of other association
with lepers being obtainable. (Communications to the fourth
of the leper's investigation Committee). Almost all the
alleged instances of communication of leprosy from one
person to another have occurred in countries where the
disease is endemic, and are therefore open to stricter inquiry.
Of the cases mentioned that of Dr. Benson, and the first
one of Sir Cayley seem strong evidence in favor of con-
tagion – the other cases contain one or two obvious fallacies.

K. Rehman, of the Rehman leper Hospital, Møre, Norway.
writes: "In my part I am convinced that it is my seldom that we can find a leper patient amongst us cannot trace to have had intercourse with other lepers." (Notes on the Etiology of Leprosy); and he quotes several cases in which investigation has shown that the disease has originated in patients who have been in prolonged contact and resident among the lepers. Many more authorities might be quoted who have declared themselves antagonists. He dismisses we have not many cases in which contagion has played an important part. I only recall one or two cases in which the patient were lepers, after association and marriage or intercourse with pandemic lepers.

On the other hand, positive evidence of very important character exists in Trinidad. The Dominican Sisters have been connected with the leper asylum for seven and twenty years; the sister has been there all that time, another for twenty six years, and others for lesser periods. Their work consists in nursing the lepers, washing and dressing ulcers, and spongismo, parts, and in point of fact they are continually in the closest contact with the lepers, and always have their hands in leper discharges. Yet there never has been a sister who has developed the disease. This is in contrast with the case of Father Damien of Molokai, but the Sandwich Islands the disease being endemic and spreading.
Spreading so rapidly, it may be presumed that he derived the disease from an outside source, and not by contagion. This same objection holds good in the case in which Mr. Spring inoculated the convict Kamele with leprosy nodule in the Palace jail on 30 September 1884. A small piece of leprosy nodule was introduced beneath the skin of the left forearm, and a month later the patient suffered from pain in the left shoulder, elbow and wrist, accompanied by painful swelling of the ulnar and median nerves. There was no fever, and only very slight constitutional disturbance. During the next six months the neuritis decreased gradually, and a small leprosy nodule formed at the site of inoculation. Leprosy bacilli could be detected here sixteen months afterward. In September 1887 distinct symptoms of leprosy developed, and in another year the disease was fully established. The fact is, in this experiment, that there was a family predisposition to the disease (diseases afterwards) in addition to the strong racial disease predisposition. This was not a crucial test and cannot be accepted in favour of inoculation.

Many of the leper population of the village of Leleke in which the Asylum is situated, who have never in their lives been discharged from the Asylum, have in the village, healthy female, I have never seen a woman contract the disease in this way, although I know of a case or two.
two in which a leprous woman has infected a healthy man. Among the natives of the island there does not seem to be much fear of contagion, whatever the popular belief may be. People mingle freely with lepers — healthy people bathe them in their houses — and among the war-to-do class a few that leper members are quite in fashion. There evidently must be an inherited predisposition to the disease in some people, and an immunity in others.

If once the word contagion must be used in a very wide sense and be made to include heredity as well, in all disease caused by a particular organism the method of entrance into the system of that organism may be often understood and difficult to be made out, as in the case of leprosy — assuming of course that the bacillus lepros is actually a causal relation to the disease. The entrance of the germ into the system will take place if it is brought into contact with an absorptive surface — any abrasion of skin or mucous membrane being sufficient for this purpose. One great objection taken to this, in connection with leprosy is the fact that there is no local lesion to indicate the site of entrance of the organism, no local one to alter change, as occurs in other contagious disease such as typhoid. But the fact of the earliest manifestation of the disease being in some one of the exposed parts of the body, such as the ear, the cheeks, the chin,
thin, base, forehead, hands, and feet, seems to indicate that the form has gained its entrance there.

The question, why when there is so much exposure to it the disease does not attack a greater number of people; and why so many people escape who are brought into daily contact with it, are difficult to answer. There is much difference in the individual susceptibility to disease,—for example, it has been proved that inoculation with some cultures of tubercle bacilli in some people produces no effect; in others, only a local effect; and in others, again, a rapid destruction of tissue. So it is with leprosy. Under the same conditions of exposure, diet, climate, and so on, one person may develop the disease and another may escape it. It seems to select its victim from all ranks of life, at all ages, and under the most varying conditions of climate. Under such diversified conditions, it is indeed difficult to pick out one cause which is equally potent and effective in all cases. We know that residence in a land where the disease is endemic may generate it in a person; in whom there is not any hereditary taint, as well as, in persons born and bred in that land may escape it. We know that the disease may occur in people who have been seen it before, and also that it may occur in people who have been in intimate and prolonged contact with it; and we also know that people so situated may escape
escape it. And we further know that it occurs in people
who are equally careful about their diet and habits of clean-
liness, and in those who are not so. The problem is to
 reconcile these striking differences, and to bring them into the
harmonious whole. To see the fact appears clear enough
that under certain conditions, about which we at present
know little, the disease may be transmitted by contagion.
Although the positive evidence we have in support of this is
very little, still it must be conceded that the case undubbed
of transmission by contagion is the evidence of which
there is no kind of fault or flaw, in more or less than
a host of negative evidence – in every country in which
leprosy is endemic we do meet with undoubted cases of
contagion, although in discussing the evidence we have
to make allowance for prejudice. Still, there are cases of
contagion, and they only show that contagion is not so
active and aggressive as in many diseases – e.g. syphilis.
They show that prolonged contact is necessary with perhaps
actually diseased parts of the body, such as occurs in sex-
ual intercourse when there are broken or ulcerations about
the labia.
The Bacillus Lepra.

Cultivation and Distribution

Hegge in his work on "Microorganisms in their relation to Infective Diseases", says: "In spite of the great blanks in our knowledge with regard to the lepery bacilli, we must look on these organisms as undoubtedly the cause of the disease, because they occur constantly and exclusively in this affection, and because also they are present in enormous numbers, and practically from the greater part of the affected tissues in the leprosy organs." Hansen in 1874 discovered the microorganism which later was termed the bacillus lepra, and observed in all parts of the world. A. Leishman in 1877, in studying tissue sections of material from the leprosy patients, described a new microorganism, which he termed the microorganism of leprosy, and which was similar to the previous organism described by Hansen. However, the microorganism described by Leishman was later determined to be a different organism.

The Bacillus lepra is very much like the bacillus tuberculosis in shape, but is considerably smaller and printed at both ends. It is stained easily by the common aniline dyes, as well as by Gram's method, thus differing from the bacillus tuberculosis.

As is well known the bacillus lepra is most difficult of cultivation—up to the present day no suitable medium has been discovered where it can be grown satisfactorily. Blood serum seems to hinder its growth.
Slight defect. I detail the results of some experiments. The medium used was a sterile pleuris which had been sterilized for four hours at a temperature of 60°C. I inoculated one tube (A) with a portion of the middle of the chink which I had excised; tube (B) with tube of right ala of nose; tube (C) with tube of left ala of nose; tube (D) with lymph from the site of an old excision of tube A. Two tubes were left free as control tubes. Twenty-four hours after inoculation (B) showed slight thickening; other tubes remained unchanged. Forty-eight hours after, commencing opacity. Third day after, tube (A) (B) (C) quite opaque, with whitish precipitate on surface, (D) now transparent, two to three days darker in colour. Control tubes transparent or clear. The change in the first four tubes progressed gradually and steadily—turbidity being set-up. Tube (A) showed a tendency to liquefaction, and then part of the fluid in tube A occurred. On microscopic examination coccci, single and grouped, occurred in tubes (A) and (B). Tube (C) there were a few rod-shaped body in addition, but exhibiting no characteristic of the bacilli here. Also tube (D) also coccii were present. In both control tubes coccii were found. Inoculation was then made into sterile pyriform tubes from tube (B) and (D). He five days a delicate white discoloration was noticeable in the mead black, and from then to fourteen days after a small, thin, flattening opaque white
white spot appeared on the surface and gradually spread in a thin, creamy-layer, on the surface of the flat, puckered in place. The examination revealed cocci were found. It is to be noted that the injured tube remained unchanged until long after the examination was made.

In another series of cultivations from a post which was gangrenous, in order to ascertain whether the bacillus before was present in the gangrenous substance I obtained a growth in relative peptone of a waxy disc, circular in outline, with raised radiating lines. The growth was a variety of staphylococcus, and no rod-shaped bodies were present. In the examination of surface, which were covered with healthy granulations (in leper subjects) I did not succeed in isolating any characteristic bacilli. Other cultivations yielded similar negative results — only cocci, large and small rods being present, and in none the bacillus before. The experiment therefore confirms the results obtained by other observers, and we conclude that the growth of the bacillus does not take place in the media we use at present, and under the ordinary conditions in which other microorganisms are grown.

**The Distribution of the Lepery Bacillus**

The bacillus before is found present in leper tissues. Their in tubercle of skin they are found most frequently, in 75 per cent of the cases examined.
examined. They are also present in the lungs and in the seminal glands; in the liver, spleen and the
median nerve, in the testis, lung and kidney. They were also found in the external and internal carotid
nerve, in the superior cervical ganglion, in the intestine, and in the lumber and mesenteric glands. Other
vices and tissues were examined with negative results. But in every case of leprosy during a period of one
week or its course untreated are to be found.

Inoculation of Animals

I have performed inoculation on guinea pigs principal
ly with leprosous material such as tubercle, piece
of infected tissue, of glands, of nerve and of lungs;
but the results have never been successful in any case.

Detail a couple of cases, as examples:

1) A small guinea pig inoculated with a piece
of seminal gland from an American leper. An in-
oculation was made on the nape of neck and a small
piece of gland introduced. The pig sickened the next
day, and died the day after. The examination the fol-
lowing day revealed no signs of disease. The tissues,
except for the prostate, were uninfected. The liver
and lungs were congested. Two tubes of pleural fluid were in-
oculated from them, and yielded only a streptococcus.
The liver and spleen were very congested. One tube of
inoculated
incubated from the splenic pulp, but yielded no bacilli. The
other organ, however, was normal. A tube was also incubated
with material from the tumors, six days after the tube was
placed, but no cultivation yielded any bacilli. The
cause of death was septic intoxication.

In another case I inoculated a guinea pig with a
piece of excised tumor from the lump, of an anac-
esthetic leper. The pig died of septic intoxication, but
within forty-eight hours. Culture from tumor, serum
wounds, the lump, and the spleen yielded negative results.

Two young boars were also inoculated with lumpy
tubercle and fed on leper's tumors, but there were
no visible signs of injury, nor any signs of leprosy.

Other workers have also made various attempts
to inoculate different animals with the disease but
have never met with success.

Inoculation in Human Being—

Patients suffering from anesthetic
leprosy have been inoculated with tuberculous
leper's tumors, and with cultures, and in no
case have they developed the tuberculated form.
The case of the Corvich Fauntz have dealt with this-
where. They inoculated healthy human
with leper's material, but without producing any effect.
Vaccination and leprosy.

Great prominence was given to the possible spread of leprosy by vaccination by a case related by Prof. Saffran in the British Medical Journal of 11 June 1887. He was a doctor in a tropical island who vaccinated his own child from a native child who afterwards became lepromatous. Another white child was vaccinated from the doctor's child, and both these children also developed leprosy. The details of the case are few, and insufficient to establish any conclusion; the disease was endemic on the island, so that possible outside sources of contagion were present.

Vaccination brings with calf lymph, the skin free from disease, and no tubercle. Scott vaccine vaccine, has been in some cases in both situations, and my hands at other times. But under the microscope I have never been able to identify any lepromatic bacilli - only a few large 200 were present. Once an aesthetic patch, also post-vaccine, virulent was produced, but no bacilli were present. With lymph from then I have vaccinated often before, the results were not always successful - the vibrules, when present in small and shrivelled, and no bacilli were present either.

The conclusion drawn is that leprosy does not spread by vaccination, and that there is in all probability no likelihood of its spreading. In Trinity
Where vaccination is carried out very carelessly, about 85 to 89 per cent of children born being vaccinated there is no case, although leprosy is endemic and the chance of acquiring it great, to show the leprosy has ever been spread by vaccination.

**Mortifl Anatomy of Leprosy.**

Vitamins her produce the leprosy product among the granuloma, and explain the lepros, known as "a little pigmentation with rapid nuclear and cellular division starting from the connective tissue lymphoid and succeeded by a progressive infiltration of cells."

The lepros, Tuber. On section a number of minute slightly granular cells infiltrate the times, and are arranged between the connective tissue layer, flattening down the papillae, and pressing together until they lead to atrophy of the hair follicles and sebaceous and sudoriferous glands. These cells may assume different shapes due to mutual compression, and they may become partly degenerated and break down. They generally are desert around the vessels.

In luncea, in the same way, there is the same cell infiltration. These much liable to lepros deposits are the sinuca cavity, the nose, and the throat, and larynx.
The lymphatic glands, especially in the sub-caruncular variety, are swollen and enlarged. But the typical leucemia deposit may not be found, only hyperplasia of the cellular elements.

The liver, spleen, and kidneys, all show changes. In the connective tissue of the liver between the lobules, there is infiltration of these granulation cells, which ultimately act upon the tissue.

The spleen shows the usual changes, which are met with in all chronic diseases—an increase of the colon, a white leucopenia. In a few examinations with the haemacytometer thrown a relative and absolute increase of the white blood cells; and with the haemoglobin a decrease of haemoglobin.

The kidneys frequently are affected, and further note will be given later on.

The testicles are similarly affected by the leucemia, since, in the growth of new cells pressing against the seminiferous tubules and blood vessels, they ultimately lead to the usual lesions which in other cases so often and the pressure of leucemia is extremely small. The ovaries also are affected in this manner.

The nervous system. The peripheral nerves are principally affected at first; there is swelling of the perimyelium, later the cell suspension accompanies the
the tubular. The larger nerves are considerably swollen, the median, the ulnar and the peroneal and anterior and posterior tibial. They are reddened and are swollen in a uniform manner, and in the more external parts are easily felt under the finger, the swelling is more prominent in these parts.

The official note. The loss of the reflexes and the extensor said are indicative of a lesion similar to that of locomotor ataxia.

In the brain no special change occurs.

Some diseases of these are dependent on the neural influence which is abstrated, and is well noted in the effect of nerve stretching in the separation of dead bone.

**Intercurrent Diseases.**

It is interesting to note the chief intercurrent diseases which prevail amongst lepers, and I have therefore drawn up a table which shows the disease and their relative prevalence among the different varieties of leprosy, and the proportion in which the sexes are affected. The table has been drawn up from the records of five years 1888-1892, and is a detailed statement of diseases affecting lepers.
<table>
<thead>
<tr>
<th>Disease</th>
<th>Tuberculosi</th>
<th>Anaesthetic</th>
<th>Mixed</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>F</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>6</td>
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<td>Varyy Liver</td>
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<tr>
<td>Gastricul Kidney</td>
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<td>Fatty Kidney</td>
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<td>1</td>
<td>1</td>
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<tr>
<td>Porosis</td>
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<td>Metastatic Fibrosis</td>
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</tr>
<tr>
<td>Total</td>
<td>318</td>
<td>107</td>
<td>591</td>
<td>68</td>
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</table>
It will be seen that lepers, like ordinary healthy people, are subject to the same kinds of disease which prevail in this island — malarial fever, dysentery, diarrhoea, claiming most patients. Indeed it may be said that lepers do not induce any particular disease. From the above account in the anaesthetic variety does not seem to bring on any reported nervous lesion. The only exception to the above statement is that tuberculosis of the lungs or kidney disease are very prevalent among lepers, and cause a large percentage of the deaths. This will be brought out in another table — I have omitted the detail from the present table.

**Lesions found after Death.**

On the next page I have drawn up a table calculated on 68 deaths during the years 1889, 1890 and 1891 in the leper asylum, which shows the determining cause of death in these cases, the proportion in which the different varieties of leprosy were affected. On a small scale it shows fairly accurately — and if has been calculated on a larger scale, showing the same results — the nature of the disease which prove fatal. The table also shows the different proportion in which the sexes are affected.
<table>
<thead>
<tr>
<th>Disease</th>
<th>Form of Leprosy</th>
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<tbody>
<tr>
<td></td>
<td>Tuberculous</td>
</tr>
<tr>
<td></td>
<td>M</td>
</tr>
<tr>
<td>Kidney Disease</td>
<td>2</td>
</tr>
<tr>
<td>Tuberculosis (lung)</td>
<td>5</td>
</tr>
<tr>
<td>Gangrene (foot)</td>
<td>1</td>
</tr>
<tr>
<td>Cardiac Dilatation</td>
<td>1</td>
</tr>
<tr>
<td>Acute Pneumonia</td>
<td>1</td>
</tr>
<tr>
<td>Acute Appendicitis</td>
<td>1</td>
</tr>
<tr>
<td>Menses of Female joints</td>
<td>1</td>
</tr>
<tr>
<td>Cardiac Atheroma</td>
<td>1</td>
</tr>
<tr>
<td>Malarial Fever</td>
<td>1</td>
</tr>
<tr>
<td>Gangrene (finger)</td>
<td>1</td>
</tr>
<tr>
<td>Rheumatic</td>
<td>1</td>
</tr>
<tr>
<td>Pericarditis</td>
<td>1</td>
</tr>
<tr>
<td>Acute Congestion of lungs</td>
<td>1</td>
</tr>
<tr>
<td>Skin Necrosis</td>
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<tr>
<td>Diarrhea</td>
<td>1</td>
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<tr>
<td>Disenteric &amp; Liver Involvement</td>
<td>1</td>
</tr>
<tr>
<td>Acute Afferent Involvement</td>
<td>1</td>
</tr>
<tr>
<td>Acute Hemorrhage</td>
<td>1</td>
</tr>
<tr>
<td>Acute Hemorrhage</td>
<td>1</td>
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</tbody>
</table>
The following table shows the actual number of subjects examined post-mortem from which the previous table was constructed. In some cases, several different lesions were found in the same body, hence the total number of lesions is in excess of the number of subjects examined.

<table>
<thead>
<tr>
<th>Sex</th>
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<th>Anasto. of site</th>
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<th>Total</th>
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<tr>
<td>Males</td>
<td>12</td>
<td>18</td>
<td>15</td>
<td>45</td>
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<tr>
<td>Females</td>
<td>11</td>
<td>7</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>25</td>
<td>17</td>
<td>65</td>
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</tbody>
</table>

Analyzing the causes, we may divide them into four principal groups:

- Disease of the Kidney — 33.84 per cent.
- Tuberculosis — 26.16
- Gangrene — 9.00
- Other Diseases — 30.92

Disease of the Kidney — has long been known to be common in depots. In the 65 cases examined, we note a percentage of 33.84, being quite a third of the total number. This number and percentage being contrasted with the record of deaths in the Colonial Hospital shows that in the latter institution, Disease of the Kidneys causes only seven and a half per cent. Thus, it is evident that kidney lesions are of very frequent occurrence in
in Lepery. The varieties of kidney lesions which prevail are, in order of frequency: (1) Mixed, (2) Large White, (3) Contracted. They occur most frequently in the Mixed variety of leprosy, next in the Tuberculated form, and lastly, in the�

acanthotic, and affect males more frequently and in greater proportion than females. The duration of life too is practically ananthotic leprosy, with kidney lesions. It is highly probable that the variety of Hyperplasia, which occurs are not due to lepern. growth, because bacilli are present in a scarcely calculable proportion in the kidneys, but that they take an increased action in proportion to the affection of the skin, and are due to the correlation of function between kidney and skin. Hence the greater frequency of the Mixed and Tuberculated varieties, being affected — because of the development of tubercles and damage to the submucous glands of the skin.

Tuberculosis: — Tubercles of the membranes of the viscera occurred in 20-16 per cent of deaths in leprosy, while in the Colonial Hospital, by and large, Eighteen per cent of the deaths are due to this cause. It is undoubtedly the case that deaths from tuberculosis, especially of the lungs, are commoner in lepers than in the ordinary population. The question arises, whether the invasion of the leprosy of the
in the tubercle bacilli cause the lesions, and on this point there is not sufficient evidence to come to any conclusion, the chief authorities differing in their opinion. Among the Report to the Hawaiia Board of Health 1886 says "the all advanced tubercular case, fewer think with the extreme frequency of granular changes in the larger viscera, more especially the lungs, liver, spleen and heart. These organs presented an aspect quite new to me, and closer examination of their tissues has enabled me to prove that we have been mistaken in attributing death of to intercurrent pneumonia, tubercular phthisis, and dysentery which were simulated by the clinical symptoms. The ulceration of heart and the breaking down of lung tissue are due to phthisis, infiltration, and we shall have to modify our opinion of leprosy being mainly a disease of the cutaneous peripheral nerves, and introduce terms such as phthisic leprosy and enteric leprosy." Hansen (Contribution à l'étude de la lèpre, Archives Romaines. Jan. 1889) takes an opposite view and attributes these lesions to tubercular changes. Experimentally all attempts to cultivate bacilli in infect animals by fragments of phthisical lungs or tubercular organs have failed. The conclusion to be drawn, at present, is that tubercle is more probably the cause of the visceral lesions. It is interesting to note of the 17 patients affected, 11 were suffering from Tuberculoses leprosy, and
and only 3 each from Acute and Mixed leprosy. In the case of tuberculoid leprosy rapid disappearance of the cutaneous tubercle is often followed by the development of no-
oral tuberculosis, and this suggests some connection between the tuberculoid and the leproma lesion.

Gangrene: — Ulceration and gangrene are present to some degree in almost every case examined, while only in 2.5% cases, a percentage of 9.08%, was it of sufficient intensity and extent as to be the cause of death. The gangrene is apt to develop very rapidly—a slight injury inducing it in patients who are much de-
bilitated. The preponderance of the affection in cases of anaesthetic leprosy, although only a few cases occurred, shows that the affection of the nerve and the interference with the trophic influence predisposes to ulceration or gangrene.

Other Lesions: — With the exception of the lesions mentioned above, it is worthy of note that none of the marked changes can be traced to leprosy, and that they are such as occur under ordinary circumstances.

The Table I have given above shows clearly the nature of the lesion, and the frequency of its occurrence in the different varieties, and sexes.
Table shewing Deaths in each Month during past twelve years together with percentage.

<table>
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<th>1882</th>
<th>1883</th>
<th>1884</th>
<th>1885</th>
<th>1886</th>
<th>1887</th>
<th>1888</th>
<th>1889</th>
<th>1890</th>
<th>1891</th>
<th>1892</th>
<th>1893</th>
<th>Total</th>
<th>Percentage on Numbers broken. Year 1882-10.50</th>
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<td>8</td>
<td>28</td>
<td>13</td>
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The foregoing table shows the deaths which have occurred in each month of the past twelve years, and the percentage of deaths each year on the total number of patients under treatment. It will be noted that the number during each month is fairly constant; only in the month of October the rate is lower. October is a healthy month, and the beginning of the cold season in the island, and this probably accounts for the lower rate.

The percentage shows 10.78 average on the number been treated each year, which is not high considering the facility with which upon contract other diseases, and the climatic condition in which they live.

The Treatment of Leprosy.

No advance in the treatment of leprosy has been made in recent years, and owing to its intractable nature, remedies have been recommended and tried, but up to the present day we cannot say that any one species of treatment has been successful. In considering the treatment will classify it under the following heads: (1) **Hygienic**; (2) **Dietetic**; and (3) **Medical**; (4) **Surgical**. It is by a combination of these that we are frequently able to obtain some amelioration in the progress of the disease.
(1) Hygienic Treatment.

That the most thorough and absolute cleanliness is one of the very first desiderata need no pointing out. In the lower classes in all countries personal cleanliness is a quantitative neglect. Therefore among the inmates of an Asylum which is recruited mainly from the lower classes this must be strictly enforced. Daily baths, either in fresh or salt water, should be had, if possible. Salt water, owing to its stimulant action upon the skin, is perhaps preferable. One patient in the Asylum has salt-water baths about three or four times a week. The clothing should be changed frequently, especially the underwear. In tropical countries warm clothing is not necessary, but care should be taken to avoid draughts, and colds in view of the great tendency to pulmonary complaints. The living rooms should be airy and well ventilated. Patients should be encouraged to be in the open air as much as possible. Outdoor occupation for such as may be able to indulge in it should also be encouraged. And lastly, overcrowding should be avoided.

(2) Dietetic Treatment.

A full and generous diet should be allowed. The food should always be quite fresh, and especially in the matter of animal food, which should
be quite fresh and well cooked. Salt fish and preserved meats in tropical climates had better be avoided. Fresh fish - if the freshness of it can be ensured - may be used well cooked. To careful attention cannot be paid to the dietary. Regarding the use of wine and spirits, unless they are absolutely necessary, I see no reason for their administration. They should be given medicinally when indicated, rarely, as a luxury.

(3) **Medicinal Treatment**

Drugs of almost all kinds have been tried, and various are the recommendations in the different countries in which they have been tried. I will state those in use in our Asylum.

Chaulmoogra oil (Gynocarica odorata) is used both internally and externally, and is used very extensively. From my experience with it, I draw the following conclusions:

(a) The action of the oil in causing the absorption of tubercle is uncertain and variable.

(b) Its action in reducing anorthemia is also very uncertain. Among my cases not one was improved in this respect.

(c) Its most certain action is that of allaying the neuralgic pains in the limbs and joints.

(d) Under its use superficial ulcerations heal up rapidly.
rapidly, and sometimes, perforating ulcers.

(c) During its use there is great improvement in the physical condition of the patient. The skin acts well, the appetite improves.

(3) There is much difficulty in its administration owing to the nausea it causes. Rather more than 50 per cent of the patients has to give up taking it on this account, and employ it only by phalan.

(7) Dosage. I generally began with the minims three times a day and pushed it rapidly. In some cases I began with thirty minims. Those who were able to retain this dose showed rapid improvement in physical condition.

(8) Length of Administration. This should be prolonged to effect any good. No persistent continuous administration is the only way to secure any benefit in the grave and characteristic lesion.

(c) Mode of Administration - usually in the pure form. It is more easily tolerated as an enema. Mixed with coconut oil or other bland oil it is used for application by phalan.

Arsenic - I have found this drug do good in some cases. One case recently under treatment seems to have gained much benefit by its use. J.W. a Hindu, suffering from anaesthetic depression, was admitted in an extreme degree of emaciation, and
had a perforating ulcer under little toe of right foot, and an
inverted ulcer on his heel. The foot was painless, and broken,
and anaesthetic. There is complete anaesthesia in the hands to
a little way up the forearm, and slight diminution of sensibility
in the back. He was very weak and feeble and scarcely able to
walk. The ulcer was shut up quickly, and he was put upon
Forke's solution of Arsenic, five minims, three times a day.
After four months of this treatment — and he had no other
treatment except a little Bismuth of Phosphorus — he
has improved much. He has put on flesh and gained body
weight. The sores have healed, and he is able to walk about
and make himself generally useful. The anaesthesia has
not diminished, but the disease is certainly stationary.
Arsenic acts as a general tonic, and good results are
invariably seen by its use here. It is generally used.

Strychnine — This drug was tried in a few cases
of nerve-lepra with the idea that there might possibly be
some action on the affected nerves. The results, however, are
not invariably satisfactory. Its action is more allied to
that of an ordinary tonic. I have not observed any diminu-
tion in the amount of anaesthesia after its use.

Salol — has been highly praised by some authorities.
For use in leprosy, and during lepatic fever, but in my
hands has never met with any success. I have tried it
in many cases where there was elevation of temperature
swelling.
swelling and tenderness of tubercle, slight swelling of joints, and much sweating. Hour administration in fifteen grain dose, but almost invariably caused nausea and vomiting. When it was retained it seemed to do no good at all, even in some instances continued for some days. It generally causes pain in the stomach after ingestion.

Thyroid Extract — in some cases lately this has been tried. Mannette has used it, in some cases, treated with this, marked aequation occurring during its administration in Myxedema; and it was tried in frontispiece successfully; he desiring, however, even when its administration was pursued to the extent of inducing the myxoe, no beneficial result ensued.

Chlorate of Potash — in Cancer of Skene's succeeded in obtaining remarkable results by the administration of large doses of Chlorate of Potash: he gave 20 grm. on the first day of the treatment, 10 grm. two days after, and 15 grm. the day after the last. Vomiting, vomiting, diarrhea and prostration set in and the day after the last an almanac attack of dyspepsia. He observed tubercles to disappear, the skin to become smooth, and "abnormal tissue", and the Extremities, "Entonation pleased", and attributed the good results to the damaging of myxedema, for the band of myxedema

chlorine was observed under the microscope, and expect...
that this condition of the blood may be incompatible with the life of the bacilli. The treatment has been tried in the asylum here, but with negative results so far.

The Beaufort ting method of treatment was carried out fully here many years ago. Depending as it does mainly upon strict hygiene measures in combination with mercury, no treatment we can understand how in many cases it causes temporary amelioration. We used the perchloride of mercury internally, and externally stimulating liniments, and such strong irritants as biurate of silver and bichromate. I am not aware that this treatment is still in vogue.

Gargling is not used here to any extent though in the East it has acquired much reputation combined with pectin, calcium or it does good.

Treatment of Leprosy by Tuberculin.

Dr Robert Koch of Berlin most kindly sent me a quantity of Tuberculin which I tried on many patients in the asylum. A detailed report of my experiments would be too lengthy, I therefore give an abstract, and analysis of the case.

Dose. I usually began with 0.001 grammes with an interval of time before the administration of subsequent doses, each of which was increased in quantity until 0.1 grammes was reached. Lately I tried the biurate method
Method, that is, administration of a small dose, at first 0.001 gramme, increasing it in some cases to 0.01 gramme daily, once, twice, or three times, endeavouring thus to keep the system continuously under its influence.

Method of Administration - subcutaneously by the hypodermic syringe.

Site of injection - generally between the shoulder blades; sometimes into substance of muscles, the deltoid, triceps, and calf of leg.

RESULTS: in years.

1. Subjective Phenomena

These phenomena were most diverse — namely, until those that were most generally complained of. In the patients complained of burning at the site of injection, but the same site was never chosen twice in succession, and no adverse results. Headache was almost always complained of. General pains — such as pain running the hip, pain in the back and in the arms, between the shoulder, in the shoulder blade, down the side, shooting pain in the ear, and down the arm; burning pain in the temple.

Pain and numbing in the lip: pricking in the tips of the fingers; once a pricking sensation in the ball of the right little finger, and right side toe. A feeling as if pains were running through the whole...
Of insects crawling on the face; of the flesh "jumping;" of blood running down the arm.

Several children... Sometimes, moments in hay, tubercular deposits. At other times, pain in anesthetic areas. Ringing in the ears, giddiness, sudden "darkness over the eyes," andema, in the head.

And finally, a feeling as if the body had been thoroughly drained, and hence their own expression "washed up."

2o Objective Phenomena.

The appearance of small tubercles and papules; their site, were the foot of the ankle, arm, wrist, neck, groin, and on legs.

The erythematous eruption occurred in the case. Tubercular (asperolos) infiltration of the skin without evidence of papulation.

Sometimes all the tubercles, and the infiltrated hyperesthetic condition of the skin, became tense and painful, and the tubercle seemed as if they were about to burst; in one case only did the "tubercle ulcerate and exude; in the other cases they subside spontaneously.

Condition of Skin: in one case, a light-colored girl, the skin about the chin and nose turned just a light yellow and then a citron color. In another woman, there
there was reddening of the hypertrophied skin; and in another, a black woman, it became formish in the legs. He also noticed to become shiny and speckly eruption in unpitted parts. After the preliminary swelling and tenderness, of unpitted skin, softness, loss of tenderness, and suppuration followed, and in one case the disappearance of a bloody condition of the skin.

Ulcers: these became reddened and irritable with pricking and painful sensation in them, and ultimately they took on healing action. I have lately tried its effect in penetrating ulcers, and other ulcers connected with small cavities, bone, in order to see if the separation of diseased bone would be hastened thereby, and to effect this, small doses were administered in order to avoid the occurrence of pyrexia. As a result from a cleansing of the ulcer, however, no result ensued.

Enlargement of lymphatic glands.—The axillary and in one case the Femoral glands were enlarged, painful and tender, but subsided after a time.

Abuminemia and Bate.—occurred in one case; in all the other cases, the urinary secretion was unaffected, being generally of low specific gravity, pale and clear, and free from albumen. In the case of albuminemia the urine was loaded with albumen, but subsequently became free of it, to the amazement.
subside, as well as the fevers.

Menstruation was accelerated in two cases. Brittle belly of the stomach and vomiting occurred frequently noticed: most intractable and yielding to no treatment except the withdrawal of the tuberculin.

Anemia, of marked intensity, occurred after prolonged injection, in two cases.

30° Temperature. The effect of tuberculin on the temperature in no characteristic in cases of tuberculosis, that we can best consider its effects on fever by going at some length into an examination of some of the cases in which the drug was tried.

Case 1. Twenty-four hours after the injection of one milligram the temperature rose to 100°; it then fell to 97.8°, and then remained at or near the normal. After the fifth injection—dose 0.015 grammes—the temperature rose in 5½ hours to 100.4°, and in 24 hr. it rose to 102°, falling to 101° after 30 hours. The day after, the temperature showed a tendency to come down, but an injection of 0.02 grammes caused high fever in about 12 hours. An injection of 0.15 grammes caused fever and general listlessness, as also did a subsequent injection of 0.1 grammes. The temperature then fell and remained steadily at the normal.

Now, in the second series of injections in this patient, amounting in all to eighty-one injections, the roe in the earlier part being
being one milligramme and later one centigramme, the temperature never rose above 99°, ale the time the injections were continued. The patient was a female, suffering from tuberculated disease.

Case II. Also a female suffering from tuberculated disease. One day after the injection of one centigramme the temperature rose to 101°, forty-eight hours after it reached 102° and then fell. Twenty-four hours after the injection of one decigramme the temperature rose to 103°, but fell shortly after it remained at the normal. Twenty-four hours after the injection of half a decigramme it rose to 102°, fell in about 30 hours to 100°, and then went down to the normal where it remained for some days. After this one injection of one milligramme caused high fever with red tongue and much debility. At fortnight after another injection of one milligramme caused a rise of temperature to 103°, and another the day after to 104°. After this it fell to the normal.

Case III. Tuberculated disease in a female - in this case sixty-eight injections of one milligramme each were made; but the temperature remained normal throughout except on four and one-half days when it reached 100° or 101°, but did not remain at that for more than forty-eight hours.

Case IV. Angina with mixed disease. The patient had fifty-nine injections of one milligramme each, in all up to the 30th injection the temperature remained at 92°.
Near the normal, except on one occasion when it rose to 100°. After the 37th injection temperature ran up reaching on one occasion 106°, and fluctuating all the time between 100° and 105°. After the last injection the temperature kept up rising to the normal only five weeks later; from which it kept down.

Case IV. A Chinese male sick with Miliary Dysentery.

Temperature after increasing dose did not rise above 99.2°.

Case IV. Male negro with Tuberculous Dysentery.

Patient was suffering from hectic fever when he had an injection of one milligramme which caused the temperature to rise slightly. Then after a subsequent injection of one centigramme the temperature ran up to 103°. A few hours after another injection of one centigramme it rose to 102°, and the next day after the injection of a similar dose it rose to 102° again. The injection were then stopped and the temperature fell to and remained at the normal. The patient felt considerably relieved.

Case VII. A Portuguese male with Tuberculous Dysentery. In this case there were two series of injections. During the first series, comprising five in all, the temperature rose to 100° on two days. In the second series of fifteen injections of one milligramme each, it only rose to 100° on two days.

Case VIII. A Portuguese male with Acute Asthma.

This patient had only one injection of one centigramme.
...gramine during a period of protracted tubercular fever. The fever was very high, but after the administration of the tuberculin, the temperature rose to 105°, and kept high for a prolonged period, symptomizing in the evening and exacerbating in the evening sometimes to 103°8. The patient was so profoundly affected with what he called "bad feeling" that he begged that no more injection should be tried.

Of four other cases, one Tubercular, one Anesthetic and two Mixed, the temperature did not rise above the normal although one had fifteen injections.

Summing up. Dealing with a substance so powerful in its effects as tuberculin, we cannot but be struck with the fact that some of the cases manifest remarkable tolerance and resistance to its use. Some of them very early showed the characteristic reaction—fever, but often again. For instance, Case IV, in which sixty-eight injections were intravenously administered, seemed to show absolutely no reaction, although the patient may be supposed to have been under its influence all the time, except on one or two occasions when the temperature rose to 100° and 101°. In Case IV it is remarkable that after thirty-six injections, had been administered the temperature ran up and remained very high for five weeks after the cessation of administration of the substance, leading to extreme prostration and debility. In administration during...
leprosy fever, that is fever attended by an eruption, caused an immediate elevation of the temperature to 105° in one case, but in another had no effect. The elevation of temperature was never in any occasion accompanied by an immediate outbreak of tubercles; these appeared only in these cases, but only late in the course of treatment, after many injections had been administered, and there were very few and slowly. In this respect our experience here does not coincide with what was observed elsewhere, namely an almost immediate outbreak of tubercles following the injection.

Improvement in varying but slight degree has occurred in some of the cases. The tense, constrictive feeling of the skin was reduced — in one patient appeared, if she was able to close her hands more easily; “the skin felt slack.” In one case absorption of tubercles occurred, preceded in some of the tubercles by ulceration. Reduction of swelling of the joint, and disappearance of pains and fever, followed in another case. There was diminution of the hypertrophied, infiltrated condition of the tissues, as was ascertained by actual measurement. But in almost all the cases, and especially those which were subjected to the prolonged continued method of administration there occurred great debility and anaemia from which the patients took some considerable time to recover.

On the whole the slight benefits compared by its use do
do not counterbalance the serious disadvantages which attend and follow its continued administration. Its effects are much too uncertain, and much too unreliable to be acknowledged as a permanent agent in the treatment of leprosy.

Leucorrhoea are treated by the drugs in ordinary use quite independent of the derma tic affection.

Among drugs used externally, alone or in combination with internal remedies, I may mention the following:

Cecobine (Svens preparation) diluted: A few drops of it, was exclusively in opening ulcers &. In an advantage, are that it reduces the smell of the gangrene; rapidly promotes the growth of healthy granulation; and there is no danger of poisoning by absorption. It was also on the Svens which so frequently complicates leprosy.

Sclighthol and Resconin have also been tried with no marked benefit.

Red Oxide of Mercury ointment— as a caustic and fungicide, has been tried in early cases, when tuberculation was not extensive; without any effect however.

Summarising the treatment of leprosy, we come to the following conclusions:-

10. No drug has yet been used which exerts a specific action on leprosy, like Mercury and the lodides.
2° Of the drugs used Chaulmoogra oil seems to act most beneficially.

3° Intercurrent diseases yield to ordinary measures.

4° The hygiene and dietetic treatment should be carried on simultaneously with the exhibition of drugs.

(4) The Surgical Treatment of Lepra

and The Value of Surgery in Lepra.

The treatment of very early cases of lepra, by the excision of nodules may be considered. The operation is indicated only in the following cases:—when the growth is of small extent and marked by circumscription, and when there is no infiltration of the surrounding skin. Be this instance, in which OPERATION REMOVED THE GROWTH INTO SOME OF THE SURROUNDING UNAFFECTED SKIN, AND CONTAINING THE AREA FROM WHICH IT WAS REMOVED WITH CARBOLIC ACID.

Fungi the operation came up readily. and cicatrisation occurred in the usual manner in all the cases, though the growths were apparently completely removed, after a few months, interval nodules have appeared, leaving however the cicatricial plexus, but rapidly affecting the surrounding areas. After experimenting in many cases, from my opinion that excision of these nodules
Treatment of Perforating Ulcers. These ulcers, so common in army camps, lead to gangrene of the tissues unless they are promptly dealt with. The method in vogue in the Army here is as follows — the ulcer is pierced with a curved bistoury right through the substance of foot from sole to dorsum, or in any other situation, and the bistoury is brought outwards towards the nearest free border, completely cutting through all the loose tissue. The wound is then kept with lint and allowed to heal by granulation. The cases treated by this method have been remarkably successful — the times heal quicker — and in many instances it may be noted that knife wounds in legs heal quicker.

The Value of Nerve Stretching. Various nerves have been stretched with the following results:

1. **Tibialis Anterior.** Perforating ulcers in the foot have been treated by stretching the tibialis anterior, and in the majority of cases have healed up, but the method advocated above is more successful.

2. **Relief of Pain.** In some cases of anesthetic relief there is severe pain, deep seated, associated sometimes with perforating ulcers, sometimes without any assignable cause. Such pain is frequently relieved by nerve stretching. When pain is due to thickening of the nerve,
nerves, as they emerge from prominent tuberosities, such as the
superficial, much relief may still be obtained.

Amputation. The results are not encouraging
in any case, but only a few benefited, and that only
temporarily.

To diminish inflammation, nerves have been
stretched in the leg, but no success has ensued.

Separation of nerves where is facilitated by
stretching of nerve.

The nerves principally stretched were the three
femoral, the median, the ulnar, the supra- and infraorbital.
They are almost always enlarged.

Amputations: an accident callos is by rapid,
spreading sarcoma; intractable ulceration; necrosis
of bones. The principal amputation was of the finger,
and two. In extensive disease of the tumor, I have performed
sympathetic operation with invariably good results—a firm
strangest stump, which the patient is able to use well.
The operation of amputation below the knee by lateral
flaps, I have always performed in lipo-sue with also
very good results.

Removal of sequestra bone is invariably carried
out in the leg, and these gangrene and other evils
are avoided. They occur mostly in anasthetic cases. Ulcer
and sinuses heal readily after the removal of dead bone.
carriage. Removal of tubercles from the torus has not been satisfactory.

Signatures of the vessels supplying tubercles of torus have been tried—it is only of temporary benefit.

Tractioning and dermatomy are frequently performed when the disease is beginning to be seriously affected. It prolongs life for some months; as it arrests sudden death by suppression which without the precaution, any measure is apt to occur.

Decisive into parts where burning, swelling, heat, into when, sooner; and to where the tension of tissues, are of much value in averting large abscesses, and gangrene.

Circumcision may be done in cases of phlyreum induced by tuberculosis of phrenum.

Operations on the Eye—such as in Cataract:

Directing: Removal of phlyreum, has been done as palliative measure.

There is no doubt that operative interference in leprom subjects is capable of affording much relief and giving much amelioration to a very large percentage of cases, and that if its timely aid life can be prolonged, and these cases of extensive phlyreum arrested, which bring an abrupt death. And considering that the healing power of leprom tissue is quite a good...
Good as that of normal and healthy tissue, no hesitation
should ever be displayed towards operative interference.
This remarkable healing process of the tissue is due to
the high percentage of fibrin in the blood of Repub-
about five times, as much as in normal blood—and
then the formation of clot takes place readily and quickly.

A Note on the Prevalence of Depress
among East Indian Immigrants.

I have drawn attention (p. ) to the large propor-
tion of East Indian Immigrants admitted into the asylum.
To obtain definite information regarding the proportion I
have searched the Register of Admissions for 25 years, 1867 to
1891, and find that in those years there were admitted
a total of 1078 patients, of whom were

Natives of Trinidad 447
India 434
Other Countries 197.

Of this total there were 101 Readmissions:—

Natives of Trinidad 37
India 38
Other Countries 26

Deducting these we have:— Natives of Trinidad 410
India 396
Other Countries 171.
This gives the following proportions of admission to the total:—Native of Trinidad 41.96 per cent.

- India 40.53
- Other Countries 17.51

For the purpose of more detailed comparison however I append another table which will enable us to form a somewhat more accurate judgment.

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<th>Natives of Other Countries</th>
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<td>6.00 p.c.</td>
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<td>53.57 p.c.</td>
<td>22.46 p.c.</td>
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<td>1891</td>
<td>40.91 p.c.</td>
<td>43.60 p.c.</td>
<td>15.49 p.c.</td>
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</table>

It will then be seen that each year a very high proportion of immigrants is admitted; and the question naturally arises: Do they bring the disease with them, or do they...
they contract it here? The possible prolonged latency of the
may be some grounds for the supposition that they are al-
ready subjects of the disease before they leave Europe; and they
there is at least that a sign of the disease there must be.
Evident in considering the fact that they have to undergo an exhaus-
ted examination at the hands of some medical men who
would unhesitatingly reject them on such discovery. We have
then to consider the period of manifestation of the disease
after their arrival in this colony, and here we have the fact
that there are now in the Asylum only two patients who have
shown the disease before the period of their indenture has expired
that there have been only a few other such cases, however, and
that in the great majority of cases the disease shows itself only
after the period of indenture, five years, has expired. It
seems unlikely that the great majority of leprosy cases, if
they bring the disease, should not manifest any symptoms
until after the expiry of this period: although the first
symptoms may persist for an indefinite length of time—
in some cases of Tuberculoid leprosy for almost five years
according to Bock, and in an aesthetic case according to
Busch, for twelve months, yet in such cases there are symptoms
which may lead to the suspicion if not the actual diagnosis
of the disease. We must therefore take it for granted that
there is not the least trace of the disease on them on
their arrival, and when they are sent to the Isolator.
would seem therefore, judging from the table above, that the number of immigrant lepers admitted maintains a steady average proportion, that this proportion is a high one, and that it shows no signs of decrease, although there does not seem any decided increase. And we must come to the conclusion that in all probability they do not bring the disease with them but contract it here, and that they are predisposed to it in some way or to make the conditions of life in which they find themselves after the expiry of their period of indeterminate affect them so as to induce the disease.

Segregation & Isolation

On a reference to the practice which prevails in the different countries in which leprosy is endemic I find that isolation is carried out in some of them, and on the other hand that free communication is allowed between the lepers and the healthy population in others. Thus in the Dutch colonies, according to the Report of the Colonial Minister to the Hawaiian Government, amongst customs, we find that in the East no segregation is enforced; while in the West Indian colonies, in reference to the popular opinion in favour of the contagiousness of leprosy, it is strictly enforced. People who go about in the streets suffering with leprosy are liable to be arrested.
by the Police, and are then examined by a special Medical Committee and sent to the Asylum.

In Spain restrictions are not placed in the way of communication between the lepers and the healthy. Nor, if otherwise in Portugal, for according to the 'Conselho de Lisboa' lepers are allowed to use public vehicles provided.

In New Brunswick Dr. Tache states that the check and the decrease are in ratio of nine to less prompt. To lazaretto: "Segregation is in my opinion the cause of the diminution of the disease." And the testimony of Dr. Smith also attributes the diminution there to segregation and the improving condition of the people.

In most other countries there prevails no systematic method of segregation.

In Norway, a country in which all questions in connection with leprosy have been worked out in great detail and with much laborious care, and where a complete registration is made of all the lepers, the steady diminution in the number of lepers is attributed principally to the system of isolation pursued. "More than a simple beneficial influence may be at work, but predominant is that exclusion dealing with the individual leper, as himself the source of it to others."

In the Sandwich Islands an attempt is made to carry out a complete system of isolation, but many lepers being...
being allowed to live with the afflicted, and to have inter-
course with the outside public, it cannot be looked upon as
very efficient.

In Trinidad there is no system of isolation, although
the system of segregation is partially carried out owing
to the existence of the Lepers Asylum. Patients, however,
are allowed to leave the institution whenever they wish
their discharge, and are granted leave of absence to
so out of the Asylum grounds, whenever they may ask
for such leave. There is no law compelling them today
in the Asylum, and no law compelling them to go there.

In going to the many advantages they see they derive
from the place that they seek admission there to—the
asylum in Trinidad is free and independent—he goes
about the streets freely, and is a sight often seen amidst
in the streets, around the busy places, and in the
markets; and places of amusement. He is allowed to
engage in trade in meat, and vegetable,
and bread; and he is given all the liberty of ordinary
citizens, and is subject to no special laws.

In view of the arguments I have adduced
in an earlier part of this Thesis, and especially of
the fact that every leper is a focus of possible contagion
and of certain dissemination of the disease, I am
strongly of opinion that rigid isolation and segregation
should
should be enforced in all countries, where leprosy is endemical; it is only to this means that we can really attribute the dying out, the stamping out, of the disease in England and other European countries. There should be a complete legislation of all lepers; a life history of the case should be kept; and the government should provide and subordinate places for their reception. No intercourse with the outside world should be permitted. Both lepers may be allowed to marry (their fecundity is not great, and such a step would save much immorality). They should not be allowed to live outside among the healthy community, nor to engage in any trade or profession. They should be strictly isolated and segregated. Such an ideal settlement would be in an island; the leper to have plots of land and be allowed to cultivate provision, to have their own orifices, and be allowed to marry; the provision to be sold to the government for market cost, the money to be paid to the leper; and such luxuries as tobacco to be brought, communication with the outside world to be prohibited.

But many difficulties present themselves in connexion with the consideration of any system of compulsory isolation. First, is the stage of the disease at which isolation should be carried out; in the very earliest stages the patient themselves are unaware of their affection, and even if...
They come under observation in their early stage, and it be true away from their relatives and be isolated? If so, should cases in every stage be allowed to mix with each other? Then again, the difficulty arises of the manner of dealing with the better class patients, for if isolation is compulsory, they will have to be dealt with in a similar manner with their poorer brethren. If a moral sense of the necessity of isolation in dealing with the disease could be made to prevail among the members of a community the task would be much facilitated.

The question of compulsory isolation is bound to come to the front: for if a system of isolation is carried out, in order to be effective it must be thorough and complete. Discrimination in the prevailing custom of burying has been observed where isolation is strictly carried out; this discrimination may possibly have been due to other causes as well, such as improved sanitation and hygienic measures. But in that as it may, one cannot help but be struck with the fact. And when we consider what an appalling disease leprosy is; how it marks its victims, and marks them; and how through a prolonged period of suffering it leads them to a sure death, no means that we can adopt, however stringent and compulsory, should be omitted by which we might stay the fatal plague.

W. W. K. K.
Illustrative Cases.

Case XI. Aesthetic Lesions. Injuries to Hands and Feet - Clear History.

Charles Jones, 50 - Male. Living in Avoca. No family history. Father was an agriculturist; died from accidental mischance - 'struck' from a fall. Mother also dead, from dysentery. One sister had none, when no face which healed rapidly.

In 1882 patient was manager of a cocoa estate in Avoca (Verdant Vale). He went out hunting in the woods. On his return was caught in a shower of rain and got wet through. The same night, severe fever (malarial) set in, and lasted for two months. It came on in the afternoon and left him in the morning. He was much emaciated and weakened after this. Two weeks after getting up from bed - in October - he noticed a yellow mark, circular, flush with the skin, but painful, "like a stain", and sensation was present. It was indistinct at the edge. It lasted about 6 months. Then about 2 months after the rest of this, he noticed another similar spot, larger; under left breast. This was red, and sensation was present. This lasted for an indefinite time. He took a decoction of Cinchona bark and Epsom salts, and
found that these spots had disappeared after one winter. At the same time he felt a great deal of drowsiness (which he mentioned to me without being questioned on the point) had no inclination to work, was easily tired out, and perspired freely. At the same time he had subjective feelings — pain and needles — in the toes of his feet. He felt nothing very far away: then he stood his left leg on a piece of wood, and a bone moved which had never healed. He had much pain in the leg, and no anaesthesia. Four years after the first case he went to Erin (a Macarthur district) where he again had fever fever, and an abscess in the back — this made him leave the district in 1885. He went back to Arina and has never done any work since owing to weakness and pain in the back. He this time there was no progress of the disease. In 1887, the feet were noticed to be numb, and to swell during the day, he got cramps easily, and 'pins and needles' in the toes. Then the skin of the lower part of the arms and of hands began to change to a dark brown. The tips of the fingers were bumbling, the nails began to thrival and fall out. Then the loss of sensation began to spread upwards. He is a steady man, given only occasionally to excess in drink. Only had gonorrhea, no other venereal disease. Has 7 children,
of whom only 5 are living, the having died in infancy, cause unknown, the other in childhood (of material fever).

Examined 14 Oct. 1899. Expression of face heavy, dull. Capillaries dilated on cheeks and chin and nose. Light anaesthesia in left ear. Skin of trunk quite free from mark and anaesthesia.


Left, except for a circular patch on palms of both hands.

Fingers swollen and glossy. Nails are thickened and dried up. Muscles of thumb wasted. Ulcers have enlarged and painful on pressure, and pain radiates to finger.

Median nerve also enlarged, painful and tender.

Lower Extremities: from lower half of legs downwards skin is affected; it thickened and browned.

Ankle swollen and edematous, skin hypertrophied. Total anaesthesia, except in toe, where tickling can be felt and there is sensation to pain. On anterior surface of lower part of left leg a large ulcer. Under right heel a chronic ulcer - margins of which are thickened, anesthetic and inconspicuous. The ulcer also tender, 1 month.

Nose still blocked sometime.

Remarks. The early healing is marked and clear; the premonitory symptoms or prodromata also are clear.

The case shows well the implication of extrenities only.
Case XII  Anesthetic leprosy of long duration

Manuel de Rekta, 30. Born in St. Kitts. Came to Trinidad 3 years before admission. Led a fairly steady life, and surroundings at home were comfortable. No family history. Attributed disease to a cold.

History. Fifteen years ago the right hand and arm became suddenly numb, and on its subsidence "left no feeling at all." When the swelling came on he had no pain - unable to lie down or move. He had no feeling and no strength. About 5 years after he had pain and swelling in right leg, from its middle to the ankle. This subsided after being blistered and leached - but soon recurred, accompanied by fever and chills. (Note he noticed always at the change of the moon). The left leg was thereafter always worse than to some extent. Sensation was lost after the swelling came on. He then had "feeling" in his body - "things" in the body eating him up, feeling of heat and cold, sometimes heat spots came out (? erythema), which made him "look like a rose." The state of things continued - he was ailing more or less. Then about 2 years before admission he lost the sensation of left hand and left leg. He says its not spreading. Has a slight erythema, swelling on the thumbs, which causes him much pain & heat.
Never had syphilis — only Granulæ.


Right Arm: an moist ditch above elbow. Came on about a year ago. It began to itch him, he scratched it, a much "water and blood" came out. It dribbled over and left a cicatric which is anaesthetic. Upper arm normal. Upper half of anterior surface of forearm normal, devoid of much anaesthesia. But only diminished sensation in palm, palm web of fingers to wrist. Little finger and ulnar side of Ring anaesthetic: all three fingers sensation diminished but not lost. Left Hand in same condition but he feels much more readily in the palm. Ulcer never enlarged.

Small erythematous patches in thighs, which cause him burning and itching. Anaesthesia commences in middle third of leg, where it is absolute, down to dorsum of foot (not quite so intense). Sensation normal in calves and in sides of feet. Oedema and burning condition of Right leg; less so of Left. Feet and toes swollen. Right Knee-jerk present. No wasting of parts. Right contraction of R. little finger. No wasting of muscles. Feet are swollen, but there are no sores. In good state of bodily nutrition. Noticeable points are 1. Its prolonged course. 2. Its limited extent. 3. The comparatively freedom of fingers and toes.
Case XIII. Anaesthetic lepra, occurring at an early age; rapid spread at first.


Family history cannot be obtained. In regard to personal history - as far as can be made out from his account it seems to have had the disease for about three years. It commenced with nodules in the ear, then he got a 'fit', and the left hand became contracted.

A boy of pleasant appearance but poorly nourished. Tächer are present on face, body, arms and legs. They are of varying size: generally circular in shape, with a minute, serrated border, and sometimes fading into the surrounding skin. Colour varies from a light yellow to a dark brown. They are mostly anaesthetic.

Anaesthesia is extensive, viz., the patches, on face, ears, whole of right arm, left forearm and fingers, leg (except right buttock), upper part of thighs, back of left leg. Sensation absent to superficial stimulation, but he feels pain deeper, i.e., where a pin is more in about half an inch. Fingers show incipient contraction with absorption of terminal phalanges of both index. Hands not so characteristic. Feet anaesthetic with characteristic thickening of skin. Feet normal. The incipient perforating ulcers under left heel. Right Spinochlein and Femoral glands enlarged. Right iliacus nerve more enlarged than left.
Remark. Case is noticeable because of its early commencement. The extent of the anaesthesia is also to be noticed, as well as the fact that it occurs independently of the fingers. The enlargement of the nipple does not frequently occur to so marked an extent.

Case XIV. Anaesthetic leprosy of long duration and stationary.

Subject. Male, 27. Cooke.

In state that blebs appeared in left forearm, then in right, and spread to trunk. It commenced the year before examination. No family history. No cause assigned. The following is his condition on examination on 5th September 1870. Skin on both cheeks slightly thickened; nose, mouth, and nose anaesthetic. Hips, thighs, and back of ear anaesthetic. The affected features are lighter in colour.

Both sides of back anaesthetic. A large tubo near arm of scapular border around aulica to front. Anaesthesia in front of triangular region.

Complete anaesthesia in both upper extremities. No signs nor ulcer borders of both forearms. Commencing contraction of fingers: leucoderma on palmar surface of some. Terminal phalanges of both indices absorbed and nails implanted on 1st phalanges.
Total anaesthesia of lower extremities, laceration on under surface of thighs and toes left toes of feet.

Nerve ganglia enlarged - arms then.

Nose etc. normal.

Remarks. Disease is of long duration in this case.

Anaesthesia is extensive over arms and legs, but con-
traction is only commencing in the fingers. The Taches are
light in colour and anaesthesia not typical leprosy type.

It's origin in the limb - the earliest signs until the
spite of extensive anaesthesia there are no evidences
of recent ulceration.

Case XV. Anaesthetic leprosy. a mild

Case. Stationary.


Disease commenced three years ago with a

sore on left great toe - no family history. Says he got

it from a cold contracted while working in the British

house of an estate.

Examined 9 Jan. 1890. Fever patches on forehead.

Nothing abnormal in Nose, Cheeks, Lips, Eyes, Ear

or Neck - no anaesthesia.

Two small pale patches. No lesions. No anaesthesia.

Nipples normal.

Upper Extremities. Pale patches, back of L. arm and
Above. Also back of R. elbow and forearm. Both little fingers becoming contracted, also 4th finger. No anaesthesia. Nails intact.


Glands not enlarged. Voice normal.

Case XVI. Anaesthetic deprray: proper.

Fairly rapid - hands involved to some extent.

McLarn, an aged Male Colic, who give his age 74 but is more 64 years in appearance.

His family history. He knows no probable cause. But on questioning him he states that next door to him on the estate had a leper with lepers - hands and feet - hands fingers dropped off. Patient is not very clear in his statement but the question of leprosy might well be considered here. Commenced three years ago with pain in left foot.

On admission 17 March 1871 his condition was as follows - face the skin is loose - there are no tache - and no anaesthesia. On trunk, small circular pale patches of varying size, not anaesthetic.

Upper Extremities - Tache, on shoulders and back.
arms. Anesthesia commences first above wrist and is absolute in hands and fingers: higher up sensation is normal. Left hand - middle, ring and index becoming contracted - right - much less so. Nails, right middle wanted; ring and little, are furrowed transversely. No cicatrices. Above extremity - From 2 in. above ankle and downwards there is total anesthesia; above this sensation is normal. Nails, no thicker, are few, left great toe absorbed and shortened. Knee-jerk diminished. Median and Medial Nerve, enlarged on both sides.

Remarks. Here we see that the tactual are not anaesthetic, that anesthesia occurs in hands and feet, contraction of fingers only, commencing; nails are much affected; no veins enlarged. He is a regularly recent case and illustrates the early affection of hands and feet.

Case XVII. A recent case of ? Mixed Erythema.


The disease commenced 3 years ago, with small papules and desquamation on back of left hand. No other member of family affected and cause unknown. He says he knew intimately and associated with two other lepers in the same estate, where he is an indentured laborer.
The admission 14 July 1891. Our ridge of nose
and both malar prominences, a reddened eczematous
inflammation - the ears shook papules. Hair now dropped off.
Reddening and thickening of skin with superficial
edges. A very red, no back.

Right Nipple slightly enlarged.

Upper Extremities. - Right - sensation only in termi-
nal phalanges; no blisters of hand come tenderly
on palms. Wanting of dorsal interossei, and monkey
ball of thumb. Nails intact. Tendency to eczematous
eruption in upper arm. Left. Anesthesia in 2 right
commencing wanting of ulnar border of hand. Nails
intact. Eczema over elbow. Both Ulnar nerveselayed.

Lower Extremities. - Puffiness and edema of
both legs - much itching. Anesthesia of feet. Nails opaque.

Spleen not enlarged. Other systems normal.

Remarks: The case bears with the slow and insidious
progress of the disease after it is implanted. The hand
and feet primarily are anesthetic. The only evidence
of tuberculosis is over the malar (where the skin is
thickened and thickened) and the papulation of ears.
It commenced in back of left hand. There is no con-
traction and anesthetic is limited. It showed itself
6 months after his arrival in the colony under evi-
dentiance. This is a very early case.
Case XIX. To illustrate paralytic symptoms which occur in anesthetic derangement, with a suspicion of syphilitic taint.

Robert Digne, 34, Negro.

Family history poor: commenced like a patch of ringworm on face.

Suspicious signs of S yphi lis: (1) thickening and pain of supra-orbital nerve; (2) mouth drawn up to left side; (3) discharge from pustules and one on penis; (4) enlarged axillary glands.

Admitted 12 July 1867. Men B. eye (left) is a small pale patch about 1/2 in. in diameter. The supra- orbital which can be plainly felt, and the thickened nerve feeling about render the fingers. Patch very hypesthetic. Much thickening of lips, more desquamation. Mouth drawn up to left side. Right foot, eye-ball prominent. B. eye blood-shot, left eye so.

Pain in eye when matter in left. Pulse, very, pulse, below and behind ears, but drowsiness unusual.

Slight patches, one back and point of chest and abdomen, varying from 1/4 in. to 6 in. in diameter. Sensibility diminished. Eyes raised.

Upper Extremity, similar, only anesthetic patches in arms, and one on back. Back of patient involved in similar patches, and to a less extent the
the joint. Fingers contracting. Skin hard, thick. Blobs on fingers have arisen spontaneously (like Brown). Hands and fingers quite anaesthetic, also back of forearm, and wherever patches are on forearm. Nails inclined to split longitudinally.

Lower extremities—similar patches on thigh. Large ike patches, extending a little above knees, and including the leg, quite anaesthetic. A little sensation left on inner side of leg above ankle, where skin is free, and on inner side of leg just above inner malleolus. No moisture. Nails broken. Heals when the body of left great toe.

Feet—articular much enlarged. Tendon slightly.

The left side of face is drawn up, and the right side is quite paralyzed: paralysis involves the re-

ticular muscle of eye. It presents all the appearance of Bell's paralysis. This variety of paralysis is frequently seen in anaesthetic leprosy.

Case XIX. Anaesthetic leprosy. Almost complete

anaesthesia of the body.

Ramparidas. Male, about 50. Comic. Over 10
years ago. First noticed anaesthesia; three years after which lasted one year.

Admitted 2 February 1891. Here since total

anaesthesia of forehead, nose, cheeks, lips, eyes, and
Ears: on the scalp there is slight anaesthesia. The neck is anesthetic and there are a few blemishes. On the front and back of the trunk there are patches of anaesthesia all over, and the site of yaws tubercles is well marked. In the right and left arm, forearm, hand and fingers there is total anaesthesia and enlargement of middle phalanx of 1st, middle and terminal joint of other fingers. Total anaesthesia in both lower extremities, the skin rough and dry, and yaws being present in soles of feet. Femoral glands enlarged.

Brain: cavity anesthetic. Larynx and voice normal.

Digestive, Respiratory, Circulatory, and Serruto-urinary systems normal, except fever in first system which is totally cured; general nutrition fair.

Fingers: right: little, slight contraction. Being, common swelling of middle phalanx. Middle, first phalanx and proximal part of second enlarged. Index, second phalanx enlarged and dislocated; thumb, meta-

Tarsal enlarged; wasting of muscle of thumb; nail unaffected. Left: swelling of distal ends of meta-
carpals, and phalanges; ulnarily off; fourth metacarpal and fifth not enlarged, but 1st phalanx of little finger.
Nails normal. Superficial ulcer of L. little toe.

Remark: 1. Extensive area of anaesthesia, only the scalp being slightly exempt. 2. Enlargement of bone — which seems like Rheumatoid Arthritis.
No pain: bone itself seems enlarged: movements at joints possible, except where the enlargement of bone, prevent it. 3. Aesthesiæa of muscle remarkable. 4. In spite of the extensive aëthesiæa of lower extremities, walk is not affected. 5. Knee jerk is normal, but no ankle clonus present. 6. Ulnar epipli prominent on chest and arms — back, irregular outline.

Case XX. Anæsthetic leprosy. Early case in a young child: mother being a patient in asylum with Mixed leprosy.

Beatrice Doris - Female - 5 years.

Mother suffering from Mixed leprosy, contracted while she was nursing the child, and when she left the child, from year ago there has a suspicion, spot on cheek.

She is a plump, sturdy child of pleasant feature, & shows no likeness to a leper. Skin soft and supple.

Features are most marked — 1. Bigger left eye about size of a shilling. 2. Wide ulnar side, back and front of R. arm. 3. Wide left upper arm. 4. Right calf and shin. 5. Inner side of left knee. They are all lighter coloured, shorter less prominent. Aæthesiæa present in varying degrees in some. Hands and nails, quite normal; also the feet. Ulnar nerve slightly enlarged. Over the arms and legs in addition to the typical
typical tache, there are small circular darker colored
patches, as are left after the disappearance of a yawm taba.

Remark: 1°. Youth of patient, probably set in three
after birth, the tache under left eye being dark in size.
2°. Slight amount of anaesthesia. 3°. Hands and feet
not yet involved. 4°. First case of early anaesthetic lumpy.

Case XXI. Tuberculated lumpy occurring in
childhood. Maternal grandmother has disease of
the same variety.

Buddram. M. 5. Admitted 5 Sept. 1890.
Disease has existed almost a year before admission,
and first appeared in right ear and cheek, and then
in left ear and cheek.

On examination, skin infiltrated and thicken-
ed over forehead; and all over face there are tubu-
lar Les of varying size. Skin of face is glossy, thickened,
with fine capillaries running over it. The whole of the
face is affected with thickening of the skin. Ears are
tuberculated and enlarged. Trunk: a few taches
of varying size over front and back with slight ana-
thesia. One large patch over R. shoulder. A pit in
nose over lower abdomen. Nipples - left enlarged, right
small. Right upper extremity - skin thickened over
elbow, on inner surface of forearm a few small
taches.
tächer. Axillary tächer extending from shoulder. Fingers glossy and slightly swollen. Left upper Extremity is the same—a few tächer with slight anaesthesia. Lower extremities: Skin over legs hypercholesterine and large tächer over calf and knees. Pityrias is spreading on to thigh, prone abdomen. No anaesthesia. 12 Aug. 91. Has had two severe attacks of Remittent Fever and the tubercles of face. Large flattened elevations, have subsided after each attack, but have grown up again. At present they are flat on the face, the skin being thickened and darker. The patches on forearm are like splashes of dirty water: sweat ducts obstructed; skin roughened and dry. The nose is now anaesthetic, also the flattened tubercles of face. Eye brows are beginning to fall out.

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