LEPROSY
and its Treatment.

by

Charles F. Beaumont. M.B.

April 1879.

The Principal Authors, whose writings have been consulted, are

Danielsen

Boeck

Hansen

Hebra Kaposi

Vandyke Carter

Cormac Wilson

Macnamara

R. Liveing

McConnell

Tilbury Fox

Lewis & Cunningham

The Leprosy Committee of the R.C.P.L. &c.

Several other medical men, European and native in India, China &c. have kindly allowed me to consult them personally.

C. F. B.

although leprosy is happily excessively rare, in the present-day, in our own country, and comparatively so in Europe as a whole, it is still fearfully common — if not actually on the increase — in Asia and Africa; and, therefore, as I have lately had opportunities of studying the disease in some of its favourite localities, I have thought that, perhaps, it would not be out of place as the subject of my Gradnation Thesis. As it is, of course, quite impossible, within the short limits of an Essay, to write anything like an Exhaustive treatise on such a disease in all its bearings, I have determined to devote myself principally to its Clinical History and Treatment, touching no more on its Etiology & Pathology than is absolutely necessary to indicate the proper course of treatment to be adopted.

Leprosy has been recognized as a disease for more than 3000 years, but it is only recently that it has ceased to be confounded with several other maladies — especially with the so-called "Jewish Leprosy" (really a form of Xeroderma); with Elephantiasis Arabum, or Barbadoes Leg; with Syphilis and Scurvy — but it is now recognized as a distinct Constitutional disease, principally

young adults and the male sex.

Various Classifications, or attempts at classification, of the disease have been made by different authors, based upon the symptoms and external appearances — the most popular division being into the "anæsthetic", "Tubercular" and "macular". But, as Hebra and Kaposi point out°, we cannot consider such types the separate or well defined species, as they often pass insensibly into one another, & may even be all present in the same individual. Hansen, of Bergen, states that in 141 cases of Tubercular Leprosy, he only found complete insensibility of the skin in 9. Other recent cases, and my own experience in the East entirely corroborates this statement; indeed I never remember to have seen a patient suffering from the disease at all in whom sensibility was not more or less impaired, while in about 20 per cent. it was really impossible to say whether the symptoms of the anæsthetic or tubercular type predominated. And this seems true to be only what is to be expected. A neoplasm is developed which invades the fibrous tissues and the nerves; in the tubercular variety the former are more prominently attacked, in the anæsthetic, the latter, but there is clearly no duality of virus. (as is sufficiently indicated by the fact that while

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° See art: "Lepra" in Hebra's "Skin Diseases".

a parent may be afflicted with one type, and the
may appear in his child), and if both are not
attacked, it is only because the disease kills
the patient before it has time, so to speak, to
spread to its full extent — otherwise I fully
believe that every case would, in course of time,
present the features of "mixed" leprosy.
Having thus explained how much, or rather
how little, importance I attach to the
division, I shall proceed to describe the
disease under the headings of anæsthetic and
Tubercular leprosy, as in the earlier stages, at
all events, the two types really do present a
different appearance. The so called "mac-
-ular" type I shall not further refer to, as it
appears to me to be nothing more than a tolerably
usual early stage of the disease.

The period of incubation is perfectly indefinite,
but a premonitory stage is described by the
Norwegian physicians which is certainly not so
well marked in the East, as it appears to be
in Europe — Indeed in hardly any of the
cases I have seen did there occur any symptoms
(except in a few cases sometimes those of dyspepsia)
before the nature of the disease clearly indicated
itself. In Norway, however, they are described
as consisting of a general feeling of lassitude
& malaise, loss of appetite nausea & vomiting,
febrile attacks, especially occurring at night-
-time, and sometimes accompanied by pain
in the back & limbs resembling that of acute
rheumatism —

This state of affairs has been known to last for years, and it is generally said to be at least of a couple of months' duration. Boeck says that the prodromata are not so common in the anaesthetic as in the tubercular form, that, in fact, among 42 attacked, he only found them in 9. As the anaesthetic form is much the commoner in the East, this may account for their comparative absence here.

The nature of the malady may first manifest itself by an eruptive stage, or by development of anaesthesia, or (and, I think, more commonly) by a combination of the two. A patient — in the East, at all events, — will generally tell you that he first noticed a spot like ringworm that, at the same time, his hand felt numb & weak. Occasional uncomfortable feelings are also often described in the upper extremities, comparable to a kind of aggravated "needles-and-pins", but I have never myself met with marked hyperaesthesia as described by European authors.

Certain forms of eruption of the skin are always present. On the pale skin of Europeans, Parsees, Chinese &c, the eruption is of a dark colour — generally reddish-brown, or even purple; but in the dark coloured races of India &c, the eruption is universally of a paler colour than the healthy skin, & this may even

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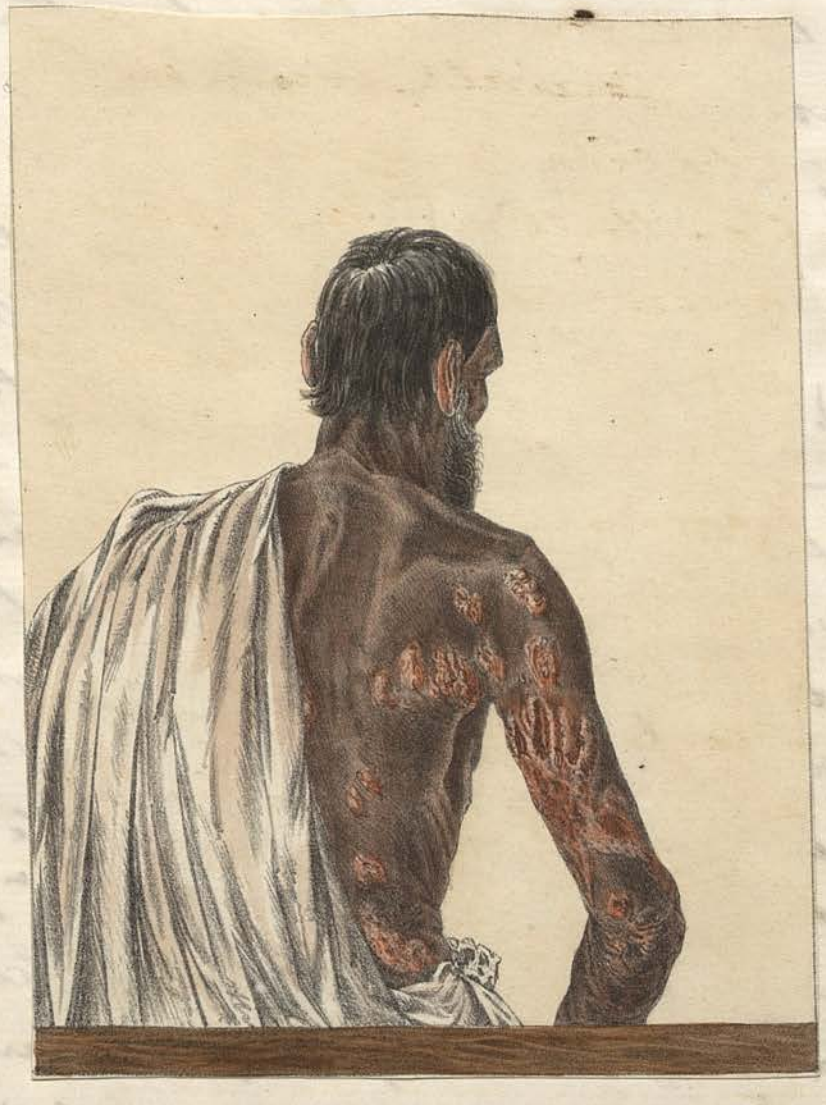
° Norsk. Mag: for Laegevid 1862.



the case in Europeans when the confection has subsided, the leprous deposit has undergone disintegration or absorption. The character of the eruption varies considerably. Commonly it consists of isolated, circular and serpiginous patches from ½ in: to 3 ins: in diameter, with raised edges of, in the pale races, a dark pink hue. The centre of the patches is generally dry, glistening and anæsthetic, and the most characteristic patches generally occur in localities exposed to irritation and more or less unprotected, such as the elbow, knee, back, front of thigh &c. These patches are not at first permanent but die away after a time, either leaving no trace behind them, or else slightly discoloured anæsthetic patches. They soon return, however, and show a decided tendency to run into one another, so that the leprous patches are frequently as large as the palm of the hand. Dr. Vandyke Carter° says that as long as there is a raised hyperæmic edge so long have they a tendency to spread. The excretory, rather more the secretory functions of the skin in these localities are considerably interfered with, the hairs on the patches are either atrophied and fall out, or become whitened. According to Hansen+ the reason why the hairs fall out is that they are pressed out by the hypertrophied epithelium of the hair-sacs: for both the sebaceous & sweat glands, the epithelium is

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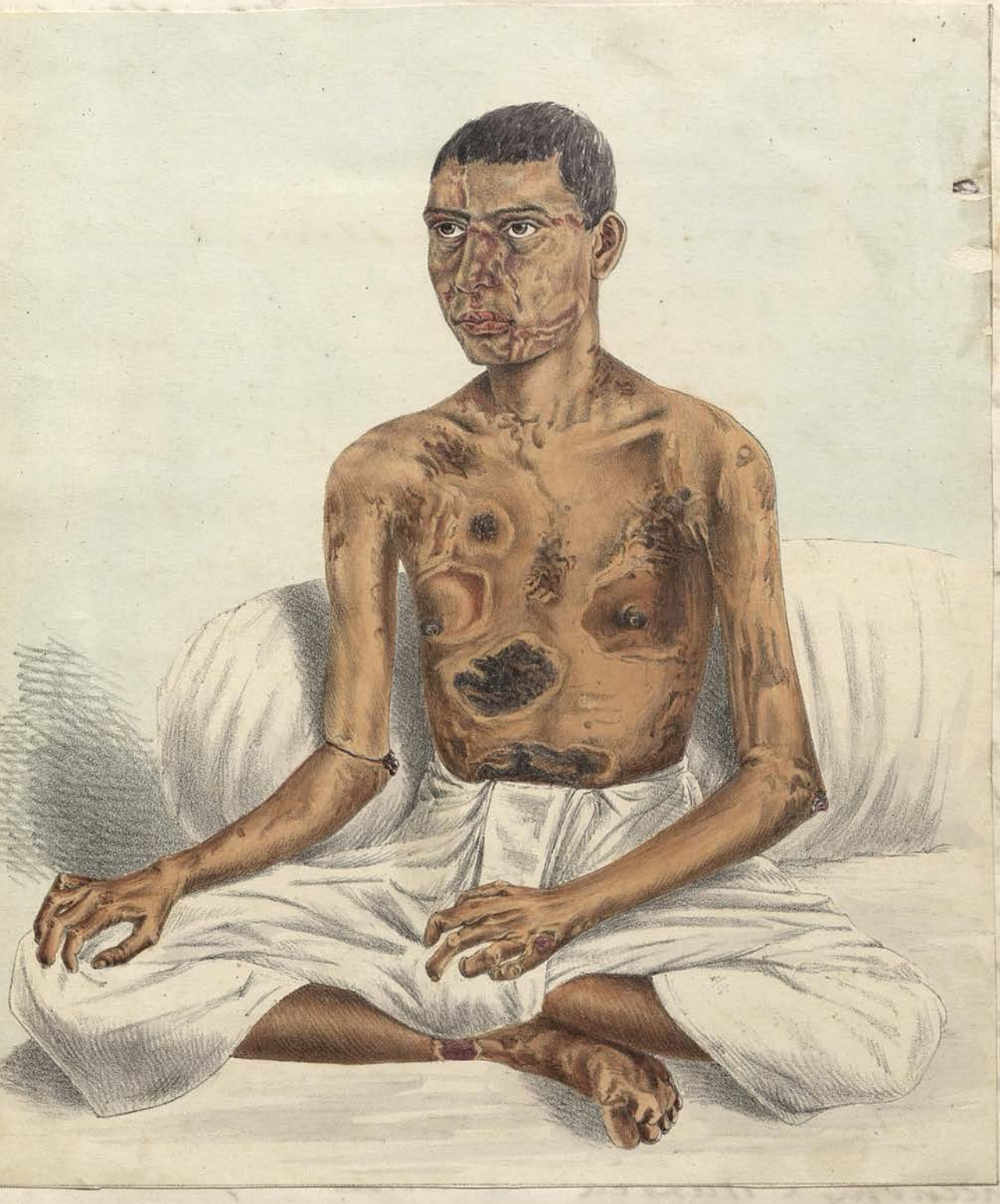
°Eruption of Leprosy. by V. Carter 1874.
+ Norsk Mag. for Lægevid: Christ: Band 2 1871



at first hyperæsthesia - In many cases among dark races, at all events, I have noticed a simple pale discoloration of the skin with anæsthesia from the first, which appeared likely to be permanent, the older spots, such as described above, frequently leave such patches behind them differing little from the healthy skin in appearance, but being decidedly anæsthetic -

At the same time as the eruption, bullæ not unfrequently occur, either singly or in crops - These are considered by some to be indicative that the anæsthetic will be the type ultimately assumed, but Dr Carter tells me that he has never seen them developed except on a surface already anæsthetic - They vary in size, but are seldom as large as an inch in diameter, contain a slightly coloured fluid & generally last for about three days, when they either subside, leaving a coloured patch behind, or burst causing a raw surface, which may ulcerate - Their favourite seat is the digits -

The temperature of leprous patients is either a degree, or degree and a half below the normal as a usual rule, but attacks of fever are not uncommon - These attacks are probably either due to absorption into the blood of morbid material — the excretory function being interfered with — or else to the deposit of leprous matter in the internal organs - When nodulated anæsthetic leprous patches occur,

the fever usually subsides - Dr. R. Lovering° gives an instructive case of temperature and pulse in a patient, from which the following is extracted.

	Morning		Evening	
Date.	Pulse	Temp:	Pulse	Temp:
Mar: 28	96	97.2°	94	99°
" 29	90	97.4°	84	97°
" 30	80	97.8°	108	102°
" 31	108	101.4°	144	104.2°
April 1	..	99.4°	112	102°
" 2	..	99.2°	148	105.2°
" 3	98	100°	108	104.2°
" 4	108	100°	108	101.2°
" 5	108	100.2°	100	102.4°
" 6	96	99.4°	100	101°
" 7	84	98.8	84	100.2°
" 8	..	98°	108	98.4°
" 9	100	98°	96	98.4°
" 10	96	97.4°	72	98°

"The febrile attack was coincident with the formation of new sores on the face & arms & enlargement and pain in the glands of the right arm."

° "Elephantiasis Graecorum" by R. Lovering M.D.

Anæsthetic Leprosy.

The distinguishing character-istic of this vari-ety is sufficiently indicated by its name, but it is not always in the earliest stages of the disease that anæsthesia is present - According to some observers there is, at first, hyperæsthesia. A the outer part of a patch is said to be sometimes hyperæsthetic & painful, while the centre is anæsthetic. I cannot say that I have ever myself seen this marked hyperæsthesia, but shooting, prick-ing & even burning sensations, accompa-nied by movements resembling those of chorea are by no means unfrequent. These symp-toms I attribute to pressure on the nerve fibres by the leprous neoplasm - In every day life, slight pressure on a super-ficial nerve will give rise to uncomfort-able sensations — if more prolonged, to numb-ness, & if still more so, to paralysis. And so it is, I fancy, in the various stages of "nerve leprosy". In this variety, then, the anæsthesia may either be the first no-ticeable symptom, or, (and more generally), it may be contemporaneous with, or follow the eruption - The seat of the nerve affection is the cutaneous system of the nerves of com-pound function, the central nervous system being, generally, left free - Therefore the first symptom noticed is impairment of the tactile sense, often a loss of appreciation of

temperature or pain: it is only in ad-
-vanced cases, where the pressure on the
nerves is sufficiently great to cause paraly-
-sis that the muscular sense is lost.
The thickening of the nerves is sometimes
so great that the ulnar & other superficial
nerves may often be distinctly felt.
Donaldson, in writing on this subject[1], says
that, among the cutaneous nerves, the an-
-terior division of the lesser internal cu-
-taneous is usually the first attacked —
then the external cutaneous, while the
lesser internal cutaneous is much less
frequently affected. The ulnar nerve is
almost constantly so, primarily in its trd
immediately above the internal condyle of
the humerus. The median & musculo-spiral
are also not unfrequently diseased. On the
leg, the nerves affected are the Sciatic,
tibial & peroneal, of the latter two are nerves
so without the former. On the head, branches of
the 5th & 7th are frequently found diseased.
But, as a matter of fact, there is no part
of the body which may not become anesthetic,
and in advanced cases, nearly the whole body
may be so. At times, the anaesthesia is excee-
-ssively complete. I have seen a patient, in
Calcutta, who at one time received a severe
burn, & at another time, was scalded with
boiling water without experiencing the slightest
pain.

[1] Donaldson, on Anaesthesia Leipzig 1862.

The extremities are almost invariably attacked by the anæsthesia &, in about 40 per cent of the patients I have seen the entire legs and the entire arms had succumbed. The next favourite seat appears to be the face and ears. The following table compiled by Drs Lewis & Cunningham* shows the proportion in which the various parts of the body are attacked by anæsthesia.

In 49 cases of this variety.

The face was anæsthetic in	86
the ears in	28
the scalp in	12
the neck in	6
the arms in	48
& the legs in	49

In 20 the entire arms were affected
& in 13 from the elbows
In 18 the entire legs
In 15 from the knees
And in 5 all the trunk.

As the disease advances, the patient presents the most pitiable aspect. He becomes much emaciated, & the muscles atrophy owing to suspension of the nerve influence. This latter phenomenon is especially noticeable in the hands & feet, the digits of which become clubbed and arched owing to the paralysis of the extensor muscles. The dorsum of the hand appears concave & the palm flat, owing

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*Report to Government on Leprosy. by Lewis & Cunningham.

owing to the paralysis and fibrous degeneration of the muscles. A flat surface or hollow is substituted for the ball of the thumb, and the fingers, when present, are curved & claw-like. Ulcers form on their dorsal aspect which eat their way down to the bone, in which, at the same time necrosis is taking place, so that the terminal segments of the phalanges actually fall or are knocked off, though happily, without any pain to the patient. After their removal, the altered nail is moved, as it were, to the 2nd ~~phalanx~~ segment, and then, as that is attacked and falls off, to the third. A similar necrotic & ulcerative process goes on in the foot, & in the worst cases, not only the phalanges, but the carpus & tarsus may be removed by it. Necrosis, and gangrene generally, are more uncommon in other parts of the body, but deep, indolent ulcers emitting an unhealthy discharge are often met with especially in parts exposed to external influences such as the elbow & knee. Wilson Fox[a] that occasionally after separation of a portion of a hand or foot a spontaneous cure takes place, but I should suspect its permanency to be decidedly dubious. The same authority, however fully admits that, as a general rule, the patient fails better as long as the ulcers are

[a] Lectures on Dermatology. J. Prof. Erasmus Wilson 1873.

discharging freely. — febrile attacks, such as those referred to before, usually supervening when they heal. The nasal bones are obliterated in some severe cases, and the tears and saliva often flow involuntarily, owing to eversion of the lower eyelid & this respectively, from disease & paralysis of branches of the 5th & 7th nerves. The mucous membrane of the mouth is rarely affected in this form. Of course the rapidity with which these phenomena take place varies in different cases, but in from three months to as many years, there are usually considerable evidences of mutilation.

From 12 - 14 years is the average duration of the disease in this form, & the prognosis, as need hardly be said, is most unfavourable. The usual immediate causes of death will be referred to further on.

The accompanying drawings were taken from cases under the care of Prof: M Connell, of Calcutta Medical College, to whose kindness I am greatly indebted. The photographs are from cases of lepra tuberculosa shown at the Calcutta Leper asylum. It would too greatly prolong this Thesis if I gave notes of all the cases, but I may, perhaps, be allowed to give a brief description of a single typical one.

Plate . Hindu Student, under the care of Prof: M Connell, of fair complexion, aged 16 -

The disease is of 4 or 5 years duration - It commenced in the form of a hawney eruption or raspy patches of a circular shape distributed irregularly over the whole surface of the body. In a few months from its first appearance, the skin began to get red & thickened - It was salivated by a native "quack" & became worse - On admission the skin over his back and chest is seen to be marked by more or less circular patches, about the size of the palm of the hand, slightly raised at the margin and undermined towards the centre - These patches are darker brown than the surrounding unaffected skin - It has slight thickening of the skin, lips, eyebrows and nipples, but no true tuberculization and the hairs are unaffected - The fingers are slightly contracted & their extremities clubbed and ulcerated, and small ulcers are also situated over the met-a carpo-phalangeal and also over the inter-phalangeal articulations & over the dorsum of the hands The feet are not affected, with the exception of one deep and foul looking ulcer on the sole of the right foot, in the first inter-osseous space - There is also ulceration on the elbows &c. The extremities of the fingers are decidedly undermined, but the toes are not so - Both the ulnar nerves are considerably thickened & painful, and along

the course of the right nerve above the elbow several small almond-shaped growths can be felt.

This case, I think, illustrates very fairly the appearance of well-marked case of anæsthetic leprosy of moderate standing.

Tubercular Leprosy.

This form of the disease is commoner than the anæsthetic in Europe, but in India & Eastern Countries in general, it is much the rarer of the two — only about ten per cent of the cases belonging to it. It begins quite, and most often, even, as I have stated before, superadding the anæsthetic type on the latter stages. The premonitory stage, when present, is the same as that described before. & much the same may be said of the eruptive. Macules appear in the skin, which eventually become permanent, varying in size from a shilling to the palm of the hand, raised and discoloured at the periphery. (at all events, while they are spreading), but dusky and shiny

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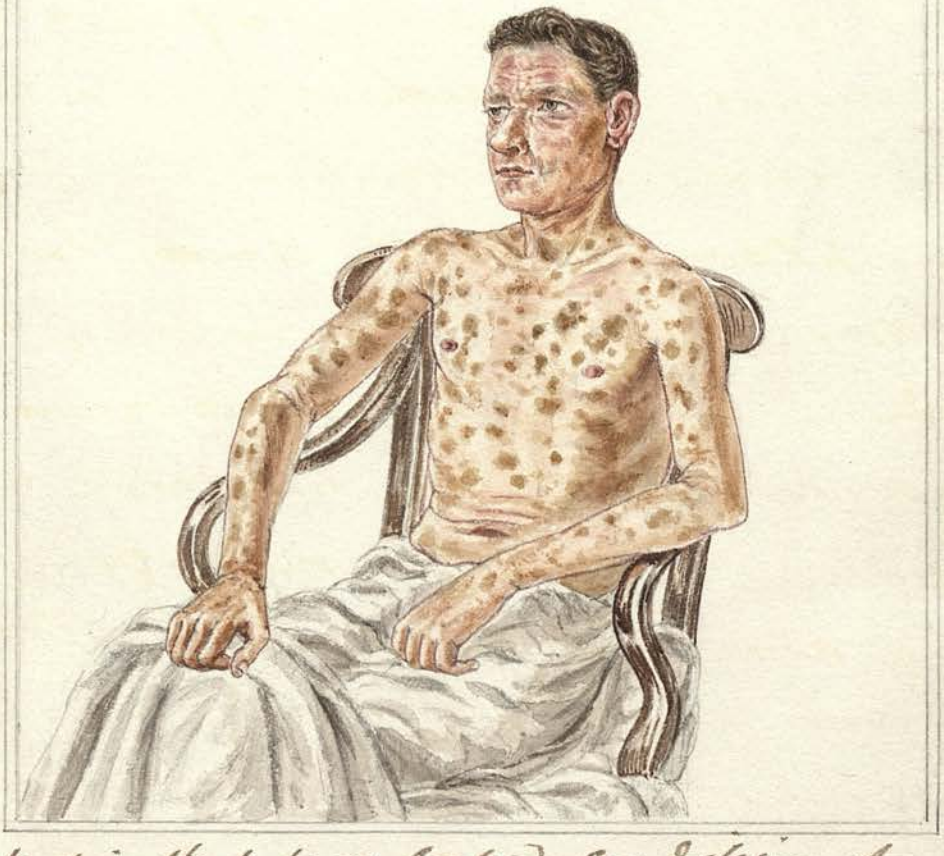
towards the centre, which is not very unfre-
-quently, to begin with even, more or less
anaesthesia. It is in these macules that
the tubercles are first developed, a slight
temperature being often observed during their
development. (Indeed febrile attacks are
common throughout the whole course of this
form of leprosy). The tubercles are of a
roundish shape, harder to the touch than the
surrounding skin, and of a somewhat elastic consistence. They ordinarily vary
in size from that of a small shot to
bullet, but in one case, at least, that I have
seen (see accompanying photograph) some
were very much larger+ (See footnote)

+This, though the most remarkable case that I have
seen of the new formations was not a typical case.
When I saw the patient he had been in the Calcutta
leper asylum for 16 years, having been altogether
afflicted with the disease for 25 years! He complains
of feeling weak, but in other way. There was no pain
but neither, on the other hand, was there any well
marked anaesthesia. The trunk was simply covered
with tubercular masses, varying in size from a
pin's head to a lemon. The largest being on the left
hypochondriac region. On the back, the tubercles were
fully as numerous as on the thorax and abdomen, &
there were fourteen as large or larger than a walnut.
The face was less markedly affected, though there were
numerous smaller tubercles upon it. There was
little or no thickening of the skin of the forehead.
The scalp was particularly affected on the left side,
the right being nearly free.
There was no evidence to be elicited of hereditary
or syphilitic taint.

Very far advanced Leprosy with
marked tubercular skin of face &
contraction of fingers - Æt: 26 -

To begin with the tubercles are vascular and are sometimes painful on pressure, but in tolerably advanced cases. I have never found them to be hyperæsthetic, & most frequently they are, on the other hand, anæsthetic. They are either cutaneous or subcutaneous - On the face, although its appearance is most characteristic, tumefaction of the skin is much more common than tuberculization, except in the case of the eyebrows - The face is, however, very commonly affected - Boeck says he found it to be so in 55 cases out of 100, while in 32 the face only was affected - The whole skin of the face is generally much thickened, &, in pale races, the colour is changed to a reddish-brown. The integument of the forehead is especially thickened - the folds being deepened, and the eyes half closed by the thickened eyelids. The nose is broad & flattened, the lips are tumefied & everted, the ears stand stiffly out from the head with enormously enlarged lobes. The hair on the face is destroyed, scattered scantily, - and, in fact, the face acquires what is known as the "leonine" expression. Next to the face, perhaps the nipples are most commonly affected, being often covered with more hard nodes & Dr. Bakewell mentions the prepuce as being a very common seat of tubercles - They are rare on the palms of the hands and soles of the feet, but the fingers again are very characteristic being more or less flexed as in the anæsthetic



Nodule & tuberculated condition of the face and anæsthetic staining of the body.

form, and enlarged at the extremities, but-
being more flattened out than in the former
case. The nails become dull, dry and
fissured, & sometimes undergo a dry
necrosis until only the stumps are left.
Where the tubercles are closely packed together
ulceration may take place, or a fungoid
mass be formed, but I do not think that
this is common unless, (or perhaps I should
say until) the anæsthetic type supervenes.
When it does take place previously, it is gen-
erally seen over the joints and is probably due
to either pressure or accident. In the later
stages of the disease, sloughing & gangrene
may take place, as in the anæsthetic type.
The life of the individual tubercles may end by
ulceration or more rarely by abscess forma-
tion, but commonly they undergo a process
of involution. The tubercles undergoing atrophy
& becoming absorbed leave behind them a
depressed scar, which, in the European is deeply
pigmented, but, in the coloured races, is usu-
ally white. An individual tubercle in the
skin may, however, last for years before this
takes place & the process of involution itself
frequently takes a month to complete.
Dr. Hansen says[1] that "when a tubercle ulcerates
the change begins either over a diffused space
or in one spot generally near the centre of the mass.

[1] Nordiskt Medicinskt Arkiv: Band I. No: 13. 1869.

The colour here is yellowish brown & in sharp contrast with the surrounding parts, whose appearance is highly white and glistening. as if moist - At a later stage of softening there is not seldom found a cavity filled with detritus of a reddish-brown tint, the colour being due to diffused blood some of the red corpuscles of which remain almost unaffected."

At the same time as in the skin, interstitial deposit takes place in the glands, especially of the groin, which are hard and sometimes tender. The testicles, also, are in some cases affected. Suppuration of the buboes is however rare. It is only after the tubercles have existed for some time in the skin that they become developed in the mucous membranes - Sooner or later, however, the latter are nearly universally affected. The hard palate becomes nodulated and fissured, rough, as far as my own experience goes. This is rarely the case in the soft palate and fauces. The tongue becomes thickened & stiff the epithelium on the dorsum is much proliferated, appearing grey & opaque while the papillae stand out prominently. The epiglottis becomes thick and immovable, and the vocal cords seem to be similarly affected giving rise to the harsh grating voice & cough which are incidental to this form of leprosy. In advanced cases, the epithelium of the nose also is tuberculated

and the sense of smell lost, and occasionally opacity of the cornea with thickness superficial, while conjunctivitis is comparatively common. Rare latter symptoms, however, when they are present, are probably as much of local as of specific origin being due to irritation caused by the enlarged upper eyelids &c. This form of the disease kills the patient more rapidly than the endothelial - usually in about 8 years.

The immediate cause of death in a case of leprosy varies - It may be due to marasmus or gangrene, or may follow one of the febrile attacks mentioned before, or may be due to laryngitis; but, more commonly, it is immediately due to bronchitis, Pneumonia or Tubercular Phthisis (which, as would be supposed is not unfrequently present); or more commonly still to an attack of diarrhoea, which, on the whole, of all events, is successively common and equally difficult to check. As I remarked before, it is really impossible, in so short a paper, to give a full description of this fearful disease, but I hope that what I have written will give, at least, a very fair idea of it.

Before proceeding to the subject of the Treat-
-ment of leprosy, it will be necessary to
consider briefly some points in connection
with its Etiology

The primary cause of leprosy, if ever known,
is lost in antiquity†, but that there must
be certain predisposing, and, on the other
hand, counter-acting agents will be obvi-
-ous to anyone who considers the history of
its decline, especially in Europe during
the last few centuries. The chief predis-
-posing causes (which are, however, very
unequal in importance), may be cited as
1. Hereditary Tendency.
2. Mal-Hygiene
3. Diet-
4. Syphilitic taint- & intercalation mercurialism
5. Contagion
6 Climate
7. Soil
8. Race-

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† Atreya, writing at least 1500 years B.C., says
"Excessive physical exercise, after sexual intercourse & too much
heat & cold, taking food after bathing, eating of
fish with milk, using of barley, sheep & other goats
curdled milk & butter milk, excessive sexual
intercourse, long protracted excessive fear & labour
fatigue, interruption of catarrh &c. - - - - - - -
produce "Kushta" or leprosy."
v. Proceedings of Asiatic Society of Bengal
Aug: 1871.

Leprosy is believed generally considered to have originat-
-ed in the banks of the Nile, thence spread from Africa
to Asia Minor & Europe, particularly during the time
of the Crusades-

The first is so generally admitted as an important factor that I need hardly do more than mention it. Danielssen and Boeck state that out of 213 cases occurring in Western Norway 187 occurred in leprous families. Perhaps they use the word "family" in rather a wider sense than it is used in common parlance, but, as far as my own experience in the East goes, nearly one half of the cases may be accounted for by hereditary transmission. Of 623 cases reported to the London College of Physicians 287 were known to be hereditary.

2. Although defective hygiene is not actually a cause of leprosy, it is not to be wondered at that a disease essentially dyscrasic in its character should be, at all events, fostered by it. And history shows that in proportion as civilization advanced and sanitary arrangements came to be considered in England & other countries, so leprosy lost its hold — and, in the present day, it is rarely found except in countries where hygiene, public & private, is more or less disregarded.

3. The above remarks will apply equally to bad diet. Many authors maintain that leprosy is especially prone to attack people who subsist principally on fish, and adduce the Norwegians as an example. But, in considering this question, it must not be for-

-gotten

that, in the first place, the inhabitants of Norway not only eat fish, but eat it in a state of decomposition — which fact might alone account for the constitution being lowered, & thereby rendered less able to resist disease — & secondly that leprosy exists in many countries, e.g. parts of Persia & India, where fish is unknown as an article of diet. And, again, in other parts, according to Dr. Richardson, Balasore, where fish is often consumed but leprosy is unknown, while at Bencoorah, where fish is scarce, it is rife.

Other authors, with perhaps more reason, mention the absence of such vegetables as contain potash as a possible cause — with respect to this Tilbury Fox† notices that, though in Ireland bad hygiene and bad diet prevail, there is no leprosy, and suggests that the large consumption of the potato as a possible opposing agent. He further states, on the authority of Dr. Hjaltelin that the disease has decreased in Iceland since the introduction of the potato in the island. While on the subject of vegetable diet, it may be noted as a very possible hypothesis that diseased grain may have some effect — Dr. Muirhead Kirk & Thomas Munro×, in particular, argue that this may be so, but it is undoubtedly the case that "diet" & other grains are staple articles of food

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° Ind: Med: Gaz: May 1. 1872 -
† Fox on Diseases of the Skin - Art: Leprosy.
× Etiology of Leprosy &c. Munro - Edin: Med: Journal - Feb: 1878.

in most countries in which leprosy is prevalent and the fact that the diet of fish given exclusively induces paraplegia lends additional weight to the argument.

4. I have noticed that among the natives of India & China, leprosy is often attributed to a syphilitic taint or to the mercurial treatment of syphilis, & one native medical man told me that he considered more than half the cases under his care were due to venereal disease. Be this as it may, it is undoubted by the case that a large proportion of lepers are also syphilitic.

5. The question of contagion is still, I consider, "sub judice". In the report of the R.C.P. & it is stated that "the all but unanimous opinion of the most experienced observers in different parts of the world is quite opposed to the belief that leprosy is contagious, or communicable by proximity or contact with the diseased ..... that leprosy is rarely, if ever, transmissible by sexual intercourse when one of the parties has no tendency whatever to the disease". This latter is certainly a saving clause; but if one entirely discredits the contagiousness of leprosy, it is a little difficult to account for such a state of affairs as that reported by Dr. Hillebrand in the Sandwich Islands. The disease was first introduced by the Chinese in 1848, and the lepers suffering from it have amounted to nearly 800. Dr. Liebing* says that

*Inspector of this district of Liebing.

in his opinion, it is inoculable in certain stages of the disease, & Prof: Wilson° considers that it may be contagious in some Countries & non-contagious in others. The same author further considers+ that it may be conveyed by exhalations given off by the lepers, & it is also highly probable that it may be conveyed through the human milk. might it not also be through the secretn?
I confess that my own opinion is strongly in favour of the possibility of inoculation at all events — there not being very uncommon of medical men & hospital dressers contracting the disease, and of white men becoming affected after cohabitation with coloured lepers women.

6. Leprosy is undoubtedly more common in tropical than in temperate climates, but of course, it does not necessarily follow from this fact that it is really influenced by the heat; and it must be remembered that the parts of the world where the climate is tropical are also those where the principles of hygiene are most disregarded. But a few centuries ago, leprosy was alike the scourge of northern and of Southern Europe, and even now it has for its favourite localities such Countries as Norway and Iceland, where the Climate is certainly very far removed from a tropical one. The

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°-Lectures on Dermatology § E. Wilson 1873.
+ Lancet. Oct: 15, 1873.

prevalence of the disease in India is often
quoted as exemplifying climatic influence,
but I think those who do so hardly consi-
-der that an immense tract of country
and what great differences of climate are
to be found in India, even though it be en-
-tirely in the tropical zone. I will only cite
one illustrative fact. Whereas the aver-age
number of lepers within the Bengal Presi-
-dency is 5.2 per 10,000, in the Kumaon
district it is as high as 21 per 10,000°.
The Kumaon forms a district of the N.W.
provinces about 7000 square miles in
area extending across the Southern Hima-
-layan range to the Central. There may
thus be said to be every variety of climate
and temperature, as the district includes
low lying marshy lands, but at the same
time, and principally, mountain ranges,
in which many of the peaks are over 20,000
feet in height. Other similar instances
might easily be adduced, especially in South
America. Dr Livingstone tells me that in his
opinion any extreme of climate is bad
for lepers, and in this idea I have no doubt-
-ing is correct.

7. As to soil — Leprosy is certainly more
common along the marshy banks of rivers, and
on level sea-boards, although, of course, there
are many striking exceptions to this statement.

°. Report of Government on Leprosy, by Dr Lewis Hunting-
-ton

But as during pomiferous° "It is not in fact the elevation above the sea, nor distance from its shores, which is, in any way, antagonistic to the disease, but the development of agriculture and the artificial drainage of the soil, which is generally to be found in inland districts."

S. As the question whether Leprosy is more liable to attack one Race than another has no bearing on the subject of treatment, I shall do no more than put it as a possible predisposing factor, though personally, I much doubt whether Race, per se, exercises any influence whatever in the matter.

°Clapham's Encyclopaedia, s.v. Norway.

Treatment.

Before considering any therapeutic agents which have been employed with the view of curing or checking this fell disease, I must call attention to the necessity of counteracting the predisposing causes just enumerated. In the first place, then, Preventive treatment is clearly indicated by the consideration of the Etiology. Whether or not the theory of contagion is tenable, there is no doubt that leprosy does spread in one manner or other, and that segregation, and legal restraint generally, have proved most useful in former ages in stamping out the disease in England and other countries. In Norway, there are, at all events, excellent leper asylums & the result is most encouraging, for whereas in 1856, the number of lepers was 2850, it has since then steadily decreased until in 1873 there were only 1856. I would then make segregation of the indigent lepers compulsory in well-ordered healthy asylums or hospitals; and, as the disease is universally admitted to be hereditary, I would see every precaution taken to prevent the birth of leprous children — not only by having the male asylums apart from the female, but by rendering the marriage of lepers, or the marriage of a leper with a healthy person penal.

of course there would be many difficulties in a country such as India, for instance, in the way of carrying out such reforms and they could only be gradually effected: but, at all events, there can be no sufficient reason why Government should not establish good asylums near all affected districts instead of, as is at present the case, allowing lepers, with running sores, to touch famished people in the bazaars, and butchers, who have lost their fingers from the disease, selling meat to their customers. The majority of lepers in India are paupers who live on the alms of the charitable, and I fancy they might easily be persuaded to render themselves amenable to restraint by having suitable bribes held out to them. It is interesting that the Chinese Government with respect to lepers is exceedingly in advance of the Indian — diseased persons being, to a great extent at any rate, obliged to live by themselves outside the cities, and marriage between a leper and clean person being forbidden to the third generation.

Next, as to the general treatment of diseased persons — a leper's surroundings are governed by the present description with few, if any, sanitary exceptions, in an unhealthy district. It should, therefore, be at once removed to a healthy spot where the drainage is good, and hygiene generally should be considered of paramount importance. This alone is usually

to say the least of it, insufficient and unwhole-
-some. He should, consequently, be fed well,
being allowed fresh meat and vegetables with
milk &c. in proper proportions. His habits and
diet can generally be put on clearly, & those
of course ought to be reformed. Inasmuch as
extremes of climate are injurious, his residence
should, if practicable, be changed at the dif-
-ferent seasons of the year. And, as leprosy
is so commonly combined with Syphilis, the
latter disease should be combated by appro-
-priate treatment.

Of ordinary medicinal agents, those that have
been most commonly employed are, cod liver
oil, preparations of iron and quinine, of mer-
-cury, arsenic, iodine, alkalies, phosphorus,
carbolic acid, Sulphates &c., as well as various
external applications, various medicated baths
and "specific" forms of treatment which I
shall notice more particularly further on -
Cod liver oil, iron & quinine have been proposed
on the ground that leprosy is a dyscrasic disease,
and may of course be useful in the way of
strengthening the constitution.

As to mercurial preparations, Dr. Danielssen
& Boeck find that both Calomel and the per-
-chloride commonly produce intractable
vomiting and diarrhœa (though salivation
is uncommon), after the disease is, in so
respect, abated by their use -
Nor do the same authors believe much in the
virtues of arsenic - on the other hand, however,

Drs Bowerbank & Nicholson (v. Report of the R. C. P. L.) maintain that it is the only medicinal agent capable of keeping the disease in check.

Iodide of Potassium has occasionally done good, probably when the Syphilitic taint is combined with the Leprous; but the iodides appear often to produce a peculiar bronzing discolouration in the Skin, so that they have to be discontinued.

Alkalies appear to have been undoubtedly useful in some cases, at all events in preventing the extension of the Disease.

Digitalis seems to be utterly useless.

Phosphorus has been tried of late years, but without any good effect — for, it seems to me, could any such be expected if the Pathology of the Leper disease is considered.

Dr. Fleming and others recommend Carbolic acid both externally and internally. I have never myself seen a patient so treated, but Dr. Danielssen says in not one of 52 cases in which it was exhibited by Carbolic acid wrought such changes that I could say its results were beneficial."

I fancy much the same remarks would apply to the use of cutaneous ointments, Castor oil, Chloride of Zinc, Nitric acid, Nitrate of Silver, Cantharides &c. from which I should not expect much benefit in a purely Constitutional disease. Of course in individual cases it may be necessary to apply Caustics, e.g.

As to the course which should be adopted with respect to the local ulcerations, in recent cases where there is any reasonable hope of a cure, slightly stimulating lotions may be used & healing promoted. In advanced cases, patients generally feel worse & attacks of fever come on when the ulcers cease to discharge, so that there is no object to be gained by getting them healed, & I would therefore only keep them clean & as sweet as possible by having them washed "Condy" water or some other weak antiseptic lotion.

the throat.

Cupping has been freely resorted to in some cases under the Norwegian physicians, and is said to do good by reducing the active movement of the new growths, and so protecting the system. (See opposite)

There are certain special modes of treatment which I shall now proceed to describe -

1. With Gurjun-oil - This oleo-resinous substance was first used by Dr. J. Donsall Senr. Med. Officer at Port Blair in the Andamans, apparently simply as an experiment based upon the fact that the Dipterocarpus terbinthaceus, from which it is obtained, is common in the islands. The "oil" is given both internally in 3j doses and applied externally with lime water - The lepers at Port Blair are put under good sanitary conditions and literally fed, rise early in the morning, cleanse their skins with dry earth, take their dose of medicine & then rub in the ointment all over the affected parts: All Dr. Donsall's cases thus treated are said to have been decidedly benefitted. "The ulcers healed, the tubercles subsided & lowered sensibilities returned ..... Softening begins at the base of the tubercle & gradually appears at the surface, where a blebb forms & gives exit to a thin serous clear fluid, in proportion as which process, the nodule diminishes in size, & gradually becomes reduced." No particulars

Mr. M., a German, who had lived in India for 14 years, and had, during that time, enjoyed good health with the exception of attacks of ague, who had no hereditary or Syphilitic taint was in May troubled with a general feeling of malaise & with numbness about the body generally, and the hands and feet in particular. Three weeks later he observed a bright-red slightly raised patch over the right eyebrow, another over the left cheek and another on the chin. In another week the whole body was covered with similar patches. The state of the face, in connection, is shown in the accompanying drawing. There was considerable anaesthesia in it. The skin of all the fingers and toes has thickened in an irregular manner, darkened and destitute of sensation. There were slightly raised reddish discolorations on the arms, legs, thighs, & round patches of the same as large as the palm of the hand over the thorax, back and abdomen. All smooth shining and anaesthetic.

After 4 months treatment as prescribed by Dr. Dowell, the dark colour of the face, hands &c had toned down very much, and the tubercular patches had become soft and flattened but without any of the ulcerative or vesicular changes noticed by Dowell. Sensation has completely recovered and the patient has discharged. In 6 months she returned, having meanwhile discontinued the use of the oil, as being of no use.

theory is advanced as to the modus operandi. It is not to be wondered at that such excellent results, attained by such a simple and economical process, should lead to a general trial of the Gurjun oil throughout the adjacent Country of India. Unfortunately, however, the results attained there have been hardly as satisfactory. In many cases, undoubtedly, marked improvement has taken place, but the general return of the disease in the majority of cases points to the conclusion that, after all, the cure of leprosy has yet to be discovered.

I fancy Surgeon Rempston of the 1st Madras Cavalry pretty accurately expresses the general feeling of the profession in India, when he says in his report to the Madras Government:

"The Gurjun oil does not possess any marked intrinsic value in the cure of leprosy. As a cheap and judicious application, it is well adapted to the carrying out of the principle of daily Exercise instituted by Surgeon Major Sandell, which, with other hygienic conditions included in his mode of treatment of the disease, has done much good in improving the health and general comfort of the patients. Internally administered, it is an useful purgative, producing a very pleasant feeling of lightness and inclination for locomotion, but if frequently used it ceases to have that effect".

The following case treated by Prof: McConnell, in Calcutta, I cite as an example of successful temporary "cure". but ultimate return of the dis-

-ease.

Before treatment.

Mrs. M.

After treatment.

ken, before. She has again treated with the Surgeon-oil, and after five months has again discharged apparently cured. This time, however she has advised to continue the use of the oil I was sent to Europe. She has since been lost sight of.

This is one of the most favourable Examples of this mode of treatment. Mr. Dr. Mc Connell has the treatment by Chaulmogra & Bontea oils may be classed with Dr. Dongalli. They are administered both internally and externally — the former in doses of m xv — ʒj.

With respect to Chaulmogra oil, Mr. Sutherland Surgeon of Bombay, in his report on the subject says "under the prolonged and continuous use of this oil, the progress of the disease is arrested, the skin becomes soft and supple, the discolorations vanish, the different morbid sensations leave the patient, the mental lebe-tude passes away, the impaired sensibility is completely or partially restored, the ulcers heal & cicatrize, though ever ready to break out again, and the general nutrition of the tissues improves" The fact of the ulcers being "ever ready to break out again" shews that, at best, this treatment only leads to amelioration. Indeed S. A., though a strong advocate of the Chaulmogra treatment, confesses that the stability & permanency of the cures are doubtful points. & further that to make success probable, it is necessary "that the disease be of recent origin, that the General health be little impaired and unassisted by

by Surgery or Syphilis - My own observations have led me to the conclusion that it is practically immaterial which "oil" is used, & I think it not improbable that any oleo-resinous substance which would act as a gentle purgative diuretic and general deobstruent would, (when combined with good hygiene diet & exercise,) be equally efficacious.

The treatment by outward application of Castor-nut-oil, advocated by Dr. Brander-Kay although in the incorrect supposition that Leprosy is a local & parasitic disease, seems to have been attended with considerable success in some cases. Dr. Bakewell, of Trinidad, says that it has more often answered his expectations & that all his cases have rapidly improved -

The mode of treatment is as follows - Soap & water baths are used twice a day, after which the whole skin is well rubbed with Castor oil which is allowed to remain on for three or four hours - The Castor-nut-oil is applied on a small piece of sponge to the diseased parts, Caution being taken only to apply to a small portion of the affected surface at a time - and an interval of a week being allowed between each application - Vesication generally occurs after 12 - 24 hours - The skin however, ought not to be broken, but the bandage allowed to remain and dry on - The oil-remains on for 10 or 12 days after which the skin is left free from ulceration - Sensibility is said to be restored after four or three applications - The bandages and subsequent scab becomes less

(I forward specimens of Serpin, chaulmoogra, carbon-tet- & bourbee oils -).

after each application until at last a sore is formed. Then the "cure" is said to be established. Dr. Bakewell says that there is generally no attendant pain, but in this he is not borne out by Indian observers. Indeed the practical objection to the treatment in India is that the natives object to it on the score of the pain. Dr. Daniellsen thinks that the action of this oil may be assisted by that of castor-oil externally, & is of opinion that no external application elicits any essential change in the depraved condition which underlies the entire leprous disease. But as Dr. Bakewell points out the external application, though it may be based on a wrong principle, has a distinct effect on the constitution, the temperature rising to 103° or 104° & remaining high for some time.

Nerve stretching in anæsthetic leprosy has lately been performed by Prof: Lannis of Calcutta with decidedly good effect. It was suggested by the practice of Prof: Nussbaum of Munich in cases of sciatica &c., and the cases appear sufficiently parallel to warrant its adoption in the anæsthetic form of leprosy – for while in the one there is chronic inflammation of the connective tissue elements, & consequent pressure on the nerve fibres by the exudation, in the other there is pressure on the fibres by the neoplasm. Dr. Lannis says[1] that he has stretched the ulnar nerve in about 30 cases of anæsthetic leprosy, & that in every case the

[1] Indian Med: Gazette. Sept: 1878.

operation was followed by benefit as far as the area supplied by this particular nerve was concerned, which appeared likely to be permanent.

The following is an illustrative case. Hurree Chun Pal æt. 40, admitted July 1st 1878 with a leprous patch on the back of the right hand. There was complete loss of sensation all over the back of the hand and wrist, and the hand was so weak that he could only feebly grasp with it. The ulnar nerve was very much thickened from the inner condyle of the humerus to about half way up the arm.

The nerve was stretched in the usual way & on the third day the skin of the hand and forearm was found to be uniformly healthy, the sensation perfect throughout the area that had been previously anæsthetic & the thickening of the ulnar nerve had disappeared. I think this treatment promises great results in the early stages of leprous anæsthesia.

Electricity has been resorted to in, at all events, two cases+ of anæsthetic leprosy at Bhagsu. In one case the patient was discharged in 8 months much improved, but as in this case, the patient had been subjected to 277 cuppings besides vapour baths and other treatment in addition to the faradisation, and as improvement commenced before the cases were resorted to, I think it is, at least, probable that the improvement was rather "post-hoc" than

+ for particulars, v. Carter on leprosy.

proper hue". In the second case, where Scarification alone has resorted to, there was no improvement - how should I expect any as there is not generally any affection of the central nervous system in Leprosy, the anaesthesia being due, as I have said before, to pressure on the nerve fibres.

It must, I think, be confessed that the treatment of this fearful disease is not as yet very satisfactory - It may be that at some future day a "specific" will be found, but until then we can at least mitigate its horrors by hygiene and diet-dietetic treatment, by tonics and such medicinal agents as the Sulphur or Chaulmogra oil, & by the process of nerve stretching just referred to. I consider that, by these means, every case can, at any rate, be ameliorated, and it is not impossible that, in the early stages, the disease may be actually cured - At all events, the importance of early presenting themselves for treatment cannot be too strongly impressed upon the victims of Leprosy -

FINIS.

Charles J. Beaumont M.B.