

# **An enquiry in to the resemblance of the Tubercle and Leprous Bacilli**

## **Publication/Creation**

c.1895

## **Persistent URL**

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Wellcome Collection  
183 Euston Road  
London NW1 2BE UK  
T +44 (0)20 7611 8722  
E [library@wellcomecollection.org](mailto:library@wellcomecollection.org)  
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ACCESSION NUMBER

89186

PRESS MARK

1486

to the resemblance  
of *Leptothrix bacilli*  
on ~~the~~ derived the affi-  
nity similarity between  
it with ~~in~~ most  
tuberculosis & Leprosy,  
behaviour ~~under~~ with  
persistency, with which  
must be classed together.

As all writers, ~~of~~ <sup>and</sup> the ~~similarity~~  
the development of the disease, ~~and~~  
associated, both & various other  
consideration which will be mentioned  
later, excited in my mind a great  
desire to try further investigation  
with Koch's ~~Test~~ fluid "tuberculinum  
Kochii". It is the result of the injection  
of this fluid in Lepers that I wish  
to communicate as an aid <sup>where</sup> ~~to~~  
to proving the still close resemblance  
of if not identity of the ~~two~~ <sup>Leptothrix</sup> bacilli  
of the disease under con-  
sideration. ~~on~~ <sup>showing</sup> the bacilli

~~with~~ <sup>the identity</sup> It is evident that admitting  
the <sup>the identity</sup> close alliance of the bacilli,  
that either bacteriological investigation  
in this line are worth the effort, that we  
have advanced a great step ~~in~~ <sup>in</sup> the  
knowledge of Leprosy. In  
other words, that Leprosy is but a  
variety of the ~~system~~ <sup>system</sup> like  
tuberculosis.

An Enquiry into the Resemblance  
 of the Tubercle & Lepros Bacilli  
 with conclusions ~~also~~ derived therefrom  
 the microscopic similarity between  
 the bacilli met with in most  
 varieties of Tuberculosis & Leprosy,  
 their <sup>aggregations</sup> ~~aggregations~~ behaviour ~~under~~ with  
 re-agents, their persistency, with which  
 they are constantly, ~~clashed~~ <sup>clashed</sup> together  
 by all writers, ~~and~~ <sup>and</sup> the similarity  
 in the development of the disease, ~~and~~  
 associated, both & various other  
 Consideration "which will be mentioned  
 later, excited in my mind a great  
 desire to try further investigation  
 with Koch's Test fluid "Tuberculinum  
 Kollin". It is the result of the injection  
 of this fluid in Lepers that I wish  
 to communicate as an aid <sup>to</sup> ~~the~~  
 to proving the still close resemblance  
 of if not identity of the ~~two~~ bacilli  
 bacilli of the disease under con-  
 sideration. ~~on~~ <sup>studies</sup> the bacilli

~~without~~. It is evident that admitting  
 the <sup>the identity</sup> ~~even the~~ close alliance of the bacilli,  
 that either bacteriological investigation  
 in this line are worthless, or that we  
 have advanced a great step ~~in the~~  
 in the knowledge of Leprosy. In  
 other words, that Leprosy is but a  
 variety of this ~~very~~ <sup>very</sup> ~~kind~~ <sup>kind</sup> like  
 disease tuberculosis.

But first of all I will quote from various authors as to the microscopic resemblance & close alliance <sup>by the staining</sup> properties of the two bacilli.

Woodhead (Pathological mycology, page 28) writes "The bacillus of leprosy also requires special treatment. It is perhaps most readily stained by Koch's original tubercle stain."

Also at page 129 "Bacillus of leprosy - microscopically - almost identical with the tubercle bacillus <sup>but</sup> it is found in different relations to the cell elements of its host."

The latter part of the statement need not detain me proceeding further for is not the tubercle bacillus found in different relations to the cell elements of its host - in fact in <sup>both</sup> leprosy & leprosy the bacilli are found to be contained in the cells and in the intercellular <sup>substance</sup> ~~space~~ as in tubercle. Yet that does not refute the alliance of leprosy & tubercle, the more need it, other evidence being similar, reports of leprosy from the ~~same~~ being and similar - the fact amongst the tubercles as tuberculous. In fact it is from the other way, for we may be dealing with a variety of tuberculous stamp as in leprosy by this very peculiarity "different relations to the cell element of its host".

Klein in his work on "Nervous Organism & Disease" claims the bacilli of tubercle & leprosy to be the same.

His descriptions read as follows:-

Concerning the tubercle bacillus

"Some with bright oval spore, some with some smooth homogeneous looking, others more of a beaded appearance".

Concerning the leprosy bacillus

"Some possess bright oval spore, others are more or less beaded owing to local collections of the protoplasm in their sheath".

Klein mentions <sup>in writing of tubercle bacilli</sup> a peculiar case where the nodules of tubercle & bacilli of leprosy were closely simulated.

at page 139 of "Nervous Organism & Disease" he writes.

"In a section through the liver of a bird (Rhea) that died in the Zoological Gardens in London prepared

This association so often observed must surely be more than accident. In the work on "Clinical Diagnosis" by Professor Jaksch & James Coffey, M.D. at page 297 referring to the flowing from the ulceration node met with in leprosy

"differs

}



horribly dependent on matters outside  
the haullus itself altogether.

Klein in his work on Micro-organisms &  
Disease ~~etc~~ classes the bacilli of tubercle  
& leprosy together constantly.

His descriptions of the two are as follows

1. Tubercle bacilli p. 162. Leprous bacilli p. 177

1. Some ~~are~~ <sup>with</sup> bright oval spores. 1. Some possess bright  
oval spores. oval spores

2. Others ~~more of a~~ <sup>more of a</sup> beaded appearance. 2 others are more or  
less beaded

Concerning the tubercle bacilli he says.

"Some with bright oval spores, some  
without, some more or less homogeneous  
looking, & some more of a beaded appearance.  
Concerning the leprosy bacilli "some possess  
bright oval spores, & others are more or less  
beaded owing to local collections of  
the rod & plasma within their sheath."

Further the methods of manipulating  
the two for staining purposes are  
almost identical.

I <sup>have been</sup> ~~have~~ asserted that the bacilli of leprosy  
occur in the cells; but that the bacilli  
in human tubercle are always scattered  
between the cells. ~~the former~~ <sup>the former</sup> of these  
statements is incorrect. For leprosy  
bacilli are always present in the inter-  
stitial tissue of the nervous system  
in the anesthetic & in the diseased.  
Further I have found them in the blood  
after injecting leprosy with Koch's fluid.

Bovine tuberculous & human tuberculous  
are allies of not identical yet what  
is we find <sup>170</sup> the bacilli in the  
tuberculous deposits of cattle are always  
contained in the cells, x.x. around many of  
the smaller & larger clumps of bacilli the  
cell outline is still recognisable, when the  
cell disintegrates, as it does so one or two,  
the bacilli become free in groups; in  
this respect there is a remarkable  
similarity between leprosy & bovine  
tuberculosis. Klein p. 170.

Further Klein's Study

Here bovine tuberculosis & leprosy  
behave alike <sup>the evidence even the different</sup> relations to the cell elements of  
~~leprosy tubercle~~ <sup>the "leprosy" not typical tendency</sup> ~~leprosy~~ are  
regarded as ~~one arising from identical~~  
~~causes~~ yet what is the matter, Klein  
~~is regarded both as~~ "But the bacilli occurring  
in the leprosy tissue as far as I can  
able to see, are morphologically  
different from the tubercle bacilli  
In a preparation made of the tissue  
of leprosy tissue, large transparent  
cells with several nuclei are found  
in the cell substance of which are  
noticed groups of the most, most beautiful  
thick & short than tubercle bacilli  
Subcutaneous inoculation of a fawn  
with human & bovine tubercle matter  
of guinea pig or rabbit produces several  
tuberculous but there are certain differ-  
ences as regards the anatomical course



As the ~~temperature~~ <sup>usual</sup> ~~temperature~~ <sup>temperature</sup> were especially low, & both the ~~patients~~ <sup>patients</sup> had had an elevation of temperature ~~for the last 24 hours~~ <sup>for the last 24 hours</sup>. I have not, however, any more knowledge, except from the ~~patients~~ <sup>patients</sup> statements, that they had fever. Neither seemed depressed nor warm. Although a defective air ~~in~~ <sup>in</sup> different to the condition is known previously.

In the four cases with ~~raised~~ <sup>increased</sup> temperature the condition seemed to vary with the amount of increase. No. 6, a patient with the highest seemed pale, cold & shivering. He sat huddled up in a corner. The only difference in the appearance of the skin I observed was that in those with depressed temperature the ~~two~~ <sup>two</sup> skin hypertrophies were more ~~marked~~ <sup>marked</sup> than in those with increased temperature. The red hypertrophy ~~in~~ <sup>in</sup> the skin were ~~more~~ <sup>more</sup> red.

Further the two with depressed temperatures were much the most advanced with disease. Looking at the a hard, ~~absorption~~ <sup>absorption</sup> seem to indicate that ~~at~~ <sup>at</sup> a advanced of the disease ~~with~~ <sup>with</sup> the ~~fluid~~ <sup>fluid</sup> was ~~even~~ <sup>even</sup> following, I marked it ~~not~~ <sup>not</sup> as primary, ~~depression~~ <sup>depression</sup> but that is the advanced stage ~~of the disease~~ <sup>of the disease</sup>.

[illegible]

came back off 7 to 10  
with the best of the  
the whole of the

1

To leprosy a variety of tuberculous.

Such a statement seems at first sight  
to be a preposterous stretch of imagination  
but <sup>more</sup> closely looking into it some  
possibilities of truth seems probable.

The organs attacked by tubercle  
& the method of ~~the~~ <sup>its</sup> manifestation  
are so variable that to include  
~~all the signs of leprosy~~  
amongst them is not to group in the  
category <sup>so</sup> ~~very~~ distinct phenomena  
as a tubercle in the lung ~~as facial~~  
& a facial lupus. No organ is sacred  
to tubercle ~~and~~ <sup>and</sup> viscera bone  
seminal organs <sup>joint, the eye, ear</sup> the substance of the  
tongue & the brain are are all liable  
to its ravages. Of the cutaneous covering  
the skin of the ~~neck~~ <sup>neck</sup> nose & cheeks  
seems the most, if not the only, marked  
hall of <sup>the</sup> tuberculous taint. This is in itself  
(Attacks)

peculiar; that it should be so limited.  
~~Other diseases manifest~~ The step from  
leprosy to the manifestations of  
leprosy ~~as leprosy~~ is but slight  
not more, not so much in fact,  
~~than~~ is the difference between an  
ordinary carcinoma of the breast  
& a 'wide-boned' cancerous impetigo  
~~marking~~ involving the skin far  
& wide, spreading <sup>day</sup> from the breast  
to ~~day~~ the clavicle, side  
of the neck, down to the shoulder  
arm and round the axillary chest.  
The Chinese class leprosy as  
~~leprosy~~ a variety of leprosy & there  
is but little doubt in many <sup>Countries</sup>  
~~and in the case which~~ ~~is~~  
~~is~~ is, or rather was held. So that  
the disappearance of leprosy in many  
countries may be <sup>ascribed to</sup> more exact  
diagnosis rather than to actual <sup>of the disease</sup> cessation

4  
this the most grievously affected part  
in the world.

Geographical Distribution. At the present  
time lepers are met with in increasing  
numbers as the Equator is approached,  
& its prevalence is in inverse ratio to  
sanitary advance. There is perhaps  
no country in Europe, Asia, or Africa  
quite free from leprosy. Of European  
countries the British Isles contain  
perhaps the fewest, & Norway, in  
proportion to population, perhaps  
the greatest number of lepers. In  
Asia two great leperous centres exist,  
viz. - Northern India & Southern  
China, but except, perhaps,  
Northern China, no country is  
perhaps quite free of it. Siberia,  
Japan, the Malay Peninsula, Cochinchina

it is the most grievously affected  
 part in the world. At the present time  
 Lepers are met with in increasing  
 numbers as the

Yes

5

China, Arabia, Syria the great  
islands of Java & Sumatra, & many  
but by no means all, of the islands  
of the Eastern Archipelago are ~~the~~  
haunted. Australia has lepers  
within its seas but they are for  
the most part Chinese, as are  
the majority of lepers in the  
Pacific Archipelago.

Africa, North, South & Central, has  
lepers among its varied peoples.  
In the best known parts they are  
fairly numerous as Egypt in the  
North, <sup>as</sup> Robin islands off Cape Colony  
with its leper settlement, testify.

In the Western Hemisphere the same  
law holds good namely that as the  
Equator is approached the number  
of lepers increases & in tropical America

in the West-Indian Islands the disease  
is prevalent.

Ætiology The bacillus lepro is the one  
pathological factor in leprosy which  
requires to be discussed. Before  
its discovery in 1871 the supposed  
causes of leprosy were multitudi-  
nous. Amongst these, want of  
salt, malaria, unwholesome food,  
scrofula & tuberculosis, syphilis,  
scurvy, anemia etc. each had  
its advocates. Dr. Hutchinson's  
theory that the consumption of  
uncooked food is the vehicle  
of contamination in leprosy  
has been neither proved nor dis-  
proved, & many arguments  
for & against <sup>the idea</sup> may be adduced.

credibly finds believers & disbelievers.  
Against the transmission of leprosy  
from parent to child is the fact  
that no child is born leprosy, &  
that a child sucking a leprosy  
mother does not exhibit signs  
of leprosy. It is seldom before the  
third year that a child so brought  
up becomes leprosy, but the  
appearance of the symptoms  
may be delayed until the  
period of puberty. All clinical  
evidence points to ~~contagion~~  
~~as being the means of commu-~~  
~~nication~~ <sup>to</sup> prolonged & intimate  
contact <sup>as being</sup> ~~seems~~ to be the real  
channel of transmission. From  
husband to wife or vice versa,  
from one member of a family to

another, more especially when  
sleeping, to gether from Mother to  
Child, especially if the child is  
breast fed, from the native leper  
to the ~~native~~ healthy European  
if occupying the same hearth  
for a time, are some of the more  
direct means of conveying the  
contagium from one person  
to another. And yet intimate  
~~contact~~ <sup>contact</sup> is not certainly  
provocative. The writer saw a  
woman, married to three leper  
husbands in succession &  
living among lepers, in the leper  
barracks in Canton who was perfectly  
free from any leprous taint or mark.  
A number of such cases are on  
record showing that leprosy is  
by no means ~~either~~ highly contagious nor infectious.

fact making the propagation of leprosy by contact at all. It would appear that leprosy is on a level in this point as in many others with tuberculosis, & just as tubercle is conveyed from one person to another so it would seem leprosy is transmissible. The bacillus lepra, so closely do the parasites in tuberculosis and leprosy resemble each other microscopically that in general terms the description of the tubercle bacillus as to shape, dimensions & reactions to staining fluids will serve for the leprosy parasite (see tubercle bacillus). A few of the more important differential points are all that it is necessary to mention.

The bacillus lepra:— (1) cannot be cultivated on artificial media. (The late Dr Bevan-Rake & the writer reported successful cultures on agar-agar after repeated failures). (2) Cannot be inoculated into lower animals. (3) When stained <sup>it</sup> decolorises by acids less readily than is the case of the tubercle bacillus. (4) Is met with within the cells of the epithelium