"Thesis"

"Vaccination and the recent Small Pox epidemic at Cape Town."

By

Alfred O. Hillier M.B. C.M. B.A.

East London
Cape Colony
March 1884
During my course as a student of medicine at the Edinburgh University - in conjunction with the rest of my fellow students - I accepted the principle of vaccination as a protective agent against small-pox - as one of the axioms of our profession - about which, for years past, in the minds of all scientific and rational-minded, there could be no question.

It was then with no small surprise and interest, that not quite two years ago, I observed that the house of Commons had given the late Mr. Taylor leave for the purpose, permission to bring in a Bill for a repeal of the con-
The clause of the Vaccination Act on the ground of what he alleged to be the failure of vaccination to prevent or control with the present smallpox epidemic.

This Bill, however, in spite of Mr. Taylor's brilliant efforts in its behalf, was summarily dismissed at the second reading. Still notwithstanding the fate of the Bill, one cannot but feel that a challenge to the efficacy of vaccination - supported by a small but enthusiastic minority - carried boldly into Parliament and published to the whole world, would be almost certain to enlist the sympathy of a certain number of the community at large - always eager to take the ultra-sentimental view of matters.
to embrace any sufficient startling 
& heterodox doctrine — 
that it did produce this effect to 
some extent is testified to by the following 
statement which I find in a paper read 
by Dr. Graham before the Public Health 
section of the British Medical Association 
at their fifty-first annual meeting — 

"With the increasing popular prejudice 
against vaccination there is a growing 
tendency in the Medical Press to lose 
sight of the principle of vaccination, & 
to defend and explain away the 
shortcomings and abuses of the present 
system & its practice —" 

A few lines further on the 
agreed says —
"the number of the unvaccinated class is annually increasing."

Dr. Taylor's challenge however at least produced one good result for the vaccinationists, and that was the publication by Dr. Baravento in the Third Number of the "Nineteenth Century" for 1882, one of the ablest and fullest papers in favour of vaccination with which the public have heretofore been favoured. This paper is as remarkable for the results shown by the statistics adduced in regard to vaccination as it is for the latitude, thoroughness, and scientific method
with which the whole question is
gone into—

The great fact which has
given Dr. Taylor & his party such a
stimulus, and it must be admitted
by all to be a fact of no small sig-
ificance, has been the marked increase
in the mortality from small-pox
During the decade 1871–1880—an increase
which was at its height in 1871 and which
since then with an occasional years in-
crease has gradually diminished—

This startling accession to small-
pox mortality after a steady diminution
for so many years past has been
urged on with great triumph by Dr.
Taylor—who points to it as conclusive.
evidence of the failure of vaccination to prevent or control with small pox.

Dr. Barbour meets this by the statement that the epidemic beginning in 1890 was one of exceptional intensity both in the severity of its type and its consequent infectious potential. He says:

"The epidemic which began in 1890 has been and still is characterized by the very considerable proportion of cases of that malignant (hemorrhagic or petechial) type in which recovery is the rare exception, raising the death rate of the entire aggregate of cases considerably above the average, and raising
the death rate of the total vaccinated, from the 37 per cent recorded by Dr. Grarrow to what is (I believe) in modern experience the unprecedented figure of 44.6 per cent."

Be further on says; “The exceptional malignancy of this epidemic has not been confined to Great Britain, it has shown the same characteristics in other countries of Europe, in the United States of America and in various other parts of the world.”

In a recent paper by Dr. Ernest Hart “The Truth about Vaccination” he gives the official reports on the devastation recently produced by this pestilence.
in Borneo, on the Gold Coast, and at Tamatave in Madagascar.

The rest of Dr. Banker's paper consists of a large number of statistics from the different hospitals of the Metropolitan Asylums Board—especially the Homerton Small-Pox Hospital. By these statistics he endeavours to establish the following points:

1. The much larger percentage of persons affected among the unvaccinated.

2. The greater tendency to the confluent and even malignant types of disease among the unvaccinated and the consequent much higher mortality.
3. The percentage mortality of those affected among the vaccinated, varying in proportion to the number and quality of the vaccination marks.

The table of statistics, on this head compiled by Dr. Gayton shows remarkable results.

This exhaustive paper published by Dr. Carpenter in the April number of the "Quarterly Bulletin" was promptly taken up by Dr. Gayton and referred to by a long article in the very next issue of the same periodical.

The plan I have myself adopted in writing this paper is to state as clearly and briefly as possible the case as it stands between the vaccinationists and the anti-vaccinationists and then to give the information and statistics I have gathered with regard
to the cause some epidemic and endeavor to show how they bear on the question at issue.

With this in view I have selected Dr. Carpenter as the most able champion of the former party, while I suppose there can be no doubt that we must regard Dr. Taylor as the leader of the latter.

I have above briefly sketched Dr. Carpenter's article containing his theory regarding the epidemic referred to by Dr. Taylor and also his conclusions based on a series of statistics gathered from different British Hospitals. I shall now take Dr. Taylor's reply to Dr. Carpenter and state the points on which he bases his case, and on which
in the most absolute manner he denies the accuracy of all Dr. Barbotet's conclusions.

After the opening paragraph of his article, denouncing vaccination as "an exploded fallacy and a baseless opinion," Dr. Taylor proceeds to give several instances of admission of failure from different sources in the early days of vaccination—notably a letter written in 1809 by Thomas Brown, Surgeon, Drumlanrig, to Alexander Innes, Professor of Anatomy & Surgery at the Edinburgh University, in which the writer says that after nearly nine years experience in the practice of vaccination it is with extreme regret that he regards it as one which, so long the profession must continue at discretion. Considering however the subsequent behaviour of
the profession in the matter thus touching,
conference has scarcely that value as a
piece of evidence which Mr. Taylor would
apparently attribute to it.
Mr. Taylor then goes on in the strongest terms
to denounce Dr. Burnett's theory of the ex-
ceptional virulence of the last evidence, as
accounting for the high mortality in spite of
vaccination— as an explanation both unsci-
tific and illogical—
It is certain is certain starting to find that
the smallpox mortality in several of the larger
English towns, notably Newcastle, Sunderland,
Woolwich, Portsmouth, &c., was as
well as in a number of Continental towns
would have been actually much higher
during 1871 than the annual average
smallpox death rate as estimated from
the bills of mortality, during the last century, before vaccination was introduced at all.

The next point which Dr. Taylor criticises severely is certainly a somewhat extravagant view and one unjustly ascribed by the writer to Dr. Barlente. It is however an opinion held to some extent amongst medical men, and one which is at any rate strongly held by a writer in the Lancet for 1852 who says: "About 90 per cent of persons in an unvaccinated community exposed to smallpox will catch it—fow a third to a half would die and the rest would be marked for life." This statement Dr. Taylor treats with great contempt, and I think on the whole most unjustly. He points out that the highest registered mortality from
Small box in any one year during
the last century in London was only
4000 — my own reading & information
on the subject would also I confess
incline me to regard this statement as
extravagant & misleading — that such
a die result away occasionally occur is
possible — as witness the terrible epidemic
in Iceland in the last century referred to
by Dr. Carpenter — but that it is by any
means invariable as is certain an inaccu-
rate statement — thus in the Chinese
community in San Francisco — the great
Dean of whom were until lately unvac-
cinated — although the small pox
mortality was occasionally very high,
thus has never been anything quite
so appalling as this - During the present epidemic at Kimberley (Diamond Fields) although there is a large unvaccinated community, and the unfortunate difference of opinion among the medical men has very seriously hampered the attempts at isolation and vaccination the percentage mortality and the number of cases affected have been much below this.

Mr. Saylow then proceeds to deal with the statistics from data adduced by Mr. Barquentin, where discrimination is made between the vaccinated and the unvaccinated. This he stigmatises as the "latest dodge of the vaccinationist," and states that in meeting it he has to deal
with something worse than want of logic and which he can scarcely otherwise describe than as "positive bad faith."
The support this by saying that in some cases "Admiration has been made by medical men themselves that their fear of damaging the cause of vaccination has been too strong for the accuracy of their returns." That "Numerous instances have been found on critical inquiry in which the same child has been registered as successfully vaccinated and in the death register as child of small pox un-vaccinated."

With regard to the number and quality of the vaccinations marks the table given by Dr. Barquentin is one compiled by Dr. Gayton. This table shows an almost
Mathematical proportion between the number and quality of the marks and the death rate.

Dr. Taylor's point blank questions the scientific accuracy of the table, and gives several others from the Metropolitan District Asylums report, which certaining show very different results.

Briefly, Dr. Taylor's article may be summed up as follows: Admitting the gradual diminution in smallpox mortality during the present century, he utterly denies it being attributable in any way to vaccination, attributing the whole of the improvement to sanitation.

He throws what discredit he can on the statistics adduced by Dr. Barlow.
and others — by stating that all being compiled by prejudiced observers they are unanswerable — and giving a few instances such as those quoted above in which inaccuracies have evidently occurred.

He also quotes a few statistics which certain facts clash with those given by Dr. Carpenter — notably in reference to the influence of the number and quality of the marks —. Finally he points with triumph to the fact that in spite of nearly thirty years compulsory vaccination, (vaccination having been made compulsory in 1853) the small-pox mortality in Great Britain during the decade of 1871—1880 is higher than it has been
at all since the decade of 1831 - 1840.

I have now given a statement of
the case at issue between Dr Carpentier
and Dr Taylor.

The evidence which I now
propose to adduce in reference to the question
is I venture to think in many points of
particular value and interest, and of a
nature distinct from anything given by
Dr Carpentier. It is the evidence of
a body of medical men and others in
relation to the epidemic at Cape Town;
an epidemic which came as it were
on a virgin soil, among a large un-
vaccinated community, the Malay and
other colored races of Cape Town.

The evidence I have gathered was obtained
during a stay of three weeks which I made
at Cape Town toward the close of the year 1882 - It is of course somewhat fragmentary in its nature, being principally the experience and notes of individual practitioners and others who worked among the sick and dying during the epidemic.

I have also however obtained what statistics were published by the various hospitals.

The small pox epidemic at Cape Town broke out in the early winter months, that is toward the middle of the year 1882 - and from the first outbreak the disease spread with the most frightful rapidity throughout Cape Town and its suburbs, continuing almost unchecked well into the following summer, when it died a lingering death in the first month or two of the year 1883.
The population of Cape Town and suburbs consists of English and Dutch, and a large mass of coloured races, viz.: Malays, Hottentot, Indian Coolie, Haffies, Zulus, and a few other South African tribes — the greater number of coloured races however consisting of Malays. Among these coloured races — more especially among the Malays, it was, that the disease raged and spread with such fatal rapidity.

As soon as smallpox had thus declared itself, hospitals were provided both for Cape Town and the suburbs — in all together in number and to these the patients were removed. In addition however to the cases removed to the Hospitals Riebeeck Eyg Pleisters and dying in the native quarters of the town and suburbs —
To judge from the subjoined hospital report and also from what I leave myself able to gather, a fair number of the coloured races seem to have been vaccinated at some period of their career—though among the Malay, fatalistic by religion, and scorners of all such attempts to alter the course of destiny, this number was small and it was among them that the mortality was highest—

Attached are the returns from the six different hospitals—

"Rentjes Farm" and Woodstock were the two hospitals provided for the town cases—The other four are suburban hospitals.
<table>
<thead>
<tr>
<th></th>
<th>Unvaccinated</th>
<th>Vaccinated</th>
<th>Total</th>
<th>Unvaccinated</th>
<th>Vaccinated</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>140</td>
<td>269</td>
<td>409</td>
<td>47</td>
<td>30</td>
<td>77</td>
</tr>
</tbody>
</table>

**Coloured Cases**

<table>
<thead>
<tr>
<th></th>
<th>Unvaccinated</th>
<th>Vaccinated</th>
<th>Total</th>
<th>Unvaccinated</th>
<th>Vaccinated</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rentyhla Farms</td>
<td>578</td>
<td>191</td>
<td>789</td>
<td>231</td>
<td>34</td>
<td>265</td>
</tr>
<tr>
<td>Woodstock</td>
<td>265</td>
<td>21</td>
<td>286</td>
<td>52</td>
<td>2</td>
<td>54</td>
</tr>
<tr>
<td>Claremont</td>
<td>56</td>
<td>32</td>
<td>88</td>
<td>21</td>
<td>1</td>
<td>22</td>
</tr>
<tr>
<td>Die Wier</td>
<td>80</td>
<td>9</td>
<td>89</td>
<td>16</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td>Rondebouw</td>
<td>50</td>
<td>6</td>
<td>56</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total**

|           | 967          | 386        | 1353  | 329          | 35         | 364   |
These returns furnish altogether a record of nearly 1700 cases. They may be summarized as follows:

White total death rate 77 out of 40900 = 0.188 percent
Colored ... 364 ... 1253 = 0.29 percent.

Death rate among white vaccinated 30 out of 26900 = 0.111 percent
... colored ... 35 ... 286 = 0.122 percent.

Death rate among white unvaccinated 47 out of 71400 = 0.065 percent
... colored ... 329 ... 967 = 0.34 percent.

These classes as vaccinated include all those who were definitely ascertained to have been vaccinated at any period of their careers.

From these results it will be seen that the total death rate among the colored vaccinated cases is only 0.122 percent.
cent higher than among the white - and
among the unvaccinated only 0.5 per cent
higher - whilst the total death rate
of the coloured races, that is including
both vaccinated and unvaccinated, is
9.2 per cent higher than among the
white - this at first sight seems
anomalous, but on referring to the table the
explanation is obvious and significant.
Thus whereas among the white cases
the proportion of vaccinated to unvaccina-
ted is as 1.9 to 1, amongst the
coloured cases it is as 1 to 3.4 -
Comparing the results of these returns
with those of the Worcester Smallpox
Hospital for the year 1871 (comprising over
7,000 cases) as quoted by Dr. Barlow; they are not quite so strikingly in favor of vaccination as the latter. Thus, taking the returns of the white cases from the black hospitals, the colored cases amounting to a considerable number, the mortality of the white whilst curiously enough the total mortality is nearly the same viz., 18.9 per cent. The mortality of the vaccinated is 11.1 per cent, highest whilst the Homerton returns give it as only 7.8 per cent; in the black returns the mortality of the unvaccinated is only 33.3 per cent; in the Homerton returns it stands as high as 44.6. The presence of a small doubtful class in the Homerton returns must be taken as a modifying factor here.
comparing the two, though this would not be enough to account for the very considerable difference between the two.

The higher death rate of the vaccinated class in the Cape Hospitals might well be accounted for by the fact that the practice of vaccination at the Cape has been laxly carried out, efficient vaccination being less frequently insured, and revaccination less frequently practised than is probably the case at home.

It is however more difficult to account for the higher death rate among the unvaccinated at Homerton, probably however that class was recruited from a lower and more destitute set of people in those than at the Cape, where vaccination has been less practised, and the unvaccinated are consequently relatively
a better portion of the community.

Having now discussed the hospi-
tal return, I will turn to another part
of my evidence - viz. the private note,
and testimony of different gentlemen acting
employed in dealing with the disease.

The most important feature about this evidence
is that it deals to a large extent with the
effect of vaccination practised during the
epidemic, and for vaccination practised
so recently as this, the very highest value
is universally claimed by all those who
practised it. In fact, many of them
gentlemen state that from their experience
any one successfully vaccinated during
the epidemic was absolutely free from the
danger of anything but a mild attack.
I will first of all take the note hurriedly banded over by Surgeon Major Ryan, the Medical Officer in charge of the British troops stationed at Balas Town.

The number of the troops including women and children was 879 — on the outbreak of the epidemic the most rigid precautions were taken — the bulk of the troops was immediately moved to Wajiragi, eight miles out of town where they were encamped in tents — a small number of the troops being left in barracks to perform fatigue duty. Vaccination was at once performed on all those who had not been vaccinated within the last three or four years — The result was that only two cases of smallpox occurred at all among the troops — there were two
Cases in which it might be found mistake
vaccination was overlooked; and Dr.
O'Ryan assures me that he believes these
were the only two cases in which this
oversight had occurred— The one
was a girl at at 16—a sergeant's daughter
she had once been vaccinated in infancy and
the mark was indistinct; the other
case was an officer's servant. Both
recovered.

Dr. Fitz, a gentleman who
probably did more work among the natives
in Cape Town itself, than anyone, had
but any written notes but summed
up his experience with regard to
vaccination as follows:

He had not had one case of death
among patients successfully vaccinated
within three or four years, though he
had been numerous innocent and fatal cases among patients vaccinated in infancy.

Rev. J. C. Fuller, member of the legislative Assembly, for Bake Town, and Chairman of the Small Pox Relief Committee, who threw himself with his usual zeal and philanthropic ardor into the work of assistance and relief, informed me that he had read the discussions between S. Carhentus and Dr. Taylor, which appeared in the nineteenth century almost simultaneously with the outbreak of Small-pox at Bake Town with great interest; and that with the "pros. and cons." of the case clearly in his mind he had carefully observed the effects of vaccination throughout the epidemic.
I need hardly say with what result as regards his own final decision —

This gentleman indeed, vaccinated a large number of people with his own hands, and he gave me one point with regard to re-vaccination which he had himself observed and which is of considerable interest —

He says that several instances came under his notice of cases in which revaccination had been tried two or even three times without success and finally abandoned on the assumption that vaccination prevented the inoculation taking proper effect, and that this same cause would confer the requisite immunity from Small Pox.

Several of these cases subsequently took Small Pox in a severe form and in some instances even terminated fatally.
Thus Mr. Walker of Horsham, gave me the following cases:

The night-watchman at the Woodstock Hospital was vaccinated four times, twice with calf lymph, and twice with human lymph, unsuccessfully. Vaccination was then abandoned - four weeks after the last attempt he took smallpox and died - the same lymph on three of the occasions successfully. Vaccinated others people -

The wife of a street inspector, a white woman, had been vaccinated in infancy. Marks not good though abundant. She was again vaccinated by good lymph three times during the chilblain unsuccessfully - ten days after the last vaccination she took smallpox and died.
so impressed was Dr. Fuller both with the complete immunity from danger which recent vaccination conferred, and with the necessity of resistance in the progress until a successful time was obtained, that he himself, after being vaccinated four times in succession unsuccessfully—succeeded on the fifth occasion by adopting the old method of raising a flap of the skin and inserting the lymph underneath—

I now come to the evidence of a gentleman who has favored me with the fullest and most interesting information which I was able to obtain—

This gentleman, Dr. Walker, a graduate in medicine of Harvard University,
was connected for some time with a
small pox hospital in America - 
de was the doctor in attendance at the
Droutray Hospital, and during the
time of the epidemic in Droutray (a
suburb of Cape Town) he appears to
have been most indefatigable in his
work.

I will put in all quote from
his Report to the Droutray Board of
management and Small Pox Hospital-
we have had the disease
among us for a period of more than
four months and a half -
It has attacked in Droutray 100
persons of whom 38 have died or nearly
in 4 -
This looks like a very high death
rate and would be slightly considered to be almost any other part of the civilized world at the present day when vaccination is so extensively practised; but when we consider that of these 160 persons only 62 had ever been vaccinated, and not one successfully re-vaccinated — consider also that of the 38 deaths 25 were unvaccinated infants, under two years of age, the death-rate is not so surprising.

Of the 160 cases, 66 were mild and 94 severe: a record which tallies pretty closely with the 62 vaccinated and 98 un-vaccinated, and which taken in connection with the fact that of the 1200 persons whom I vaccinated this year — only 2 were attacked (and these I believe were vaccinated too late when the disease had
already laid hold of them) — furnishes to my mind, at least, a conclusive proof of the value of vaccination as a prophylactic against small pox — of the total 160 cases, 28 were white, 76 Malays and 56 of the other coloured races — showing plainly that here as elsewhere the Malays were by far the greatest sufferers, owing to their reckless and ignorant exposure to contagion. — Mr. Wallace then goes on to give the Hospital report, the results of which I have already given in the above table. — From Mr. Wallace’s private note, I have selected the following cases as of recent interest.
There were thirty-two colored inmates in eight rooms — only one of them, a woman, had ever been vaccinated. With this solitary exception all took the disease — the escaped Scot free of the remaining thirty-one. Eighteen died.

Among a colored family of eight, all unvaccinated, one took the disease — the remaining seven were then vaccinated — of these three took well and merely sufficed from mild varioloid — the remaining four did not take and had confluent small pox — two of them died.

"John Ambrose, a colored man, twice vaccinated, once in infancy and once in 1857 — he was one among a
family of seven, none of whom were vaccinated. All took the disease. Four died. The rest recovered. He alone escaped with an attack of smallpox leaving one little mark on his nose.

Dr. Walker also gives several other similar cases, but I have selected the above as the most interesting.

I further interviewed several other medical men. Their testimony all amounted in general terms to what I have already given.

I have now stated as clearly and concisely as I could, what evidence I have been able to collect with regard to the Bakhmoum epidemic. The belief in vaccination seems to be
universal and strong among every class of the community, and I venture to question whether there is one single individual of intelligence and education resident in or near Bale Form during the epidemic — who for one moment questions its efficacy as a prophylactic agent against smallpox. Indeed, how the Malays, amongst whom the disease raged fiercest — fatalists by birth and training, with whom any attempt to alter the course of destiny is regarded not only as utterly futile but almost-irreligious, had, towards the end of the epidemic, such an overwhelming mass of testimony to the efficacy of vaccination placed before them, that they at last sought it of their own free will, in direct
violation of their stubborn Ishmaelites
 creed and the inborn instinct of
centuries —

As I have before stated, it is to the
latter portion of the evidence, the private
testimony of Surgeon Major Ryan, Dr. Walke
and other gentlemen, that I attach the
greatest value — It has in every instance
this striking feature, the extreme importance
which it attaches to vaccination during the
epidemic as it might conveniently be
turned “recent vaccination” —

This epidemic, coming as it did among
a large unvaccinated community, presented
a unique opportunity for testing “recent
vaccination” — an opportunity which was
throughly and fairly tried by
the different medical views. The result of this trial from the clear and full evidence adduced on the subject, I contend may be stated as follows:

"That successful vaccination practised during the chilinder, conferred complete immunity from all severe types of small pox and consequent danger of death & reducing the liability of those so vaccinated to that of an attack of mild variolation."

Assuming this then to be the case it raises an extremely interesting and important question viz: For what length of time does vaccination retain its full value as a prophylactic agent against small pox?

I am aware that seven years is usually accepted as about the time, but I will
I must deal with what evidence I have gathered from the bare facts. Evidence...

The epidemic may be taken as being of nearly a year's duration, and thus it can be fairly stated that this epidemic at any rate established the fact that vaccination retains its full value for at least one year.

I am of course only dealing with the evidence above quoted and that is all that this permits me to state—That vaccination does retain its full value for a much longer period than this. I have no doubt; but the my statistics quoted are those which could throw any light on the matter are those from the six hospitals and these are so...
unfortunately not sufficiently explicit to suggest any definite statement as to the number of years. There are however certain points in the evidence which make one question whether seven years is not possibly a rather extended period to assign. Thus I find that several of the medical men had, from their experience in the evidence, formed an opinion to the effect that it probably was so; and then again the results, as stated in the evidence, claimed for vaccination during the evidence are so astounding that one cannot help feeling that vaccination at its full value, that is while its prophylactic force is still at its height, is possibly
Something higher than the majority of its present advocates believe — but and this is the difficulty, vaccination was only to be assigned what I have termed its full value when practised within the year — and for how much longer it can be held as retaining this the evidence unfortunately does not show —

In conclusion, in tendering this essay for the criticism of a body of medical and scientific men I may perhaps be allowed to say a few words as to my selection of such to the great man of medical men, a one sided question for discussion —

I close this subject on the following grounds:
The increase in small pox mortality
in Britain during the last decade, and the public challenge so boldly thrown down by Dr. Taylor and his supporters, a challenge which doubtless preceded in making a number of converts to the anti-vaccinationist views. My principal reason however for choosing this subject was the interesting and valuable nature of the evidence collected from the Balle Tourn evidence — evidence which my residence during my stay in Balle Tourn, with the chairman of the Small Pox Relief Committee fortunately gave me special facilities for obtaining.

This evidence in addition to the overwhelming testimony which it bears to the general protective influence of vaccination has to my mind a still more
Striking significance—It clearly attributes to vaccination, successfully performed during the epidemic, a higher function and a more valuable result than anything which is at present claimed for it among its most ardent advocates—almost pointing to the possibility of realizing the sanguine hope of eradicating Smallpox, held by its original and enthusiastic founder, Edward Jenner—