"Clinical Notes on Small-pox."

By

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THESIS
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Surface

It having been my privilege to occupy a position affording exceptional opportunities for the study of smallpox, viz. that of medical officer at one of the largest smallpox hospitals in the province, during an epidemic period, it is natural that this disease should have formed an important part of my clinical experience and that I should choose it as a subject for my M.D. thesis.

In April of last year I presented a thesis on the same disease which has been accepted for the degree of Doctor of Science in Public Health. It then however limited my attention to a consideration of its natural history carefully omitting all reference to its clinical aspect or to the subject of vaccination.

On the present occasion it is my intention to limit myself to that which has been omitted. Inasmuch however as I imagine that a thesis should not be unduly long and as smallpox is of all the zymotic diseases the one about which most
could be written, I feel that it will be necessary to restrict myself to observations which I have myself made rather than to attempt anything of the nature of a complete digest of the observations of others. Nor shall I attempt to give a complete clinical picture of the disease, excellent such descriptions being found in many of the numerous works of the subject, but rather to record interesting cases, which have been under my own observation and which illustrate special features of the disease. I have succeeded in collecting a considerable amount of clinical material including photographs of a number of my cases taken exclusively by myself.

Since, as I have already stated, I wish this thesis to be a record of my own experience I do not propose to introduce many references, but at the same time I have not omitted to make amongst the best I would reckon the Art. on Small


At the same time as mild and especially in modified cases, is often so entirely wanting that the patient may refuse to believe that he really has smallpox. Such cases often escape observation altogether and are undoubtedly a very important means in the spread of infection. The following striking case occurred during the recent epidemic:

It was discovered that a woman was being treated at home with a mild attack of smallpox. No medical man had been called in, and the case had not been reported. There was evidence to show that the nature of the disease was known to the persons concerned and the husband of the patient was therefore summoned by the Health Committee for failure to comply with the Notification. In the report it was stated that during the hearing of the case a sensational discovery was made in court that the man himself was suffering from the disease though of this he was quite ignorant.
Chart VIII

Name: Eliza Hawthorne  Age: 24  Disease: [Chart details not legible]

[Graph with temperature readings showing a peak labeled "Discrete (Very mild)" and separate labels for "Sweat," "Pulse," and "Deep".]
Although usually the initial symptom of pyrexia are well marked in severe confluent cases and slight or absent altogether in mild discrete cases, this is by no means always the rule and if subtle upon may in course of events error in prognosis. The following case illustrates this. In this case the initial pyrexia was severe but the attack proved to be of the mildest description. Possibly the patient's "heat-regulating mechanism" was easily disturbed as even the secondary fever was out of proportion to the amount of eruption.

**Varieties of Smallpox.** It is the recognized and orthodox thing to describe smallpox as consisting of three varieties or forms, viz. discrete, confluent and hemorrhagic. Subvarieties are sometimes added as Coherent, semi-confluent, "vaporous" etc., but the three main divisions are always insisted upon and separate clinical descriptions given for each. So much is this the case in the text books of general medicine that the student is
apt to get the impression that there are pathologically distinct forms of the disease demarcated by well defined characteristics. This is hardly the case: with the exception of the malignant forms of the other varieties described, are merely differences in degree in the amount and distribution of the eruption, one form shading off into another with no attempt at a natural grouping of the cases. The classification into discrete, confluent, & confluent is in fact purely artificial and the determination of the boundary between one and another quite arbitrary. This being the case it is hardly scientific to make a classification further than into unmodified, modified and malignant smallpox, this being the only natural division. At the same time the disease is one which owing to its singularly striking clinical feature, especially as regards the eruption, readily lends itself to a somewhat more elaborate subdivision and as such classification is convenient for purposes of description and of some clinical value I propose to make.
make use of it here. I shall adopt with slight modification the classification given by Curschmann and amplified by Collie.

A. Normal Smallpox

1. Discrete
2. Coherent (Semi-confluent)
3. Confluent
4. Croupose

B. Haemorrhagic Smallpox (Malignant)

1. " Variola Haemorrhagica Pustulosa "
2. " Negra
   (a) Var. Purpurea
   (b) Acute Haemorrhagia

C. Modified Smallpox

1. By Vaccination
2. " previous Smallpox
3. " Inoculation
4. " Natural Insusceptibility (?)

The following cases will illustrate three different varieties:

A. Normal Smallpox

1. Discrete
A. Normal Smallpox

1. Discrete (thick)

Wm. Carrington, aged 29, unvaccinated


Novel constitutional disturbance abated. Jan 9. Admitted to hospital. There was then a thick papular eruption on face, markedly swollen on forehead. General condition fair; inclined to vomit. Had not slept for several nights.

Jan. 24. Photographed (i.e. 15th day)

2. In suffering from secondary & lymphatic glands. Mar. 20 (i.e. 5½ weeks from onset) patient discharged cured.

It will be observed that in this case the eruption did not appear till the 5th day. There was well marked turgidity from due to "secondary". No cause was ascertained for the rise of temperature in the 4th week. The eruption was so thick on the forehead that it might almost have been described as coherant rather than discrete.
2. Coherent

Thos. Griffis, aged 30, Unvaccinated

Takes ill Dec 26, 93, Eruption appeared Dec 29th (i.e. 4th day), admitted to hospital Dec 31. Photographed 1st day.

The patient made an uninterrupted recovery.

It will be noticed that on the face four of the patches stand alone nearly all touching & blending with others.

The case may therefore be called 'Coherent'.

The true character of the patches, those in this patient, comes out well in the photograph.

Well developed true patches is a favourable sign in prognosis, the exact reverse being the case if the eruption is of the low tension, flat type (see page, photo 10).

James Shaw, aged 6, Unvaccinated.

April 25. 94, Eruption appeared May 1. Photographed 5th day. Made a good recovery.

The total number of lesions in this case was not great but they were remarkably large & well developed.
Name: Thos. Cassidy  Age: 33  Disease: Var. Confluent  Result: R

<table>
<thead>
<tr>
<th>Date</th>
<th>Fever</th>
<th>Time</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

**Varicella Confluent**  
**Recovery**

**Vaccination Dots Full**
make myself thoroughly versed in the literature of my subject. The following is a list of some of the works and articles on smallpox which I have personally consulted. So vast, however, is the literature of this subject that I need hardly apologise for its being incomplete. Owing to its antiquity and to its dire importance to mankind, there is probably no disease about which more has been written than smallpox.

Literature

Kitchew W. Text Book of Medicine
3rd Ed. 1864


Brookes P. "Public Health" 1874. On Smallpox in Nottingham


Eichmann H. Art. in Ziemann's Cyclopaedia

Fagge Hilton Text Book of Medicine

Hecker Epidemics of the Middle Ages

Syd. Soc. 1846
Mary Brooks, aged 10, Unvaccinated

If it be desirable to make a further subdivision than into Cohesive and confluent
the term semi-confluent might be reserved for cases such as this one. The
eruption is nowhere quite confluent and yet it is almost more than cohesive.
In this particular case the eruption is almost as thick on the body and limbs
as on the face. This is quite exceptional.
As a rule the eruption is thicker on the
face than on any other part, and it is from
the eruption in amount of eruption on the
face that the type of the disease is judged.

3. Confluent

Thomas Cassidy, aged 33, Vaccinated (?)

Think he had the voice? But no fears could
be discerned. The eruption was absolutely
confluent on the face but distinct on the
trunk & limbs. This is well seen in the
photograph. There was considerable swelling
about the face & neck but with the ex-
eruption of a few "secondary" and a small
superficial abscess he did very well and
made a good recovery. Taking into
consideration
consideration the severity of the eruption this makes it probable that the patient really had been vaccinated in infancy though the absence of scars points to the view of having been inefficiently performed.

Ellen Reeves, aged 18, Vaccinated
This was one of the worst vaccinated cases I have seen and it proved fatal on the 16th day. The patient was an alcoholic. The eruption was confluent on cheeks, forehead, and extremities. Spotted on trunk.

It is very rare, even in the worst cases, for the eruption to confluent everywhere, but such cases do occur. The next case in the record to it that I have seen.

Rose Davenport, aged 34, Unvaccinated
March 25, 1832, April 7, 1832. Death June 3rd.
The eruption on the face, arms & hands is absolutely confluent, no islands of normal skin to be seen anywhere. It is also confluent in many parts of trunk & lower limbs. The trunk & face were literally dotted in one spot of pus!
Rose Davenport (hand), same day.

Hand and forearm universally emphysematous.
4. **Confluence.** In this form the eruption may be described as being distributed in a number of confluent patches, or confluent groups. The total number of pustules may not be very great, but they tend to run together, like bubbles on the surface of a fluid, leaving considerable areas of healthy skin entirely free. It is impossible to give an explanation for this peculiar behaviour. It is known that pre-existing pressure or irritation of any kind will cause the eruption to be confluent at that particular place. This is often seen after the wearing of a tight bracelet.
a light sheet, and in the next photo the large patches over the front of the ankles may have been thus inflamed. Mr. Ward states that this complicated form of the disease is especially fatal. At the London Smallpox Hospital in thirty years there were 184 cases of complicated smallpox admitted, 29 in unvaccinated, 74 in vaccinated and 1 in inoculated persons. Of these 44 1/2 of the unvaccinated and 41 1/2 of the vaccinated died. According to these figures this form of the disease is evidently extremely fatal, and vaccination would appear to make but little difference. These facts however have not been born out altogether by other observers. The following is the only case I have a record of and indeed is about the only well marked case I have seen. The patient had been vaccinated and eventually recovered but only after a long and severe illness.

Amin Hasme, aged 17, vaccinated, contracted smallpox whilst a patient in the Court Prison Infirmary. The eruption
Chart XII

Annie Mason
Age: 17
Disease: Smallpox
Result: R

<table>
<thead>
<tr>
<th>Vaccinated</th>
<th>Primary</th>
<th>Secondary</th>
<th>Tertiary</th>
</tr>
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<tbody>
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<td></td>
<td></td>
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</tbody>
</table>

Prolonged Temp.
Three months in hospital

Photo 9

Annie Mason
in the lower limbs was distinctly edematous, that elsewhere much less so. Convalescence was very slow, the patient suffering severely from "secondary" inflammation of the skin. Conjunctivitis occurred and corneal ulcer formed on both sides which at one time threatened to perforate. Patient was finally discharged cured at end of three months. In the photo, large symmetrical patches of eruption are seen extending over front of each ankle and lower part of leg. Howson says stress upon symmetry as a special feature, but of course if the patches referred to in the photo are due to influence of high local heat the symmetry in this case is easily accounted for.
B. Hemorrhagic or Malignant Smalls.

At first sight it would seem as if the well marked characteristics of this group, the rapidity and certainty with which death usually ensues, the tendency to hemorrhage &c. would mark it off very definitely from all other forms. This is certainly the impression conveyed by many of the old descriptions. In reality I am sure it is erroneous; so much so that difficulty frequently arises as to what should & what should not be classed as malignant. As I have stated earlier there is in very obvious physical natural distinction between many of the forms of smallpox. A considerable number of the severe cases of normal smallpox manifest some signs of malignancy such as petechiae and hemorrhages into the mucous and even into the skin sometimes only one or two of the latter spots are affected. Some of them can recover and if they are counted as hemorrhagic cases, we must not say that the form is invariably fatal.

In my table of classification I have divided hemorrhagic cases in (b) & (c)
Herrick Augustus "Handbook of Geography and Hist. Patterns" New Syd. Soc

McVair J. E. "Art. on Smallpox in "Stemons 2nd Ed. Hygiene & Pub. Health"
Manson J. F. "Art. on Smallpox in Reynolds System of Medicine"

Nead "On the Smallpox Pox" Syd. Soc. Pub

More J. N. "Hist. of Pract. of Race" London 1817
" " "History of the Smallpox London 1815-

Moore J. W. "Textbook on the Eruption & Cure" from 1892


Watson Sir Thos. "Lectures on Medicine 5th Ed. 1871
according as the hemorrhage occurs chiefly confined to the eruptin, "hemorrhagic pustular", or also involves the skin & mucous membranes independently of any eruption, "Varicella Nigra", the true "hemorrhagic form". The level, color and opacification only occurs after the appearance of the eruption. The earliest, the hemorrhage occurs in the pustule, the worm is the proparas. Collies makes a further subdivision into Hemorrhagic Pustular, Hemorrhagic Vesicular & Hemorrhagic Papular, according as the hemorrhage occurs in the pustular, vesicular or pustular stage, but this seems to me to be an almost unnecessary refinement. Hemorrhage during the pustular stage is almost always accompanied by communications into the skin between the "smaller papules", this class then merging into the true Var. Nigra. The point into which hemorrhage occurs are readily seen as they assume a purple color. In Varicella Nigra the hemorrhage occurs independently of the eruption and frequently before the cuticle has begun to appear. I have subdivided it into -
Varicella Purpurae & Acute Haemorrhoid.
In the former the haemorrhages into the skin & mucous membranes (purpura, ecchymosis) in the latter there is free haemorrhage – epistaxis, hematemesis, haematuria, metrorrhagia, varying from the gum 9c. Indeed in the worst cases the patient is thrown into "blood from every pore and orifice of the body!"

I will now quote some cases of my own the illustration of these different varieties, or rather degrees, of malignant smallpox.


Frank Lewis, aged 27. Said he was well.

3 days uneventfully in infancy.

Jan 3. Had "pain in his mouth" & across the shoulder, "chills", headache.

Jan 5. Eruption appeared.

Jan 7. Admitted to hospital. Had a thick purulent nose, prominent to the English, was very thick as arms. Patient was still feeling very ill but not as ill as he had been. A calomel opium was given, and to some night a draught containing 9c.
<table>
<thead>
<tr>
<th>Date</th>
<th>Fever</th>
<th>Eruption</th>
<th>Disease</th>
<th>Vaccination</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>103.5</td>
<td></td>
<td>Var. Hemorrhag.</td>
<td>3x unsuccessful</td>
</tr>
<tr>
<td>2</td>
<td>104.5</td>
<td></td>
<td>Pustulae</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>105.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>106.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>107.5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Frank Lewis 12th day

Photo. 11
each of Pot., Brom. & Chloral hydrate. In spite of this he refused to sleep at all.

Jan 8. Conjunctivitis both eyes, lumps present around eyes. Bromide & chloral repeated with addition of 1/4 X. T. Optic. This produced some sleep.

Jan 9. T. Optic increased to 1/4 X & found by a good nightly rest.

Jan 10. (8th day of illness) Patient is taking nourishment well, but conjunctivitis now commencing to "maturate" is of the "lump" type, and as he has been rapidly prostrated Bromide prescribed at rate of 30 in 24 hr.

Jan 11. (9th day) Haemorrhages into pasteules on chest

" 12. (10th day) Photographed

" 13. (11th day) Haemorrhages into pasteules a little worse than all night. Patient sinking into "typhoid" state.

Jan 14. (12th day) Again photographed. Patient is in a very offensive condition and smells very badly.

Jan 15. (13th day) Delirious

" 16. (14th day) Pulse failing

Death

The interesting points in this case
were — absence of "scarlet."; what pain there was, being across the shoulder. In a severe case like this this is unusual. Absence of vomiting, also unusual. Obtaining the case was very typical. The symptoms, followed finally by delirium and the "typical state" are very characteristic. The 14th day (12th day of eruption) is one of the worst. In this case hemorrhages were first noticed into portions of the chest, & only later on the legs. Usually the legs are the first part on which they appear. This is a little peculiar in the eruption appears earlier on the legs. The "low, flat" character of the eruption is well seen in the first plate. It is always a bad sign in scarlatina. Although I have described this case under hemorrhage because of account of the extraordinary occurrence of a few intra muscular hemorrhages it did not differ clinically from a severe confluent case without hemorrhages.

In the next case the malignancy was present more marked —
Henry Shakespeare 4th day.

Photo 12
Henry Shakespeare, aged 41, unvaccinated.


11. Noticed some pimples on legs (? erupting).

12. Rash appeared on face.

13. Still vomiting, but pain in back.

Admitted to hospital - "There is a moderate amount of rash which for the most part is purpuric, not hot, and rather more ill-defined at the edges of the lesions though it swelled in S.P. On the thighs there are some vesicles. Much injection of palate which shows numerous typical opacities.

The patient was photographed the same day as admission (photo 1/2). Although he had a temperature of 102.2°, he was in good spirits and feeling pretty well, the pain in the back having passed off.

Jan 14. Eruption becoming vesicular (6th day).

Very plentiful on palate.

Jan 15. Complains of not sleeping well.

Same patch on forearm looks healthy.

Jan 16. Numerous hemorrhagic vesicles on legs & face. In spite of draught only slept about 1/2 hour last night.
Jan 17 (8th day) Another plaster, night but feels better. Has developed bronchitis. Not taking nourishment well. Brandy (3 p.m. 3 hrs) ordered Jan 18. Has all the signs of Right Pneumonia (Brandy increased to 3 p.m. 2 hrs). Patient fairly good but looks a bad colour. To be ill examined thoroughly. 10.30 p.m. Patient much more delirious, fever rising. 11.30 p.m. Death.

This case closely resembles the former but the haemorrhages were more abundant and death occurred so early as on the 9th day. This is seldom the case in non-malignant cases, i.e. with no traces of haemorrhage.

In the first photo, taken on the 4th day, the eruption, then in its second (or third) day and in the pustular stage, is seen as a number of pustules on the chest and on the arms. On the face it was so diffused that it does not show in the photo. The second photo (13th), taken 2 days later, the legs are seen covered with a thick vesicular eruption. The haemorrhages did not appear till the following day.
Course of the Temperature. In few
syphilitic diseases is the course taken by
the temperature more striking and char-
acteristic than it is in smallpox. It is
therefore worthy of some consideration. It
may be briefly described as follows—
With the onset of an attack the temperature
rises rapidly to a maximum, usually about the
second day, of 103°–105°, sometimes
reaching even to 106°. With the appearance
of the eruption, the temperature falls almost
as rapidly as it went up and reaches the
normal on the second or third afterward.
In mild discrete cases and especially in
cases which are "modified" the temperature
may again rise unless some accident
complicates. This rapid fall as
the eruption appears is almost pathognos-
monic of smallpox and will be referred
to again. In the majority of cases,
however, the temperature again goes up at
the 24–48 hours, this "secondary" fever being
due to putrefaction or "maturation" of the
eruption and depending both as to
duration and degree upon the amount
of
B. 2. Verioia Vigga. The following case is a good example of the truly frightful form of the disease.

Sarah Washington, aged 2½, un-vaccinated May 31. Did not seem well. (No previous history of patient--was brought to hospital alone)

June 2. On Admission. Fairly thick purulent discharge from chest, becoming seruoidea, with a few hemorrhages into skin, varying in size from a mere point to a split pea. Child's general condition is poor and she has evidently been much neglected. Sours very foul, as if in ano. Throat.

No conjunctival hemorrhage.

June 3.1. Bleeding from mouth & nose, also bloody tears. The hemorrhagic spots into skin that were seen yesterday are very much larger, and there are numerous fresh ones, especially on neck. Also into some of the part, face pain; chest--will all right. Does not take nourishment well. There are large bruise-like patches on various parts of the body and especially on scalp. Sub-mucous hemorrhages on palpebral conjunctiva. No hemorrhage into corneal conjunctiva.

5.30 p.m. Death.
The same. Enlarged View

Chart XV.

Name: Sarah Watkins
Age: 24
Disease: S.P. Ves. Piesa
Diagnosis: Admitted

Temperature:
- 101.5
- 102
- 102.5
- 103
- 103.5
- 104
- 104.5
- 105
- 105.5
- 106

Selected Dates:
- 1
- 3
- 4
Patient was photographed the same afternoon almost immediately after death, before any post-mortem changes were visible. I found it impossible to obtain a good negative during life as the patient was restless. The hemorrhage from mouth, nose are there. June 4, "Post-mortem" examination made 20 hours after death. Much blood about epiglottis & aryteno-epiglottidum folds, larynx edematous. Trachea is main bronchi healthy. Some pleural pulmonary sub-pleural ecchymoses. Also in left lower lobe about size of walnut into which hemorrhage had taken place but no consolidation or sign of pneumonia. Heart & pericardium normal. In two small sub-peritoneal ecchymoses. Small ecchymoses in scalp of kidney. Substance of kidney appears very pale, no hemorrhage. Other organs appear normal. Stomach - intramural hemorrhage in stomach and some blood (? contained) in small intestine."

H. B. the note of this case and of the "P.M." were made by one of my lab...
Same case; back view

Photo 16
Colleagues under whose immediate care the case was. Photo 16 shows the patient back.

C. Modified Smallpox. Although normal smallpox can be classified with one or other of the forms already described, the disease if occurring in a person partially immunized is apt to depart very much from the type above given. This modification may not only lie in the way of decreased quantity of the eruption but also of an actual and striking alteration in its quality. If the former, the disease runs an ordinary course but the attack is comparatively slight, trivial in consequence of the small amount of the eruption. In the latter the disease would appear to be cut short quite independently of the eruption. The attack may commence with the symptom of a severe one. The preliminary symptoms may be well marked and the temperature high. The rash may even threaten to be emphatic. About the 2nd or 3rd day after its appearance shows its further development
is arrested and it fails to reach its
particular stage. There is no secondary
fever to the disease as cutaneous, the pustule
or vesicle drying up & giving no further
fever. This remarkable behavior of the
eruption in those modified cases is often
very striking. There is and is usually
spoken of as "aborting." Such cases
invariably do well.

Quite recently I was called to
see a child vaccinated child aged
two years. I found it covered with a typical
smallpox eruption in the papular stage.

The pustules were so thick on face & some
parts of body, limbs that had it
developed the case would have been one
able to complain. The child was ad-mitted to hospital and, as we expected,
the eruption at once "aborted" these
even becoming vesicular. The pre-
monitory symptoms in this case
were very slight. As regards age
of vaccination I must hardly say
that such an attack although much
modified was quite unusual in any
chart XVI.

<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>Disease Var.</th>
<th>Modified Smallpox</th>
</tr>
</thead>
<tbody>
<tr>
<td>John Pugh</td>
<td>18</td>
<td></td>
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</table>

Temperature Chart:
- Vaccinated: 38.5°C on 10th day
- Modified Smallpox: 39°C on 12th day

Annie Greaves 8th Oct. 1897, 9th day. Photo. 17
experience and had I not seen it myself I would not have believed that
the case was one of variola.

The chart on the opposite page is that of a well-nec3. patient aged 15, who
had a well marked rash and a thick discrete eruption. The latter abounded at
end of 4 or 5 days. There was no
secondary fever.

In modified cases, when the
eruption is also very beauty,
in some cases limited to a few
lesions only, the diagnosis often
becomes extremely difficult.

In one or two cases, those
exposed to the disease, in all
the cases the cause of the modification
was vaccination. Photo No. 17. is that
of a young woman supposed to be un
vaccinated but found afterwards to have
an accidental inoculation with vaccinia
on her under lip. Extract from musing the
little child at the time the latter had a bad
arm after being vaccinated. The parental
screak is seen on chin in the photo.
of the cutis. It is generally more prolonged but seldom reaches as high as the initial or "primary" fever. In favorable cases it subsides by typhus as the eruption scales reaching the normal from the 13th to 17th day. They very frequently observe a third phase due to a secondary inflammation in or rather around the scabbing pustules. This "tertiary" fever I have seen but little noted of in the various authors I have consulted. It is often very severe and may end fatally. It appears to be caused by an invasion of the superficial layers of the healthy skin surrounding the pustules by septic microorganisms from the pustules themselves. It can perhaps be described as a complication quite distinct from and much more common than either pyemic suppurative, cellulitis, or furunculosis, all of which known are more likely to occur where this "secondary" inflammation is present. It is seldom that the whole of the eruption takes on this unhealthy action.
The Photos 18 & 19 are those of vaccinated children aged 5 & 10 respect.

In either case the disease consisted of a few scattered papules,

and there was no constitutional disturbance whatever.

Although the protection given by a previous attack of variola is appa-

rently more permanent than that conferred by vaccinia it is not a very

rare thing for a second attack to occur.

During our epidemic we had altogether ten cases in which previous smallpox

was alleged and had apparently occurred. Two of these cases had been inoculated.

We were not able to detect any difference from the disease when modified by

vaccinia. They were of varying degree of severity, some modification in these

cases there appeared to be no

One of them was a hemorrhagic attack 25

g years after the first one, the other two

were emphysematous but recovered. The previous

attack occurred 23 years before in one

and 30 years in the other.
Of smallepox modified by invectin
I have had no experience. It appears to
have special characteristics.

It is not quite certain how
far the disease can be modified by
natural insusceptibility. It is often
quite conceivable that an individual may
be naturally so resistant to the
disease that although not quite immune
yet an attack when contracted cannot
properly develop. It is certainly the
case that although the vast majority
of the human race are highly insus-
cceptible to the disease there are some
who, though repeatedly exposed to in-
fected escape. Others again may
contract the disease in their remittent
from "variola sine variola," I have
never seen a case but the best
authorities agree that it does occur.
It would therefore seem reasonable to
regard natural insusceptibility as one
cause of modification. At the same
time it must be very rare. I do not
remember ever seeing a genuine case
I am inclined to believe that a great many of the supposed examples would be found, if we knew all the facts, to have been previously vaccinated, though perhaps unconsciously. The case of the girl who had previously vaccinated herself on the lips (Photo 17) is a good example.

Photo 20 shows very well the appearance of the eruption in a modified case during the beginning stage. This was not an "abortive" case, such "climbing" as there were running a normal course.

Photo 21 gives even a better idea. The brown, discoid, pustule-like appearance of the discs is very characteristic and can hardly be mistaken for anything else. The patient whose hands are fine china, had only some 1½ dozen lesions altogether beside the three seen on the hands, but any one of them would have been sufficient to have made a positive diagnosis from.
Chart Xvii

Name: Leah Wright
Age: 9
Disease: Var. Discreta
Result: D

Thick Discrete
(Death on 12th day)

NOT VACCINATED

Chart Xviii

Name: John Reeves
Age: 32
Disease: Var. Confluentes
Result: D

Confluent
(Death 10th day)

VACCINATED

Chart Xix

Name: Margaret Wright
Age: 5
Disease: Var. Discreta
Result: D

Influenza
(Death during Tertiary stage)

VACCINATION "DOUBTFUL"
I have already mentioned that the end of the second week is the most-fatal period, counting from the first appearance of any symptoms. Charts xvi, xvi, are examples. This is because no particular day was more fatal than another. It sometimes happens that a patient may successfully take over the secondary fever only to succumb from severe or prolonged tertiary.

Chart xix. is that of a case which was an example of this.

Chart xx. shows the temperature of a circular case complicated in tertiary stage with severe cellulitis of both arms. Cellulitis of the true form of erysipelas - simple, phlegmonous, & diffuse cellulitis are common during this stage, but...
of the two latter, the last—(diffuse cellulitis)—is in my experience the most common. I have, I think, only twice seen large areas of skin destroyed, but much more frequently has the inflammation been confined to the subcutaneous cellular tissue. In the case where the chart I have given both arms were affected within a few days of each other. However, in this case, I could perceive that the condition of the case for some time was in a very critical condition.

The next case, Dr. Brown's, illustrates the importance of a point which is not much emphasized in the books. It is that young children are occasionally really immune or to vaccinate, but that this immunity quickly passes off with time as the infant gets older. I have had a case a boy a few weeks old in which it was imperative that vaccination should be at once performed. I entirely failed to get it to take although I tried different kinds of lymph. When the child was 12 months old, I tried again with the result that the vaccine “took” exceptionally at the first attempt.
The case whose photo I have here had been three unsuccessfully vaccinated in infancy. Unfortunately the operation was not as I imagine repeated at a later age. At 14 the unfortunate lad took smallpox with the result shown. I have seldom seen a worse emaciated case than this. The condition of the patient at the time the photo was taken was offensive in the last degree, and the poor fellow suffered exceedingly.

Chart xiii (v. post-) was that of a case in which vaccination had also been three times unsuccessfully performed in infancy. I venture to say that each case illustrates the need for great caution by medical men in exercising the right granted by law of certifying children as susceptible to vaccination after three unsuccessful attempts.

The Chelsea of smallpox, is a retiring picture of the disease. It comes during the secondary fever and is usually of the wild manicaral type. It is most common in adult men, especially such as have led idle intemperate lives. In hospital the in
more usually individual PVRs, for all over the body, sometimes as many as 50% are affected. Instead of a dry healthy scar being formed a raw ulcerated surface is left which blending with neighboring patches gives rise to satirize excavated surface very similar in appearance to those produced by burns. (To common is thus secondary form of inflammation that in hospitals it bore the technical name of "secondary" and the same were called "secondaries")

The following chart will help to illustrate the above brief description.

Chart I. This was a mild discrete attack occurring in a well vaccinated young woman. Then Chart II. slight primary but no secondary fever.
About 15th day (?"diphtheritic pock").
often no alternative but to put them by physical means though it is doubtful if this method is justified except as a matter of expediency. It frequently greatly aggravates the mental disturbance, the patient seems to feel it, and often becomes extremely noisy and abusive. Morphia is the only drug that I have found to have any effect in these cases and even it must be given in very large doses to produce a result. I have several times known 2% morphia fort altogether three times in six produced dangerous toxic symptoms when it appeared to have but little effect. 24 hours previously.

The photograph shows the form of straight jacket we employ at this hospital. The species of the patient is very expressive.

Photo 24 illustrates a tendency the multiple eruption occasionally has to remain moist instead of beading or drying up. The portions become large and flabby and their contents very offensive. "rotten" it might almost be described. I fancy this condition must correspond to
Chart II. Discrete smallpox & moderate primary & slight secondary fever.

<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>Disease</th>
<th>S.P. (Vaccinated)</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. E. White</td>
<td>32</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Temperature Graph:

- Primary fever was well marked and never fell quite to normal before the secondary fever commenced.

Chart III. A thick discrete attack. The primary fever was well marked and never fell quite to normal before the secondary fever commenced.

<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>Disease</th>
<th>S.P. (Vaccinated)</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarah Hand</td>
<td>45</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Temperature Graph:

- Primary fever remittent type.
Chart IV. A complaint case. Moderate secondary & tertiary fever.

Chart V. A complaint case: severe secondary, moderate tertiary fever. This case all but proved fatal at end of 2nd week.
Chart VI. A coherent unvaccinated case. Moderate secondary & prolonged tertiary fever. It is certainly the case that vaccination has a marked effect in the tertiary stage even when it has apparently failed to influence the previous stages.

Chart VII. This shows that even in unvaccinated cases however, provided the eruption is healthy, the pyrexia may be limited almost entirely to the primary stage.
Ernest Sayers (10th day)

Photo: 25
the "diphtheritic" type of some of the older writers. Photos illustrate it very well. The great majority of the pustules on the lips have here taken an abnormal condition, but a few have dried up & deserted in the usual way. Convalescence is prolonged in these cases & apt to be complicated with abscess or, etc.

The tendency to erupt tubercles in the skin is a marked feature of smallpox. Cellulitis has already been referred to.

Much more common is the appearance of small subcutaneous abscesses frequently spoken of as "boils", so there is no central core of dead tissue it is probable that this term is not quite correct.

They occur from the 3rd week onward and are more likely to occur after inoculated cases, especially if in unvaccinated subjects. They develop with astonishing rapidity, commencing as a slight nodule with tenderness of the skin, these may be fluctuating swelling the size of a walnut at end of 24 hrs. No portion of the body is exempt from them.
Chart XXII

Name: Ernest Sayers
Age: 21
Disease: Var. Discreta

- Patient had a high fever late in the disease, which continued for several weeks.
- "Boils" appeared on the skin.
- There was noticeable improvement after vaccination.

Ernest Sayers (end of 4 months)
unless perhaps the palms & soles, and they are usually multiple. A "furuncular disease" would appear to be established and as soon as one crop of "boils" has been opened & cured another crop appears. The patient Sagens, two photos of whom I show, was a well marked example. Unfortunately, and contrary to the rule, he had been efficiently vaccinated in infancy & had 4 good marks. Altogether this patient developed 52 "boils", 20 of them appearing in three days! The less than 46 of the 52 required to be opened with the knife. His convalescence was very much retarded and he remained in hospital for over 6 months. I photographed him again before he left and the "pitting" which led by that time occurred in well skin.

I would emphasize the fact that this case was very exceptional. It is rare for such "acute furunculosis" to occur except in the unvaccinated.
I hereby declare that this thesis has been written & composed entirely by myself.

All the twenty-five photographs shown were taken by myself (with a 1½ plate Lancaster camera) from the wards of the Birmingham City Hospital.

C. Killick Millard

April 30, 1876