Does Vaccine Virus become Impaired by Transmission?

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Before Entering on the particular merits of the Subject of our Thesis it may not perhaps be improper to notice first, Some of the many opinions Entertained Regarding the Origin of the disease Small-pox; & others bearing Some Resemblance to it, viz Cow-Pox & Chicken-pox. Of the former of the two last mentioned diseases, Dr Jenner gives us a particular account, in his work published in 1798 & entitled "An Enquiry into the causes & Effects of the Variolæ Vaccinæ: A disease he says discovered, in Some of the Western Counties of England, particularly Gloucestershire. His opinion is, that the disease in the horse which the farriers term "grease" is Capable of engendering in man through the medium of the Cow - the disease called Cow-pox. Which to use his own words, "bears so Strong a Resemblance to

the Small-pox that I think it highly probable it may be the source of that disease. He thus describes the way in which the virus is transmitted from the horse to the human subject

In this dairy Country. the Office of Milking is performed indiscriminately, by Men & Maid Servants. One of the former after dressing the heels of a diseased horse, incautiously bears his part in Milking the cow's, with particles of the infectious matter adhering to his fingers. Thus the disease is communicated to the Cow's & from the Cows to the dairy Maids, until most of the Cattle & Domestics, on the farm feel its unpleasant consequences. However plausible this theory may appear to some, it is by no means Satisfactory; not that we undervalue him as a writer, or wish to deprive him of that Reputation which his conscientious firmness & indefatigable perseverance have so justly won. So far from this we cherish & revere his memory, as one of the greatest benefactors

Of the human Race. To to his Exertions alone, the profession is indebted for almost all the information as yet possessed, on this important Subject. Doubtless there are other great Names connected with this Controversy, both at home & abroad; many of whom are Stanch Supporters of his theory; Yet, there are others who have laboured as assiduously as his Supporters have done, whose practical Knowledge, field of Experiment, & Powers of investigation, have been & still are as Extensive & accurate as theirs; who not only deny this to be the Origin of the disease, Variola Vaccina, but also deny that such a disease, as that described by Jenner in 1798 Exists among cattle at the present day. Now that such a disease does Still Exist, we do not doubt, but that it derives its Origin from the disease "Grease" we doubt very much. On this point, we have as yet no Set of facts Suffeciently decided to merit our confidence, Some again who deny the Existance of Cow-pox as a disease peculiar to the cow affirm

that it does not derive its origin from the disease "grease" but from another disease to which the horse is liable viz a pustular disease of the heels, Of the two we think the latter the more plausible, for this reason, diseases of the same class & having a strong affinity, although, Existing in, & peculiar to, animals of a totally different Species, may be propagated with success through a modified type in the animal receiving it. but how a disease which in the horse is not pustular, can produce, by one transference a pustular disease in the Cow, we are at a loss to understand. There is however another disease liable to attack the heels of the horse which from its nature we shall place intermediate. It appears in Spring & fall & is vulgarly termed "scratches" in addition to the characteristic Crack in the Skin, there are a few well marked pustules, which have before maturation a red Shining surface, afterwards assuming a very irregular form, & at

length fall off, in the form of hard irregular deeply serrated scabs - Can it originate even from this? we are not prepared to accede to this there being a deficiency of legitemate proof - the fact that it has been denied, by not a few able enquirers, is sufficient I think to warrant me on the present occasion (without being thought Egotistical) venturing to bring a little of my own practical knowledge to bear on this part of the subject.

From the year 1835 till 1847 I had the care & management of two or more horses committed to me on a farm where from twelve to fourteen horses, & fifteen to twenty Cows are constantly kept. Thus for fourteen years I had an opportunity of observing the various diseases to which those animals are most commonly subject. & among others those above referred to. In all my Ex= =perience I have never seen or heard, of a single case such as Dr Jenner describes as being so common in his neighbourhood, & am very unwilling to believe

+ The cause was not known till Sumner pointed it out and traced the connection between the different facts.

W. G

that it ever did occur in England so frequently at least, as we are led to believe from his work. If this was the known source of so much annoyance disease & loss, why was it not checked at once? as it appears it easily could have been by simply attending to cleanliness or still more effectually by cutting off all communication between the horse & cow & allowing the Maid Servants to do all the Milking. Having questioned its power to produce Cow-pox, let us now turn our attention for a little to the disease itself -

"Grease" is a disease peculiar to the horse & is in my opinion purely local. In this, I am supported by many of undoubted authority. It seems to originate from an inordinate secretion of a gummy, or rather oily like fluid. peculiar to this region of the animal, or at least, more abundantly secreted in this, than in any other part. According to certain laws in nature; which we do not here attempt

to Explain, but it is sufficient for our present purpose to know, that this fluid is necessary for the production, growth, & nourishment of the hair, an irregular Secretion of it induced by other circumstances in themselves adverse to healthy action, is considered to be the primary cause of that disease. Young horses of a full fleshy habit coarse breed, with thick legs, hairy heels &c - are particularly subject to it, while high bred horses resist it altogether. Farriers describe three different kinds, but I Shall only name them, Simple, Ulcerative, & Grapy. The usual Symptoms in the first Stage of "Grease", is a dry Scurfy State of the Skin, with redness, heat & itching, when inflammation sets in the whole limb becomes swollen & Stiff, & the oily Secretion being Suppressed causes

The Skin of the heels to assume the red colour just mentioned as we have seen, they next become hot, dry, & Scurfy, & Lastly Crack. These Symptoms Extending, Soon involve the whole Surrounding texture - & Ulceration is the result.

wet is the Exciting Cause hence the disease is most common in Spring & fall. It is not a contageous disease, although after once appearing it often goes the round of the Stables. But this State of things is chiefly attributable to bad Stable management. St Bel obtained a Prize for an Essay on this subject from the Society of Medicine in Paris - He thus begins his paper "The grease is in general a cutaneous Chronic affection, Sometimes inflammatory, Sometimes infectious, & I have known it contageous: But in the next Sentence he calls Jenners opinion a Novel idea now little heard of, as if it had died a Natural death. However I believe all agree on this point that the heels of the horse are particularly liable to inflammation on account of their being so far from the centre of circulation.

But we must allow Dr Jenner to Speak for himself we shall only quote a few of his cases & give them nearly in his own words

The Cow-pox, Says he appears on the teats

of the Cow's in the form of irregular pustules. At first, they are of a palish blue, or rather livid colour, surrounded by an Erysipelatous inflammation. Which if neglected frequently degenerates into phagedenic ulcers. The animals become indisposed, & the Secretion of Milk much lessened. Inflamed Spots now begin to appear on the hands of the milkers, sometimes on the wrists running on to Suppuration. At first they resemble vesications produced by a burn, most commonly they appear about the points of the fingers, & at their extremities. They are commonly of a circular form, with their edges more elevated than their centre, Colour approaching to blue, Absorption takes place - tumours appear in each axilla - the System becomes affected, the pulse is quickened - & rigors lassitude, & pains about the loins & limbs, with Vomiting, come on. The head is painful & in some there is a tendency to delirium. These symptoms, varying in their degrees of violence, generally continue from one,

to three or four days leaving still a few sores about the hands, which from the sensibility of the parts, sometimes heal very slowly. frequently becoming phagedenic like those from whence they sprung.

Case I

A Servant-Man, named Joseph Merret assisted in Milking his Master's Cows several horses belonging to the farm, which he attended to had sore heels. The Cow's soon became affected with cow-pox. Immediately thereafter sores appeared on his hands, with swelling & stiffeness on each axilla. He was much indisposed for several days. Previous to this there was no fresh cow brought to the farm, nor servant employed, who was affected with cow-pox. Twenty five years after this, Merrit was vaccinated with his family. The matter was repeatedly inserted into his arm, but produced no effect: An Efflorescence only, leaving an Erysipelatous look about the centre, appearing on the skin near the

punctured parts. This man was afterwards exposed to the contagion of Small-pox in his own family (one of whom had it very full) but received no injury from being thus Exposed.

Case II

Sarah Portlock was injected with the Cow-pox, when a farm Servant. Twenty years after thinking herself Secure from the infection of Small-pox, Nursed one of her own Children who had caught the disease, but no indisposition ensued. At this time Matter was inserted into both her arms, but without producing any farther effect than in the preceding case.

Case III

Mary Barge was inocalated with Variolous Matter in the year 1791. An efflorescence of a palish Red colour appeared about the parts where the matter was inserted, Although it Spread at first Rather Extensively, it Soon died away without producing any Variolous Symptoms. She was repeatedly

employed as nurse to Small-pox patients without experiencing any bad consequences. She had Cow-pox thirty one years before.

Case IV

John Phillips had Cow-pox at nine years of age. At the age of sixty two he was inoculated with active matter, an efflorescence appeared, which on the fourth day was rather extensive, with some degree of pain & stiffness: but on the fifth day these symptoms began to disappear, & went off, without producing any effect on the system.

Case V

A Gentlewoman who had Cow-pox when very young received the infection from the handle of a pail which one of the Maids had been using. She had many sores on her hands & they were communicated to her nose, which became much swollen. She was soon after exposed to the contagion of the Small-pox. by attending a Relative, who had the disease in so violent a degree, that it

proved fatal to him. She was afterwards inoculated with active matter. The same appearance followed, as in the preceding cases - an Efflorescence on the arm without any effect on the constitution.

Among the numerous cases cited by Dr Jenner, we find the following

Thomas Pearce, Son of a Smith & Farrier who never had Cow-pox, But in consequence of dressing the heels of diseased horses, Caught the infection; Sores appeared on his fingers which Suppurated, Causing pretty severe indisposition. Six years afterwards, variolous matter was Repeatedly inserted into his arm but produced only a slight degree of inflammation which appeared very soon after the matter was applied. He was afterwards Exposed to the contagion of Small-pox, with as little effect.

Case XIV

A Farmer had a disease from the same source as the preceding case, was also inoculated some years afterwards with variolous matter. He had a little pain

in the axilla, with slight indisposition for a few hours. A few eruptions shewed themselves on the forehead, but soon disappeared without maturation.

Case XV

A farmer in consequence of dressing the heels of a Mare was affected with very painful sores in both his hands, tumours in each axilla, & severe general indisposition. A Surgeon attended him, who. knowing the similarity between the sores on his hands, & those produced by the Cow-pox. & knowing its effects on the human constitution, assured him that he need never fear the infection of small-pox: but twenty years afterwards. he was exposed to the infection, caught the disease, which ran its regular course. though in a very mild way.

The last Case I shall mention, is one of great interest, & it may be useful to remember it in connection with the latter part of our discussion

Case XIX

William Summers. A Child five years & a half old. was vaccinated with Matter fresh from the Cow, He became in= =disposed on the 6th day. Vomited once, & felt the usual slight Symptoms, till 8th day. when he appeared perfectly well. The progress of the pustule. formed by the infection of the virus. was similar to those already noticed, it was free from the livid tint observed in some instances, From this Child it was transfered to William Read, a boy eight years old, Several Children & Adults were vaccinated from his arm The greater part of them sickened on the 6th day, & were well on the 9th. but some had secondary indis= =position. Hannah Excell. a healthy girl seven years old, was one of the above mentioned, & received the infection. The pustule rose in three distinct points & on the 12th day resembled those produced by the insertion of Variolous matter. From this girls arm Matter was taken & inserted into the arms of John Macklove,

one year & half old Robert F Jenner
Eleven months old. Mary Read five years
old. & Mary James six years old. among
these R F Jenner did not receive the
infection. It affected the Systems of
the other three, in the usual manner.
From the arm of Mary Read, matter
was taken, & inserted into that of
J Barge, a boy seven years old, He
sickened on the 8th day & the disease
ran its usual course. William Summers,
one of those patients, was afterwards
inoculated with variolous matter from
a fresh pustule: but his System did not
feel the effects of it, in the smallest
degree. Dr Jenners Nephew inoculated
other two of the boys, also with variolous
matter, but no Symptoms of indisposition
followed. The Dr to Satisfy himself that
the matter then used was perfect tried
it with a patient, who had never gone
through Cow-pox. & it produced the
Small-pox in the usual regular Manner"
These Experiments says Jenner, afforded
me much Satisfaction they proved

that the matter in passing from one human subject to another, through five gradations, lost none of its original properties. But to return for a moment to the point of difference. Jenner says Morbid Matter of various kinds when absorbed into the system, may produce effects in some degree similar. But what renders Cow pox virus so extremely singular, is, that the person who has been thus affected, is for ever after, secure from the infection of Small pox; Neither Exposure to the Variolous Effluvia, nor the insertion of the Matter into the Skin producing this distemper. Now in my opinion, this is saying a great deal too much, as we shall hereafter see; But it has been proved beyond a doubt; that pure vaccine by myth, in the human System acts as a powerful protective agent, against the invasions of the desease Small-pox. & as regards the sentence before quoted, where he thinks "grease" the source of that disease, we have already questioned on account of its vagueness & uncertainty.

But here the Dr like many others has fallen into error, by catching at the first plausible hypothesis which appeared to prove what he otherwise found to be very difficult; instead of patiently waiting for other facts, either confirmatory or non confirmatory as the case might be. He seems to have been so completely carried, by the novelty of his new theory, as to forget the importance of his task, & the necessity of further investigation, ere it could become an established principal, or true basis, upon which other men less sanguine than himself might rely.

We come next to the consideration of Varicella or Chicken-Pox This disease says Bateman is usually so slight, as to require little Medical assistance, but, in Consequence of the resemblance of the eruption, under some of the varieties, to the Small-Pox, it becomes important, as a point of diagnosis, to establish its Character with accuracy." In page 260 he says "the three principal species of Chicken-Pox were well known a

century ago, & were distinguished in the north of England, and in some counties of Scotland, by the papular names of Chicken-pox, Swine-pox, & Hives. Dr William proposed to distinguish them by the forms of the vesicles, thus first V. lentiformis. Second V. coniformis. & third V. globularis.

I The appearance of the pustules in the former of these diseases, is indicated by the name it bears, in this species there is seldom any febrile symptoms, they appear in form of small red ob-long pro= =tuberances with shining surface, in the centre of which a transparent vesicle is soon formed, containing a thin white lymph, which gradually assumes a straw colour, & commonly begin to break on the fourth day. The edges then purse, or draw together, so that by the evening of the fifth day few remain. The scabs are at first brown then yellow, & at length fall off, leaving for a time only a few red marks, without pitting. The symptoms are Rigors watchfulness, furred tongue, quick pulse, shifting pains

loathing of food, Short Cough, Sore throat &c. The peculiarity of this disease is, the pustules are seldom numerous, but usually distinct; & appear first on the back - Whereas in small-pox they appear first on the face, neck & breast. Another test is puncture a vesicle, it falls to the level of the skin. This form says Bateman, is generally distinguished by the absence of premonitory fever; the pustules have not the hard base & central depression, which we find in cases of Modified Variola.

II. Varicella Conformis Swine-pox. In this form of the disease the vesicles rise suddenly, & have a hard inflamed border; containing a bright transparent lymph" is sometimes preceded by a slight Cough. restlessness, & fever." On the second day they appear turgid, the lymph of a bright straw colour, On the third day the vesicles shrivel. Those which contain whitish purulent fluid, after scabbing, leave pits. On the fourth day thin dark brown scabs form - these soon dry, & fall off in a few days, a fresh eruption may be expected

on the second & third day; each set having a similar course to run. The whole eruptive stage in this species, may be said to last from six to eight days. The last formed scabs fall off on the eleventh or twelfth day. Should these ulcerate, they do not slough as in small pox, but usually leave pits.

III Varicella Globularis. Hives. This species, may also be said to be described by the name. The vesicles are large & globular, the base however is not quite round. Sometimes there is considerable inflammation around them. At first, the lymph is transparent, but after the second day turns whey coloured, after the third day they become shrivelled, as in the preceding species. Pus being present causes them assume a yellowish tint. The scabs dry & fall off in four or five days. The pustule generally attains its acme on the sixth day. A degree of fever precedes this species; indeed all the different species of Varicella; of the ordinary type, (& modified Variola;) which continues

sometimes till the third day of the eruption.

In conclusion on this part of our subject allow me to quote a sentence from the Lectures of Erasmus Wilson "It is said of true chicken-pox that it occurs but once in the same person (usually in children) that it spreads by contagion; that it appears in the vaccinated equally with the unvaccinated; & that it is not communicable by inoculation.

The last disease we shall notice is variola or small pox: although we admit it to be of comparatively rare occurrence in Britain now as with what it formerly was, yet we must not pass it lightly over, or treat it merely as a tale that has been told by our fathers & therefore requiring little of our attention, It is still present with us, though in a modified form. And the fact that it does occur, & that not unfrequently in private practice, is sufficient to point out the necessity, of a thorough knowledge of its diagnosis, & treatment.

Small-pox is a Specific disease, & may be propagated, either by infection, or Contagion Like that other large family of Cutaneous diseases, to which it is allied, nay of almost inseparable affinity, its true origin is as yet unknown. Many Conjectures have been formed, some of which appear very plausible, & ingenious, Yet nothing has been proved, the tendency has rather been to Err.

All the knowledge we possess of the early history of this disease, is derived from the writings of Aron, who practised in the Reign of Mohammed about the year 622. when it is thought by some, the Small-pox took its Rise in Egypt. Others carry it still farther back to the year 572. Isaac Judeeus, Galen, & others, also wrote of it. In the year 569 it Committed sad devas= =tation in the besieging Army at the Siege of Mecca. More Recently the Saracens communicated it to the Crusaders; & they spread it throughout Europe. Some authors says Wilson, Maintain it to be the Effect of the generation of Myriads of Minute Animalcules in the Skin.

but there is no ground whatever for such a belief. Rhazes, a celebrated Arabian Physician says that every man, from the time of his birth till he arrives at old age, is continually tending to dryness; therefore the blood of Children is moister than the blood of young men, & the blood of young men, still more so than that of old men, & much hotter: "& that of infants hotter still, the heat of the latter greater in quantity; but that of young men more intense in quality." The following are the comparisons deducible from this Statement. Comparing the change of the blood, with the fermentative process, he says the blood of Children may be compared to Must, in which the movement towards fermentation has not yet taken place; the blood of young men to that which has already fermented & made a hissing noise, & has thrown its superfluous parts like Wine now still & quiet having arrived at full strength: while the blood of old men, may be compared to wine which has lost its strength & is beginning to grow vapid & sour

Now he says the small pox arises when the blood putrefies & ferments & this Change takes place in the first transition Stage, & small-pox may be compared to fermentation & the hissing noise which takes place in Must at that time. Thus we see the young are most liable to be attacked with it. However it may occur at any period throughout life - from the foetus in the womb, to the last term of our days Having thus shortly alluded to a few of the popular opinions, regarding, the origin of the Malady, we come next to the disease itself. In most cases, its first appearance is indicated by pretty smart febrile Symptoms, with Rigors. The Skin then becomes hot, & dry, The pulse hard & frequent. also pain in the Epigastric Region, with headache nausea & vomiting, & sometimes even fits of delirium, & Convulsions, However the Symptoms that are attendant on the outset of all febrile diseases, are, found to be very much the same. Therefore mistakes have occurred patients have been treated for some other

complaints, which turned out in a few days to be Small-pox But when once fully formed, it can never be mistaken for any other disease; we may now cite some other Symptoms, which, being common in this, & not common in Continued fevers, may assist us greatly in Early diagnosis, Vomiting: pain in the back & Loins, these if violent are premonitory of a severe form of the disease: loss of appetite with thirst &c &c. As the period of Eruption approaches, these Symptoms become greatly augmented, immediately thereafter followed by calm, which always attends the eruptive stage. The Eruption generally makes its appearance on the third day of the fever, It is thought a good sign when it does not show itself, until the fever has nearly passed off: In this Case the disorder is less likely to prove severe, & the constitutional disturbance to be little felt. The papillæ on their first appearance are very minute & apt to be overlooked, so that friends & attendants very often call

the second day of the Eruption the first. They come out first on the face, then on the neck wrists & trunk, & lastly on the inferior extremities, & commonly cease on the fifth day; & so on throughout the disease. But there are some rare exceptions to this rule, Sometimes they come out first on the Extremities, at other times a few straggling papillæ appear from time to time after the first crop has run its course. But these very seldom attain to the size of the first. The Pustor pimples gradually assume a more determinate form, by ripening into pustules which may be said to have arrived at maturity by the eighth day: they then begin to break, forming Scabs which fall off in four or five days more. Here also we have variations & exceptions. The severity of the disease, is almost always in proportion to the number of pustules; for they indicate the quantity of poison present ("reproduced in the blood") Thro the Extent of inflam= =mation in the Skin. In some cases there

may be only from six to twenty pustules present. at other times we may find many thousands. Thus then we see that peril & danger in a great measure depend on the amount of the Eruption. In cases where the pustules are numerous they have a tendency to run together, but if few they separate, this forms the line of distinction between the two kinds viz- Variola discreta. & Variola Confluens. In the former they are destinct, & circular, in the latter they Coalesce. & are of an irregular form. The discrete is very seldom dangerous but the con= =fluent is never free from danger. What forms the most important difference between them, is, Secondary fever. This sets in on the Eleventh day of the disease, & Eighth of the eruption. About this time a dark speck appears on the tip of Each turgid pustule, at this point the cuticle bursts & matter oozing out dries into a scab. When this falls off, it leaves a red mark, which fades slowly. It may sometimes be necessary to confine the patients

hands, or he must be closely watched to prevent him scratching off the heads of the pustules: for by so doing they ensure the formation of pits. Watson says there is no contgion so strong & sure as that of Small-pox; nor that operates at so great a distance It is readily communicable in every way: by inoculation, by breathing a contaminated atmosphere & by the contact or vicinity of fomites. It may also be caught from the dead body. M Flinders relates a very interesting case where the disease was eight or ten days later in the foetus that a in the Mother. A woman, near her full time, took Small-pox. The pustules were matured about the tenth or Eleventh of June. On the 18th She gave birth to a full grown Child upon whose face & body there were many pustules, discrete, & nearly ripe. The child died the same night. Sir William Watson in the Philosophical Transactions describes an instance in which the scars left by the pustules were visible upon an infant at

its birth This Child was afterwards inoculated without taking the disease. Its Mother, who had formerly had it, nursed, when far advanced in pregnancy, a Servant ill of Small-pox. Dr Pearson met with a similar Example. Mary Spooner was inoculated by him in her Sixth Month of Utero-gestation, & She had the disease severely. Her Child was twice inoculated with Small-pox matter but without effect.

We come now to the question does Vaccine Virus become impaired by transmission? In answering this question, we must expect to meet with strong opposition, & I must acknowledge that taking a superficial view of the subject, at first sight many startling difficulties arise, & these will appear all the more important from the fact, that they have puzzled the whole Medical profession, for the last eighty or a hundred years.

The Subject of Vaccination is one of great importance in the Science of Medicine.

It may be said to involve the whole controversy of contagion. On enquiry we find a great many conflicting opinions among the Scientific men even of the present day, on this point. In fact judging from appearances it must, for a considerable time at least, remain an open question. Nevertheless we have many strong proofs of the efficacy of vaccination. If it does not avert the Malady of Small-pox altogether, it most unquestionably & in no small degree ameliorates it. Like all other human discoveries it has its imperfections. Its Supporters may also have erred in eulogizing it too highly. Still it is one of the greatest boons, which Science has ever yet procured for Suffering humanity; Instead of a virulent epidemic, which carried Misery & death to every part of our globe. Slaying its thousands, & tens of thousands; threatning almost the total destruction of the human family, we now have little more than a slight eruption, preceded by slight fever, & followed by general debility, for a few weeks, from which the patient gradually recovers, And provided due care be taken without even the slightest Mark.

How different from what it was in times past! This then is what Vaccination has done; In Corroboration of this fact, we have only to look around us & Mark the Countenances of the passers by. It is only here & there, that we meet with a Solitary pillar as it were to remind us of a former disease, in itself as loathsome as it was dreaded, Once afflicted with it the patient Carried the disfiguring marks to the grave. But such cases are now of rare occurence, & when they do occur they are in a great measure traceable to neglect, as we have just seen, when treating of Small pox. I presume there are none now a days who will venture to deny the utility of its practice or be fool hardy Enough, to lend their influence to retard its progress. Public Consent approves & we are supported, but such was not the case at one time those venturing to approve of its use were branded with the blackest Epithets, & Even from this University it was spoken of as a thing too horrible to be practised upon a being bearing the image of God. But who of us that has had practise

Even for a short time among the lower classes in our own City has not had to encounter a more than fair share of discouragements & difficulties, & some of these even from our professional brethren who ought rather to have rendered us help. I speak from Experience.

My attention was early directed to the subject we are treating of through the kindness of Dr. McCowan, one of the City Parochial Surgeons under whom I have been a good deal of practice during the last two years, & I have had many opportunities both of witnessing & performing many Experiments with Lymph which he has been transmitting for several years. Of these I availed myself, not with the view of supporting a theory, but of eliciting facts either for or against what I am about to set forth concerning its Non-impairment. All of these amounting to above a hundred well authenticated cases which I watched with care, were successful, & furnish a strong array of proof in favour of an opinion which

has not been hastily entertained. If we set aside all theory & select a set of proper subjects, sufficiently numerous to represent fairly the human species, rejecting those whose constitutional tendency renders them unfit, & transmitting it directly through those only who are considered free from blood or Constitutional disease – allowing it to die in the former after giving them its security. I have no doubt that the result of my Experience, would be abundantly supported by that of Every other unprejudiced & candid enquirer – viz that pure lymph carefully transmitted through a long line, with the above mentioned precautions, has no tendency to become impaired either in its power to protect, or to produce a disease in every respect similar to that of the original. One fact or set of facts correctly proved requires more than verbal Statements or theories to set them aside, so that we consider our position is safe. We believe that the true Jenner lymph in these & Similar circumstances

will prove as efficacious now as it did at the time of its first introduction; but if it be taken from vitiated sources it does become impaired to a certainty, both in its protective qualities & in its power to produce a like disease, & at the same time it becomes the agent whereby disease is introduced into families where such did not previously exist. Thus by Carelessness or inadvertency the blessing is capable of being converted into a curse. But what is it that makes this subject difficult? Simply that which makes the Science of Medicine in nearly all its branches difficult— viz. that we have more false facts, so to speak, to combat, than true ones to guide & direct us, & it is only after years of hard earned experience & trial that we discover & emerge from the darkness in which from the first we have been enveloped. Here I am tempted to relate the following in illustration of the remark about discouragements. In the month of July last a fine healthy woman whom I had delivered six weeks before of (in every

respect) a healthy Child, requested me to vaccinate it, I did not comply giving as my reason, that only the day before a healthy Child had been vaccinated with our old transmitted lymph which I would insert fresh from the arm - Small-pox being in the neighbourhood She grew impatient sent to the Richmond Street Dispensary & had it done there, the Grandmother gave the wrong Name & address lest as she said the Drs would Make her give the Matter back, which She alleged was wrong & sinful however in opposition to the Grandmothers & Great grandmothers remonstrances & threats I removed a full glass of matter & inserted it immediately into the arm of another apparently healthy child, which took & ran the usually Mild course, On the eighth day from it I vaccinated three other children in presence of the Mothers at the earnest request of all parties her Child being what they termed a fine clear bawn" at the same time I charged twenty tubes for preservation. One of the children then operated on had the Scrofulous

diathesis strongly marked, it was thin & emaciated & although nearly two years old showed not- Even a glimmering of reason, I was averse to operating on this child & was only induced to proceed by the entreaties & tears of the Mother, which my apparent hesitation produced, & expressions like this O yes do it for the Mothers sake if not for the bairns, they turned out to be very Excellent cases & all Even this poor Idiot made good Recoveries, showing no signs of eruptive disease. About a week after they had passed through it, an Eruption appeared, which covered the body & Extremities of the child from which they were vaccinated,- the Mother called to see me, being however from home She showed the child to the servants & abused me in no measured terms. they following in her wake, said that- She wished to see me for She had gone to Dr Alexander the Ramsgate Dr. & he had assured her that both She & her child were healthy but that- foul Matter had been used by the Dr Who had vaccinated it, somewhat

annoyed but nothing discouraged I called on her & had all the children produced. Not one of the others showed the slightest sign, by this I endeavoured to prove to her that the peculiarity did not lie in the lymph (or it would most likely have appeared in even a more aggravated form in one, or all, of those vaccinated from hers) but in the con=
=stitution of her own Child, or rather owing to some peculiar irritability of its Skin. An occurrence which should occasion no uneasiness to any one, as it is sometimes observed on the healthiest Children, vaccinated with the purest lymph. Unknown to the neighbourhood I again tried it on the Child of a Police Man next door it also did well, with no eruption following. It has since been propagated in both town & Country with good success & has been transmitted from infant to infant without loosing any of its power as far as I can learn. I shall still continue my investigations with it as well as with the former which has been

transmitted for a Series of years.

Although we may fail to prove its absolute power (in the human system) to avert the Malady of Small-pox altogether. Yet we can have no great difficulty in Establishing its protective agency. & this is sufficient in our opinion to warrant its practice, & Stimulate to greater Exertion, to perfect what is deficient; by Zealously Embracing every opportunity of Eliciting new facts in its favour, thereby doing good to ourselves, & at the same time conferring an inestimably precious Service, upon the Whole human Race. It is a Labour of Love therefore let us Embark in it with all diligence & interest, so as not only to Cope with our forefathers, but to surpass them in Skill & Caution: & Sweet will the Recollection of a life time be, to the man who feels that he has done his duty to his Suffering fellow Creatures.

We have seen then the necessity of its practice, that Something must be done to avert the Ravages of that direful

disease, so prevalent before vaccination was introduced by the illustrious Jenner, & which has been productive of much good in every quarter of the globe, & to every race & degree in the human family, from the prince to the beggar, & from the civilized peasant, to the untutored savage, all have felt & acknowledged its controlling effects over that disease, & that when perfect it has the power, of protecting the individual vaccinated. But says one we hear of individuals having Small-pox after vaccination, very true, We also hear of cases of Small-pox after Small-pox. Cases of the one are not more common than cases of the other. Therefore the general law has been broken, by a stronger law, If it be fair to admit this in the one case, it becomes just as admissible in the other. In short Vaccine virus does not become impaired by transmission.

Here I may be allowed to make a few quotations in my defence.

The first I shall mention will be found in Watson's Practice of Physic Vol II page 795 "A third question is, how far the frequent failure, in late years, of complete protection can be ascribed to the circumstance that the vaccine virus has been repeatedly transmitted from one human being to another, & its supply thus kept up, without any fresh recurrence to the cow, the original source of the disorder. Dr Jenner was, himself, not without apprehension that this might prove a cause of failure. But the analogy of other animal poisons supplies no warrant for such a belief. For one year I had a seat as the Senior Censor of the College of Physicians at the National Vaccine Board, & I then had opportunities of satisfying myself that lymph which had been transmitted without interruption, from person to person, ever since the time of Jenner, continued to generate as perfect a Cow-pox vesicle as at the first.

Some writers say the Vaccine matter produced from the Cow - in 1844 is superior to that of the year 1836 both having been tried the new seemed to be most active, & possessed greater facility of transmission, through the human subject

M. Fiard concludes from his Experiments that the greater or less development of the vaccine vesicles on the third or Ninth day ought not to be regarded as the test of the degeneration of the lymph. But he regards the continuance & regularity of the eruption, the period of duration, the most certain sign of its activity. The following he says will prove this. When the lymph of 1836 & that of 1844 was inserted into the same arm of a Child, the progress of both was identical in every respect till the eighth day. On the Ninth desiccation began in the vesicles produced by the lymph of 1836, whereas desiccation was not complete in the others until the twenty seventh day. His opinion is that as the vesicle produced

by the lymph introduced by Jenner in the year 1800 desiccated on the twelfth day. So it proof of its inferiority to the new. But this must be considered another exception to the general rule. What he says is rather Confirmatory, of our assertion, than otherwise, that it does not become impaired. He proves that the lymph produced by Jenner, in the year 1796 is still Capable of generating a true Vaccine Vesicle. His only fault to it is, that it runs its course too speedily. & therefore leaves the System unprotected. If this be true, what faith then can be placed in Vaccination? We are told by all, or most of its supporters, that the true Vaccine Vesicles are ripe on the eighth day, but how seldom do we meet with such cases as he describes, I should be very much inclined to doubt the purity of his lymph. At present there is no necessity for having recourse again to the Cow. The lymph is not so much at fault as those who use it, & the Constitutions that receive it. Dr Jenner warns

his followers on this point. The constitutional symptoms after vaccination, with the old lymph, are usually very slight; whereas after primary lymph has been used, the symptoms are often very severe, Hence unless something more tangible than this, either in form of argument, or proof can be adduced by our opponents against the use of the old lymph: we would still use it & advise it to be used in preference to any other. thinking it better practice (the effect being equal) to give the patient all the advantage we can, by selecting that agent, which will cause least annoyance & distress

And to those who deny its protective agency altogether we would say read over the reports of late years, published by the National Vaccine Board, & see if we have not good grounds for dependence on its practice.

But it may be asked how do you account for those cases of failure daily met with in practice? We have vaccinated the same individual even seven times, each time

carefully selecting the purest lymph, yet
producing no effect. Whilst on the same
day with the same matter we succeeded
to a charm with a child perhaps the
very next door; & to all appearance,
not so susceptible as the one, on whom
it had no effect We answer. This want
of success, may arise from a variety
of causes.

1st The constitutional tendency
at the time May have been unsusceptible
of this set of no other disease.

2nd The character of the lymph.
may have been to a certain degree
defective, thereby Modifying its power,
& rendering efficacy abortive in the
one case, but not in the other.

3rd It is possible that the general
surface of the skin may not have been
accurately examined.

4th The patient may have been
under the influence of some other erup=
=tive disease, though not observed, which
for a time would render it ineffectual.

5 The amount of knowledge

may not have been sufficient to make a good selection, for it is upon this point the great weight of the question hinges. The matter may have been taken from a perfectly legitimate source, & still be very defective, if the parent vesicle shall have passed its acme, & is in the decline; then its power over the human system, in producing a similar disease, will have become impaired to a certainty. In fact it must be admited that as there are varieties in the human constitution. So there are various periods in an individual existance, in which he is susceptible of infection or contagion, even after having undergone the same disease, perhaps years before, at other times again, we find the same cons= =titution, be the circumstances, what they may, resisting its influence altogether In proof of this Statement we shall mention the following cases three of which are taken from Baron's Life of Jenner. The first is that

of a Medical Gentleman, Surgeon to the South Gloucestershire Militia, who said that he is so susceptible of the contagion of the Small-pox that he never attended a patient with that disease without catching it.

In a foot note Baron relates the case of a Cousins Child, who was vaccinated in India, & apparently with success, had the operation repeated after he arrived in England, & again received the infection. This Child was subsequently inoculated for the Small-pox, & received the infection. But this is not all, he was recently exposed to the influence of this contagious disorder, & took it in a casual way;

The third case, is that of a Woman named Elizabeth Everet, who it appears had been a Small-pox nurse for forty years, She had Small-pox when a Child, She was sent for to Bristol to nurse a patient, Caught the disease & died.

The following facts appear to me to be very interesting & perhaps the more

so on account of their never having been published. A servant girl named Margaret Mackenzie then in the North Highlands, had been vaccinated when a child, Nevertheless she became affected with small-pox, which ran the usual course, only rather severely. Six months afterwards she was again exposed to the contagion of Small-pox became affected with it, & passed through the usual Symptoms, which were somewhat modified, yet perfectly distinct.

Another case, of a man whose name I do not remember, has had two attacks, but in this case twenty years Elapsed between them. The last attack was by far the most severe. These cases however are exceptional, & besides as some concomitant circumstances which to other observers might have imparted another complexion than that presented to us in the reports may have been overlooked so that especially with our very limited Experience we do not feel warranted even to suggest a hint, that the generally received doctrine should be set aside or even received with caution —

A young Lady of my acquaintance was vaccinated, when a child, the matter took effect, & the disease ran its usually mild course. Many years after this, Curiosity led her to accompany the Maid-Servants to Milking,- Under the commendable desire to acquire a practical knowledge of this useful accomplishment in a rural district, Milking a Cow. She forthwith began, & carried it on some time, Cow-Pox being present. I need hardly add, She again contracted the disease, & passed through it lightly. Some time afterwards, She was exposed both to the infection & contagion of Small-Pox. She caught the disease which ran a very mild course, Only about a dozen well marked pustules appeared over the whole surface of the body

Two of her Sisters & a brother had also undergone vaccination when children. The brother when returning home from School, met a Woman who had been nursing a Small-Pox patient, he stopped her to enquire, how the individual

was: he imagined She had a very heavy disagreeable smell about her person, almost immediately after reaching home he was put to bed, & in a few days had a severe attack of Small-pox,

One of the Sisters who had resisted Vaccination three times, did not become affected with Cow-pox from Milking, neither did She become affected with Small-pox, altho Equally Exposed, at the time of the brother's illness.

And Lastly the other Sister who like the former, received the vaccine disease, in Childhood: became affected with Cow-pox two or three times from Milking, but resisted entirely the contagion of Small-pox.

The Maid Servants, also caught the infection from the cows - but in them the constitutional Symptoms, were of an aggravated type, they also resisted Small-pox at the time

These cases show very clearly the various actions which those poisons may have on the different constitutions

Even in the same family; & when we find such differences in so small a circle, what may we not expect to find when we look abroad over the whole race of man? The following is a strong proof of its protective power, of 139 persons attacked with small-pox in the course of 8 years, in a district of Prussia, 47 had not been vaccinated, & 92 had been vaccinated; of the former, 15 died, while of the latter only one was lost, In addition to these it was known that 121 persons who had been vaccinated, were in immediate attendance upon the patients labouring under small pox, without becoming affected.

Experience proves, that among the vaccinated, only one in forty six die or two per cent. whereas in the unvaccinated at least one in six die, Sixteen per cent. And now if we reason from analogy we shall find proofs to multiply on our side very rapidly. For Example who ever heard of the virus in Syphilis having become impaired by transmission? & that has been transmitted from individual to individual, since the time

of its first appearance till the present, & who will doubt for a moment its power to produce a like disease, in all who may have the misfortune to to imbibe its virus.

Having satisfactorily proved the advantageous effects of Vaccination to the system as a protective agent, we shall now only mention another question which has arisen. Does the protective power continue generally throughout life? This is a question of grave importance, & we have yet many investigations to make in search of facts, ere we can give a decided answer. If we admit the theory of a continual chain of Changes, going on from time to time in the system, so as in the course of years, the then existing body, shall have been so completely changed by the laws of reproduction, (as to be as some declare a new body. the old having been removed by certain vital laws, which we do not understand therefore cannot explain, then we must admit Revaccination to be indis= =pensibly necessary. If it were at all likely to become Epidemic again but as there is no prospect of this, we cannot extend our support to those, who question its efficacy, & thus excite doubts in professional Minds, distinguished only by indecision, & having achieved this, advance them as proofs, that the Profession generally have decided conviction of its efficacy or utility.

The following table, quoted from Dr Heim, places Small-pox & Cow-pox in a very interesting light, as regards the protection which they are capable of affording.

Vaccinated with success	32
Modified	26
Without Effect	42
	100

Revaccinated with success	34
Modified	25
Without effect	41
	100

"M. Bardien has related a case of
"the simultaneous existence of Variola
"& Vaccinia in a man aged 18, who was
"vaccinated, on the day on which the
"Eruption of Small-pox had made its
"appearance, The Variola ran its course,
"with its Characters Modified, & after the
"desquamation, an irregular Eruption
"of Cow-pox appeared. From this case,
"he thinks that we may vaccinate, with
"the hope of doing good, not merely

" during the preliminary fever of variola.
" but even after the out break of an
" Eruption. At first sight this case may
seem to militate against & neutralise
our Statement in page 45-4th Cause-
this however ~~is not~~ is not the case, for
we think proof is not wanting that
Cow-pox & Small-pox are not two
but one & the same disease. The former
being greatly Modified. Jenner
was of opinion that they were identical
in nature, & it has since been confirmed
by practice. During an Epidemic of
Small-pox, Cow pox seemed to prevail
also as an Epidemic among the cattle
of certain districts. By inoculation
we can transfer Small-pox to the cow
& by bringing back the matter thus produced
to the human Subject the true Cow
Pock is generated. We referred to other
diseases of which there is a great
variety having or at least believed to
have a modifying if not a counteracting
tendency to Vaccinia such as measles scar-
latina & even cases of acute & chronic Diarrhea &c.

"In an account of an Epidemic at
" Heidleberg of Revaccinations, which he
" practised there Dr Hoefl, asserts that
" he found the pustules of Revaccination
" bear to those of primary vaccination, just
" the same relation, as those of a second
" attack of Variola, bear to those of a first-
" attack. He states moreover that he
" observed this Modification, although
" he never employed Revaccine lymph,
" & though he always vaccinated directly
" from arm to arm. Dr Wests Report on
" Midwifery 1845-6.

We quote the following from Dr Churchill. In Russia several Extensive Revaccinations have been practised, & even among those who took it, some few cases of Small-pox occurred. The late Dr. Labatt, whose high Standing & Experience all will admit, objects to these Revaccinations as being unnecessary, considering the small proportion of Variola after vaccination, & also as not being valid as a test of the former vaccination, or as a safeguard for the future.

" But says he granting that a certain number of such cases occur, or even supposing them far more numerous than they are, it ought not to shake our confidence in vaccination, considering the millions who pass through life with perfect immunity from Small-pox; nor would it prove that even in those cases vaccination was of no use, for these exceptional cases seldom or never take the genuine variola, but that modified form of it which is called Varioloid, — an infinitely milder disease, & one almost never involving either danger or disfigurement.

If justice requires that we award to him who unbefriended and unaided labours day after day and year after year to fertilise and render the Earth more productive than in times gone by, the high honour of being the benifactor of Mankind, how much higher is the honour due to him who, thus early touched at the sight of human woe, nerved his arm to grapple with the pestilence which had blighted the beauty and destroyed the life of Millions. Though it had paralyzed the energies of each and all of his predecessors - And would not they who were privileged to live with him instead of standing aloof or with treating him and his cause with contumely come forward and second his efforts now? Alone he knelt at the Shrine of Science offering a sacrifice at once both rich and rare, yet with a steady hand he touched the glowing embers and reached a blessing down. Fired with

Philanthropy his manly spirit rose
above every difficulty he was in the right
and he achieved a noble conquest.
His weapons were not those of war
for they brought peace instead of sorrow
and wailing, with a vaccine glass in
one hand & a lancet in the other he
entered alike the Palace and the Hall
nor stopped he there - the poor mans
home was not forgot his step brought
joy and drove the enemy from every
abode, his look & kindly smile reproved
a fathers over wrought anxiety, and
filled Each tender Mothers bleeding
heart with encouragement, and bade her
hope that even She would see her
Offspring live to love Each other.

The names of a Washington. a Napoleon.
and a Wellington Stand high in the
annals of fame. their glory was in des=
troying life to procure liberty for those
that were to follow them in life even
ages yet unborn, they caused many
a heart to bleed at home. Many a
Widow and Childless Mother sank broken

hearted into an early grave. Such were the effects of war, are still, and ever will be. But Fenners glory was of a nobler order he bent his energies to save life. Millions that otherwise must have fallen hapless victims live to bless his name, proving that he was in very deed a true Physician wounding but to heal

Robert Christie

Very good. I think this Thesis deserves honourable mention.