



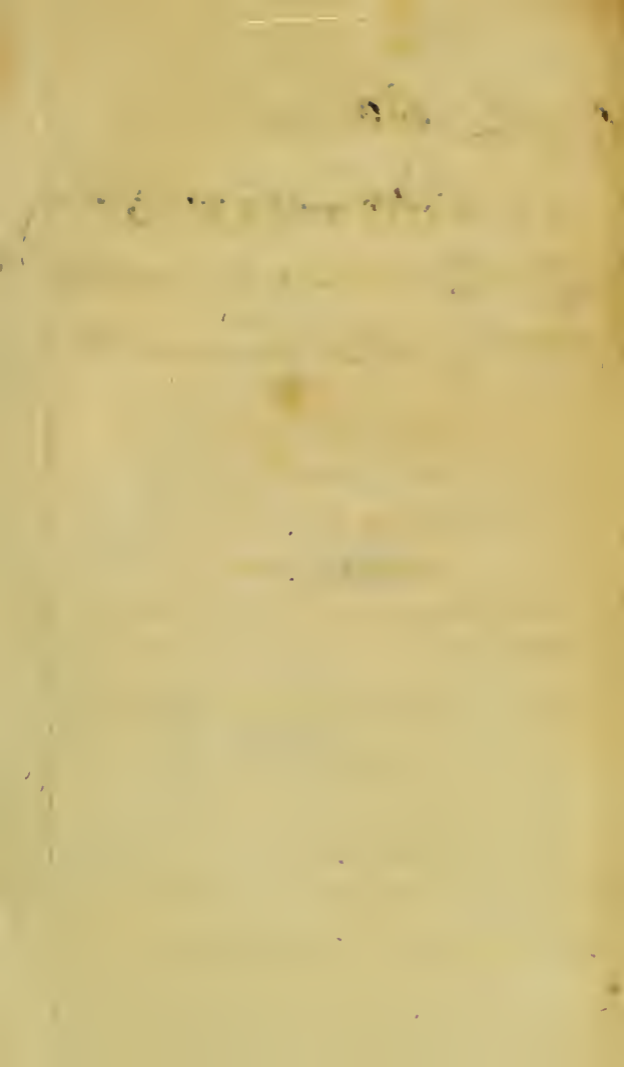
The R. Hon.ble Lord Gray

1791.

The Honble

Francis Gray

With the sincere respect  
regard, of his friend the



A  
TREATISE  
ON THE  
COW-POX;

CONTAINING  
AN ENUMERATION OF THE  
PRINCIPAL FACTS IN THE HISTORY OF THAT DISEASE;  
THE METHOD OF COMMUNICATING  
THE INFECTION BY INOCULATION; AND THE  
MEANS OF DISTINGUISHING  
BETWEEN THE GENUINE AND SPURIOUS COW-POX.

*ILLUSTRATED BY PLATES.*

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1807.

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TO  
THE CLERGY OF SCOTLAND,

THIS TREATISE ON

THE COW-POX

IS

RESPECTFULLY INSCRIBED

BY

THE AUTHOR.

EDINBURGH, }  
NOVEMBER 20, 1807. }





## PREFACE.

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THE Small-pox, one of the most severe and dangerous diseases to which mankind is subject, has descended, with undiminished violence, from generation to generation, ever since its introduction into Europe, more than a thousand years ago; and every effort hitherto made to extirpate this formidable disease, has failed of success.

Many thousands annually fall victims to the Small-pox; and even when it does not prove fatal, it frequently produces painful and lingering complaints.

It is often injurious to beauty, by the permanent pits and scars which it leaves on the face: it often destroys the sight, by the inflammation and scales which it induces on the eyes; and it sometimes terminates in swellings and ulcers, by which the strongest constitutions are gradually undermined, and ultimately ruined.

Inoculation has, indeed, rendered the Small-pox much less fatal; but even inoculated Small-pox is frequently attended with fever, and with other alarming symptoms. It is this circumstance which has prevented the practice of inoculation for the Small-pox from becoming general among the lower classes of the people; and there is cause to believe, that the practice of partial inoculation, though beneficial to the in-

dividuals inoculated, has, on the whole, been injurious to mankind, by spreading the contagion to numbers who otherwise might have escaped the disease altogether.

Mankind are, therefore, infinitely indebted to Dr Jenner, for his zeal in introducing to public notice an easy, safe, and effectual method of preventing the Small-pox, by the substitution of another disease. This disease is known by the name of Cow-pox, and is now universally acknowledged to possess the singular property of producing a change in the human constitution, which enables it to resist the variolous contagion.

The facts which Dr Jenner has stated on the subject, have been investigated, and their accuracy ascertained; the ex-

periments which he has made, have been repeated times without number, and found to be accurate; and the concurring testimonies of many medical practitioners have confirmed his inferences.

The Author of the following pages will not presume to say, that he has much new information to communicate; but having had extensive experience in the practice of Vaccine Inoculation, and wishing to do every thing in his power to render it general; he conceives, that a short account of the principal facts relating to the history of the Cow-pox, addressed to the Clergy of Scotland, who deservedly have great influence over the minds of the people, and who are much disposed to promote every object tending to the public good, will more effectually introduce

the Vaccine Inoculation in this country, than any other measure that could be adopted.

With this view, he has stated every thing of importance that is generally known on this interesting subject. No circumstance is mentioned, as a fact, which is not confirmed by his own experience; and, at the same time, he has carefully referred, in the most material points, to the original and best authorities, in order that they, into whose hands these pages shall fall, may have an opportunity to obtain the most complete information on a subject so interesting and important to mankind.

Since the first edition of this Treatise was published, the Author has had occasion to correspond with a number of very respectable clergymen and

practitioners on the subject; and he is extremely happy to find, that the plan which he has adopted has met with general approbation, and that the Vaccine Inoculation continues to gain ground in almost every part of Scotland.

A great deal, however, still depends on the exertion of individuals; and daily experience convinces him more and more, that the support of the Clergy, collectively, is necessary to complete the ultimate success of the Cow-pox inoculation, which has been so happily introduced under the auspices of Dr Jenner.

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A  
TREATISE  
ON THE  
COW-POX.

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CHAPTER I.  
OF THE CASUAL COW-POX.

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SECTION I.

*Of the Discovery of the Cow-pox.*

**I**N the month of June 1798, Dr Jenner, Physician at Berkeley, in Gloucestershire, published an interesting account of experiments which he had made, for the purpose of investigating the nature of a disease known

in that country by the name of the Cow-pox.—He had commenced his inquiries nearly twenty-two years before, but had not an opportunity of making any experiments on the subject, till the month of May 1796.

In the course of his inquiries, he found, that, in the spring and autumn months, particularly if the weather is rainy, an eruption of pustules, or rather of vesicles, appears on the teats and udders of cows, in the extensive dairies of the western counties of England; and that this eruption is communicated to the milkers, by the matter contained in the vesicles being rubbed on the hands and fingers when the skin is abraded.

Dr Jenner also found, that the common people of Gloucestershire had been long acquainted with this circumstance,—that they, who were thus infected with the Cow-pox, remained ever afterwards unsusceptible of the contagion of Small-pox.

Having ascertained the truth of this circumstance, he attempted to render the ob-

servation generally useful, by communicating the disease received accidentally by the milkers, to children who had never been infected with the Small-pox. This he successfully accomplished ; and the happy result of these experiments has facilitated the introduction of the inoculated Cow-pox into almost every corner of the world. To the rapid dissemination of this practice, Dr Jenner's judicious conduct materially contributed.— He did not publish his discoveries, till he had it in his power to announce the confirmation of them by ample experience ; thus precluding all doubt or dispute about them, however new and extraordinary they might appear.

## SECTION II.

*Of the Origin and Appearance of the Casual Cow-pox.*

THE udders of cows, during the time they are suckling their young, are subject to pustulous sores of different kinds, which are occasioned by the stinging of flies, by external injuries, or by allowing the milk to collect in too great quantity.

By handling these pustules, sores are sometimes communicated to the hands of the milkers, which excite a good deal of uneasiness in the parts affected, but are never accompanied with fever. They often leave ulcers, that do not heal readily, both in the cow and in the human subject; but none of these sores preserve the person from the contagion of the Small-pox.

There is another kind of pustule, however,

more resembling a vesicle, to which the teats of cows are liable, which assumes a very different appearance, and is produced by a different cause from any of those that I have mentioned; the fluid of this vesicle, when introduced into the human constitution, occasions a disease, that renders the person ever afterwards secure against an attack of Small-pox. This vesicle has been denominated the Cow-pox, and it seems to be produced in the following manner.

In the spring, after a severe winter, horses often become affected with a disease in the heels, which farriers call the Grease.

It appears at the roots of the hairs, in the form of small vesicles, containing an acrid fluid, which bursts out when the vesicles are compressed, in rubbing down the horse's legs.

At this time the horse is evidently hot and feverish, and if any of the matter is applied to an excoriated part of the fingers or hands of the grooms, sores are produced, which, are also accompanied with fever. These

sores do not heal readily, and often remain open for several weeks.

If a person who is thus affected, or who has any of the infectious matter on his fingers, milks the cows, as is frequently done in extensive dairies, vesicles of a particular appearance are soon observed on their teats.

These vesicles are at first of a pale blue or livid colour, with a depression in their centre, and are surrounded with an erysipelatous inflammation. They contain a transparent watery fluid, and the parts in their immediate vicinity become hard and inflamed. If care is not taken to prevent them from being rubbed, they burst, and give rise to a foul deep-eating ulcer, which is long of healing. Sometimes the cow appears to be sick, and yields less milk than usual; but this is not a frequent occurrence.

If at this time any of the matter of the vesicle, or sore, touches the milkers, when the scarf skin has been previously scratched, or rubbed off, vesicles similar to those on the

teat of the cow are produced in the course of a few days.

At first, small inflamed spots appear on the wrists, hands, and joints of the fingers. These soon become vesicles, which fill with a transparent watery fluid, and continue to increase for several days. On the fifth or sixth day from the commencement of the vesicles, they are found to contain a quantity of a bluish fluid; are of a circular form, depressed in their centre, and elevated at their edges. Soon afterwards, their bases are surrounded with an inflamed ring or areola, which, in the space of a day or two, is sometimes two inches in diameter.

On the seventh or eighth day, symptoms of absorption take place; tumours appear in the glands of the arm-pit; the pulse becomes quick; the patient complains of sickness, anxiety, oppression, and frequent changes from heat to cold; sometimes, although rarely, he is even delirious.

These symptoms are not always equally

violent, but they continue in a certain degree for one, two, or three days; and when they recede, are followed by ulcerated sores on the parts, very similar to those on the cow from which the infection was received.

It must be observed, however, that no vesicular eruption on the skin has ever been known in Cow-pox to follow the feverish symptoms, as in the Small-pox, if it be not on the spot at which the infection is communicated. This accounts for vesicles appearing occasionally on the nose, lips, eyelids, and other parts where the skin is extremely thin. They arise from the patient carelessly rubbing them with the infected fingers.\*

“Thus, the disease makes its progress from the horse to the nipple of the cow, and from the cow to the dairy-maid.” †

\* See Jenner's Inquiry into the Causes and Effects of the Variolæ Vaccinæ, p. 5.

† See Jenner's Inquiry, &c. p. 6.



When a person has gone through this disease, he is ever afterwards secure from the infection of the Small-pox.

In support of the opinion, that the matter of grease in horses produces the Cow-pox, when applied to the teat of the cow, Dr Jenner has mentioned a circumstance which is still more remarkable,—That the matter of grease itself occasions a disease, when the human body is inoculated with it, which prevents the person from being afterwards susceptible of the Small-pox contagion.\*

Dr Jenner, indeed, relates the history of two cases, which seem to invalidate this position; but the difference of the event in these cases can be accounted for, on the supposition, that the matter of grease, with which the persons were first infected, was sufficiently acrid to produce an eruption, but had lost its specific anti-variolous quality, as in vari-

\* See Jenner, *Case of Thomas Pearce*, p. 27, and of *John Baker*, p. 36.

ous circumstances happens even with the vaccine matter itself.

Since the publication of these important facts, many experiments have been made, both in Great Britain and on the Continent, for the purpose of ascertaining, whether the Cow-pox was really produced by the matter of grease applied to the udders of cows, as asserted by Dr Jenner. Experiments on this subject have been made by Dr Woodville, Mr Simmons, and Mr Coleman,\* all of which seem to refute Dr Jenner's opinion; but, in the month of October 1801, Dr Loy of Whitby, in Yorkshire, published a set of experiments, which, as they appear to have been carefully conducted, and to be accurately and faithfully described, must, in the opinion of every unprejudiced inquirer, prove, that Dr Jenner was right in his conjectures; and shew, that a person who has been infected with the mat-

\* See Reports of a Series of Inoculations for the Variolæ Vaccinæ, by W. Woodville, p. 7. See also Mr Simmons' Experiments; and Dr Pearson's Inquiry, p. 83.

ter of grease, is equally incapable of receiving the Small-pox contagion, as if he had had the genuine Cow-pox. Indeed, from the description which Dr Loy gives of the disease produced by inoculating with the matter of grease, one is induced to consider it as the same in every circumstance with the genuine Cow-pox.\*

Dr Loy has also pointed out a probable reason for the result of his experiments being different from the account given of similar trials by Dr Woodville, Mr Coleman, and Mr Simmons, namely, that he employed the matter of grease taken from a horse on the seventh day from the appearance of the eruption, and at the very time when the animal laboured under a considerable degree of fever.

It appears from Dr Loy's observations—  
1. That the matter of grease taken at this time, produced a disease on the teats of cows, similar in every respect to the Cow-pox.

\* See Loy, Account of some Experiments on the Origin of the Cow-pox, p. 20.—26.

2. That matter taken from the cows infected in this manner, and introduced into the human subject, produced a disease which preserved the patient from the contagion of Small-pox.

3. That a person inoculated with matter produced in cows in this manner, received the genuine Cow-pox from it, and passed regularly through the disease.

In the sixth volume of the *Memoirs of the London Medical Society*, there is a communication from Dr Jos. Head Marshall, which appears to me to afford additional evidence of the accuracy of Dr Jenner's observations.

Dr Marshall states, that he was called to visit a young woman who had four or five vaccine vesicles on the hand: she had received the infection from one of the cows, which having been restive one morning, had been milked by the farmer's son, who was in the habit of attending a horse with sore heels in the stable. In this instance, the farmer's son conveyed the matter of grease from the horse to the cow, on whom it produced the Cow-

pox, and the cow communicated the infection to the dairy-maid.

The confirmation of these facts would be a matter of much importance in the history of the Cow-pox, as it would point out a method of procuring genuine active matter, should that which is now in use fail, in those countries where the casual Cow-pox, as affecting cows, is unknown.

It must, however, be acknowledged, that the experiments hitherto made on this curious and interesting point, are not so numerous as might be wished, from the difficulty of procuring the genuine matter of grease; as it is supposed, that the constitutional affection in the human subject is produced by that matter only which is taken from the horse during the eruptive fever when he first becomes affected with the grease, which is said to endure only for a very short period. But there are strong grounds for thinking, that Dr Jenner's opinion will ultimately appear to be well founded.

## CHAPTER II.

## OF THE INOCULATED COW-POX.



## SECTION I.

*Of the Method of Procuring the Virus of Cow-Pox,  
and of preserving it for Use.*

IN propagating the Cow-pox by inoculation, the matter must be taken at a certain stage of the vesicle, otherwise a spurious disease may be produced, that does not preserve the constitution from Small-pox, and yet may readily be mistaken for the genuine Cow-pox, by those who are not accurately acquainted with the appearances of this disease.

To guard practitioners, and the public, therefore, against accidents of this kind, I

shall mention the manner of obtaining and preserving the proper vaccine virus; and, in a subsequent Section, shall point out the sources of that matter from which the spurious disease originates.

It ought to be held as an invariable rule, that Cow-pox matter should be taken from a vesicle on one of the days between the fifth and ninth inclusive from the inoculation; for we commonly fail in producing the genuine disease, if the matter be not thin and limpid; but after the ninth day it usually becomes thick and purulent, and it cannot often be procured sooner than the fifth.

The genuine vaccine disease has, no doubt, been produced by matter taken on the twelfth, or even the fourteenth day, from under the scab; but more frequently a spurious pustule is induced when the matter is taken at this late period, by which the practice is brought into discredit. There is, however, no necessity for using matter in this state; so that, although some have ventured to advise this

measure, few who have had full opportunities of observing its effects will be inclined to adopt it. I mention this with more confidence, as I know that Dr Jenner is decidedly of the same opinion; for he says, that the matter should be taken between the fifth and ninth days after inoculation, and at all events, never after the scab has begun to form. This Dr Jenner inculcated to Dr Tierney, who has lately published an inaugural dissertation on the subject of Cow-pox.\*

I ought, however, to mention here, that although it is unsafe to inoculate with matter taken after the ninth day, or from under the scab; yet, that the same objections do not exist against the employment of a solution of the scab in water, for the purpose of inoculation. With regard to the virus contained in the vesicle, it is generally contaminated

\* See Tierney, *Disputatio Medica de Variola Vaccina*, p. 29. Glasgow.



with purulent matter, and of course improper for being used in inoculation, after the ninth day of the disease; whereas the scab, or crust, as it seems to be composed of the transparent, active virus, which hardening daily, from the fourth to the eighth or ninth day, gradually assumes the form of a hard, semi-transparent, brownish crust, may be used with safety for inoculation, in the manner pointed out in page 22 of this Treatise.

A Cow-pox vesicle seems to be composed of a numerous assemblage of minute cells, each of them containing a small quantity of fluid, and not communicating with one another, as the cells of the cellular membrane do in the healthy state; at least we are induced to adopt this opinion from observing, that when one, or even two or three punctures are made in a vesicle, they do not give vent to all the fluid which it contains.

One who is unacquainted with the structure of the Cow-pox vesicle, would, from this peculiarity, be induced to think, that the

quantity of virus in it is very small; but by puncturing the vesicle in various places, through its whole circumference, almost all the fluid will be discharged; and if we wait for half a minute, or a minute, more lymph will form in the vesicle, and more than it seemed originally to contain, will ooze out at the punctures. It appears, however, that the virus first taken is the strongest; and when a large quantity is subsequently discharged, it becomes proportionally weaker; so that we ought to make use of that only which flows immediately after the punctures are made.

This account of the structure of a Cow-pox vesicle was, so far as I know, first given in a letter published by Dr Cappe of York, in the York Herald, about seven years ago, and it seems to be accurate. For although Dr Willan, in his Treatise on Vaccine Inoculation, p. 9, says, the cells communicate with each other, yet after very minute examination, I am rather disposed to agree with Dr Cappe; and I think it is probable,

that the communications between the cells of the cellular membrane, of which they are composed, are obliterated by the inflammation preceding the formation of the vesicle.

If the inoculation is to be performed in the course of a few days, or if the matter is to be sent to a short distance only, it may be taken on a lancet, by making one or two punctures in the vesicle, from which a sufficient quantity may be procured, and the pustule will not be deprived of virus for after-inoculations. A piece of tinfoil, gold-beaters leaf, or moistened bladder, should then be wrapped round the lancet, to prevent the matter from being injured by exposure to the air.

But when we wish to send the virus to a distance, or to preserve it in an active state for a longer period, various other and more effectual means may be employed for the purpose. Two or three punctures being made in the most turgid part of the vesicle, a good deal of the fluid which it contains will ooze

out. This being collected on two thin plates of glass, each about an inch square, the two pieces should be laid close together when the matter is yet fluid, by which means, when the serous part of it has evaporated, the plates of glass will be agglutinated to each other.

On the pieces of glass being laid together, they should be covered with tinfoil, or moistened bladder, to keep them more firmly in contact, and that they may be more conveniently carried in the pocket, or transmitted in a letter.

This I consider as the easiest and best method of excluding the air, and consequently of preserving the virus in its most active state.

The virus may also be collected by soaking a piece of cotton-thread in it, and placing this between two plates of glass, which should be covered with moistened bladder or tinfoil; or the thread may be inclosed in a small phial well corked, or in a glass-tube, or in a quill, which should afterwards be sealed with wax.

Other methods have been advised for preserving Cow-pox virus in its active state ; one of these consists in having a small phial with a stopper, which reaches nearly to the bottom. The virus is spread on the stopper, and inclosed in the phial when fluid. This has been done, in the expectation that it will remain fluid for several weeks. It is an extremely convenient method of collecting and preserving the virus ; and answers the purpose of those who are in the daily habit of using it, better perhaps than any other. But, although we are thus enabled, almost to a certainty, to preserve the virus, for several days, in a fluid state, provided there is a sufficient quantity of it, and although it generally retains its active property during that period, particularly in cold weather ; yet even if it were to continue fluid for several weeks in warm weather, it is probable we should not find it of any use, as it would in all likelihood be decomposed by putrefaction, and thus its specific anti-variola quality be destroyed ; so that I con-

sider this mode of preserving virus as better adapted for daily, immediate, employment, than for conveying it to considerable distances, or for keeping the virus for a longer period than a few days.

For some years past, Mr Bryce informs me, that he and the other gentlemen of the Vaccine Institution in this place, have been accustomed to inoculate with a solution of the crust, or vaccine scab, in water; and by many experiments made for the purpose, have ascertained, that the disease is as readily communicated in this manner as if the inoculation were performed with recent fluid virus. When the crust is to be used, the outer parts of it are scraped off, and only that portion employed which is transparent, and of a hard horny consistence. The quantity intended to be used, is then put on a flat piece of glass, and being moistened with a drop of warm or cold water, is bruised with the flat side of the inoculating lancet, until a complete solution of a milky-

coloured fluid is effected. The inoculation is then performed in the usual manner.

Mr Bryce, who discovered this mode of obtaining and preserving vaccine virus,\* advises the crusts to be put into a small phial, with a well-ground glass stopper, as soon as they fall off, so that they may be secluded, as much as possible, from the action of the air.

The efficacy of a solution of the scab in warm water, in producing the genuine Cow-pox, is farther corroborated by Mr Shoolbred, Superintendant of Vaccine Inoculation at Calcutta, who succeeded in producing perfect vesicles with a scab four months and a half old.†

Although I have repeatedly made use of the scab in inoculating, and have sometimes succeeded with it in producing the perfect

\* See Practical Observations on the Inoculation of Cow-pox, by James Bryce, p. 128.

† See Report on the State and Progress of Vaccine Inoculation in Bengal, during the year 1804, by John Shoolbred, Superintendant General of Vaccine Inoculation.

disease, yet my experience of it is too limited as yet to entitle me to recommend it in preference to any other mode of preserving the vaccine virus; more especially as I have hitherto found, that, if the matter be properly preserved between two plates of glass, in a cold dry place, and the air carefully excluded from it, and the inoculation performed with due care, it will seldom fail, at least in climates where the temperature is the same as it is in this country.

I find also from the report for 1806, of the committee of the Central Vaccine Society, for the extinction of Small-pox in Paris, that in France and in Italy, they have not been so successful with a solution of the crust, in producing the disease, as the surgeons in this country and in the East Indies.\* The method proposed by Mr Bretonneau, and re-

\* See Report of the Committee of the Central Society for the Extinction of Small-pox in France, by the propagation of Cow-pox, read June 12, 1806, p. 86.



commended by the committee in Paris, for preserving the vaccine virus in its fluid and active state, is extremely ingenious, and I have no doubt of its answering the purpose completely. It consists in applying one extremity of a capillary tube to a vaccine vesicle open over its whole surface. The fluid matter rises in the tube, and when the latter is filled, both of its extremities are sealed with sealing-wax. When the matter preserved in one of these tubes is to be used, the sealing-wax is removed from its ends, one of which is introduced into another tube, rather wider and longer, and the other extremity is placed over a plate of glass. On blowing into the tube which incloses that which is filled with the fluid matter, the matter runs out on the plate of glass, and is then used for inoculation. The committee have used matter which was preserved for two months in this manner, with complete success; they do not now employ any other method of transmitting it to their correspondents at a dis-

tance, who apply to them for fresh supplies less frequently than formerly, as they succeed more readily in communicating the disease with matter preserved in this manner.\*

I have even produced the disease with matter kept for two months; and Dr De Carro mentions, that he succeeded with virus six months after he received it from Dr Pearson; although the virus was sent on a piece of cotton-thread, inclosed only in a letter, from London to Vienna.

But the best method of preserving Cowpox matter, and of propagating the disease, is to inoculate a few patients only at one time, and afterwards from these to inoculate others, thus keeping up a constant succession and supply of matter. Were this generally done, less risk would be incurred of producing the spurious disease, even if the matter should be taken at an improper stage of the vesicle; and thus patients would very

\* See Report, &c. p. 88.

rarely be attacked with the Small-pox, in consequence of the Cow-pox having failed.

In many of those cases, therefore, where the vaccine inoculation fails, the failure most commonly proceeds from the matter not being genuine, or not having been taken at a proper period of the vesicle ; or, if Dr Woodville's opinion is well founded, from some individuals not being susceptible of the Cow-pox contagion, which, he thinks, is the case with about one person in sixty.

But, for confirming this opinion, much observation is necessary. I rather think, that most children may be made to take the Cow-pox, provided they are not at the time under the operation of mercury, of sulphur, or affected with the itch, scald-head, or some other eruptive disorder, and that some fallacy has probably occurred in Dr Woodville's practice ; at least I have never yet failed in communicating the disease, where I was permitted to repeat the inoculation as often as I wished, although in some in-

stances it has been necessary to repeat it several times. In three or four cases, it was not produced till the fifth inoculation, although at each operation, at least one puncture, and sometimes two punctures, were made in both arms; but the patient was only three weeks old when first inoculated, and in this circumstance Cow-pox bears much resemblance to Small-pox; for it has been long known, that infants of two or three weeks old do not receive the variolous contagion by inoculation so readily as those that are farther advanced.

## SECTION II.

*Manner of performing the Inoculation.*

THE manner of performing the inoculation is a matter of considerable importance; as, on the one hand, we are apt to fail by making the puncture too superficial; and, on the other, by making it too deep, we may excite an unnecessary degree of inflammation. Indeed, the size of the vesicle, and extent of the subsequent inflammation, depend, in a great measure, on the depth of the puncture, or length of the incision made in performing the operation.

Of the truth of this opinion, I have seen numerous examples since the first edition of this Treatise was published; and I have been consulted in various cases, where the inflammation proceeded to a very alarming height,

evidently in consequence of the incision having been too extensive, or carried to such a depth as to penetrate the true skin. In one case, an erysipelatous inflammation spread over the whole arm, fore-arm, neck, and shoulder, in the space of three or four days, and it continued to extend for nearly a fortnight, until it had covered the whole of the breast, back, shoulder, and belly, of one side, and even the shoulder of the opposite side; and the little patient was left by it in so exhausted a state, that it was for some time doubtful whether or not he would have survived.

I am happy to observe, that my opinion and observations on this point are corroborated by the experience of one whose authority must always have great weight: I mean Mr Pearson, surgeon to the Lock Hospital, who has favoured us with some very judicious observations respecting the Cow-pox, in Dr Willan's valuable work on that subject. Mr Pearson states, that

where such an improper mode of inoculating is discovered early, a great part of the mischief may be prevented by applying the vegeto-mineral water, with a little spirit of wine, to the inflamed part, about the ninth day, and giving the bark very freely. When called in at a later period, he orders the affected part to be fomented with hot port wine, and bark with aromatics, to be given every three or four hours.\*

The puncture at which the matter is to be inserted, should be made in the hollow that is perceptible in each arm, at the insertion of the deltoid muscle, nearly half way between the shoulder and the elbow.

It is better to make a puncture in each arm, than to inoculate only in one place, not merely as the success of the operation is thus rendered more certain, but also because a

\* See Mr Pearson's Observations, page x of the Appendix to Dr Willan's Treatise on Vaccine Inoculation.

greater chance is given us to procure virus for farther inoculations; and when matter is taken frequently from the same Cow-pox vesicle, at an early period of the disease, which must in most cases be done, such a degree of inflammation is sometimes induced, as makes the vesicle run on to suppuration suddenly, before the symptoms of a constitutional affection have appeared. By suppuration thus taking place, an open sore is produced; the virus is discharged the moment it is formed, instead of being absorbed and taken into the system as it ought to be; and the patient may in this way be made to suffer all the uneasiness attending the operation, without obtaining any benefit from it. At least one vesicle should therefore be left untouched; and the matter may be taken from the other to propagate the disease.

The vesicle may also inflame, from the child rubbing it, if he is restless, and tearing off the crust, when it becomes itchy on the fifth or sixth day. From the risk of this



taking place, there appears to be a necessity in many cases for tying up the hands of children, to prevent the vesicle from being injured.

In performing the operation, the point of a clean lancet should be inserted beneath the scarf-skin, and carried so deep, as just to scratch and irritate the true skin.

If the virus to be made use of in the inoculation is fluid, it requires no preparation; but if it is dry, the piece of glass or cotton on which it is preserved should be held in the steam of warm water for a few seconds, till the matter can be worked into the consistence of paste by the aid of the moisture deposited on it. Of this a small portion should be taken on the point of the lancet, which is to be again inserted into the puncture, and gently rubbed upon the cutis for half a minute, or a minute, or at least until it excites a slight appearance of blood.

In this part of the operation, the lancet should be held in such a direction, that the

matter, if it is fluid, may run down towards the point.

Instead of inserting the matter by means of a puncture, some have recommended a scratch with the point of a lancet. In this case, the scratch should not exceed the eighth part of an inch in length, and it should not be carried to a greater depth than I have advised for the puncture, that is, to such a depth as will merely produce the appearance of blood from the vessels of the true skin. But I am rather inclined to think this method is liable to objection, from the irritation of a scratch being greater than that of a puncture; so that suppuration sometimes takes place in the course of a few days, by which the virus is thrown out when the vesicle breaks, and thus fails to produce the desired effect.

Dr Sacco makes use of a hollow needle with a groove on one of its sides, inclosed within two scales-like a lancet. With this instrument, which he charges with vaccine matter,

by filling the groove with it, he can inoculate upwards of an hundred patients in a quarter of an hour, making four punctures in each. This is the mode of inoculation employed for some time past at the vaccine hospital.\*

When the child is restless and unsteady, or when the virus is procured in a fluid state, it may be introduced more easily, and with less pain perhaps to the patient, by making a small incision, about the eighth or tenth part of an inch in length, with the shoulder of a lancet, or the edge of a small scalpel, or of a round pointed knife, which has been previously dipped in, or covered with the fluid matter. The instrument being made very sharp, and the incision rapidly performed, scarcely any blood appears until the virus has run into the bottom of the wound; the edges of which being brought by the finger and thumb into close contact for a few se-

\* See Report of the Vaccine Committee at Paris, p. 79.

conds, the bleeding is restrained, and the virus retained for a sufficient length of time to admit of its being absorbed.

When the virus is preserved on thread, or on a piece of cloth, it is generally inserted by making a scratch or cut in the usual place, into which a portion of the thread or cloth is gently pressed, and kept in its place with adhesive plaster; but as both the plaster and the scratch are apt to induce too much inflammation, and even suppuration, it answers better to hold that part of the cotton-thread that is to be used over the steam of warm water for half a minute or so, when, if it is fully impregnated with virus, a sufficient quantity may be pressed out with the point of a lancet, and introduced in the manner I have formerly advised.

## SECTION III.

*Of the Symptoms of the Inoculated Cow-pox.*

ON the third day from the insertion of the virus, if the infection has taken place, a small inflamed circular spot will be observed, with the puncture in its centre. At this early period a slight swelling may be felt, and even seen on looking sideways at the part.

On the fourth day, the inflammation has spread, and the swelling and hardness have evidently increased: the puncture, which hitherto appeared like a particle of hardened blood, begins to assume a yellowish brown colour, and forms into a crust.

On the fifth day these appearances have advanced; and on touching the tumour, or on viewing its profile, a slight depression is discovered in the centre, owing to the edges

being elevated by a small quantity of a transparent bluish or pearl coloured fluid that is secreted into the vesicle; and the inflamed circular spot, which was visible on the third day, is now, in a great measure, occupied by the new-formed vesicle.

In most instances, as I have mentioned already, the virus, which is now in its most active state, may be taken at this time for the purpose of inoculation; but, in some cases, it cannot be collected in sufficient quantity till the sixth or seventh day.

About this period, the swelling gradually increases, and the vesicle contains a larger quantity of lymph.

On the eighth day, although it sometimes happens on the sixth or seventh, a slight degree of inflammation appears near the base of the vesicle, of a dark red colour, which lessens in brightness till it reaches the extremity of the swelling, where it is lost as it were in the surrounding skin. Within the

circumference of this circular inflammation, or areola, the skin is hard and irritable, so that the least degree of pressure excites pain; and the glands in the arm-pits, in some instances, are stiff, swelled, and painful, but seldom in any considerable degree.\* The patient becomes sick and restless; has sudden changes from heat to cold; his pulse is quick; he complains of thirst, and is apt to start on falling asleep.

This constitutional affection is by no means an uniform occurrence; and it is not requisite it should be so, in order to ascertain that perfect vaccination has taken place; but at the same time its appearance, in conjunction with the other symptoms, must certainly increase our confidence in the efficacy of the inoculation. Dr Jenner had, at one time, some doubts with regard to this, but he is now quite decided as to vaccination giving

\* Sometimes the pain and swelling in the axilla appear on the sixth day from the inoculation. See Jenner's Inquiry, &c. p. 38.

security "when no indisposition has been perceptible throughout the whole progress of the pustules on the arm."\*

But although these symptoms appear occasionally in a slight degree, they are commonly not so severe as to require any medical treatment, and seldom continue longer than twenty-four hours.

As soon as this feverish attack takes place, the vesicle, which had been advancing slowly and regularly to maturity, increases more rapidly; the inflamed ring, or areola, with which it was surrounded, spreads in the course of a few hours to nearly double its former size, and on the tenth day, or sometimes sooner, is an inch and a half, often two inches, in diameter. This inflammation, or efflorescence, which seems to be of the erysipelatous kind, when it takes place to a sufficient extent, may be considered as a pretty certain

\* See Letter from Dr Jenner in Appendix to Willan on Vaccine Inoculation, p. 3.



test of the matter having been genuine, and of its having produced the real vaccine disease.

Hitherto the vesicle has been most elevated at the margin, and has had an evident depression in the centre; but about the ninth day the depression begins to fill up, and on the tenth or eleventh, the whole surface is either plain, or the centre is more elevated than the margin.

Some time between the eighth and tenth days, an eruption of small pimples, or rather a rash, now and then appears on different parts of the body, bearing a strong resemblance to that which is frequently observed before the eruption of the inoculated Small-pox.

This rash is of no farther consequence than as it affords an additional proof of the disease having entered the constitution; and it requires no particular medical treatment.

On the eleventh day the vesicle has attain-

ed its full maturity; and about this time, the virus contained in it is very similar to purulent matter; it becomes less fluid than it was before, and also loses much of its activity, as is found to be the case on its being used.

On the twelfth day the inflammation is much diminished, leaving a slight degree of redness at the base of the vesicle, and an inflamed ring round the circumference of the areola, while the intermediate space is nearly of the same colour with the sound skin.

This double ring, as it may be termed, is a distinctive mark of the real Cow-pox, provided it takes place after the symptoms already enumerated; although, as it is not perceptible in every case, especially where the inflammation has been more severe than usual, the want of it does not necessarily imply that the disease is of a spurious kind. The fluid in the vesicle now begins to dry up, the cuticle to separate, and the crust,

which before was brown, acquires a darker hue, and becomes more extensive.

On the twelfth or thirteenth day, the external margin of the areola completely disappears; and on the fifteenth, scarcely a vestige of inflammation is perceived.

From the time of the matter becoming dry, the crust is perceived to be thicker and more elevated, and of a darker colour; and sometime between the eighteenth and twenty-second day, it separates and falls off, when it is found to be semi-transparent, and leaves either a pit, somewhat larger than that of a single Small-pock, or a slightly ulcerated surface.

The cicatrix, or scar that remains, is permanent, corresponding in size and shape with the vesicle to which it succeeded; and a number of minute indentations may be observed in the skin, shewing the cellular structure of the original vesicle.

Lastly, it must be remembered, as I have

observed already, that in the genuine Cow-pox, the inflammation does not commonly take place, in any considerable degree, till the third day; from which time, till the eleventh day, it continues gradually to increase. Yet this is not the case universally: I have known inflammation follow the insertion of the virus immediately, and the vesicle pass afterwards through all its stages in the most regular manner.

The time at which the puncture becomes inflamed is various, and seems to depend on one or other of the following circumstances.

1. On the age and habit of the patient.—In weakly infants, the inflammation is not so rapid in its progress, and does not proceed to such a height as in adults, or in robust children. The sickness and febrile symptoms are commonly more severe in adults than in early infancy. In young children, indeed, they are often scarcely to be observed, if it be not by their making them more fretful than usual for a few hours.

2. On the kind of matter that is used in the inoculation.—If the matter has been taken at a late period of the disease, when it approaches to purulency, it loses much of its specific activity, and often has no farther effect than that of exciting an immediate and slight inflammation, similar to what any irritating substance inserted beneath the cuticle might be supposed to induce; but this dies away on the third or fourth day from the inoculation. In some cases again, it produces a good deal of inflammation, and a variety of irregular appearances, which have been occasionally mistaken for the genuine Cow-pox, by those who were not aware that such irregularities sometimes take place, or who had not attended sufficiently to the progress of the symptoms. At other times the matter lies in a manner torpid till the fourth or fifth day, when the part inflames suddenly, and the disease runs its course regularly from that period in the usual manner.

3. On the season of the year.—The Cow-

pox, like the Small-pox, has been observed in many cases to proceed with greatest rapidity in warm weather; and in winter, the progress of the pustule is less rapid than it is in summer.

It is necessary, therefore, that practitioners should be aware of these circumstances, that they may not be surprised at their occurrence; that they may guard against them as much as possible; and that mistakes on their part, which might be ascribed to the failure of the Cow-pox, may be avoided.

From all that has been said, it appears, that the indisposition arising from the inoculated Cow-pox is so slight, as scarcely to deserve the name of a disease; but the greatest degree of fever that has ever taken place from the concurrence of several unfavourable circumstances, such as the inoculation being performed during very hot weather, on a very robust patient, or during a fit of teething, has uniformly yielded to the means that are usually adopted in the common febrile

attacks in children, whether these arise from accidental cold, or some other occasional irritation; I mean, keeping the patient on a cool moderate diet, his body open, and bathing him for two or three minutes, up to the neck in warm water at bed-time. As it is, however, a point of much importance to know, that the virus has entered the constitution; and as the febrile symptoms which appear about the eighth day, form one of the strongest proofs that this has taken place; we should not, in any instance, attempt to prevent their accession. When the irritation arising from the vesicle is considerable, and excites much inflammation, a gentle laxative or two, of calomel, senna, or jalap, seldom fails to remove it; and dusting the inflamed parts with flour or hair-powder, is the best local application that can be made.

From scratching, or other causes, the vesicle is sometimes ruptured, and a sore is formed, which, if it is not checked in its progress, will, in bad habits of body, such as

where there is a scrophulous or scorbutic taint in the patient's constitution, occasionally spread in different directions, as frequently happens in Small-pox. Whenever the vesicle inflames too much, and afterwards ulcerates, if it does not, in the course of a few days, yield to the mildest dressings, such as simple ointment, the sore should be sprinkled every second day with calcined alum in fine powder, by which it is commonly cured.

But this is seldom necessary. Excepting in a few instances, I have not had occasion to make use of any kind of dressings.



## SECTION IV.

*Means of distinguishing the Genuine from the Spurious Cow-pox, and Causes of imperfect Vaccination.*

As the spurious Cow-pox, or as Dr Willan has named it, imperfect Vaccination, is, in many circumstances, similar to that which I have termed the genuine disease, it is an object of the greatest importance to be able to distinguish the one from the other. If this is not attended to, practitioners, as well as patients, may frequently be deceived and disappointed, by which means the practice of inoculating the Cow-pox will fall into discredit.

The genuine Cow-pox is, in some circumstances, indeed, so different from the spurious, that no one who has been accustomed to attend minutely to eruptive diseases, and who has, even in a very few cases, examined

the progress of the vesicle with attention, from the period of inoculation till its termination in a brownish scab, can afterwards well mistake the one for the other. But they who are not aware of the relation which the different stages of the Cow-pox bear to one another, and who have even inoculated with matter which they believed to be genuine, are very apt to be deceived: being led to expect that the genuine Cow-pox must take place, (although it is well known that a spurious or irregular pustule may be produced, under certain circumstances, by inoculating with matter from a genuine vesicle,) and not attending to the progress of the symptoms with sufficient care, they take matter from the vesicle with which they inoculate others, and are thus induced to persevere in propagating a spurious disease.

There is reason to think that this has sometimes happened; but even the possibility of such a misfortune points out the necessity of visiting the patient frequently from

the time of the inoculation, especially from the third to the twelfth day.

For we ought to consider not only the risk there is of individuals taking the Small-pox, who have been inoculated with a spurious disease, but also the risk there is of matter taken from a case of this kind, being spread extensively, and thus doing infinite harm.

Hence, it becomes an object of much moment to have clear and established rules for distinguishing the genuine Cow-pox from the spurious.

As the spurious Cow-pox appears under various forms, I shall mention all of them that, in my opinion, can be mistaken for the genuine disease.

1. When the matter for inoculation has been taken from the spurious Cow-pox, or from a genuine vesicle at a late period of the disease, after it has acquired the consistence of pus, the inflammation arising from the puncture is apt to take place early, even in the course of a few hours, and next day the

pimple is as far advanced as the genuine Cow-pox would be on the fourth day from the inoculation.

The inflammation continues to increase rapidly ; and, on the fourth day, it has an irregular inflamed base ; the pustule is of a conical shape, with no depression in its centre, and in general it is filled with purulent matter, which is discharged on this or the following day, when it heals like a common pimple or small phlegmon.

In other cases, instead of a pustule, an ulceration, and sometimes an attack of erysipelas, has been induced by the imprudent use of the vaccine fluid taken at a very late period of the disease.\*

The same appearances also take place frequently when the virus of the genuine Cow-pox is long kept without proper care, and, in some cases, where the inoculation is performed with a solution of the scab or crust of a Cow-pox vesicle in warm water.

\* See Willan, p. 32.

But in other instances where virus has been used in this state, the progress of the inflammation is more tardy; and no matter being formed, it gradually dies away; so that on the ninth or tenth day scarce a vestige of it remains.

2. There is another variety of spurious Cow-pox, or rather imperfect vaccination, which I have occasionally met with; and although an attentive practitioner will immediately distinguish the imperfect from the genuine vesicle, yet it may very readily be mistaken by those who are not accustomed to examine objects of this kind minutely. The virus with which the inoculation was performed in these cases was perfectly good, as it communicated to others the genuine disease; and I could not discover, that any of the children who were inoculated with it, and in whom a spurious pustule was produced, were previously affected with a constitutional or any other complaint, excepting perhaps a slight eruption on some

parts of the body, resembling the red gum, or strophulus intertinctus. The inflammation from the puncture seemed for the first three or four days, to follow the usual course of the perfect inoculation ; but on the fourth or fifth, instead of lymph beginning to appear in it, and the vesicle to become more prominent at the margins, and depressed in the centre, purulent matter formed in it; the pustule was of a conoidal shape, and larger than the usual size of the vaccine vesicle at the same period. The pustule, from this time forward, did not increase much in size, there was a very small degree of inflammation, of an irregular form, surrounding its base, but no double areola ; and, on the eighth day, the matter contained in it was completely dried up, nothing remaining on the surface, but a thin, opake, brownish scab, which separated on the ninth or tenth day, leaving no ulceration or pit ; and in the course of a few days more, no vestige of it was per-

ceptible. Dr Willan would most probably have called this an irregular vesicle.\*

3. Another variety of the spurious Cow-pox, is produced by inoculating with genuine matter preserved on a rusty lancet; in which case, the puncture becomes much inflamed in the course of the second day; the inflammation increases rapidly till the fifth or sixth, when the pustule contains a fluid of the consistence of pus, and thicker than genuine vaccine matter; and during the whole progress of the inflammation, the inoculated parts are much more itchy than the vesicle of the genuine Cow-pox.

A double areola begins to form on the sixth or seventh day; but it is not so regular in its shape as that of the genuine Cow-pox, and the pustule has none of the characteristic marks that distinguish the genuine from the spurious disease.

The fluid contained in it, instead of being

\* See Willan, p. 39.

thin and transparent, is viscid and opaque, and of a yellowish colour; the pustule, instead of being depressed in the centre, is elevated, and instead of being round, or oval, or well defined, is irregular in its shape, and ragged in its edges.

If matter is taken from this pustule, some of those that are inoculated with it may pass through the real disease; but the greater number will either not be infected, or will take the spurious Cow-pox, from the deficiency of vaccinc virus in the matter with which they are inoculated, and in which the character of common purulent matter predominates.

This variety of the spurious Cow-pox, is also exemplified in the pustules of those who have at some former period passed through the Small-pox, or the genuine Cow-pox. The double areola in this case appears on the sixth or seventh day, instead of the eleventh or twelfth, as happens in the genuine Cow-pox. As this is a point of much practical import-



ance, a Plate is annexed, to shew the appearance of this variety of the spurious Cow-pox, and to contrast it with the genuine disease.\*

4. I have observed another variety of spurious Cow-pox, or rather perhaps of Imperfect Vaccination, which is very similar to the real disease, but which does not secure the constitution from the Small-pox. It is produced by the scab or head of a genuine Cow-pox pustule being rubbed off, as I have mentioned already, on the fifth or sixth day from the inoculation. At this time the vaccine virus escapes as soon as it is formed, and the patient or attendants not being apprized of the necessity of preserving the pustule entire, if the parts are itchy or uneasy, the scab is rubbed off again and again, by which, either the whole of the virus is discharged as it is formed, so that none of it enters the constitution, and the inoculation is thus rendered ineffectual, or, such a degree of inflammation is in-

\* See Plate II.

duced, as completely defeats the intention of the inoculator.

An areola is no doubt formed, but it is very different from the areola in the genuine disease : its edges are irregular and jagged, and terminate abruptly, instead of shading gradually into the appearance of the surrounding skin.

The pustule frequently breaks, discharges purulent matter, and fills again ; and, lastly, the scab which forms on it is thin, and of a dirty yellowish colour ; while that which follows the real Cow-pox, is of a dark brown colour, somewhat transparent, and of considerable thickness.

All who have had sufficient experience in inoculating for the Cow-pox know, that there is no one certain criterion, applicable to every case, by which it can be ascertained that the disease has pervaded the constitution ; and it is also known, that the surest way of judging of this, is by minute attention to the progress of the pustule from its commencement,

and being satisfied, that all the principal marks of the genuine Cow-pox have appeared.

There is also reason to think, that the matter should be allowed to remain in the pustule, that it may be absorbed and taken into the constitution. From my experience in this disease, I am of opinion, that the febrile paroxysm alone, which is generally perceptible about the seventh or eighth day, is not a sufficient test that the disease has taken place, unless it is followed by a distinct and well-formed areola. Symptoms of fever may arise from teething and other causes; and, as I have mentioned already, that when a Cow-pox pustule is frequently robbed of the matter which it contains, previous to the eighth day from the inoculation, although the inflammation round the pustule increases to a considerable extent, the areola in these cases is sometimes irregular, and not accurately defined. Whenever there is reason to suspect, from this, or from any other

cause, that the Cow-pox has not properly taken place, another inoculation should be advised, and repeated from time to time, till the genuine vaccine disease is produced, by which alone the patient can be made safe; or until it is ascertained, by the appearance of the subsequent inoculation, that the patient has already passed through the genuine disease.

In some cases, if the surgeon is off his guard, or is not aware that a certain degree of irregularity occasionally takes place in the progress of the symptoms, he may regard the genuine Cow-pox to be spurious.

Thus I have observed, in a few instances, that when matter which had been kept for a considerable time was used, no inflammation appeared at the puncture till the seventh or eighth day, when the parts became red, and the disease ran its ordinary course, as if the inoculation had been performed on one of these days. Mr Ring mentions two cases of this kind, in one of which, the pustule did not

form till the fifteenth, and in another, not till the sixteenth day from the inoculation; and yet in both the genuine disease was produced.\* I have also met with an instance of the same kind; and Mr Pearson states, that in one case, the inflammation did not commence till the twentieth day after the insertion of the fluid.†

The same suspension of the symptoms has been observed to take place under a variety of other circumstances; as for example, when an attempt was made to vaccinate patients who had already contracted the contagion of Scarlatina, Measles, Typhus, Variella, and Influenza. In these cases the virus lay inactive for some time, and the areola was proportionally long of being formed.

The regular progress of the symptoms has also been impeded by the presence of a va-

\* A Treatise on the Cow-pox, by John Ring.

† See General Observations on the Cow-pox, by John Pearson, Esq. F. R. S. in the Appendix to Dr Willan's Treatise on Vaccine Inoculation, p. ix.

riety of cutaneous diseases, such as Herpes, or Ring-worm; Tinea, or Scald-head; the Itch, Lichen, the dry and humid Tetter, and several others, particularly when these diseases are of a contagious nature.

In the report of the French Vaccine Committee, various cases are noticed where the progress of the vaccine vesicæ was retarded by the occurrence of the measles.—One case is particularly remarkable. A child, four years of age, was attacked on the fourth day after the inoculation with Cow-pox, with symptoms of measles; on the sixth day, the measles appeared; the vaccine vesicles had hitherto advanced regularly, but they now remained stationary for ten days, at which time, the measles having disappeared, the vaccine vesicles resumed their course, and five days afterwards, matter taken from them produced the regular Cow-pox on another patient.\*

In other instances, from causes with which we are not acquainted, the puncture does not

\* See Report, &c. p. 42.

inflammation; and concluding that the inoculation has failed, we repeat it, when, in the course of a day or two, the first puncture begins to inflame, and on the ninth or tenth day from the first insertion of the matter, is as far advanced as it ought to be.

## SECTION V.

*Means of ascertaining, whether a Patient has passed through the Genuine Cow-pox.*

IN judging from my own experience, as well as from conversation and correspondence with others, and the perusal of the best books on the subject, my opinion is, that when the Cow-pox runs regularly through the stages that I have stated, it never fails to preserve the patient from the contagion of Small-pox. But it must be confessed, that some patients have been seized with the natural Small-pox, or have received the infection by inoculation, who were supposed to have undergone the genuine vaccine disease.

This failure to procure exemption from Small-pox, cannot so fairly be charged to the



want of a preservative virtue in the Cow-pox, as to inattention on the part of the inoculator. The Cow-pox is comparatively so much milder than the Small-pox, that many practitioners think they have done enough if they inoculate their patient, and visit him once or twice during the progress of the disease.

But so much delicacy of observation is requisite to ascertain the regular progress of genuine Cow-pox, that every patient should, if possible, be seen at least once in two days, otherwise mistakes will occur, the practice will fall into disgrace, and many be thereby deprived of the advantages that would result from it.

It has sometimes also happened, even where causes of doubt have taken place, that the practitioner, either from inadvertence, or false delicacy, or from some other improper motive, very injurious to all concerned, has not intimated his suspicions, but in place of making a candid avowal, has concealed his

doubts, till some of his patients, in this state of uncertainty, have been seized with the natural Small-pox, by which an outcry has been raised against the Cow-pox.

In every case of this kind, in which there is reason to suspect, that the Cow-pox has not taken place, the inoculation should be repeated immediately with fluid matter; and if the appearances that have been already described are not produced, we may conclude, with much probability, that the patient has previously gone through the genuine Cow-pox.

Or, if the patient will not submit to a second inoculation, he and his friends should be warned of the danger, and cautioned not to trust to the first as a preservative from the Small-pox.

I have already had occasion to state, that there is no one certain test of a patient having passed through the genuine Cow-pox; and that it is only by the most minute attention to every circumstance of the disease in

all its stages, and to the combination and relation which all the appearances bear to each other, that a decisive opinion can be formed.

In order to ascertain whether a patient has undergone the genuine Cow-pox or not, the double inoculation has been proposed. It has long been known in Small-pox, that if a person be inoculated with variolous matter at different times, before the fever arising from the first puncture takes place, all the punctures arrive at the same state of maturity nearly at one time; with this difference only, that the pustules produced by the subsequent punctures are smaller than the first, and proportionally smaller according to the lateness of the period at which the inoculation is performed.

This experiment has been frequently repeated by different practitioners with the matter of Cow-pox, and the result has been uniformly the same.\* By inoculating on the

\* See Woodville's Reports of a Series of Inoculations,

fifth day from the first operation, the areola on both is observed to be nearly in the same state on the ninth day, varying only in this, that the areola of the second puncture is not quite so large as that of the first.

When we meet with this, it may be reckoned a pretty certain test of the virus having entered the constitution; but the failure of the second or third puncture is no proof that the patient has not received the genuine vaccine disease by the first inoculation, as those punctures will at least as frequently fail to produce pustules, as if the patient had not been inoculated before. It happens fortunately, therefore, that this kind of test is not necessary with those who are in the practice of the vaccine inoculation; none of whom, if they duly attend to the different stages of the disease, can ever hesitate to say whether or not the infection has taken place;

and we find, accordingly, after the experience of five or six years from its first introduction, that it has not been generally adopted.

I have not therefore, for these last three or four years, practised the double inoculation, except in those cases where the patient or his friends have wished it to be done; and I have been induced to adopt this conduct by the following considerations.

The double inoculation was proposed as a test of the patient having upon him at the time the genuine Cow-pox. When the second inoculation proves efficient, there can be no doubt that it affords additional evidence of the presence of the genuine vesicle; and were it always to be efficient, the general adoption of the measure would at least not produce any inconvenience. But the second inoculation is at least as apt to fail as the first, and a failure is known to take place in a considerable proportion of inoculations, so that many require to be inoculated three, four, or

five times, before the disease can be produced. It is evident, therefore, that, under these circumstances, the double inoculation must act as a double-edged weapon. If it fails to excite a second vesicle, the confidence of the patient's friends in the preventive power of this inoculation will be shaken, however much they may believe in the anti-variolous influence of the genuine Cow-pox; so that it is as likely to do harm on the one hand, as it might on the other hand have done good, by affording additional evidence of the efficacy of the inoculation. I believe it is generally allowed, that the symptoms of the disease, and appearance of the vesicles in their different stages, are now so thoroughly understood, that no experienced practitioner, who attends carefully to every circumstance requiring attention, can mistake a genuine for an imperfect or spurious vesicle. Now if this statement be correct, there is no necessity, on the part of the practitioner, for any additional proof

of the disease being genuine; so that the only remaining motive for the double inoculation, is the anxiety of the patient or his relations. If, however, notwithstanding the assurances of the surgeon, the patient's friends shall have any doubt as to the genuine Cow-pox having taken place, or if, in consequence of any unforeseen or uncommon circumstance, the inoculator himself shall see cause to hesitate in pronouncing on the real nature of the disease; then by much the best way is to perform the inoculation some weeks after the patient has recovered from the first; and as I conceive a second inoculation, provided it is followed by the formation of a vesicle at such a distance of time, to be a never-failing, invariable test, whether he has at any former period passed through the Cow-pox, or Small-pox; I would even go farther, and propose, that it should be adopted in every case where there can be any doubt.

When, either from inadvertence on the part of the practitioner, or from any other

cause, it is not with certainty known whether the genuine vaccine disease has been produced, the operation should either be repeated, or the patient should be inoculated with the matter of Small-pox, by which complete certainty can be obtained; and as the patient, if he has passed through the genuine Cow-pox, will not be susceptible of the Small-pox, no injury will be done by this inoculation.

As it is frequently necessary to gratify the wishes of some individuals, by subjecting the patient to inoculation with the Small-pox, which is conceived by many to be the most unequivocal test of his having been properly vaccinated, I shall state the appearances of the Small-pox puncture, when the constitution is really armed against the infection, by having previously passed through the vaccine disease.

They may be distinctly perceived in three varieties.

1. In the first of these, a few hours after



the variolous matter is inserted, the puncture inflames, and continues nearly in the same state for eight, nine, or ten days, the redness never varying much, or extending over a greater space than about the eighth part of an inch in diameter.

2. In the second, the puncture inflames soon after the variolous matter is inserted, and very early produces a pustule containing matter, which pustule recedes suddenly about the sixth or seventh day; and, in this case, may be reckoned a certain test of the patient having been previously affected with Cow-pox.

3. The last and most important variety, is that in which the pustule is inflamed on the day after inoculation, and continues to increase regularly till the tenth or eleventh day, when it is at its height, and when, from the soreness of the part, the patient becomes sick, and is sometimes affected with startings similar to those that precede convulsions. In this case, the inflammation is commonly of

the size of a half-crown piece, but is of a darker colour than in Small-pox, and has not so much crysipelatous redness as the Cow-pox. The pustule is of a livid colour; on being punctured, it rarely gives out any matter; and where it contains a fluid, this does not so readily produce any marked disease in those cases where it has been accidentally used in inoculation, as that matter which is taken from the pustules in a case of ordinary Small-pox.

The inflammation begins to recede about the eleventh day; and on the fourteenth or fifteenth, is scarcely perceptible, leaving, in the place of a pustule, a brownish scab, similar to that which remains where the inoculated Small-pox has failed to produce a constitutional disease.

This variety, which is not uncommon, is more like the genuine Small-pox than any of the others; but although it must be confessed that fever, much resembling the eruptive fever of Small-pox, followed by an eruption

of pimples on different parts of the body, chiefly under the clothes, is sometimes met with after inoculation with variolous matter, even when the patient has been vaceinated, or has already had the Small-pox; or in nurses who have had the Small-pox, and are employed in keeping children ill of the disease,\* yet it differs essentially from Small-pox in the following circumstances. It is never accompanied with any eruption of proper Small-pox pustules in other parts of the body; the pustule does not follow the same regular progress with that of the Small-pox; and matter taken from it does not so readily propagate the former, as the virus does which is taken from a patient, who is labouring under the disease in its ordinary form.

It appears, therefore, in all cases of doubt, to be a safe preeaution, either to repeat the vaeine inoculation, or to inoculate the patient with the Small-pox.

\* See Willan, p. 68. and Jenner's Continuation, p. 38.

## SECTION VI.

*Cases in which the Vaccine Inoculation should be deferred.*

THE inoculated Cow-pox is so mild, that it has been communicated with safety to a woman within a few days of delivery, and to children in the earliest stages of infancy. Some indeed have asserted, that the vaccine inoculation may be performed with safety a few hours after birth, but it is undoubtedly better to defer it till the sixth, seventh, or eighth week.

While children are suffering severely in teething, particularly when they are liable to fits, the vaccine inoculation might be brought into discredit were it to be advised, as many would refer the symptoms produced by teeth-

ing to the effects of the Cow-pox; but the symptoms of this disease are so mild, that in all other circumstances of teething the inoculation may with safety be performed.

There are some states of the body, which there is reason to suspect do not readily receive the vaccine disease, as is said to be the case with patients infected with itch, as well as with those who have been recently using much mercury\* or sulphur. A remarkable proof of the influence of sulphur in enabling the constitution to resist the infection of Cow-pox, is given in Dr Tierney's inaugural dissertation, which shews, that in such circumstances the vaccine inoculation should not be advised.

Dr Jenner was ordered by the Commander in Chief to inoculate such men of a regiment,

\* The anti-vaccine influence of mercury is not uniform; as in the Report of the Physicians and Surgeons of the Cow-pox Institution in Dublin, it is stated, that in three cases under the influence of mercury, for the cure of lues, the Cow-pox observed its usual course.

at a considerable distance from London, as had not previously had the Small-pox. On his arrival at the head-quarters of the regiment, he found most of the men were ill with an inveterate itch, so that he declined inoculating them till they were cured of that disease. He therefore put them under a course of sulphur, and returned when he supposed they would be well. Thirty were inoculated with the vaccine virus, but not one of them took the disease. Dr Jenner concluded, I think with reason, that the failure arose from the constitutions of these men being charged with sulphur, because, when they were inoculated two or three weeks thereafter, they all took the genuine Cow-pox.\*

Some practitioners have been averse to this inoculation in patients with scrofulous tumours or sores; but in this I think they are wrong. Even in the worst stages of scrofula,

\* See Tierney Dissertat. &c. p. 46.

no bad consequences ensue from the vaccine inoculation. On the contrary, it appears, that, in a variety of cases, scrofulous enlargements of the parotid and submaxillary glands, of those of the neck, and of the amygdal, which were very large previous to vaccination, disappeared soon after the children had passed through the Cow-pox.\*

Others again have alleged, that some constitutional diseases are rendered less violent during the progress of the Cow-pox, and that this is particularly the case with chin-cough. I cannot, however, verify this opinion from the result of my own experience; for although I have inoculated several with Cow-pox, who were at the time labouring under chin-cough, I never observed that it became less violent.

It is, however, abundantly well known, that the condition of various local eruptions, and of some even where the constitution is af-

\* See Report of Vaccine Committee at Paris, p. 69.

fect, is ameliorated, and that they are frequently cured by the influence of the vaccine inoculation. Dr Jenner states the case of a child, whose face was involved in one general thick incrustation, and who had been in that state for more than two years, during which time applications had been made to no purpose. The disease extended to the scalp, and spots of a similar appearance were produced wherever any of the acrid discharge happened to come. The child was vaccinated, passed through the genuine disease, and at the expiration of a fortnight, the whole of the incrustation had disappeared.\*

Those who oppose the vaccine inoculation say, that when a person has been exposed to the contagion of Small-pox previous to his being inoculated with Cow-pox, and the two diseases meet, the Small-pox will be rendered more severe; but this is not supported by the

\* See Jenner on the Varieties and Modifications of the Vaccine Pustule, occasioned by an Herpetic state of the Skin, p. 11.



experience of the most accurate observers. I have repeatedly seen the Small-pox eruption take place on the fifth and sixth day after the introduction of the vaccine virus; both diseases passed through their different stages; and, so far as I could judge, the Small-pox in such cases was as mild as usual.

In general we ought to avoid inoculating a child with vaccine matter, when any eruption has recently appeared on the skin, until the nature of this eruption shall be fully ascertained. For although various eruptive complaints seem to have been modified, or rendered milder, or even cured by the vaccination of the patient, on the other hand I have repeatedly seen the progress of the vaccine vesicle retarded, and sometimes its antivariolous influence prevented by an attempt to communicate the infection at the commencement of an eruptive disease of a different nature. How far the character of this other eruption was modified by the vaccine inoculation, I cannot pretend to determine;

but to elucidate the description of both, I have added a Plate, No. III. in which I have represented the vaccine vesicle, and one of the constitutional pustules, as they appeared on the sixth day after the vaccine matter was inserted. At the time of the inoculation, the mother of the child pointed out to me three or four pimples, not larger than the heads of small pins, one on the arm, the others on the breast and legs, which did not then appear to me to arise from any constitutional disorder. Two days after the inoculation, however, the child became feverish, and although no new eruption of pimples came out, yet those which were already out increased rapidly in size, and the fluid contained in them, from being at first transparent, soon became opaque, and acquired a yellow colour, together with the consistence of purulent matter. The vesicle, or rather pustule, on the arm, in its progress towards maturation, kept pace with those on the other parts of the body. But it was not like them, of a re-

gular circular form; it was irregular, elliptical, with its edges indented or ragged; in which circumstance, and in the appearance of the surrounding inflammation, it bore a strong resemblance to the spurious Cow-pox, delineated in Plate II. fig. 3. Crusts formed on the vesicle at the inoculated spot, and on the pustules on the other parts of the body, nearly at the same time, and were constantly receiving additions from the matter oozing out from below, and hardening at their edges. When the scabs separated, the subjacent sores did not heal, but in place of healing, new crusts formed, and separated again and again, and each successive crust was larger than that which immediately preceded it. A succession of crusts continued to form and separate for five or six weeks, and at one time the sores below each of them were nearly equal in size to a six-pence; and when these sores healed, the places which they had occupied were of a darker colour than the surrounding skin.

I could not satisfy myself with regard to the nature of this eruption. It seemed to resemble the hives, or conoidal varicella, more than any other. It certainly was longer of receding, and the eruption was less numerous than usual in the hives, and there was no succession of vesicles, as is often met with in this disease. However this may be, the vaccine inoculation was rendered ineffective by the disease which previously existed in the constitution; for upon inoculating the child some months afterwards, he passed regularly through the Cow-pox.

I think it only necessary to observe farther on this part of the subject, that the vaccine inoculation may be advised at all ages, in every season of the year, and in whatever habit of body the patient is, excepting in the first six or eight weeks of infancy; in severe fits of teething; during the continuance of measles, scarlatina, itch, herpes, of all those affections which are described by Dr Willan under the head of Psoriasis, of the red

and yellow gum in young children, the tooth-rash, and in general all other eruptive diseases; in febrile, and other hazardous complaints; or when the patient is using much sulphur or mercury, for the cure of any constitutional disorder.

## SECTION VII.

*Of the Advantages of the Cow-pox over the Small-pox.*

BEFORE I quit this interesting subject, it may be proper to state more fully the reasons for preferring the vaccine to the Small-pox inoculation.

1. The inoculated Cow-pox has not hitherto proved fatal; whereas it is well known, that many die annually of the inoculated Small-pox. It has been said indeed, that the Cow-pox has proved fatal in various instances; but, on investigating all the circumstances of the cases that were advanced in proof of this assertion, they were uniformly found to originate in mistakes.

2. The Cow-pox has neither done harm to

the constitution, nor has it been followed by any secondary disease. It has indeed frequently been asserted, that the vaccine inoculation has, in many cases, given rise to various kinds of cutaneous eruptions. In refutation of this assertion, I need only quote Dr Willan, who has long been at the head of that branch of practice, connected with the treatment of cutaneous diseases.

“ I have carefully examined, with different  
“ physicians and surgeons, various cases of  
“ cutaneous eruptions, attributed to vaccina-  
“ tion. Instead of the mange, or any other  
“ eruption communicable from quadrupeds  
“ to the human skin, we constantly found dis-  
“ eases, which were known, and have been  
“ fully described, by medical writers, more  
“ than a thousand years ago, viz. the lepra,  
“ the dry and the humid tetter, the prurigo,  
“ the chronic nettle-rash, and the strophulus  
“ candidus; but more especially the dandriff,  
“ the favus, the crusta lactea, the scald-head,  
“ and the ring-worm. Some persons main-

“ tain, that if the inoculation of vaccine virus  
 “ does not excite new eruptions on the skin,  
 “ it, at least, increases the number of the cu-  
 “ taneous complaints with which we were be-  
 “ fore acquainted, and renders them more  
 “ inveterate. My own experience would au-  
 “ thorise me to contradict this assertion, but  
 “ I shall perhaps refute it more satisfactorily,  
 “ by exhibiting the annexed lists, which Dr  
 “ Bateman, at my request, extracted from  
 “ the register of patients at the public dis-  
 “ pensary in London :

	Total number of Diseases.	Number of Chronic Cutaneous Eruptions.
“ In the year 1797	1750	85
1798	1664	82
1804	1915	89
1805	1974	94

“ This table shews that the proportion of  
 “ cutaneous eruptions to all other diseases,  
 “ was the same before the publication of Dr  
 “ Jenner’s Inquiry, as in the 6th and 7th year  
 “ of vaccination. Nearly the same propor-



“ tion may be deduced on comparing Dr  
“ Murray’s, Dr Reid’s, Dr Walker’s, and my  
“ own, Reports on Diseases in London for  
“ the last ten years.”\*

The few cases in which a superficial sore has remained on the arm, from the scab or crust being removed too soon by the restlessness of the patient, cannot be regarded as a secondary disease produced by vaccination. On the contrary, some, as I mentioned formerly, have asserted, that, by inoculating with Cow-pox, the violence of different febrile symptoms, such as those which accompany measles, chincough, and teething, appears to be mitigated.

On the other hand, even when the Small-pox does not prove fatal, it often lays the foundation of other diseases that continue for life, and render the person miserable: it frequently causes inflammations, specks, and films on the eyes, rouses into action the la-

\* See Willan, pp. 81 and 82.

tent scrofulous predisposition that otherwise might never have appeared ; and it often induces such debility, that the patient never recovers from it.

From these circumstances, many still entertain great prejudices against the variolous inoculation ; and as the contagion is continually kept up and propagated by those who inoculate, often at unfavourable seasons of the year, it has been supposed, that in Great Britain alone, not less than forty thousand are annually cut off by the Small-pox : so that it is at least doubtful, whether the introduction of inoculation has, on the whole, contributed to lessen the number of those who die annually of that disease.

3. The inoculated Cow-pox gives so little uneasiness, that even when we are watching for the expected attack of fever, it cannot always be distinguished, so that on this account parents may lay aside anxiety. But the degree of fever that may accompany Small-pox can never be foreseen ; and the

inoculation of a child on the breast, has often bad effects on the mother, from her fears and anxiety for the consequences of the disease.

4. The Cow-pox can be propagated by inoculation only, and not like the Small-pox, through the medium of the atmosphere; so that a child on the breast, after being inoculated, may sleep with its nurse during the whole course of the disease, even though the latter never had the Small-pox. Nor will the nurse run any risk of contracting the Cow-pox, provided the matter of the vesicle be not allowed to touch any part of her body where the skin is broken.

The contagion of the inoculated Small-pox, as far as we know, is equally powerful with that of the natural Small-pox; so that, on being communicated to any one person of a family, every individual in the same house, and ultimately in the neighbourhood, who has not had the Small-pox, must be inoculated, to escape the risk of taking it in the natural

way; and this may frequently happen at an unfavourable season of the year, or at a time very inconvenient for the patient.

5. The Cow-pox may be communicated with safety at all seasons, in every climate, without changing the patient's diet, or in any way altering his manner of living.

The inoculated Small-pox, although comparatively much milder than the natural, cannot be propagated with safety at every season. In summer it is unsafe, as the heat of the season renders the disease more dangerous; and in winter the patient is apt to suffer from being exposed with that freedom to the open air, which is so essential to the success of the practice.

6. No preparation is necessary for the Cow-pox, if the patient be not habitually costive; in which case, an opening medicine, such as a dose of calomel or jalap, may be given two days before the inoculation, and repeated once or twice during the progress of the disease. Whereas, in the Small-pox, if the pa-

ient is of a full habit, he must be reduced by low diet and purgatives before the inoculation can with propriety be advised.

7. In the inoculated Cow-pox, no medicines need be given to obviate the symptoms peculiar to that disease, as they are so mild as scarcely to require attention. Whereas, in the inoculated Small-pox, epileptic fits, and other alarming symptoms, very frequently take place.

8. The smoothest face is often injured by the Small-pox. Even when it is communicated by inoculation, pits are often produced over the whole surface, so as to disfigure the features: such pits are never produced by the Cow-pox.

9. The Cow-pox, as I have observed already, may be communicated with safety even in the earliest period of infancy, and almost in every situation, if it be not during the continuance of a contagious or some other dangerous disease. Whereas, it is unsafe to inoculate a child with Small-pox till the fourth

or fifth month; so that, previous to this age, children are daily exposed to the danger of suffering by the natural Small-pox. This danger is obviated by the introduction of the Cow-pox, which, from this circumstance, as well as from many others, has acquired a decided preference to the inoculation of the Small-pox.

## SECTION VIII.

*Of the Advantages which might arise from the Clergy exerting their Influence in promoting Vaccination.*

IT has, always been my opinion, that the exertions of medical practitioners, even if they should be aided by the civil power, would not be able to establish generally, over the whole country, the practice of Vaccination. All that could well be expected from them, was, to introduce vaccination to the public—to represent, fairly, the advantages resulting from the new practice—the probability that if it were universally adopted, the Small-pox would be eradicated—and to offer to inoculate gratuitously all who should apply to them, for that purpose. The greater part of the medical profession have performed their duty to the public, in the most disinte-

rested manner, by doing all in their power to introduce a new practice, for which they receive little or no recompence, to extirpate a disease, the daily occurrence of which afforded almost every practitioner of medicine, a considerable revenue.

The Government has done all that it would be prudent for it to attempt, by calling the attention of the House of Commons to the business, and directing the Royal College of Physicians of London, to collect information on the subject, from every part of the united kingdom, and to report the result of their investigations. This the College has accordingly done, in an able report,\* which must satisfy every candid person of the anti-variolous power of the vaccine inoculation, and of the folly of those who have cried out against it.

But there is yet another highly respectable class of men, I mean the Clergy of Scotland, whose influence with their parishioners is de-

\* See Appendix, No. I.



servedly great, and whose zealous exertions in recommending the practice of vaccination would probably soon render it universal in this country. I know, from my own intercourse and correspondence with many of them, in various parts of Scotland, what great and successful exertions some of them have made to establish vaccination in their own districts. But this very proof of their influence with their parishioners, makes us regret that they have not exerted themselves more on so interesting a subject. There are still among the common people, chiefly in the country parishes of Scotland, as well as England, many religious scruples, and other prejudices, which ought to be removed. This the clergy are well qualified to do; and I have no doubt but that, by their judicious perseverance, they would soon induce the people to receive, generally, the new inoculation. But I should wish them to go much farther than mere recommendation and argument; in my opinion, every clergyman might easily learn

the few essential facts relative to the practice of vaccination, and when discharging his clerical functions in visiting his parishioners, might inoculate all those who apply to him, or who live at such a distance from a town or village, that the assistance of a medical practitioner cannot readily be procured.

If the clergy of this country were to engage generally and heartily in the measure, they would find numberless opportunities of gaining the affections of their people, and they would do more towards extirpating the Small-pox, than the whole medical profession, aided by the legislature, can accomplish. Indeed, if they visited their parishes twice in the year, and inoculated all the young children in the course of their progress, which might easily be done by devoting to it a few minutes every day, the Small-pox never could become epidemic in these districts, and would soon be absolutely unknown.

I am happy to observe, that the opinion I had formed on this matter, is corroborated

by the result of the application made to the clergy in France, by the committee of vaccine inoculation. The official document containing the detailed account of what was done by the clergy in that country, with the loan of which Dr Duncan, jun. Professor of Medical Jurisprudence and Police in this University, was so good as to favour me, is so important, that I think it right to transcribe a portion of it in this place.

The committee begin by enumerating the various plans adopted by the prefects, sub-prefects, and mayors, for the introduction of vaccination; and state, that one of them gave directions to have the children in all the hospitals in his department vaccinated; that another gave pecuniary assistance from the parish funds to those poor people who had their children inoculated, and withheld it from such as refused; that another directed different medical practitioners to travel through his department, and to vaccinate all those who should apply to him; that

others ordered all the foundlings in their departments to be vaccinated, and deprived the nurses of those children of their wages, if this order was not complied with; that one refused admission into the secondary schools to those children who were not vaccinated; that one prefect was himself inoculated, another had his child, and a third his whole family; that a professor of medicine at Paris examined those who were candidates for degrees on their knowledge of vaccination; that one prefect directed considerable pecuniary rewards to be given to those who had vaccinated the greatest number in his department; that an order was issued by the Prince of Neuchatel, Major-general of the grand army, for all those soldiers who had never had the Small-pox being vaccinated; and that several prefects, gentlemen of independent fortunes, and even ladies, propagated the Cow-pox most industriously, by inoculating many with their own hands.

The committee then proceeds to detail the

advantages arising from the interference of the Clergy.

“ But one can scarcely conceive, how ineffectual the decrees of the prefects, the orders of the sub-prefects, the exhortations of the mayors, and the good-will of every one connected with the administration, and with the medical faculty, would have been without the assistance of the clergy. The prejudices of the people were more deeply rooted than could well be imagined, and the whole influence of religion was requisite to convince the country people in various places, that Divine Providence did not object to their having recourse to a preservative, which, in its infinite goodness, it had bestowed on mankind.

“ The committee have the satisfaction to inform you, that almost the whole clergy made it a point of duty to return an answer to the invitation which his Excellency addressed to the Bishops of France, and that the clergy, in many parishes, uniting exam-

ple to advice, have themselves vaccinated their young parishioners, distributed instructions, and done all in their power to overcome not only religious scruples, but repugnance of every kind, the most frequent cause of which has been found to be the most absolute ignorance. In this manner the Archbishops of Besançon and Thoulouse, the Bishops of St Flour, Aix-la-Chapelle, Coutances, Versailles, Mans, Naney, and Rochelle, adding to the motives of public advantage, which were explained in the letter addressed to them by his Exeelleney, those with which an enlightened zeal of a benefieent religion could furnish them, have effected in their respective dioeeses, what the eivil authority alone never could have aecomplished. The Arehbishop of Besançon wrote to the committee, that during a visitation of three months, in different parts of the two departments, of which his extensive dioeese is composed, he had considered it as one of the most sacred duties imposed on him to distri-

bute among the rectors and curates, a pastoral letter, in which, after having explained to them the astonishing and important effects of vaccination, he informed them of the wish of government, that they should second its paternal intentions. It is without doubt as much owing to the persevering zeal of this prelate, as to the constant activity of the prefect of Doubs, and to the talents of M. Barrey, that the eagerness with which the inhabitants of these two departments have recourse to vaccination, ought to be attributed. M. Barrey informs us, that they consider their enrolment to be vaccinated of as much importance as that which certifies the legitimacy of their children. The Archbishop of Thoulouse, convinced of the importance of joining the civil power with the ecclesiastical authority, has sent to all the clergy of his diocese a memoir, which M. Richard, prefect of the Upper Garonne, drew up on the subject of vaccination, which he has enjoined them to read after the homily of the

parochial service. The Bishop of Mans having witnessed the good effects of vaccination, in several children of his family, requested the clergy of his diocese, in a letter written for the express purpose, to do every thing in their power to communicate this preservative to their parishioners; and he ordered them all to read his letter at the conclusion of the parochial service. The Archbishop of Aix-la-Chapelle, after thanking the committee for their last report on vaccination, which they had sent him, requested, that the minister (of the interior) would permit him to reprint a letter which the minister had addressed to him, and to distribute it through his diocese, as this would be the most effectual means of enlightening and augmenting the zeal of the clergy. The Bishop of Nancy informed his Excellency, that one of the three departments which compose his diocese, has been filled with prejudices, which he considered to be anti-religious errors, as well as anti-social; these he endeavoured to extin-



guish at their commencement, in a letter which the prefect of La Meurthe has distributed in his department. Since that time, the preachers of his diocese have taken pains to propagate the advantages of vaccination; many of the clergy have lent their houses, and even given money to induce their young parishioners to be vaccinated.

“ M. Barante, prefect of Léman, being informed, that timid and ignorant men had been endeavouring to create religious objections against one of the greatest benefits that Providence had conferred upon mankind, prevailed on the Bishop of Geneva to address to his clergy a circular letter, to inform them of the advantages of vaccination, and to exhort them to contribute as much as they possibly could, to the success and the propagation of vaccine inoculation. M. Kepler, prefect of la Sarre, informed us, that Mons. Schmitt, vicar of Niederstadtsfeld, had himself vaccinated, gratuitously, 943 patients. He added, that the zeal and disinterested-

ness of this excellent ecclesiastic was the more praise-worthy, as it was owing to him alone that vaccination was introduced into a poor country, which is thinly inhabited, and where prejudices are the more alarming, because they are far behind in point of knowledge.

“ Mons. Pellieux, physician at Baugenci, in the department of Loiret, informed the committee, that the success of the new method had ceased to meet with any obstacle in religious prejudices, since M. Reuilly, rector of that town, and the clergy of some neighbouring communes, had made use of arguments, drawn from religion, to induce their parishioners to withdraw themselves from the ravages of the Small-pox.

“ The Abbe of St Medard, vicar-general of the diocese of Rochelle, and rector of the Isle of Oleron, wrote to us, that after having engaged a surgeon, to vaccinate all the children that presented themselves to him, he mounted the pulpit, combated keenly their prejudices, and endeavoured to inspire them

with confidence in the practice; that in consequence of this, upwards of 200 were vaccinated in the village, and, in short, that he was so fortunate as to put a stop to the ravages of the Small-pox, which had for some time been epidemic in that place.

“ In an excellent report made to the prefect of Cantal, by M. Parra, secretary to the committee of Aurillac, we have remarked, that several clergymen, convinced that a father of a family had no right to deprive his children of the advantage so generally acknowledged to be derived from vaccination, had made the refusal to vaccinate their children, a case of conscience with their parishioners: these venerable clergymen, adds M. Parra, now enjoy the satisfaction of having prevented much misery, and of having dried up the tears of many eyes.

“ M. Couguet du Boisset, rector of Balaivilliers, in the department of the Seine and Oise, did not wait for the letter which had been addressed to him by the Bishop of

Versailles, to exhort his parishioners publicly to vaccinate their children. M. Brunet, surgeon to the prisons in Paris, vaccinated a child in the village, and M. Couguet made use of the matter from it to vaccinate nine others, and from these he afterwards inoculated the majority of his young parishioners, and several in the adjoining parishes.

“ M. Troussel, rector of Chambray, in the department of the Eure, struck with the disasters occasioned by the Small-pox in his parish, had his niece vaccinated, and, in conjunction with a surgeon in the neighbourhood, employed the matter obtained from her in inoculating 75 other children. This vaccination having succeeded, he converted his house into an hospital, vaccinated in it nearly 200 patients, and collected a number of important observations, which the committee of the department of the Eure has been so good as transmit to us, and which we find to possess a great deal of merit.

“ The prefect of the Moselle has given in

the name of M. Louis, a domestic chaplain at Vatimont, as having successfully, and in the most disinterested manner, vaccinated about two thousand patients of all ages. M. Laby, rector of Marehais, near Montmirail, announced in the homily, on three successive Sabbaths, that his parishioners need not be apprehensive of any bad consequences from vaccination, and invited them to avail themselves of the gratuitous offer made to them by M. Ravelet, surgeon at Montmirail. This appeal had the desired effect.

“ In short, the committee endeavoured to profit by the residence of the sovereign Pontiff at Paris, by endeavouring to persuade him to recommend the new method to all the clergy of France.

“ We conceived that the clergy could not fail to unite in favour of the new method, if the supreme head of the church were to recommend it. We were not deceived in our expectations; the Pope received favourably the deputation which had been intrusted with

the mission; and being well convinced of the mildness and great advantages of vaccination, he assured them, in his answer, that he approved highly of the exertions of the committee, and that he was deeply interested in the success of a discovery, as valuable as it is useful to humanity, the salutary effects of which had already been fully proved by experience.”\*

In consequence of this well-directed energy and zeal, upwards of four hundred thousand individuals were vaccinated in France, in the space of fifteen months, which is equal to about a third part of the number of children born in that country, in the course of the same period. †

From these observations, extracted from a Report drawn up by a committee of medical practitioners, it is obvious how much the

\* See Report of French Vaccine Committee, p. 21. to 28.

† See Report, p. 46.

exertions of the clergy in France have contributed to establish and propagate the vaccine inoculation; and I see no reason why the clergy of this country might not, by similar exertions, contribute as effectually towards the establishment of vaccination, and the eradication of the Small-pox.

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WERE it necessary for me to quote particular facts, from the experience of individuals, to corroborate what has been said in this Treatise; many proofs might be adduced, particularly from the great body of evidence collected by Dr Pearson in his Inquiry; from Mr Ring's Treatise on the Cow-pox; from the London Medical Review, and from the Physical Journal; in all of which, much curious and useful information is contained on the subject of Cow-pox.

But in the present advanced state of our knowledge concerning the vaccine disease, it will not be expected that many additional proofs should be given of its anti-variolous influence.



The following facts, however, are so important, and the authorities on which they rest are so unquestionable, that it would be improper to withhold them.

1. About a year and half ago, the natural Small-pox appeared in a large village in Scotland, accompanied with symptoms of the most alarming kind. The surgeon of the place, considering this as a good opportunity to give a fair trial to the vaccine inoculation, and having prevailed on many to agree to it, the practice was immediately begun at the end of the village opposite to that in which the Small-pox first made its appearance.

With great satisfaction he found, that none of his patients suffered any inconvenience from the Cow-pox. None of them took the Small-pox; while scarcely any escaped the infection who had not previously had the disease, and a great proportion of those who were seized with it died.

2. The second fact to which I allude, is communicated in a letter from a clergyman

in Yorkshire, who, with his own hand, had inoculated about 1500 in the course of one year. All of them did well. The Small-pox was in the county at the time. Those who had had the Cow-pox were mingled with those in the Small-pox, and numbers of the former became nurses to the latter, and yet none of them were infected with the Small-pox.

3. It is not easy to conceive, that any stronger evidence than that which those instances afford, can be given of the influence of the Cow-pox in making the human body unsusceptible of the variolous contagion: but I am much pleased to have it in my power to add another interesting fact, of the same kind. I mention it on the authority of my father, the late Mr Benjamin Bell, surgeon in this city, who, in several journies through England some years since, and particularly when in Gloucestershire, made it his business to inquire minutely into the degree of credit given by practitioners, and the people of the coun-

try, to the anti-variolous power of the Cow-pox. He found them uniformly of opinion, that a person who has had the genuine Cow-pox, is ever afterwards unsusceptible of the contagion of Small-pox. He found also, that the facts on which this opinion rested, had been known for many years to the common people of Gloucestershire; nay, that the observation had been handed down, from father to son, even for three generations. In short, the result of his inquiries clearly proved, what some even now doubt, that the vaccine inoculation, not only gives present security against the Small-pox, but that none, in whom it has taken place, can ever be affected with that disease: which, in the strongest manner, corroborates what Dr Jenner has said on the subject.

It is proper, also, to add, that, at first, my father was one of those, who rather declined recommending the vaccine inoculation, till more extended practice, and farther know-

ledge of the anti-variolous powers of the disease, should warrant its practice. From this circumstance, his opinion appears to me to have the greater weight.

4. M. Caussade, of Blanquefort, in the department of the Gironde, saw a mother die of Small-pox, who at the time of her death was suckling her child, to whom she did not communicate the disease. This child had been previously vaccinated.\*

It may perhaps be expected that I should take some notice of the controversy, respecting the power of vaccination to prevent the contagion of Small-pox, which has existed ever since the introduction of the vaccine inoculation, by Dr Jenner, in 1798, and which has proceeded to a great extent within these last two years. But an examination of the evidence that has been adduced by the anti-vaccinists, would be foreign to my intentions

\* See Report of the Vaccine Committee in Paris, p. 53.

in publishing this little Treatise; in which I propose only to state, in a concise form, the most important facts relative to this disease; which ought to be known to every one, who practises the vaccine inoculation. I would, however, refer those who wish for the most complete and satisfactory information on the subject, to Dr Willan's Treatise on Vaccine Inoculation—to Mr Moore's Reply to the Anti-vaccinists—to a very able, candid, and comprehensive view, which is given of it in the 17th number of the Edinburgh Review—and to the concentrated mass of evidence in the Report of the College of Physicians of London on Vaccination.\* It may be sufficient for me to say, that I can safely add my unequivocal testimony, as to the anti-variolous influence of the vaccine inoculation.

In the course of my own practice, I never met with Small-pox after the patient had

\* See Appendix, No. I.

passed through the genuine Cow-pox; some cases, indeed, of reputed failure have occurred; but on investigating these, I uniformly found, either that I had warned the patient not to trust to the previous inoculation, from the disease being spurious; or, that the supposed Small-pox was only an eruption of Chicken-pox.

I have also investigated a very considerable number of reputed failures, which were said to have occurred in the practice of other surgeons; and all of the gentlemen to whom I applied, conducted themselves in the most liberal manner, and gave me every assistance in their power. Hitherto I have not met with one unequivocal case, in which the Small-pox occurred after vaccination, although one that is detailed in the Appendix, No. III. is rather of a suspicious nature; and it appears, from the report made by the Royal College of Surgeons of Edinburgh, to the requisition of the Royal College of Physicians

of London, (see Appendix, No. II.) that  
“ the members of the Royal College have  
“ met with no occurrence, in their practice,  
“ of vaccine inoculation, which could operate  
“ in their minds, to its disadvantage.”

From these considerations, from being aware that similar reports were propagated and believed, of the Small-pox having occurred more than once in the same individual, although no instance of this kind has come within my own observation; and from having weighed deliberately all the most important written evidence, on both sides of the question, I am disposed to concur most heartily in the opinion, which is well expressed by an eminent surgeon of Gloucester, “ that  
“ whatever has been said against the sufficiency of Cow-pox matter, as a security  
“ against variolous infection, may be also  
“ said, with truth, against Small-pox matter  
“ as a similar security ;” \* so that I conceive

\* See Mr Trye, in *Medical and Physical Journal*; November, 1804.

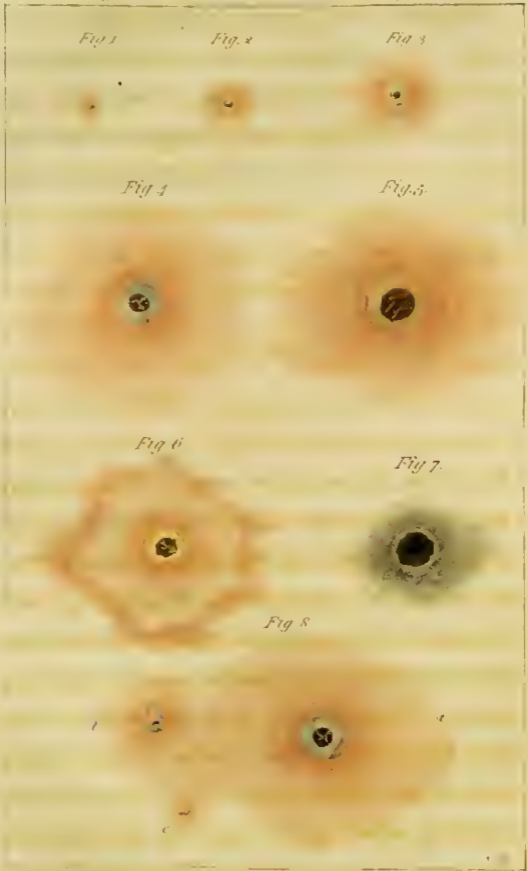
every unprejudiced person, who attentively considers all that has been said of it, must be convinced, that those who have had the genuine Cow-pox, can never afterwards be infected with the Small-pox.





PLATE I.

*Pustules of the genuine COW POX in their successive stages.*



EXPLANATION  
OF THE  
P L A T E S.

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PLATE I.

I THINK it necessary to remark, that the figures represented in this Plate, were not all copied from the vesicle of one individual, in the successive stages of the disease; but such examples were selected from a number of patients whom I inoculated myself, as I conceived would exhibit each stage of the vesicle in its most perfect state. I have taken care to have those appearances most strongly marked, which take place in the greatest number of cases. This will account for the

tints in the different figures not corresponding perfectly with each other, which would have been the case, had the vesicle of one individual been taken as a specimen of every stage of the disease.

Fig. 1. The appearance of the inoculated spot at the commencement of the third day, or forty-eight hours after the inoculation. See p. 37.

Fig. 2. The Cow-pox vesicle on its first appearance, with the fluid contained in it, on the fifth day after the inoculation. See p. 37.

Fig. 3. The vesicle on the eighth day, about which time the inflammation round its base begins to spread rapidly, the glands in the axilla begin to enlarge and harden, and symptoms of a constitutional affection to appear. See p. 38.

Fig. 4. The vesicle at its height on the tenth day; the inflammation and hardness of the neighbouring parts being now at their greatest extent. See p. 41.

Fig. 5. The appearance on the eleventh day; the inflammation and hardness in the axilla, and of the neighbouring parts, beginning somewhat to recede. See p. 42.

Fig. 6. The parts on the twelfth day from the inoculation, with the double arcola in its most perfect state. See p. 42.

Fig. 7. In this figure, the scab or crust of the Cow-pox is represented on the fifteenth day, just before it begins to loosen and separate, which generally happens on the eighteenth or nineteenth day. See p. 43.

Fig. 8. Represents the appearance of the Cow-pox vesicles, when the matter is introduced at three different times in the same person, in the immediate vicinity of each other. *a.* Shews the primary inoculation; *b.* the vesicle produced by inoculating six days afterwards; and *c.* that of the third inoculation on the eighth day. See an account of this, p. 67.

It may be proper to mention in this place, that, in a few instances, the Cow-pox vesi-

cle, like that of the Small-pox, varies a little in its progress; for although, in a great proportion of cases, it proceeds in the manner I have stated, yet, in some, it advances more slowly, in others with greater rapidity; so that in these instances, the appearances delineated in this Plate, must be somewhat different from what they commonly are on the days that have been mentioned. These occurrences, however, are so rare, that I did not think it necessary to state them in the description of the symptoms of the inoculated Cow-pox.



*Figurae de Sepuribus CCXV*

Fig. 1



Fig. 2

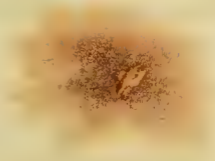


Fig. 3



Fig. 4



Fig. 5

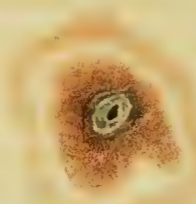
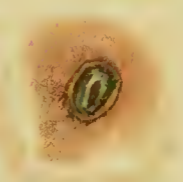


Fig. 6





## PLATE II.

IN this Plate are represented the appearances of the pustule produced by inoculating a person with vaccine matter, who has already had the Cow-pox or Small-pox. I have repeatedly met with the same appearances in young children, who, to the best of my knowledge and belief, had not had either of these diseases; and I considered it as a species of the spurious Cow-pox, both because they afterwards had the genuine disease in its regular form, and also for the reasons which are stated in page 55.

Fig. 1. Represents the inflamed puncture at the beginning of the third day from the inoculation. A small quantity of fluid is seen at this time in the pustule, the inflammation is much more extensive and irregular, and

the tint brighter than in the genuine Cow-pox. In short, the pustule in this figure is farther advanced, than it is in the genuine Cow-pox on the eighth day. See Plate I. fig. 3.

Fig. 2. The pustule on the fourth day, which corresponds to the vesicle of the genuine Cow-pox on the ninth day.

Fig. 3. The appearance of this spurious pustule on the fifth day, when the fluid contained in it is of the consistence and colour of purulent matter, and the pustule is covered with a yellowish crust or scab. The genuine Cow-pox vesicle is not farther advanced on the tenth day. See Plate I. fig. 4.

Fig. 4. The spurious pustule about the end of the sixth day. The inflammation is nearly at its height, and a double areola has begun to form.

Fig. 5. The double areola more distinctly formed than in fig. 4., as seen in the spurious Cow-pox on the seventh day after inoculation; but in general it is less extensive,



PLATE III.

*Anomalous Case of COW POX described Page 81*



more irregular in its shape, and of a brighter red colour, than that of the genuine, in which the double areola rarely appears before the twelfth day. See Plate I. fig. 6.

Fig. 6. The appearance of the spurious pustule on the eighth day from the inoculation. The scab is of a darker colour than it ever is in the other; this figure may be considered as corresponding with the fourteenth or fifteenth day of the genuine Cow-pox. See Plate I. fig. 7.



### PLATE III.

THE case of Cow-pox represented in this Plate, is described in page 81.

THE [illegible] OF [illegible]

## CHAPTER I

[illegible text]

## CHAPTER II

[illegible text]

# APPENDIX.

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## No. I.

*Report of the Royal College of Physicians of London,  
on Vaccination.—Referred to in p. 116.*

## REPORT.

THE Royal College of Physicians of London, having received his Majesty's commands, in compliance with an address from the House of Commons, "to inquire into the state of Vaccine Inoculation in the United Kingdom, to report their opinion and observations upon that practice, upon the evidence which has been adduced in its support, and upon the causes which have hitherto retarded its general adoption;"—have applied themselves diligently to the business referred to them.

Deeply impressed with the importance of an inquiry which equally involves the lives of individuals, and the public prosperity, they have made every exertion to investigate the subject fully and impartially. In aid of the

knowledge and experience of the members of their own body, they have applied separately to each of the Licentiates of the College; they have corresponded with the Colleges of Physicians of Dublin and Edinburgh; with the Colleges of Surgeons of London, Edinburgh, and Dublin; they have called upon the societies established for vaccination, for an account of their practice, to what extent it has been carried on, and what has been the result of their experience; and they have, by public notice, invited individuals to contribute whatever information they had severally collected. They have in consequence been furnished with a mass of evidence, communicated with the greatest readiness and candour, which enables them to speak with confidence upon all the principal points referred to them.

1. During eight years which have elapsed since Dr Jenner made his discovery public, the progress of vaccination has been rapid, not only in all parts of the United Kingdom, but in every quarter of the civilized world. In the British islands some hundred thousands have been vaccinated, in our possessions in the East Indies upwards of 800,000, and among the nations of Europe the practice has become general. Professional men have submitted it to the fairest trials, and the public have, for the most part, received it without prejudice. A few, indeed, have stood forth the adversaries of vaccination, on the same grounds as their predecessors who opposed the inoculation for the Small-pox, falsely led by hypothetical reasoning, in the investigation of a subject which must be supported, or rejected, upon facts and observation only. With these few exceptions, the testimony in favour of



vaccination has been most strong and satisfactory, and the practice of it, though it has received a check in some quarters, appears still to be upon the increase in most parts of the United Kingdom.

2. The College of Physicians, in giving their observations and opinions on the practice of vaccination, think it right to premise, that they advance nothing but what is supported by the multiplied and unequivocal evidence which has been brought before them; and they have not considered any facts as proved, but what have been stated from actual observation.

Vaccination appears to be in general perfectly safe; the instances to the contrary being extremely rare. The disease excited by it is slight, and seldom prevents those under it from following their ordinary occupations. It has been communicated with safety to pregnant women, to children during dentition, and in their earliest infancy; in all which respects it possesses material advantages over inoculation for the Small-pox; which, though productive of a disease generally mild, yet sometimes occasions alarming symptoms, and is in a few cases fatal.

The security derived from vaccination against the Small-pox, if not absolutely perfect, is as nearly so as can perhaps be expected from any human discovery; for amongst several hundred thousand cases, with the results of which the College have been made acquainted, the number of alleged failures has been surprisingly small, so much so, as to form certainly no reasonable objection to the general adoption of vaccination; for it appears, that there are not nearly so many failures, in a

given number of vaccinated persons, as there are deaths in an equal number of persons inoculated for the Small-pox. Nothing can more clearly demonstrate the superiority of vaccination over the inoculation of the Small-pox, than this consideration; and it is a most important fact, which has been confirmed in the course of this inquiry, that in almost every case, where the Small-pox has succeeded vaccination, whether by inoculation or by casual infection, the disease has varied much from its ordinary course; it has neither been the same in the violence, nor in the duration of its symptoms, but has, with very few exceptions, been remarkably mild, as if the Small-pox had been deprived, by the previous vaccine disease, of all its usual malignity.

The testimonies before the College of Physicians are very decided in declaring, that vaccination does less mischief to the constitution, and less frequently gives rise to other diseases, than the Small-pox, either natural or inoculated.

The College feel themselves called upon to state this strongly, because it has been objected to vaccination that it produces new, unheard-of, and monstrous diseases. Of such assertions no proofs have been produced, and, after diligent inquiry, the College believe them to have been either the inventions of designing, or the mistakes of ignorant men. In these respects then, in its mildness, its safety, and its consequences, the individual may look for the peculiar advantages of vaccination. The benefits which flow from it to society are infinitely more considerable, it spreads no infection, and can be communicated only by inoculation. It is from a consi-

deration of the pernicious effects of the Small-pox, that the real value of vaccination is to be estimated. The natural Small-pox has been supposed to destroy a sixth part of all whom it attacks; and that even by inoculation, where that has been general in parishes and towns, about one in 300 has usually died. It is not sufficiently known, or not adverted to, that nearly one-tenth, some years more than one-tenth, of the whole mortality in London is occasioned by the Small-pox; and however beneficial the inoculation of the Small-pox may have been to individuals, it appears to have kept up a constant source of contagion, which has been the means of increasing the number of deaths, by what is called the natural disease. It cannot be doubted that this mischief has been extended by the inconsiderate manner in which great numbers of persons, even since the introduction of vaccination, are still every year inoculated with the Small-pox, and afterwards required to attend two or three times a week at the places of inoculation, through every stage of their illness.

From this, then, the public are to expect the great and uncontroverted superiority of vaccination, that it communicates no casual infection, and, while it is a protection to the individual, it is not prejudicial to the public.

3. The College of Physicians, in reporting their observations and opinions on the evidence adduced in support of vaccination, feel themselves authorised to state, that a body of evidence so large, so temperate, and so consistent, was perhaps never before collected upon any medical question. A discovery so novel, and to which

there was nothing analogous known in nature, though resting on the experimental observations of the inventor, was at first received with diffidence: it was not, however, difficult for others to repeat his experiments, by which the truth of his observations was confirmed, and the doubts of the cautious were gradually dispelled by extensive experience. At the commencement of the practice, almost all that were vaccinated were afterwards submitted to the inoculation of the Small-pox; many underwent this operation a second, and even a third time, and the uniform success of these trials quickly bred confidence in the new discovery. But the evidence of the security derived from vaccination against the Small-pox, does not rest alone upon those who afterwards underwent variolous inoculation, although amounting to many thousands; for it appears, from numerous observations communicated to the College, that those who have been vaccinated are equally secure against the contagion of epidemic Small-pox. Towns indeed, and districts of the country, in which vaccination had been general, have afterwards had the Small-pox prevalent on all sides of them without suffering from the contagion. There are also in the evidence a few examples of epidemic Small-pox having been subdued by a general vaccination. It will not, therefore, appear extraordinary, that many who have communicated their observations should state, that though at first they thought unfavourably of the practice, experience had now removed all their doubts.

It has been already mentioned, that the evidence is not universally favourable, although it is in truth nearly

so; for there are a few who entertain sentiments differing widely from those of the great majority of their brethren. The College, therefore, deemed it their duty, in a particular manner, to enquire upon what grounds and evidence the opposers of vaccination rested their opinions. From personal examination, as well as from their writings, they endeavoured to learn the full extent and weight of their objections. They found them without experience in vaccination, supporting their opinions by hearsay information, and hypothetical reasoning, and, upon investigating the facts which they advanced, they found them to be either misapprehended or misrepresented; or that they fell under the description of cases of imperfect Small-pox, before noticed, and which the College have endeavoured fairly to appreciate.

The practice of vaccination is but of eight years standing, and its promoters, as well as opponents, must keep in mind, that a period so short is too limited to ascertain every point, or to bring the art to that perfection of which it may be capable. The truth of this will readily be admitted by those acquainted with the history of inoculation for the Small-pox. Vaccination is now, however, well understood, and its character accurately described. Some deviations from the usual course have occasionally occurred, which the author of the practice has called spurious Cow-pox, by which the public have been misled, as if there were a true and a false Cow-pox; but it appears, that nothing more was meant, than to express irregularity or difference from that common form and progress of the vaccine pustule, from which its efficacy is inferred. Those who perform vaccination

ought therefore to be well instructed, and should have watched with the greatest care the regular progress of the pustule, and learnt the most proper time for taking the matter. There is little doubt, that some of the failures are to be inputed to the inexperience of the early vaccinators; and it is not unreasonable to expect, that farther observation will yet suggest many improvements that will reduce the number of anomalous cases, and furnish the means of determining, with greater precision, when the vaccine disease has been effectually received.

Though the College of Physicians have confined themselves in estimating the evidence, to such facts as have occurred in their own country, because the accuracy of them could best be ascertained, they cannot be insensible to the confirmation these receive from the reports of the successful introduction of vaccination, not only into every part of Europe, but throughout the vast continents of Asia and America.

4. Several causes have had a partial operation in retarding the general adoption of vaccination; some writers have greatly undervalued the security it affords, while others have considered it to be of a temporary nature only; but if any reliance is to be placed on the statements which have been laid before the College, its power of protecting the human body from the Small-pox, though not perfect indeed, is abundantly sufficient to recommend it to the prudent and dispassionate, especially as the Small-pox, in the few instances where it has subsequently occurred, has been generally mild and transient. The opinion that vaccination affords but a temporary

security is supported by no analogy in nature, nor by the facts which have hitherto occurred. Although the experience of vaccine inoculation be only of a few years, yet the same disease, contracted by the milkers of cows, in some districts has been long enough known to ascertain that in them, at least, the unsusceptibility of the Small-pox contagion does not wear out by time. Another cause, is the charge against vaccination of producing various new diseases of frightful and monstrous appearance.

Representations of some of these have been exhibited in prints, in a way to alarm the feelings of parents, and to infuse dread and apprehension into the minds of the uninformed. Publications with such representations have been widely circulated; and though they originate either in gross ignorance, or wilful misrepresentation, yet have they lessened the confidence of many, particularly of the lower classes, in vaccination; no permanent effects, however, in retarding the progress of vaccination, need be apprehended from such causes, for, as soon as the public shall view them coolly and without surprize, they will excite contempt, and not fear.

Though the College of Physicians are of opinion, that the progress of vaccination has been retarded in a few places by the above causes, yet they conceive that its general adoption has been prevented by causes far more powerful, and of a nature wholly different. The lower orders of society can hardly be induced to adopt precautions against evils which may be at a distance; nor can it be expected from them, if these precautions are attended with expence. Unless, therefore, from the im-

mediate dread of epidemic Small-pox, neither vaccination nor inoculation appear at any time to have been general; and when the cause of terror has passed by, the public have relapsed again into a state of indifference and apathy, and the salutary practice has come to a stand. It is not easy to suggest a remedy for an evil so deeply imprinted in human nature. To inform and instruct the public mind may do much; and it will probably be found, that the progress of vaccination, in different parts of the United Kingdom, will be in proportion to that instruction. Were encouragement given to vaccination, by offering it to the poorer classes without expence, there is little doubt but it would in time supersede the inoculation for the Small-pox, and thereby various sources of variolous infection would be cut off; but till vaccination becomes general, it will be impossible to prevent the constant recurrence of the natural Small-pox, by means of those who are inoculated, except it should appear proper to the Legislature to adopt, in its wisdom, some measure, by which those who still, from terror or prejudice, prefer the Small-pox to the vaccine disease, may, in thus consulting the gratification of their own feelings, be prevented from doing mischief to their neighbours.

From the whole of the above considerations, the College of Physicians feel it their duty strongly to recommend the practice of vaccination. They have been led to this conclusion by no preconceived opinion, but by the most unbiassed judgment, formed from an irresistible weight of evidence which has been laid before them. For when the number, the respectability, the disinterest-



edness, and the extensive experience of its advocates, is compared with the feeble and imperfect testimonies of its few opposers; and when it is considered, that many, who were once adverse to vaccination, have been convinced by further trials, and are now to be ranked among its warmest supporters, the truth seems to be established as firmly as the nature of such a question admits; so that the College of Physicians conceive, that the public may reasonably look forward, with some degree of hope, to the time when all opposition shall cease, and the general concurrence of mankind shall at length be able to put an end to the ravages at least, if not to the existence, of the Small-pox.

LUCAS PEPYS, President.

Royal College of Physicians, }  
10th April, 1807. }

J. A. HERVEY, Register.

No. II.

SIR,

*Edinburgh, March 3d, 1807.*

I mentioned in my former letter, that I would take the earliest opportunity of laying before the Royal College of Surgeons of Edinburgh, the communication with which the Royal College of Physicians of London had honoured them, on the 23d of October last.

I am now directed by the Royal College to send the following answer on that important subject.

The practice of vaccine inoculation, both in private,

and at the Vaccine Institution established here in 1801, is increasing so rapidly, that for two or three years past, the Small-pox has been reckoned rather a rare occurrence, even amongst the lower orders of the inhabitants of this city, unless in some particular quarters about twelve months ago; and, among the higher ranks of the inhabitants, the disease is unknown.

The Members of the Royal College of Surgeons have much pleasure in reporting, That, as far as their experience goes, they have no doubt of the permanent security against the Small-pox, which is produced by the constitutional affection of the Cow-pox; and that such has hitherto been their success in vaccination, as also to gain for it the confidence of the public, insomuch that they have not been required, for some years past, to inoculate any person with Small-pox who had not previously undergone the inoculation with the Cow-pox.

The Members of the Royal College have met with no occurrence in their practice of Cow-pox inoculation which could operate in their minds to its disadvantage; and they beg leave particularly to notice, that they have seen no instance of obstinate eruptions, or of new and dangerous diseases, which they could attribute to the introduction among mankind of this mild preventive of Small-pox. The Royal College of Surgeons know of no causes which have hitherto retarded the adoption of vaccine inoculation here; on the contrary, the practice has become general within this city: and from many thousand packets of vaccine matter having been sent by the members of the Royal College, and the Vaccine Institution here, to all parts of the country, the Royal

College have reason to believe, that the practice has been as generally adopted throughout this part of the United Kingdom, as could have been expected from the distance of some parts of the country from proper medical assistance, and other circumstances of that nature.

I have the honour to be,

Sir,

Your most obedient servant,

WM. FARQUHARSON,

President of the Royal College and  
Incorporation of Surgeons of  
Edinburgh.

No. III.

DEAR SIR,

*Edinburgh, Oct. 2. 1807.*

The following is an account of the ease of Small-pox after Cow-pox, which fell under my observation.

I am, Dear Sir,

Your's truly,

WM. BROWN.

Mr George Bell, Surgeon,  
Edinburgh.

“Margaret Borthwick, aged five years and some months, daughter of a shopkeeper in St Mary's-wynd, Edinburgh, was inoculated at the Dispensary for Cow-pox on 2d of October, 1802. The disease went through its regular stages till the 9th day, and several children were inoculated from the arm. It does not appear that she was

seen by any of the gentlemen belonging to that establishment after that period. The scar of the Cow-pox pustule was seen on the arm."

"This child was taken ill on 9th of May, 1807; on the 11th an eruption took place on her skin, and I saw her on the 12th. The eruption was numerous, and the skin of a red colour in the interstices. 13th, Eruption consists of numerous distinctly-marked pustules, but the skin is less red—her eyes are watery, and a good deal inflamed—the fever is not considerable. 14th, Pustules advancing, and in some places are confluent—eyes much affected. 15th, Pustules advancing; face and extremities somewhat swelled. 16th, Carried Mr James Russell, Professor of Clinical Surgery, to see her, who declared the disease to be unequivocally Small-pox, and not farther advanced than common at this period of the disease. 17th, Face so much swelled as to shut the eyes—matter is contained in the pustules. 18th, Swelling of the face greatly abated—eyes open—the pustules on the face are beginning to scab—those on the rest of the body contain matter, but have little or no inflammation around their bases—the child takes food. 19th, The pustules are scabbing over the whole body, and the child is quite at her ease, taking food as usual."

The respectable authority from which this case of Small-pox after vaccination is reported, would not allow me to entertain any doubt of the failure of vaccination in this particular instance, were it not that there is still some ground for suspecting, that the child might not have had the genuine Cow-pox. Mr Bryee, with whom

the records of the vaccine institution of this place are deposited, most obligingly, at my request, looked over the books, and favoured me with the following report, from which it appears, that no opportunity was afforded of examining the vesicle after the seventh day, although it is well known, that the formation of the double ring, or areola, on the tenth or eleventh day, furnishes one of the most certain marks of the existence of the genuine disease.

“Margaret Borthwick was inoculated at the Dispensary on the 2d October, 1802; she was brought back on the 6th, and on the 9th, for examination; and it appears, from the journal kept at the Dispensary, that at both these periods the affection on the arm was advancing regularly. According to the regulations of the Dispensary, she should have been brought back on the 13th, and on the 16th also, for farther examination, but this was not done—so that nothing can be said with regard to the formation of the areola, or state of the vesicle, after the 7th day.”

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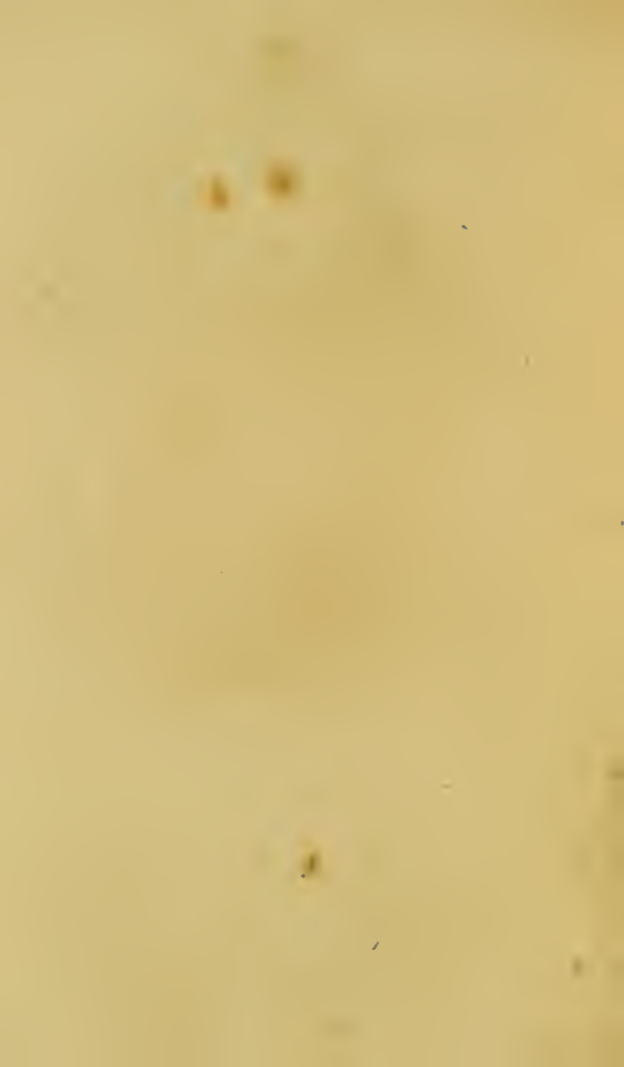
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