

An inquiry concerning the history of the cowpox : principally with a view to supersede and extinguish the smallpox.

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INQUIRY
CONCERNING
THE HISTORY
OF THE
COWPOX,
PRINCIPALLY WITH A VIEW TO
SUPERSEDE AND EXTINGUISH
THE
SMALLPOX.

BY GEORGE PEARSON, M. D. F. R. S.
PHYSICIAN TO ^{the} ST. GEORGE'S HOSPITAL;
OF THE COLLEGE OF PHYSICIANS, &c.

FELICIORES INSERT. — *Hor.*

LONDON :

Printed for J. JOHNSON, No. 72, ST. PAUL'S CHURCH YARD,

1798.

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TO
SIR GEORGE BAKER, BART.

PHYSICIAN TO THEIR MAJESTIES,

F. R. S. &c. &c. :

Whose Medical Writings and pre eminent Learning reflect HONOUR ON THE PROFESSION OF PHYSIC :

This Work is inscribed as an acknowledgment for promoting the present Inquiry, and as a public testimony of personal regard,

By his ever truly faithful,

And obedient servant,

GEORGE PEARSON.

Leicester Square,

Nov. 1798.

TO

SIR GEORGE BAKER, BART.

PHYSICIAN TO THEIR MAJESTIES

&c. &c. &c.

Whole Medical Writings and
most Learning of the Honour on the
Treatise on Phlegm:

This Work is inscribed as an ac-
knowledgment for promoting the pro-
fess Faculty, and as a public testimony
of personal regard.

By his ever truly faithful

And obedient servant,

George Pearson.

Printed by
New York

INQUIRIES *concerning the* COW POX.

THE curiosity of the public has been lately gratified by the publication of the long-expected treatise of Dr. Jenner,* on an epizootic disease, commonly known to dairy farmers by the name of the *Cow Pox*. This distemper of Cows has been noticed, time immemorial, in many provincial situations, where it has been also observed to have been communicated from these diseased animals to the persons who milk them. In the work just spoken of several facts are related, which seem to let new light into the nature of the animal œconomy, and to exhibit a near prospect of most important benefits in the practice of physic. But as some of these facts do not accord, nay, as they are at variance in essential

* An Inquiry into the causes and effects of the *Variola vaccinae*, &c. or the Cow Pox, by Edward Jenner, M. D. F. R. S. &c. 4to. London, 1798.

particulars with those to which they are nearest related, the truth of them is rather invalidated than confirmed by analogy; hence the testimony of a single observer, however experienced, and worthy to be credited, it is apprehended is insufficient for procuring such facts a general acceptance. But granting that the facts should be generally admitted, without hesitation, to be true in the instances which have fallen under the notice of the writer of the above work, the more judicious part of the medical profession will require the observations to be derived from much more extensive and varied experience, in order to appreciate, justly, the value of the practical conclusions. Hence there appears but little likelihood of improvements in practice being made, unless the subject be investigated by many inquirers, and the attention of the public at large be kept excited. I do not think that it is necessary for me to explain the various modes, and point out the situations in which inquiries may be prosecuted. These I suppose will, without difficulty, be understood by perusing Dr. Jenner's treatise. I hope I shall not be considered as assuming too much in recommending, not only those of the profession of physic, but dairy farmers, and others who reside in the country, to collect the facts on the subject, which have

hitherto fallen under notice, only in a casual way. From such a procedure, it is reasonable to calculate that the acquisition of established truths will be greatly accelerated, or error will be exploded.

Agreeably to the preceding representation, I go forward to examine the evidence of the principal facts, asserted in the publication on the Cow Pox; and to state what farther evidence I have derived from my own experience, and from the communications of a number of professional gentlemen, of unsuspected veracity, and undoubted accuracy.

Perhaps it may be right to declare, that I entertain not the most distant expectation of participating the smallest share of honour, on the score of discovery of facts. The honour on this account, by the justest title, belongs exclusively to Dr. Jenner; and I would not pluck a sprig of laurel from the wreath that decorates his brow.

This declaration I can prove to demonstration*, is utterly superfluous for this gentleman

* On shewing to Dr. Jenner the original paper which I read, as a Lecture on the Cow Pox, and which furnishes the principal materials of this dissertation, he seemed only anxious that I should not think it important enough for publication.

himself, but I am not confident that it is altogether without use, to exempt me from the suspicions which certain members of the profession (with whom I will have no fellowship) would be anxious to excite.

The first fact in order which I shall examine, may be stated in the following terms :

I. *Persons who have undergone the SPECIFIC FEVER and LOCAL DISEASE, occasioned by the Cow-Pox infection, communicated in the accidental way, (who had not undergone the Small Pox,) are thereby rendered unsusceptible of the Small Pox.*

To establish this important fact, *Dr. Jenner* has related (p. 9 to 26) about twenty instances of inoculation of the Small Pox, of persons who were known to have gone through the Cow Pox, but not one of them took the Small Pox in this way; nor by associating, afterwards, with patients labouring under this disease. The permanency of the inexcitability of the constitution to the Small Pox, was manifested by some of the instances being persons who

had been affected with the Cow Pox twenty, thirty, forty, and even fifty-three years before. It must not be supposed that the fact is supported by merely these twenty instances; which were selected for illustration; for Dr. Jenner having resided in Gloucestershire twenty years, in which county the Cow Pox is frequently epizootic, several hundred instances must have fallen under his own observation, or that of his acquaintance, of persons not taking the Small Pox, who had gone through the Cow Pox. Dr. Jenner appears to have been occupied for a long time in ascertaining this fact. And to prove that he has an extraordinary claim to credit on that account, I will mention the following occurrence. When I was in company with the late Mr. John Hunter, about nine years ago, I heard him communicate the information he had received from Dr. Jenner, that in Gloucestershire an infectious disorder frequently prevailed among the Milch Cows, named the Cow Pox, in which there was an eruption on their teats—that those who milked such Cows were liable to be affected with pustulous eruptions on their hands, which were also called the Cow Pox,—that such persons as had undergone this disease, could not be infected by the variolous poison,—and that as no patient had been

known to die of the Cow Pox, the practice of inoculation of the poison of this disease, to supersede the Small Pox, might be found, on experience, to be a great improvement in physic.

I noted these observations, and constantly related them, when on the subject of the Small Pox, in every course of lectures which I have given since that time.

This fact has been mentioned in two publications: namely, by Mr. Adams,* in his book on Morbid Poisons, &c. in 1795; and by Dr. Woodville, in his History of Inoculation, in 1796†.

On conversing with *Sir George Baker*, Bart. concerning the Cow Pox, rendering people unsusceptible of the variolous disease, Sir George

* “The Cow Pox is a disease well known to the dairy farmers in Gloucestershire—‘What is extraordinary, as far as facts have hitherto been ascertained, the person who has been infected is rendered insensible to the variolous poison.’—Adams on Morbid Poisons, 8vo. 1795, p. 156.

† “It has been conjectured that the Small Pox might have been derived from some disease of brute animals: and if it be true that the mange, affecting dogs, can communicate a species of itch to man: or, that a person, having received a certain disorder from handling the teats of Cows, is thereby rendered insensible to variolous infection ever afterwards, as some have asserted; then indeed the conjecture is not improbable.—Woodville, p. 7.

observed, he had been informed of the fact, in some papers, on the Cow Pox, communicated to him many years ago; but that as the statement did not then obtain credit, it was not published. After a fruitless search for these papers, Sir George, whose zeal for the improvement of Physic did not forsake him on this occasion, authorized me to write to his relative, the *Rev. Herman Drewe*, of Abbots. From this gentleman, who had availed himself of great opportunities of inquiring into the nature of the Cow Pox, when he resided in Dorsetshire, I immediately received answers in a very polite letter, to all the queries which I took the liberty of proposing. With regard to the fact under examination, the information received from this gentleman is in these terms: “ Mr. Bragge,* who inoculated my parish, rejoiced at having an opportunity of ascertaining the fact. Three women had had the Cow Pox, he therefore charged them with a superabundance of matter, but to no purpose; all his other patients, more than 50, took the infection, but the three women were not in the least disordered, even though they associated constantly with those who were infected. Thirteen similar instances I at that

* Mr. Drewe's Letter, Abbots, July 5th, 1798.

time, in that neighbourhood, ascertained." Mr. Drewe observes, that the disorder "is epizootic in Devonshire, Dorsetshire, and Somersetshire, and there is no doubt that it is to be met with elsewhere, under the name of Cow Pox, or some other denomination. When I made inquiries about the Cow Pox, I resided in Dorsetshire, and gained all my information from a Mr. Downe, Surgeon, of Bridport, a Mr. Bragge, Surgeon, of Axminster, and a Mr. Barnes, of Colyton (since dead). I have not thought of the matter since, and as my letters on the subject have escaped Sir George Baker's search, so many particulars have my recollection."

*Dr. Pulteney** of Blandford, who did me the honour to answer the questions which I troubled him with, informs me "that the disease is well known in Hampshire, Dorsetshire, Somersetshire, and Devonshire. That it is not uncommon in Leicestershire, and other midland counties: but dairy-men keep it a secret as much as possible, as it is disreputable to the cleanliness of the produce.—An intelligent and respectable Inoculator in this country, informed me, that of several hundreds whom he had inoculated

* *Dr. Pulteney's Letter, Blandford, July 14, 1798.*

for the Small Pox, who had previously had the Cow Pox, very few took the infection; and such as did, he had great room to believe were themselves deceived, in regard to their having had the Cow Pox."

I am deeply indebted for several letters on the subject, to the *Rev. Hen. Jerome de Salis, D. D.**. "I have heard," says he, "a good deal of the Cow Pox in this country. I have given a copy of your questions to Mr. Heurtley, and another to Sir William Lee, and I dare say, after a time this country will produce much information relative to the Cow Pox. I have found that in this parish, (Wing) this disorder raged in one farm, but did not get beyond it, three years ago. A man who now works with me, was employed with three others in milking the Cows. None but himself had had the Small Pox, all three had the Cow Pox, but he quite escaped it. One of these three is now in the parish, and I will have him inoculated for the Small Pox. He was much struck with the resemblance of the symptoms to those he had lately experienced in the Small Pox. Mr. Thomas Rhodes, a respectable farmer and dairy-man at Abbots-Aston, (a parish adjoining

† Dr. de Salis' Letters, Wing, Bucks. July 20th, 25th, and 29th, 1798.

to this) had the Cow Pox when he was a boy, and was afterwards inoculated for the Small Pox, without effect. As this is a case quite in point, and as I know the man perfectly well, and also know the inoculator, I will have all the particulars drawn up in the manner you may direct, and authenticated in the course of a few days. I have the name of a servant of his father's, who had the Cow Pox at the same time that he had it. This man lives in the adjoining parish of Soulbury, and if he has not had the Small Pox since, I will have him inoculated after harvest."

In the dairy farm above mentioned, in which the Cow Pox raged three years ago, it had not appeared for the preceding fourteen or fifteen years. Two men were then infected, one of whom lives now at Aylesbury, and the other at Bushy. For reasons which I will hereafter give you, I shall inquire after the man at Aylesbury."

From *Mr. Downe*,* *Surgeon of Bridport*, I have received some important information.

"The Cow Pox is a disorder in Devonshire as well as Dorsetshire, but it so rarely occurs, that the sources of information are very scanty. A few years ago, when I inoculated a great number for the Small Pox, I remarked that I

* *Mr. Downe's Letter, Bridport, August 1, 1798.*

could not, by any means, infect one or two of them, and on inquiry, I was informed they had previously been infected with the Cow Pox. Some few families who had been infected with the Cow Pox, were repeatedly inoculated with the matter of the Small Pox, and without effect. I know that a medical man in this part of the country was injured in his practice, by a prejudice raised unjustly, that he intended to substitute the Cow Pox for the Small Pox. So great an enemy to improvement are the prejudices of the public in the country, that I think experiments of importance can only be made in hospitals.

“ A farmer’s * wife in this neighbourhood, her daughter, and two sons, were all employed in milking the Cows when this disorder prevailed among them. The mother had gone through the Small Pox in the natural way, but the others had never had the Small Pox. The latter, viz. the two sons and daughter, were infected from the Cows, and the mother continued to milk them the whole time, without the least inconvenience. The daughter and two sons had a slight fever, and afterwards eruptions on the hands, by which they were much re-

* Mr. Downe’s Second Letter, Bridport, Aug. 25, 1798.

lieved of their fever. I had this account from one of the parties infected, and it may be depended upon.

About three years since I inoculated between six and seven hundred, and I recollect one or two of the number who could not be infected. On inquiry I found they had previously had the Cow Pox."

The *Rev. John Smith of Wendover*, to whom I owe many thanks for very willingly, at my request, taking upon himself the trouble of making inquiries in his neighbourhood, informs me* "that the high land of his parish does not admit of dairying upon it, and the dairy farmers here know nothing of the Cow Pox. But Mr. Henderson, the Surgeon in the parish, whose practice takes him a little into the vale, tells me, that he has met with the disease, and that a few years ago he three times endeavoured to inoculate a lad, who had been used to milking, but could only excite inflammation upon the arm, without any pustulous appearance. And upon inquiry, he found the lad had previously been affected with the Cow Pox. Mr. Woodman, a Surgeon at Aylesbury, had met with the disease among the Cow boys in the

* Mr. Smith's Letter, Vicarage, Wendover, Aug. 5, 1798.

vale. Mr. Grey, a Surgeon of Buckingham, says the disorder is common among the milkers in his neighbourhood. He had not been led to consider, particularly, the effects of the disease, but he remembers one boy possessed of the idea, that he could not take the Small Pox by inoculation, because he had had the Cow Pox, and that he could only excite redness upon the boy's arm. He thinks he recollects cases of boys having had the Small Pox, after having had the Cow Pox. The disease is not very notorious, for I passed some days last week with two intelligent farmers, one of them had kept 70 milch Cows for many years past, but knew nothing of the Cow Pox among his servants. The other knew as little."

Mr. Giffard, Surgeon of Gillingham, near Shaftsbury*, has been so good as to write to me on the subject of the Cow Pox; he informs me "That it is a disease more known in Dorsetshire than in most other counties." "I last winter," says he, "inoculated three parishes, and some of the subjects told me they had had the Cow Pox, and that they should not take the Small Pox, but I desired to inoculate them. I did so two or three times, but without effect."

* Mr. Giffard's Letter, Gillingham, Aug. 9, 1798.

—“ Persons never take the Small Pox after they have had the Cow Pox.”

On Thursday, June 14th last, happening, with Mr. Lucas, Apothecary, to be on professional business at Mr. Willan's farm, adjoining to the New Road, Marybone; which farm is appropriated entirely for the support of from 800 to 1000 milch Cows; I availed myself of that opportunity to make inquiry concerning the Cow Pox. I was told it was a pretty frequent disease among the Cows of that farm, especially in winter. That it was supposed to arise from sudden change from poor to rich food. It was also well known to the servants, some of whom had been affected with that malady, from milking the diseased Cows. On inquiry, I found three of the men servants, namely, Thomas Edinburgh, Thomas Grimshaw, and John Clarke, had been affected with the Cow Pox, but not with the Small Pox. I induced them to be inoculated for the Small Pox: and, with the view of ascertaining the efficacy of the variolous infection employed, William Kent and Thomas East, neither of whom had had either the Cow Pox or the Small Pox, were also inoculated.

Three of these men, viz. Edinburgh, East, and Kent, were inoculated in each arm with perhaps a larger incision, and more matter, than usual, on

Sunday, June 17th, by Mr. Lucas; and Dr. Woodville and myself were present. The matter was taken from a boy present, who had been inoculated 14 days before this time, and who was obligingly provided by Dr. Woodville.

CASE I.

Thomas Edinburgh, aged 26 years, had lived at the farm the last seven years. Had never had the Small Pox, nor Chicken Pox, nor any eruption resembling that of these diseases, but the Cow Pox, which he was certainly affected with six years ago. He was so lame from the eruption on the palm of the hands as to leave his employ, in order to be for some time in a public hospital; and he testified that his fellow-servant, Grimshaw, was at the same time ill with the same disorder. A cicatrix was seen on the palm of the hands, but none on any other part. He said that for three days in the disease, he suffered from pain in the axillæ, which were swollen and sore to the touch. According to the patient's description, the disease was uncommonly painful and of long continuance; whether on account of the unusual thickness of the skin,

which was perceived by the lancet in inoculation, future observations may determine.

THIRD DAY.—*Tuesday, 19th June.*

A slight elevation appeared on the parts inoculated. No disorder was perceived of the constitution, nor complaint made.

FIFTH DAY.—*Thursday, 21st.*

The appearance on the part inoculated, of the left arm, was like that of a gnat bite, and Mr. Wackfel, Apothecary to the Small-Pox Hospital, observed that the inflammation seemed too rapid for that of the variolous infection, when it produces the Small Pox. On the other arm there had been a little scab, which was rubbed off, leaving only a just visible red mark. No complaint was made.

EIGHTH DAY.—*Sunday, 24th.*

The inflammation on the left arm had subsided, and there was in place of it, a little scab. The right arm as before. Has remained quite well.

Sent the patient with Mr. Wackfel to the Small-Pox Hospital, where he was inoculated a second time, with matter from a person present, who then laboured under the Small Pox.

FOURTH DAY *after Second Inoculation,*
Wednesday, 27th.

A little inflammation appeared on the part inoculated of one arm, but none of that of the other. Except some slight pains and head ach on Monday last, had remained quite well.

EIGHTH DAY *after Second Inoculation,*
Sunday, July 1st.

A little dry scab was upon each part inoculated. No symptoms of disorder had appeared.

CASE II.

Thomas Grimshaw, aged about 30 years. Had lived in town, at the farm only 7 weeks, but six years ago also lived at this place, when he was affected with the Cowpox; and he testified that his fellow-servant, Edinburgh, was at the same time ill of the same disease. Grimshaw said he had pains and soreness on touching the axillæ during that illness, but he got much sooner well than Edinburgh.

On Tuesday, the 19th June, Grimshaw was inoculated in both arms, at the Smallpox Hof-

pital, from a patient then ill of the Small-pox.

THIRD DAY.—*Thursday 21st.*

A little inflammation and fluid appeared under a lens in the parts inoculated, as if the infection had taken effect. Remained quite well.

SIXTH DAY.—*Sunday 24th.*

Inflammation which had spread near the parts inoculated has disappeared; and now nothing was seen but a dry scab on them. Had not been at all disordered. He was inoculated this day a second time, as before, at the Smallpox Hospital.

FOURTH DAY.—*Second Inoculation,
Wednesday, June 27th.*

Not the least inflammation from the last inoculation, nor any complaint.

EIGHTH DAY.—*Second Inoculation,
Sunday, July 1st.*

Not the smallest inflammation from the inoculation. Had remained quite well.

CASE III.

John Clarke, 26 years of age, had the Cowpox ten years ago at Abingdon, where he was under the care of a medical practitioner of that place. He was inoculated by Mr. Wackfel, at the Smallpox Hospital, on Tuesday, June 19th, from a patient affected with the Smallpox.

THIRD DAY.—*Thursday, June 21st.*

There was inflammation, and a fluid in the parts inoculated; but these appearances were judged to be premature, with respect to the Smallpox.

SIXTH DAY.—*Sunday, June 24th.*

The appearances of inflammation and fluid in the right arm, were such as to make it doubtful, whether or not the variolous infection had taken effect; but there were no such appearances on the left arm, the inflammation being gone.

He was this day inoculated a second time at the Smallpox Hospital, from a patient.

EIGHTH DAY *after Second Inoculation,*
Sunday, July 1st.

No effect but inflammation, and afterwards festering, from the second inoculation.

The inflammation on the right arm, from the first inoculation, went off in a day or two after the last report. He had remained quite well in all respects.

CASE IV.

William Kent, 30 years of age, had lived at Mr. Willan's farm about 8 weeks. Had never laboured under the Smallpox, but said he had gone through the Chickenpox; and he had been told that he had been affected with a disorder, which was supposed to be the Cowpox, when he was 4 years of age. He was inoculated under the same circumstances as Thomas Edinburgh, by Mr. Lucas, on Sunday, June 17th.

THIRD DAY.—*Tuesday 19th.*

The parts inoculated were scarcely red, yet their appearance was such, when viewed under

a lens, as to render it probable the Smallpox would take place. Remained quite well.

FIFTH DAY.—*Thursday 21st.*

The inoculated part of the left arm appeared red; and on viewing it with the magnifier, a little bladder was seen in the middle. The same was the state of the right arm, but less evidently. Continued free from illness. Pulse 94 after walking two miles in a very hot day.

EIGHTH DAY.—*Sunday 24th.*

The left arm was more inflamed, and a small flat vesication appeared in the middle of the inflamed part. The right arm was affected in the same manner, but in a less degree. It was not doubted that he was infected with the variolous disease, especially as he complained of soreness of the arm-pits, and he had been very much disordered the two last nights, having had pain of his bones in general, and head ach, and had felt very hot, but not chilly. Pulse was only 80, and his tongue had the healthy appearance, nor was he thirsty.

ELEVENTH DAY.—*Wednesday 27th.*

Variolous eruptions in number, perhaps 20 or 30 had made their appearance.

FIFTEENTH DAY.—*Sunday, July 1st.*

Eruptions are in a suppurated state. Had been quite well, and he has continued his employ during the present hot week.

CASE V.

Thomas East, aged 21 years, he believed he had never been affected with the Smallpox, and certainly not with the Cowpox. There were several cicatrices, however, on his arms, exactly like those from the Smallpox, and if the inoculation had not succeeded, I should have been disposed to conclude that he had already gone through that disease.

He was inoculated by Mr. Lucas on Sunday, 17th June, at the same time, and under the same circumstances, as Thomas Edinburgh and William Kent.

THIRD DAY.—*Tuesday 19th June.*

Only a just visible scab on the parts inoculated, and it was thought the infection had not taken effect. Remained well.

Went to the Smallpox Hospital, and was inoculated a second time.

FIFTH DAY.—*Thursday 21st June.*

Redness appears now in the parts inoculated, as if both the first and second inoculation had taken effect.

EIGHTH DAY.—*Sunday 24th June.*

All the four parts inoculated were so much inflamed, that it seemed now doubtful, whether the Smallpox would come on. Parts first inoculated, less inflamed than those of the second inoculation; and the right arm more inflamed than the left. Pains of the axillæ were complained of, which were a little swelled, and sore to the touch. There were no symptoms of fever.

ELEVENTH DAY.—*Wednesday 27th June.*

About a dozen variolous eruptions were now out. No complaints were made.

FIFTEENTH DAY.—*Sunday, July 1st.*

Variolous eruptions were in a state of suppuration. There was a suppuration of the parts inoculated pretty much alike, from both the first and second inoculation.

It was thought the second inoculation had excited inflammation in the parts first inoculated, which otherwise might not have taken place so soon, or not at all.

Notwithstanding the hot weather for the last fortnight, the temperature being generally 68° to 78° of Fahrenheit's thermometer, the patients who took the Smallpox were so little disordered, that they continued their daily work.

No treatment was prescribed previously to inoculation, all the men being in health; but every other day after it, for a fortnight, they were purged with salts, and directed to abstain from strong liquors, and to eat very little animal food.

I did not require any farther evidence than what I have already procured, in my own practice, to satisfy me, that the quantity of variolous matter does not influence the disease; but on account of some late assertions, that the disorder is rendered milder by using a smaller quantity of matter in the above cases, a larger quantity was purposely inserted; yet milder cases than the above could not be desired.

It should also be noticed, that the three patients above mentioned, who did not take the infection on inoculation for the Smallpox, had their children soon afterwards inoculated, who

all took the Smallpox. These men lived in the same apartments with their children during the illness of the Smallpox; but not one of them was infected.

We have seen in the above cases, five persons inoculated for the Smallpox, under the most favourable circumstances for the efficaciousness of the infection; two of them took the disease from once inserting variolous matter, but the other three were uninfected, although the matter was twice inserted; and although they were exposed to infection, by living with their children while they were suffering under the Smallpox.

The three patients who did not take the Smallpox, gave strong circumstantial evidence that they had been affected with the Cowpox, but not with the Smallpox. The other two patients, who were infected with the Smallpox, there is no reason to doubt were as credible persons as the former, and they attested that they had not had the Smallpox; which attestation being verified by their taking the disease, it would be injustice to question the other part of their evidence, that they had not laboured under the Cowpox. For, as to the mere traditionary story of William Kent having the Cowpox, no circumstance supported the truth of it against

the extreme improbability of a boy of 4 years of age, or under, suffering a disease which is contracted by handling the teats of Cows in milking, when they are so difficult to manage, that male, instead of female servants, must then, generally, be employed. In some places, it seems the eruptive disease, which is known to medical men by the name of the Chicken, or Swinepox, is called by the lower orders of people, Cowpox. Mr. Giffard takes notice that “there are two kinds of Cowpox,” the one is attended with eruptions on the skin in general, and sometimes produces pits; but the other is a disease confined to the hands. It is most probable that Kent’s eruptive disease, when a child, was the Chickenpox, if he really had an eruptive disease. One of three reasons may be assigned for the above three patients not taking the Smallpox: viz. 1. That they had already suffered the Smallpox. 2. That they had not had this disease, and that their constitutions were not excitable at the time they were inoculated: for one can scarce suspect the failure to be from the mode of inserting the matter. 3. That they were not capable of infection with the Smallpox poison, because they had undergone the Cowpox. In respect of the first assignable reason, it must be allowed that a person may go

through the Smallpox, and the disease be so slight, that it is neither noticed by the patient, nor by his friends. But such unobserved cases are extremely rare, and they bear so very small a proportion to the others, that for three such cases to occur together on the present occasion, seems to be barely a possibility.

With regard to the second assigned reason, probably about one out of 50 persons does not take the Smallpox by inoculation of the same matter, and in the same manner; and perhaps not more than one out of 50 of those who are not infected by a first inoculation, fail to be infected on a second inoculation. According to this representation, then it appears to be a mere possibility that the Smallpox poison should not take effect, for the second assignable reason, namely, a peculiar disposition; especially as the patients were subsequently under very favourable circumstances, for being infected with variolous effluvia.

With regard to the third assignable reason, as in so many instances now recorded, it appears that persons, who have undergone the Cowpox, are not susceptible of the Smallpox; and as the failure of the inoculation cannot be imputed with justice to the two other causes above mentioned, it seems most reasonable to impute

the inefficacy of the variolous poison in the above three instances to a state of inexcitability, produced by the Cowpox poison.

On making inquiries at *Mr. Kendal's* farm, for Milch Cows, on the New Road, Marybone, a female servant informed me that she laboured under the Cowpox many years ago, when she lived in Suffolk, where this disease prevails. From her description I could not doubt that she had really been affected with the Cowpox. After this she took, what she believed to be the Smallpox, from an infant, which was nourished by her breasts. A fever preceded the eruptions, which were only about 50 in number, and they disappeared in a few days after they came out. If the latter part of this testimony is accurate, one cannot admit this case to be an example of the Smallpox, taking place in a constitution which had previously been affected with the Cowpox.

At this farm, a Cow was shewn to me which was said to be affected with the Cowpox: on examination, the disorder appeared to be in its last stage of desiccation. However, eight persons, who had not undergone the Smallpox, were inoculated with the scabs of this disorder, but no disease ensued.

On calling at *Mr. Rhodes'* milk farm on the

Hampstead Road, where there is a very large stock of Cows, I found the Cowpox had not fallen under his observation; but two of the male servants were well acquainted with some parts of its history. It appeared also on inquiry, that one of the Cows had really laboured under the disease two months before, namely, in May last, but the milker was not infected, because he said there were no cuts on his hands, or abrasion of the cuticle. It was described very clearly to be a different disease from the common inflammations and eruptions which produce scabbed nipples. One of the male servants had often seen the disease in Wiltshire and Gloucestershire. The milkers, he said, were sometimes so ill, as to lie in bed for several days, and there was a fever at the beginning, as in the Smallpox, but that no one ever died of it. He had known many persons who had laboured under the Cowpox, but who had never suffered the Smallpox, although it prevailed in their own families; except in one instance in which he was told that the person who took the Smallpox, had gone through the Cowpox when a child. The same servant said it was a common opinion, that people who have been affected with the Cowpox, to use his own words, are "hard to take the Smallpox."

Mr. Francis, who keeps a farm for Milch Cows on the road to Somers' Town, had seen the disease several times in the autumn among his cattle, and he knew that it was very apt to produce painful sores on the hands of the milkers; but he had never heard, or observed, that it prevented persons from having the Smallpox.

He said that three years ago, in the spring, the disease prevailed at several farms on the New Road.

A male servant of *Mr. Francis*, who has a good understanding, and is a man of veracity, and had lived in dairy farms all his life, stated, "that he had seen the Cowpox 35 years ago at King's Wood, in Somers' Wood, in Somersetshire, and frequently there, and in London since that time. The disease, he said, was then vulgarly called the Cowpox; it appeared on their teats and udders with fiery or flame like eruptions—was very infectious among the Cows and the milkers; but never knew either human creature, or beast die of it. It affects the hands and arms of the milkers with painful sores, as large as a sixpence, which last for a month or more, so as to disable the sufferers from continuing their employment. The disease breaks out especially in the spring, but occasionally at other times of the year. Most of the Cows in his master's, *Mr. Francis*' farm, were infected three years ago in the

spring, at which times many of the milkers were also infected. A new Cow is very liable to take the disease.—He had always understood that a person who had had the Cowpox, could not take the Smallpox, and never knew in the course of his life an instance of the Smallpox in such persons.

The following instances fell under his own observation: a fellow male and a female servant were affected with the Cowpox; some time after this, the parish in which they lived were in general inoculated for the Smallpox, but these two persons, who had never laboured under the Smallpox, could not be infected with this disease; nor did they take it, although they subsequently lived with their children while they were suffering the Smallpox. He also believed, and it was a common opinion in many parts of the country, that persons who have undergone the Smallpox cannot take the Cowpox. He himself laboured under the inoculated Smallpox when 17 years of age, but never took the Cowpox, although he had milked a great number of Cows labouring under the disease, and by which other milkers were infected. He had never known either a human creature, or Cow have the disease more than

once. He had the Measles previously to the Smallpox, as well as the Hooping Cough.

At some other farms, near London, where Milch Cows are kept, I found the disorder was not known either to the masters, or servants.

Dr. Haygarth very kindly wrote me a letter from Bath, on the 30th of August last, in which he says, “To none of your questions, concerning the Cowpox, can I give any answer from my own knowledge. Of such a distemper, I never heard among the Cheshire, or Welsh farmers. My first intelligence upon this subject came from my friend, *Dr. Worthington*, of Ross, some time ago. He, as well as another friend, *Dr. Percival*, speak very favourably of *Dr. Jenner*, on whose testimony the extraordinary facts he has published at present principally depend.”

I feel most sensibly the great favour shewn to me by *Professor Wall*, of Oxford. Although this gentleman's zeal and ability in promoting useful inquiries are acknowledged, I cannot but attribute the great pains which he bestowed to procure answers to my queries in so short a time as I required, in part, to the friendship founded in the days of academical studies: to use this amiable gentleman's own words —“ those days of free, manly, and liberal

conversation which I reflect on with infinite pleasure.

The information belonging to this place, from Professor Wall,* is the answer to the question, whether there is sufficient evidence that the Smallpox cannot infect a person who has once had the Cowpox, attended with fever; and if there has been a local affection without fever, is such person still capable of taking the Smallpox?

“ I receive but one answer to the two different modes of the question, which is, that any person who has ever had the Cowpox, has never been known to have the Smallpox.

A servant who has kept the Cows of a considerable dairy-farm in this neighbourhood a great many years, told me that he had the Cowpox early in life. Yet about 6 or 7 years ago he wished, for security, to be inoculated for the Smallpox—the operation was performed three several times, but no disorder nor eruption ensued—The Surgeon, a gentleman of great eminence in this place, asked him if he had ever had the Cowpox; upon his answering yes, the Surgeon replied, Then it is useless to make any farther trial.—This servant, the next year,

* See Dr. Wall's Letter, Oxford, Sept. 3, 1798.

had feveral children inoculated by Sutton. He was with them all the time till their recovery, but did not receive the infection. A fervant-girl at another confiderable farm, told me ſhe had the Cowpox early in life; feveral years after ſhe was inoculated, but nothing took place, except the appearance of red bluſh round the incifion, fimilar, I fuppoſe, to what Dr. Jenner mentions.

This red ſuffuſion has been haftily, by ſome inoculators, regarded as a proof, that the ſyſtem has been infected with the virus of the Smallpox; but neither this appearance, nor even a much more confiderable affection of the arm is always ſufficient ſecurity againſt future infection, unleſs there has been ſome eruption—See *Memoirs of the Medical Society.*”

From *Mr. Dolling*, an Inoculator at *Blandford*, I have received important intelligence, for which I am under further obligations to the Rev. Herman Drewe*. “Mr. Dolling has inoculated for the Smallpox a great number of perſons, who ſaid they had been affected with the Cowpox, and very few of them took the infection, to produce the Smallpox, and he is of opinion that thoſe who took the Smallpox, were miſ-

* The Rev. H. Drewe's Second Letter, Sept. 7th, 1798.

taken in supposing they had really laboured under the Cowpox. In one family five out of seven children took the Cowpox, by handling the teats of a Cow affected with the Cowpox; these seven children were inoculated for the Smallpox, but none took the infection, except the two who had not laboured under the Cowpox.

Dr. Croft tells me, that in *Staffordshire*, to his knowledge, the fact has been long known, of the Cowpox, which prevails in that county, affording an exemption of the human subject from the Smallpox. This gentleman affords me an unequivocal proof of his conviction of the safety and efficacy of the inoculated Cowpox, by his application to me for matter, in order to inoculate one of his own children.

My honourable friend, *Mr. Edward Howard*, has been assured, on very good authority, that of a relation, who is an officer in the *Oxfordshire Militia*, that it is a received opinion among the soldiers, that it is unnecessary to be inoculated for the Smallpox, if they have already laboured under the Cowpox, as many of them have done.

Dr. Redfearn of *Lynn** informs me, that “ the Cowpox is a common disease among

* *Dr. Redfearn's Letter, Lynn, Sept. 15th, 1798.*

the cattle in this part, and the farmers have made use of the appellation Cowpox for near thirty years, although totally ignorant of the disease existing in the West of England."

But

Dr. Alderson, of *Norwich** acquaints me, that there is reason to believe the disease is not known in his neighbourhood.

My correspondents in the North and East Ridings of Yorkshire, in Durham, in Lincolnshire, and in the neighbourhood of Windsor, acquaint me that the Cowpox is not known in those parts. But from the success which I have had in discovering the disease, by making a strict enquiry in farms, where it was believed not to exist; I can scarce doubt that it breaks out occasionally in every part, where a number of Cows are kept, and that the infection is widely disseminated.

I do not find that the Cowpox is known in Lancashire. *Dr. Currie*, † of *Liverpool*, obligingly answers my letter; he says, "I have made inquiries among the farmers, but I have not been able to find one who is acquainted with the disease. Of course I cannot answer any

* *Dr. Alderson's Letter*, Norwich, Sept. 16, 1798.

† *Dr. Currie's Letter*, Liverpool, Sept. 8, 1798.

of your queries. My friend, Dr. Percival, of Manchester, who is now here, never heard of the Cowpox in this county, any more than myself."

II. Persons who have been affected with the Specific Fever, and peculiar local Disease, by INOCULATION OF THE COWPOX INFECTION, who had not previously undergone the Smallpox; are thereby rendered unsusceptible of the Smallpox.

The first set of evidences of this fact are those of Dr. Jenner, in the cases XVII, XIX, XX, XXI, XXII, XXIII. They are instances of inoculation of the Cowpox, as in the Smallpox, with matter taken from the teats of Cows. A fever like that of the Smallpox arose in 6 to 9 days after the incision, but scarce of more than 24 hours duration; attended with an inflammatory appearance, or erythematous efflorescence around the parts inoculated, and pustulous sores of those parts; which do not suppurate, but remain limpid till they disappear: and there is no eruption of other parts of the skin, as in the Smallpox.

In the cases of inoculation under Dr. Jenner, the local affection was commonly as slight as

in the inoculated Smallpox, but sometimes there appeared a disposition to a more extensive inflammation of the skin around the parts in which the matter was inserted. " It seemed to arise from the state of the pustule, which spread out accompanied with some degree of pain, to about half the diameter of a sixpence. By the application of mercurial ointment to the inflamed parts, (as is practised in the inoculated Smallpox) the complaint soon subsided.—To prevent inflammation of the skin, caustic was also applied to the vesicle of the inoculated part, to excite a different kind of inflammation : but the precaution was perhaps unnecessary, as a third patient had nothing applied, and the arm scabbed quickly, without any erysipelas.

One of these patients inoculated with the Cowpox was only six months old, and who took the disease. In none of the above cases, after the Cowpox, could the Smallpox be excited, by repeated inoculation. The confidence of Dr. Jenner, in the safety and efficacy of the inoculation of the Cowpox is unequivocally declared by the inoculation of his own son, R. F. Jenner, aged 11 months; although the poison did not take effect in this instance. The project of inoculation of the Cowpox occurred

to other practitioners, antecedently to Dr. Jenner's experiments.

Mr. *Drewe*, in his letter above cited, speaks of the practice. He says, "Mr. *Bragge* and I endeavoured to try the experiment of inoculating with the matter of the Cowpox, but from the scarceness of the disease, and unwillingness of patients, we were disappointed."

Dr. *Pulteney* informs me, that "a very respectable practitioner acquainted him that of seven children whom he had inoculated for the Smallpox, five had been previously *infected with the Cowpox purposely*, by being made to handle the teats and udders of infected Cows; in consequence of which, they suffered the distemper. These five, after inoculation for the Smallpox, did not sicken; the other *two* took the distemper."

Farther, "A farmer in this country inoculated his wife and children with matter taken from the teat of a cow. At the end of a week the arms inflamed, and the patients were so far affected, as to alarm the farmer, although unnecessarily, and incline him to call in medical assistance. They all soon got well, and were afterwards inoculated for the Smallpox, but no disease followed. I was not applied to in this case, but the fact is sufficiently ascertained."

Mr. *Downe* furnishes me* with important information on the present fact. “R. F. near Bridport, when about 20 years of age, was at a farm house when the dairy was infected with the Cowpox. It being suggested to him that it would be the means of preserving him from the Smallpox, which he had never taken, if he would submit to be inoculated with the Cowpox; he gave his consent: he was infected in two or three places in his hand with a needle. He felt no inconvenience till about a week, when the parts began to inflame, and his hand to swell, his head to ach, and many other symptoms of fever came on. He was recommended to keep much in the open air, which he did, and in 4 or 5 days the symptoms of fever went off, as the maturation of the hand advanced. The parts soon healed, leaving permanent scars. He was afterwards inoculated twice by my grandfather, and a considerable time after twice by my father, but without any other effect than a slight irritation of the part, such as is occasioned in the arms of persons who have already had the Smallpox. It was not expected at the time, that the Smallpox poison would be effectual, but it was inserted, partly by way of ex-

* See Mr. Downe's Letter of August 25, 1798.

periment, and partly by way of precaution, the Smallpox being then in the family. The Smallpox has been repeatedly since in his own family, and he never avoided it, being confident that it was not possible to infect him with this disease. The next case, by Mr. Downe, although it affords defective evidence, is not useless. "I have lately conversed with a person who was in play, inoculated in the hand with the Cowpox matter. The wounds apparently healed for a time, and then inflamed. He had a swelling in the axilla, pain in the head, sickness, and slight fever. No eruption took place, but there was much maturation at the place of insertion, and considerable scars remain."

Next hear what *Professor Wall* says in his answer to the question, "Whether the disease has been communicated by inoculation, and whether it has produced a milder or more severe disease than in the casual way?"

"I have* not yet learnt that this disorder has, in this part of the country, ever been propagated by inoculation designedly. It has been communicated to persons who have had slight wounds from thorns, abrasions of the skin from other causes, perhaps more readily than in the

* Professor Wall's Letter, above cited.

common way ; but it has not appeared that the character or severity of the disorder has been altered by this circumstance."

Mr. *Dolling*,* of Blandford, communicates the following instances : "Mr. Justings of Axminster inoculated his wife and children with matter taken from the teats of a Cow that had the Cowpox: in about a week after inoculation, their arms were very much inflamed, and the patients were so ill, that the medical assistance of Mr. Meach, of Cerne, was called for. The patients did well. They were afterwards inoculated for the Smallpox by Mr. Trobridge, without effect."

III. *The disease produced by inoculating with the matter of the Cowpox, does not differ from the disease produced by inoculation with the matter from the human animal; nor is any difference observed in the effects of the matter from the first human subject infected from the brute animal, or from the matter generated, successively, in the second, third, fourth, or fifth human creature, from its origin in the brute.*

This important fact, at present, is only sup-

* Mr. Drewe's Second Letter, above cited.

ported by the instances related by Dr. Jenner, in the cases XIX to XXIII, p. 37 to 44. Hence, according to these instances, the poison of the Cowpox has the same properties, as appears from its effects on the human constitution, whether it be generated by the Cow, or by the human animal; and these properties are the same, however remote from the origin of the poison in the Cow. But it has not been determined by inoculating the teats of Cows with the matter taken from the Cow, and with that taken from the human creature; that the properties of the poison from this latter source are the same with regard to the brute, as those of the matter from the Cow with regard to the same animal.

I apprehend that the Cowpox is the only example at present known, of a permanent specific infectious disease in the human constitution, produced by matter from a different species of animal; but it has been often conjectured, that many of the infectious diseases of the human species are derived from brutes.

IV. A person having been affected with the Specific Fever, and Local Disease, produced by the Cowpox poison, is liable to be again affected as before by the same poison; and yet such person is not susceptible of the Smallpox.

I find that most part of professional men are extremely reluctant in yielding their assent to this fact. Some, indeed, reject it in the most unqualified terms. They are not averse from admitting the evidence, that the Cowpox may affect the same constitution repeatedly; or even that a person having had this disease, is unsusceptible of the Smallpox; but that the constitution having suffered the Cowpox, should still be susceptible of this disease, and not be susceptible of the Smallpox, is an assertion with regard to which they demur to acquiesce. The unfavourable reception of the evidence for this fact does not seem to arise so much from the observations in support of it, being suspected to be inaccurate, or sufficiently full and complete, as from its appearing, as they say, absurd and inconceivable. On enquiring why the fact appears in this light, we find it is because there is no support from any other analogous fact. There is, in reality, no analogous fact. We have facts which shew that a person having undergone certain diseases, occasioned by particular poisons, in some instances is, and in others is not, again susceptible of the same disease, by the same poison; but the instance before us is the first which has been observed of the constitution being rendered inexcitable to a disease,

from a given morbid poison, by having suffered a different disease from another different poison, and yet it remains susceptible of this different disease by this given morbid poison. In the first instance of certain new facts, it is easy to conceive that there may be no analogous fact to the one discovered. When the Smallpox first broke out, on its being discovered that the same constitution could not undergo this disease a second time, no analogous fact was, I think, then known; and on that account it probably was not admitted without much hesitation. But on a subsequent discovery that the same constitution could not be infected more than once with the measles, this, as well as the former fact, readily found acceptance. An evidence for a fact ought not to be rejected, because it is incomprehensible or inconsistent with what is already known; but on the present occasion, if the subject be well considered, it does not seem to me to be difficult to conceive that a change may be effected in the human constitution, by a disease from a morbid poison, so as to render such constitution unsusceptible of a disease from a given different morbid poison, and yet such constitution shall remain susceptible of the former disease, from the former morbid poison. Hence, I apprehend, the only just ground of objection

which may be taken, is that of the observations on the authority of which the fact is said to be established. Let us then state the evidence.

Under Case IX. p. 21. Dr. Jenner relates the history of a person who was first affected with the Cowpox in the year 1780, a second time in 1791, and a third time in 1794. "The disease was equally severe the second and third time as it was the first," which is, in general, otherwise both in the brute and human kind. Inoculation of the variolous poison was twice instituted in this patient, but without producing disease, nor could the patient be infected by associating with persons labouring under the Smallpox.

Another patient (see Jenner, p. 51.) suffered the Cowpox in 1759; in 1797 he was inoculated with the variolous poison, but without exciting the disease. In 1798 the Cowpox again took place.

With respect to the information which I have gained by my inquiries, concerning this fact; some of my correspondents observed, that the Cowpox occurred so seldom among the human kind, that they had no observations to determine, whether a person could undergo the disease more than once; the greater part of my correspondents ventured to say, that it had never

been seen more than once in the same person ; but some testified that the Cowpox certainly does take place, repeatedly, in the same constitution.

Mr. Woodman, of Aylesbury,* says, " the Cowpox does not supersede itself on future occasions, for that Cow-boys have it repeatedly."

It may be worth while to notice, that none of the gentlemen of whom I made inquiries, knew an instance of the disease attacking the same Cow more than once; and it was said that it was the current opinion that this was a fact.

The evidence for this fact, to my apprehension, only proves, satisfactorily, that the *local affection* of the Cowpox may occur in the same person more than once; but whether the *peculiar fever* also occurs more than once in the same person, from the Cowpox poison, does not appear certain; and must be determined by future observations, to be made with a particular view to this point. Future observations must likewise determine, whether, in those cases, (if such occur) in which a person, after having gone through the Cowpox, takes the Smallpox, the Cowpox was attended with a fever, or was merely a local affection. It seems pretty well

* See Mr. Smith's Letter, above cited.

ascertained, that the variolous poison may produce the Smallpox only locally, or without any affection of the whole constitution; and in such a case, the constitution is still susceptible of the Smallpox, and yet, in both cases, viz. of the *local affection* only, and of the whole constitution, the matter of the eruptions is capable of infecting others, so as to produce the Smallpox; either locally only, or also in the whole constitution. Hence it seems probable, that similar local and general effects may be produced by the Cowpox poison, and not only in the human kind, but in Cows. I acknowledge, however, that the Case, p. 51. in *Jenner's* book, militates against this supposition.

V. *A person is susceptible of the Cowpox, who has antecedently been affected with the Smallpox.*

Dr. *Jenner*, p. 15-19, gives some instances of persons taking the Cowpox, who had certainly gone through the Smallpox. But he says, "it is a fact so well known among our dairy-farmers, that those who have had the Smallpox, either escape the Cowpox, or are disposed to have it slightly; that as soon as the complaint shews itself among the cattle, assistants are procured, if possible, who are thus rendered less

susceptible of it, otherwise the business of the farm could scarcely go forward."

I have not got much additional information on this fact. It seems, however, sufficiently authenticated, that people may have the Cowpox after they have had the Smallpox, but it will require more nice attention to satisfy the query, whether, in such cases, the Cowpox affects the whole constitution; or is only a local affection.

Mr. Downe,* in particular, speaks of a family who did not take the Cowpox when much exposed to the infection, because they had all gone through the Smallpox; except one who had been affected already with the Cowpox. I met with a servant at *Mr. Rhodes'* farm, on the Hampstead Road, who attested that he had suffered the Cowpox 14 years ago, but that long before that time he had gone through the Smallpox.

Professor Wall † says, "The answer to the question, Whether a person is capable of taking the Cowpox, who has gone through the Smallpox? is of some, decidedly, that such a person is not liable to the infection of the Cowpox.

* *Mr. Downe's* Letter of August 30th.

† Letter of *Professor Wall*, above cited.

Others of equal experience have answered this question with doubt."

At Mr. Rhodes' farm, at Islington, I found that one of the male servants, who had been long employed in taking care of Milch Cows in the environs of London, distinguished the Cowpox very clearly from common inflammation of the teats, with scabs; with which several Cows were, at the time I saw this man, affected. He had never contracted the Cowpox, although he had repeatedly been exposed to the infection, and when others took it. He was deeply pitted with the Smallpox; which he laboured under when a young child.

VI. *The Cowpox is not communicated in the state of effluvia, or gas; nor by adhering to the skin, in an imperceptibly small quantity; nor scarce unless it be applied to divisions of the skin, by abrasions, punctures, wounds, &c.*

Some morbid poisons are communicated to animals, only in the state of invisible effluvia, or gas; e. g. the miasmata which produce intermittent fevers; the contagion which produces the ulcerous sore throat; that which occasions the Hooping Cough, the Measles, &c. Other morbid poisons are communicated, both in the state of effluvia, and in a palpable or visible

quantity, *e. g.* the variolous poison; the matter which produces in oxen, the murrain, or lues bovilla, &c. Others again are not propagated in the state of effluvia, or gas, but in a palpable or visible quantity only, as the hydrophobic poison; the syphilitic, &c.; and to these last must now be added the morbidic poison of the Cowpox.

It does not appear that the disease spreads from any infected Cow among other Cows, which are fed in the same stable, like a contagious disease. Persons who sleep in the same bed with one who is labouring under the Cowpox, are not, in this way, liable to be infected, (see Jenner, p. 68 and 69.) It is not even propagated from the Cows to the milkers for the most part, unless the skin of the part of the hands, to which the matter is applied, be divided.

This property of the Cowpox infection not being propagated, so as to produce disease but by contact, and then only when applied in a palpable or visible quantity, and also scarce, unless the skin be divided, is a most important one. Yet a few instances, I apprehend, will suffice to shew clearly under what circumstances the Cowpox infection produces disease.

A boy who was inoculated for the Cowpox, slept while he was labouring under the disease

with two other boys, but neither of them, by this exposure to the infection, got the Cowpox. A young woman who had the Cowpox, with several sores, which matured to a great extent, slept in the same bed with a fellow dairy-maid, who never had been infected either with the Cowpox or Smallpox, but the disease was not communicated. A young woman, on whose hands were several large suppurations from the Cowpox, was a daily nurse to an infant, but the infant was uninfected, (see Jenner, p. 68 and 69.)

I am instructed, uniformly, by my correspondents, that the Cowpox arises only from matter evidently applied, most frequently, by friction of the diseased teats in milking; but sometimes from the matter lodging accidentally on some soft part; yet even under this circumstance, it frequently fails to infect, unless there be a cut, scratch, puncture, &c. of the hands.

Mr. Drewe mentions the instance of a woman who lost her eye sight, in consequence of the infectious matter being heedlessly applied to the eye: and that the Cowpox has been observed to take place from handling the milk pail, on which the infectious matter had been incautiously allowed to remain.

VII. *The local affection in the Cowpox, produced in the casual way, is generally more severe, and of longer duration, than usually happens in the local affection in the inoculated Smallpox; but in the Cowpox the fever is in no case attended with symptoms which denote danger, nor has it, in any instance, been known to prove mortal.*

The Cowpox in the incidental way, for sufficiently obvious reasons, most commonly affects the palms of the hands. There is a wide difference in the degree of the local affection. I am instructed, by my communications, that the extreme cases are, 1st. Those in which the patients are afflicted with so much painful inflammation, as to be confined to their beds for several days, and have painful phagedenic sores for several months. 2^{dly}. Those cases which are so slight, that the patients are not confined at all, but get well in a week or ten days. In the more severe cases, in which the inflamed spots become vesicular, with edges of the pustules more elevated than the cuticle, and of a *bluish* or *purple colour*; there are pains of the axilla, fever, and now and then a little delirium.

These symptoms continue from one to three or four days, leaving ulcerated sores about the

hands, which, from the sensibility of the parts, are very troublesome, and commonly heal slowly; frequently becoming phagedenic, like those from which they sprung. The lips, nostrils, eyelids, and other parts of the body, are sometimes affected with sores; but these evidently arise from their being heedlessly rubbed or scratched with the patient's infected fingers. Dr. Jenner considers the *bluish*, or *livid* tint of the pustules to be characteristic of the Cowpox, p. 5.

Mr. Drewe's information on this fact is, "That the symptoms are similar to the Smallpox, but *less violent*. The pustules are only about the hands, in the parts which have been in contact with the infected teats." But in answer to the question, Whether, on the whole, the Cowpox is a disease of less magnitude than the Smallpox by inoculation? he says, "When I consider what a slight disorder the inoculated Smallpox is, it will not, in my humble opinion, admit of comparison."

Mr. Dolling says, "there is a swelling under the arms, chilly fits, &c. not different from symptoms of the breeding of the Smallpox. After the usual time of sickening, viz. two or three days, there is a large ulcer not unlike a carbuncle, which discharges matter."

Dr. Pulteney's account of the symptoms is in

these terms: "A foreness and swelling of the axillary glands, as under inoculation for the Smallpox; then chilliness, and rigors, and fever, as in the Smallpox. Two or three days afterwards abscesses, not unlike carbuncles, appear generally on the hands or arms; which ulcerate, and discharge much matter."

Mr. Downe, speaking to this point, says, "The symptoms, as far as could be ascertained in the Cowpox, were similar to those of the Smallpox, but I never heard of any who had them in any degree alarming." Again, "The symptoms are exactly similar to those of the Smallpox by inoculation, when of the most favourable kind. The disease generally disappears in about the same time that the Smallpox does."

Mr. Giffard tells me, that "he never heard of either men, or cows dying of the Cowpox."

Mr. Woodman, (see *Mr. Smith's* letter,) testifies that he never observed symptoms worthy to be called fever; there was merely "feverish heat when the pain was considerable."

Dr. De Salis observes, that one of the persons affected with the Cowpox "was much struck with the resemblance to the symptoms he had lately experienced in the Smallpox."

Professor Wall's information is, that "The

milkers have the disorder only once, generally with preceding fever, sometimes very violent, sometimes more mild."——"No human creature, or Cow, has been known to be in danger, or to die of the Cowpox." After a strict inquiry at the milk farms adjoining to London, I could not find that any person had ever died of the Cowpox.

With respect to the animals from which the human creature derives the disease, it is only known to affect Cows. They have sometimes, but it is very seldom observed, a disorder of the whole constitution, "the secretion of milk being much lessened."—The local affection appears with irregular pustules on the nipples. "At their first appearance they are commonly of a *palish blue*, or rather of a colour somewhat approaching to *livid*, and are surrounded by an erysipelatous inflammation. These pustules, unless a timely remedy be applied, frequently degenerate into phagedenic ulcers, which prove extremely troublesome." See Jenner, p. 3—4.

Dr. Pulteney acquaints us, that "the disease makes its appearance on the udder of the Cow, and affects the teats principally, which inflame, and then ulcerate, discharging a bloody matter; *but it does not appear that the disease is more than*

local, as the Cows seem not to be out of health in other respects."

From *Mr. Drewe's* testimony, however, it appears, that the whole constitution of the Cow is affected. There being "loss of appetite and of milk," as well as "ulcerated teats," so as to render the animal, in some cases, totally unfit for the dairy. "It is infectious in the herd, and the infection is probably conveyed by the person's hand that milks them."

Mr. Downe's information, relating to the present part of our inquiry is, that "the only symptoms were eruptions about the teats of the Cow, exactly similar to the Smallpox, which gradually become sore, and fall off; and the infection was soon communicated to a whole dairy, as was supposed by the hand of the person who milked. The animals suffered much in the operation of milking."

Professor Wall mentions, that the symptoms are "blue or livid blotches on the teats and udder, painful and suppurating. The Cows are seldom ill, so as to refuse their food. Others observe, that Cows being naturally disposed to a lax habit of body, are not so much afflicted with feverish symptoms. Some say Cows suffer no fever at all."

The testimony of several other correspondents

has been already stated, that a Cow has never been known to die of the Cowpox ; to which I add, in confirmation, that of the milk farmers near London.

VIII. *No consequential disease, which should be attributed to the Cowpox, has been observed ; nor has any disease been excited, to which there previously existed a disposition ; nor has it been discovered to produce a pre-disposition to particular diseases.*

Although a considerable body of evidence might be stated in confirmation of these momentous facts, from the experience of Dr. Jenner, and the uniform testimony of my correspondents : and although we should be inclined to conclude in favour of these facts, from the consideration of the nature of the Cowpox, as far as yet known ; yet it does not appear to my judgment that the observations and arguments warrant more than conclusions on the side of great probability. A number of persons, many hundreds, have gone through the inoculated Smallpox under the observation of many practitioners, without any disease, or disposition to disease, being produced by the Smallpox ; yet no one doubts, that in a certain proportion

of instances, disease has been excited, and disposition to disease been produced.

We are led then to think, that a greater number, and more accurate observations are wanting, to authorise positive conclusions relating to the facts stated under this VIII head.

IX. *The Cowpox infection may produce the peculiar local disease belonging to it, but without the disorder of the constitution; in which case, the constitution is liable to be infected by the Smallpox infection.*

This fact is not of small consequence, either in respect of general pathology, or practice. Dr. Jenner's work, p. 71, furnishes us with an unequivocal example of this fact. A woman was affected with the local disease of the Cowpox in the ordinary way, but without any pains or swelling of the axillæ, or any disorder of the whole constitution. This person was subsequently infected by the Smallpox; but a fellow servant, who had suffered the Cowpox, (at the same time, and from the same source of infectious matter,) in which there was fever as well as local disease, could not be infected by inserting the Smallpox poison; even repeated trials for this purpose were successful. Hence

they who offer as evidence, instances of persons taking the Smallpox after they have gone through the Cowpox, will do well to assure themselves, that the whole constitution was affected in the Cowpox, otherwise such evidence will be inadmissible. Analogous facts have been ascertained on good authority, in the Smallpox, although the instances are too scarce to afford to scrupulous minds full proof. It has been found that the usual local disease of the inoculated Smallpox may occur, unattended by a disorder of the whole constitution; but yet the matter of such local Smallpox will, in other persons, produce not only the local disease, but general eruption and fever: and that the person who had undergone this local Smallpox only, will be infected at a future time, so as to have both the ordinary local disease and fever of the Smallpox, with eruptions.

It appears from the observations of Dr. Jenner, p. 50, Mr. Drewe, Dr. Pulteney, and others, that during the Cowpox in the human subject, inflammation and sores are apt to be excited by the matter being lodged upon various parts, especially if the skin be divided; but no mention is made of fresh fever being excited, nor of the peculiar *livid* and *bluish* tint of the Cowpox pustulous sores. Enough has been

said in a preceding part of this paper to direct observers in future to ascertain more accurately the effects of the agency of the Cowpox infection on the whole constitution, and on part of it only.

It will be necessary also to caution inquirers against the error of admitting facts to belong to the Cowpox, as understood in this paper, which, in reality, belong to the Chickenpox, or Swinepox, or some other eruptive disease; which, it seems, in some provincial situations, are designated by the name of the Cowpox.

Yet another caution is necessary in investigating the truth, namely, to distinguish from the Cowpox, “ the pustulous sores which appear spontaneously on the nipples of Cows, and instances have occurred, although very rarely, of the hands of the servants employed in milking being affected with sores in consequence, and even of their feeling an indisposition from absorption. These pustules are of a much milder nature than those which arise from that contagion, which constitutes the true Cowpox. They are always free from the bluish or livid tint, so conspicuous in the pustules in that disease. No erysipelas attends them, nor do they shew any phagedenic disposition, as in the other case; but quickly terminate in a scab, without

creating any apparent disorder in the Cow." Like the Cowpox, "this eruption appears most commonly in the spring, when the Cows are first taken from their winter food, and fed with grafs."—Jenner, p. 7.

I observed during my visits to the Cow stables near London, in August and September last, that a number of Cows were infected with eruptions, fores, and scabs on their breasts; especially on their paps. None of the animals had any constitutional affection, nor could I learn that any of the milkers were infected. The eruptions now spoken of break out, as I was told, especially in new comers. Fresh Cows, it was said, were apt to be thus affected, on account of the much richer food which is given in London than in the country. The same kind of fores, eruptions, and scabs, (which must be distinguished from the Cowpox,) I apprehend, are common in the country; of which the following testimonies will be useful.

Sir Isaac Pennington, who could not learn that the Cowpox was prevalent in Cambridge-shire, says, "I find Cows are liable to inflammations of the udders, but they do not affect the hands of the milkers."

A number of Milch Cows are kept near

Twickenham, and *Mr. Beauchamp*,* Surgeon, gave himself much trouble to oblige me, by making inquiries according to the direction of my queries. He instructs me, “that all the Cow-keepers agree that warts, and small bladders, or pustules, appear frequently on the teats of the Cow, but never observed the animal, or the milkers, to be affected; not even when these pustules were burst by the hands of milkers who had never suffered the Smallpox.”

Dr. Beckwith, of *York*, who well merits my best thanks, bestowed great pains in making inquiries among the medical practitioners in his neighbourhood, and the farmers. His report is, “I † am well satisfied that no such disease as the Cowpox has ever appeared here in the memory of man; but soreness and chops of the paps are observed, from distention by milk in summer, never in winter, without affecting the hands of milkers.”

In the *Pestis bovilla*, or murrain, the breasts, and especially the paps, are sometimes affected with pustules, or tubercles ‡; which, however,

* *Mr. Beauchamp's Letter*, Twickenham, Sept. 18, 1798.

† *Dr. Beckwith's Letter*, York, Sept. 19, 1798.

‡ *Illos duntaxat boves, & quidem admodum raros, mortem effugisse quibus abscessus ac decubitus in formam tuberculo-*

seem to be in that disease the least of the unfavourable symptoms.

*Dr. Belcombe, of Scarborough, in his obliging letter, observes,** “there is a disease of the paps, which renders them exceedingly sore and difficult to milk, but it is not infectious, and the same Cow has it many times; nor are the hands of the milkers ever sore from it.—It commonly happens in hot and wet summers.”

On considering the facts of the preceding history, it appears that some useful conclusions of a practical kind may be drawn from them.

1. The body of evidence is numerous and respectable, declaring that a person who has laboured under the Cowpox fever, and local eruption, is not susceptible of the Smallpox. It does not appear that a single well-authenticated contravening instance has fallen under observation. But I do not apprehend, that accurate

rum, scabiei, depilationis, vel rhagadam, in uberum papillis fieri contegerit.—LANCISI de bovilla peste, pag. 3, tom. 2, No. 134.

* Dr. Belcombe's Letter, Scarborough, Sept. 22, 1798.

and able reasoners will consider the fact as completely established; though I doubt not they will allow that the testimonies now produced, greatly confirm the probability, and that the cautious appropriation of it, in practice, is warrantable. In the present inquiry, the attestations have been obtained from so many persons, that it seems highly improbable indeed, that the contrary instances should have been unobserved, or purposely kept out of sight. If the fact had been supported by the testimony of one observer only, the experience of the world would have justified us in demanding the account of the failures; after the example of the keen sceptic of old, who, on being shown the votive tablets of those who had been preserved from shipwreck, instead of yielding his assent, replied, “Where are the tablets of those who have perished? *”

* *Intellectus humanus in iis quæ semel placuerunt (aut quia recepta sunt et credita, aut quia delectant) alia etiam omnia trahit ad suffragationem et consensum cum illis. Et licet major sit instantiarum vis et copia quæ occurrunt in contrarium; tamen eas aut non observat aut contemnit, aut distinguendo summovet et rejicit, non sine magno et pernicioso præjudicio quo prioribus illis syllepsibus autoritas maneat inviolata. Itaque recte respondit, qui, cum suspensa tabula in templo ei monstraretur eorum, qui vota solverant, quod naufragii periculo elapsi sint, atque interrogando premeretur,*

Granting the truth of this fact, its usefulness in practice, in contemplation of it as a substitute of the Smallpox, must depend upon the effects of the Cowpox, in comparison with the Smallpox, especially in the particulars *of the degree of danger to life; the kind of symptoms, and their duration; and the subsequent effects on the constitution.*

1st. The evidences, shewing that no one has ever died, or even been apparently in danger, are the same as those for the fact itself; that a person is not susceptible of the Smallpox after having suffered the Cowpox. But the conclusion, with respect to the point of danger, is far more equivocal. The comparison for this purpose should be made with not fewer than one, or even two thousand instances. For though in several hundred examples of the Cowpox, which have been under observation, not one person has fallen a victim; this might, and indeed has been, the fortunate issue of the inoculated Smallpox, of which it will suffice to give two instances.

Dr. William Heberden informs me, that at Hungerford a few years ago, in the month of

anne tum quidem eorum numen agnosceret, quæsit denuo;
At ubi sunt illi depicti qui post vota nuncupata perierunt?—
 VERULAMII Novum Organum, Aphor. XLVI.

October, 800 poor persons were inoculated for the Smallpox, without a single case of death. No exclusion was made on account of age, health, or any other circumstance, but pregnancy; one patient was 80 years of age; and many were at the breast, and in the state of tothing.

Dr. Woodville acquaints me, that in the current year, from January to August inclusive, out of upwards of 1700 patients inoculated at the Inoculation Hospital, including the *in* and *out* patients, *only two died*; both of whom were of the latter description.

Such instances of success can only be attributed to a certain favourable epidemic state of the human constitution itself, existing at particular times; for the proportion of deaths is usually much greater; indeed, sometimes it is very considerably greater, owing, probably, to certain unfavourable epidemic states. Of the various different estimates which have been made, the fairest seems to be that which states (under a choice of the most favourable known circumstances which can be commanded) one death out of two hundred inoculated persons. But when it is considered that we are now to make the comparison between the inoculated Smallpox, and what may be called the *natural* Cowpox; when it is considered that the

inoculated Cowpox, in respect of the local eruption and ulceration, is a much less painful and shorter disease than the natural, or casual Cowpox; when it is considered that the inoculated Smallpox is especially dangerous from the number of eruptions, and that there is only a trifling local eruption of the part poisoned in the inoculated Cowpox; when it is considered that the Cowpox infection is not propagated in the state of effluvia: I say from such considerations, it seems to be most reasonable to conclude, that *there is great probability of the Cowpox either not proving fatal at all, or at most being much less frequently so than the inoculated Smallpox.*

Further: the comparison of the two diseases should be instituted, with respect to danger, under the particular circumstances of *Pregnancy; Age; Toothing; Peculiar morbid states; Peculiar healthy states, or Idiosyncrasies; and certain Seasons, or epidemical States.*

Pregnancy. The inoculated Smallpox is so commonly mortal to the unborn in every period of gestation; and so frequently so likewise to the mother in advanced states of gestation; that no prudent practitioner would choose to inoculate under these circumstances; but to escape the taking the disease by effluvia, in the casual

way*. The exposure to infection, being sometimes unavoidable, I confess I feel anxious to ascertain the effects of inoculating the Cowpox infection in such persons. And on the grounds of the slightness, and short duration of the Cowpox eruptive fever, and of the merely local eruption, I apprehend a practitioner would be justifiable in preferring the inoculation of the infection of this distemper to that of the Smallpox.

On another account, the practice of inoculating the Cowpox seems recommendable in pregnancy, namely, that of preventing the irritable state of the womb, which is produced by abortion, during the Smallpox. From which irritable state, the female will be very liable, in future, to the misfortune of abortions. This is so notorious a fact in brutes, that a Cow which has suffered abortion, while labouring under the *Lues bovilla*, or murrain, will seldom, in future, bring forth a live calf; and on this account such a Cow becomes greatly degraded in value. Whereas a Cow, which has had the inoculated murrain when a calf, or at least before she was impregnated, is thereby greatly enhanced in value. It was the great

* See my paper *On the effects of the variolous infection on pregnant women*. Medical Annals, Vol. IX, Decade 2d, 1795.

Camper who recommended to his countrymen in Holland the general inoculation of calves for the murrain. The matter is most advantageously inserted into the ear, tail, or dewlap.

Dr. Layard says, oxen may be inoculated, either with the pus of their eruptions, or with the mucus from the nose; and that few, comparatively with the casual disease, die. Oxen were not infected by eating matter of the pustules with their corn; nor by covering their heads with a cloth, which had been impregnated with steam from the breathing of infected oxen.

Whether the unborn animal will take the infection of the Cowpox from the mother, is a question for future observation to determine. It has been fully determined (antecedently to the recent controversy between two eminent anatomists, for the honor of the discovery,) by pathological observations, and demonstrated by anatomical* experiments and artifices, that

* *Succus nutritius et chylosus matris, ex poris et vasculis uterinis interventu membranæ villosæ tenuissimæ quæ chorio contigua est, non secus ac chylus a tunica intestinorum villosa recipitur, absorbetur, et per umbilicalem venam fertur, ex qua cum sanguine ad hepar infantis deducitur.*—————

Nutritur infans mediante succo temperato, gelatinoso matris, qui per spongiosam uteri substantiam transcolatur et a secundina recipitur, per cujus vasa ad infantem defertur.—

the blood of the mother does not pass to the fœtus, nor return from the fœtus to the mother: for the unborn frequently escapes the disease of the Smallpox, although the mother be affected with it; and when the fœtus is infected, it is uniformly subsequent to the eruption, and even to suppuration of the pustules on the mother.* Further injections will pass from the umbilical

Ipsa secundina quatenus utero adhæret ex ejus substantia porosa succum alibilem, non vero sanguinem matris recipit—Credididerunt veteres, sanguinem matris nutrire infantem et vasa uteri cum vasis secundinæ et fœtus invicem connecti: sed notabile est, liquorem siphone umbilicales arterias injectum per venam umbilicalem redire, modo placenta illæsa fuerit; ex quo apparet, nullas dari anastomoses vasorum uteri cum vasis secundinæ et fœtus, neque sanguinem fœtus rursus ad venas matris redire.—Placenta uterina ex innumeris capillaribus minimis vasculis est connecta, per quæ dum transit sanguis atteritur, comminuitur inque minimas partes ac globulos dividitur, intima unione succi nutritii cum sanguine facta, ut hac ratione per tenues canaliculos embryonis commodius transire et nutritionem præstare possit: unde revera secundina in fœtibus vice fungitur pulmonum, qui in fœtu à munere suo vacant, quod identidem in intima sanguinis partium comminutione earumque unione cum chyloso succo consistit: qua de causa etiam vena umbilicalis id habet peculiare cum vena pulmonali ut sanguinem fluxilem floridum, et arterioso similem vehat quod omnibus aliis venis negatum est—
F. Hoffmann, t. 1. lib. 1. sect. 11. cap. XIII.

* See the paper above cited, on the effects of variolous matter in pregnant women.

arteries of the fœtus into its body, and return by the umbilical vein, provided the placenta, or vicarious lungs of the fœtus be entire. The fœtus then does not receive its blood from the mother, nor does the blood of the fœtus circulate through the mother. Yet the infant, before birth, frequently does receive some kinds of infectious matter from the mother, viz. the syphilitic, variolous, &c. and of consequence, it seems possible that it may receive the Cowpox infection, subsequently to its formation by the mother's constitution. In this case we should expect no local disease, but merely the specific fever.

Age.—Whatever doubts may be entertained of very advanced, or decrepit age, being adverse to the success of the inoculated Smallpox, I am sure that I shall be supported by the opinion and practice of a very decisive majority, that *infancy* is the state in which the largest proportion die under inoculation. In medical families, and in large towns; where, to the reproach of our police, persons labouring under the Smallpox are suffered to appear in the streets and public walks; even the most cautious practitioners deem inoculation of infants warrantable, but not even then otherwise than to avoid the casual disease.

Of the effects of inoculation of infants with the Cowpox infection, we have but one or two examples; however these are in favour of the practice.

Toothing.—Though the tender irritable state of a new-born child may be a more dangerous one with the Smallpox, than even the state of actual great irritation during the cutting of teeth with this disease, yet the evidence in point of safety is against inoculating the Smallpox in the latter cases. This being the fact, we shall feel inclined, under the circumstance of dentition, to inoculate for the Cowpox; if exposure to the Smallpox infection be unavoidable.

Peculiar morbid states.—Certain diseases have been found to have no influence in occasioning the inoculated Smallpox to take place in a severe manner. On the contrary, it appears that some of these diseased states render the Smallpox milder. But of the influence of such morbid conditions on the Cowpox, we possess no experience to authorise an opinion. There are some states induced by particular diseases, namely, by the Measles, Hooping Cough, &c. which are considered to be the occasion of a severe disease in the inoculated Smallpox; and from this con-

sideration, under the circumstance of unavoidable exposure to the Smallpox infection, it seems warrantable to prefer the inoculation of the Cowpox.

Peculiar states of health, or Idiosyncrasies.
The cases of certain families in which the Smallpox is uncommonly severe, and of other families in which it is very mild, are so frequent as to have fallen under the notice of every physician of experience. Some families have been so unfortunate, that all their children have died in the Smallpox, either in the casual way, or by inoculation. It is not a very great rarity to find a family, in which several children have fallen victims to the Smallpox, and in which a single surviving child remains: in such a case, the parents, and perhaps the child, are under constant apprehensions of the casual Smallpox; for they are deterred from inoculation by what has happened. Surely, in such circumstances, one would be inclined to recommend inoculation for the Cowpox.

During certain seasons, or epidemical states.*
At certain times, when the Smallpox is epide-

* A very mild and innocent endemial Smallpox, occurred in the practice of Dr. Hicks, of which a history is expected by the professional public.

mical, it is mostly violent and very fatal; and at other times it is mostly neither violent, nor very fatal.

Such different sorts of Smallpox seem to depend upon prevalent peculiar states of health of people, rather than on the properties of the atmosphere. When an unfavourable epidemical state is discovered, the judicious practitioner will find the question worthy of his contemplation, whether it will not be justifiable to introduce the inoculation of the Cowpox, to supersede the Smallpox?

2. *The kind of symptoms, and the duration of the two diseases, must be compared together.*—If an inoculator could, at his will, command on inoculation of the Smallpox, a slight local affection, a trifling eruptive fever, and a very small number of eruptions, there would be no temptation held out on the score of symptoms, to inoculate for the Cowpox; because, in this disease, it appears that we are liable, even by inoculation, to produce a painful phlegmonic inflammation; extensive and very irritating inflammation of the skin around the part poisoned, and ulceration of the phagedenic kind. A sufficient number of cases of the inoculated Cowpox have not been attested, to enable us to form

an accurate judgment of the degree of the symptoms, in comparison with those of the inoculated Smallpox. It does not appear that there is nearly so great a difference between the constitutional disorder, or fever, of the inoculated Cowpox, and of the casual Cowpox, as between the disorder of the constitution of the inoculated Smallpox, and the casual Smallpox: nor of course are the advantages of the inoculated Cowpox so eminently great, comparatively with those of the casual disease, as the advantages of the inoculated Smallpox are superior to those of this disease in the casual way. On comparison of the symptoms of the inoculated Chickenpox, the inoculated murrain, and the inoculated Measles, with these diseases, in the casual way, by effluvia, the difference is not so great as to raise considerably our expectation of advantages from the practice of inoculation. Although Camper and Layard are advocates for inoculation for the Murrain, *Monf. de Berg* gives a contrary opinion, declaring, * *Que l'inoculation n'offre aucuns avantages réels; sur-tout dans les cas où l'épizootic est très-meurtrière, circonstance qui d'ailleurs est la seule dans laquelle elle puisse être de quelque utilité.*

* Lettre a Monf. Linguet, p. 28, Appendix.

3. *The subsequent effects on the constitution,* from the Cowpox, must be compared with those from the inoculated Smallpox. A disposition to certain diseases, and even diseases themselves, are not rarely brought on by the Smallpox; but sometimes also dispositions to diseases, and diseases themselves of the most inveterate kind, are removed by the Smallpox. In families, wherever certain dispositions to diseases are hereditary, and which diseases are known to have been excited by the Smallpox; inoculation for the Cowpox on this account may be a considerable benefit; but that is on the supposition, that no diseases, or morbid dispositions, are induced by it. As far as my inquiries have extended, I have found that no such morbid effects have ensued from the Cowpox; but I apprehend that many more observations, than have hitherto been made, are requisite to ascertain this point satisfactorily.

Although pits from the Smallpox are not a disease, they are at least a deformity, which it is of the greatest moment for many persons to prevent; but which, however, no one can certainly guard against, even by inoculation; and as in the Cowpox, no such consequences take place, an inducement is afforded to inoculate for this disease.

II. As the Smallpox infection is propagated in the state of effluvia, and by adhering in an unseen, and even invisibly, small quantity, to cloaths, furniture, &c. : but as the Cowpox infection is only propagated in a visible quantity, and for the most part, only when applied to the divided cuticle; the means of avoiding the Cowpox are easy, and obviously simple. On account of the extremely contagious nature of the variolous poison, the extensive dissemination of it by inoculation, and the practice of inoculating for the Smallpox being only partial; it appears that the mortality by the Smallpox, has been in a greater proportion since, than before the introduction of inoculation. And no sagacity is required to predict, that should the practice of inoculating for the Cowpox ever become very general amongst young persons, the variolous infection must be extinguished; and, of consequence, that loathsome and destructive disease, the Smallpox, be known only by name. And this benefit will accrue, without even the allay of the introduction of a new disease, it being plain from the nature of the Cowpox poison, that it will be easy to avoid, and prevent its dissemination.

III. The Cowpox poison appears to alter the

human constitution, so as to render it unsusceptible of the agency of a different morbidic poison, namely, of the variolous, in producing the Smallpox. This fact is, I believe, quite a novelty in physiology and pathology: it indicates a new principle in the mode of prophylactic practice. And we now see upon what principle, diseases from various other morbidic poisons may possibly be prevented from taking place; such as the measles, ulcerous sore throat, hooping cough, syphilis, &c., viz. in consequence of destroying the excitability of the constitution to such poisons, by the agency of different, and perhaps less hurtful ones. Whether the Cowpox preserves the constitution from other morbidic poisons, besides the variolous, is an undecided question. This fact also suggests the idea, that the œconomy of live beings may be liable to undergo permanent changes in the state of excitability of each, in respect of certain stimuli, both morbidic and innocent ones; which observation has not hitherto discovered. And on account of the unobserved agency of such stimuli, some constitutions are utterly incapable, either permanently or for a limited time, of taking the Smallpox, and perhaps other diseases. But if there are in nature means of rendering the human constitution unsusceptible, it must

be allowed that it is probable there are also means of rendering it particularly disposed to certain diseases. And it is possible that the same constitution may, in the course of life, undergo repeatedly a temporary state of inexcitability to certain stimuli; but there is no reason to suppose that a state of inexcitability, which would otherwise be permanent, may be removed by certain morbidic stimuli.

In the veterinary branch of physic, it is a matter of still greater importance to possess the means of rendering the constitution unsusceptible of the agency of the morbidic poison which produces the *murrain*: because,

1. This malady is more destructive when it is epizootic, than the Smallpox is among human creatures: 2. Because inoculation for it is not nearly so beneficial; a great proportion dying under inoculation.

It seems of small consequence in practice, but it is very important on account of physiology to determine, whether the human œconomy is rendered unsusceptible of the Cowpox, by having undergone the Smallpox. In the instances related, of people taking the Cowpox who had gone through the Smallpox, the observation was not directed with a view to determine, satisfactorily, whether the local affection

was certainly attended, or preceded by a constitutional affection.

IV. If it be true that the same constitution is liable to undergo repeatedly the Cowpox, to which distemper no one has fallen a victim, practitioners may avail themselves of this mean of exciting an innocent fever, as a remedy of various disorders; it being a truth, admitted by men of experience, that fevers are occasionally efficacious remedies; especially for inveterate Chronic maladies; such as, Epilepsy; Hysteria; Insanity; St. Vitus's Dance; Tetanus; Skin deformities and diseases, &c.

V. Concerning the *Ætiology* of the disease, which is the subject of our inquiry.—The Cowpox in the human animal has, in every *casual instance* of the disease, been so clearly traced immediately to the Cow's breasts, affected with the Cowpox, that it would be mispending time to relate, particularly, the history of cases, to prove what is asserted. The inoculation with matter from the Cow, produces the same disease as the casual Cowpox. It appears also, that the Cowpox matter of the human animal excites the same disease as the matter from the Cow. It has not been deter-

mined by experiment, nor by any observation of incidental agency of Cowpox matter; that this matter generated in the human animal, will excite the same disease in the Cow; but from the facts just spoken of, probably few persons will doubt that this must be the case. The Cowpox of the brute is either excited by matter conveyed from a beast, labouring under the disease, (in an obvious way by the hands of milkers) to uninfected Cows; in which manner one diseased beast may infect an unlimited number of beasts; or the disease is excited by aboriginal Cowpox matter, that is, by matter compounded in the animal œconomy of the Cow, without any matter of the same kind having been applied. The means by the agency of which the animal œconomy is put into such a state, as to compound this peculiar matter, are not yet found out. A connection is, however, observed between the disease and the spring season, the autumn, and change from less nutritious to more nutritious food.

It has been concluded by Dr. Jenner, that the aboriginal matter is from the matter of the grease of horses, which gains admission through the milkers who handle such greased horses: but this conclusion has no better support, than the coincidence in some instances of the pre-

valence of the two diseases in the same farm, and in which the same servants are employed among the horses and cows. This assertion stands in need of support from other observations. The *experimentum crucis* seems to have been already instituted, but without success, namely, the inoculation with the grease matter of the Cow's breast, by Dr. Jenner. It is to excite farther research, that I shall mention how successful my inquiries have been to find the origin of the Cowpox to be in the grease.

1. I have found that in many farms the Cowpox breaks out, although no new comer has been introduced into the herd; although the milkers do not come in contact with horses; although there are no greased horses; and even although there are no horses kept on the farm.

2. It appears that the Cowpox does not break out under the most favourable circumstances for its production, if it be occasioned by *the grease*. Through the application of my inestimable colleague, Dr. William Heberden, I have got much instruction relating to this head, from *Sir Isaac Pennington*. "I* have had," says Sir Isaac, "Dr. Jenner's book some weeks,

* Sir Isaac Pennington's Letter, Cambridge, Sep. 14, 1798.

and the particulars stated in it are really astonishing. I have made inquiries upon the subject at Cottenham and Willingham; in which two parishes, 3000 Milch Cows are kept, also a great many horses of the rough-legged cart kind, (much liable to the scratches or grease,) half the parishes being under the plough, and the men much employed in milking. But I cannot find that any pustulous eruptions on the teats of the Cow, or on the hands of the milkers, have ever been heard of; and what seems to prove the negative in this case, I understand inoculation succeeds just as well in these parishes, as any where else. I cannot find from those concerned in inoculation, that shoeing-smiths are less liable to the infection of the Smallpox than other people."

Dr. Parr is one of the few men of learning, and acknowledged ability, who has imbibed an unfavourable opinion of the whole of the facts, and reasoning, of Dr. Jenner. But as my Exeter friend merely opposes reasoning and gratuitous suppositions, to at least some well-attested facts, I do not think any thing will be gained by stating, particularly, his sentiments on the subject, yet I acquiesce to his judgment, "that the assertion, that the Cowpox proceeds from the heels of horses, is gratuitous." He repro-

bates the conclusions on this part of the subject, in somewhat opprobrious terms; in which, however, the Doctor himself argues more on gratuitous suppositions, than admitted truths.

“Limpid* fluid is always more active than pus: for a wound no longer spreads when the matter becomes purulent. If a disease does proceed from the matter of the heel of the horse; it is no other than such as occurs in the human subject, namely, topical ulcers, from a putrid fomes; since it is probable, (p. 49, Jenner) on Dr. Jenner’s own foundation, the eruptions must precede its influence.—Men servants seldom milk cows in this country, and when they do, such insufferable dirtiness as to milk with hands streaming with the running of a fore heel, would not be tolerated in any milking court in this county. Indeed, I think this publication (Dr. Jenner’s) is a libel on his own neighbourhood.”

At the close of these adverse observations, it is but fair to represent, that this opinion, respecting the origin of the Cowpox, is not merely that of Dr. Jenner—for Mr. Smith (letter above cited) says, “Mr. Woodman had a notion of the Cowpox originating from the fore heels of

* Dr. Parr’s, M. D. Letter, Exeter, July 22, 1798.

horses." And several male servants at the milk farms near London said, "there was such a notion entertained in several parts in the country, whatever might be its foundation."

The Cowpox poison, and the hydrophobic poison, are the only specific morbid matters to the human animal economy, which are clearly proved to be derived from brute animals; for there is only small probability on the side of the opinion, that the syphilitic poison is from the *bull**; the Smallpox from the *camel*†; and the itch from the *dog*. The œconomy then of the human kind, and of Cows, resemble, in the particular of being excitable to a disease, the Cowpox, by a certain specific poison. Whether other animals; especially males of the bovine kind; can take the Cowpox, has not been determined by experiment, or accidental observation. Morbid poisons, which produce specific diseases, act in this way only on one species of animal, except in a few instances; such as the hydrophobic, and Cowpox poisons. Camper, Ingenhousz, and Woodville, in vain, attempted to produce the Smallpox by inoculation, in a

* Bulls so diseased, are said to be *stung*.—*Sir Isaac Pennington's Letter*.

† See Bruce's Travels, and Dr. Woodville's History of Inoculation.

number of different brute animals.* J. Hunter failed in attempting to excite the syphilis in a dog, by inoculating him with the poison of the gonorrhœa, and of a syphilitic ulcer. Camper attests, that in the most malignant epizootic murrain; which spread most rapidly among oxen; yet other animals, such as sheep, horses, asses, dogs, &c. were not infected by associating with the distempered oxen; nor even by feeding with them in the same compartments of a stable.

In the eruptive contagious disease among sheep in France 40 years ago, other species of animals which associated with them were not infected.

The newly-observed disease, which prevailed among domestic cats in 1796, throughout great part of Europe, and even America, did not appear to affect other animals.

These observations may serve to remove the fears of those who apprehend, that in conse-

* Berrier, of Chartres, asserts, that monkeys, dogs, sheep, rabbits, oxen, and other brute animals, are susceptible of the Smallpox; but his evidence has not the weight of a feather against the contrary authorities.

Swediaur asserts, that monkeys are never affected with the syphilis, although in England they are subject to the scrofula, and that other animals are equally unsusceptible of the syphilis, although *Pauw* affirms, that in Peru, dogs are affected with this disease.

quence of domesticating brute creatures, we are liable to render their diseases *endemic*.

VI. As it appears that the Cowpox poison, after its admission into the human constitution, takes effect, or sensibly exerts its agency upon the whole economy, in seven or eight days; it seems probable that it will anticipate, in many instances, the agency of the Smallpox poison; if the two poisons be introduced at the same time, or nearly so; in which case the patients should be in future incapable of the Smallpox.

If the morbidic poison of the varicella, or chickenpox, were to be inserted at the same time with the Cowpox poison, it is probable also that the Cowpox would suspend the Chickenpox; and perhaps render the constitution unsusceptible of its action in future. But if it be a truth that the rubeolous poison can be inserted by inoculation; and that it affects the constitution in six days; when this poison and that of the Cowpox are introduced at the same time, it is most likely the Measles will suspend the Cowpox.

So long as the constitution is under the agency of the Cowpox poison, it is not probable that it will be infected by those morbidic poisons, whose existence is only known by their effects; (for they operate in too minute a quantity to

fall under the notice of our senses) namely, the poison which occasions the Influenza, Hooping Cough, ulcerous Angina; that which occasions the Typhus fever; the miasmata, and the contagion of intermittent fevers, &c.

To give an instance of application of the facts to practice: if a woman be far advanced in pregnancy, and exposure to Smallpox infection has been, or is unavoidable; in that case it will be of vast importance to avert the present impending danger, from the female. Under such a circumstance, the temptation to inoculate for the Cowpox will be felt by the practitioner. And provided the inoculation be instituted in not more than six or seven days after exposure to the variolous infection, it should, according to principle, pretty certainly preserve the patient from the Smallpox; or if it be done within ten or twelve days, it should frequently answer the purpose. For the variolous poison lies within the human body, most frequently, fifteen days, and often four or five days later, before its general agency is perceived; whereas the Cowpox poison acts upon the whole constitution in seven or eight days after its admission.

VII. The Cowpox poison is, according to

the present facts, totally different in its nature and effects from every other morbidic poison, both of cattle and human creatures. It is not necessary to enter minutely into the distinguishing characters of it, as it appears in Cows, as these will be collected from the history of the disease. I think it right just to mention, that care should be taken not to confound the Cowpox with the common warty eruptions and inflammations, ending in scabs, which affect the paps only, or at most the paps and the udders. It must also be recollected, that the Cowpox is quite different from the diseases of cattle, which are attended with eruptions of the skin in general, such as take place in the murrain, or *pestis bovilla*, already spoken of; on which eruptive diseases more has been written by the Italian, French, and Dutch physicians, than by the English*.

* Gli assistenzi a' bovi ammalati e molt' altri uomini degni di fede m'attestarono d'aver osservati, in alcuni tumori crudi in diverse parti del corpo con lingue aride, nere e tagliate, in altri aver veduti tumori maturate.—*P. A. Michelloti*, p. 12, 1711.

La terza osservazione fu circa alcuni buovi, che dimorarano in ima stalla come alle pecore: due di essi cacciarono d'alla cute certi tubercolletti.—*Padre Boromeo*, p. 48.

Annis 1713, 1714, in nostro Ferrariensi Ducatu, lues contagiosa boum, &c.—Correpti enim boves cibum respuebant;

On account of the notion which, by some, is entertained, that the Cowpox infection is of the same nature as the variolous, it may be useful to point out the great differences between them.

1. The Cowpox poison, introduced by inoculation, affects the whole constitution at the same time, in the same degree, and manner, as when admitted in the casual way; and if the local affection be more severe in the casual, than in the inoculated way, it seems to be owing to the structure of the part, namely, the thick cuticle in the palms of the hands.

2. The Cowpox poison only affects the constitution, through the intervention of the part poisoned.

3. This morbidic poison produces no eruption

aures subito collapsæ procidebant: pili erigebantur; tremor pené universalis aderat: oculi lacrymabant: per nares multa lymphæ copia exibat; alvus solvebatur: et in aliquibus pustulæ sub cute prodibant, ita ut crederent aliqui Variolis boves ipsos affici; tandemque brevi septem dierum spatio moriebantur.—*J. Lanzoni*, t. 20, b. 202.

Maculis denique et pustulis infecta cutis, adeo ut quibusdam, in mentem venerit cogitare boves non lue, ut nunc res est, sed ipsis pustulis quas Variolas vocant interire.—*J. M. Lancisi* de bovilla peste.

Schreiben an die Generalstaaten betreffend die Einimpfung der Viehseuche geschrieben den 16 Febr. 1770.—*CAMPER* Von Einimpfung der Kindviehseuche, ihren Vortheilen und Bedingungen.—*CAMPERS Berliner Gesellschaft*.

or inflammation, but of, and near, the part to which the poison is applied.

4. The Cowpox poison from the human subject will, in all probability, infect the Cow with the Cowpox; which the variolous poison will not.

5. It is asserted that a person may have the Cowpox who has had the Smallpox.

6. The local pustulous eruptions in the Cowpox are rather of the nature of vesicles, or phlyctenæ, than purulent eruptions; and the ulceration is apt to be of the phagedenic kind.

7. The Cowpox infection is not propagated in the state of effluvia, or gas.

8. Cowpox matter applied to the eyes, lips, and various other soft parts; or to any parts which are punctured, or wounded, in persons who have already had the Cowpox; or are then ill of the disease, will excite the peculiar local affection from this poison, and perhaps fever.

VIII. There are some who are not certain whether or not they have gone through the Smallpox, yet they have such a dread of the disease, as not to submit even to inoculation for it. To such persons, the inoculation for the Cowpox, as a substitute for the Smallpox, must prove a happy discovery.

Some who have never gone through the Smallpox, have been repeatedly inoculated for the Smallpox, and also been exposed much to the infection of it in the casual way, yet could not be infected. Persons, so circumstanced, to be more secure, may be inoculated for the Cowpox.

Such is the representation which I shall venture to lay before the public, of the benefits likely to accrue to human society, from inoculation for the Cowpox. I shall be no better contented with those who will consider the facts to be already completely demonstrated, than with the opposite extreme opinion, that the whole of the prospects displayed are merely *Eutopian*. The fortunes of the new-proposed practice cannot, with certainty, be told at present by the most discerning minds. More instances are requisite to establish practical and pathological truths. Without assuming pretensions which, I think, unwarrantable, the number of instances farther requisite cannot be stated; but one may safely assert, that well-directed observation in a thousand cases of inoculated Cowpox, would not fail to produce such a valuable body of evidence, as will enable us to apply our knowledge with much usefulness

in practice, and establish, or at least bring us nearer the establishment, of some truths.

They who take a part in the present inquiry, must not expect to escape detraction. But such a prospect will not divert him from his path, who labours in the culture of physic for the satisfaction of his own mind; well knowing that it argues egregious ignorance of what is passing in the world, to do so from any other motive.

Communications received after the preceding Sheets were printed; and additional observations.

Mr. Rolph, Surgeon in *Peckham*, practised physic nine years at *Thornbury* in *Gloucestershire*. During two of these years, he was the colleague of the late *Mr. Grove*, who had been a medical practitioner at *Thornbury* for near forty years. The greater part of the facts above stated, relating to the *Cowpox*, are familiarly known to *Mr. Rolph* from his own observation, and from the experience of *Mr. Grove*.

Mr. Rolph tells me, that in *Gloucestershire* the *Cowpox* is very frequently epizootic in the dairy-farms in the spring season. It especially breaks out in Cows newly introduced into the herds.

When a number of Cows in a farm are at the same time affected, the infection seems generally to have originated in the constitution of some one Cow, and before the milker is aware of the existence of the disease, the infectious matter is probably conveyed by the hands to the teats and udders of other Cows ; hence they are infected. For if the disease in the Cow first affected be perceived in a certain state, and obvious precautions be taken, the infection does not spread, but is confined to a single beast. Whether the morbidic poison is generated in the Cow first diseased in a given farm, *de novo*, from time to time, and disseminated among the rest of the herd ; or, like the Smallpox poison, is only communicated from animals of the same species to one another, is not ascertained. No Cow has been known to die, or to be in danger from this disorder.

A great number of instances of the Cowpox in milkers had fallen under Mr. Rolph's observation ; and many hundreds more under that of his late partner, Mr. Grove ; but not a single mortal, or even dangerous, case had occurred. The patients were ordinarily ill of a slight fever for two or three days, and the local affection was so slight, that the assistance of medical practitioners was rarely required. He had

no doubt that the inoculated Cowpox was attended with as little pain and uneasiness as the ordinary cases of inoculated Smallpox.

Mr. Rolph says, there is not a medical practitioner of even little experience in Gloucestershire, or scarce a dairy-farmer, who does not know from his own experience, or that of others, that persons who have suffered the Cowpox, are exempted from the agency of the variolous poison.

The late Mr. Grove was a very extensive Smallpox inoculator, frequently having 200 to 300 patients at one time, and the fact of exemption now asserted had been long before his death abundantly established, by his experience of many scores of subjects who had previously laboured under the Cowpox, being found unsusceptible of the Smallpox; either by inoculation, or by effluvia.

While Mr. Rolph practised at Thornbury, he thinks not fewer than three-score instances of failure, in attempting to produce the Smallpox by inoculation, occurred in his own practice; all of which were persons who had been previously affected with the Cowpox. In almost all of these cases the uninfected persons associated with those who took the Smallpox, and many were repeatedly inoculated. Although Mr.

Rolph has not, in his recollection, any instances of people taking the Smallpox, who gave admissible evidence of their having laboured under the Cowpox; he thinks such cases may, and have indeed occurred to others, where the Cowpox had been only local; it being requisite that the whole constitution should be affected, in order to destroy the excitability to the variolous poison.

Mr. Rolph declared, that his confidence in the efficacy and safety of inoculation for the Cowpox was such, that he regretted he could not, at present, procure Cowpox matter to inoculate two of his own children, who had not yet had the Smallpox. This measure is, however, determined upon.

As a particular instance, Mr. Rolph related the following: A soldier's wife, while in the Smallpox, was accidentally in the company of several farmers at an alehouse in Thornbury. Two of the company who had gone through the Cowpox, but not the Smallpox, were not affected by the variolous infection; but three others, who had not laboured under the Cowpox, took the Smallpox.

Mr. Rolph's mind was not satisfied that a person could be constitutionally affected by the Cowpox poison more than once, but he had no

doubt that the local affection might be produced repeatedly. Neither did he certainly know that a person was susceptible of the Smallpox, who had been constitutionally affected by the Cowpox.

Mr. Rolph, in a letter to Dr. Beddoes, dated June 10th, 1795, communicated the following observations. Speaking of a man who could not be infected, although he was repeatedly inoculated for the Smallpox, and although he lived in the same room with another man who died of the Smallpox—Mr. Rolph says, “it is worthy* of remark, that this man had some years before, a complaint incident to Cows, and commonly called the Cowpox; a malady more unpleasent than dangerous. It is generally received by contact in milking. In the human species, the complaint is sometimes local, at other times absorption takes place, and the glands in the course of the absorbents be-

* See the queries of *Dr. Beddoes*, concerning inoculation, subjoined to his translation of Gimbernat's method of operating for the Femoral Hernia.—London, Johnson, 1795.

come indurated and painful. When this is the case, *I have learned from my own observation, and the testimony of some old practitioners, that susceptibility to the Smallpox is destroyed.* Some advantage may probably, in time, be derived from this fact."

Letter from Dr. Jenner to Dr. Pearson.

Cheltenham, 27th Sept. 1798.

MY DEAR SIR,

The perusal of your proof sheets has afforded me great pleasure, both from the handsome manner in which you mention my name, and from the mass of evidence which has poured in upon you from different countries in support of the fact which I so ardently wish to see established on a steady and durable basis.

Your first query respecting the Foetus in Utero I cannot resolve.

With respect to your second, you may be assured that a person may be repeatedly affected, both locally and generally, by the Cowpox, two instances of which I have adduced, and have many more in my recollection. But, nevertheless, on this important point, I have some

reason to suspect that my discriminations have not been, till lately, sufficiently nice. I must observe to you, that what the constitution feels from the absorption of the Virus*, is of a mild and transient nature, but the sores (which sores, when casual, are often numerous, and attended with much soreness and inflammation) are sufficient of themselves to occasion much disorder in the system. Certain it is, that the skin is always subject to the ulcerative effects of the virus, but whether the constitution can repeatedly feel the primary effects of it, I have experiments in view to determine.—Let me here call your attention to a similarity between the Smallpox and the Cowpox. The symptoms of absorption first disturb the system, and, secondly, the system feels the consequences of the local sores. Exactly so with the Cowpox; and as the Cowpox inflammation is always of the erysipelatous kind, when it spreads over the skin to any great extent, it produces symptoms not unlike the confluent Smallpox.

It is painful to me to tell you, that I have not an atom of the matter that I can depend upon for continuing the experiments. Mr. ———, when he inoculated the boy, did not

* I use this expression as the common language of the day, without consenting to the truth of it.

take matter early enough from the pustule to secure its efficacy,—for after it has lost its limpid quality, and becomes pus, I fear its specific effects cease.—Much precaution is therefore necessary in the progress of the inquiry; and this is my grand fear, that the discovery may fall into discredit from a want of that attention, in conducting the experiments which the subject requires. For example—a person may conceive he has the Cowpox matter on his lancet, when, in fact, there may be only a little putrid pus—with this he scratches the skin, and excites disease;—the patient is afterwards subjected to the insertion of the variolous poison, and unquestionably will have the disease.—Thus a delusive inference would be drawn, at once hurtful to the cause, and particularly injurious to me. However truth must appear at last, and *from your researches, its appearance will certainly be expedited.*”

I remain

Yours very truly,

E. JENNER.

Abstract of a Letter from Mr. Fewster, Surgeon in Thornbury, dated October 11th, 1798, to Mr. Rolph, Surgeon in Peckham.

“ In the spring of the year 1768 I came to live at Thornbury, where I have resided ever since. In that very year, from the following occurrence, I became well acquainted with the disease called Cowpox. The late Mr. Grove and myself formed a connection with Mr. Sutton, the celebrated inoculator; and to inoculate for the Smallpox, we took a house at Buckover. We found in this practice, that a great number of patients could not be infected with the Smallpox poison, notwithstanding repeated exposure under most favourable circumstances for taking the disease. At length the cause of the failure was discovered from the case of a farmer who was inoculated several times ineffectually, yet he assured us he had never suffered the Smallpox, but, says he, ‘ *I have had the Cowpox lately to a violent degree, if that’s any odds.*’ We took the hint, and, on inquiry, found that all those who were uninfected, had undergone the Cowpox. I communicated this fact to a medical society, of which I was then a mem-

ber, and ever afterwards paid particular attention to determine the fact. I can now, with truth, affirm *that I have not been able to produce the Smallpox, in a single instance, among persons who have had the true Cowpox*; except a doubtful case which you are acquainted with. I have, since that, inoculated near two thousand for the Smallpox, amongst whom there were a great number who had gone through the Cowpox; the exact number of these I cannot tell, but I know that they all resisted the infection of variolous matter.

With regard to your questions—

1. As to danger from the Cowpox. In the course of thirty years I have known numberless instances of the disease, but never knew one mortal, or even dangerous case.

2. Is a person susceptible of the Cowpox more than once? I cannot answer this question.

3. Is the Cowpox, in the natural way, a more or less severe disease than the inoculated Smallpox? I think it is a much more severe disease in general than the inoculated Smallpox. I do not see any great advantage from inoculation for the Cowpox. Inoculation for the Smallpox seems to be so well understood, that there

is very little need of a substitute. It is curious however, and may lead to other improvements*.

4. Have you ever known any pregnant woman labour under the Cowpox? Yes, many—but it *never produced abortion*. The state of the foetus I cannot speak of.

5. Are Cows affected at certain times more than at others? They are especially affected from February to May, when there is the greatest number of greased horses.

I cannot procure any Cowpox matter this season.”

From Mr. Bird to Dr. Pearson, Oct. 16, 1798.

Mr. G. G. Bird, of Hereford, who is now attending medical lectures in London, tells Dr. P. that he has very often seen the Cowpox in Cows, and human creatures, near Gloucester—that it attacks the same person repeatedly, and once the third attack was observed to be more severe than the preceding ones, but ordinarily

* I have stated the writer's opinion of inoculation for the Cowpox, in obedience to a law imposed on myself, of not suppressing any part of the evidence communicated, however differently I might reason on the facts.—NOTE by the author of this Inquiry.

the reverse is the fact. It appears with red spots on the hands, which enlarge, become roundish and suppurate—tumors take place in the armpit—the pulse grows quick—the head aches—pains are felt in the back and limbs, with sometimes vomiting and delirium. It is most common in a wet spring. No one dies of the disease.

Dr. Currie, of Chester, informs Mr. Thomas that the disease called Cowpox is unknown to the medical practitioners and farmers in Cheshire.

Dr. Richard Pearson, of Birmingham, in his obliging letter of the 26th Sept. last, says, “From this united evidence, (that of medical persons and farmers) I think it may be inferred that the disease, which Dr. Jenner calls *Variolæ vaccinae*, is not epizootic in the counties of Warwick, Worcester, and Stafford.”

Dr. Woodville acquaints me, “that not being able to procure Cowpox matter, he is making trials with *grease matter*: from which, no doubt, some useful information will be obtained.”

*Extract of a Letter from Mr. Thomas Wales,
Surgeon at Downham, Norfolk, dated Oct. 18,
1798, to Dr. Pearson.*

I shall endeavour to give you satisfactory answers to your queries.

Previous to my conversation with Dr. Redfearn, I had no knowledge of the disease called Cowpox, nor was it known to any medical practitioner in this district. But on inquiring at the dairy-farms, I have got much information concerning the disease. I this day saw two persons who have had the Cowpox. One of them, a man above sixty years of age, who has been a milker all his life, knows the disease very well, by the name of *Pap-pox*, having himself experienced the disorder a great many years ago. He remembers that on that occasion he was sick at the stomach, and otherwise ill for two or three days. The eruption on his hands was considerable, and the fingers were swollen, probably owing to improper applications; the places healed slowly, and left scars, which are evident at this day; and when the hands are very cold, these scars are of a *livid cast*. He had not gone through the Smallpox

before he had the Cowpox, nor has he had the Smallpox since this disease, although he has been repeatedly inoculated.

The other case above mentioned is that of a young woman, who had the Cowpox some years ago, but never suffered the Smallpox, although she has been several times inoculated.

There are, I find, many other instances, of persons who have gone through the Cowpox, and who have not been able to take the Smallpox, either naturally, or by inoculation.

As the public in this part are not at all aware of the advantages of inoculation for the Cowpox, there are no instances of this disease by this mode of producing it.

I do not find that any person has had the Cowpox more than once; that is, a fever with the local affection more than once; but the local affection, without the fever, has occurred in the same person repeatedly. I have met with two cases, in which the matter of the Cowpox, by being applied to the eyes, destroyed the power of vision, from the opacity of the cornea so produced.

No person has been known to die, or even to be in danger, with the Cowpox: although the axillary glands have been much affected,

and the sores on the hands have healed with difficulty.

I have not met with a case of a woman who has gone through the disease during pregnancy.

No instance has fallen under my observation, of a person who has gone through the Cowpox after having had the Smallpox.

With regard to Cows: they are subject to the Cowpox more than once. It comes on in the spring, when they first begin to taste luxuriant food, but not uniformly every year. One farmer informed me, that he thought it broke out especially when the Cows were fed with turnips in autumn; but I do not depend much upon this observation."

Remarks on the term VARIOLÆ VACCINÆ.

For the sake of precision in language, and of consequence, justness in thinking; and considering that there is no other way of disabusing ourselves from many of the errors in physic, but by the use of just terms; it is not unworthy of our attention to guard against the admission of newly appropriated names, which will mislead by their former accepted import.

Variola is an assumed Latin word, and its

meaning will be popularly understood in the English tongue, by saying that it is a name of a disease, better known by another name, the *Smallpox*. Granting that the word *Variola* is a derivative from *Varius* and *Varus*, used by Pliny and Celsus to denote a disease, with spots on the skin; the etymological import of *Variola* is any cutaneous spotted distemper: but one of the most formidable and distinct of the cutaneous order, is what is called the *Smallpox*, and, therefore, as I apprehend the name *Variola* has been used technically κατ' ἐξοχην, to signify this one kind of spotted malady, and no other.

Now as the Cowpox is a specifically different distemper from the Smallpox, in essential particulars, namely, in the nature of its morbidic poison, and in its symptoms; although the Cowpox may render the constitution not susceptible of the Smallpox; it is a palpable *catachresis* to designate what is called the Cowpox, by the denomination *Variolæ vaccinae*; for that is to say, in English, *Cow-Smallpox*, and yet the Cow is unsusceptible of infection by the variolous poison.

To the name *Cowpox*, or better, perhaps, *Cow-pocken** in our language, I think no rea-

* Instead of the modern orthography Small-poX, &c. in

sonable objection can be urged. According to the more distinct and lucid arrangement of cutaneous distempers, by Dr. Willan*, the Cow-pox belongs to the *order*, entitled *pustules*: the word *pock* is known to signify *pustule*: and the prefix *Cow* denotes the only animal in which the morbidic poison of the disease has its $\gamma\epsilon\upsilon\epsilon\sigma\iota\varsigma$. Farther; if hereafter by the practice of universal inoculation, the human animal should be a much more abundant, and better known source of this morbidic matter, than the brute animal, it is fit that the latter, to which obligations will be owing for an inestimable benefit, should live in the grateful memory of mankind; as ought also the name of JENNER, who will be so great a PUBLIC BENEFACTOR.

QUERIES.

It may save some persons the trouble of thinking, and time, if a set of questions be stated;

which *es* and *cks* are denoted by *x*, it will be, perhaps, thought preferable to follow the original orthography, *pock*, with its plural *pocken*, as the Germans still do; from whose language we have received the words.

* Description and treatment of cutaneous disorders. Order 1. Pustulous eruptions on the skin: by *Robert Willan*, F. A. S. 4to. with plates, Johnson, 1798.

which will serve to guide observation in the acquisition of facts belonging to the subject of inquiry. For this purpose the following queries are proposed :

With respect to Brutes.

1. If a distemper of Cows has been noticed, called the Cowpox, or by any other name; in which the breasts, especially the paps, are affected with pustulous, and generally purple, or livid eruptions and sores, by which the hands of milkers are infected; what are its symptoms?

2. Can any connection be traced betwixt this disease and the grease of horses' heels? between the disease and particular kinds of food, and water? between it and any particular states of the atmosphere? between it and any particular season?

3. Is the same Cow liable to the disease more than once?

4. Has any Cow ever appeared to die of this disease?

5. Is the Cow susceptible of the Cowpox by the inoculation of the breasts, with grease matter of horses?

6. Are males of the Ox kind; or other different kinds of brutes; susceptible of the disease by inoculation with Cowpox matter of Cows?

7. Have Cows, in a state of pregnancy, been observed to be affected with this distemper?

8. Is the Cow susceptible of the disease by inoculation of other parts beside the breasts?

9. Is the Cowpox matter of human creatures capable of producing the Cowpox in Cows?

With respect to Human Creatures.

1. What parts are affected, and what are the symptoms of the distemper, when contracted in the casual way?

2. Has any person been supposed to be in danger, or to have died of this disease?

3. Is the whole constitution disordered *previously*, or *only at the same time* the pustules break out? Does the disorder of the constitution disappear on the appearance of the pustules? Does the same, or a different disorder of the constitution again appear; and under what circumstances in the course of the disease?

4. If in the course of the disease, when there is no disorder of the whole constitution, the infectious matter of the Cow, or of the human patient already labouring under the Cowpox, be applied to fresh parts, does a disorder of the whole constitution arise, as well as a local affection; and of the same kind as those which have already taken place?

5. Is the same person susceptible of the Cowpox local affection, and fever, or disorder of the whole constitution more than once? or only of the local affection more than once? In the instances in which the disorder of the whole constitution was said to have occurred more than once, is it not probable that in one case only the specific fever of the infection occurred, and in the others a different disorder of the whole constitution, such as was merely from the irritation of the local affection?

6. Is the local affection of the same nature on a second, or on farther attacks in the same person, as on the first?

7. In the instances of Cowpox in persons who had gone through the Smallpox, were the local affection and disorder of the constitution of the same nature, as in persons who had not laboured under the Smallpox?

8. Has it been observed that a person has ever taken the Smallpox, after having gone through the Cowpox? In the instances in which the Smallpox was said to have taken place, was it certain that the preceding Cowpox was attended with its specific fever, or was there only a local affection, or at most, was there only disorder symptomatic of the local affection?

9. Does the Cowpox render the human con-

stitution unsusceptible of any other disease, beside the Small-pox; or, on the contrary, increase its susceptibility to any particular diseases?

10. What are the effects of the Cowpox on pregnant women?

11. In the inoculated Cowpox, is the fever less considerable than in the casual way?

12. In the inoculated Cowpox, is the local affection slighter and of shorter duration than in the casual Cowpox?

13. How long after the insertion of the matter is it before the constitution is affected?

14. If a person were to be inoculated at the same time with the Cowpox and variolous matter, which disorder would appear first, or what other effects would be produced?

15. If the Cowpox morbid matter be applied to a secreting membrane, *e. g.* to the urethra, will it produce a gonorrhœa, or pustulous fores?

16. Does this disease appear to injure the constitution, by producing or exciting other diseases?

17. Does this disease appear to eradicate any other diseases already present?

18. Does the mildness or severity of the inoculated Cowpox depend upon the quantity of

matter inserted ; or on the wounds inflicted for inoculation ?

19. Does the Cowpox matter produce the disease as certainly in its dried as in its fluid state ; and when old, as when recent ; and with equal mildness ?

20. Are there any particular states of the constitution, in which the Cowpox is particularly mild ; or, on the contrary, severe ; as after the Measles, Hooping Cough, &c. ?

21. Are there particular idiosyncrasies in families or individuals, which influence the Cowpox, as is the case in the Smallpox ?

22. Is the inoculation of the Cowpox equally successful in infancy, manhood, and decrepit age ?

23. Do certain epidemic states appear to prevail, which influence this disease ?

Answers to the preceding questions will be principally obtained by inoculation for the Cowpox, of which there are many opportunities in provincial situations ; which practice it is one of the chief objects of this publication to encourage.

P. S. *Extract of a Letter from Dr. FOWLER to Dr. PEARSON, dated Sarum, October 24, 1798.*

MY DEAR SIR,

The disease called Cowpox is known in this neighbourhood, only to a few farmers, but they understand that it is a preservative from the Smallpox. This morning, *Anne Francis*, a servant girl, aged 26 years, was brought to me; she informs me, that some years ago bluish pustules arose on her hands, from milking Cows diseased by the Cowpox. These pustules soon became scabs, which falling off, discovered ulcerating and very painful, which were treated by a Cow doctor, and were long in healing. Some milk from one of the diseased Cows having spurted on the cheek of her sister, and on the breast of her mistress, produced on these parts of both persons, pustules and sores, similar to her own on her hands. None of these three had suffered the Smallpox, nor have they gone through it since that time, although they have been much exposed to the infection; and the sister above mentioned has been inoculated three times for the Smallpox. The Cow doctor who attended these three women said, he would forfeit his life if any of them should afterwards have the Smallpox.

With sincerest good wishes for the success of this, and all your undertakings,

I am, &c., &c.

R. FOWLER.

NOTE.—*Mr. Hughes' Letter*, dated Stroud-Water, Gloucestershire, Oct. 27, 1798, to *Mr. Blifs*, Surgeon, Hampstead, has been just sent to the Author, in answer to his Queries. Unfortunately this valuable letter cannot now be published. It especially confirms, by a number of instances, the facts of the safety of the Cowpox, and of its producing unsusceptibility of the Smallpox.