

A Prospect of exterminating the Small Pox

PART II,

BEING A CONTINUATION OF A NARRATIVE OF FACTS CONCERNING
THE PROGRESS OF THE NEW INOCULATION IN AMERICA ;

TOGETHER WITH

PRACTICAL OBSERVATIONS

ON THE LOCAL APPEARANCE, SYMPTOMS, AND MODE OF
TREATING THE

VARIOLA VACCINA,

OR

KINE POCK ;

INCLUDING SOME LETTERS TO THE AUTHOR, FROM DISTINGUISHED
CHARACTERS, ON THE SUBJECT OF THIS BENIGN REMEDY,
NOW PASSING WITH A RAPID STEP THROUGH ALL
RANKS OF SOCIETY IN EUROPE AND
AMERICA.

BY BENJAMIN WATERHOUSE, M. D.

PROFESSOR OF THE THEORY AND PRACTICE OF MEDICINE IN THE
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A TRUTH constantly to be found in the disposition of all things in the
Universe, is, that GOD makes use of the *smallest* means and causes to operate
the *greatest* and most powerful effects. In HIS hand, a *pepper corn* is the
foundation of the power, glory, and riches of India. He makes an *acorn*,
and by it communicates power and riches to a nation.

Bruce's travels to the source of the Nile.

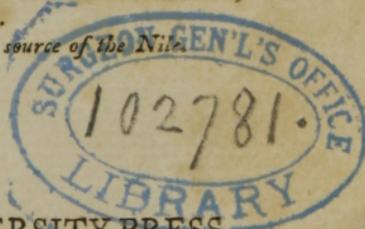
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CH 21144 MMT
To JOHN COAKLEY LETTSOM;

AND

To EDWARD JENNER;

PHYSICIANS PREEMINENTLY DISTINGUISHED FOR

THEIR ACTIVE BENEVOLENCE

AND

PROFESSIONAL SKILL,

T H I S E S S A Y

IS INSCRIBED,

AS A MARK OF ESTEEM AND RESPECT,

BY THEIR TRANSATLANTIC FRIEND

BENJAMIN WATERHOUSE.

CAMBRIDGE *New England,*
November 1802.

JOHN COAKLEY YETTS

PROGRESS OF THE NEW INOCULATION

PHYSICIANS IN AMERICA

BY JOHN COAKLEY YETTS

PHILADELPHIA

Two years ago, I published a treatise, entitled
"A Proposal of extending the Small-Pox, being the history of
"the Variolæ Malignæ, &c. &c. as it appeared in England,"
"with an account of a series of experiments performed in Milan."
"Glasgow, 1782."

It was said in that pamphlet, that our Variolæ Malignæ
virus from England, I commenced the experiment, July 25th
1800, on my own children, four of whom with three of my
domestics, passed regularly through the distemper; and that
they soon after went into the licensed small-pox hospital in that
neighbourhood, and all seven of them were inoculated by Dr.
Aspinwall with the matter of the small-pox, without the least
trait of infection. This decisive experiment encouraged others
to follow the example set by my own family, so that by the
first of September I had inoculated about fifty persons, at this
fourth year, scarce and conditions.

By this time the public attention was so far excited,
and judging by the very numerous letters I received from all
parts of New England, requesting further information,

Thomas Hays of New York, presented me with a letter
from that city,



PROGRESS OF THE NEW INOCULATION IN AMERICA.

TWO years ago, I published a tract, entitled,
“ *A Prospect of exterminating the Small pox ; being the history of
the Variola Vaccina or Kine-pox, as it appeared in England ;
with an account of a series of inoculations performed in Massa-
chusetts.*”

It was said in that pamphlet, that, on receiving the vaccine virus from England,* I commenced the experiment, July 8th, 1800, on my own children, four of whom, with three of my domestics, passed regularly through the distemper ; and that they soon after went into the licensed small-pox hospital in this neighbourhood, and all seven of them were inoculated by Dr. Aspinwall with the matter of the small-pox, without the least trait of infection. This decisive experiment encouraged others to follow the example set by my own family, so that by the first of September I had inoculated about fifty persons, of different ages, sexes and conditions.

By this time the public attention was thoroughly excited, and, judging by the very numerous letters I received from all parts of New England, requesting further information, as well

* From Dr. Haygarth of Bath ; procured for him by Mr. Creaser, Surgeon, in that city.

as a supply of *matter* for carrying on the inoculation, we must conclude that there never was any thing, in the medical annals of our country, that excited half the speculation. Nor will this appear extraordinary to those who know the peculiar situation and sentiments of this part of the United States. The inhabitants of New England view the small-pox with singular dread; not that they ever suffered any remarkably desolating visitation from it, but the malady has been kept at an awful distance, by restrictive laws, and still stronger popular impressions; so that in New England, the most democratical region on the face of the earth, the priest, the magistrate, and the people, have voluntarily submitted to more restrictions and abridgments of liberty, to secure themselves against that terrific scourge, than any absolute monarch could have enforced. We cannot, therefore, wonder that, to a people thus circumstanced, the annunciation of a mild, safe, comparatively pleasant, and *non contagious* substitute for the small-pox, was received with an ardour bordering on enthusiasm.

The very numerous applications at this time for the vaccine virus embarrassed me not a little. Practitioners were not then apprized of the very small quantity obtainable from a *SINGLE pustule*.* I threw out a cautionary hint on this subject, and entreated even my quondam pupils to protract their applications for matter, or virus (denominate it which you will) until the practice was more firmly established by experiment; and observed that some unsuccessful cases, in the beginning, deprived Scotland of the benefits of the small-pox inoculation for more than twenty years. But this disinterested hint was misconstrued, and the mischief I dreaded ensued.

* By the *pustule*, the British writers mean the circular sore, or vesicle made in the arm by inoculation; and not those eruptions, that have, in a few instances, appeared in places remote from the inoculated part. This difference in our phraseology has misled some among us. It ought not, strictly speaking to be called *pustule*, until its contents have become *purulent*. The eruptions on the udder of the cow are more of the *phlyctenæ* than of the *purulent* kind:

I had been particularly careful to caution my readers against *SPURIOUS cases* ; that is, a pustule, or an appearance on the arm not possessing the characteristic marks of the genuine vesicle ; and which may be excited according to the *qualities* of the matter applied, or the *state* of the person inoculated. I warned them, that there were some circumstances, which, if not critically attended to, would bring the inoculation of this recently imported disease into a temporary disrepute. I pointed out, from the writings of Dr. Jenner, the fallacious sources whence a distemper merely imitative of the genuine kine-pock might arise. I stated that *matter*, though originally possessing the specific virus, but which had suffered an alteration either from putrefaction, or some other less obvious cause, would produce a *spurious* disease. I mentioned, that when the pustule, or inoculated part, had degenerated into an ulcer, the matter taken from it, though it possesses the power of inflaming the arm, and of raising fever in the person to whom it is applied, is nevertheless *incapable of securing the system against the infection of the small-pox.**

I felt it my duty in November of the same year to acquaint the public, through the medium of the newspaper, that the kine-pock had, in many places, degenerated from its original mild character, and that this deviation appeared to have arisen from the inoculator taking his matter from the pustule at *too late a period*. To give all possible weight to my cautions respecting *spurious cases*, I added this extract from the celebrated Jenner to his learned and indefatigable follower Dr. Pearson :—“ Much caution is therefore necessary in the progress of this 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 cow-pox on his lancet, when, in fact, there may be only a little *putrid pus* : with this he inoculates, and excites a disease of some kind, *but not such*

* See Jenner's 2d part, or “*further observations.*”

a one as will prevent the small-pox. 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 lest the reader’s attention should not, after all, be sufficiently roused, I added—“ Instances of this kind are recorded to have happened in England, where the patients were afterwards inoculated for the small-pox, and took the disorder.”

But these repeated cautions were disregarded by the young and sanguine practitioner, who saw nothing but regular cases, little trouble, and great profits. If those whom it most concerns will not attend to what is written expressly for their information, they must alone be answerable for the consequences. There are cases where ignorance is converted into a crime.

Perceiving that my reiterated warnings were misconceived and misrepresented, and finding some professional gentlemen in the country so wrapt up in ideas of extreme simplicity, that they encouraged women and children to inoculate each other, I ceased from further expressions of that kind, and endeavour to content myself with predicting the consequences.

During this period, viz, the autumn of 1800, a singular traffic was carried on in the article of *kine-pock matter*, by persons not in the least connected with the medical profession; such as stage-drivers, pedlars, and in one instance the sexton of a church. I have known the shirt sleeve of a patient, stiff with the purulent discharge from a foul ulcer, made so by unskillful management, and full three weeks after vaccination, and in which there could have been none of the specific virus; I have known this cut up into small strips, and sold about the country as genuine kine-pock matter, coming directly from me. Several hundred people were inoculated with this caustic morbid poison, which produced great inflammation, sickness, fever, and in several cases *eruptions*, with a greater disturbance of the system than what occurs in the true disease. It is worthy of remark, that I could not influence these people to believe that

they had *not* passed through the true disease, and that they were *not* secure from the small-pox. So true it is, that a man need not despair of making the common people believe any thing *but* TRUTH! That vagrant quacks should stroll about the country, inoculating for half a dollar a head, and some for less, is not quite so surprising as that they should, in such a country as ours, find people weak enough to receive it from such hands! This imprudence ought not, however, to be attributed to the common people alone. Many young practitioners in country villages come in for a share of it. Not a few first inoculated themselves, and then others, without having read more than the newspaper publications, and some not even those, and were looking out for eruptions, and foretelling appearances and symptoms that are never attached to the disease; and if any very disagreeable occurrence arose, in the course of this imprudent practice, the odium reverted to me.

At length a very serious occurrence arrested, in some degree, the blind rage for promiscuous inoculation; and as this accident is much oftener quoted than understood, I shall take some pains to explain it, especially as it has ultimately turned out to the honour of the *Jennerian* discovery and practice.

I had inoculated two inhabitants of Marblehead, a considerable sea-port about 16 miles from Boston. The one was a young gentleman, Mr. F. a particular connection of Dr. S. The other was a boy of about ten years old, the son of Dr. D. Dr. S. had obtained some matter from the arm of a common sailor, who came from London to Marblehead, in a ship of which Dr. S's son was an officer. But this matter, which was *supposed* to have been the cow or kine-pock virus, was in fact the *variolous* matter, and Dr. S. began the use of it on his own children, which sufficiently proves that the parent, as well as his son, was imposed on. The consequence was, the small-pox spread through the neighbourhood, and the municipal authority gave leave for a general inoculation.

Previously to this sad accident, Dr. D. had inoculated about forty persons, from the arm of his son whom I had vaccinated, but did not adhere to my directions respecting the *time* of taking the matter. *ALL that he inoculated took the small-pox, either casually, or by inoculation, one excepted.** The consequence was, as might have been foretold, a sudden downfall of the credit of the new inoculation, and not a few execrations on the original promoter of it. Although I saw clearly the cause of this disaster, (for I repaired immediately to Marblehead, and saw the chain of their calamity, and examined every link of it in conjunction with Dr. S. and Dr. D.) I found it vain to attempt to explain or palliate, but left its developement to time, that infallible test of truth. There was one thing, however, which attracted the attention of a few, namely, that the two persons whom I inoculated escaped the small-pox, although one was an assistant inoculator, and in some instances nurse, during the whole time that disorder was passing through the town; and the other slept with his brother during the whole disease, which was pretty severe. When the popular voice condemned the kine-pock, these two facts plead strongly in the minds of a few for an *arrest of judgment*.

Some of my transatlantic brethren seemed to have had a just sense of the anxious situation incident to the first steps in an important experiment and practice, entirely new. For it should be borne in mind that I commenced this new inoculation at a period when it was a novelty even in London. To rouse attention, to create belief, to inspire confidence, were laborious preliminary steps. But to confirm assertion by a public experiment, insulated as I was, and remote from all aid in case of embarrassment, was a task delicate, difficult, and anxious.

Few mariners chuse to risk entering the bay of Massachusetts, and to sail up to Boston, without a pilot; yet how sim-

* The one first inoculated by Dr. D. from his son.

ple and easy is that passage now, compared with what it was, when ~~the~~ first ship entered it ; when it was not merely steering by a known fixed object, but sounding every inch of the way, amidst islands, rocks, reefs, eddies and shoals, in order to determine the safe channel. In like manner, if in our first attempts to ascertain the safe passage, we sometimes got aground, or run ashore, we never failed to mark the ground for the benefit of those who came after us. We have buoyed the channel as well as we were able, and noted the bearings of every dangerous rock, point, reef or shoal. It should be remembered too, that we had not a leading wind, nor a flowing tide. Since that time we have endeavored to make an accurate chart of the coast ; taking care to note the variations of the compass, the predominant winds, and the prevailing currents. Our last labour is to collect materials for erecting a light-house to guide those adventurers, who attempt the same rout in the dark.

THE MASSACHUSETTS MEDICAL SOCIETY, impressed with concern for the evil tendency of the many idle and false reports respecting the *spurious cases* at Marblehead, appointed a committee, consisting of their President, Vice President, and myself, to inquire into facts on the spot, and make report. But their commission was very imperfectly executed, as but one of the three thought fit to attend to it.

Dr. D. of Marblehead gave me a very particular account of his inoculation from the matter taken from the arm of his son, and appeared to be thoroughly convinced that all his cases but one, were *spurious*. He concludes his candid narrative in these words : " On the whole, from what I have seen, it is my decided opinion that the inoculation for the kine-pock, if properly performed, is a certain preventative of the small-pox. The principal thing to be attended to in this operation, is to take the matter at a proper time, which, in my opinion, as I have

now learnt, is commonly on the eighth or ninth day, in a limped state. The matter I used was in a *puriform* state, and mostly on thread."

In a letter from the Reverend Mr. Story, brother to Dr. S. dated Marblehead May 7, 1801, he says; "It ever has been, and now is my firm belief that the kine-pock is a sovereign antidote against the small-pox. The only point to be determined is, whether the person has really passed through the *genuine* disease; for much spurious matter has been in use, which, though it may produce some eruptions, will be no security against the small-pox, as was the case of the bulk of those in this place. It appears that Dr. D. took matter for his inoculations on the thirteenth day. I view the kine-pock inoculation as a most important discovery, and, when better understood, will be carried on with safety and advantage to the public."

To these respectable evidences I will just add, that I had designedly inoculated my chaise driver eight days before I went on this commission of inquiry from the Medical Society, and the clergymen, physicians, and other respectable characters in Marblehead, all declared that their unfortunate cases had a very different appearance from his. I did more: I found a person in the family of one of the practitioners, a stranger, who had not passed through the small-pox, and inoculated him from my servant, that they themselves might see the true disease in all its stages. This completed their conviction, so that now there is no town in New England where the inhabitants are more convinced of the efficacy of the kine-pock as a security against the small-pox. Lynn, a town contiguous to Marblehead, principally inhabited by a people remarkable for not being carried away *by every wind of doctrine*,* has given ample proof of their full faith in this new inoculation, by submitting to receive the benefits of it from my hands,

* The Friends.

I have been more particular in narrating the incidents at Marblehead, because they have been so often quoted, misconceived, and misrepresented, and because the narrative explains similar incidents in other places in America. The like occurrences took place at Geneva, and at several places in England, especially at Petworth, where the virus first sent by Dr. Jenner to Lord Egremont did not succeed in communicating the disease; and a second supply from another quarter gave a *spurious* one: the effects produced formed a counterpart to the disasters at Marblehead. See the whole related by Mr. Ferri-man, and Mr. Andre, surgeon at Petworth, in a letter to Dr. Jenner and to Dr. Pearson, in Ring's excellent *Treatise on Cow-pox*.*

It is not easy to convey to an European, an adequate idea of the distress attendant on the commencement of a general inoculation like that of Marblehead, where a very large proportion was to have the disease. This town is situated on a rocky peninsula. Its inhabitants draw not merely their superfluities, but their *support* from the ocean. They have as little to do with agriculture as the inhabitants of Gibraltar. To confine a Marbleheadman to the dry ground, and to keep a fish out of water, is in effect nearly the same thing.

As the casual small-pox was spreading fast, every one was anxious to be inoculated *first*. To alleviate this anxiety, practitioners went from neighbouring towns to assist in this operation. A barrier with proper guards, smoke houses &c. were erected at the entrance of the town, and all vessels passing from that port to the capital were subjected to a quarantine. Nay, the intercourse between Marblehead and Salem, only four miles apart, was impeded as much as if that town was infected with the Levant plague.

* Mr Ring has collected from every publication, in every country, the most important facts respecting the vaccine discovery, its practice, and progress, to which is added his own experience. The author has happily contrived to engage the mind by pleasure, while he fills it with clear and instructive ideas.

Conceive for a moment, a poor widow with her children, of which that town has an uncommon proportion, all about to undergo a dreadful disease, rendered still more so by hedious apprehensions. Let a person of philanthropy imagine such people, so impressed, shut up in a town, as if besieged, and doomed to pass through an "untried scene," aggravated to something horrible by fearful apprehensions of a loathsome disease, of poverty and its direful concomitants. Then let the same person conceive the apathy, the absolute indifference;—but that is impossible—let him be told that there are not wanting characters so utterly insensible to the miseries of such a situation as to argue in favour of a general inoculation for the small-pox, *at this time* in Boston, where there are perhaps 10,000 persons liable to the disease! But let us dismiss the incredible idea, lest our veracity should be questioned.

The distressed situation of the inhabitants of Marblehead excited a general regard. A considerable sum of money was raised by subscription among the merchants in different places; while another class sent in provisions and other necessaries to support the needy in the stagnation of business, and to afford comfort to the sick. When they thus felt the effects of the general sympathy, and found that even the casual cases were uncommonly mild, they went through their trial with comparatively few fatal cases, and with a cheerfulness characteristic of these intrepid children of the ocean.

I wish not to conceal from the public, that about the latter end of the autumn, or beginning of the winter of 1801, I perceived that the vaccine disease had deviated from its original character, and assumed a face with which I was not acquainted. I endeavoured to account for this change of countenance by persuading myself that the virus became milder as it receded from the cow; and that it would at length become effete by passing through a given number of human subjects. When

philosophers or physicians come to a stand in the rough road of experiment, they are very apt to turn into the flowery path of conjecture and there get bewildered. But this notion was encumbered with several difficulties, as many cases arose in direct opposition to it ; for instead of being milder, they were in fact severer in all their symptoms. This induced some to adopt a notion directly opposite ; that the small-pox was at its origin the cow-pox ; and that it increased in force and malignity as it progressed through *sinful* man from age to age ; for when the small-pox appeared first at Marblehead, it was very universally believed that it was the cow, or kine-pock, verging in malignity to the small-pox ; and the writings of some of the London physicians countenanced this error. Dr. W. and Dr. P. contended that the vaccine matter was capable of producing small-pox pustules with all their phenomena as to contagion &c. and that the vaccine disease was attended, like the small-pox with pustules all over the body. This error is conspicuous in my first publication. I silently entertained another whim, that the cold weather aggravated this disease, as it does that one for which mercury is the only specific. But endless are the doubts, whims, and fears while wandering through a perplexed path.

At this gloomy period of the business I wrote to my correspondents in England for a fresh supply of the vaccine virus, and gave out that the present season was less favourable to the inoculation than the spring. I gave Dr. Jenner a minute history of the whole transaction, and begged him to explain this *deterioration*, as I conceived of the virus : for I wish not to conceal my own perplexity at this period.* This worthy man answered that he had heard of our disasters, and that in his anxiety, he had at times longed for powers that a mortal ought not

* The same disaster has occurred this autumn at New York. Dr. Miller has just written to me to resupply their vaccine institution with matter. Not many days since I had a similar application from Dr. Coxé at Philadelphia.

to aspire at; nothing less than a *speaking-trumpet*, that would carry these words on the rapid wings of the wind across the wide ocean that divided us; "*Take the virus before the efflorescence appears.*"

Very early in the spring of 1801, I received a fresh supply of matter from Dr. Lettsom and Dr. Jenner; and soon after more from Dr. Pearson, Dr. Woodville, Mr. Ring, Mr. Wachsel, Mr. Kerre, Sir Grenville Temple, and the Vaccine Institution of London; and also from Dr. Haygarth and Mr. Creaser of Bath; and from Mr. Dunning of Plymouth-Dock. Previously to this second importation, I had reason to believe that the true virus had become extinct throughout America. The inoculation was, however, carried on here and there in the country, with such matter as they had.

The Massachusetts Medical Society, as well as several practitioners in Boston and its neighbourhood, imported the matter about the beginning of this summer; but it all failed in communicating the true disease, one case excepted, owing I suspect to their not softening the thread with water; or to their not exercising that degree of patience which I have found requisite in the first use of a thread infected the other side of the Atlantic.* The same disappointment was experienced by the prac-

* The method I have adopted is this. I select a youthful subject, and after gently chaffing the skin, I make an incision about a quarter of an inch long, so superficial, however, as scarcely to draw a drop of blood. Into this incision is lain the infected thread, previously moistened by water. On this I press my finger six or eight minutes; then I turn it upside down, and press it as before. Then it is taken out and a fresh one put in, treated the same, and pressed in as long; nay, I sometimes put in a third, which I leave in, covered over with a piece of gold beater's skin, the transparency of which admits of our seeing if it retain its exact position; or if it need more moisture, in which case, I added a very small portion of water from the point of a needle. I can account for my success in the use of transatlantic thread, over my brethren, on no other principle than that of using a due degree of moisture, and a greater degree of patience.

I have just received virus from Mr. Ring on the points of quills or tooth picks, which was collected about the first of last August, and used here the sixth of November; and although I inserted the matter with

titioners of New York, Philadelphia, Baltimore, Charleston, Newport and Providence Rhode Island, and several other places in the southern parts of the Union. When, and how they were supplied will be related hereafter.

With more information and a fresh supply of active virus, I recommenced my inoculation in March 1801, and rejoiced to find the distemper possessing every genuine characteristic. It proceeded like my first cases in my own family, slowly, mildly, and pleasantly. I now reinoculated all the doubtful cases within my reach; and several of my patients expressed surprize that the distemper, which I now pronounced the *genuine* one, was so much milder, both as it regarded the sore arm and the constitutional symptoms, than the disease they underwent the autumn before, which I had pronounced *spurious*. But so it was. All those cases, where there were violent inflammation, deep seated ulceration, eruptions, and heavy febrile symptoms, were not the true kine-pock, but a malady generated by an highly acrid, putrid matter; or in one word, poisonous matter, taken from under a scab, or from an open ulcer, long after the specific virus was annihilated. I used in three or four persons some shining, glazy looking thread, which was dispensed in great profusion in Boston and its neighbourhood, in the autumn of 1800, and it produced in every case very distressing, if not alarming symptoms; severer, in most respects, than the ordinary ones in the variolus inoculation. The *quantity* of this infected thread excited my suspicion; for the genuine virus could not be collected and dispensed in such profusion. I am still ignorant of the genealogy of this matter; I only know, that it was not the vaccine virus then, whatever might

out moistening, it communicated the disease in every trial. With three tooth pick I gave the true disease to six persons. I held the point of the tooth pick in a puncture made by a lancet, for perhaps six or eight minutes, but without diluting it with water. This I did at the request of Mr. Ring, who has his doubts respecting the propriety of diluting the matter. It is certain that I have seldom succeeded in the use of matter preserved on glass, where dilution with water was always practised.

have been its origin ; for it excited inflammation, and in most cases within 24 hours. The arm was in several instances swelled and painful from the shoulder to the fingers ends. The pulse was rapid ; the breathing difficult ; the thirst great ; and the other febrile symptoms severe. I had but few cases of this cast, but nevertheless heard loud complaints from others. And although I dared not, at that period, utter my thoughts as to the cause, I could not but be affected for the credit of the practice, because I had imported the distemper, and held it up to the people of America as a pleasant *commutation tax*, which a kind PROVIDENCE had allowed us to pay, in lieu of that horrid and loathsome one, the small-pox. Had these severe cases continued, I should have relinquished the practice, and advised every body else to do so likewise. “ I should certainly flatter myself too much,” says Dr. Jenner, “ were I to conceive that a perfect knowledge of the vaccine inoculation could keep pace with the rapid progress it is making through the world. The vaccine lancet is not to be trifled with.”* And again in a letter to me dated March 4, 1801, he says, “ Dr. — and Dr. — have in many of their writings confused the matter greatly. Is it to be wondered at, that gentlemen, who hastily take up a subject, with which they are but imperfectly acquainted, should in presuming to elucidate, create confusion ?”

With a fresh supply of matter, then, I recommenced my inoculation in March 1801, and have continued it with undeviating success to the present time, two short periods excepted. The first interruption in the continuity of my cases happened in the month of July, when the weather was extremely hot, and when I trusted to the infected thread, instead of the fluid warm from the pustule. This accident led to the knowledge of a fact of some importance, and which I suspect is not generally known to those who practice the vaccine inoculation, even

* In a letter to Mr. Fermor, Medical Journal, vol. 6, p. 325.

in England. It has been sufficiently proved, that in moderate weather, when the mercury ranged between 40 and 70° of Fahrenheit's thermometer, the vaccine virus has retained its activity three months, and even longer. But I found, last summer, that perfectly active virus, taken on cotton thread, from cases every way satisfactory, (proved so by their recent fluid communicating the disease in perfection) will lose its virtue, when exposed ten or twelve hours, and even less, to 95 or 96° of Fahrenheit's scale. It appears that in such a temperature the virus or vaccine *aura*, evaporates. Ever since March 1801, I have inoculated more or less almost every day, and have scarcely experienced a single disappointment when I took the limpid fluid warm from the pustule; and but few instances of failure when I had recourse to the infected *thread*.* But during the very hot and very dry weather in July, the thread has failed in almost every instance.

You will see by the abstract from the Meteorological Register, kept in this University by Mr. Webber, Professor of experimental Philosophy, that the mercury rose almost every day for a fortnight to about 90; sometimes 96, and once to 97 degrees in the shade, and that the hygrometer pointed at 40 and even to 39° † That this great degree of heat was accompanied with an extraordinary dryness in the atmosphere, which was noticed by our hay-makers, there being scarcely the appearance of dew at sun-rise for nearly a week. Finding these failures in the use of the thread, I was led to investigate the cause, and am now satisfied, that it arose from the dryness which reigned for two or three weeks at this season.

If a thread, dipped in the oil of lavender, lose its fragrance by an exposure for several hours to the degree of heat just men-

* This is to be understood of patients susceptible of the disease; for I find some who appear totally insensible to the action of the virus.

† The thermometer is Fahrenheit's; the hygrometer De Luc's. See Medical and Physical Journal No. xxxii. p. 328.

tioned, can we wonder that the more subtle *AURA vaccina* should in like manner evaporate, and the virus become effete? What tended to confirm me in this opinion was a passage in one of Dr. Jenner's letters, received last year. It is this; "I shall just say a word in proof of the *extreme delicacy* of the nature of the vaccine fluid, to shew how easily it may be disorganized. In the early part of my practice, I used frequently to evaporate the fluid by the fire upon *threads, glass, or lancets*, yet with much caution respecting the degree of heat; but experience has taught me, that even this procedure frequently occasioned an unnatural deviation from its perfect state, and a failure in communicating the disease."

I hope not to be misunderstood. I can never desire more satisfactory cases of kine-pock, (as it is universally denominated in America) than have occurred at this warm season; but they were produced by the recent fluid, transferred from one patient to another; whereas thread, ever so well imbued with the fluid of these satisfactory cases, and kept for a week, has lost its virtue; being as I conceive, evaporated and exsiccated by a series of hot and dry days. It is recorded, that when the *Harmattan* blows (which is a very hot and a very dry wind in Africa, when the backs of books crack open, and cabinet furniture flies to pieces) the small-pox could not be communicated by inoculation.* Is it probable the failure arose from this cause?

As the mercury, if I mistake not, very rarely rises above 84° in Britain, the practitioners there could not have been led to these observations. I believe the mercury seldom rises higher than this in the open ocean in any climate. The vaccine virus, sent me from London and from Bath, has demonstrated that it will *live* nearly four months.

The second interruption, in the continuity of my cases, was from relying on some of my brethren (to whom I had given

* Philosophical Transactions for 1781.

the matter) for the recent fluid, and thereby relaxing in attention to the continuity of it in my own patients. This was a source of inexpressible anxiety and perplexity. But for one patient, the virus would have become extinct a second time in America.* I mention this, by way of caution to my brethren. Jenner himself informs me that he finds it needful to give and receive assistance, in order to keep up the necessary supply of fresh virus for use. The greatest difficulty, in the vaccine inoculation is the scarcity of virus. The kine-pock has but ONE pustule, whereas the small-pox has its thousands. The number of poor people I have inoculated in the hottest weather, in order to keep up a diurnal supply of matter; the anxiety I have endured, lest they should fail; and the offence I have given when it was not in my power to transmit an inch of infected thread, are not mentioned in the tone of complaint; but merely to notify the young practitioner, who may be ambitious to distinguish himself in this department of his profession, that he must not expect to diffuse the blessings of this benign remedy, and reap the rewards of it, without some trouble and some anxiety.

About this time (the Spring of 1801) I received a number of letters from a variety of people in the southern States, especially from Virginia, expressing a strong wish to be better acquainted with the kine-pock, and a desire to introduce this benign remedy into that extensive region. As most of the writers were entirely unknown to me, I was at a loss how to act. I might deny a physician of character, and I might entrust it to a person who had none. Some untoward occurrences in the past year rendered me cautious; for I had unknowingly encourag-

* At this critical period I received some matter from England between plates of glass; and on application from Dr. Aspinwall, I divided this English matter with him; but it all failed, both in his hands, and my own. One of my patients had, without my knowledge, preserved some virus on thread; this happily communicated the disease, and from it I propagated the distemper afresh, and have continued it in my own cases, from that time to the present.

ed mere *speculators*. I use that word in its modern and degenerate sense. While doubting what course to take, the right road opened to my view.

I had heard that President JEFFERSON was favourably impressed by my first annunciation of the Jennerian discovery and practice. Indeed the following letter, written in consequence of transmitting him a copy of my pamphlet on this subject, sufficiently testifies it,

Washington, Dec. 25, 1800.

SIR,

I RECEIVED last night, and have read with great satisfaction, your pamphlet on the subject of the kine-pock, and pray you to accept my thanks for the communication of it.

“I had before attended to your publications on the subject in the newspapers, and took much interest in the result of the experiments you were making. Every friend of humanity must look with pleasure on this discovery, by which one evil more is withdrawn from the condition of man; and must contemplate the possibility, that future improvements and discoveries may still more and more lessen the catalogue of evils. In this line of proceeding *you deserve well of your country*; and I pray you accept my portion of the tribute due to you, and assurances of high consideration and respect, with which I am, Sir,

“Your most obedient, humble servant,

(Copy.)

“THOMAS JEFFERSON.”

Dr. Waterhouse, Cambridge.

“This letter of the President of the United States,” says Mr. Ring, “breathes the spirit of philanthropy—the spirit of WASHINGTON; and, his attention to the welfare and happiness of the people, proves him worthy to fill the station of his immortal predecessor.”

Hearing by some gentlemen direct from the seat of government, that the President wished for still more information, and that he was desirous to see the practice introduced into Virginia, and the other southern States, I sent him the vaccine virus, and painted representations of the pustule, in all its stages on the white man, and on the African, together with the following letter :

Cambridge, June 8th, 1801.

To THOMAS JEFFERSON, *President of the United States,*
and
President of the American Philosophical Society.

SIR,

THERE may possibly seem a want of due consideration in sending this letter, and what accompanies it, to draw the attention of the PRESIDENT *of the United States* from the important concerns of our nation to a subject more nearly allied to medicine, than to the affairs of state.

On this account, I should have hesitated still longer, were I not constantly receiving letters from unknown persons, in different parts of Virginia, entreating me to send them the vaccine matter, with instructions for carrying on the kine-pock inoculation. From one, received very lately, I learn that the small-pox is unknown to half the inhabitants of your extensive and populous state ; that in some quarters of it, the very name of small-pox excites terror ; and that your laws are full as severe as those of Massachusetts and Rhode Island, respecting its introduction by inoculation. From these letters I am convinced that there is, perhaps, no state in the Union more deeply interested in the adoption of this new inoculation than Virginia. By letters from Norfolk, I find, that the inoculation for the kine-pock has been attempted there, but that the subjects of it did not resist the small-pox. Such failures may bring this admirable discovery into disrepute, and deprive you, for a time,

of its blessings ; nay, what is very serious, such accidents may be the means of spreading the small-pox among you, as it has in some places among us. Not merely ignorance, but avarice, rivalry, and some other unworthy passions, have cast a temporary shade over this important discovery, in some of the towns in this Commonwealth ; and I suspect you have experienced something similar, though not from the same causes.

I presume you will think with me, that too much care and attention cannot be exercised in the introduction of this valuable but delicate remedy among you. I will do all in my power for its establishment, provided I can obtain the countenance of men of more consequence than myself. Amidst the pelting storm of his adversaries, Dr. Jenner had the countenance of his SOVEREIGN ; and the Duke of York is the patron of the London Vaccine Institution. BONAPARTE took a lively interest in the diffusion of *vaccinism* in France ; and so did the German nobility at the court of Vienna. Under such patronage, people in the inferior walks of life embraced the doctrines of this new discovery with entire confidence.

Having no personal acquaintance with any medical man in Virginia (some of my own pupils excepted, to whose inexperience I should hardly venture to commit this delicate business) I cannot see my way clear to transmit the matter to I know not whom. After much thought, and some advice, I have concluded to send it to President JEFFERSON, together with such books and descriptions as may enable a physician experienced in exanthematous diseases, to conduct the process with certainty.

My view is this :—The President can at once fix his eye on some proper medical character, to whom the first experiments may be entrusted ; some cautious discerning person, perhaps his own family physician. A series of experiments may be directly instituted by him ; and when the distemper has proceeded according to the description herewith sent, the subjects of

them, may afterwards be submitted to the test of the small-pox inoculation, just as was done at Paris, under direction of the *National medical school*.

As your domestics are principally *blacks*, I have taken no small pains to procure a picture of the disease, as it appeared on their skins (see fig. xii). Besides being of vast importance to the state at large, I conceive that an exertion to preserve this wretched people from the horrors of the small-pox, cannot but be agreeable to that beneficent *ENS ENTIVM*, who has seen fit to make that enviable distinction between the situation and faculties of this helpless race and us!

By causing this inoculation to pass through the respectable channel here contemplated, Virginia, and of course, the other southern States, will insure to themselves the blessings of this invaluable discovery, and the serious evils that have arisen in some places, will be avoided. Young and unexperienced practitioners are most forward in this business; yet such can neither excite attention, nor inspire confidence; whereas, if it came from Mr. JEFFERSON, it would make, like a body falling from a great height, a deep impression. Need I then, make any further apology for sending the *matter* first to you, encumbered, as I know you must be, with other concerns?

I here send a little book, compiled by Mr. Aikin, Surgeon of London; being perhaps, the best manuel for the inoculator, extant. I have it in contemplation to publish something of the kind, more adapted to this country, and containing some letters of Dr. Jenner to me, on the best mode of conducting this inoculation. I also transmit for your acceptance, exact pictures of the kine-pock pustule, in all its stages, from the third day to its final termination, painted with surprising justness, together with similar representations of the small-pox, on corresponding days. The dark coloured picture, (fig. 12) is a

representation of the kine-pock on the skin of the *negro*. I have never inoculated but three of this colour ; but, as far as I can remember, it is equally accurate. The graphic art never, perhaps, received a greater honour. I likewise send some fresh infected thread, confined between two thin plates of *talc*, and inclosed in the laminæ of a card ; the whole pasted up so as to exclude entirely the external air. In this way, I conjecture, it may be sent to the Cape of Good Hope, the Isle of France, or the hot regions of India, without losing its efficacy.* The red thread marks the place where it is to be opened.

I would advise the inoculator, when he makes the incision, or rather scratch, in the arm, not to draw blood, if he can help it. If this should be unavoidable, it is best to wait a moment until the exudation ceases, lest the blood should dilute the virus too much, and so weaken its power. The thread is then to be covered with a piece of *gold beaters skin*, which I generally take off in 24 hours. By the fifth or sixth day, the inoculator may expect to see the effects of his operation. By the eighth the *vesicle* will be found to contain a small quantity of pellucid fluid, but in no degree resembling matter, or *pus* ; on the contrary, as limped as the dew drop on flowers, at this season. And this is the exact period, and proper condition of the vaccine fluid, for I will not call it *matter*, for the purpose of inoculation. It may be taken on the ninth day, but seldom or never later. The want of strict attention to this important point, has produced all the disasters that have occurred in this inoculation in Europe and America, and therefore, this rule cannot be too emphatically urged. The virus should never be taken after the efflorescence has come on, much less during the febrile symptoms. Mr. Aikin allows too much latitude. Some give a still wider license, and assert that the genuine virus is found in a pustule on the twelfth or thirteenth day ; but Jenner and

* It was several weeks after writing this, that I discovered the pernicious effects of *heat* on the vaccine virus. See page 19 ; also Medical Journal, vol. 6, p. 327.

experience say otherwise. "I wish you to consider, says Dr. Jenner, in one of his letters to me, this EFFLORESCENCE as a "sacred boundary, over which the lancet should never pass." I cannot then but reiterate the injunction, to take the vaccine fluid on the seventh, eighth or ninth day, and not on the tenth, eleventh, or twelfth. For want of this knowledge, spurious cases have arisen, and multiplied in our country. It is the most important point in the whole process, the *fulcrum* on which the whole business turns; and yet no writer, but the celebrated Jenner, appears to be impressed with its importance. It is natural, say some, to conclude that it is best to take the fluid for inoculation, at the very height of the disorder, that is, of the *efflorescence*. But I am doubtful whether this be the voice even of a legitimate theory. When the inflammation, or efflorescence of the inoculated part commences, it indicates that absorption has already begun; and after absorption has commenced, the *quantum*, or force of the virus in the vesicle, pustule, or inoculated part, denominate it which you will, is diminished. To note the progress and aspect of the pustule, is of prime importance in the commencement of this practice. "One of the first objects of this pursuit, says Dr. Jenner, should be to learn how to distinguish with accuracy, between that pustule which is the *true* cow-pox, and that which is *spurious*. Until experience has determined this, we view our object through a mist." My insulated situation, and remoteness from all correct information on this head, has compelled me to the closest observation of the progress of the pustule, even from hour to hour, with the microscope; and I am convinced of the importance of Dr. Jenner's injunctions to me; nay more, I am convinced by my own blunders.

In people of weak circulation, I have found the progress of this disease more backward, than is here represented: that is to say, the efflorescence described around the pustule on the ninth day, did not make its appearance until the tenth or elev-

enth, and continued thus backward through the whole progress. I suspect that this may oftener occur in the southern States, than in the colder regions of the north. I have just inoculated a family from Natchez, where this variation was remarkable. In such cases, I take the fluid for inoculation on the ninth, tenth, and even eleventh day. Should the physician, or physicians, to whom you would think proper to confide this matter, wish for any further information from me, they cannot be more ready to ask, than I shall be to communicate what little I know on this subject.

It is perhaps unnecessary for me to say, that it is found, from the most incontestable experiments,

I. That the kine-pock is not contagious.

II. That it never has been fatal.

III. That it completely prevents the small-pox.

IV. That it conveys no constitutional disease. And

V. That it creates no blemish, or mark, on the human frame.

These properties make this vicarious distemper, one of the most precious gifts of Providence to afflicted man. That it actually possesses them all, we are assured by the united testimony of the first physicians in London, which is saying the first physicians in the world.

Besides England, this new inoculation now prospers in France, Germany, and at Geneva. The physicians at Geneva had many spurious cases, and some perplexity, until Dr. Jenner sent them, as he did me, fresh matter, and clearer instructions. It has taken the place of the small-pox inoculation in the British army and navy, and is spoken of by the surgeons of the latter, as one of the greatest blessings ever extended to it.* By a Madrid gazette, just come to my hands,

* Address to Dr. Jenner, on delivering him a gold medal;

I find that it is introduced there from Gibraltar, by permission of both the British and Spanish governments. Nay more, Lord Elgin has planted it in Constantinople, just about eighty-six years after the Turks helped us to the practice of the variolous inoculation. In no place has the vaccine inoculation been received with more prudence, than at Paris, under the conduct of the *National medical school*. The report of the committee may be seen in the 4th volume of the *Medical and Physical Journal*; where it will appear, that they made themselves sure of every inch of ground they passed over.

As to the progress of the inoculation in this quarter, it is very satisfactory. Last autumn we were pestered with spurious cases, and absolutely lost the genuine virus. The most eminent physicians in this region, as well as the most distinguished characters, in the two other learned professions, are advocates for this inoculation; not that I would insinuate, that this new practice is destitute of the advantage of having adversaries, even among the faculty.

It is in such a prosperous state of the business, that I am desirous of transmitting the blessings of this new discovery to my brethren of the southern States; and in order to ensure it success, I wish it may pass from your hands to them.

Should I be the means of introducing this disease, or rather remedy, not merely into Virginia, but into the vast region of the southern States, I should indeed rejoice in its recollection to the end of life.*

With the highest respect,

I remain, &c.

BENJAMIN WATERHOUSE.

The President's answer convinced me, that I had done right in transmitting these things to him.—Should these pages

* There are numerous copies of this letter circulating in manuscript, at the southward.

ever be read beyond the bounds of the United States, it will not be superfluous to remark, that the elective *Chief Magistrates* of this new empire, differ somewhat in their habits, manners, and conduct, from those of Europe. Having fewer ministers, they feel more nearly connected with their constituents, the people, in whatever concerns their domestic happiness, and personal comfort. Mr. JEFFERSON has long cultivated that kind of philosophy, which Socrates was said to have brought down from the high Heavens, for the use of men ; and still finds time to practise it. Mr. ADAMS, while executing the affairs of State, was President of the American Academy of Arts and Sciences ; and was, and still is, esteemed its ornament and pride.—WASHINGTON's whole life was a series of benevolent deeds. But, the countenance of this modern MOSES shone with a brightness, too dazzling for me to delineate !—I notice but one trait in the character of these three illustrious chiefs, and merely to inform foreigners, that in our eyes, the lively interest which President JEFFERSON has taken in that discovery, “ by which one evil more is withdrawn from the condition of man,” has shed a lustre on the supreme officer of our nation.

Although the President immediately put the matter into the hands of a long established, judicious, and successful physician, it failed in communicating the disease ; so did the second portion I sent ; and so did the third. The President observed, that as great anxiety was produced at Washington to obtain a successful inoculation, he wished me to continue to send it until he could inform me it had taken. But, as the weather was extremely hot, thermometer 94, 95, 96, and 97 degrees in the shade, (see page 19) and the distance between Cambridge and the city of Washington 500 miles, he suggested a mode of conveying the infected thread in a small vial, immersed in a larger one, filled with water. This portion of matter, thus guarded from the heat, did not rest at Washington, but went on to the President then at Monticello, and suffered no

deterioration by the journey ; for Dr. Wardlaw inserted it into some of the President's family on the 6th of August 1801, when it communicated the true disease. It was from this source that the President supplied Dr. Gantt at Washington, and thus first planted the vaccine inoculation in the capital of the UNITED STATES.—Are not public benefits estimable according to their extent and duration? Some, as wise laws, good government, able and virtuous magistrates, are indeed precious blessings, as far as they extend ; but their merit is generally confined within one age or nation. They are like the showers of Heaven, blessings for a season. But are there not others still more valuable, such as the application of the discovery of the polarity of the magnet, by which feeble man passes in safety over the trackless ocean ;—and the *Franklinian* discovery, by which ourselves and dwellings are secured from the fatal and destructive blasts of lightening ?—and the *JENNERIAN discovery*, by which the greatest plague under Heaven is struck out of the catalogue of human evils ? These are not like the former, blessing for a season, confined to one spot, or nation, and transitory in their nature ; but they are donations to the whole human race, a present to the future race of men, and like the blessings of the Sun, universal and everlasting. The wisdom of antiquity invariably made this distinction, between the value of local and temporary benefits, and such as were universal and permanent. Thus they decreed only *heroic* honors to founders of states, lawgivers, and exterminators of tyrants ; but *divine* honors to inventors and authors of new arts and discoveries, for the benefit of the whole human race. This is beautifully illustrated in the splendid allegory of Apollo, and also of Ceres ; one giving *food* to mankind, and the other *health*.* That our philosophic President views it in this light, is evident, from a passage in one of his letters to me, where he says, “ It will be a great service indeed rendered to *human nature*, to

* See Bacon de augment. Scient.

“ strike off from the catalogue of its evils, so great a one as the
 “ small-pox. I know of no discovery in medicine equally
 “ valuable.”

By repeated letters from Dr. Spence of Dumfries, I learn, that none of our States are more deeply interested in the diffusion of the kine-pock inoculation, than the large and populous state of Virginia. Indeed the President himself says, “ in
 “ planting the disease here, (Monticello) I imagine it will be
 “ as salutary as any where in the Union. Our laws indeed
 “ have permitted the inoculation of the small-pox, but under
 “ such conditions of consent of the neighbourhood, as have ad-
 “ mitted not much use of the permission. The disease therefore
 “ is almost a stranger here, and extremely dreaded.” In another letter dated Monticello, September 17th, 1801, the President says, “ I have sent matter to Richmond, Petersburg, and sev-
 “ ral other parts of this State, so that I have no doubt it will
 “ be generally spread through it, notwithstanding the incred-
 “ lity which had been produced by the ineffectual experiments
 “ of Richmond and Norfolk.” The President sent a portion of this matter to Dr. John Redman Coxe at Philadelphia, which introduced the true disease, for the first time into that city, November the 9th, 1801. The following letter, from President JEFFERSON to Mr. Vaughn, printed in Dr. Coxe’s pamphlet on Vaccination, will come in here with propriety.

“ *Washington, Nov. 5th, 1801.*

“ DEAR SIR,

“ I received on the 24th ult. your favor of the 22d, but it is not till this day that I am enabled to comply with your request of forwarding some of the vaccine matter for Dr. Coxe. On my arrival at Monticello in July, I received from Dr. Waterhouse of Cambridge, some vaccine matter taken by himself, and some which he at the same time received from Dr. Jenner of London. Both of them succeeded, and exhibited precisely

the same aspect and affection. In the course of July and August, I inoculated about seventy or eighty of my own family; my sons in law about as many in theirs, and including our neighbours who wished to avail themselves of the opportunity, our whole experiment extended to about two hundred persons. One only case was attended with much fever and some delirium; and two or three with sore arms which required common dressings. All these were from accidents too palpable to be ascribed to the simple disease. About one in five or six had slight feverish dispositions, and more perhaps had a little head-ach, and all of them had swellings of the axillary glands, which in the case of adults disabled them from labour one, two, or three days. Two or three only had from two to half a dozen pustules on the inoculated arm, and no where else, and all the rest only the single pustule where the matter was inserted, something less than a coffee-bean, depressed in the middle, fuller at the edges, and well defined. As far as my observations went, the most premature cases presented a pellucid liquor the sixth day, which continued in that form the sixth, seventh, and eighth days, when it began to thicken, appear yellowish, and to be environed with inflammation. The most tardy cases offered matter on the eighth day, which continued thin and limped the eighth, ninth, and tenth days. Perceiving therefore that the most premature as well as the tardiest cases embraced the eighth day, I made that the constant day for taking matter for inoculation, say, eight times twenty-four hours from the hour of its previous insertion. In this way it failed to infect in not more I think than three or four out of the two hundred cases. I have great confidence therefore that I preserved the matter genuine, and in that state brought it to Dr. Gantt of this place on my return, from whom I obtained the matter I now send you, taken yesterday, from a patient of the eighth day. He has observed this rule as well as myself. In my neighbourhood we had no opportunity of obtaining va-

riolous matter, to try by that test the genuineness of our vaccine matter ; nor can any be had here, or Dr. Gantt would have tried it on some of those on whom the vaccination has been performed. We are very anxious to try this experiment, for the satisfaction of those here, and also those in the neighbourhood of Monticello, from whom the matter having been transferred, the establishment of its genuineness here will satisfy them. I am therefore induced to ask the favor of you to send me in exchange, some fresh variolous matter, so carefully taken and done up, as that we may rely on it ; you are sensible of the dangerous security which a trial with effete matter might induce. I should add that we never changed the regimen nor occupations of those inoculated ; a smith at the anvil continued in his place without a moment's intermission, or indisposition. Generally it gives no more of disease than a blister as large as a coffee-bean produced by burning would occasion. Sucking children did not take the disease from the inoculated mother. These I think are the most material of the observations I made in the limited experiment of my own family. In Aikin's book which I have, you will find a great deal more. I pray you to accept assurances of my esteem and respect.

(Signed) " THOS. JEFFERSON.

" Mr. JOHN VAUGHAN."

I had taken care to acquaint those gentlemen who had written to me for a supply of matter, from different parts of Maryland, Pennsylvania, Virginia, and other States still farther south, with the steps I had taken to establish the practice nearer to them, under the auspices of Mr. JEFFERSON, by whose directions they might be accommodated with less risque of disappointment, than if attempted to be supplied from Cambridge. And I have had the satisfaction to hear of his condescending

attention to their applications. So that I believe those parts of the Union are happily supplied, through this respectable channel.

It is remarkable, that neither at New York, Philadelphia, Charleston, nor Savannah, did any of the vaccine matter, repeatedly imported from London, by different practitioners, ever communicate the disease. In the latter end of May 1801, I had the satisfaction of planting it in New York; which was effected by inoculating a servant of the Governor of the Mississippi territory, and sending him on to that city, where he arrived time enough to afford the genuine virus. But it was lost before the autumn. In November, I resupplied the physicians of New-York through the hands of Dr. Seaman. Soon after a Vaccine Institution was formed in that city, on a plan similar to the one in Golden Square London. Many were here inoculated, and afterwards tested with the small-pox, to entire satisfaction. They nevertheless lost the matter a third time, and again I supplied them, November 1802. On this occasion, Dr. Edward Miller wrote to me thus; “For a number of weeks before the final extinction of the matter here, the disease began to decline from its original exquisite character, and gave us some apprehensions that it might not afford entire security against the small-pox. Was this owing to some unknown neglect, at any one, or more links of the chain of succession? Or is it to be ascribed to any *degeneracy* of the disease itself, produced by time, climate, temperature, or any similar cause? As you have had more experience on this subject, than any person in the United States, you will do a great favour to the Medical board of our kine-pock institution, by giving your opinion on this subject.”

Dr. Seaman, another physician of the New York vaccine institution, in a letter to me, dated Nov. 15, 1802 says, “the kine pock infection with us has been fairly worn out; for notwithstanding a careful attention to taking it within the limit-

ed time, it has appeared to undergo a regular degeneracy, in gradually producing a pustule, less and less like the original one; and being communicable with less and less certainty, till it has finally become perfectly inactive. For the purpose of regenerating the activity of the virus, I inoculated a Cow; and on the 7th day I inoculated a person with the pellucid water, warm from the pustule upon her teat; but without inducing the disease. We have now to acknowledge, that even at our vaccine institution, the infection is extinct. We have been trying some matter just received from London, but it has failed in every instance. Our institution depends therefore entirely upon Dr. Waterhouse for a supply." My opinion, in answer to these letters will appear in its proper place; I shall only add here, that I sent fresh virus on a quill, inclosed in another, by way of case, every three or four days by the mail, until I heard it had succeeded; and wrote to these physicians, that I had reason to believe, that the vaccine virus would never degenerate, but will remain pure and irreproachable in every climate, and amidst every epidemic, the small-pox excepted. I gave them my idea of the cause of this seeming degeneracy; and ventured, moreover to say, that if, in taking the matter, for the purpose of inoculation, they did not restrict themselves within a narrower circle, than what is allowed in the writings of Dr. W. and Dr. P. in London; and of Dr. C. in Philadelphia, they may expect to see this deviation from the perfect pustule.

In the autumn of 1801, Dr. Ramsay of Charelston, South Carolina, wrote to me, "that every attempt to introduce the vaccine disease into that city from England, or elsewhere, had failed; and earnestly requested me to send him the matter for another trial." Besides a particular wish to gratify Dr. Ramsay, I hastened to comply with his request, in consideration of the convenient position of Charleston, for diffusing this practice still farther south. With the matter, therefore, I

transmitted a set of the pictures of the vaccine pustule, in all its stages, as well as of the small-pox, from the third day of inoculation to its final scabbing; together with such rules and observations, as I thought calculated for promptly establishing the business there. Whether the particular matter which I sent, first communicated the disease in South Carolina; or, whether it was effected from the same stock, by another route, I never could distinctly learn. I only know, that within a few months after my transmission of the virus, a Vaccine institution was engrafted on their Dispensary in Charleston, and the practice now flourishes there, in a manner highly pleasing to the friends of science and humanity.

Without being more particular, I shall just mention, that I have planted the true vaccine disease directly in the Province of Maine;* in New Hampshire; in the state of Vermont, Rhode Island, Connecticut, New York, Virginia, South Carolina, Georgia, Kentucky, and Tennessee; and in every part of Massachusetts, including the Islands of Nantucket, and Martha's Vineyard. The physicians in the states of Pennsylvania, Delaware, North Carolina, and Maryland, were supplied from my stock, through Mr. Jefferson, agreeably to the plan suggested in my letter to that distinguished philosopher,† who deserves the praise of every friend of humanity, for extending the blessings of this benign remedy to the savage nations, by causing a numerous embassy of Indians to be inoculated at the city of Washington in the winter of 1801, as will appear by the following

Extract from the European Magazine for April 1802.

“ Last winter there was a grand embassy of Indians to the President and Congress at Washington. Little Turtle was the head warrior. The President and Government had sup-

* A vast district of forty thousand square miles, interposed between the British province of Nova Scotia and Massachusetts, and under the jurisdiction of this state.

† See page 23.

plied them with ploughs, and every instrument in common use in agriculture; as well as with spinning-wheels, looms, &c. &c. and, to crown all, the President explained to Little Turtle, how the *Great Spirit* had made a donation to the enlightened white men; first to ONE * in England, and from him to one † in Boston, of the means to prevent them from ever having the small-pox, which had occasioned great fatality among that race; and, such confidence had the copper coloured King in the words of *his Father*, the President, that he submitted to be inoculated, together with the rest of the warriors, by the hands of the Rev. Dr. Gantt, Chaplain to Congress. On their departure the President caused them to be supplied with the vaccine matter, and gave their interpreter an abstract of the letter of instructions which Dr. Waterhouse had written to him. Not long after, fifteen more warriors came down to Washington to receive the same blessing from the Clergyman who had inoculated Little Turtle and his followers.”

After the vaccine matter had been planted here and there, over such a vast extent of country, I conceived it would conduce to public benefit, to collect and publish the result of the experiments made with it, in the form of a table. For notwithstanding we could adduce thousands of well attested cases of the kine-pock rendering the constitution unsusceptible of the small-pox in England, and other parts of Europe; yet, as people are not ready to believe what happened a great way off, or a great while ago, it was found necessary to collect proofs of its prophylactic virtue in our own country. I therefore addressed the American practitioners of physic, as usual, through the medium of the Newspaper, and submitted such a plan to their consideration. My idea was explicitly this,—to establish a central point, to which every thing relating to this inoculation might be directed; and whence every

“ * Dr. Jenner, the first inoculator of the cow-pock in Europe.”

“ † Dr. Waterhouse, the first inoculator of the cow-pock in America.”

ray of light, that came from a single place, might be reflected, and every where extend its power of illumination. I was in hopes that the *Massachusetts Medical Society* would form such a centre; in which case the reflected ray would become not only more brilliant, but even generative at the point of repercussion. But, I was constrained to pursue a more diminutive plan, and to go on in this business, as I began it, ALONE.

Scarcely any thing ever occurred in this country, which excited such an universal speculation, as this new and simple mode of counteracting a malady, peculiarly dreadful to the people of this new world. It may easily be imagined, that personal applications, as well as applications by letter, were numerous and incessant. This, however, constituted but a part of the labour. It was necessary to elucidate doubts, remove difficulties, and guard TRUTH, in its disputed march against an host of unbelievers. Indeed, vaccination and its concomitants absorbed all my attention, engrossed all my time, and abstracted me from all other pursuits.

Besides the contest with the incredulous and the indolent, vaccination had to struggle with the interested. They threw many, many obstacles in its way. Of these, the most mischievous was, the discouraging doctrine, that its prophylactic power lasted but for a short time. The common people, when they applied to certain physicians for advice, were taught to believe, that the kine-pock would secure them against the variolous infection *seven* years, and no longer. Though repeatedly urged, I declined for a long time, the discussion of this pernicious doctrine. Knowing that it sprung from one of those motives which does the least honor to the human character, I was fearful it would stir up "*the angry passions,*" and then candid discussion would be banished by personal abuse. But finding that this doctrine was in a fair way of growing into a fixed belief, I published the following refutation of it in the Centinel, July 28th, 1802.

ON THE ABSURD NOTION OF THE TRANSITORY EFFICACY OF
THE COW OR KINE-POCK, IN SECURING THE HUMAN
CONSTITUTION FROM THE SMALL-POX.

I was in hopes it would be needless for me to come forward again in the newspaper; and was especially desirous to be excused from the disagreeable task of discussing the present subject; but I am called upon both by letters, from the country, and otherwise, to undertake it. The argument urged upon me is, that the enemies of the new inoculation have been fairly beaten from every ground they have taken, but this; and here they are entrenched to the chin, and think themselves perfectly secure. As I have hitherto met every thing, capable of a speedy experiment, that has been brought forward to impede the advancement of this admirable blessing, with a *public contradiction*, so, in like manner, I will meet this DOCTRINE, and then leave it for common sense to determine, whether this last redoubt, erected and occupied by sordid interest, be, not only commanded, but infiladed, and in great danger of being levelled with the ground.

It is well known what a dismal chasm intervened in medicine, literature, and the arts, about the sixth century, when all was ignorance, wonder, and credulity. The human mind, neglected, uncultivated, and oppressed, sunk to the lowest grade of debasement. These effects of Gothic, Arabian, and ecclesiastical barbarity, were discernible in almost every branch of science, especially in medicine, as low down as the reign of JAMES I; for even then, the priest, the conjuror, and the physician were united in the same person. But with Lord Bacon, commenced the scrutinizing æra of experiment, or, as it regarded natural things, *the age of reason*; or the philosophy of a *sufficient cause*. Medicine soon felt the good effects of this improved state of philosophy, and anatomists and physicians contemplated the human body and surrounding nature, with juster views, and on surer principles.

From this lucid period, physic, led by experiment, went on improving to the present time, so that now our theory is put in practice, not by simple imitation, as formerly, but by the knowledge of causes, or the previous knowledge of things to come; so that from a vague and fluctuating art, physic has now acquired the stability of a science. Hence, at this enlightened period, it is expected that he, who assumes the honorable title of a *physician*, is enabled from experiments, to tell us, not only *what* is to occur, and *what* is to be done, but *why* it is to occur, and *why* it is to be done. For it is only then, that the empiric quits his name for the more honorable one of physician, when to his *experience* he adds science, or a knowledge of the principles, on which his art is founded.

It is impossible to banish reflections of this kind, when we hear practitioners uttering opinions, which the *theory* and *practice*, or in other words, the principles and experience of the profession reject, as not founded in reason, or the nature of things.

The opinion to which I particularly allude is, that the vaccine or kine-pock secures a person from the small-pox *a few years only*, after which he will be as liable to that disease as ever! An opinion, or rather *doctrine* (for all who propagate it do not themselves believe it, for then they would maintain it to physicians, instead of urging it on the ignorant) not justified by experience, analogy, or common sense. But let us leave arguments, and turn to facts, entreating our readers, previously to consider that the cow-pock is not a recently discovered disease. The distemper has been known among the cows in England and Ireland, time immemorial. It is known in Ireland by a *celtic* word. As the celtic has not been a colloquial language there, for more than 500 years, it throws the knowledge of this epizootic malady so many ages back. With a knowledge of this disease has ever been connected an opinion, that a person once infected with it WAS EVER AFTER SECURE FROM THE SMALL-POX.

Dr. Jenner was the physician, who with a *Franklinian* sagacity, first transferred it from that mild, healthy, and invaluable animal, the Cow, to the human species.

Cases proving that the kine-pock secures a person from the small-pox during the whole course of their lives.

Dr. Jenner relates the case of Joseph Merret, who was inoculated with the small-pox twenty five years after he took the kine-pock from milking a cow, without the least signs of infection; Sarah Portlock, twenty seven years after; Mary Barge, thirty one years; Elizabeth Wynne, thirty eight years; William Stinchcomb, ten years; Hester Walkley, twenty six years; — Phelps, five years; and John Phillips, FIFTY THREE years after taking the kine-pock. [See *Jenner's Treatise* from page 9 to 43.]

Dr. Barry of Cork, relates the case of Cornelius Credon, who was inoculated with the small-pox ten years after having the kine-pock; and during three successive inoculations for the small-pox in his family he attended his children while under it, without the least traits of infection. Ellen Goggin suckled her two children under the natural small-pox at an interval of more than seventeen years after having the kine-pock.

Johanna Sullivan was carried with some other children to a dairy farm in Ireland, for the express purpose of taking the kine-pock from a cow, in order to be secured from the small-pox, when she was about thirteen years of age; and when she was twenty, was twice inoculated for the small-pox without any effect; and afterwards slept four nights with some children during the height of the small-pox the natural way, and equally resisted the loathsome disease. For more particulars, see the *London Med. and Phys. Journal*.

A lady wrote to Dr. Barry thus: "Thirty years since my mother had the cow-pox, and has been inoculated frequently since, and exposed to the infection of the small-pox various

ways, without taking it ; and my grandmother, who is above 80 years old, had the distemper fifty years ago, and has been very frequently exposed to the small-pox, without ever taking it."

To these we may add the case of a Mr. Williams, who was inoculated with the small-pox four times, FIFTY years after taking the kine-pock. Mr. Crocker, after an interval of FORTY years. He was a plumber, and frequently employed in soldering up coffins of those who died of the small-pox. Mrs. Hutchins, after an interval of twenty years ; five years afterwards, she was inoculated with one hundred others. All took the small-pox but herself, during which she attended them. Since then she laid out three persons, who died of the small-pox. Mr. Deacon, inoculated after sixteen years, when the small-pox went through his family, while he escaped.

It may be said, these are but the testimonies of physicians, *interested* in promoting a belief of the *permanent efficacy* of the vaccine disease. Let us quit then this suspected order of men, and turn to the testimony of those who are not practitioners.

The letter of the Rev. Mr. Holt, Rector of Finmore, near Buckingham, to Mr. Abernethy, Surgeon of St. Bartholomew's Hospital, may be seen in the London Medical and Physical Journal. This worthy clergyman inoculated his neighbours for the kine-pock, because there was no medical practitioner in his parish. At the close of the account of his practice he adds, that, B. Cowley caught the cow-pock in 1785. Three years after he entered the Oxfordshire militia, in which he remained five years ; during this time he was thrice inoculated by the surgeon of the regiment, without effect. R. Smith caught the distemper about the same time, and his large family have, at different times since, had the small-pox, and, although he attended them, he caught not the disease. Edward Stockley's case was very similar. A servant of Mrs.

Morris had the cow-pock several years ago, and has been inoculated SEVENTEEN times since for the small-pox, without effect.

Lest the testimony of a clergyman should have as little weight with unbelievers, as that of a physician, let us have recourse to those, who are neither one nor the other.

The *Earl of Berkley*, in a letter to Dr. Denman, relates the case of a servant of his own on the verge of seventy, who caught the cow-pock when a boy, and who had exposed himself again and again, in the course of his life to the small-pox, without being infected. William Fermor, Esq. of Tusmore, near Oxford,* relates in his excellent pamphlet, that William Treadwell was inoculated for the small-pox several times, between three and four years after he caught the kine-pock from a cow. Alban Collingridge went through the same experiment four years after. Mr. Stevens was inoculated four years after receiving the infection from a cow; and twenty six years after that, his whole family had the small-pox, and he attended them without receiving the infection. Jane Grey, wife of one of the servants at Corpus Christi College Oxford, caught the distemper by milking twenty five years ago, and slept with and nursed several of her children with the small-pox, at different periods since, without taking the disease. Thomas Slatter, butler to Sir Digby Macworth in Oxford, had the kine-pock at eighteen years of age; and at the age of twenty four was sent to the inoculating hospital in London, and was repeatedly inoculated, at a fortnight's interval, without any infection. Sixteen years after this, he attended his own children with the disease, he himself escaping contagion. Henry Collingridge caught the distemper, when about fourteen years of age. Ten

* "A gentleman, says Mr. Ring, blest with the gifts of fortune, but not corrupted by her allurements; addicted, not to fashionable pleasures, but to philosophic pursuits; and who, actuated by motives of humanity only, caused 326 persons in his neighbourhood, to be inoculated with the kine-pock, and then caused 173 of them to be inoculated with the small-pox, when every one resisted the infection."

years after, he was three times inoculated for the small-pox; after a lapse of ten years more, he inoculated two of his own children with the small-pox; and again after a lapse of several years, he inoculated another, and although he lived with them all the time, he was in no degree affected.

Now, what are all the idle notions, respecting the *transitory* efficacy of the kine-pock, when confronted with FACTS like these, asserted too by physicians of the *first rank*, by *clergymen*, by *noblemen*, and by *private gentlemen*?

Some have triumphed in imagination, because, as our own country could not afford instances to silence their mischievous insinuations, they hoped no other could. But a distinguished British writer, speaking on this very subject, says, "the notion that the cow-pox only secures the constitution from the small-pox *for a time*, is refuted by volumes of evidence and a cloud of witnesses." What construction ought candor itself to put on such medical advice as this?—"have nothing to do with the kine-pock inoculation, until it is proved that it will preserve you like that of the small-pox, FOREVER.*" Alas! do we not all know, that before "TRUTH, in its silent and disputed march, has roused the attention of the indolent, converted the supercilious, subdued the interested, and reached the ears of all, an age shall pass away!" Before which period, how many valuable citizens may perish with the most loathsome of diseases, that might have been saved by this new inoculation! More than two hundred perished under the small-pox inoculation, when it last prevailed in Boston. The apathy, with which they talk of a future spreading of that disorder by inoculation, and the absolute indifference, with which its benign remedy is received, in that large and crowded town, is really astonishing, and will hardly be credited in years to come. With what energy do some of our orators declaim on the evanescent subject of party, and local poli-

* This is like the wise advice of Patrick to his son, "never go into the water, Paddy, until you have learnt to swim!"

tics ! With what pathos, do they appeal to the feelings of their inferiors respecting objects, delusive in their nature, transitory in their existence, and uncertain, as to their ultimate good ! and yet with what coldness, bordering on torpor, do they speak on a subject that absolutely strikes out, *forever*, from the catalogue of human evils, the greatest plague under Heaven !

If people will not believe physicians of the first rank, because they are physicians ; if they will not believe noblemen, clergymen, and private gentlemen, because they are Britons, (and however incredible it may appear, *even that has been urged*) then may they have recourse to one of our own countrymen, who can be consulted every day on the Exchange of Boston, respecting the opinion prevalent in England, of the *lasting* security which the cow or kine-pock affords against the small-pox ; as the following letter will fully explain.

Medford, July 17, 1802.

“ DEAR SIR,

“ When in England, seventeen years ago, I was in company with some persons from one of the dairy counties, together with Dr. Williams, an aged physician. They were speaking of the cow-pox that prevailed at that time among their herds. One observed, that the cows would scarcely suffer themselves to be milked while under the disease. Another remarked that it would be unsafe to milk them ; as the person would be in danger of taking the disorder. Dr. Williams replied, that he would advise every person, who had never had the small-pox, to milk them while infected, for then says he, they will take the disorder, which will secure them *forever* after from the small-pox. This led to many observations on the distemper, which being new to me, I listened to with attention, and learnt, that it was a prevalent opinion, in certain parts of England, that if a person caught the cow-pox, he could *never* after take the small-pox. I then asked Dr. Williams, if this was merely a popular opinion, or the result of certain observation ; he an-

swered, in the strongest terms, that *there are thousands of instances of persons taking the cow-pox in younger life, and who are now arrived to a great age, and have been repeatedly exposed to the small-pox without ever taking it.* I then enquired how it happened, that the gentlemen of the faculty had never transferred it to men by inoculation; he replied, that it had been talked of ever since he was a young man, and, that he fully believed it would be put in practice at some future day.

When I read your first publication in the Centinel, in 1799, it brought this conversation fresh to my recollection, and I related it to my family and acquaintance, as a circumstance strongly confirming the truth of your assertion, of the existence of such a disease in England, *and of its power to secure a person FOREVER against the small-pox.*

I am, &c.

JONATHAN PORTER."

After the absurd doctrine, respecting the *short duration* of the efficacy of the kine-pock, is no longer urged, there is but one other scheme, to which the enemies of the new inoculation can have recourse for effecting its disgrace, and that is, throwing it into the hands of improper persons. I have endeavoured to expose the manifold mischiefs that have arisen, and will again arise, from this irregular conduct, in "*a narrative of facts, concerning the kine-pock inoculation in New England,*" just published at New York, in the Medical Repository. I should not have glanced at this subject at this time, were not the same practices now going forward in a town close by Boston, where, from the delusive offers of inoculating *gratis*, or for a very small fee, people have been induced to receive the disease from persons not qualified to judge between the *true* and the *spurious* pustule; the consequence has already been, that children have followed the example, and inoculated one another. The result will be, some of these imprudent people will go into the neighbouring hospital, take the small-pox, and then the odium will, as usual, revert to me, because the matter used was taken from

my patients. I therefore feel it no more than justice to myself, considering the pains I have taken to mature this business, and a duty I owe to the public, to notice this conduct of ignorance and presumption.

Cambridge, July 21, 1802.

Two gentlemen, one in Middlesex, the other in Norfolk, erroneously supposed themselves *particularly* aimed at, in the foregoing publication. One of them has forever secured my friendship and respect, for the decent and gentleman like mode of obtaining an explanation.

It should be remembered, that at this time, the summer of 1802, the new inoculation had not been generally adopted in Boston. It had made greater progress in every capital of each state in the Union, than in the capital of Massachusetts, although the first annunciation in America, of the existence of such a disease as the cow-pox, was made in Boston, nearly three years before.* The faculty in that town, with but one exception, had not given it their decided approbation and countenance. The younger practitioners inoculated, now and then, a few, but scarcely enough to keep up a continuity of cases, for the preservation of the matter. Soon after, persons not of the profession assumed the business in different parts of the country. From such hands, the practice passed into those of journeymen mechanics, apprentices, day labourers, and, in some instances, children inoculated each other. When rebuked for this imprudence, they replied, they might as well inoculate themselves, as Mr. such a one. Many thoughtful people saw what would be the consequence of such conduct; and both by letter, and in conversation, urged me to publish something on the subject. Indeed, I deemed it *my duty* to hold this practice up, for the public consideration; which I did in the Columbian Centinel August 2d, 1802; but first read it to the

* See my first publication in the Centinel March 1799.

President of the Massachusetts Medical Society, determining to suppress it, should the principles and design of it, meet his disapprobation. Its publication, notwithstanding, let loose all "*the angry passions.*"*

The town of Boston was frequently alarmed by the introduction of the small-pox. It was sometimes brought in by sea ; sometimes a patient was infected with it, no one knew how ; and, being too sick to be removed, the street was boarded up, the *red flag* displayed on the house, † the country people terrified, and the markets affected by it. Such was the actual state of things in Boston, in the month of May 1802. An European can hardly form an adequate idea of the effects of such an alarm in Massachusetts. Thus situated, many terrified people, who dwelt near the infected spot, disbelieving the efficacy of the kine-pock, went to the licensed hospital in Brookline, and were there inoculated for the small-pox. The hospital was, at this time, crowded with patients.

It was ten years since a general inoculation pervaded Boston and its neighbourhood ; and it was conjectured, that there were nearly *fifteen thousand* persons liable to the small-pox within that circle. ‡ On this occasion, the forcible expressions of Dr. Jenner, in a letter to my friend Dr. Lettsom, incessantly occupied my mind, viz.

“ The small-pox rages at this time in the metropolis. We have the means in our power of stopping the calamity. Why not employ them ?

“ We perceive, as it were, our houses on fire, and with *buckets* in our hands stand idly gazing on the flames !

* See a specimen in the Centinel, by way of reply to this publication, dated Dorchester August 11, signed “ JOHN C. HOWARD.”

† See my printed correspondence with Dr. Haygarth.

‡ Boston is connected on the north to Charlestown by a bridge 1500 feet long ; to Cambridge on the west by one more than twice as long ; and to Roxbury on the south by a long street. Within 3 miles of these towns are others nearly as large.

“ We bar the door against foreign plagues by our laws of quarantine ; whilst the greatest domestic plague, that ever infested us, is suffered to advance without controul. *Would it not be wise in the Legislature to interfere in the cause of suffering humanity ?*” *

Thus circumstanced, I found it, in a peculiar manner, my duty, seeing I had imported the vaccine disease into America, and had held it up to my countrymen, as an easy *commutation tax*, in lieu of that horrible one, the small-pox, to make a serious effort to diffuse the benefits of it, first through the metropolis, and then through every part of the Commonwealth, so as even to exterminate the very pabulum, or fuel, on which the small-pox feeds. But *how* to effect it, was the question— I must have been grossly ignorant of the world and of myself, to have supposed, that the old physicians of Boston, where I was not, strictly and legally speaking, an inhabitant, would follow my lead in any general scheme of vaccination ; and, without their hearty co-operation, nothing extensively useful could be effected. A vaccine insitution would fall far short of the objects aimed at. Besides, it would be beginning at the wrong end, both of society, and of the profession. There was no legally constituted body of men, which appeared to me so likely to carry this desirable object into effect, as *the Board of Health*, which is a kind of *standing committee of humanity*, composed of “one able and discreet person,” from each of the twelve wards of Boston. Their power is extensive. They put in force the laws of quarantine. They direct the removal of filth, or supposed sources of contagion or infection, within the town and harbour. They prohibit the sale of unwholesome provisions. They oblige the keepers of boarding houses to make return to them of all sick sea-faring people under their roof, within twelve hours from their seizure. They allow no person to be removed from any ship at the wharves, into the town, without their special permission. But the grand

* Lettson's observations on the cow-pox, p. 31.

object of their vigilance is, to guard against the introduction of the *yellow fever*, and the *small-pox*. Three of this board sit every day. And this arduous task they perform without any pecuniary compensation.

I knew that the Board of Health of the last year* was averse from the very idea of patronizing such a plan; for Dr. James Jackson had addressed a letter to them, asking permission to test with the small-pox some of his vaccine patients, when the board voted to reject his application *in toto*. I was therefore aware, that if my memorial did not carry with it absolute conviction, it would share the fate of the letter of my ingenious and esteemed pupil; in which event I was all prepared to transfer my plan from the town to the Legislature of the Commonwealth. In either case, I thought it proper to take a broader ground than that of a private practitioner. I therefore addressed the board of health as follows;

The Memorial of BENJAMIN WATERHOUSE, M. D. *Professor of the Theory and Practice of Physic* in the UNIVERSITY OF CAMBRIDGE,

To the BOARD OF HEALTH IN BOSTON.

Gentlemen,

NO one can doubt the propriety of my addressing you on the subject of *the new inoculation*, who considers, that you are placed by law, as so many guardians of our lives, health, and safety. The authority, which has made it your duty to put in force the laws and rules, best calculated against the introduction of infection from abroad, and to obviate the causes of contagion at home, has made it my duty to investigate and teach the principles, on which such laws are founded. Under this idea, it is probable, your board, or the individuals of it, applied for my opinion, and made use of it, when the quarantine law was before the Legislature. From recollection of that circumstance, I am induced at this time to address you, not as a private practitioner, but as *the public teacher of the practice of physic*

* They are chosen annually.

in this Commonwealth ; and am willing to annex to the assertions in this memorial the implied responsibility of my official station ; for it has been, agreeably to an early declaration,* under a serious impression of the duty, imposed on me by the medical institution of this University, that I have laboured incessantly, for four years past, in the investigation and diffusion of the most important medical discovery, ever made since the world began ; it being no less than that of exterminating the most loathsome and widely wasting pestilence, that Providence ever permitted to afflict the human race.

Being made acquainted, at a very early period, with this extraordinary discovery, I felt it my duty, as a teacher of medicine, to collect all the facts for the information of those who attended my public lectures. Having imported the disease itself into America, I feel, if possible, a still stronger obligation to acquaint the public with every step I took in diffusing it, even before it passed the limits of my own family. I therefore published all my proceedings from time to time in the newspaper, in a stile so simple, as to require no other preparation, than common sense and an unprejudiced mind. But, as they have never yet been collected together in one book, it may be of some use, on this particular occasion, to throw together the leading particulars, and lay them in order before the public, through the respectable medium of *the Boston Board of Health*. For really, gentlemen, (seeing vaccination is marching triumphantly over the globe, and PRESIDENTS, EMPERORS, KINGS, CONSULS, and PARLIAMENTS, are giving it public countenance and support) it is time for that town, distinguished as "*the head quarters of good principles,*" to consider, whether they will chuse to be the last in adopting a practice, which has been followed by France, Italy, Spain, Germany, Prussia, and

* See page 18 of the pamphlet, entitled "A prospect of exterminating the small pox."

Constantinople, and even received with warmth in the cold regions of Russia and Norway ?

It has been to me an humiliating reflection, that the very plans I have offered for a *Vaccine Institution* in Boston, for inoculating the poor *gratis*, and which have been received with a chilling apathy, and a repellent suspicion, have, on being transmitted to some of the middle and southern States, been adopted with alacrity. From these places, I am continually receiving letters, replete with the most grateful expressions for transmitting them the matter and directions for carrying on this new inoculation.

I pass from these prefatory remarks to

A CONDENSED HISTORY OF THE KINE-POCK INOCULATION.

THERE is a mild distemper, which has been noticed here and there among the herds of kine, in several parts of England, time immemorial. This disorder appears first on the teats and udder of the cows, in the form of irregular pustules, or pocks, of a palish blue colour ; and those who milk them, when thus affected, seldom fail of catching the disease.

This distemper has existed so long in Ireland, as to be known there by a *Celtic* name, viz, "*Shinnaugh*," which word is found, on dissection to mean, *a cow's teat*. This carries the knowledge of this epizootic disorder back full 500 years.

There are innumerable instances of persons in Britain and Ireland, who caught the malady by milking cows in their youth, and who have passed through a long life, and have been repeatedly exposed to the contagion of the small-pox without being infected ; so that with a knowledge of this disease, has ever been connected an opinion, that a person once affected with it, is ever after secure from the small-pox.*

* The absurd doctrine, that the small pox would secure a person only a short time, was urged *eighty* years ago to prevent Dr. Boylston from advancing with his inoculation in Boston.

EDWARD JENNER of Berkley, a town in the vale of Gloucestershire in England, a learned, skilful, and accomplished physician, was the first who took this knowledge, so long floating on the breath of the vulgar, and impressed upon it the stable form of science. He it was, that with a Franklinian sagacity, first transferred it from that mild, healthy, and, invaluable animal the Cow, to the human species ; and by a series of experiments, demonstrated, that it is *a perfect security against that loathsome disease, which has destroyed more than FORTY MILLIONS of people every century!* whereby he has been the means of preserving more lives than ever fell to the lot of any other human being. This extraordinary fact came forth from his hands in so finished a form, that were all other writings on the cow or kine-pock, but Jenner's, destroyed, posterity might have a clear and perfect idea of this benign remedy, and its salutiferous consequences. For Dr. Jenner has demonstrated,

I. That cows are liable to a pustular disease, which was popularly called in England the *cow-pox*.

II. That the human species might be inoculated with the *limpid* fluid produced in the pustules of this cow-pox.

III. That, in consequence of such inoculation, an action commences, which makes such a change in the constitution of the inoculated persons, as to render it impossible for them to be ever infected with the small-pox.

IV. That the disease, induced by inoculating with the cow-pox, is of a slight kind, wholly free from danger, seldom attended with fever, and never with suppurating eruptions, like those of the small-pox.

V. That if, by any accident, too much general disturbance is excited in the constitution by inoculating for the cow-pox, it is easy, by a proper application to the inoculated part, to regulate, or suppress such disturbance.

VI. That one child in a family might be inoculated for the cow-pox, without the hazard of infecting any other person in the family ; the cow-pox not being a contagious disease. And none of the facts, or observations, published by Dr. Jenner, have been disproved, or refuted.”*

This vicarious disease retains in England, its vulgar name of *cow-pox*. It is called *la vaccine* in France ; *vajuolo vaccino* in Italy ; *vaccina* in Spain, Germany, and the Northern Nations ; and in the United States of America, the KINE-POCK. †

That I produced the *same* disease in America, is confirmed by virus taken from my patients here, and sent to England, producing the *same* disease there. We have, besides, demonstrated the *identity* of the distemper to the *eye*, by means of pictures of the kine-pock in all its stages, painted in England under the direction of Jenner himself, which exquisite representations ascertain the *identity* of the local disease beyond the faintest shade of ambiguity. In like manner, the depicted *spurious* pustule is an exact description of the impostor that pestered us in the autumn of 1800.

That this cow or kine-pock will secure the human constitution from the contagion of the small-pox as certainly, as rods of iron will secure a building from the effects of lightening, no one, *who has paid due attention to the subject*, now doubts in America. But as *lightening rods* may be so *injudiciously* placed, as not to protect the building from injury, so the kine-pock inoculation may be so *unskilfully* conducted, as not to secure the person from the contagion of the small-pox.

When a building, guarded by rods of iron, is struck with lightening, we conclude they were not adjusted according to the rules laid down by *Franklin* ; they being founded on a *law of nature* relative to the electric fluid and a metallic rod. And

* Dr. Denman.

† Instead of the plural *pox*, because it has but *one* pustule.

when we hear of a person having the small-pox, after being supposed to have had the kine-pock, we are as certain that the inoculation was not conducted according to the rules laid down by *Jenner*; they being, in like manner, founded on a *law of nature* respecting the vaccine virus and the human subject. Whenever, therefore, we meet with adverse accidents in applying the *Franklinian*, or the *Jennerian* discovery to practice, we must look for the cause in *erring man*, and not in UNERRING NATURE. It is the business, then, of the philosopher and the physician, to enquire into the causes of these aberrations.

Assuming it then, as a fact (and the learned of all nations have admitted it) that Dr. Jenner has demonstrated a *new law of nature*, respecting the prophylactic, or preventive power of the kine-pock in the human system; we presume that every one who dreads the small-pox, would gladly shelter himself behind the *Ægis* of Jenner, from its too fatal effects, *had he but a cloudless view of the whole business*; and the ultimate object of this address, Gentlemen, is a PLAN to help your fellow citizens to such a view of it; and thus to relieve them from their present state of doubt and uncertainty, respecting a matter of more importance to your commercial town, than any that ever exercised its deliberations, since our venerable forefathers first landed on your renowned peninsula.

In the present unsettled state of this practice, the inhabitants of Boston know not what to adopt, or what to reject. Altho' I hold up to you, with *confidence*, a sure, safe, and effectual method of forever securing your offspring from the worst of maladies, yet I wish not that you should patronize, much less adopt it, without A PUBLIC EXPERIMENT PERFORMED UNDER YOUR OWN INSPECTION.

The only question now remaining on the minds of those who are well wishers to the new inoculation is, *why has this operation ever failed? Why have not the true prophylactic effects followed every application of the vaccine virus to the abraded skin?* The full

discussion of these questions is reserved for another place. Suffice it to say for the present, that I very early warned the public against *spurious* cases, or an appearance on the arm not possessing the characteristic marks of the genuine pustule, and cautioned my readers against certain occurrences, which if not critically attended to, would bring the inoculation of this recently imported distemper into a *temporary* disrepute. But my warnings were misconceived, and misrepresented; so that at length, I ceased from any further expressions of caution, and endeavoured to content myself with predicting the consequences, that would ensue from aiming to walk strait, in an unfrequented path, blindfold.

A public experiment by some learned body, or association of physicians, or some regularly constituted body, as the board of health, is requisite to infuse confidence into the minds of the people. For an individual, however warmly disposed to promote the good of his fellow creatures, can do but little in such a peculiar business as this. More than a year since, an advance of the kind was made by me to the *Massachusetts Medical Society*. They never acted regularly upon it, but it appeared that they wished for the united authorities of the whole medical world, before they would venture to commit themselves, or the dignity of the society, on the suggestions of a single enthusiastic member. These discouragements have induced me to address the *Boston Board of Health*,—to request them to take this new mode of preventing the small-pox infection into their serious consideration, as a matter of great importance to the community, and coming with peculiar propriety under their cognizance.

The writer of this has for more than three years devoted his undivided attention to maturing, and bringing forward this mode of exterminating an horrid disease. He has, by suggesting, but not obtruding on the public, held up to their view, A MILD AND EASY SUBSTITUTE. In the same spirit he would now propose to the *Board of Health*, as

a principal mean of effecting this end, that they would take some step toward forming a *committee*, to enquire, 1st, *Whether there be sufficient evidence of the efficacy of the kine-pock to justify the expense of a public experiment*; and ample documents are here transmitted to assist in you this inquiry. If this is found to be the case, to establish 2dly, a COMMITTEE OF PHYSICIANS to conduct the experiments. To ensure universal satisfaction, it is suggested, that the Committee should consist of *six of the oldest physicians* of Boston; men, who from their age and character, are rather retiring from extensive business, than candidates for it; and that to these should be invited the physician of the small-pox hospital at Brookline. I would further ask leave to propose, that to these medical characters, should be associated as many *clergymen*, whose information, habits of enquiry, and benevolent views, would complete a committee, every way adequate to the important task, of forming, and laying, in conjunction with the board of health, before the public, a correct and unbiased report of facts.

On this occasion, may I not be allowed to make a remark or two for the consideration of those, who from their daily occupations, cannot be supposed to have been in the habit of closely contemplating the works and operations of Nature? * Such are apt to imbibe erroneous opinions concerning what they denominate the *mean* and the *noble*, the *great* and the *small*, the *trivial* and the *magnificent*, which he, who is ~~not~~ in the habit of closely contemplating the GREAT FRAME OF NATURE, the mutual connexion, combination, affinity, and harmony of parts, as well as the never ceasing circulation of causes and effects, cannot admit. Such do not consider, that, however essential the distinction of bodies into *great* and *small* may be to *us*, they are not so in the view of the SOVEREIGN ARCHITECT, with whom an *atom* is a world, and a world an *atom*! Who then can stigmatize any work, or operation of nature, by the epithets of

* Local opinions and prejudices rendered these illustrations necessary. A considerable proportion of the board of health were unbelievers in the efficacy of the kine-pock at the time this memorial was presented.

mean and *trivial*? I have been lead to these remarks on hearing some declare, that they never could have faith in an operation, or process, that had so *mean* and *trivial* an origin as this, now offered to the public, as their greatest benefit, and as the most valuable discovery ever made in medicine. The fact is gentlemen, the *greatest* benefits now enjoyed by man, both in *art* and *nature*, sprung from what is called *mean* and *trivial* origins. A few instances may illustrate my meaning.

Two or three people, cast away in ancient times, on the coast of the Mediterranean, made a fire to cook their victuals and repair their boat. In this operation, they happened to burn the plant *Kali*, which mixing with some sand, or coarse gravel, and all melting together, first produced *glass*; by means of which we can not only bring distant objects as if within our touch, but open an intercourse with the Heavens. Nay further, by the help of two or three pieces of glass fixed in a triangle of wood, the seaman can tell to a mile where he is, south or north of the equator. But shall we despise the *telescope* and the *quadrant* because they had so mean an origin?

Some other persons playing with a little *red stone*, found that it attracted iron; and at length that a needle touched with it, would always point towards the north-pole. Some lucky mortal, like Jenner, took the hint, and with it formed the *mariner's compass*, by means of which the sailor traverses the trackless ocean, in the darkest night, with perfect safety.

If we turn from these instances in *art* to those of *nature*, and consider the causes of the wealth and power of nations, do we not see similar instances, full as striking? Is not a *pepper-corn* the foundation of the power, glory and riches of India; as is the *acorn* of that renowned nation whence we of New England sprang? * “A truth, constantly found,” says Bruce,

* The board of health is principally composed of commercial men and sea captains retired from business. Hence the reason for selecting instances in the commercial and nautical line.

“in the disposition of all things in the Universe, is, that God makes use of the *smallest* means and causes, to operate the *greatest* and most powerful effects.”

Let us then no longer be told of the contemptible origin of that benign remedy, which PROVIDENCE has destined for the preservation of your offspring from a loathsome and destructive plague. The earth maintains not a more clean, placid, healthy, and useful creature, than the Cow. She is peculiarly the poor man's riches and support. From her is drawn night and morning, the food for his ruddy children ; while the more concentrated part of her healthy juices is sold to the rich in the form of cream, butter and cheese. It would indeed be uncomfortable to live without this animal, as she supplies man with more conveniences, and at a less expence, than any other quadruped in the creation. When we have exhausted her by age, her flesh serves for our nourishment, while every part of her has its particular uses in commerce and medicine. On these accounts she is an useful, though invisible wheel in the great machine of state.* Hence we cease to wonder that this useful domestic animal was consecrated among antient nations, as an object of worship.

You will readily see gentlemen, that this memorial, though meant to carry every mark of respect, is not made in the stile of cringing solicitation, like a man exclusively interested in the event, and actuated by personal motives merely ; but of a man conscious of his duty, and zealous in promoting a public benefit every way worthy your patronage ; a benefit of more real value to the town of *Boston*, than all the riches contained within its limits. You will also remember, that the main object of this address is not to persuade you blindly to patronize

* The word wealth was derived from this species of animals, viz, *pecunia* from *pecus*. Hence it was that the first money ever coined in the world, had a *cow* stamped upon it, as a portable representative of riches.

the new inoculation, but to induce you to cause a rigid inquiry to be made into the truth of my assertions, and to have them subjected to the test of A PUBLIC EXPERIMENT, by a set of men, whose knowledge, age, and virtues, will create confidence, and inspire satisfaction.*

BENJAMIN WATERHOUSE.

Cambridge, May 31st, 1802.

The Board of Health paid a prompt attention to this address, adopted and pursued the plan here suggested in every particular, excepting that which related to the physician of the small-pox hospital in Brookline; and that which regarded the gentlemen of the clergy. I grieved in silence that they mutilated any part of my plan, yet would not utter a word, lest it should impede their meritorious exertions. Partial to my original idea, I must nevertheless be allowed to remark, that if to the six oldest Physicians of Boston, had been added the six oldest Divines, they would have formed a weighty and dignified jury, whose verdict would have every where, and forever have silenced the insinuations of the ignorant and mischievous respecting interested and professional motives. In 1721, six clergymen of Boston did more in strengthening the hands of Dr. Boylston, than any six hundred people that could have been selected in the Province. For these reasons I have never ceased to regret that that part of my design was not likewise adopted.

Had the Board of Health hesitated in pursuing the plan in general, chalked out in my memorial, I had determined to petition the Legislature for a law to prohibit what is called a *general inoculation* for the small-pox, and to confine the inoculation for it to two or three hospitals. I should have grounded my petition on this solemn truth, that under the most favourable circumstances of the inoculation, some die immediately,† or

* That is, a committee of six of the oldest physicians, and six of the oldest clergymen in Boston, together with Dr. Aspinwall.

† More than 200 died in Boston during the last inoculation.

by some slowly wasting disease ; or if they escape with life, are liable to a loss or injury of some of the senses ; whereas a kind Providence has now offered us a mild and easy substitute, that has never proved fatal in a single instance.

To have expected such a law at present, from the representatives of this land of liberty, savoured more perhaps of the sanguine expectations of a projector, than the cool reasonings of a politician ; but the great object of my wishes would nevertheless have been obtained by such a petition, which was, *an examination of the prophylactic power of the kine-pock, by a COMMITTEE OF THE ELDER PHYSICIANS, DIVINES, AND GENTLEMEN OF THE LAW.*

The Board of Health however, pursued the main object with unremitting attention and success. On the 16th of August, 1802, nineteen children were inoculated for the kine-pock at the Health Office in Boston ; and went through the disease to the entire satisfaction of the physicians, and of the board.

On the 9th of November following, these nineteen children, with another who had the kine-pock two years before, were sent to Noddle's Island, which is about a mile from the long wharf of Boston, and there inoculated with variolous matter. Two children were at the same time inoculated for the small-pox, with a view to compare the progress of the local affection in each, and also to afford a stock of fresh matter for a re-inoculation ; and to obtain moreover a perfectly variolated atmosphere, so that the infection might be applied to the lungs, as well as to a wound in the skin. The following is

THE REPORT OF THE MEDICAL COMMITTEE.

WITH a view of ascertaining the efficacy of the cow-pox in preventing the small-pox, and of diffusing through this country the knowledge of such facts as might be established by a course of experiments instituted for the purpose, and

thereby removing any prejudices, which might possess the public mind on the subject, the Board of Health of the town of Boston, in the course of the last summer, came to a determination to invite a number of Physicians to cooperate with them on this important design : and with a liberality becoming enlightened citizens, erected a Hospital on Noddle's Island for carrying it into execution. Accordingly, on the 16th of August last, nineteen boys, whose names are subjoined were inoculated for the cow-pox at the office, and in the presence of the above mentioned Board, with fresh, transparent cow-pox matter taken from the arms of a number of patients then under this disease. These all received and passed through the disease to the complete satisfaction of every person present, conversant with the disease.

On the 9th of November, twelve of the above children, together with one other, George Bartlett by name, who had passed through the cow-pox two years before, were inoculated for the small-pox at the Hospital on Noddle's Island, with matter taken from a small-pox patient in the most infectious stage of that disease. The arms of these lads became inflamed at the incision, in proportion to the various irritability of their habits, but not to a degree greater than what any foreign, virulent matter would have produced. The small-pox matter excited no general indisposition whatever, through the whole progress of the experiments, though the children took no medicines, but were indulged in their usual modes of living and exercise ; and were all lodged promiscuously in one room.

At the same time and place, in order to prove the activity of the small-pox matter, which had been used, two lads, who had never had the small-pox, or cow-pox were inoculated from the same matter. At the usual time the arms of these two patients exhibited the true appearance of the small-pox. A severe eruptive fever ensued, and produced a plenteous crop of

small-pox pustules, amounting by estimation, to more than five hundred in one, and two hundred in the other.

When these pustules were at the highest state of infection, the thirteen children before mentioned were inoculated a second time, with recent matter, taken from said pustules, which said matter was likewise inserted into the arms of the seven other children, who were absent at the first inoculation. They were all exposed, most of them for twenty days, to infection, by being in the same room with the two boys, who had the small-pox, so that if susceptible of this disease, they must inevitably have received it, if not by inoculation, in the natural way.

Each of the children was examined by the subscribers, who were individually convinced from the inspection of their arms, their perfect state of health, and exemption from every kind of eruption on their bodies, that the cow-pox prevented their taking the small-pox, and they do therefore consider the result of the experiment as satisfactory evidence, that the *cow-pox is a complete security against the small-pox.*

JAMES LLOYD M. D.	JOHN JEFFRIES M. D.	} <i>Committee.</i>
SAMUEL DANFORTH M. D.	JOHN WARREN M. D.	
ISAAC RAND M. D.	B. WATERHOUSE M. D.	

Dr. Charles Jarvis was appointed one of the committee, which completed the number of Boston physicians I had originally in view ; but he did not attend through the whole procedure, and therefore did not sign the report.

Several other gentlemen, who witnessed the whole, or part of this public experiment, corroborated the testimony of the committee by their signatures.

This decisive experiment, which has fixed forever the practice of the new inoculation in Massachusetts, was instituted three years and eight months after my first publication of the

existence of such an epizootic distemper, as the cow-pox; and about two years and four months after I made the first experiment with it in America.*

Perhaps it may be asked hereafter, why was this experiment delayed so long? He who is best acquainted with human nature will be the last to wonder at it. Mr. Gardiner, of Frampton upon Severn, a benevolent writer on the utility of this inoculation, in speaking of the slow progress of the practice in Jenner's native land, observes, that "every deviation from established practice, every medical theory which overturns old and deep rooted opinions, must always encounter opposition. This opposition is natural to the human mind; and he must be a philosopher possessed of wonderful powers of self denial, who can wholly suppress the sigh of sorrow, when he contemplates another's fame." The whole of this observation is just and applicable to London, and to Jenner, while only a part of it is applicable to ourselves.

The following letter must be grateful to every friend of humanity, as it gives a pleasing account of the progress of the new inoculation among our brethren of the south. The writer, Dr. Spence, is one of the most zealous, philanthropic, and successful inoculators in Virginia.

* The first person inoculated for the kine-pock in the western hemisphere was

DANIEL OLIVER WATERHOUSE, at the age of 5 years.

The second Benjamin Waterhouse, at 3 years.

The third Mary Waterhouse, at 1 year.

The fourth Elizabeth Watson Waterhouse, at 7 years; and then three of my domestics—all in Cambridge. Six of these were soon after inoculated by Dr. Aspinwall with the matter of the small-pox without any signs of infection.

The first person inoculated in Boston, was Mr. Eliphalet Williams, merchant, August 19, 1800.

The persons first inoculated in Charlestown, were two children of the Honourable Mr. Dexter late Secretary of the Treasury of the United States, and two children of the Rev. Dr. Morse; all on the 22d of August 1800.

Dumfries, (Virg.) December 7, 1802.

DEAR SIR,

AS soon as I received your favor of the 7th ult. requesting me to inform you of the success of the vaccine inoculation in Virginia, I addressed a few queries on the subject to several of my correspondents, that I might have it in my power to furnish you with the latest and most accurate information. As yet I have not received answers to all my letters, but those that have come to hand are very satisfactory. They give accounts of the propagation of the new practice in various districts, and evince that wherever it has been warmly espoused by the faculty, it has proceeded with every degree of success, popularity and usefulness. It is true indeed, that its progress, though great, has by no means been so extensive as might have been expected, in so populous a State as this; where it may, without exaggeration be said, nearly FIVE HUNDRED THOUSAND of its inhabitants are strangers to the small-pox. Through your unremitting exertions however, which exceed all praise, a solid foundation is laid for its future advancement. The prejudiced and uninformed people, who in some places, undertook to oppose the new inoculation, are now either convinced of their error, and obliged to retract, or subdued into silence and shame. This victory over error, prejudice, and passion, is perhaps the most pleasing and important information I can give you. It ensures the triumph of vaccination in this quarter of the Union. The nature and management of the vaccine affection is also, I can assure you, pretty well understood among us; and nothing but the supineness or indifference of medical practitioners can now retard its rapid and successful progress.

Although I do not wish to swell this communication by quotations from letters of my correspondents, yet I deem the following extract of one I have just received from Dr. Shore of Petersburg, a physician of the first eminence in the southern parts of Virginia, too interesting to be omitted.

Petersburg, Nov. 27, 1802.

“DEAR SIR,

“I have the pleasure to acknowledge the receipt of your esteemed favor of the 20th instant, and am happy that I have it in my power to give you favourable accounts of the progress of the new inoculation in this place and neighbourhood.

“With the vaccine virus you sent here, our physicians commenced their inoculation early in the Spring; and notwithstanding it had to contend with some opposition, arising from an unfortunate and unsuccessful attempt to propagate it in Richmond, a short time before, yet it soon became general, many hundreds having been inoculated, without a single instance, as far as I know, of its failure.

“Applications to us for matter extended far and wide, particularly in the State of North Carolina, where I am well informed, thousands went regularly through the disease. Indeed in that State it appeared to produce a degree of enthusiasm.

“In all the cases which came under my own observation, great uniformity marked the progress of the symptoms; nor have I been able to discover any deviations from those described by Jenner, Lettsom and other physicians.

“In one instance it was said to be attended with a pretty numerous eruption, and in another to have excited a violent disease, attended with fever, in a person who had undergone the small-pox. Perhaps I ought not to mention those cases, as I took particular pains to inform myself of the circumstances of each, without any conviction as to their truth; hence I place no confidence in them myself.

“Three cases only have been tested here by the small-pox, in all of which it was completely resisted.

“I had preserved several infected threads, but have been prevailed upon by physicians, in different parts of the country,

to furnish them with matter ; and I could not resist their importunities. The physicians here, trusting too much to the providence of each other, have left us without a supply. The difficulty indeed, of preserving the virus is to me, one of the greatest inconveniences and objections in the whole management of this important discovery."

Here I cannot help taking notice of the laudable and exemplary conduct of the Petersburg physicians. As soon as they were in possession of the vaccine virus, they united in a body in its favour, and showed their faith in it, not only by publishing their opinion in the newspapers, but by vaccinating in the first instance their own families and friends, and announcing publicly, that each of them in rotation, would attend one day in every week at the Court house, to inoculate gratuitously, such poor people as wished to take advantage of the blessings of this benign antidote. How worthy is this of imitation. Fortunate would it be for humanity and the healing art, could it be said with effect and authority, to every medical association, and every professional man throughout the United States, "Go, and do thou likewise."

I do not wish to conceal, that the advocates of the new inoculation here, have had to contend with many vulgar errors, as well as much opposition from the faculty. Exanthematous diseases were uncommonly prevalent in this State during last Spring and Summer—particularly chicken-pox, scarlet fever, measles, and a vesicular eruption resembling pemphigus.* This last disease and the chicken-pox no sooner appeared than they were ascribed to the new inoculation ; but on enquiry, it turned out that adults who had passed through the small-pox, and children who had undergone neither the small-pox nor cow-pox, were equally subject to these diseases. The measles were unusually severe, in many cases fatal ; but this mortali-

* These eruptive disorders were at that time, also prevalent in Massachusetts. w.

ty was owing, in a great measure, to a violent hooping-cough, which was epidemic at the same time. Reports were again circulated that this bad sort of measles must be ascribed to the prevalence of the *new distemper* ; but a plain statement of facts soon convinced those, whose minds were open to conviction, that this story was as groundless as the tales about the other eruptive disorders. Such reports should never be suffered to pass uncontradicted. It is owing no doubt, to the remissness of physicians, who laugh at, or regard such vulgar errors with silent contempt, that the public mind has been so often distracted, and the Jennerian inoculation brought, on many occasions, into a temporary disrepute. It requires but little pains in these instances to arrive at truth ; and as little, when the investigation is conducted with candor, and with a respectful deference to the opinions of those, whose doubts respecting new plans often originate from the purest motives, to obviate objections, and repel such idle and sceptical misrepresentations.

Since I began the new inoculation here, I have had the pleasure of supplying with virus at least twenty practitioners in different parts of this State ; all of whom have carried on the practice to a considerable extent. The infected threads were generally accompanied by letters containing your valuable instructions. Jenner's sacred boundary has been piously respected. The *eighth day* is as well known among our people as the most important day in the calendar ; and has been observed with every degree of veneration. These circumstances, relative to this nice point in vaccination, must be highly gratifying to you, particularly at a time when some eminent physicians in America have departed with great freedom, and perhaps not a little pride, from this GOLDEN RULE OF JENNER.

For more than twelve months past, I have regularly inoculated every week with warm vaccine fluid ; during that period several hundreds have passed through my hands in the mildest manner ; and I ought to add, that some of my patients, when

removed from this State, have been subjected with impunity to the test of the small-pox; and by medical gentlemen too, who at the time they made their experiments on my patients, were hostile to the new discovery. Although I wish not to enter into minutiae in this letter, yet it may be proper to observe, that the physicians in this part of Virginia, have generally made a point of watching with a jealous eye, over every case under their care; and thereby have prevented many a sore arm, which might have arisen from tight sleeves, scratching the pustule, or by neglecting the necessary applications, when the inflammation happened to be redundant. By this vigilance, the character of the vaccine affection, for safety and benignity, has been preserved here as fair and irreproachable, as in any town in the United States; or perhaps in any part of Europe. I shall make but one other observation; that in all the cases which have fallen under my notice, I have seen no eruptions over the body; and although the virus we have been using, has passed through so many successive trials, its purity has remained untainted, and its activity undiminished.

I have lately seen Sir Alexander McKenzie's *Voyages through North America*; and read with horror, the account he gives of the ravages of the small-pox among the poor deluded Indians. Fortunate has it been for the Jennerian discovery, of which you are justly regarded as the Founder in the New World, and which you have supported and propagated with so much judgment and ability, that the vaccine virus was committed to the care of so illustrious an Indian Chief as *Little Turtle*; a man no less beloved by his people, than distinguished as a warrior, a statesman, and a philanthropist. How gratifying to your feelings must it be, on perusing these voyages, to think that under Heaven, you may be the happy instrument of warding off so much human misery, and furnishing even the savage tribes in the distant wilds of America, with a shield of protection against the most dreadful foe that ever assailed them!

That Heaven may more and more bless your labours, and that you may be blessed with length of days, to see the universal triumph of vaccinism over one of the most dreadful foes to health, to beauty, and to life, in the whole catalogue of human afflictions, is the sincere prayer of, Dear Sir,

Your ever grateful and most obedient humble servant,

JOHN SPENCE.

DR. WATERHOUSE.

It may be thought superfluous to add another word in favour of the new inoculation ; but justice seems to demand the insertion of a letter from a physician, who occupies a great space in the public estimation. The enemies of vaccination had made use of the respectable name of RUSH, with a view to impede the advancement of this salutary practice among us. It was generally reported here last winter, that this eminent physician had unfavourable impressions of the vaccine disease, and of the inoculation for it. But the following letter from the "*American Sydenham*" himself, will at once dissipate all those idle stories.

Philadelphia, Feb. 9, 1801.

DEAR SIR,

ACCEPT my thanks for your friendly and instructing letter. Our whole city will, I hope, be benefited by it, as well as myself ; for I have put the most important facts into the hands of a printer, and they will appear in a day or two in one of our daily papers.

In answer to your letter, I shall send you a copy of part of a lecture I delivered to my class a few weeks ago, upon the new mode of inoculation from vaccine matter ; from which you will perceive that I have adopted the discovery with as much zeal and confidence, as you have done, and that I look forward to the complete extinction of the small-pox by it.

“ There was a time, when the very name of the small-pox inspired more terror than war, famine, earthquakes, and pestilence ; and with reason, for more of the human race have been destroyed by it, than by any one of them, or perhaps by all of them, in a given time, put together. War has its intervals of peace ; famine is often preceded and followed by years of plenty ; earthquakes are extremely limited in their destructive effects upon human life ; and even the plague itself is a less evil than the small-pox. The truth of this last assertion will appear, when we consider that the plague is confined to filthy cities, and marshy countries ; whereas the small-pox prevails in all situations. Cleanliness and the cultivation of the earth are no securities against it. The plague prevails only in certain years and seasons, and requires the concurrence of a malignant constitution of the atmosphere ; whereas the small-pox prevails in all seasons and states of the air. The plague now and then ceases, like war, from the face of the earth ; but the small-pox has never ceased for a single year, to spread death over some parts of our globe, since it made its first appearance in the year 572. It has been computed, that forty millions of people have died of it in different parts of the world, in the course of the last century, during part of which time its mortality was much lessened, compared with former centuries, by means of inoculation. Allowing for its being confined for many centuries, in its ravages upon human life, to its birth place in Africa, it is still probable, several hundred millions of people have perished by it, since its first introduction into the world. In contemplating this immense destruction of our species by a single disease, together with the ravages it has occasionally committed upon the senses, upon beauty, and upon health in persons who have survived it, we are struck with horror at the retrospect, and are led to mourn over the wide extended scene which it exhibits of human misery. But happily for mankind, this general mortality and misery will be felt and seen no more. A new era is begun in the medical

history of man, and the most mortal of all diseases is about to be struck out of the list of human evils. Its destiny is fixed, and the day is not very remote, when the very name of the small-pox shall be found only in books of medicine. I need hardly add, that this great revolution in favor of the population and happiness of our species, has been effected by the substitution of a harmless disease, taken from a domestic animal, to the small-pox. Thick and lasting be the honors of that highly favoured physician, who first discovered and established this safe and delicate antidote to a mortal and loathsome disease. Unknown, till lately, beyond the limits of the district in which he practised, the name of Dr. JENNER has extended to every part of the globe, and will be coeval with time itself. His extensive and durable fame will be merited, for he has introduced into the world, the means of saving millions and millions of lives.

“For a full account of the advantages of vaccine inoculation, above inoculation for the small-pox, I refer you to Dr. Aikin’s epitome of nearly all that has been published upon this subject. I shall briefly enumerate them.

1. It requires no preparation in diet and medicine.
2. It may be performed with equal safety at all seasons.
3. It is a mild disease, seldom confining a patient to his house, or interrupting his business.
4. It risks no sense, and does no injury to beauty.
5. It is not contagious.
6. It sometimes carries off chronic diseases.
7. It is never mortal, except when it is accidentally combined with other diseases.

“Let us not be discouraged by the few instances which have occurred of the vaccine matter having failed to produce the disease. Time and experience will soon correct our errors, and perfect our knowledge in this branch of medicine. I well

recollect the time when inoculation for the small-pox was attended with much less certainty and success than it is at present; and when the deaths and sore arms from it, had nearly banished it from our country. So unpopular was it, from those, and other less reasonable causes, that Dr. Boylston had the windows of his house broken for attempting to introduce it into the then province of Massachusetts.

“In expressing our triumph in the conquest, which reason and humanity have lately obtained over the most mortal of all diseases, we are led to anticipate the time, when they shall both obtain a similar conquest, by applying the means which *have been discovered*, to the prevention and annihilation of the plague. How long the blindness, which has perpetuated this disease for so many ages may continue, I know not; but I believe it is as much out of the power of prejudice, error and interest, to prevent its final and total extinction, as it is to prevent the change of the seasons, or the annual revolutions of our globe around the sun.”

* * * * *
 * * * * * Continue to diffuse the results of your inquiries and observations through our country. Dr. Mead’s “*non sibi, sed toti*” should be the motto of every physician.

From, Dear Sir, your friend and brother in the
 Republic of Medicine,

BENJAMIN RUSH.

DR. WATERHOUSE,

Professor of Medicine in the University of Cambridge.

P. S. I have presented the curious and elegant engraving you sent me of the vaccine and variolous pustules to Dr. Coxe, who proposes to frame it, and give it a place upon the wall of his parlour.

* A considerable part of this paragraph being complimentary is, for that reason omitted.

PRACTICAL OBSERVATIONS

ON THE

VARIOLA VACCINA OR KINE POCK.

CHAPTER I.

THERE is a mild distemper, which has been noticed here and there among herds of kine in several parts of England time immemorial. This disorder appears first on the teats of *cows* in the form of irregular pustules, or pocks, of a palish blue colour; and those, who milk them, when thus affected, seldom fail of catching the disease.

This epizootic distemper has existed so long in Ireland, as to be known there by a *Celtic* name, viz, "*Sbinnaugh*"; which word is found, on dissection, to mean *the cow's teat*. There are innumerable instances of persons in Britain and Ireland, who caught the malady by milking cows in their youth, and through a long life, were repeatedly exposed to the contagion of small-pox without being infected; so that with the knowledge of this disease has ever been connected an opinion, that a person, once affected with it, is ever after secure from the small pox.*

EDWARD JENNER of Berkley, a town in the vale of Gloucestershire in England, a learned, skillful, and accomplished physician, was the first who took this knowledge, so long vaguely floating on the breath of the vulgar, and impressed upon it the stable form of science. He it was, that with a *Franklinian* sagacity first transferred it from that mild, healthy, and invaluable animal, the *cow*, to the human kind; and by a series of experiments demonstrated that it is a perfect security against that loathsome and widely wasting pestilence, the small pox;

* See a series of facts from page 39 to 47.

whereby he will be the means of preserving more lives than ever fell to the lot of any other human being. This extraordinary fact came forth from his hands in so finished a form, that, were all other writings on the cow, or kine pock, but his, destroyed, posterity might have a clear and perfect idea of this benign remedy and its salutiferous consequences; for he has proved,*

I. That cows are liable to a pustular disease, which is popularly called in England the cow pox.

II. That the human species may be inoculated with the limpid fluid, produced in the pustules of the cow pox.

III. That in consequence of such inoculation an action commences, which makes such a change in the constitution of inoculated persons, as to render it impossible for them ever to be infected with the small pox.

IV. That the disease, induced by inoculating with the cow pox, is of a slight kind, wholly free from danger, seldom attended with fever, and never with suppurating eruptions, like those of the small pox.

V. That, if by any accident too much general disturbance be excited in the constitution by inoculating for the cow pox, it is easy, by a proper application to the inoculated part to regulate, or suppress such disturbance.

VI. That one child in a family may be inoculated for the cow pox without hazard of infecting any other person in the family; the cow pox not being a contagious disease. And none of the facts, or observations, published by Dr. Jenner on this subject, have been disproved, or refuted.†

* "Jenner is not only great by the magnitude of his discovery, but he is also great by the manner in which he conducted his researches; by the perfection which he gave to them before he published his work; and by the extreme modesty with which he speaks of himself."

De Carro of Vienna.

† Dr. Denman.

This happy discovery was announced to the world by Dr. Jenner in June 1798. Five months after, it was communicated to the author by Dr. Lettson, who in his letter said, “Several trials have been made with this cow pox on children in London, and it has proved not only trivial as a disease, but a certain security against the small pox.”* At this period not more than three or four persons had been inoculated with the matter of the cow pox in London.

In the beginning of the year 1799, the author received from the same friendly hand the *golden Treatise* of Jenner. In March the 12th of the same year he published a short account of the cow pox; a disease totally unknown, and till then unheard of in this quarter of the world. He exhibited this sketch of the Jennerian discovery, with a view to excite the attention of the dairy farmers, should such a distemper appear among their herds; and to gratify his brethren of the faculty with an account of the very extraordinary discovery of an epizootic disease, capable of being communicated from the brute to the human kind by inoculation; which when communicated was a certain security against the small pox.

This publication excited general attention, but experienced the fate of most others on new discoveries. A few received it as a precious truth, highly interesting to humanity. Some doubted it; others observed that seemingly wise and prudent conduct, which would allow them to censure or applaud as the event might terminate; while a far greater number derided it, as one of those medical whims which arise to day, and to morrow is no more.

This vicarious disease retains in England its vulgar name of cow pox. It is called *la vaccine* in France; *vajuolo vaccino*

* The author remarks with pleasure, that the benevolent Lettson was not only the first who transmitted the knowledge of the existence of such a disease as the cow pox to this quarter of the world, but actually revived the divine practice, by sending a fresh supply of matter, after that sent by Haygarth and Crafer had become extinct.

in Italy; *vaccina* in Spain, Germany and the Northern Nations; and in the United States of America, the KINE POCK.*

That I produced the *same* disease in America is confirmed by virus, taken from my patients here, and sent to England, producing the same disease there. We have beside demonstrated the *identity* of the distemper to the *eye* by pictures of the kine pock in all its stages, painted in England under the direction of Jenner himself; which exquisite representations ascertain the *identity* of the local disease beyond the faintest shade of ambiguity. In like manner the depicted *spurious* pustule is as exact a description of the impostor, that pestered us in the autumn of 1800. †

That this cow, or kine pock, will secure the human constitution from the contagion of the small pox, as certainly, as *rods of iron* will secure a building from the effects of lightning, no one, *who has paid due attention to the subject*, now doubts in America. But, as *lightning rods* may be so injudiciously placed, as not to protect a building from injury; so the kine pock inoculation may be so unskilfully conducted, as not to secure a person from the contagion of the small pox.

* Instead of the plural pocks or pox, because it has but *one* pustule. Whether *vacciola* would not be more proper than *variola vaccina*, I leave others to determine. *Variola* means any cutaneous *spotted* distemper; but it has been used to signify only *one* spotted distemper, the small pox. See what Dr. Pearson says on this subject. Consult also the accurate Willan on cutaneous disorders.

† These admirably coloured engravings, transcending all verbal description, were sent me by Dr. Jenner. Conceiving they would be of eminent service in the cause of vaccination, I distributed them through the United States, as follows; Two copies I sent to President JEFFERSON; one to Dr. Rush, another to Dr. Coxe, which he has copied into his publication on the cow pox; one to the physicians of New York, which has also been copied; another to Dr. Ramsay of Charleston, S. Carolina; one to Dr. Spence of Dumfries, Virginia; one into Vermont; another for the use of Nantucket and New Bedford; one to Dr. Hunt of North Hampton; one to Dr. Samuel Danforth; another to Dr. Rand in Boston; and one to the Board of Health. Two other copies I have kept in circulation through the country. These pictures have been highly serviceable to physicians and to their patients. No others of the kind have been received from England.

When a building, guarded by rods of iron, is struck by lightning, we conclude they were not adjusted according to the rules, laid down by Franklin ; these being founded on a *law of nature*, relative to the electric fluid and a metallic substance ; so, when we hear that a person has had the small pox, after being supposed to have had the kine pock, we are as certain, that the inoculation was not conducted according to the rules, laid down by Jenner ; they being in like manner founded on a *law of nature*, relative to the vaccine virus and the human body. Whenever, therefore, we meet adverse accidents in applying the Franklinian, or the Jennerian discovery to practice, we must look for the cause in *erring man*, not in UNERRING NATURE. It is the business then of the philosopher and physician, to enquire into the causes of these aberrations.

Assuming it then, as a fact, (and the learned of all nations have admitted it) that Dr. Jenner has demonstrated a *new law of nature* with respect to the prophylactic, or preventive power of the kine pock in the human system ; we presume that every one, who dreads the small pox, would gladly shelter himself behind the *ÆGIS* of Jenner from its too fatal effects, had he but cloudless view of the whole business ; and the ultimate object of this essay is to help the reader to such a view of it. That task the author is compelled to assume, though unfitted for it by his insulated position, and remoteness from the source of correct information.

Dr. Jenner informs us, that during his early investigation of the kine pock* he found that some of those, *who seemed to have undergone the disease*, nevertheless on inoculation with the small pox felt its influence just the same, as if no disease had been communicated to them by the cow. As he proceeded, he

* In quoting from British writers I sometimes substitute the term kine pock for their cow pox. Local reasons, I hope, will justify this liberty.

learnt that the cow was subject to eruptions on her teats, that were capable of communicating sores to the hands of the milkers; and that, whatever sore was derived from the animal, was called in the dairy the cow pox. Thus was he led to form a distinction between these diseases, one of which only he denominated the *true*, the other the *spurious*. A discouraging impediment however arose, which checked for a while the advancement of our philosopher. When the *true* cow pox broke out in a dairy, he discovered instances of persons, who had milked infected cows, and had thereby apparently gone through the disease in common with others, who were nevertheless still liable to receive the small pox. The mind of Jenner could not rest satisfied with the idea of want of uniformity in the operations of nature. He conceived it improbable that the human constitution, having undergone the cow pox, should in some instances be perfectly shielded from the small-pox, and in many others remain unprotected. He therefore started afresh in the pursuit of truth, with redoubled ardour. The result was fortunate; for he now discovered that the virus of the cow pox was liable to undergo progressive changes from the same cause precisely with the small pox; and that, when it was applied to the human skin in its degenerate state, it would produce the ulcerative effects in as great a degree, as when it had not undergone a change, and sometimes in a far greater degree; but, having lost its specific properties, it was incapable of producing that change in the human body, which is requisite, to render it unsusceptible of the variolous contagion. Thus it became evident, that a person might milk a cow one day, and, having caught the disease, be forever secure; while another, milking the same cow next day, might feel the influence of the virus in such a way, as to produce a sore, or pustular eruption, and in consequence of this might experience an indisposition of considerable extent; yet, the specific quality being lost, the constitution would receive no pecu-

liar impression.* These observations fully explain the source of those errors, which have been committed by many inoculators for the small pox as well, as for the kine pock.

Here then, two important objects of pursuit offer themselves to our view. The first is to learn, how to distinguish with accuracy between that pustule, which is the *true* kine pock, and those which are *spurious*. Secondly, to ascertain the precise time or state in which to take the matter for the purpose of inoculation. But previous to these enquiries are the doctrines of *morbid poisons*, and the investigation of *the laws of inflammation*, and *maturation*. Neither of which however can be clearly understood without a correct idea of the *Lymphatic*, or *absorbent system*; and a right notion of the powers, which excite and govern it. This is a subject of sufficient importance to merit a distinct chapter; which will be written for the sake of those, who are not educated to medicine.

CHAPTER II.

Of the LYMPHATIC, or ABSORBENT SYSTEM.

IT is a vulgar error, when the poison of the small pox, or virus of the kine pock, is inserted into a little wound, or scratch in the skin, it enters *immediately* into the blood, and so pervades in the first instance, the constitution through the medium of the sanguiferous system. Before the discovery of the Lymphatic system this opinion prevailed even among physicians. The human system was an opaque body to the eyes of the old anatomists and physiologists, even to the eyes of the immortal BOERHAAVE. But the recent discovery, which demonstrates the lymphatics to be a *distinct system*, appropriated to the sole purpose of *absorption*, presents to our contemplation a body, that is transparent.

* See Jenner's small tract, entitled "Origin of Vaccine Inoculation."

The *Lymphatic* or ABSORBENT SYSTEM denominate it, which you will, consists of 1st the Lacteals, or absorbents of the intestines. 2dly, The common Lymphatic vessels, running every where through the whole body. 3dly, The Thoracic duct; and 4thly, The Lymphatic glands.

The Lymphatics are fine pellucid tubes. They begin with open mouths in every part of the body, and terminate in the Thoracic duct; which begins at the receptacle of the chyle, and terminates in the great vein under the collar bone, through which the lymph and chyle pass into the blood. They are called *valvular* lymphatics on account of the numerous valves, locks, or floodgates, with which they are crowded in their course; and from their contents appearing colourless, like the lymph of the blood, or the white of an egg. Neither the demonstration of the *nervous system* by WILLIS; nor the *circulation*, so called, of the blood by HARVEY, has contributed more to the elucidation of the animal economy, than this discovery of the *Lymphatic*, or *absorbent system*. For want of this knowledge the indefatigable *Sanctorius* laboured in the dark; for, while his whole attention was engaged in detecting the process of insensible perspiration, he had no conception of *insensible absorption*.

Dr. *William Hunter* first taught the structure, course, and general use of these transparent, absorbing vessels; but the full explanation of their economy and particular laws was left to that Prince of Physiologists, his brother.*

When the famous *Boerhaave* likened the human body to a hydraulic machine, explicable on the principles of mechanical philosophy; he diverted his followers from seeing those powers of action and laws of motion within us, which have scarcely any resemblance of mechanical; or even chemical operations; powers depending on that excitability and energy, which is the attribute of living organization. This wonderful quality, which

* John Hunter was to physiologists what Columbus was to geographers.

is the preserver and renovator of beings, leaves no other traces of its presence in the body, than what are exhibited by the motions of life. Thus in the action of these absorbents, while former physiologists extended not their ideas beyond capillary tubes and other mechanical apparatus, JOHN HUNTER, with a sagacity transcending his cotemporaries, likened them to the proboscis of a fly, or musquito, or the trunk of an elephant; or in other words, to a living muscular organ, capable by its own inherent power, not only of filling itself with liquids, but of breaking down, and taking up even solid substances. This novel doctrine opened a new scene of curious operations in animal bodies, totally unknown to the antients. That the coats of these lymphatics are vascular is apparent from the redness, or efflorescence observable when poisons are passing through those nearest the surface. The Lymphatic is the most irritable system of vessels in animal bodies.

Beside the absorbents, accompanying the arteries of the arm, there is a set of cutaneous lymphatics which accompany the basilic and cephalic veins. Over and above all these is a set still more superficial, and vastly more numerous, than the cutaneous blood vessels. We are taught by *Professor Mascagni* of Sienna, that the absorbents of the scarfskin consist of capillary tubes of a texture more subtle and tender, than those in any other membrane; and that by these they are enabled to absorb æriform fluidities. The variolous poison can be imbibed by them; but the vaccine cannot. In Scotland they communicate the small pox, by binding infected thread tight to the arm.*

We shall not attempt a description of a lymphatic gland. We can only discover an intricate assemblage of tubes of extreme minuteness, folded and contorted a thousand different ways. The structure of even the largest gland in the body has never been unraveled. It is scarcely necessary to add, that

* See Professor Monro's letter to the faculty of Medicine at Paris.

the lymphatic glands are as really a part of the absorbent system, as the ganglions are of the nervous. Whether these lymphatic glands be any more, than mere convolutions of simple lymphatics, we know not; for in dissecting them the most acute anatomist is soon bewildered. We are certain, however, that their susceptibility of stimulus is far greater, than that of the simple lymphatics. They are affected, not only by the passage of a morbid poison, but by simple irritation. A prick in the finger, by a *clean* needle, produced a red streak all along the inside of the biceps muscle, with pain and swelling of the lymphatic glands of the arm, together with rigor and sickness. Hence says Mr. Hunter the importance, in all affections of the lymphatic system, of keeping these two causes in view.

Whether the deeply seated lymphatic glands be affected by the variolous, or vaccine poison, is doubtful. It is conjectured, that morbid poisons affect only those in the proximity of the skin.

Although inoculation is the insertion of poisonous matter by a wound that *bleeds*; yet the virus enters not directly into the blood vessels, as is vulgarly supposed; but passes into the constitution through the medium of these infinitesimally small colourless tubes, denominated lymphatics, or absorbents. Not only *original*, but *morbid* poisons, and even the natural fluids, pass through these vessels with surprising celerity. Mr. Cruikshank found that the chyle passes through the absorbents of the mesentery at the rapid rate of four inches in a second, or twenty feet in a minute.

When a morbid poison enters through a wound, for example in the finger, whether it be variolous, vaccine, or venereal, its effects may often be traced through the diseased absorbents up to the lymphatic glands in the armpit. When the poison is passing through them, they inflame and tumefy, and there follows soon after a chilliness, shuddering or horripilatio; and it is said that these symptoms are marked more or less distinct-

ly in proportion to the healthy, or unhealthy state of the subject; or in other words, the irritation and commotion in the system are greater, when they arise from a recent accident in a healthy person, than where the constitution had long sympathized with an old sore, whence the matter was absorbed. Does not the absorption of every kind of morbid poison produce this shuddering, and a correspondent degree of reaction in the system? Does not every sudden impression, or intrusion of foreign matter, produce these symptoms, which some have mistaken for genuine fever? The reception of it may be accompanied moreover, with mental horror from fearful apprehension of a loathsome and abominable disease,* connected with extreme depression of spirits, and even with slight delirium. Such apprehensions operate with redoubled force on delicate frames and acutely sensible minds; and will produce a train of low spirited symptoms, resembling *typhus fever*; which however want the pathognomonic symptoms of that formidable disorder. †

There may be variations in the action of particular absorbents as well, as of the system in general, altering and modifying the imbibing process, which we cannot at present distinguish, nor are all fully prepared to believe. Who can tell what effects trepidation, sudden fright, or horror, has, on this very irritable system? We find they have visible effects on the skin, and a sensible one on the largest secretory organs. We shall glance at some of these causes, when we come to speak of the failures and variations in inoculation.

We have used the expressions, *lymphatics* and *absorbents*, indiscriminately; but the latter is the more accurate term; for, although these transparent vessels contain some serum and water; the whole volume is called by the vague name of

* As of the LUES from a wounded finger.

† See three cases related by Dr. Haygarth in the 3d volume of the London Medical and Physical Journal page 198; to which these observations may not be entirely inapplicable.

lymph. If in the descending series of arteries some of them are so subtle, as to exclude the red globules of the blood ; so in the ascending series of absorbents it is probable some of them exclude the pure lymph, and convey only pure water. *

After what has been said need we add that there is no such thing, as transudation, or soaking through the membranes of a living body. Even fat, which in the heat of our bodies is liquid, never transudes. It may however, under certain circumstances, be absorbed by the natural energy of the lymphatic vessels. They may however, be immersed for years in a fluid without absorbing any ; but this is owing to a morbid insensibility, or loss of their natural energy.

Thus much being premised of the absorbent system ; let us next speak of *inflammation* ; and of the *secretion of the pellucid fluid*, in which resides the vaccine poison ; and of the *formation of pus* ; and then we shall be better able to contemplate the action of a morbid poison, while passing into the system through a wound in the scarfskin by a process denominated inoculation.

CHAPTER III.

Of INFLAMMATION, and its CONSEQUENT SECRETION.

AS perfect vaccine virus is pellucid, as the dew drop, so our suspicion of its deviation from this standard of perfection should increase in proportion to its opacity. The vaccine poison is united with, or contained in a transparent secretion, but not with pus, or yellow matter. It is hardly probable, that it is united with pure lymph, which is, according to some, the "*primary matter*" of the animal organs, possessing, like that, all aptitude and no sensible quality. Be this, as it may, it never is found united with opaque matter.

* Saumarez.

Our old small pox inoculators have associated the idea of ripeness, or the state of perfection of the variolous virus, to that of a thick yellow matter ; and to that of a transparent fluid they annex the idea of an effete water. Wherefore we must remove some of these prejudices, before we can inculcate an opposite doctrine. We shall endeavour to show that in this matter there exists a nice coincidence of experience and of the laws of the animal economy.

Inflammation ought scarcely to be denominated a disease, because it is commonly a regular process or effort of the vires naturæ medicatrices to restore an injured part to its pristine integrity. Inflammation is not only the forerunner, but the absolute cause of the formation of pus, and this is the mode of it. During inflammation the smaller blood vessels, the veins especially, are not only considerably enlarged, but become more numerous ; and these new vessels are so constructed, as to make the blood undergo certain changes, by which a *pellucid* fluid is formed, which is afterward changed into pus.

Pus is defined by Mr. Hunter to be "*globules swimming in a fluid, which is coagulable by a solution of sal ammoniac, while no other secretion is.*"

How is it known, that a pellucid fluid precedes the formation of pus ? By attending to the following experiment we shall be able to ascertain this, and to form just notions of the kind of fluid, which contains the true vaccine virus. See Home's dissertation on the properties of pus.

"A blistering plaster, the size of a half crown piece, was applied to the stomach of a healthy young man. In eight hours a blister arose, which was opened, and the contents removed ; they were fluid, transparent, and coagulated by heat ; had no appearance of globules, when examined by the microscope ; and in every respect resembled the serum of the blood. The cuticle was not removed, but allowed

to collapse; and the fluid, which was formed upon the surface of the cutis, was examined from time to time through a microscope, to detect as accurately, as possible, the changes, which took place. The better to do this, as the quantity in the intervals stated below must be exceedingly small, a piece of talc, very thin and transparent, was applied to the whole surface, and covered with an adhesive plaster; and the surface of the talc, applied to the skin, was removed, and examined by the microscope, applying a fresh piece of talc after every examination, to prevent any mistake, which might have arisen from the surface not being quite clean."

"The fluid was examined by the microscope, to ascertain its appearance; but, as the aqueous part in which the globules of pus swim, is found by experiment to coagulate by adding to it a saturated solution of sal ammoniac, which is not the case with the serum of the blood, nor the transparent part of milk, I considered this, as a property peculiar to pus; and consequently that it would be a very good test, by which to ascertain the presence of true pus."

In 8 hours—from the time the blister was applied, the fluid discharged was perfectly transparent, and did not coagulate with the solution of sal ammoniac.

9 hours—the discharge was less transparent; but free from the appearance of globules.

10 hours—the discharge contained globules, which were very small, and few in number.

11 hours—the globules were numerous; but still the fluid did not coagulate with the solution of sal ammoniac.

12 hours—no alteration.

14 hours—the globules a little larger; and the fluid appeared to be thickened by a solution of sal ammoniac.

16 hours—the globules seemed to form themselves into masses; but were transparent.

20 hours—the globules were double the size of those first observed at ten hours, and gave the appearance of true pus in a diluted state; the fluid was coagulated by a solution of sal ammoniac; the globules at the same time perfectly distinct; so that I should consider this as true pus.

22 hours—no alteration.

32 hours—the fluid was considerably thicker in consistence, the number of globules being very much increased; but in no other respect, that I could observe, did it differ from that, formed 24 hours after the application of the blister.”

Nearly the same changes we have discovered in the vaccine pustule, when much inflamed, though these changes are more gradual.

In ulcers of weakened and indolent parts pus is made up of globules and of *flaky* particles; but the flaky appearance is no part of true pus. Their proportion is greatest, where the inflammation is least perfect.

“ Pus varies in its appearance according to the different circumstances, which affect the sore, that forms it. Its nature, whether healthy or unhealthy, depends upon the state of health and strength of the parts yielding the pus; for example, twenty men with worn out constitutions lived in the same apartment of a hospital, and had large ulcers on different parts of

their bodies. It was found that, when the weather was mild, dry, and temperate, these ulcers put on a healing appearance, and formed good matter; but any sudden change in the weather, becoming either rainy or damp with fogs, produced so great and sudden an effect on the discharge of these ulcers, as to change it in twenty four hours from a healthy appearance to the very reverse; the whole ulcer being covered with coagulable lymph, resembling melted tallow.

“ Pus is always in harmony with the parts, which form it, having no power of irritating them, even when the surrounding parts are affected by it. The parts, which form it, assume a structure, similar to that of a gland, by becoming exceedingly vascular; and, what is curious, those parts appear to require more time to be rendered fit for carrying on this process in proportion, as they are different in structure from a gland. In internal canals, which have naturally a secreting surface, pus is formed in five hours. On the cutis, which is very vascular, in less than twenty four hours; and in common muscles in nearly forty eight hours.”*

After what has been said, the following passage from Dr. Jenner's treatise page 113 and 114 will be read with redoubled relish.

“ Is *pure pus*, though contained in a small pox pustule, ever capable of producing the small pox perfectly? I suspect it is not. Let us consider that it is always preceded by the limpid fluid, which, in constitutions susceptible of variolous contagion, is always infectious; and though, on opening a pustule, its contents may appear perfectly purulent, yet a given quantity of the limpid fluid may at the same time be blended with it,

* The author learnt the general doctrine, contained in this chapter, from the mouth of that celebrated philosopher JOHN HUNTER, to whom he owes more, than to any public medical teacher, he ever heard. He is indebted to Mr. Home for the illustration of this doctrine, from whose “dissertation on the properties of pus” a considerable portion of this chapter is taken.

though it would be imperceptible to the only test of our senses, the eye. The presence then of this fluid, or its mechanical diffusion through pus, may at all times render active, what is apparently *mere pus*, while its total absence, as in stale pustules, may be attended with the imperfect effects we have seen.

“ I consider both the pus and the limpid fluid of the pustules as secretions, but that the organs established by nature to perform the office of secreting these fluids may differ essentially in their mechanical structure. What but a difference in the organization of glandular bodies, constitutes the difference in the qualities of the fluid secreted? From some peculiar derangement in the structure, or, in other words, some deviation in the natural action of a gland destined to secrete a mild, innoxious fluid, a poison of the most deadly nature may be created: for example—that gland, which in its sound state secrets pure saliva, may, from being thrown into diseased action, produce a poison of the most destructive quality. Nature appears to have no more difficulty in forming minute glands among the vascular parts of the body, than she has in forming blood vessels, and millions of these can be called into existence, when inflammation is excited, in a few hours.”

CHAPTER IV.

Of INOCULATION.

WITHOUT venturing to define a *poison*, we presume every one will understand that by this term we here mean any matter, or substance, which will change the action of a part, or the whole constitution, from a healthy to a diseased state.

POISONS are derived from the animal, vegetable, or mineral kingdom* *Animal* poisons are distinguishable into *original* and

* Can destructive airs, or gasses be ranked under the head of poisons? Do they destroy life by means of the attenuated particles of all terrestrial

morbid. Original poisons are certain secretions of venomous reptiles ; such as those of the rattle snake, or viper ; whereas *morbid* poisons are those, which convey a diseased action from one animal to another of the same, or of a different species ; which is generally done through a wound, as from a diseased cow to the abraded hands of the milker, as in the kine pock ; sometimes by simple contact, or by effluvia from man to man, as in the small pox.*

If we take on the point of a lancet a drop of that morbid poison, which from its parent is denominated the cow pock virus, and with it slightly puncture, or scratch the scarfskin, we very rarely fail communicating the vaccine disease. If on the punctured part a little red spot appear on the third day, we have reason to believe that vaccination has succeeded. Even in twenty four hours the part, thus inoculated, frequently appears through a microscope to be a little more inflamed and elevated, than is a similar puncture, made by the same instrument, when clean and void of virus. But on the third day from the operation the part appears through a good microscope to have a faint, orange coloured tinge. On the fourth day the colour still deepens, and resembles a mosquito bite,† and feels hard under pressure of the finger. At the close of the fourth day, or beginning of the fifth, we can discern the gathering vesicle, and see the cuticle, or scarfskin, starting, as it were, from the true skin, to make room for the collecting fluid. On the sixth day the vesicle is distinctly visible, resembling the seed of *creeping mallows* ; exhibiting, like it, a depression in the middle,‡ with similar lines or ribs from that point to its base.

bodies contained in them ? or do they extinguish life by mere privation of its pabulum ? But, who will venture to define a poison ?

* See the Hunterian doctrine of morbid poisons, as expounded by Dr. Joseph Adams in his observations on morbid poisons, phagaedena, and cancer, chap. III.

† Our mosquito is the English gnat, only somewhat larger.

‡ This depression, which is of a darkish colour, is not essential to the pustule, but the effect of the puncture. By making the puncture so

If carefully punctured at this period, the pustule, or vesicle will frequently be found to contain a small portion of a limpid fluid. It is however more frequently found on the seventh day ; almost always on the eighth, and not once in five hundred cases absent on the ninth.

Here then we see (I mean on the eighth day from vaccination) the ripe, perfect, pearl coloured kine pock pustule, resembling in shape and size the plump seed of the mallows* ; and replete with a transparent fluid. The base of the pustule is at this time encircled by a red border, about two lines in breadth ; and *this is the state of the pustule, when the virus should be taken for the purpose of inoculation.* In some rare instances this appearance has not come on before the fifteenth day ; in some, still more rare, not before the twentieth ; and then the pustule has little or no depression in the middle. This shows that the *punctum temporis*, for taking the matter, is not to be determined so much from the age, as from the *state* of the pustule.

At this period, that is eight times twenty four hours from the vaccination, sometimes a day sooner, and in a few cases a day or two later, the patient first feels a stiffness and pain in the armpit. †

When perfect vaccine virus is lodged under the wounded cuticle, there arises gradually an inflammation. The first act of the vessels, thus stimulated, is simply an increase, or distention of their natural size ; and the part inflamed appears to become more vascular by it, just like the effect of heat in the *punctum vitæ* of an egg in the first stages of incubation. This inflam-

slight in a child, that it skinned before the tardy vesicle was formed, I have created a pustule perfectly hemispherical, clear, and smooth as a pearl.

* Called by the children "*cheeses.*"

† It is always to be understood in this treatise, that the inoculation is made in the arm ; about midway between the shoulder and the elbow ; or, to speak with more precision, on the belly of the biceps muscle.

mation is followed by maturation; not suppuration, or inflammation producing purulent matter, which never occurs in the *true* kine pock. Then follows about the ninth day pain, running from the pustule along the course of the larger lymphatics. The glands under the arm swell, and become painful. Soon after this fever commences; which is known by chilliness, dizziness, shuddering, aversion to animal food, general heaviness, disinclination to exercise, soreness in the limbs, pain about the loins; sometimes by painful tension, or uneasiness in the pit of the stomach, and not unfrequently in the upper part of the chest, as if under the collar bone.

In patients of a delicate constitution, if a moisture of the skin supervene, there is a temporary mitigation of these symptoms. The same relief happens, when vomiting occurs; but otherwise the pulse is quickened, the head throbs with pain; the eyes are watery, as if suffering from the smoke of green wood, and there is a heat, or a slight sensation of scalding in the throat. When the patient drops asleep, he often wakes by a sudden start, and is confused. There are instances, indeed, in which it has amounted to that derangement of the organs of sensation, and of the powers of the mind, which is known by the vague name of delirium. Patients have described their feelings in this disease, as pervading every fibre, and as different from what they ever before experienced.

But all these symptoms are not present in every patient; or rather they vary in their degree of violence and duration; some one symptom being more predominant in one constitution, and less in another. But, whatever the symptoms may be, they generally rise gradually with the efflorescence of the inoculated part; then as gradually subside; and on the twelfth or thirteenth day from vaccination leave the patient as well, as ever. This is a description of one of the most strongly marked cases; occurring in those subjects only, we presume, that would have had the small pox in the severest manner.

In the greatest number of cases the indisposition is so slight, as not to prevent a person from following his ordinary occupation ; and in a few the sickness is scarcely perceptible. This is the case with children more especially, who are seldom taken off an hour from their amusements. But let it be remembered that contrary to the ordinary practice of writers on the cow, or kine pock we here record the severest case, that the peculiar nature of the disease may be known by its most prominent features. We believe that writers have in general conceived too lightly of this disease, and have caused others to err in this respect.

As the kine pock pustule has an aspect, progress, and contents, peculiar to itself, and unlike the small pox, or any other pustular disorder, so it is probable, that it has symptoms peculiar, or pathognomonic,* indicative of its specific nature and essence, which future observers will detect and establish, but which our limited experience, at this early period, cannot perhaps ascertain. Physicians may not always rest satisfied with the name of *fever*, a term, like that of *nature*, to which scarcely two practitioners of different schools or periods annex precisely the same ideas. †

Let us resume our description by remarking, that after the eighth day the red line incircling the margin of the pustule, generally increases, and the efflorescence spreads over the surrounding skin. This increased redness denotes that the cutaneous lymphatics, stimulated by the recently generated virus, are actively employed in its absorption ; nature in this case conferring new activity on those delicate and irritable vessels.

In nine days, or to speak with due precision, in nine times twenty four hours from vaccination, but sometimes not before

* An epithet for a symptom, or a course of symptoms, that are inseparable from a disease, and found in that only. Pathognomonic symptoms are therefore those, by which a disease may with certainty be discovered, the enumeration of which forms the most concise definition.

† Consult Dr. George Fordyce's dissertations on fever.

ten times twenty four hours from that operation, the cutaneous vessels are so affected as to occasion a beautiful efflorescence around the pustule ; which is itself now about the size of a sixteenth of a dollar, or an English threepence. The efflorescence at this period is of the colour of a damask rose, with here and there a tint of scarlet, which deepens in its progress to crimson. Sometimes we discover a red streak, running up toward the armpit in the course of the larger lymphatics, that is, with the basilic and cephalic veins, especially if the inoculation, as some chuse, were performed on the hand, between the fore finger and thumb.

At this period, that is, about the tenth day, the local affection, designated by the efflorescence, has a small degree of tumefaction, and, if embraced by the thumb and finger, a pretty deep seated hardness is perceptible. Experience forbids us to take the matter at this time for the purpose of inoculation ; and theory justifies this prohibition, because the lymphatics, through which the virus enters the blood, have already weakened its force by absorbing it from the pustule, to carry it into the constitution ; the areola and the red streak extending up the arm being evidence, that the operation has actually begun. Hence we perceive the reason of this emphatical injunction of Dr. Jenner, "*I wish this EFFLORESCENCE, to be considered as a sacred boundary, over which the lancet should never pass.*"*

On or about the eleventh day the pustule appears to be drying up ; the colour surrounding it fades by degrees from a crimson to a pink ; and the swelling as gradually subsides. That part of the skin which is in the neighbourhood of the pustule resumes its natural colour first. On the thirteenth day the sore is covered by a dark brown scab with a margin, resembling horn, or rather dried glue, containing a core of a black, or dark chesnut colour, which some have, not unaptly compared to a dry tamarind stone. This adheres to the skin a

* In a letter to the author, dated London July 1801.

few days longer, then falls off, and the whole process is at an end. Compare this description of the rise, progress, and termination of the genuine vaccine pustule with Jenner's admirably coloured engravings; and then compare both with the actual distemper in a clear skinned patient.

It has sometimes happened, that the pustule, or inoculated part, instead of regularly healing, or rather exsiccating, as just described, passes from the maturative process over to the ulcerative, and creates some trouble. After the specific inflammation and true pustule have proceeded with due regularity to perhaps the eleventh or twelfth day, the inflammation has retired, and a hard, rough scab has come on, when a new irritation is discovered, and ulceration commences, accompanied with renewed pain under the arm, rigor, and a stupid head-ach and sickness. Pus has been formed under the scab, and the ulcer has finally healed by granulation.

At another time, though the local affection and general symptoms may have progressed in proper order, the inflammation retired, and the febrile symptoms vanished; yet the angry pustule shows no disposition to scab. On the contrary, the aperture in the skin increases; the inflammation blazes forth afresh, and the illness keeps pace with the progress of the ulceration; the pain under the arm recurs with a shivering, and a transparent, glairy fluid fills the cavity, which leaves a hollow space, that granulates very slowly. As the contents of this sore are not purulent, but transparent, some practitioners have not hesitated to use it for the purpose of inoculation; erroneously supposing that *transparency* of the fluid is an infallible test of its goodness. When taken on thread, this matter has a glossy appearance, and is more brittle than genuine virus. It is the most virulent of all the discharges, I have ever noticed in this new inoculation. This is the caustic matter, which, if used for inoculation, is apt to produce in patients of a certain habit, a crop of eruptions, and

a heavy weight of constitutional symptoms.* If I mistake not, all the cases of eruptions that have yet appeared among us, were from matter, taken at too late a period, or where the pustule had been imprudently so irritated, as to create an abundant discharge. Had the progress of this ulcerative pustule been arrested about the tenth day as it ought to have been, by proper applications, these disagreeable symptoms would not have arisen; because they arise not *primarily* from the action of the virus, but *secondarily* from the irritation of the sore. This irritable state of the pustule, in some persons, may be owing to a peculiarity of constitution; in others to a declension from the standard of health toward a typhoid diathesis. Thus in the small pox this habit disposes the patient to the confluent kind. In which case the pustules have no well defined inflammatory circle around their bases; but the weakened *vis vitæ*, and its consequence, a flabby skin, allow them to run together. The variolous poison is one and the same in every person, and its effects are differently marked, only as the patient is more or less disposed to *synocha*, or *typhus*. It is probable however, that the circulation may in some cases be so very rapid, as to produce an *eccymosis*, or effusion of blood, which putrefying produces a confluent small pox of a peculiar kind. Copious well timed bleeding would have prevented this black confluent small pox.

Among children inordinate inflammation of the inoculated part, and its consequence, ulceration, arise from blows, or other injuries, common to rough boys at school. Among those still younger it may arise from inattention of nurses, who neglect

* In the autumn of 1800 matter of this kind was lavishly distributed, and even left at the houses of some physicians without their knowing from whom, or whence it came. Whatever was the real intention, it is certain, the distribution of this spurious matter exceedingly hurt the reputation of the new inoculation. It occasioned violent sore arms, very heavy constitutional symptoms, and eruptions; and, what was still more serious, it did not secure the afflicted person from the small pox. This matter gave a glossy appearance to the thread; and it appeared to have been obtained in great quantities, and was evidently the production of a sore, verging to ulceration, if not already ulcerated.

to gather up the child's stiff sleeve. In children of a certain age it frequently arises from scratching off the vesicle at the point of time when it is beginning to fill with fluid. Ulceration may arise in all ages from an indelicate mode of taking matter for the purpose of inoculation. A careful puncture with a lancet, or needle, can do no injury; but all chaffing, pressing, and squeezing should be carefully avoided.

The attentive reader need not be informed, that these disagreeable occurrences are accidental, and foreign to the true disease, and that they may all be avoided by obviating the causes of inordinate irritation.

Most commonly this new inoculation and its consequences ought scarcely to be called a disease. On the eighth, ninth, or tenth day a little shivering with now and then a slight headach, a little nausea, and a transient dizziness are sometimes experienced; but frequently none of these occur. A little more heat, than usual, and a little more restlessness during the night are noticed by an attentive patient, or an attendant. But none of these symptoms trouble the patient so much, as to prevent him from following his ordinary business. As to children, they are rarely kept from school by it; and in infants it produces no apparent sickness, a little peevishness being all, that distinguishes their condition from that of high health. To this we may add that the true pustule has but a very small degree of soreness, even at the height of the efflorescence. What a difference this, compared with that loathsome, that horrible disease, the small pox; especially, when it attacks young children! "Fancy to yourself one of these little innocent sufferers, stretched out, and covered with one continued sore; threatened with suffocation, uttering the agonies, he feels, by piercing, heartwounding groans. Observe how his mouth foams; listen to the grinding of his teeth; see how he thrusts his little trembling tongue betwixt them, and how piteously it is wounded! Look, how he is agitated with the

most dreadful convulsions ! His feeble limbs are twisted and contorted, and threaten dislocation ; his frame bends backwards, is lifted up, and thrown down again ! These fits now increase ; then cease ; alas, only to return with redoubled violence. Misery calls aloud for help, help ; but calls in vain. New convulsions succeed ; he foams, struggles, gasps, gasps again ; and expires !”*

“ We may now pause,” to use the words of the benevolent Lettsom, “ to consider, whether the small pox inoculation be a justifiable practice ? Opinions, and even prejudices, although illfounded, which result from old habits, strengthened by domestic sensibility, claim attention, and demand indulgence. But, allowing due condescension to these feelings and prejudices, can a conscientious practitioner encourage, or give his sanction to the old practice, which he knows to be attended with the sacrifice of at least one victim in five hundred cases, while the vaccine inoculation is never fatal ? Were parents previously informed of the probable proportion of deaths by variolous inoculation, and were it, like the vaccine, incapable of communicating infection to others ; some apology might be admitted, and the old practice in a great measure justified. But, if we take into the ballance the dangerous influence of variolous inoculation by spreading infection, and endangering the lives of those, who have not had the small pox, I can hardly consider a professional man as justifiable in supporting this practice in the present period of experience.”*

I shall close this chapter with the sentiments of that skillful physician and excellent historian, Dr. Ramsay of Charleston South Carolina, as expressed in a letter of a recent date.

“ The weight of Dr. Lettsom’s name is a great support to the friends of vaccination here. He is perhaps more known and respected in America, than any other European physician now living.”

* Dr. M’Donald of Hamburgh.

† See Dr. Lettsom’s “ Observations on Cow pox.”

CHAPTER V.

Of the SPURIOUS SMALL POX.

HAD all, that Dr. Jenner has advanced concerning the prophylactic power of the kine pock, been erroneous, he ought nevertheless to be ranked among the benefactors of mankind; for he has rendered clear and intelligible certain variations and anomalous appearances in the inoculated small pox, that before were involved in mist and confusion.

The spurious small pox had scarcely, if ever, been mentioned in America, before the publications on the kine pock appeared, notwithstanding its woful consequences had been felt in many families in every part of the Union. We have found it difficult to convey a correct idea of spurious matter, and of its necessary effect, spurious cases. Even the best British writers have used the same term to express failures in communicating the true disease, which have originated from different causes. A few examples will best explain, what is meant by spurious small pox. "A medical gentleman," says Dr. Jenner, "now no more, who many years inoculated in this neighbourhood, frequently preserved the small pox matter, intended for his use, on a piece of lint or cotton, which in its fluid state was put in a vial, corked, and conveyed into a warm pocket; a situation certainly favourable for speedily producing putrefaction in it. In this state, not unfrequently after it had been taken several days from the pustules, it was inserted into the arms of his patients, and brought on inflammation of the incised part, swellings of the axillary glands, fever, and sometimes eruptions. But what was this disease? Certainly not the small pox; for the matter, having from putrefaction lost its specific properties, was no longer capable of producing that malady; those, who had been inoculated in this manner, being as much subject to the contagion of the small pox, as if they had never been un-

der the influence of this artificial disease ; and many unfortunately fell victims to it." This is a well expressed case of spurious small pox. Take another related by Mr. Earl of Frampton upon Severn. " In March 1784 a general inoculation took place at Arlingham, when I inoculated several patients with active variolous matter, all of whom had the disease in a favourable way ; but my matter being all used, and not being able to procure any more in the state, I wished, I was under the necessity of taking it from a pustule, which experience has since proved was advanced too far to answer the purpose, I intended. Of five persons, inoculated with this last matter, four took the small pox afterward in the natural way ; one of whom died, three recovered, and the other, being cautioned by me to avoid as much, as possible, the chance of catching it, escaped from the disease through life." In each of these cases inflammation took place in the arm, and fever came on with a considerable degree of pain in the armpit. In some of their arms the inflammation and suppuration were more violent, than is commonly observed, when perfect matter is used. In one there was an ulcer, which cast off large sloughs. It is precisely so in certain cases of the kine pock inoculation, where the matter used was too old, and where every symptom, local and general, was severer, than in the true disease.

" From these circumstances," continues Mr. Earl, " I should suppose no medical practitioner would scarcely have entertained a doubt, but that these patients had been infected with true small pox. In the year 1789 I inoculated three children, whose arms inflamed properly, fever and pain in the axilla came on precisely at the same time, as in the former cases, and in ten days *eruptions* appeared ; which disappeared in the course of two days. The matter, here used, was procured for me by a friend ; but no doubt, it was in an improper state ; for from the similarity of these cases to those, which happened at Arlingham, I was somewhat alarmed for their safety, and desired

to inoculate them again ; which being permitted, I was particularly careful to procure matter in its most perfect state. All the children took the small pox from this second inoculation, and all had a very full burthen.”*

What are we to infer from the foregoing cases ? Assuredly this, that “the small pox matter may undergo such a change from the putrefactive process, as will render it incapable of giving the small pox in such a manner, as to secure the human constitution from future infection ; although we see at the same time it is capable of exciting a disease, which bears so strong a resemblance to it, as to produce inflammation and matter in the inoculated part, (frequently indeed more violent, than when it produces its effects perfectly) swelling under the arm, general indisposition and eruptions.”†

The spurious small pox is indeed so common an occurrence among inoculated patients, that we may with equal propriety put the same query here, that Dr. Jenner did in England, “Where is the village, that hath not yielded its victim to the small pox, after inoculation for that disease was supposed to have been properly performed ? Can the metropolis, even among the higher and more experienced gentlemen of the medical profession, claim an exemption from fatal errors ? Certainly not.”‡

In the last general inoculation in this quarter, which was in the autumn of the year 1792, a considerable proportion of the first cases were spurious, owing to the difficulty of obtaining a sufficiency of good matter. Two of my own children were inoculated five times, before they took the true disease. Several practitioners were satisfied with fewer trials.

Since spurious small pox cases have been the subject of conversation, practitioners as well, as people in common, have

* See Jenner's observations page 81. † Ibid page 84.

‡ Letter to William Fermor Esq. inserted in Med. and Phys. Journal.

recollected many instances of this fallacious disease. It does not appear, that our inoculators had any correct ideas of the change, which variolous matter may undergo in the putrefactive process; or that matter, thus changed, would give rise to a train of symptoms, bearing so strong a resemblance of the true small pox, as to be often mistaken for it; or that a severe disease, resembling the small pox, would arise from variolous matter, taken at too late a period of its pustule. The idea is indeed a recent one even in England, which is evident from the cases that occurred in the year 1791, as related by Mr. Kite in the fourth volume of the memoirs of the London Medical Society. That these eight cases were spurious no one at this time can doubt. Yet Mr. Kite, who is a surgeon of repute, had not a just idea of the deterioration of the virus in a stale pustule at the period, when he inoculated the subjects of his second, third, and fourth cases; for he inoculated them “from the only remaining pustule on the body of a woman on the *fifteenth day after the eruption*, when she appeared perfectly recovered, and all the other pustules dried away.” It is more than probable, that those cases, mentioned by Baron Dimsdale, wherein the disease came on so suddenly after inoculation, that the whole affair was terminated, purges taken, and the patient returned home perfectly well in a week’s time, ought to be ranked under the head of spurious.

The attention of American practitioners is however now directed toward this important subject, as numerous letters from almost all parts of the United States testify. Most of these were confidential communications, otherwise we could fill pages with deplorable instances of persons taking the small pox, after having been supposed to have passed through that malady. I cannot however resist transcribing a passage from a letter of Dr. Ramsay’s of Charleston, South Carolina, dated July 23d 1802; because neither names, nor circumstances are mentioned, by which the feelings of any one can be wounded.

“ It is a remarkable fact, that in Charleston seven or eight persons have taken the small pox in the natural way, since last January, who had been inoculated for it three, four, or five years ago; some of whom had been much exposed to it during the intermediate years. The pious say that this coincidence is a smile from Providence in favour of vaccination. The fact is unquestionable, and has shaken the faith of many in the security of small pox inoculation.” Such failures in communicating the true small pox have given rise to the opinion, that a person may have that dreadful malady twice.

We shall not be surprised at the number of spurious cases, when we consider that the criteria, by which our small pox inoculators judge of a constitutional affection, are such, as will not bear the test of theory or experience. Swelling and soreness under the arm are thought by many to be certain signs of the virus having entered the constitution. But this opinion must be received with some limitation, since we know that a blister, or an issue on the arm, will cause the lymphatic glands in the armpit to swell and become painful. Nay farther a person may have the true small pox from inoculation in the arm; the virus may be absorbed from the pustule, and every symptom follow in due succession and order, *the tumefaction and pain under the arm excepted*. The explanation of this irregularity depends on an accurate knowledge of the course of the larger lymphatics; for, if variolous, vaccine, or venereal virus, be inserted in the little, or the ring finger, or near to them, the lymphatic glands on the internal condyle of the humerus, or some one in the course of the brachial artery, will probably inflame, and a swelling and pain of the axillary glands follow. But, if the virus be inserted into the thumb, or fore finger, or near to them, it is probable, that it may not pass into any glands, before it come to the inside of the clavicle.* Thus have we seen patients complain of stricture

* See Cruikshank on the Lymphatics.

and pain across the chest, who had none under the arm, although they possessed every other characteristic of the variolous, or vaccine disease. Another criterion, by some deemed infallible, of constitutional affection from variolous, or vaccine inoculation, is the sense of cold, shuddering, and nausea, following after the pain and tumefaction in the axilla. But even these are not pathognomonic symptoms of either of these inoculated diseases, seeing they all may follow from simple irritation of a *clean* instrument, as has already been mentioned. We hope not to be misunderstood. We look upon the circumstances of tumefaction and pain of the glands under the arm, followed by shuddering and nausea, as decisive symptoms, when they coincide in their series and order with certain peculiar aspects and conditions of the pustule or inoculated part. All we wish to convey is, that they alone are not the pathognomonic signs of the variolous, or vaccine disorder; since they sometimes follow the absorption of other morbid poisons, and in a rare instance from simple irritation, void of any acrid substance. We may add too that these symptoms are more strongly marked in the spurious, than in the true kine pock.

I have now before me a letter from Dr. WALL, *Clinical Professor in the University of Oxford*, dated April 15 1802, written in consequence of my inquiries respecting certain unfortunate cases of kine pock, said to have happened at that famous seat of science, and which had been transmitted to this country with increased deformity, in which the learned Professor, after correcting the mistake, says, “a gentleman of this neighbourhood inoculated the inhabitants of two or three villages, as he thought, with variolous matter; in consequence of which an eruptive fever, and a mild form of disorder, resembling small pox, came on at the usual time. But, after these persons had been well some months, nearly one half of them took the small pox by contagion, and some had it very unfavourably.”

Before I quit this hitherto neglected subject of spurious small pox, I would ask, who has not heard inoculators boast of the hundreds, they have inoculated for the small pox without having failed to convey, in a single instance, the true disease? Dr. Woodville, physician of the small pox hospital in the city of London, asserts however, (and who, that knows his great experience and accuracy, will doubt it?) that about one in sixty, taking mankind, as they rise, is found not to be susceptible of small pox, either by inoculation, or in the casual way.

CHAPTER VI.

SPURIOUS KINE POCK.

THERE is not only spurious small pox, but spurious kine pock; and, if we mistake not, spurious measles, that is, a morbilious affection so slight, as not to secure the person from a second attack of it. It is commonly called the measles rash, and is sometimes the precursor of true measles.

It may be questioned, whether the term *spurious*, as applied to the irregularities and failures, incident to inoculation for kine pock, be sufficiently definite; since these failures may arise from different causes. A spurious pustule is an appearance on the skin, not possessing the characteristic marks of the genuine vesicle. A correct definition, accurately discriminating it from the true, is not to be found in any book, we have yet had opportunity of examining. That purulent variolous matter, taken from under a scab and used for inoculation, will occasion ulcerated arms with pain under them, severe headach, sickness, and fever, without communicating the true disease, is a fact, more and more known and acknowledged in Europe and in America. That vaccine matter, taken at an advanced period of a forward pustule, will occasion nearly the same local appearances, and give a severe, but fallacious disorder, will require no farther proof, than what appeared at Marblehead,

New York, Norfolk in Virginia, and several other places nearer home. But that the causes are precisely the same in both disorders may not be so generally known and acknowledged. A person may conceive that he has kine pock matter on his lancet, when in fact he has only a little putrid pus; with this he inoculates, and excites a disease of some kind, but not such a one, as will prevent the small pox. Dr. Jenner complains to me in a letter of a recent date that the most arduous task, he has lately had to execute, was that of making practitioners sensible of the absolute necessity of attending to the *quality* of the vaccine matter.

According to my own observation, fallacious cases appear under two forms. The first arises from the application of matter impoverished, as it respects the specific virus, and weakened by being diluted with lymph, serum, or the aqueous portion of the blood; or else deteriorated by long keeping, by excessively hot weather, or by being frozen and thawed again; for "*Here frost performs th' effect of fire.*"* Matter of this quality appears to affect the skin merely, and seems to struggle on to raise the specific inflammation, and effect the propagation of the specific virus; but fails for want of sufficient force to carry it on. Moreover its stimulus is not great enough to excite the lymphatics to absorb it.† Hence there are no signs of that operation in the cutaneous lymphatics, no efflorescence, nor any constitutional affection whatever. There is only a soft scab formed, creeping gradually round the inoculated part, having a red, cranberry‡ coloured base; which, fading away, leaves behind a crustaceous, amber coloured scab; whence a transparent fluid sometimes issues, but

* Milton.

† The lymphatics may have their mouths immersed in fluids for years, and take up none of them, till a particular stimulus for absorption is given: Cruiks.

‡ Vulgarly called *cramberry*; Uva grœna.

most commonly a purulent one. When this scab scales off, it leaves no durable mark in the skin. Now this abortive pustule ought rather to be denominated inefficient, imperfect or defective; since the matter of this sort of pustule is incapable of generating its kind. Whereas the spurious pustule may be propagated. It seems indeed to possess a venom, sufficiently acrimonious to give birth to a similar impostor.

That anomalous disease therefore, to which we would appropriate the term *spurious*, owes its origin to matter taken from a genuine vaccine pustule; but at so late a period, that all the specific virus is absorbed. Sometimes the scab is thrown off, and the part is ulcerating, and throwing out a glairy fluid, previously to the formation of pus; or, if at a still more advanced period, when pus is not only formed, but actually changed to a state of putridity. This sore then differs widely from that, first mentioned, which arose from diluted, languid virus, and formed that slow and reluctant scab. This is the inefficient, defective pustule; that a rapid, virulent boil with a deep cranberry coloured efflorescence; whose effects on the inoculated part and on the system have in some cases been so quick and severe, as to resemble an original rather, than a morbid poison.* Although, like that, it affects not the part, which secreted it; yet it operates powerfully on another. When such matter has been lodged by a deep puncture on the adipose membrane, it has created alarming symptoms. The whole arm has been swelled, become stiff and painful; so have the glands under it. To these have succeeded rigor, distress at the præcordia, rapid pulse, pain in the region of the loins, stupefying headach, accompanied with a suffusion of tears, and almost always eruptions on different parts of the body. Many such cases occurred among us in the autumn of 1800, which induced some to suppose that vaccine virus suffered an unavoidable degeneration, as it receded from its parent the

* See the distinction in page 92.

cow ; and that it is necessary to have recourse to that animal for a fresh supply. It was at this period, and in this perplexed state of the business, that I wrote to Dr. Jenner, who together with Dr. Lettsom resupplied me with matter, resolved my doubts, and removed all my difficulties, as will more particularly appear from the following letter.

“ MY DEAR SIR,

“ PREVIOUSLY to the transmission of your letter to me, by Dr. Lettsom, I had heard of the sad embarrassment you had fallen into from the loss of your vaccine matter, and most ardently do I hope that the efforts I have used with the view of your being resupplied, may long before this time have proved successful.

“ In some of our seaports are practitioners who are inoculating with the virus from my stock, and it is from among these, as they have been previously apprized of my wishes, that I entertain the hope of your having been furnished.

“ By the conveyance which brings you this, you will not only receive vaccine matter, such as I employ with my patients here, and among them I frequently find the offspring of some of the first families in our Realms, but such laws also for conducting the vaccine process, or if you please, such a map of the road you are to pursue, as will in future prevent forever your losing your way.

“ Allow me ere I proceed to offer you my best thanks for your very excellent pamphlet, and for your very kind and friendly letter, the whole breathing that perfect philanthropic spirit which should ever go forth with the laborer whose search is truth, and the melioration of human nature.

“ I am about to publish a fourth Tract upon the cow pox, and am sorry that it is not yet in print, or with pleasure would I send it to you. My motive for sending this into the world is chiefly with the view of preventing mistakes among those who may unwarily use the vaccine virus, after it has undergone those changes which render it incapable of producing that peculiar effect upon the human constitution, which secures it from the small pox. But although I am thus precluded from sending you the pamphlet, that information which may prove most satisfactory to you will lie in a small compass, and shall form the principal subject of this epistle.

“ The vaccine fluid must be considered as extremely delicate in its texture, and subject from a variety of causes, some of them apparently trifling, to partial and to general decomposition; to partial, when it retains its qualities imperfectly; to general when these qualities are entirely destroyed. The perfect virus only can produce the perfect vaccine pustule, at least the fluid inserted must contain some particles of it in its perfect state.*

“ Now I conceive that at some period of your inoculation, which may now have escaped your recollection, an imperfect pustule arose, either from some peculiarity in the constitution of your patient, or some alteration in the qualities of your matter, and that from this stock you propagated. The consequence was, that continued degeneracy you complain of in the nature of the disease. The same thing has happened to many in this country, and indeed many other parts of Europe. Now, either from an idiosyncrasy, or some change in the nature of the virus, a variety has sprung up in the character of the pustule. The practitioner not deeply versed in the nature of the cow pox has inadvertently inoculated from this variety. He proceeds with his inoculation hoping to call back his original

* “ This is fully explained towards the conclusion of my first Treatise. J.”

pustule, but alas! in vain; while this is going forward, his sources for conducting the business properly, are cut off. This happened to the celebrated Professor Odier at Geneva; virus, originally vaccine, had suffered so much derangement in its qualities, that when inserted it produced vesication, extensive efflorescence, and with these an evident affection of the system within *forty eight* hours after its application; and having assumed this character, it continued to maintain it. This was clearly not the true cow pox. I furnished the Professor with perfect matter, and now the disease is propagated with the most complete success at Geneva.

“ I shall not detain you with an attempt to describe all the varieties, the vaccine fluid when altered in its properties is capable of exciting. The task would be too arduous; but that just mentioned is I think most common, viz, the extensive efflorescence, with an affection of the system within *forty eight* hours. That which appears next in frequency is, according to my observation, a soft scab gradually creeping around the punctured part until it has attained the size of a sixpence, or a larger size, and then dying away, instead of the hard red spot converting itself in four or five days into a vesicle.

“ So far this history must tend to depress rather than cheer you, by leading you to suppose that human foresight is not equal to the preservation of the virus from degeneracy. But I shall give you immediate consolation by assuring you that my opinion is far otherwise, and that we shall not want recurrences to the animal from whence it sprung for renewal.

“ I am aware that it is the opinion of some, that the vaccine matter loses its properties after it has passed from the cow through a given number of human subjects. It was certainly very natural for you, insulated as you are, from all ready intercourse with those who could afford you correct information on the subject, to take up this idea; but what will you say

when I inform you that the virus you began to inoculate with came from my stock, and that with a continuation of the same, I am now, almost daily, inoculating children in the metropolis; and producing with it the vaccine disease with all its characters, as perfect as when it first came into my hands from the cow? In short there does not appear to be the least tendency towards change in the nature of the virus *from time*.

“ You will excuse my laying before you those rules which I conceive should be perfectly understood by those who practise the vaccine inoculation, confident that if they be adhered to, no disappointment will occur.

“ First—We should be careful to take the vaccine fluid for the purpose of inoculation at an early period of its formation.

“ Secondly—We must observe that the pustule excited by the insertion of the fluid goes slowly and regularly through its progressive stages of *inflammation*,* *vesication*, with its concomitant *efflorescence* and *scabbing*.

“ Thirdly—That if any material deviation should arise in the character of the pustule, forming a variety, this pustule should not be used for further inoculations.

“ I shall make some comments upon these rules.—With respect to the first, let me observe that the activity of the virus, in my opinion, begins to diminish upon the formation of the efflorescence; therefore if circumstances will admit, I never take it after the *eighth* day, and as much earlier as I can, even on the *fifth*. The surest guide will probably be the progress of the efflorescence.

“ I do not presume to say that after this period the fluid is effete, certainly it is not; but that it frequently occasions dis-

* “ By inflammation, I mean the red spot formed during the first three or four days. It should appear hard to the touch and be somewhat prominent. J.”

appointments, my early trials sufficiently testify, and those of others in whose accuracy I can rely.

“The necessity of attending to the second of these injunctions must be obvious. Were it neglected even an exanthematous blush excited on the arm by the insertion of the virus might be deemed a sufficient security, and a spurious pustule, a mere vesicle, quickly forming and as quickly subsiding, be considered as the real.

“I have already anticipated any observation on the *third* rule. However I shall just say a word in proof of the extreme delicacy of the nature of the vaccine fluid, to shew how easily it may be disorganized.

“In the early part of my practice, I used frequently to evaporate the fluid by the fire upon threads, glasses, or lancets; but yet with much caution respecting the degree of heat. But experience has taught me that even this procedure frequently occasioned an unnatural deviation from the perfect progress of the pustule produced by it; as it was apt to commence with a soft, creeping incrustation, which in some instances produced at its edges, as it advanced, the perfect vaccine fluid in a ring round it, and this formed a boundary to the extension of the scab. The proper efflorescence followed, and the constitution was rendered secure. But in other instances the process ended more abruptly; no fluid was formed as above described, nor efflorescence; and then of course the susceptibility of the action of the vaccine virus remained, which was evinced by subsequent inoculation with active fluid matter.

“It is unnecessary for me to say that the vaccine virus I now convey to you is perfectly genuine, when you may be assured it is from that stock which I am using among all my patients here, and these are of every order from the Peer to the Porter; for all ranks of society readily embrace our new doctrine. Prejudice, that undescribable something, which ever has for a

while, hung heavily on the wheel destined to bring forth any thing new in science, has almost hidden its diminished head, and the vaccine inoculation has decidedly triumphed over the variolous. Through Europe it is now going forward with a rapid step. May it as rapidly march over the continent of America, and I do assure you I have no wish to entrust it to a more able commander than yourself.

“ I perceive, by the perusal of your pamphlet, that you were led into some perplexity by Dr. Woodville’s first publication on the cow pox. His second has set the affair to rights. An irritable skin may be affected in a variety of ways by the local irritation of the inoculated pustule. It is by no means uncommon to see an appearance something like the tooth rash. I have seen too, though very rarely, the vaccine pustule, once upon the chin of an adult, and in two or three instances among children. But every thing of the eruptive kind I have ever seen has been too immaterial to merit notice.

“ Dr. ——— as well as Dr. ——— have in many of their writings, confused the matter greatly. Is it to be wondered at, that gentlemen who hastily take up a subject with which they are but imperfectly acquainted, should in presuming to elucidate, create confusion ?

“ Both these gentlemen have insisted that the vaccine matter is capable of producing variolous pustules on the human body, with all their phænomena as to contagion &c. &c. Although they now deny their own positions, yet it will be a long time before the first false impression be perfectly effaced.

“ Cold water with a little vinegar, or strong goulard-water seem to be the best applications, in case you find much inflammation around the pustule. And when the scab is rubbed off prematurely and ulceration is threatened, I apply the undiluted extract of saturn to the part.

“ This letter ought certainly to be written over again, but Dr. Lettsom has just sent a message that forbids it. It is of no less magnitude than that the ship, which is to convey it across the Atlantic, is about to sail,

“ It will afford me much pleasure and satisfaction to be favoured with your correspondence on this subject, or any other. Sincerely wishing you health and happiness, and complete success with your inoculation, I remain

Dear Sir,

your obliged and very faithful
humble servant,

EDWARD JENNER.

London, 4th March 1801.

“ P. S. Some of the virus I have sent was taken from a pustule this morning by my friend Mr. RING, *Surgeon in New Street Hanover Square*. We occasionally assist each other with the fresh fluid. The whole is from my original stock. I have sent you one of the coloured plates, which will be published with my next pamphlet, to shew the progress of the perfect pustule.

E. J.

“ BENJAMIN WATERHOUSE M. D.

*Professor of the Theory and Practice of Physic
in the University of Cambridge America.”*

CHAPTER VII.

Of the MODE OF PERFORMING INOCULATION.

ALTHOUGH from what has been said it may appear, that the *fulcrum*, on which the business of this new inoculation turns is an accurate knowledge of the genuine pustule, the state of the fluid, and of the period in which it should be taken for transfusion into another person ; nevertheless the operation, or mode of conveying it, is an affair of no small consequence.

Inoculation, a term borrowed from gardeners, and synonymous with ingraftment,* means here the operation of transferring variolous or vaccine virus from a perfect pustule to the wounded lymphatics of a person, susceptible of the contagion.

The directions for performing inoculation in *Heister's surgery*, a standard book among our old practitioners, are these, "make a small incision into the arm or leg with a *knife*, and therein lodge some *purulent* matter, taken from patients labouring under a *mild kind* of small pox." These directions are copied into *Jame's Medicinal Dictionary*.

It will not however be difficult to demonstrate that the use of the knife is pernicious ; the use of purulent matter fallacious, and the idea of a mild kind of variolous virus absurd.

We have already mentioned from Dr. Jenner the practice of a certain defunct inoculator, who used to cut deep enough, "to see a bit of fat," and there lodge the matter. The consequence of so rude practice was observed to be severe inflammation, abscesses, and in some cases death. Cutting thus deep-

* LADY WORTLEY MONTAGUE used the term *ingrafting*. EMANUEL TIMONIUS entitled his book *Historia variolarum, quæ per insitionem excitantur*. Constantinople 1713. That of JACOBUS PYLARINUS bears this title, *Nova et tuta variolas excitandi per transplantationem methodus nuper inventa, et in usum tractata*. Venice 1715.

ly has been, and still is a practice among too many inoculators in America. Some never fail of cutting through the skin of children; and most commonly through the skin of adults. These deep wounds commonly create very sore arms, and febrile commotions, which pass for the small pox. It was the opinion of that philosophic physician GEORGE FORDYCE, that the *quantity* of the variolous matter made a difference in the violence of the disease. But Dr. Jenner is inclined to the opinion, that this increased violence of the disease is owing merely to the punctures being made so deep, as to go *through* the skin and wound the adipose membrane. Both these opinions merit our serious attention.

That the use of *purulent* matter for inoculation is pernicious no one can doubt, after what has been said. Almost all the disasters, that have occurred in attempting to communicate the small pox, have arisen from a injudicious use of purulent matter in place of that pellucid fluid, which precedes it in the natural order of secretion.

If purulent matter very seldom communicates the true small pox, it always fails in communicating the genuine knee pock. The matter, used at Marblehead, was purulent, as was that first used in New York, and at Norfolk in Virginia, and also that, first used in some parts of Vermont.

That doctrine, which teaches to select matter from a *mild kind* of small pox for the purpose of inoculation, in order to secure the like mildness in the subsequent disease, has no solid foundation in nature. The small pox poison must always be one and the same. There is nothing, hitherto published, which renders it probable, that variolous matter, taken at a proper time, from the distinct sort, or from the confluent, can create any difference in the disorder, produced by it. The confluent, or the distinct small pox, is not owing to any variation in the *quality* of the virus imparting more or less maligni-

ty, but to habit of body, predisposition, or *ιδιοσυγκρασια* of the sufferer. The small pox may invade a body already distempered. It may attack at a season intensely hot, or otherwise unfavourable. It may surprise debauchees soon after excesses; or it may seize the innocent after indispensable watchings, hard labour, or sinking under depression of spirits. In such the small pox virus will produce a disease different from that, which the same poison would occasion in subjects strong, pure, cheerful, and living in an healthy atmosphere. To all which we may add, that fever operates with increased force on the weakest part of every constitution.

In a healthy person, inhabiting a clean place, breathing a salubrious air, and living temperately, a train of salutary processes are going forward in his system; digestion is well performed, the chyle is proper, blood made from that chyle is perfect, and the secretions and excretions natural and regular. Should a simple wound be inflicted on such a person, inflammation, thence arising, would be regular in all its stages; the pus formed would be replete with white globules, and perfectly sweet; the consequent granulations, a concomitant effect of the same cause, would be florid and firm, and a perfect restoration of the wounded part would soon follow. If such a person be inoculated with matter from the most malignant sort of small pox, taken at the proper time, his pustules will nevertheless be distinct, the basis of each encircled by a border of crimson, the intermediate spaces will approach to the colour of the damask rose, the matter in each pustule will in due time acquire a yellow colour and laudable consistency. The vires vitæ are here strong enough to throw up a redoubt against the enemy, and to repel him. The fever, accompanying such a

* *Idiosyncrasia*, a word which cannot be perfectly translated, means that singular disposition of the solids and fluids, which exists in every individual, and is the true cause, why several things, that are hurtful to some, are beneficial to others; and why the same person finds some things agree with him at one time, which disagree at another.

state, is of the true *synocha* type. But in a person, otherwise situated, and predisposed, other symptoms will appear, if inoculated with the same matter. In him the eruptions come on sooner, are more numerous, appear in clusters, like the measles, and do not maintain their circular figure and spheroidal form; but run one into another and become flat; and, when the pustules are in any measure distinct, their bases are not bounded, as in the former case, by an inflamed margin, while the skin, that is free from pustules, is pale and flabby. The matter in these vesiculæ is a whitish, or brownish sanies, and the accompanying fever is *typhoid* or nervous; while the concomitant inflammation is of the erysipelatous species, or that sort, which shows a disposition to spread, or rather no disposition to set bounds to itself, as in the distinct small pox.* At this period, should the depressing effects of fear unfortunately concur, the edges of the eruptions will soon show that they are too weak to resist the encroaching evil, and will all run into one shocking sore. Now instead of yellow matter, or pus, only ichor is produced. Soon after purple spots appear, profuse hæmorrhages of thin corrupt blood pass off by the several outlets of the body, and the sufferer sinks under the weight of misery. In such cases the violence of the disease is not occasioned by the greater malignity of the variolous poison, that is used; but it is owing to the *vires nature medicatrices* being too far depressed to resist the *potentia nociva*. Hence the imperfect inflammation and imperfect suppuration; hence the symptoms of approaching dissolution, indicated by the incapacity of each pustule to confine its own matter.

From what has been said it appears that the choice of matter is of less importance, than the mode of inserting it. The pernicious effects of deep punctures are no less apparent in the

* It is a law of our system, that where perfect pus is formed, the sore does not spread. Is it not probable that the matter of the vesicle of the confluent small pox is weaker, than that in the pustule of the distinct sort?

kine pock, than in the small pox inoculation. It is indeed sufficient, if we lodge the virus *on* the skin, nay short of the skin, *in* the rete mucosum.

But, before we can clearly understand this subject, it may be necessary to describe the structure and explain the nature of

THE CUTICLE OR SCARFSKIN, THE RETE MUCOSUM, THE TRUE SKIN, AND THE ADIPOSE MEMBRANE.

BY the vaccine pustule we always mean in this treatise that circular sore with a smooth flattish surface and well defined edge, replete with a pellucid fluid, the consequence of inoculation, which about the eighth day from vaccination is of the size and shape of the mallows seed. Before we can have a clear idea of this pustule, it is necessary to acquire an accurate one of the parts, which enter into its composition. These are the cuticle, the rete mucosum, and perhaps the adipose membrane, this being frequently, but unfortunately, punctured in inoculating infants.

The *cuticle*, *epidermis*, or *scarfskin*, call it which you will, is a thin, transparent membrane, covering the human body every where. It is not only insensible, but incapable of undergoing the corroding process of ulceration. It is not even susceptible of the action of morbid poisons, and must therefore be punctured or abraded, before they can be received into our vessels. When the scarfskin is removed, it is regenerated with surprising quickness. Its organization is hence presumed, but has never been demonstrated.

The *rete mucosum* is interposed between the scarf and the true skin; and is that membrane, which gives the peculiar colour to the different nations of the earth. To make this plainer (for we write this for information of those, who are not educated to medicine) let us say with Mr. Cruikshank that,

when a blister has been applied several hours to the surface of a negro, a thin, transparent, greyish membrane is raised, under which we find a fluid. This membrane is the cuticle or scarfskin. When this with the fluid is removed, there appears under it another membrane, which is the rete mucosum. This is white in us, but black in Africans ; and, like the amalgam behind a looking glass, probably enables the cuticle to reflect the sun's rays in very hot climates.

The rete mucosum is a double membrane, containing a mucus, which gives the peculiar colour to a man through the scarfskin. Immediately under the internal layer of the rete mucosum is a third lamina, *on which are situated the pustules of the small pox.** Then comes a fifth membrane, which some have imagined was created by certain eruptive diseases ; but it is more probable, that such inflammatory diseases, like an artificial injection, only demonstrate it. Immediately under this delicate membrane is

The *Skin*, which is crowded with veins, arteries, nerves, glands, and absorbents. The skin is exquisitely sensible ; and when once destroyed, it is never, like the cuticle, regenerated. Hence the indelible pit or mark after a successful inoculation for small pox or kine pock.

The *Cellular membrane*, which lies immediately under the skin, is called *reticular* and *adipose*, according to its situation and office. The universal extension of this membrane may account for the symptoms, that are apt to arise from the lodgment of acrid matter. This membrane makes a general bed for all the solids of the body. It covers and unites them one to another. It covers and unites the fibres and fasciculi of the muscles, tendons, and ligaments. It covers and unites all vessels and nerves. It unites all smooth investing membranes

* This membrane was discovered by Dr. Baynham of Virginia, and confirmed by Cruikshank. See his letter to Mr. Clare p. 96.

with the parts, which they cover. It pervades the fat, and is even intermixed with the substance of the skin. Nay it is found in every part of the body, excepting the substance of the hard bones and in the humours of the eye.*

From such a view of this all pervading membrane, some eminent physiologists have been led to believe (among whom we may name *Baglivi*, *Rega*, and *Bordeu*) that through the medium of this universal membrane or web is conveyed that consent of distant parts, or sympathy, observable in many diseases, and remarkably so in those, popularly denominated "nervous." In the subject before us we know, that virus, whether variolous or vaccine, laid on this membrane will often excite very alarming symptoms.

From this description it will appear, that in such a puncture with a lancet, as is commonly made in the operation of bleeding, we first cut through the cuticle; then through the rete mucosum; next through that vascular membrane, on which small pox pustules are principally seated; then through a similar, but more delicate one; after this we penetrate the true skin; and lastly we cut through the cellular or rather *adipose* membrane, before we touch the vein.

After this view of the integuments of the muscles, it is indeed desirable that it may be determined by experiment, how superficial a puncture will answer the purpose of effectual inoculation. Is it enough, that virus be laid *on* the rete mucosum? Or must it be laid *between* this compound membrane and the skin? Being provided with an acute instrument and a good magnifying glass, I endeavoured to ascertain this point by experiments on several persons, selected for this purpose. After another set of observations I may possibly publish the result. In the mean time I offer the following, as the natural history of the vaccine pustule in the human subject.

* See a description of the cellular membrane by Dr. Hunter in *Lond. Medical Observ.*

Soon after the virus is laid on the rete mucosum, it occasions an increased action of that living power, which every part, susceptible of stimulus, naturally possesses, and which is similar to a blush, being a momentary distension of the smallest vessels. For it is a law of our bodies that, when a part has more to do than merely to support itself, the blood is there collected in larger quantity.* The part, thus agitated, actually becomes more and more vascular; and thus gently commences the beautiful process of inflammation. The effect of vessels, thus roused into new action, is the secretion of a pellucid fluid, similar to the virus applied, but not distinguishable from the coagulating lymph, except by its effects. This process soon destroys the minute vessels, connecting the rete mucosum with the scarfskin. When the puncture is made a little deeper, it destroys those, which connect the rete mucosum with the true skin.

The scarfskin, being in this manner detached, is gradually elevated, and forms the external coat of the incipient vesicle, which is now every minute filling with a limpid fluid, secreted by the newly distended vessels, while the rete mucosum forms its base. Or, if the puncture have been made deeper, it forms one of the coats of the vesicle, while the skin is its base. As the pustule increases, the vessels become distended, or inflamed. Still the newly secreted virus is confined to a small spot, and remains there, until the lymphatics are sufficiently roused to absorb it, and carry it into the blood; which operation rarely commences before the eighth or ninth day. How differently appears the pustule, so raised, from that, which follows a puncture *through* the skin? Yet how peremptorily do some pronounce on the aspect of a pustule without attending to the physiology and pathology of the parts, that have suffered their random punctures?

* John Hunter.

It appears from what has been offered, that the vaccine virus is not immediately absorbed, (and we have already established it, that there is no such thing, as transudation, or soaking through a membrane in a living body) but that it remains on one or other of the membranes before mentioned, and that it must there excite certain progressive changes, denominated *inflammation* and *vesication*.*

About the eighth or ninth day from vaccination the inflammatory process has so far advanced, as to stimulate the lymphatics to absorb the virus, and bear it into the blood. When this commences, it is known to the eye by the increasing efflorescence, and to reason by the soreness under the arm. The efflorescence around the pustule is not always precisely of the same colour; for, to speak with Mr. Hunter, although the colour of every inflammation is red, it is a red of various hues. If the patient be perfectly healthy, it is of a pale red; if less healthy of a darker, even to a purple, and so on to a blueish down to a state bordering on mortification.

Since the vaccine disease has never been fatal, to make these subtle distinctions may, in the opinion of some, be giving importance to trifles. But if they will look at the consequences, they will do honour to our principles. It is not improbable, that in future time kine pock inoculation will be in the hands of mothers, provided physicians are successful in the discriminating marks of it. It is not every practitioner, who can discriminate that pustule, which may be raised on the arm of one, who has gone through the small pox, from that, which is created on him, who never underwent this malady. Even in that common distemper, the chicken pox, are practitioners so far agreed in its diagnosis, as to exclude doubts and dis-

* "It is not the identical matter inserted which is absorbed into the constitution, but that which is, by some peculiar process in the animal economy, generated by it. Is it not probable that different parts of the human body may prepare or modify the virus differently?"

putes? Does the description of it by Dr. Heberden exactly correspond with what we often meet in America? Certainly not. We may yet find the variola vaccina among the kind of our own country, and the virus may be applied to other purposes beside exterminating the small pox. Every case of *hydrophobia* in the human species is an inoculated disease; and the progress of its virus through the lymphatics into the blood must be by laws, not very dissimilar to those, we have laid down. That dogs may be inoculated with vaccine virus is a new wonder in its history; and it is said, that inoculation preserves them from that malady, which from its universality in the canine race, is called "*the distemper.*" I cannot but indulge the expectation, that the application of the vaccine discovery will more and more open to us new and pleasing wonders in the healing art; that even the terrific hydrophobia will be struck out of the catalogue of human miseries; but by what means I will not now pretend to determine.

In the preceding experiments, the objects of inquiry were,

I. To learn the exact appearance of the pustule, when the virus is laid *on* the rete mucosum.

II. Its appearance, when the virus is laid *between* the rete mucosum and skin; or on that membrane which is the principal seat of the small pox pustule.

III. Its appearance, when the puncture is made *partly* through the skin.

IV. When the puncture is made through the skin, and the virus is lodged on the *adipose membrane.*

V. To determine, whether the local inflammation and constitutional symptoms be always in proportion to the depth of the wound.

"Although the skin, adipose membrane, or mucous membranes are all capable of producing the variolous virus by the

stimulus given by the particles originally deposited upon them, yet I am induced to conceive, says Jenner, that each of these parts is capable of producing some variation in the qualities of the matter previous to its affecting the constitution. What else can constitute the difference between the small pox when communicated casually, or what has been termed the natural way, or when brought on artificially through the medium of the skin?"

I perceived however that to make these experiments with precision required the skill and dexterity of a *Leeuwenhoek* and the knowledge of a *Jenner* as well, as the discriminating accuracy of a *Willan*, together with a large portion of that exquisite graphic art, which adorns their respective works, to express them.* Even this would be insufficient, "for who can paint like NATURE?"

• To insure success, these experiments should be made at the
"PUNCTUM VITÆ IN VITELLO ORBIS."

CHAPTER VIII.

MEDICAL TREATMENT.

ALTHOUGH inoculated kine pock occasions in most cases so slight disturbance in the system as hardly to justify calling it a disease, it nevertheless excites in a few instances fever accompanied with slight delirium, which though void of danger ought not to be considered too trifling for medical attention.

That morbid state which is denominated fever is one and the same forever in its nature and essence, but admits vast varieties from accidental occurrences. It may for example invade a body already weakened or distempered. It may attack at a season peculiarly unfavourable. Moreover, as fever finds out the weakest part of every constitution, how can we pronounce on the mild progress of it, when raised by application of vaccine virus ?

Mild as is the vaccine disease in general, the reputation of it has been injured by an idea that British physicians have pronounced it equally mild in all cases. This erroneous opinion has increased the number of quacks, introduced extreme carelessness, and multiplied spurious cases. Because none ever died with it, some inoculators have conducted as if no one ever could. The most experienced inoculator will however say with Dr. Jenner that "*the vaccine lancet is not to be trifled with.*"

Very sore arms do not necessarily belong to the kine pock inoculation. They result from either an unskilful mode of inoculation, or from some accident after it has been properly performed ; or, in patients of a bad habit of body, from an unfavourable state of the atmosphere.* Sometimes the puncture is made too deep, especially in children, and the virus is laid on the

* See page 90.

adipose membrane. This, with the unceasing motion of their arms will sometimes create a troublesome sore. In grown persons, laborious exercise, or riding on horseback will often so chaff the arm as to occasion the inoculated part to bleed. If to these mechanical irritations be added intemperance, can we wonder that a mild pustule is changed into an angry ulcer; or that fever should sometimes rise higher than is consistent with perfect safety?

Experience teaches us, that the kine pock is uniformly severer in grown persons than in children. This may depend on that condition of the human fibre in the adult state, which determines it more to the phlogistic diathesis, than in the infantile. We are taught to believe that, in small pox an inflammatory state of the whole system, particularly of the skin, occasions a greater number of pustules.* Hence the propriety of keeping the skin cool throughout the eruptive fever. It is not so in the kine pock, which differs from small pox only in not being a pustular disease. In this, we find that bathing the feet in warm water, on going to bed, has an agreeable effect in mitigating the pain of the head, heat in the eyes, and scalding sensation in the throat. Pediluvium also abates the soreness of the flesh, and disposes the patient to tranquil and refreshing sleep.

Whether certain persons have more itching at the pustule, or only less patience I cannot absolutely determine; but some, between the fourth and sixth day, complain of it as intolerable. To appease them I direct a leaf of plaintain to be bound on the part with a handkerchief day and *night*. This at least secures the incipient pustule from the violence of the nails. But should the itching increase, let the part be bathed with the saturnine wash of Goulard; or, what is preferable, sea water.

R

* Cullen.

If on or about the tenth day the efflorescence should extend to a hands breadth in a grown person, or in the same proportion in an infant, nothing need be done to restrain it. Patients and parents however commonly induce us to make some mild application, such as vinegar and water, or a solution of *aqua lythargiri acetati*. But it must always be remembered, that no application should be made to subdue the action of the pustule, until convincing proof had appeared of the patient's having felt its effects at least twelve hours.*

Sometimes the patient feels throbbing pain in the inoculated part about the eleventh day; the superficial efflorescence increases to a deep seated inflammation, and the whole arm becomes stiff and painful. In this condition we apply *Ung. Mercur. fort.* not merely on the pustule, but inside of the forearm. If febrile symptoms accompany this painful local affection, it is proper that the patient should take a cathartic, and that his feet and legs be bathed in warm water at bed time. Should any nervous irritation, so called, arise, and continue over another day, let it be taken off at night by an opiate.

If through inordinate inflammation, or some untoward accident, ulceration appear, as described in page 97, it will require particular attention.

It would be digressing beyond the limits assigned, to go far into the doctrine of ulceration. We therefore only remark here, that whoever closely attends to the procedure of inflammation, to the formation of pus, the progress of granulation, together with the process of ulceration, will discern the regular steps, by which Nature advances toward a cure. He may likewise observe how, when baffled in her first intention, She directly has recourse to a second, and to a third, in order to restore a disordered part to health.

* Jenner p. 109.

The human body is guarded and preserved by an innate principle, a *vis conservatrix*, or *medicatrix*, a power of excitement, or reaction against a sudden injury; and when suffering under a loss of substance, the whole force of this power is bent to restore the injured part to its pristine integrity. It is the peculiar office of the physician to restrain these efforts when too violent, and excite them when too inert and languid. These pathological laws should be carefully regarded in ulceration, which is an attempt to separate a diseased from a sound part. Disregard to them has occasioned a difference in opinion respecting the use of escharotics in an ulcerating state of the vaccine pustule. Some dispute the propriety of attempting to subdue the pustule, even when there are signs of ulceration. They think with Baron Dimsdale, that the symptoms of inoculated small pox are milder, in proportion as the local inflammation is greater. We assert however, from better authority, that inflammation and ulceration on the skin, is not the process in small pox or kine pock which affords security to the constitution.†

At one time we find an irritable state of the integuments in particular, or else of the habit in general, in which escharotics cannot be applied with advantage; at another, an opposite, or indolent and languid state of the part, or habit, in which they are required. Therefore, when to rouse by escharotics, when to assuage by opposite applications, and when to assist the scabbing process, by an artificial covering of any innocent powder, must be determined by the perspicacity of the practitioner.*

* Hoping to be able to extend and illustrate the leading pathological doctrines, interspersed in this treatise, in a separate publication on *Ulcerated Legs*, we merely glance at them in this chapter.

† Jenner.

CHAPTER IX.

Has this celebrated prophylædic of the small pox been found in any quadruped in America?

I CONFESS that I am unable to determine this question. Those, who have favoured me with communications on the subject of indigenus cow or kine pock, will I hope excuse the postponement of the publication of their accounts, until a previous question be determined, I mean the *equine* origin of the virus.

On the subject of indigenus cow pox I was heretofore more inclined to believe, than to doubt; but lately I have been more inclined to doubt, than to believe. In some instances, what I had conceived to be a solid structure, I found on near approach to have neither bottom, nor sides.

In a letter, I received from Dr. Jenner last February, he says, "I have always ventured to predict that the cow pox was not confined to this Island; but that, wherever in the same dairy there shall happen to be the peculiar intercourse, I have pointed out, between the horse, (for we must be compelled to own its humble origin) the groom, the cow, and the milker, that the disease may be called into existence." We learn from Dr. Jenner's publications that, wherever the cow pox appears, the "*grease*" is generally found to have preceded it. But I have inquired in vain after this distemper in the heels of the horse, and am far from being satisfied, that it exists in this country. Our farmers and farriers know it by name only. They confound it with the *scratches*, but no two farriers give the same account of it. It may nevertheless exist; for, I speak it with sorrow, the *Ars veterinaria* is in a miserable state in America, compared with France and England.

Not being able to satisfy myself as to the existence of the *grease* among the laborious horses of New England, I wrote

to Virginia, where the horse is a pampered animal, and devoted to the pleasures of the “*turf*,” and often rises in value to a thousand guineas. One of my most intelligent medical correspondents in that State, after describing the attachment of the Virginian sportsman to his horse, which fully equals what is related in the histories of Tartary and Arabia, adds—“No fond mother was ever more minute in her attentions to the diseases of her darling child, than these gentlemen are to the diseases of this noble animal.” Yet even thence I could obtain no satisfactory account as to the existence of the disease in question, much less a description of it.*

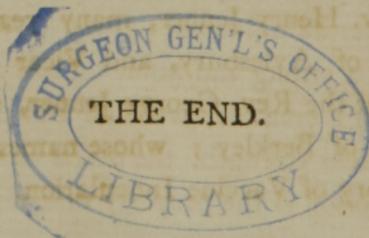
After diligent inquiry I cannot find that our farriers, grooms, coachmen, or drayman have ever received a pustular distemper from handling the sore heels of horses; nor do I know an instance, in which any of this order of men remarkably resisted the small pox.

That this famous prophylactic has been found in the horse in England I have no doubt; but that it has an *equine* origin is the most dubious of all the facts, that have been advanced on the subject. The causes, assigned as generating this pellucid secretion in the heels of the horse, with all its extraordinary qualities seem inadequate. The mind revolts at the idea, as at the doctrine of *equivocal generation*. Beside, I cannot easily admit that the noblest of quadrupeds forms an exception to a law, that pervades all animated nature. Where is another instance, in which a strong and noble animal generates a poison? If we look through creation, we shall find that, where an animal naturally lacks strength, the defect is supplied in venom. To generate a poison is the property of a reptile.

* If those gentlemen in the southern States, who are most interested in the welfare of this noble animal, would unite in a plan to send an intelligent native to pass a year or two in the *Veterinary College in London* under Professor Coleman; they, and in time the whole country, would reap an advantage, infinitely surpassing the expence of it.

We have domesticated six animals, whose natural home was the forest ; and five, to say no more, of these six are liable to a disease analagous to small pox. In the East Indies that species of domestic birds (which, having no name in our language, are called *cocks* and *bens*) is subject to an eruptive disorder, so similar to small pox, that the natives of Bengal call it by the same name *Gooty* ; which is doubtless the origin of the chicken pox. The hog has a pustular disease called swine pox. The dog has "*the distemper*," which is so analagous to small pox, that inoculation with vaccine virus is said to secure him from a future attack.

Have we not then reason to suspect that these analagous distempers in our domestic animals have *one common origin*, and that they are all derived from the same *original poison*, generated probably in some reptile or insect, that inhabits places, where these animals feed ? That this original poison is varied and modified in each species of animals will be admitted by those, who recollect that small pox poison is even changed in its malignity by passing through the integuments and lymphatics of the human body. But "nothing, to speak with Mr. Aikin, but positive experiment, can give much assistance in an inquiry pursued in a path so little trodden, as that of the particular modifications, which a disease assumes by passing through animals of different species."



APPENDIX.

BIOGRAPHICAL ACCOUNT OF

DR. JENNER.

DR. EDWARD JENNER is the youngest son of the Rev. Stephen Jenner, M. A. of the university of Oxford, rector of Rockhampton, and vicar of Berkley in Gloucestershire ; where the subject of this memoir was born, in 1749.

Independent of church preferment, his father was possessed of considerable landed property in the same county. His mother was the daughter of the Rev. Henry Head, of an ancient and respectable family in Berkshire ; who also once held the living of Berkley, and was at the same time a prebendary of Bristol.

Dr. Jenner had the misfortune to lose his father at a very early period of life ; but this loss, which too frequently prevents the proper cultivation of the mental faculties, was fortunately supplied by the well directed and affectionate attention of his elder brother, the Rev. Stephen Jenner ; who brought him up with a tenderness truly parental. He had another brother, the Rev. Henry Jenner, many years domestic chaplain to the Earl of Aylesbury, and Vicar of Great Bedwin, Wilts ; father of the Rev. George Jenner, and of Mr. Henry Jenner, surgeon of Berkley ; whose names so frequently appear in the history of Vaccine Inoculation.

After receiving a classical education at Cirencester, and learning the rudiments of surgery and pharmacy from Mr. Ludlow of Sodbury, a man of high professional eminence, he was placed under the immediate tuition of the late celebrated

JOHN HUNTER; with whom he lived two years as a *house pupil*.*

In liberal minds a congeniality of talent and pursuits lays the foundation of sincere and lasting friendship. This observation is fully exemplified by that friendship which ever after subsisted between the celebrated preceptor and his pupil. A constant correspondence was kept up between them, which only ceased with the death of the former.

As a proof in what estimation Mr. Hunter held the abilities of Dr. Jenner, we may remark, that he offered him a partnership in his profession, which was extremely valuable. Mr. Hunter was desirous of giving lectures on *natural history* upon an extensive plan; and, justly appreciating the abilities of his pupil Jenner, and his ardour and perseverance in those enquiries, he well knew the ample support he should derive from the acquisition of his talents.

After finishing his studies in London, Dr. Jenner settled at Berkley. His attachment to this situation was so strong, that nothing seemed capable of seducing him from it; neither the offers of a connection with Mr. Hunter, nor the allurements of the Eastern world, though held up to him in the most dazzling point of view, could tempt him to desert it, for no mortal was ever more charmed with the place of his nativity than Dr. Jenner.

He continued the practice of physic and surgery at Berkley, with increasing success and reputation; and, did the limits of our publication permit, we could enumerate many instances of his eminent skill in the healing art, during this period of his life.

From the extent of his practice, his professional duties became extremely laborious; and, as it continued to increase,

* So called in Britain, to distinguish them from ordinary pupils, who attend only the public lectures.

he was under the the necessity of relinquishing the most fatiguing part of his business.

In 1788, Dr. Jenner married Miss Catherine Kingscote, sister to Colonel Robert Kingscote, of Kingscote in Gloucestershire; a family of the highest antiquity and respectability in the county, by whom he has three children, two sons and a daughter.

Having disengaged himself from surgery, he had leisure for the pursuit of other studies more congenial to his mind; physiology, and *natural history*. But, even previously to this event, notwithstanding the pressure of numerous avocations, he frequently found opportunities of indulging his favourite propensity. By the joint aid of actual observation, and apposite conjecture, he completely elucidated a very obscure and much disputed point in ornithology.* The originality of this disquisition excited much attention among naturalists. He was soon after elected a fellow of the Royal Society.

Among other discoveries in the early part of his life, we may notice a mode of producing pure emetic tartar by a new and easy process, which was published in some of the medical journals of that day. We may also refer our readers to a late publication by the ingenious Dr. Parry, of Bath, wherein it appears, that the discovery of the cause of that dreadful malady, the *angina pectoris*, originated with Dr. Jenner.

Strong as was the attachment of Dr. Jenner to his native valley, yet circumstances soon occurred, which rendered his presence in London absolutely necessary. We allude to his most happy discovery of *Vaccine Inoculation*

For the discovery of the divine art of vaccination, we are indebted to a fortunate concurrence of circumstances; talents,

S

* Relative to the *cuckoo*.

education, and situation : to the talents of Dr. Jenner, his education under the celebrated Hunter, and his situation in the vale of Gloucester. His inquiry into the nature of the cow pox commenced about the year 1776. His attention to this singular disease was first excited by observing, that among those whom he inoculated for the small pox, many were insusceptible of that disorder. These persons, he was informed, had undergone the casual cow pox, which had been known in the dairies from time immemorial, and a vague opinion had prevailed, that it was a preventive of the small pox,

Vaccine inoculation is beyond all comparison, the most valuable, and the most important discovery, ever made. It is a discovery, to which even that of Harvey must yield the palm. "It strikes one out of the catalogue of human evils."* It annihilates a disease, which has ever been considered as the most dreadful scourge of mankind.

The mind, satiated and disgusted with the contemplation of the political world, with the revolution of Empires, the inordinate ambition of potentates, the sanguinary deeds of heroes, and the artful machinations of statesmen, turns with pleasure to an object where it can find repose. On such a theme, the pen of panegyric dwells with delight. "Saul may have boasted of his thousands slain, and David of his ten thousands; but the altar of JENNER is not consecrated by hecatombs of the slain; his claim is that of having multiplied the human race, and happily invoked the goddess of health, to arrest the arm that scatters pestilence and death over the creation."†

"Te mater omnis, te lachrymabilis

Accurret uxor, ne caducum

Orba virum, puerosque ploret :

* Jefferson.

† Lettsom.



Seu confluentes forte timet notas

Decora virgo,—tu faciem eripis

Periclitantem, protegisque

Delicias juvenum futuras.”

HORACE.

TRANSLATION.

To thee shall weeping wives and mothers fly,
Or see their husbands and their children die ;
To thee the virgin trust her lovely face,
Or some rude blemish rife ev'ry grace.

Oh, ward the perils that around her wait !
Oh, shield her beauties from impending fate !
Nor let a cruel pestilence destroy,
The hope of youth, and pledge of future joy !

ERRATA. In page 6 line 16 for *annunciation* read *enunciation*. In page 58 line 25 dele *not*, and read, which he who is in the habit.



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