

A practical treatise on vaccina or cowpock / by Samuel Scofield, M.D. ... ; embellished with a coloured engraving, representing a view of the local affection in its different stages.

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A
PRACTICAL
TREATISE
ON
VACCINA OR COWPOCK.

BY SAMUEL SCOFIELD, M. D.

One of the Physicians of the New-York City Dispensary
and First Resident Surgeon of the New-York In-
stitution for the Inoculation of the Cowpock.

EMBELLISHED

WITH

A COLOURED ENGRAVING,

REPRESENTING A VIEW OF THE LOCAL AFFECTION IN
ITS DIFFERENT STAGES.

NEW-YORK:

PRINTED BY SOUTHWICK AND PELSUE,
For Collins & Perkins.

1810.

DISTRICT OF NEW-YORK, ss.

BE IT REMEMBERED, That on the thirteenth day of February, in the thirty-fourth year of the Independence of the United States of America, *Samuel Scofield*, of the said district, hath deposited in this office, the title of a book, the right whereof he claims as author, in words following, to wit: "A Practical Treatise on Vaccina or Cowpock. By SAMUEL SCOFIELD, M. D. one of the Physicians of the New-York City Dispensary and First Resident Surgeon of the New-York Institution for the Inoculation of the Cowpock. Embellished with a coloured engraving, representing a view of the local affection in its different stages."

In conformity to the act of the Congress of the United States, entitled, "An act for the encouragement of learning, by securing the copies of Maps, Charts, and Books, to the authors and proprietors of such copies during the times therein mentioned," and also to an act entitled, "An act supplementary to the act entitled an act for the encouragement of learning, by securing the copies of Maps, Charts and Books, to the authors and proprietors of such copies, during the times therein mentioned, and extending the benefits thereof to the arts of designing, engraving and etching historical and other prints."

CHARLES CLINTON,
Clerk of the District of New-York.

TO

VALENTINE SEAMAN, M. D.

ONE OF THE SURGEONS OF THE NEW-YORK HOS-
PITAL, &C.

MY DEAR SIR,

TO you, who first implanted the germ of vaccination in our metropolis ; who, though assailed by prejudice, ignorance and envy, nobly persevered to establish the reputation of the new inoculation at the hazard of your own ; and who still continue your exertions with undiminished assiduity, to eradicate from the minds of the uninformed those unfortunate prejudices and prepossessions so hostile to the complete adoption of Cowpock ; and which, if per-

mitted to continue, will inevitably preclude the extermination of one of the greatest pests that ever afflicted man, I dedicate the result of my labours.

Should this work be considered by you as possessing a proper share of merit in elucidating the interesting subject upon which it is written, I am not apprehensive but it will receive your patronage ; if not, let it be consigned to oblivion.

Another motive which actuates me in addressing this work to you, is, the pupilage I was so fortunate as to pass under your friendly and instructive guidance, and, be assured, sir, your familiar lectures and well-timed advice will never be forgotten, by

Your Friend,

SAMUEL SCOFIELD.

New-York, Feb. 12, 1810.

EXTRACT OF A LETTER FROM
DOCTOR SEAMAN TO THE AUTHOR.

Dated, 8th mo. 15th, 1809.

“ I HAVE read thy manuscript work on Cowpock, and am particularly pleased with the practical information and instructions which it contains. However physicians may differ in respect to some of the *theoretical* opinions, I am convinced that every experienced vaccinator would consider it a judicious and well-timed practical publication.

“ An attempt so well calculated to arrest the progress of the smallpox, and to ensure the success of vaccination, could not but be productive of public good.

“ Sweet peace be his, who wipes the weeping eye,

“ And dries the tear of sobbing misery !

“ Still higher joys shall to his bosom flow,

“ Who saves the eye from tears, the heart from woe !

“ —A far, far greater honor he secures,

“ Who *stops the coming ill*, than he who cures.”

PREFACE.

FREQUENT solicitations from a number of my medical friends, and repeated applications from practitioners in the country, for my Inaugural Thesis on Cowpock, with which it was impossible for me to furnish them (not having a second copy left) together with a desire to diffuse accurate information upon a subject in which I had taken an early interest, and of extending the benefits of the new inoculation among my fellow citizens, were the motives which influenced me to present the following treatise to the public.

I have devoted much time and attention to the subject of vaccination, which has ever been a favorite one with me, and, for these eight years past, I have made particular observations upon the progress and appearances of the disease. Whenever any deviation has been observed in the character or pathognomonic marks of the vesicle, areola, or process of scabbing, they have been carefully marked down in a book kept for that purpose.

Having taken an active part in the promotion of vaccination, from its first introduction into this city, by having been appointed Resident Surgeon to the original Public Institution established for that purpose, and which, from its being the first, if not the only one ever formed in this country, the Directors may expect some account from me on this subject: the Public, through whose munificence this establishment was supported, are certainly entitled to the result of my observations.

It is not my intention to bewilder the reader in a labyrinth of useless and unnecessary disputes upon the unimportant and collateral points of the subject, or to lead him through volumes of unmeaning pages. My object is, in as brief, plain, and accurate a manner as I can, to lay down such rules as are deemed necessary to enable the physician to impart to his patient, the desirable and lasting benefits of vaccination. I trust that this treatise will be found to contain a clear and concise account of all that is necessary for the *Practical Vaccinator*. Great care has been taken to concentrate all the important facts, and all the improvements that have been lately made, that can be of any practical utility, into this little performance; together with the result of my own observations: accompanied with a print, exhibiting the progress of the affection, from its earliest appear-

ance to the drying of the scab—taken from nature, and coloured from the life.

It has been observed to me by some, that there were already a sufficient number of publications upon this subject, and that so much had already been said, it was impossible to offer any thing new or useful at the present day. As well might they say that the sources of science were exhausted, and that the walks of literature ought to be abandoned, or that it was impossible to make any discoveries in anatomy, or improvements in surgery. It should be remembered that the subject is still a *new* one, and not yet arrived at its full perfection; and one that so closely embraces the dearest interests of society, it scarcely admits of too much investigation. Not a single ray of light that can possibly be thrown on the subject, should we suffer to be lost. With respect to the existing publications on vaccination, those which have lately appeared (and those only are the ones that contain the most important improvements in the art) are so voluminous and expensive as to preclude a great proportion of practitioners from being benefited by them.

We have long been in want of a treatise of this kind in America: whether I have succeeded in the attempt, I will leave to a candid and enlightened

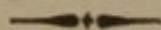
public. If I have, I shall be gratified in having contributed, in some degree, to the benefit of humanity; if not, I shall at least console myself with the reflection of having done my endeavours.

To the country practitioner, far removed from the source of information, not having it in his power to procure European publications, and which, if he even possessed, he would be destitute of time, probably, to peruse them; a work of this kind must be peculiarly acceptable: For, I will venture to assert, that no physician, however well qualified he may otherwise be in the duties of his profession, is competent, without proper instruction, to conduct vaccine inoculation with judgment, or success. Should it be asked from whence do *city practitioners* gain their knowledge, my answer is, from their advantage of mutual intercourse, free communication of sentiment, and interchange of ideas with each other; besides the opportunity of perusing the many publications on the subject which are not in general circulation in the country, particularly those of the distinguished JENNER, whose just fame will descend in the tide of time to the latest ages.

“ Oh! while adown the stream of life thy name
“ Expanded flies, and gathers all its fame—
“ Say, shall my little bark attendant sail,
“ Pursue the triumph, and partake the gale!”

The first vaccinator, Doctor Jenner, has laid down *radical precepts*, which may admit of *collateral improvement*, but *no change* from their *original import*. The way being once opened, improvement is a necessary consequence, and frequently progresses to such a height as to claim almost equal merit with the original discovery. This consideration, should, therefore, stimulate every vaccinator to investigate, with the most scrupulous and minute attention, this truly interesting subject. Who knows but in America it may be discovered that cowpock is an effectual antidote to some other disease, next to smallpox, the most fatal on the catalogue of human maladies? Perhaps, in this Western Hemisphere, there exists a malady, whose morbid secretion may arrest the rude blasts of pestilence, or check the direful ravages of phthisis pulmonalis!

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CONCLUSION

THE

A PRACTICAL TREATISE
ON
VACCINA OR COWPOCK.

CHAPTER I.

OF THE ORIGIN AND PROGRESS OF VACCINA-
TION AND THE ORIGIN OF VACCINA.

SECTION I.

Of the Origin and Progress of Vaccination.

THE annals of history do not present to us a discovery of equal importance with that of Vaccination. It is not only intimately connected with the interests and policy of states and empires, but involves, in its consequences, the health and happiness of the whole human race.

Eleven years have now elapsed since the world was put in possession of this inestimable blessing, by the accurate and indefatigable JENNER; a name, that must be recorded

high on the list of the exalted and distinguished benefactors of mankind; a name, that will be endeared to all posterity.

Notwithstanding the era of this great and ever-memorable improvement in the science of medicine is of so recent a date, its existence in the cow, and its capability of being communicated from the cow to the human subject, has been known in some of the dairy countries of Europe, from time immemorial. Those persons to whom were committed the affairs of the dairy, in these countries, were known frequently to contract disagreeable and troublesome sores from milking such cows as were labouring under this complaint; manifesting themselves upon such parts as were most exposed to the infection, as the hands and wrists. During the continuance of these, more or less fever supervened in *all* cases. Unless the person had previously passed through the disease. The complaint, thus communicated, passed through its several stages with great regularity, and the person was left in a state *ever after* unsusceptible of smallpox, either

by inoculation or contagion. The truth of this is confirmed by the experience of ages : but, unfortunately for humanity, this knowledge was principally confined to the proprietors and domestics of the dairy ; they being aware, that the prevalence of this disease among their cows, if publicly known, would greatly depreciate the value of their produce.

Doctor Jenner, who resided at Berkley, in Gloucestershire, at length, from finding it utterly impracticable to communicate the variolous infection to such of his patients as were known to have experienced the effects of cowpock, was induced to investigate the affair, and by a series of accurate and impartial experiments in transmitting the virus from the cow to the human subject, evinced, beyond a possibility of doubt, that the disease thus induced was equally effectual in securing the constitution from the variolous complaint as that communicated immediately from the cow by milking, and further, he discovered, that the virus sustained no diminution of its prophylactic virtue from having been regenerated

by *human* organic action. A number of years experience now fully warrants the belief, that through this medium the infection may be handed down to the latest posterity in an undegenerated state ; thus, even exceeding Dr. Jenner's most sanguine hopes ; and, contrary to the opinion he first entertained, will supersede the necessity, of having frequent recourse to the original stock, in order to keep up a supply of the genuine infection.

In the year 1798, Dr. Jenner published an account of this most extraordinary affection, entitled " An Inquiry into the causes and effects of Variola Vaccina," &c. which naturally excited a great degree of astonishment among all classes, more particularly those of the faculty. Many doubted the validity of his position, and some, among the latter, even opposed it by publications ; and, to the disgrace of the profession, *some few* are possessed of sufficient effrontery still to persist in their error. This arises either from interested motives or from want of proper information on the subject ; if from the

latter, it may be, in some cases, excusable; but I am fearful it too often has its origin in the former of these circumstances; as no physician of observation and candour, after having had, even a small degree of experience in conducting the new inoculation, can pretend to deny its efficacy: and, base indeed must be the man who would act contrary to his own conscience in a subject so closely connected with the dearest interests and welfare of humanity.

Shortly after Dr. Jenner's publication, viz. in November, 1798, Dr. Pearson, of London, published a treatise on the subject, entitled "An Inquiry into the history of Cowpox, with a view to supersede and extinguish the SMALLPOX." In this treatise, Dr. Pearson investigates the subject with ability and candour, and adduces many cases and facts in support of Dr. Jenner's discovery.

In May, 1799, Dr. Woodville published his "Reports concerning a Series of Inoculations," &c. in which he maintains that the substitution of vaccina in place of smallpox would be of little or no advantage to man-

kind, as it was in many cases attended with eruptions not inferior in severity to those arising from variolous inoculation. The reader must immediately perceive the error which this gentleman has fallen into with regard to eruptions being an effect of cow-pock in the inoculated form, it never being accompanied with *any* except at the place of inoculation. Dr. Woodville performed the inoculations from whence these cases originated in an hospital appropriated for variolous inoculation. In such a place the atmosphere must necessarily have been surcharged with smallpox infection, and the bedding, with every other article of furniture of such an establishment, must have been loaded with variolous effluvia; hence the eruptions are easily accounted for, as a person is susceptible of vaccine impression, notwithstanding he may, at the time of vaccination, have the infection of the smallpox in his system, or even have passed through that disease.

Many have since written on the subject in England, as Aikin, Ring, Willan, Bryce,

Bell, &c. In America, many detached pieces have been published, but no regular treatise, except Cox's of Philadelphia, has as yet appeared. A perusal of the abovementioned authors will afford much information and instruction in conducting vaccine inoculation, particularly the publication of Mr. Bryce, as it affords a test of the *constitutional* affection of vaccina, an occurrence of which is *absolutely* necessary, in order to secure the system against the ravages of small-pox. This subject will meet with more particular attention in the course of the succeeding observations.

The cowpock inoculation has been practised in every quarter of the globe, and we have the most unquestionable authority of its having answered every expectation that has been formed of it. In the West-Indies I have witnessed the most salutary effects from it in preserving the blacks from small-pox, which so frequently commits the most terrible ravages in tropical climates. It has received the patronage of every government under whose cognizance it has come, and in

many countries, as America, Great-Britain, France, Italy, and several others, institutions have been established for the gratuitous inoculation of the poor.

For its introduction into this city, we are indebted to the persevering and philanthropic exertions of Doctor Valentine Seaman, who, on the 22d of May, 1801, procured virus from the arm of Governor Sargeant's domestic, who was vaccinated in Boston, by Doctor Benjamin Waterhouse, and fortunately arrived here at the proper period for procuring the virus. With this infection he inoculated several, and was happy enough to communicate the genuine affection. There had been virus received in this city during the preceding winter, but unfortunately, it gave rise to a spurious disease.

In January, 1802, an institution was established in this city for the purpose of vaccinating the poor gratis, and of keeping up a constant supply of the genuine matter.—To this establishment the author of the present treatise was appointed Resident Surgeon, and from the duties which devolved

upon him in that station, had an opportunity of gaining an early acquaintance with the peculiar marks and character of the disease. This institution has since been connected with the New-York City Dispensary, and a physician is appointed for the express purpose of vaccinating such as may apply for that purpose. Notwithstanding the many unfounded reports still in circulation, fabricated, in most instances, for the sole purpose of retarding the progress of this invaluable discovery ; the applicants for the last six months have been very numerous.

At the request of the Medical Board, previously to retiring from the Institution, I selected a number from among the first who had been vaccinated, for the purpose of testing them with variolous infection. This was done by introducing the fluid matter of small-pox into both arms of each of them. On the third day from inoculation the patients were examined, and, with one or two exceptions, the virus appeared to have taken effect ; by the sixth day, however, the inflammation surrounding the punctures had entirely subsid-

ed, and not the least symptom of fever or eruption ever occurred in either of them.

From late accounts we are informed that the cowpock has been received in the East-Indies with the greatest enthusiasm, and many millions are said to have been already vaccinated. It seems that the Bramins pretend to have had a knowledge of the prophylactic powers of cowpock, and of vaccination, anterior to that of Jenner. It is supposed by Mr. Shoolbread, however, to be an imposition, calculated with a view of supporting their claim to a prior acquaintance with all useful knowledge in science and philosophy; and to rest merely upon the authority of an interpolated passage in a Shanscrit book. In Bombay the smallpox is said to be totally extirpated. In Ceylon it is so far subdued that the smallpox-hospital has been given up to the army. A general vaccination has taken place in the immense city of Canton, and so well convinced are its cautious and suspicious inhabitants of the prophylactic properties of the vaccine disease, that a very large sum has been raised by public subscription for the

purpose of establishing an institution, in order to disseminate its happy effects throughout the vast and populous empire of China. In Madrass, according to the last accounts, 216,000 had been vaccinated, and in the island of Ceylon 26,000.

In Swedish Pomerania the number that have smallpox since the substitution of *vaccina*, is, to those who had it previous to that period, only in the proportion of one to fourteen. It will be found, by an examination of the bills of mortality, for the city of Vienna, for ten years immediately preceding the introduction of vaccination, which was in 1801, that the average number of deaths from smallpox were 835, annually. From this period to 1802, only 164 died with this disease; in 1802, only 61; 1803, 27, and in 1804, out of 14,000 deaths, there were but two occasioned by smallpox! Since which, Dr. De Carro informs us, that smallpox is utterly unknown among the inhabitants of that extensive and populous city, and that it is considered by them as completely exterminated.

“ During the fifteen years immediately preceding the introduction of the vaccine disease into the city of New-York, it appears, by a regular record preserved by the sexton, that 5,756 persons were interred in the cemeteries of St. Paul’s and Trinity, of whom 610, which is upwards of a tenth part of the whole number, had died under the immediate operation of the smallpox. From the public obituary, since established by the corporation, we find that in the years 1805 and 1806, 4,595 persons have died in this city ; 110 only, which is less than one fortieth part, was by the smallpox ; whence it may be fairly inferred, that, during the two last years, the practice of vaccination has preserved 376 of our fellow-citizens from falling victims to that most loathsome of all human maladies, while itself does not form a single item in the bills of mortality.”*

Vaccination has become so general in Copenhagen, that the bills of mortality re-

* See Dr. Seaman’s Report to the Trustees of the New-York City Dispensary, vol. 4th, 2d Hex. p. 431 of Med. Repos.

turn none as dying with smallpox ; and his Danish Majesty, being so well convinced of the antivariolous quality of cowpock, has passed an edict, prohibiting variolous inoculation, not only in his kingdom, but in all his colonies. The discovery is considered by the inhabitants of Santa-Croix, where the smallpox frequently rages with great calamity, as the greatest blessing ever bestowed on man.

Vaccination was introduced into the city of Moscow, in 1801, at the time the Russian court was there. In such high estimation did the empress hold the discovery, that she named the first child that was inoculated *Vaccinoff*. The University of Wilna, in Russia, in 1804, entertaining a proper estimation of the discoverer, elected Dr. Jenner an honorary member.

Cowpock has already penetrated the interior of Hindostan. The royal family in the city of Delhi, were the first who experienced its salutary influence. It was introduced into the palace by a Mr. Reid, in 1805, who performed the first inoculation upon

Mirza Selim, the son of Acbar Shah, the king's eldest son, and the second, upon one of the young princesses. The smallpox is naturally very fatal in this country, and it appears that inoculation for that disease is totally unknown.

In the Ottoman empire vaccination has been adopted, and is practised with the utmost confidence and success.

In the year 13 of the republic, 40,000 were vaccinated in the French dominions, and the government has adopted the most effectual methods to disseminate the blessing, with a view of totally eradicating the smallpox.

Its salutary influence has long since pervaded the most remote corner of the United States, and is now adopted by all the better informed part of the community; a few only, among the ignorant, still entertain their prejudice. The smallpox raged with considerable violence in this city during the last winter, but only among the poor; and proved fatal to numbers. Being one of the physicians of the City Dispensary, a number of cases came under my care. I took particular pains to trace them to their

source, and, as far as I could ascertain, they originated, generally, from inoculations performed in the neighbourhood. Does not this serious fact demand municipal or legislative interference?

By various accounts I understand that the Indians, bordering on our frontiers, have unanimously adopted vaccination.

In 1803 the Spanish government fitted out an expedition, attended with a vast expense, for the sole purpose of conveying the benefits of vaccination to their colonies in the East-Indies and South-America. It sailed from Corunna, in November, of that year, and after having conferred the blessing upon their friends in the East, proceeded to South-America, where they were happy enough to effect its introduction into the provinces of Mexico and Peru. These vast and beautiful regions, where nature is forever blooming and forever new, were, previous to the preventive career of cowpock, annually desolated by that most cruel enemy of humanity, the smallpox. Since this period the deaths occasioned by the smallpox

are diminished in the proportion of nine to one. To this unhappy and oppressed country, which is the best ever bestowed by bounteous Providence on man, the introduction of vaccine inoculation forms a glorious and never fading era. Here, the poor Indian, with smallpox, exposed to the influence of a tropical sun, unacquainted with the means of soothing the morbid agitations of his system, which pervade with increasing violence the minutest fibre and contaminate the purple tide of life, with the most loathsome of poisons; in unavailing and heart-rending groans and writhings, sinks into the bosom of his beloved Inca!

SECTION II.

Of the Origin of Vaccina.

IT is the opinion of Dr. Jenner, and others, that this disease derives its origin from the horse. This hypothesis, from its singularity and its importance to society, deserves the most particular and scrupulous in-

vestigation. The horse is known to be subject to an inflammatory affection of the heel, accompanied with fissures or cracks, from which issues a limpid and transparent fluid, possessing properties of a very peculiar nature. This affection varies in its symptoms and appearance, and accordingly is divided by veterinary surgeons into *scratches* and *grease*. Dr. Jenner is of opinion that the virus of the latter of these gave rise to the cowpock. He says this fluid finds a communication to the cow through the medium of male domestics; who, after having been engaged in dressing the heels of a horse, labouring under this disease, without paying proper attention to cleanliness, incautiously bear their part in milking the cows, and from some of the infectious matter adhering to their hands convey it to the teats of this animal.

In my Inaugural Thesis, which was published in 1803, I went to some length, in order to disprove this theory. It is there stated, that neither Dr. Jenner, or any of the advocates of this theory have, after repeated

experiments, been enabled to produce a disease that was capable of securing the system against variolous impression, either with matter taken directly from the heels of the horse, or after it had experienced that peculiar modification in the system of the cow, which, by this gentleman, is considered so essentially requisite, in order that it should possess the property of completely securing the system against the infection of smallpox. And also, that the disease had been discovered on the teats of American cows, and in several countries of Europe, as Lombardy, the Dutchy of Holstein, Ireland, &c.

In these countries it is well known that the horses and cows are not attended to by the same persons. In Ireland, where the cowpock has existed from time immemorial, it is even considered a disgrace for a man to milk the cows. In corroboration of this I shall cite an anecdote, which Mr. Ring, in his treatise on the cowpock, informs us was related to him by Dr. Jenner himself: "Two peasants who lived on a nobleman's estate in Ireland, having been compelled to milk

the cows in the park, were considered as utterly unfit for all society. Had they committed murder they might have found some kind friend to speak to them and associate with them, but they had been guilty of a much greater crime, that of *milking cows*."

One of Dr. Jenner's principal arguments in support of his hypothesis, is, the "total absence of the disease" as he supposes "in Ireland and Scotland." It appears that the above anecdote was communicated to Mr. Ring by our author, previous to his knowledge of the existence of the disease in that country. Since which, we are informed, by persons of the most undoubted veracity, that the disease has existed in these countries for a great length of time. It has long been considered in Ireland among the common people, as a certain preventative of smallpox, and instances are on record, of persons voluntarily giving themselves the disease from a conviction that it would shield their system from the ravages of this most terrible malady.

The origin of Cowpock is a subject, admitting of a great latitude of theoretical discussion, but owing to the bounds which I have prescribed to myself in the present treatise, I am precluded from investigating it with minuteness. If, however, we can place confidence in the most recent information, the identity of the virus of these diseases seems pretty well established. It is said that Dr. Sacco, of Milan, procured some infection from the heel of a gentleman's coach horse labouring under *scratches*, with which he succeeded in exciting a disease in the human constitution exactly resembling the cowpock, not only as respects its peculiar character, but also in protecting the system against the ravages of variolous poison. Dr. Sacco afterwards transmitted matter taken directly from the heels of a horse, to Dr. De Carro, of Vienna, and to Dr. Friese, director of vaccine inoculation in Silesia. Both of these gentlemen, it seems, were equally successful in producing the disease, with this virus, as Dr. Sacco had been; and it is now stated that

they inoculate with vaccine and equine virus indiscriminately.

If this be the fact, in case a failure of virus should ever occur, either in the cow or human subject, recourse may be had to the horse. I should hesitate, however, except we should be reduced to this situation, to make use of equine matter. For, notwithstanding it may give rise to a pisease resembling in appearance and symptoms, that induced by the vaccine, it may, nevertheless, not be possessed of its permanent prophylactic virtues. We have cases on record of persons, who from twenty to sixty years, after having been affected with the casual cowpock, have resisted every attempt to communicate smallpox to them, either by inoculation or exposure; but no such cases can be cited in regard to the effects of equina.*

* This is a term of my own coining, and I hope I shall be excused for making use of it, as I think it essential that the disease produced by this virus should not be confounded with that arising from the vaccine.

As there is such an abundant supply of vaccine infection, and as this will probably never be exhausted, I consider it much more prudent for physicians to keep on the safe side and confine themselves *altogether* to vaccine inoculation. I have no hesitation in acknowledging that experiments with the equine virus might tend very much to elucidate the subject of vaccination. But should we in conducting these experiments, give, even to one of our patients, a false security, and he should afterwards fall a victim to the variolous contagion, with what unceasing and unavailing regret should we reflect on our credulity and folly.

CHAPTER II.

DESCRIPTION OF THE CASUAL AND INOCULATED
COWPOCK, TOGETHER WITH ITS ANOMALIES,
AND AN ACCOUNT OF THE SPURIOUS DIS-
EASE.

SECTION I.

Description of the Casual Cowpock.

THIS disease makes its appearance on the teats and udder of the cow in the spring of the year. According to Dr. Jenner, when one cow becomes affected with it, it soon spreads through the whole farm, not by any contagious effluvia which arise from the vesicles, but from the matter being conveyed, by the hands of the milkers, from one cow to another: and all those concerned in milking generally suffer, more or less, notwithstanding they may have previously passed through the disease.

When it is first observed in this animal it is in the form of small vesicles; these shortly

enlarge, and in the course of their progress are surrounded by a tumid inflammatory affection, which appears to be of the erysipelatous kind. The vesicles are characterized and happily distinguished from all other eruptive complaints to which this animal is subject, by their bluish or livid colour. If proper caution is not used in the treatment of these eruptions, they frequently end in a foul and disagreeable phagedenic ulcer. The Cow-Doctors cure these ulcers by the application of strong escharotics. The animal, during the progress of these vesicles, is generally indisposed, if it be the first attack. They lose their appetite, and there is a considerable diminution in the secretion of milk.

Virus, issuing from these vesicles, by coming in contact with the hands of the domestics of the dairy, give rise to a similar eruption, manifesting itself, more particularly, about the joints of the hands, and at the ends of the fingers. This is what has been denominated Casual Cowpox ; and is

universally more severe than the inoculated form.

The severity of casual cowpox is owing in the first place, to the number of vesicles, and secondly, to the membranous and ligamentous nature of the parts affected. The inoculated form consists of only one pock, and affects principally the cellular substance, it being generally inserted into the arm about midway between the shoulder and joint of the elbow, immediately over the insertion of the deltoid muscle, at which place there is always a considerable body of cellular substance.

During the progress of the casual vesicles the person is affected with a considerable degree of fever, which, for the reasons above-mentioned, is universally more severe than that accompanying the disease by vaccination. Neither do these vesicles dry away and heal so kindly as those from inoculation; but frequently end in disagreeable and troublesome sores. Smallpox does not *exempt* a person either from the *casual* or from the *inoculated* cowpock: at least, it does not exempt them from the local effects of the disease, in

all cases; indeed, instances have occurred where persons, after *vaccination*, have had the local complaint again excited, by an introduction of the active virus. But all these instances, either after smallpox or cowpock, are, most probably, merely local affections only, similar to the local complaint from smallpox inoculation, performed upon a person after having had that or the vaccine disease.

SECTION II.

Of the principal Discriminating and Characteristic Marks and Symptoms of the Inoculated Vaccina.

THIS disease, when induced by vaccination, very much resembles, in its commencement, the smallpox by inoculation. At the end of the second or beginning of the third day, (*i. e.* forty-eight or fifty hours from the time of introducing the virus,) if the operation has been successful, a small speck of inflammation generally manifests itself at the place of inoculation. This, gradually and

uniformly increasing, in the course of the third day, for the most part, becomes much more conspicuous, and generally, by the commencement of the fourth, we may discover by the touch, a minute pimple elevating itself somewhat above the common surface of the skin; with a slight inflammation circumscribing its base. *See the Plate, figure 1.*

From this time it gradually increases in magnitude, and by the termination of the fifth, or beginning of the sixth day, begins to assume that characteristic and specific appearance, which, to the experienced eye, so obviously and so happily distinguishes it from the inoculation of that terrible malady, the smallpox. The reader, by referring to the second figure of the plate, will be enabled to form a tolerably correct idea of its appearance at this stage, provided its progress has been natural.

These criteria, however, cannot in every case, as early as the fifth or sixth day, be so clearly discerned by the naked eye. Hence some vaccinators use magnifying glasses in

examining the early stages of cowpock. The peculiar visible features of *vaccina* consist principally in the perfectly regular margin, and beautifully circumscribed form of the vesicle; having its surface much flattened, with an evident and remarkable depression in its centre, of a darkish colour, giving it the appearance and form of elevated edges. This depression is occasioned by the cuticle still adhering, in that spot, to the true skin, underneath, exhibiting, in many instances, a peculiar radiated appearance very similar to the fractured end of a piece of lunar caustic.

Contrary to this, the smallpox pustule, by the fifth or sixth day, begins to assume an irregular angulated margin, and is altogether destitute of the flattened surface and central depression, which so peculiarly distinguishes the genuine cowpock vesicle. What more certainly, if possible, discriminates the vaccine from the variolous pock, is, that the former appears to be an entire congeries of small vesiculæ or cells, so that to exhaust the common vesicle completely of its contents, it would be necessary to puncture each one of

these vesiculæ ; and after having exhausted it as far as we are capable of, its magnitude seems very little diminished ; whereas, the pustule of smallpox, consists merely of one common cavity ; and upon making a single puncture into it, the contents are immediately and entirely exhausted, leaving no trace of its existence, except the flaccid and relaxed cuticle, which had previously served to contain the matter.

An invariable circumstance, which is entitled to particular notice, as a discriminating mark of the genuine affection, is, that the circumscribed appearance and regular margin are evident in all the latter stages of the vesicle, even in the process of scabbing : while the smallpox pustule, in contra-distinction, becomes daily more and more irregular, in consequence of the confluence of the circumjacent pustules.

About the fifth or sixth day, as before mentioned, and in some instances, as early as the fourth, the inoculated part begins to change from the red pimple, assuming a ve-

siculated appearance, containing a fluid, the colour of which, through the cuticle, very much resembles that of whey, being of a perfectly limpid consistence and very transparent. These qualities of the virus, however, are apt, from certain causes, to undergo a considerable change, which we shall hereafter have occasion to mention. It is at this period the virus possesses its greatest activity, and, provided it can be obtained in sufficient quantity, is most suitable for the purposes of vaccination: though, from the sixth day to the tenth, is laid down by Dr. Jenner, as the most proper time for procuring it. During the time that intervenes between these two periods the vesicle is greatly augmented, so much so by the tenth day, in some strongly marked cases, as to equal nearly the size of a half-dime; it, however, does not generally exceed that represented on the annexed print. The surface of the pock, at the same time, becoming much more evidently flattened in proportion as it increases; so that frequently, in a vesicle of the above dimensions its elevation above the

surface of the surrounding skin will scarcely equal the one twelfth of an inch. The vaccine vesicle is always destitute of that plump rotundity which is so invariable an attendant upon the variolous pustule.

From the seventh to the ninth day, sometimes a little earlier or later, according to circumstances, the local affection having obtained its acme, the constitutional symptoms begin to manifest themselves; first, by pain in the inoculated part, extending itself towards the axilla, the glands of which now become swelled and painful when making any exertion with the arm. These symptoms having extended themselves thus far, the whole system begins now to participate in the affection, by association with the local part; as is evinced by the succeeding languor, drowsiness, head-ache, flushes of heat, pain of the limbs and back, loss of appetite, nausea and sometimes vomiting; a degree of increased fullness and preternatural frequency of the pulse, thirst, white tongue, and, in short, all the symptoms of fever. It is not, however, to be supposed that these

symptoms discover themselves in every case; on the contrary, it frequently happens that we are unable to discover the least constitutional indisposition. Some of these symptoms, however, for the most part make their appearance, continuing from a few hours to a day or more, according to the constitution of the patient, together with other collateral circumstances; then subsiding spontaneously without any evident crisis or disagreeable consequence.

The slight marginal inflammation, which has remained permanent from the commencement of the vesicle, begins, about the eighth or ninth day, sometimes a little earlier or later, to extend itself, very moderately affecting the surrounding parts, till the tenth or eleventh, when its increase becomes much more rapid, diffusing itself, generally, about an inch from the vesicle; in some instances, its extent is two or three inches from its source, and sometimes, again, though rarely, as high as the shoulder and as low down as the elbow. This, it is, that constitutes the *efflorescence* or *areola*, so much spo-

ken of by authors ; and by many is considered as a *pathognomonic* symptom of the complaint. Figure 4th of the plate, presents a view of the same.

From the commencement of the areola the central depression in the vesicle begins to assume a darker appearance ; which, extending itself towards the circumference, completes, in the course of four or five days, that dark mahogany coloured scab so peculiarly characteristic of the disease, and is well represented by figure 6th of the prefixed plate. This scab, if it be minutely examined, in the first stages of its formation, will be found to exhibit, more evidently, the stellated appearance before remarked of the vesicle ; having a number of small lines like radii shooting out from the centre to the circumference, generally in a curvilinear direction, with a corresponding number of little sulcii or furrows. From the commencement of the scabbing process to its completion, the scab passes through all the different grades of colour, from a light brown to that of a dark mahogany ;

assuming, finally, very much the colour and form of a tamarind stone. Towards the latter stages it becomes very thick and heavy, and daily increasing in the intensity of its colour; and gradually detaching itself at its circumference, from the surrounding parts, adheres, at length, by nothing but its centre, falling off eventually, though at different periods of time, generally in three or four weeks from the time of inoculation. It leaves no trace of its existence behind, except a slight pit or depression in the cuticle which is peculiarly characteristic of the preceding affection. This circumstance shall be more particularly noticed in the succeeding paragraph. The last figure in the plate affords an accurate view of the scab, in its latter stages.

The cicatrix, subsequent to vaccine inoculation is specific, and peculiar to itself. It is a circumstance which I have universally noticed, that the scar of vaccina manifests a number of small indentations or inequalities of surface, corresponding, perhaps,

with the number of vesiculæ that had constituted the preceding vesicle. This is certainly very different from the smooth polished scars consequent upon variolous inoculation: and, to the experienced and accurate practitioner, will afford a good test whereby to discriminate between the vaccine and variolous cicatrix. For this, I have no authority but my own observation; but any one who will pay proper attention to the subject, must be convinced of its correctness.

Thus does the cowpock vesicle, as it has occurred to me, complete its several stages. Some varieties, however, remain to be mentioned, which I shall proceed to treat of in the following sections.

SECTION III.

Of the Anomalies of Cowpock.

IT sometimes happens, that either from some peculiar change in the qualities of the

virus used for inoculation, or from some specific disposition of habit, the vaccine vesicle varies, not only in respect to its progress, but also in its appearances. These varieties resolve themselves, principally, into the three following heads :

1. In regard to the progress and appearances of the *vesicle*.

2. In relation to the *areola* or *efflorescence* : and,

3. As respects the *scabbing process*.

The vesicle of cowpock, as above mentioned, notwithstanding the utmost precaution is used in performing the inoculation, and in selecting the virus for that purpose, will sometimes deviate considerably from its natural appearances, as described in the preceding section. And the virus, in some instances, after its introduction, does not produce any evident change in the part for a number of days, being apparently in a dormant state ; when, either from a second inoculation, or some other cause, it becomes

roused into action and proceeds through its regular stages, assuming its natural appearances throughout its progress, but is always more rapid than usual. I have known infection to remain in this inactive state for ten or fifteen days. Several instances of this nature occurred during my residence at the "New-York Institution for the Inoculation of the Cowpock," and one or two have since taken place in my private practice. The following case, though not exactly similar, occurred in the practice of a physician of this city, and, from its singularity, may be well worth noticing.

The virus in this case, after its introduction had lain in an inactive state for several days; when, from a second inoculation with variolous infection, near the place where the vaccine had been inserted, it was excited into action, and passed regularly through its several stages; entirely superseding the effects of the smallpox inoculation, although the latter had made some considerable progress. This person had been repeatedly vaccinated by Dr. Waterhouse, of Cam-

bridge College, and by him was considered as unsusceptible of the disease.

The above instance affords direct proof against the tendency of the two diseases to hybridize, a theory, which has been maintained by many. I believe it impossible for two general diseases to exist at the same time in the same person. The vesicle of cowpock may, indeed, proceed with much regularity, notwithstanding a person, at the time, has variolous infection in his system, but no constitutional affection will ever take place from the former, if that of the latter commences first; but the vesicle will dry away very soon, without the occurrence of any general affection. The smallpox, although it does not totally eradicate from the system, its susceptibility of cowpock, it is very much diminished by its influence.

In many instances the vesicle is very tardy in its progress and does not arrive at maturity till the twelfth or fifteenth day; it being very obvious, at the same time, that the operation had succeeded at the time the virus was inserted. At other times again, the

vesicle is premature, acquiring its acme as early as the sixth or seventh day, with a formation of its areola proportionably soon. I have obtained matter from a vesicle which answered every purpose of inoculation, as early as the fourth day.

The vesicle very often varies in respect to its size ; it is, generally, about as large as the one represented in the plate. I have seen them, however, fully equal to that of a half-dime : and in some cases, so small as hardly to exceed the one-eighth of an inch in diameter. Indeed, the pock varies more in respect to its size than in any other circumstance.

Notwithstanding all these varieties in progress and magnitude, the vesicle, if genuine, still preserves its central depression, circular form, regular margin ; and, in short, every characteristic and specific appearance. These, however, may also vary, and are much more strongly marked in some than in others. Does this fact and the largeness of the vesicle depend on the strength and vigour of the patient, or are they to be attributed to a

different species of the disease? Most probably, they are owing to the latter circumstance. Mr. Adams enumerates several species of the smallpox; and, perhaps, this is the case in cowpock; but not having paid sufficient attention to the subject, I am unable to determine.

Some few cases I have observed, in which from one to two or three pock made their appearance, generally, however, in the vicinity of the original one; and exactly resembling it in every circumstance, except that their progress was more rapid. This is by no means a common occurrence; and when such pock do appear, they are, in all probability, induced by the patient's infecting the part with his nails, after having loaded them with virus from the original pock. From the itching which accompanies the local affection, persons, particularly children, are apt to break the vesicle by scratching.

It must be evident, from what has been said, that the vesicle is subject to great variation, especially as regards its progress;

and therefore, that no *specific* time can be fixed upon for procuring the virus. I have obtained it as early as the fourth day, or within ninety-six hours from the time of inoculation. In other cases, I have found it impracticable till the twelfth or fifteenth day.

2. The efflorescence, as mentioned in the preceding pages, does not commence till the ninth or tenth day. In some instances it will begin as early as the fifth or sixth; and in other cases, again, it has not made its appearance till the fourteenth or sixteenth day; and sometimes not at all. A few weeks since, I vaccinated a child who had a most perfectly regular and beautiful pock, but no efflorescence ever made its appearance. On the fifth or sixth day after the operation was performed, I was called to the child and found it to be labouring under a very hot fever, for which I prescribed hydrarg. mur. mit. gr. 5, and pulv. jallap. convolv. gr. 8, to be taken at a dose, which operated well, and in the morning when I visited her, she was free from fever, which did not afterwards return. The child was teething, and to this

cause I attributed the supervention of fever, as it occurred at too early a stage to have originated from vaccina. Was the areola prevented from taking place from this occurrence of fever? Or rather, was it one of those cases in which the areola never appears? Having considerable doubt whether the child ever had any constitutional affection, I shall, at some convenient period, reinoculate her.*

It has been previously observed, that the efflorescence, after its commencement, advanced very rapidly to its height, from which it soon began gradually to decline, first at its circumference, and in the course of two or three days, at farthest, it was entirely gone, succeeded, generally, by a desquamation of the cuticle. Frequently, however,

* We never should consider our patient as secure against variolous infection, if the efflorescence does not take place during the progress of the vesicle. It is probably owing to some morbid action of the system, and the person should always be revaccinated at some future period.

instead of subsiding first at its circumference, it commences around the *base* of the vesicle ; leaving between this and the circumference of the areola, a space of uninflamed surface, which, gradually advancing towards the confines of the efflorescence, gives to this last the appearance of an inflamed ring, which also disappears in the usual time. At other times, the areola subsides in such a manner as to leave a circumscribed inflammation immediately around the base of the vesicle, and an inflamed circle without, so as to constitute a complete external and internal areola.

As the efflorescence differs in respect to its time of commencement and mode of declension, so also does it vary in its appearances when formed. I have stated above, that it was naturally circumscribed and limited in its extent, and uniform in its colour from the vesicle to its border ; these characters, however, are sometimes varied, and the areola, instead of exhibiting this circumscribed and limited extent, assumes a stellated appearance ; not having its inflammation

uniformly diffused, even within its boundaries, but exhibiting alternately, a streak of inflamed and a streak of uninflamed surface, shooting out from the vesicle, and exhibiting no definite boundary.

The efflorescence varies also in point of duration. Its usual time of continuance being from twenty-four to seventy-two hours, but frequently, either from mechanical irritation, or the natural tendency of the disease, it continues a much longer time.

It also varies as to its intensity of colour, being naturally that of a rose-pink, in some cases, the colour of the pink only, manifests itself, and in others, it is a dark vermillion.

Having mentioned the varieties that are occasionally manifested in the vesicle and efflorescence, let us proceed to notice some of the most prominent that occur in the process of scabbing, which forms the third and last division, of the anomalous appearances of the local affection.

3. The change of colour which is to be observed in the centre of the vesicle, about the close of the tenth day, indicates the com-

mencement of this process, and extends itself over the whole surface of the vesicle in the course of two or three days. The pock at the same time gradually hardening, the scab, for the most part, is completely formed in twelve or fourteen days from the time of vaccination; after which it begins gradually to detach itself from the skin, first at its circumference; and in the course of six or eight days falls off, leaving behind a scar peculiar to itself, as above described, highly characteristic of the preceding affection.

The formation of the scab, sometimes, instead of commencing at the period mentioned in the preceding paragraph, begins at a much earlier day, and in other instances the process is protracted far beyond its usual time. It has, indeed, been known to commence as early as the *sixth* or *seventh* day, and complete its course proportionably soon. In other cases it has not commenced till the *seventeenth* or *eighteenth* day; though, in such cases, it has been observed to advance to a state of maturity in a shorter period

than when it has commenced at the regular time.

As to the colour of the scab, in genuine vaccina, it seldom varies, assuming, almost universally, that dark brown, chesnut, or mahogany coloured appearance, heretofore mentioned, exhibiting a smoothly polished and glossy surface. In the dark skin of the African I have observed the colour to be more intense than in the European, being influenced, probably, by the colour of the rete-mucosum. The other characters of the affection exhibited by the former, correspond with those of the latter, except the areola, which is naturally invisible, from the cause just mentioned. Its existence, nevertheless, is fully evinced by that tumid hardness which is so invariable a concomitant of this local inflammation.

Having now, as far as my observation has extended, accurately delineated the natural appearances of genuine vaccina, and with as much precision as I could, trace it through its different anomalies, I proceed to mention

some of the most obvious and discriminating characters of the *spurious* complaint.

SECTION IV.

Description of the Spurious Cowpock.

WHEN a deterioration of the natural and inherent properties of the genuine virus has taken place, whether, while existing in the vesicle or from mismanagement in preserving it; if it be inserted in to the human system, instead of producing that beautiful symmetry of appearance heretofore described, it gives rise to a disease, not only totally unlike it in appearance, but also, one that is altogether dissimilar in effect; which, instead of affording that permanent and effectual security against smallpox, ever attendant on the genuine disease, is entirely destitute of all prophylactic influence; leaving the system equally susceptible of variolous impression as it was before the operation.

The effect, thus produced, not answering the desired expectation, has led many unwary and inattentive physicians to allege, that vaccina did not protect the system against the variolous infection. Hence, we may observe the necessity of indefatigable research and reiterated experiments in order to arrive at the truth, in conducting such novel and interesting subjects.

The effect produced by spurious or impure virus is very readily distinguished from that which results from the real. The effect of the former, when inserted beneath the cuticle, is, frequently, to excite premature inflammation, attended with intolerable itching, (this symptom is a presage of its not having succeeded at all, even when the genuine matter is used,) many times producing an elevation of the cuticle, and forming a pimple of considerable magnitude within twenty-four hours. This rapid progress of circumstances, however, is not always evinced in cases of this nature; in some instances its effects do not become apparent sooner than those induced by the genuine

virus. From this time the disease progresses through its different stages, not, however, with that admirable and beautiful regularity which characterizes the true disease. The effect subsequent to inoculation with impure virus, instead of manifesting itself in the form of a regular and circumscribed vesicle, has the appearance of an ill conditioned creeping sore, seldom or never assuming the vesicular form; and instead of terminating in a scab exhibiting the character of one from the genuine vesicle; it is, a festering, light-coloured or yellow one, being always less thick and heavy than the former.

What is still more strikingly different is, that the scab succeeding the genuine vesicle appears to be merely, as it were, laid on or slightly adhering to the skin, having its superior surface very level or plain, and its margin or external circumference is very abruptly elevated above the common level of the surrounding parts: whereas, the scab, of the spurious has considerable convexity, is thickest in the middle, rising but little

above the surface, very light and thin at its margin, gradually, though irregularly, losing itself in the surrounding skin and frequently terminates in a disagreeable ulcer difficult of cure.

The spurious pock is never accompanied by any regular areola, but has merely an *inflammation* surrounding it, frequently extending itself to a considerable distance from the place of inoculation, particularly when much irritated ; putting on the angry and fiery redness so peculiarly characteristic of phlegmonic or suppurative inflammation ; whereas the genuine pock is surrounded by an erysipelatous-like inflammation. The inflammation surrounding the spurious complaint is much more permanent than the efflorescence attendant on true vaccina, neither is it so rapid in its accession or declension.

The constitutional affection attending the spurious disease, when it induces any, is often more severe than that produced by the real complaint ; especially, if the local affection proceed to any great height. The

slight symptoms of fever that most commonly occur in real vaccina, are here, sometimes, considerably aggravated; the patient, for the most part, is affected with much pain in the inoculated part, and swelling in the axilla, pain in the head and back, frequent and full pulse, tongue whitish, preternatural heat on the surface, and sometimes even nausea and vomiting. These symptoms, which frequently accompany the *spurious* cowpock, when the local affection proceeds to a great height, unlike those attendant on the *real*, have no *particular* period at which they manifest themselves, but invade the system indiscriminately, as circumstances may influence.

If the affection arising from vaccination shall put on the above appearances, no one need hesitate for a moment in pronouncing it *spurious*; and he may with confidence assert, that it has not wrought that peculiar change in the system, so essentially necessary to secure it from the impression of variolous poison.

Thus much was it deemed proper to say on the spurious cowpock. Indeed, I consider it *absolutely* necessary that as minute and accurate a description should be given of all the phenomena relating to it, as to those connected with the genuine affection. How many physicians are there who are so completely ignorant of the necessary and discriminating characters of vaccina, as to suppose, if a sore, no matter of what nature or appearance, succeeds vaccination, it is amply sufficient; and, that it has wrought the anti-variolous change in the system. Does not this, of itself, afford sufficient grounds for dividing the cowpock into *genuine* and *spurious*?

However, Mr. Bryce, in the appendix to the second edition of his "Practical Observations on the Inoculation of Cowpox," says, "The terms, therefore, of spurious cowpox, and of irregular vesicle, producing imperfect vaccination, appear to me, to be contrived rather with a view of explaining something not understood, than from any correct observations on the subject, terms

contrived under which the practitioner might sculk in case of failure or mistake, and the more nearly the description of these said spurious and irregular vesicles are made to resemble the genuine vesicles, and the greater difficulty there is in distinguishing between them, the more effectually will this shield protect those who use it." He further says, "The term, spurious cowpox, as applied to the inflammation that takes place subsequent to inoculation, and terminates in a pustule, in a creeping or spreading ulceration, or in erysipelas," might as well be applied to the effects resulting from the prick of a thorn, a wound from a rusty lancet, the bite of a leech in certain constitutions, &c.

Now, this position of Mr. Bryce is clearly erroneous ; for in the first place, we are certain that vaccine virus was made use of for the purpose : Secondly, we have every reason to believe that the matter, or some portion of it was inserted at the place of inoculation : and, Thirdly, it is not less a fact that the phenomena manifesting themselves

at the place where the virus was introduced, flow from and are absolutely the effects of this virus. What, let me ask every candid physician and physiologist, are we to denominate this affection? and why not adopt the term *spuricus*? The disease is certainly somewhat allied to the cowpock, as it is produced by the same matter, but from some peculiar idiosyncrasy of habit or other adventitious causes, the virus does not produce the *genuine* affection.

It seems rather illiberal in Mr. Bryce to say that physicians have made use of this distinction, to explain "something not understood," rather than from correct observations made upon the subject; or that they are terms contrived under which physicians "might sculk" in case of a failure or mistake. I conceive the spurious to be a real anomaly or variety of the disease, and not as totally unconnected with it, as the effects resulting from the infliction of a wound with a rusty lancet, or other mechanical injuries. Indeed it would be the natural and inadvertant distinction adopted by any per-

son in conducting a train of experiments of this nature, should he meet with any cases that proved inefficient. He would say, *this* is not the *real* disease; it is not *genuine*; or, that it was *spurious*. Mr. Bryce is very particular in describing the marks and characters of that affection which works the anti-variolaous change in the system, but is altogether silent as it respects a delineation of the one which is destitute of such power, and which, nevertheless, occurs, and is capable of being accurately and minutely described. Thereby leaving the uninformed and unwary to be imposed upon by this insidious foe, and mankind to suffer from its unhappy propagation !

CHAPTER III.

OF THE NECESSARY PRACTICAL RULES TO BE OBSERVED IN CONDUCTING VACCINE INOCU- LATION.

SECTION I.

*Directions necessary to be observed in Selecting,
Obtaining and Preserving the Virus of Cow-
pock.*

THE earlier the period at which the virus is procured, the greater will be its activity. However, in order that we may obtain a larger quantity from the vesicle, it is preferable, generally, not to disturb it, till near the time of the commencement of the areola.

A vesicle selected for this purpose should exhibit all the specific marks and characters of the genuine disease; the smallest deviation from these should be sufficient cause to

reject it; having it in our power, almost always, of choosing between vesicles, too much attention cannot be paid to the subject. I have observed, with surprise and regret, gentlemen of standing in the profession, take virus from almost every vesicle, indiscriminately; without the least attention, apparently, whether it possessed the genuine characteristics or not; and, in many instances, from such as were labouring under eruptive complaints. The unpleasant consequences of such culpable inattention must be perceived by the most superficial observer, and cannot be too severely censured. It is from such carelessness and want of observation, in conducting vaccine inoculation, that not only so many mistakes have occurred, but that Herpes, Psora, perhaps even *Tinea Capitis*, and other eruptive diseases have been communicated. We cannot, therefore, be over attentive in these minute points, if we wish to preserve our own credit, and establish the reputation of the cowpock on an unshaken basis.

When we have made choice of the vesicle from which infection is to be taken, it must be repeatedly and gently punctured with a sharp and *clean* lancet, being very particular not to penetrate too deep; otherwise, the serum from the adjacent vessels will be effused and mixed with the vaccine fluid, which, being so exactly similar in appearance, might deceive us, and so far dilute the virus as to render it incapable of producing the disease. The vesicle having been punctured, as above directed, the virus begins immediately to issue out at each of these punctures, and stands in the form of transparent limpid drops, upon the surface of the vesicle, provided the lancet has not penetrated so deep as to injure the adjacent blood-vessels. The virus thus collected is to be transferred to whatever it is to be preserved on. This shall be more particularly noticed hereafter.

We ought never to have recourse to the same vesicle, for infection, more than once; as the irritation arising from the punctures, and from collecting the virus, most proba-

bly occasions a change in the properties of that remaining in the vesicle. Besides, opening a vesicle repeatedly, and exhausting it of its contents, may annihilate its power of producing that constitutional affection which is so indispensably necessary to secure the system against the attacks of smallpox.

As vaccine infection is of so perishable a nature, it becomes essential, that every physician who practises vaccination, should be acquainted with the best methods of preserving it, for the longest time, in its most active state. For this purpose, various plans have been devised.

It is a practice with many physicians, to preserve the virus on the point of a lancet. This is a very improper method ; in the first place, the metal of the instrument will very often become oxydated, and the lancet thereby spoiled ; and, secondly, the very process that ruins the lancet, also decomposes the virus, and renders it inert. It is a well established fact, that all fluids possessing a portion of oxygen, as one of their constituent principles, on coming in contact

with iron, are very subject to be decomposed thereby. The oxygen they contain unites with the metal and forms an oxyd. In this manner the natural and innate properties of the fluid become dissevered and destroyed. Now, that vaccine virus, in common with the other animal secretions, contains a quantity of oxygen in its composition, is a fact that no one at all conversant with modern chemistry and physiology will doubt; consequently, on its being subjected to the same process, must undergo the same, or similar changes of its properties. When these changes do take place in the virus, from remaining on the point of a lancet, it is rendered altogether unfit for use; and if used, will either produce no effect at all, or worse than none, will give rise to a spurious complaint; the bad effects of which require no farther comment. Hence it is evident, that when this manner of preserving the virus is pursued, the physician is not only often foiled in his attempt to communicate the disease, but at the same time is deprived of his instrument; for, no lancet, after having

been used for this purpose, should again be used for blood-letting till it has passed the hands of the cutler. The consequence is, that the physician is continually labouring under unnecessary expense, and his reputation, together with that of the disease, are materially injured. The above difficulties and embarrassments, I presume, will be sufficient to deter any one from adopting this method to preserve this invaluable fluid. Lancets of gold or platinum have none of the before-mentioned objections, and are very proper to preserve the virus upon.

Preserving it on cotton thread, is a method that is practised by many. This manner has also very serious objections. In the first place, it is not sufficiently economical, as a small portion of thread will absorb a large quantity of virus before it becomes properly imbued with it, and every experienced vaccinator must know how common it is to meet with vesicles where the quantity of matter is very small, so much so, in some instances, as scarcely to afford sufficient to

vaccinate half a dozen ; even when it is conveyed immediately from the vesicle to the subject for inoculation. Another objection of a much more serious nature than the foregoing is, that virus so preserved is prone, from the nature of the substance on which it is preserved, to run into the putrefactive fermentation. This process, as it necessarily destroys the chemical combination of all bodies subject to its action, unfits the virus for the purposes of vaccination. Hence we see that the objections to this method are almost as cogent as those to the former. This was the manner in which matter was transmitted from the "New-York Institution for the Inoculation of the Cowpock," during my residence there. I have sent it preserved in this way, and closely sealed in the barrel of a quill, to many parts of the United States, to a number of the West-India islands, and to Canada ; but, having had so many accounts of its failure, accompanied with requests for new supplies, that I am well convinced this is a very improper mode of keep-

ing the virus for any length of time, particularly in warm weather.

Another, and which appears to me the best method that has been practised, is by preserving it on pieces of quill, or ivory, made pointed at one end. All that is requisite, when recourse is had to this mode, is to immerse the tip of the points in the fluid issuing from the punctures previously made in the vesicle, and allowing the infection to become perfectly dry upon them previously to sealing them up from the atmosphere. I have latterly been in the habit of reimmersing these points two or three times after the matter becomes dry upon them, in order to be more certain of communicating the disease; and when this precaution has been taken, I have seldom failed. One or two little minutiae ought to be particularly attended to in making these points, which many may consider of too little importance to be noticed here, but, as it may guard physicians against a frequent source of failure, I shall not let them pass. The points ought not to be made very slender, as I have ob-

served many physicians to be in the habit of, but rather obtuse or rounding, in order to afford sufficient surface for the virus to adhere to. When a quill is used for the purpose of making the points, it must be previously divested of the pellicle which surrounds it, which possesses such an oily and polished surface as to render it almost impossible for the virus to adhere to it, and instead of diffusing itself generally over the extremity of the point, it will remove some distance from thence and collect in the form of a pellucid drop. Inattention to this circumstance, viz. whether the virus is attached to the extremity of the point or not, is one cause why so many physicians complain of their ill success in communicating the disease with infection taken in this way. The points, after they are properly formed, should be wiped with a wet cloth, in order to remove any oily particles that may still adhere to them.

Pieces of glass have been used for the purpose of preserving the vaccine fluid on. Common window glass cut into squares of

about an inch each is made use of. Their surface ought to be level and fitted so as to come in exact contact with each other.—Some have recommended one of the pieces to be made on purpose, with a small cavity in its centre to contain the virus. Having attended to the above precautions, the virus which has oozed from the punctures and stands collected on the vesicle, is to be taken off on the point of a lancet, or any other convenient instrument, and transferred to the plate of glass on which it is to be preserved, confining it to a small spot in the centre. After sufficient has been conveyed in this manner to the surface of the glass, it should be left to stand in a cool dry situation until it forms a dry hard and semi-transparent mass. The other piece of glass is now to be placed accurately over the one containing the infection and secured by wrapping them up in a piece of gold-beater's skin, or wetted bladder, to secure it from the air.

Mr. Bryce, in his treatise on the cowpock, describes a small vial in which he preserves the virus. It has a stopper nearly long enough to reach the bottom, ground into several squares, which are numbered.—The virus is placed upon these squares, suffered to dry as above directed, and the stopper is returned into the vial, whose mouth it is made exactly to fit; and in this way it is completely secluded from the atmosphere. This is no doubt a very effectual way of preserving the activity of the virus, but from the expense and trouble attending it, I presume few will adopt the plan; when it may be as well preserved on the points above mentioned, with little trouble and no expense.

The virus of cowpock, I believe, is capable of being preserved for the greatest length of time, in the form of the scab which succeeds to the vesicle of inoculated vaccina. Mr. Bryce appears to be the first who recommended the use of the scab as a substitute for the virus. When this innovation was first proposed, I did not think fa-

vourably of it, as it seemed equally objectionable as virus taken after the formation of the efflorescence, and that it was transgressing Jenner's *golden rule*, which is, that virus "never should be taken for inoculation after the efflorescence has formed." Experience, however, and particular attention to the subject, has convinced me to the contrary; there can be no doubt but it produces the same antivariolous revolution in the system as virus procured previous to the formation of the areola. Having made frequent inquiries last autumn, of my medical acquaintances for infection, and not being able to obtain any (for I believe it was extinct in this city) I made use of a portion of a scab that had been kept over the preceding summer by merely wrapping it in a piece of paper, and succeeded perfectly to my satisfaction in my first trial. The succeeding vesicle was a very fine one, bearing all the necessary marks and characters designating the genuine affection: and from which the disease was now gradually spread.

A method has been invented and practised by the central society in France, for preserving the virus in its fluid state. This they inform us is effected by applying one end of a capillary tube to the vaccine vesicle, open over its whole surface; on the tube being thus applied, the virus rises and fills it, when both extremities are closed with sealing wax. This method, however, has not been found to possess any advantage over any of those before described; indeed I am of opinion, that virus, in its fluid state, would more readily suffer a deterioration of its qualities, than in the dry; and this belief is corroborated by what Doctor Wood, of Newcastle upon Tyne, informs us, viz. "that some vaccine matter was preserved last winter (1803) for nearly six months, at the Dispensary here, in capillary tubes, hermetically sealed; it had been preserved as before, and answered very well.

"This last spring, all the children about (200) inoculated with this matter, had their arms violently inflamed, and, instead of the regular pustule (vesicle) a large crust of a

brown colour, with ulceration, took place." Here we see that notwithstanding this matter was preserved, in capillary tubes, hermetically sealed, consequently excluded from the air in the most complete manner possible, it evidently gave rise to the spurious disease. This, therefore, cannot be considered as any improvement in the art of preserving the vaccine fluid. The most serious objection, however, is the following, which is mentioned by Mr. Bryce, viz. that if the vesicle should be opened over its whole surface, the matter would be so far expended from the copious and constant discharge that would necessarily ensue, that the purposes of vaccination, as it respects the individual from whom the virus is taken, would by no means be fulfilled. It ought therefore, to be rejected. Whatever method we may adopt, it will be necessary to seclude it from air and light, as the action of either of these is found to decompose the infection.

The above, comprises all the principal methods that have been used for preserving

this valuable matter. Others have been proposed, but these appear to me the best. I shall not, therefore, enter into a particular account of them. It is supposed by some that virus retains its activity much longer when preserved in hydrogen gas. As to the correctness of this, I shall not hazard an opinion, as I have never made any experiments in order to ascertain its truth.

SECTION II.

Different modes of Vaccination, and the one that has been found most successful.

THE frequent failure in communicating vaccina, has been a source of great disappointment and perplexity both to the physician and patient. With some, it has not only been a matter of serious complaint, but has, in their minds, afforded sufficient

cause for its total rejection. Any thing, therefore, which can be offered that will tend to elucidate the cause of this failure, will doubtless, be acceptable to the reader.

If we trace this ill-success to its source, we shall find that, for the most part, it is attributable to mismanagement on the part of the physician. The virus of cowpock is certainly not so virulent, and, of course, not so sure to take effect as that of the smallpox. I am, however, warranted in asserting, that the former, if every necessary precaution be used in taking and preserving it, a failure will not occur once out of ten times when it is properly introduced.

Upon accurately investigating the immediate causes of failure, in vaccine inoculation, we shall find them to be arranged under the three following heads, viz.

1. A deterioration of the virus.
2. A peculiar idiosyncrasy of habit, or morbid state of the organic functions, whereby the system is incapacitated to receive vaccine impression ; and
3. The manner of introducing the virus.

1. The deterioration of the virus may arise from various causes both from within and without the system. It may be changed while existing in the vesicle by the morbid action of the vessels that secrete it ; which are not only endowed with the power of elaborating and secreting the most virulent poisons, but possess also, the power of rendering them inert and harmless ! It is the peculiar action of the vessel that makes each of the different secretions a fluid, *sui generis*. Hence, should any circumstance, either external or internal, occur to discompose or derange the peculiar motion of the vessels necessary to the production of vaccine fluid, a different secretion may be the result. It is believed by Jenner, and many of the most eminent vaccinators, that there is, immediately ensuing the formation of the efflorescence, a great change in the properties of the virus. This change is sufficiently evinced by the frequent ineffectual attempts to produce the disease with matter taken at this period ; and that, if it takes effect, it gives rise to an imperfect or spurious disease.

Opposed to this are Mr. Bryce, Doctor Cox, and others, who tell us, that infection may be used at any period of the disease, without being apprehensive of its producing the spurious complaint. Mr. Bryce says, that matter which has been used with ill success after the accession of the areola, was not virus from the cowpock vesicle, but that it was matter arising from suppurative inflammation beneath the vesicle, induced by the irritation of the superincumbent scab on these tender parts. However true this may be, I consider it infinitely more proper to adhere to the precise rules laid down by Doctor Jenner. May not the qualities of the virus be changed during the continuance of the efflorescence, and resume their pristine properties on the disappearance of this phenomenon?

Vaccine virus should never be used after it has, in the least, changed in its original transparency or limpid consistence. These alterations are occasioned by causes other than its own specific inflammation, as the peculiar action of the vessels, that morbid

state of them resulting from mechanical irritation, &c.

The virtues of the virus are also frequently destroyed from not having been preserved in a proper manner ; which has been sufficiently spoken of heretofore ; and I earnestly hope, will be particularly attended to by those who may be engaged in conducting the new inoculation.

The above come under the head of deteriorated virus, and are evidently sources of frequent failure and embarrassments.—Hence, if we wish to preserve sacred our own reputation, and that of this great prophylactic, the most scrupulous attention must be paid to the purity of the infection.

2. The second cause of failure, mentioned, is a peculiar idiosyncrasy of habit, or a morbid state of the organic functions, whereby the system is incapacitated to receive vaccine impression. The validity of this position must be conceded by every vaccinator of experience ; he can require no further proof than a reference to his own

practice. Many instances are on record, which prove the tendency of the constitution, of certain persons, to resist, and, in some cases, totally to reject the action of certain morbid impressions. This may arise, in the first place, from a peculiar innate disposition or idiosyncrasy of habit, which is not to be explained, except it consist in the peculiar physical arrangement of the component particles of the body. It is not likely the veil of mystery will ever be withdrawn from this phenomenon. I have frequently observed that, either from this, or some morbid derangement in the system, the virus has lain under the cuticle, in an inactive or dormant state, for several days ; sometimes not less than ten or fifteen ; not even producing the slightest appearance of inflammatory action ; when, either from the virus having overcome the local action of the vessels, or from some unknown cause, it commenced its career and progressed through its several stages with much regularity.

I have known children, who were labouring under tinea capitis and other eruptive

diseases, to be, for the time, proof against the impression of vaccina.

I have seen a case of cowpock, in which the efflorescence was entirely suspended for several days beyond its usual time of appearance by the supervention of measles.

In those instances where vaccine virus, inserted fresh and in its most active state, does not produce the disease, such persons are equally unsusceptible of variolous infection.

3. The third cause of failure, is from the manner of introducing the virus. The manner in which this is performed, provided the virus is lodged under the cuticle, may appear, to many, of trifling importance. From seven years practice in vaccination, however, and from close attention to every minutia and circumstance relative to the complaint, I am convinced, that the manner of introduction, influences, very much, the success of the operation. If, at the time of inoculation, the operator occasions a great degree of mechanical irritation, the part becomes prematurely inflamed, and conse-

quently the operation fails. From the same cause, inoculation with virus preserved on cotton thread, is not so often successful as when preserved on points of quill, ivory, &c. The portion of thread introduced, acts as an extraneous body, giving rise to suppurative inflammation, by which the infection is eventually rejected. Premature inflammation, almost universally, denotes the failure of the operation; or, that spurious disease has been produced.

From the above stated facts, the following practical rules are deduced, viz.

1. That cowpock virus, either for immediate use or for preservation, should always be procured before the formation of the efflorescence.

2. That we should always use the most recent matter that can be obtained. If it is not practicable to obtain it immediately from the vesicle, we should prefer such as has been preserved on substances that are incapable of oxydation.

3. That as little irritation should be excited in performing the operation as can be

dispensed with : which may be very small, as it is never necessary to draw blood.

Having pointed out the frequent cause of failure in vaccine inoculation, I shall proceed to mention the most approved methods of performing the operation. These are two, puncture and incision.

1. Vaccination, by puncture, I should prefer in all cases, let the infection have been preserved in whatsoever manner ; even if upon cotton thread, I believe it will be more apt to succeed than when performed by incision. The portion of cuticle, raised by the lancet, forms a covering to, and retains whatever may be introduced beneath it, which must necessarily give greater security to the operation. Whatever method may be adopted, it is necessary that we should be provided with a perfectly clean and sharp lancet. I mention this that physicians may be guarded against the unpleasant effects that have been produced from carelessly making use of a lancet that had been previously armed with the matter of small pox. It is also essential to use a sharp

instrument, on this occasion, lest a purulent inflammation be induced that might prevent vaccina from taking place.

The place most proper for the insertion of the virus, is between the elbow and shoulder, at the place of the insertion of the deltoid muscle.* If it can be avoided, the lancet should never be carried so deep as to draw blood, as the operation would be less likely to succeed; the ensuing hæmorrhage washing away the virus. In very young children it is almost impossible to avoid more or less hæmorrhage, on account of the extreme tenuity and vascularity of the skin. The object,

* It was observed in a former part of this treatise, that one cause why the casual cowpock was more severe than the inoculated, was on account of its affecting membraneous and ligamentous parts. It is, therefore, clear, that the introduction of the virus, at this place, is much more proper, as there is a large bed of cellular or adipose substance; consequently, should the inflammation run high, the effects would be much less violent than when affecting the hand or other membraneous parts.

is to penetrate only sufficiently deep to produce the slightest discolouration between the cuticle and cutis. This is very easily effected in the adult, provided the vaccinator carry a delicate hand. It is painful to observe the rough indelicate manner of some, in performing this operation: I have seen physicians use the lancet so liberally, and with such a heavy hand, as to occasion the blood to follow so profusely as to run down and drop from the fingers' ends! Is it any way surprising, that such uncouth conduct in the vaccinator, should be followed by a failure?

The lancet being carried thus deep, obliquely between the scarf and true skin (*i. e.* so as to leave a slight stain behind) is to be withdrawn, and the virus immediately introduced. If the infection has been preserved on cotton thread, a small portion, say the sixteenth of an inch, is to be crowded into the puncture, and suffered to remain there. If upon a quill, or ivory point, the point is to be inserted and kept in the puncture two or three minutes, when it is to be

withdrawn. If it has been preserved on a plate of glass, or any such substance, the matter must be previously moistened with a small particle of *cold* water, and after having been collected on the point of a lancet or quill, in sufficient quantity, is to be conveyed into the puncture. Court or adhesive plaister, from their tendency to excite the part to suppurative inflammation, should never be used to retain the virus when inoculation is performed by puncture.

When the crust or scab of vaccina is to be used, Mr. Bryce has recommended previously dissolving a small portion in cold water. As respects this point, the gentleman has fallen into a great error; for, whenever any extraneous fluid is added to the virus, it necessarily dilutes it, and diminishes its activity; hence, the reason why matter preserved on points more readily takes effect than when we are obliged to add water to fit it for the purpose of inoculation; for instance, when it has been preserved on glass. I have been in the practice of cutting off a small piece of the

scab and introducing it into the puncture by means of a lancet or any other convenient instrument, and with a success equal to my most sanguine expectations. The genuine scab is nothing more than the virus in a dried or indurated state, interspersed with a small quantity of cellular substance.

The scab of vaccina, if genuine, is equally effectual in exciting the disease as fluid virus. But great caution is necessary in making the choice. In the first place, it is necessary to know *positively* whether the preceding affection was, in every respect, regular and well marked. Secondly—We should be *certain* that the scab was formed immediately from the vesicle, and that it is not a secondary one.—When the scab is removed at an early stage of its formation, it is not uncommon for one to succeed, resembling, very much, the original one; and, I know of no particular mark or character whereby we can, with certainty, discriminate between them, merely from their appearance. Hence, in order to avoid mistakes, it is necessary that we

should have been eye-witnesses to the progress of the preceding vesicle.

Those scabs that, after having been preserved, are of an amber colour and most transparent, should be selected for vaccination. If they are opaque, dark-coloured and tough in their consistence, it is a proof of having more or less purulent matter in their composition. The more brittle a scab, the more active it is. If there be a margin around it of a lighter colour, and varying in other respects from the body of it, it ought to be removed previously to making use of the scab for inoculation.

It is somewhat difficult to perform vaccination with the scab, by means of a lancet, only. Doctor Fancher, of Massachusetts, aware of this, has invented a machine for the purpose ; he terms it *The Vaccinator*. Its construction is very simple ; it consists merely of a silver tube, with a handle and slide. Attached to the slide, is a blunt kind of pin or conductor, by means of which it is made to project beyond the extremity of the tube ; the scab having been previously prepared,

by breaking it down with a steel instrument, for this purpose, the extremity of the conductor (which is cut square off) is wetted with a little saliva, which attaches the small particles of scab to it, and is now retracted within the tube : the end of which is introduced into the puncture, previously made with a lancet, the conductor is forced out again, and the particles of scab adhering to its extremity are lodged at the bottom of the puncture.

This gentleman, not long since, vaccinated a number at the Dispensary in this city, with this instrument, and from the facility with which the operation was performed, and the success with which it was attended, I think it is a very considerable improvement in vaccinating with the scab.

The second mode of vaccinating, is by incision. When the operation is to be performed in this way, the same precaution, in not exciting hæmorrhagy, as was mentioned, in speaking of inoculation by puncture, must be observed ; the same local situation should also be preferred. The slightest

touch with the point of a lancet is sufficient, and if fluid matter is used, the lancet should be held perpendicular to the arm, that the virus, from its specific gravity, may the more readily be conveyed into the incision. When a thread is used it will be necessary to confine it there by means of some kind of adhesive plaister. Mr. Bryce says, when he uses fluid virus, he has been in the habit of depositing a small particle of it on the place where the inoculation is to be performed, and within the confines of it to make several slight scratches with the point of a lancet, being careful not to extend these beyond the size of a common vesicle. This method, he observes, has been very successful. Indeed, there is every reason to believe, that it would be more sure than the single incision, as the chances of success would necessarily be increased, in proportion to the number of incisions. Whenever, therefore, the mode by incision is to be preferred, I think this the better way of performing it.

Whatever method is adopted, if we wish to be certain of success, on account of a scar-

city of infection ; or if the person has been previously exposed to the smallpox ; or for any other cause, I should advise, always, to inoculate in both arms. It has a double chance of success ; and the soreness is so slight, that any objection on that account is too trifling to notice.

SECTION III.

Test of a Constitutional Affection.

THIS has long been a desideratum in the science of vaccination. Where is the physician who would have the boldness to pronounce his patient secure from the impression of variolous infection, unless he were certain of the system having been generally pervaded by vaccine action ? Every one who has had much experience in vaccine inoculation, must well know the difficulty of discovering the existence of a constitutional affection in a great portion of those

who pass through the cowpock ; more particularly in children, in many of whom it is impossible to observe the least symptom of general indisposition. Besides, its duration is so short, that the physician, in all probability, will not have an opportunity of observing it, one time in ten, where it does occur.

Three methods have been proposed in order to obtain a means of ascertaining the existence of the constitutional affection of cowpock, during the progress of the local complaint, the occurrence of which is deemed, by Doctor Jenner, to be absolutely necessary to shield the system from the effects of smallpox. That the disease may be merely local, and still exhibit every characteristic mark with much exactness, is a fact that is well established. To this circumstance we are to ascribe many of the failures of cowpock in protecting the system against variolous infection.

The first of these methods for obtaining a test was necessarily had recourse to by Dr. Jenner himself, and consisted in variolous

inoculation soon after the person had passed through vaccina. This affords at once a direct and clear test, which does not admit of a semblance of doubt. It must, however, be recollected, that to enable us to employ this test, variolous inoculation must be kept alive ; a circumstance that must counteract the great and ultimate object of vaccine inoculation, viz. extermination of the smallpox.

The anti-variolous change wrought in the system by constitutional vaccina, is now so completely and incontrovertibly established, that, provided we could discover a means of ascertaining the real existence of the constitutional affection, the dreadful test, by variolous virus, ought to be immediately abandoned. That we are in possession of such a means, will be presently shewn, and shewn, we apprehend, to the satisfaction of every one.

A second means of obtaining a test of variolous unsusceptibility was proposed by Doctor Pearson, of London ; it consisted in a second inoculation by vaccine matter, at

some subsequent and convenient period. This he was induced to employ as a test, from a conviction, that a person was only once susceptible of vaccine impression, provided it had been complete.

This method of Dr. Pearson's, is liable to several objections; but the bounds assigned to this treatise, will not permit me to enter into a very minute investigation of this subject. There is, however, one very important objection, and must be well known to every vaccinator; it is the impossibility of employing it in a great proportion of cases in particular situations, as large towns and cities, and institutions for the inoculation of the poor. In these places, a great proportion of those vaccinated are never again seen by their physicians, after they have passed through their complaint.

The third, and which, I am convinced, will be found an effectual method was proposed by Mr. Bryce. It is a *second* inoculation performed during the *progress* of the first. This gentleman tells us, that being well aware of the necessity of some certain

mode of ascertaining the constitutional affection of cowpock, and that it was in our power to increase the eruptions of smallpox in any local part, by means of blistering plasters, and other stimulating applications to the skin, he was induced to adopt this method as a test of general vaccine action, but did not succeed. The eruption of vesicles, as a consequence of constitutional affection, does not belong to cowpock. Does not this fact go far to prove that the cowpock and smallpox are originally and radically distinct diseases, and not in any way allied or connected with each other?

At length, recollecting some experiments made with the smallpox, viz. that if a person was inoculated every day, till the fever from the first inoculation supervened; in the course of twenty-four hours from the commencement of the fever, each inoculation would be equal, in point of maturity. From this, he was induced to make a similar trial with cowpock, and happily succeeded in a manner that equalled his most flattering expectations. He relates a number of cases,

in which the second inoculation was performed at different periods from the original one: in order to ascertain the most proper time for its performance. He finally concludes, that the end of the fifth, or beginning of the sixth day from the first inoculation, or between thirty-six and forty-eight hours previous to the commencement of the efflorescence of the primary inoculation, to be the most proper in general. It is impossible, indeed, to fix any *exact* time for the second inoculation; we must vary according to the progress of the vesicle of the first. Again, it is necessary that the second inoculation shall have made some progress, before the areola of the first commences, otherwise the second will have none formed around it. If the second inoculation be delayed beyond the sixth day, the affection will be very indistinct; if performed at an earlier period, the contrast between their duration will not be sufficiently great.

By a second inoculation, performed at a certain period of the original inoculation, a clear and well defined mark of a constitu-

tional affection may be obtained, in every instance in which the disease is effectual.

It appears, from the experiments of Mr. Bryce, that if a second inoculation be performed between thirty-six and forty-eight hours previous to the accession of the areola about the first; if constitutional vaccine action shall ensue; the accession and declension of the areola of the last inoculation, will be but a very little time after that of the former. If the efflorescence does not accompany the second inoculation about the time above stated, we may infer that no constitutional affection has taken place: and the vesicle from the second inoculation, will progress through its several stages as regularly as if no former inoculation had been performed.

Mr. Bryce concludes his observations on this method of obtaining a test of perfect vaccination, in these words: "I have thus described a mode of obtaining such a test of constitutional affection in cowpox, as, I trust, will be found effectual: and it is hoped this description has been given in such a

manner, as both to induce and to enable others to follow the plan proposed. The grounds upon which the criterion itself is founded, the ease with which it may, at all times, be put in practice, the success with which it has hitherto been attended, and, above all, the satisfaction arising from being assured of the important point which it is meant to ascertain, will ensure it farther trials; of the success of which I can at present see no reasonable cause of doubt. It is, therefore, to be wished, that this test may soon be generally practised, as an improvement in conducting the inoculation of cowpox, as at once giving confidence in the extent of the ailment, and precluding all necessity of any future inoculation with the virus of smallpox."

It may be necessary to observe, that the second inoculation may be performed in the other arm, in case one only has been vaccinated, or in the leg, as may best coincide with circumstances; but we must avoid performing it in the same arm or leg with the original.

Some objections have been made to this method of obtaining a test of the constitutional affection of vaccina. In the first place, it has been said that it is not fitted for general practice, because it so far increases the trouble of the operation, as to render it sometimes necessary to procure a second supply of infection four or five days after the first, which, in private practice, and country situations, is not always to be obtained.

This objection is futile in the extreme, as no second supply of virus can ever be required in order to obtain a test, when the disease has progressed regularly, and in this case, there never can be any difficulty at thirty-six or forty-eight hours prior to the commencement of the areola in getting a sufficient quantity of infection to perform a single inoculation with. And, as there is no necessity of employing this test, unless we shall be convinced that the pock is genuine, this objection, of course, is altogether groundless.

Another objection has been stated by Mr. George Bell, of Edinburgh, which is, that a second inoculation is, at least, as apt to fail as the first. This is not the fact; for, the first inoculation having succeeded, does away the apprehension of the existence of any peculiarity of constitution, or any morbid derangement thereof, preventive of vaccine action. Here we see two very prolific sources of failure at once removed. Farther, Is there not reason to believe that there exists, at this short period, previous to the commencement of the efflorescence, a certain predisposition to vaccine action in the skin, thereby giving to the operation greater surety of success? Another circumstance, favourable to the second inoculation taking effect, is the recentness of the virus employed; being taken immediately from a vesicle, in one arm, and transferred to the spot chosen for its insertion in the other. Hence, if the operation be performed with any degree of skill or dexterity, it can scarcely fail to take effect. Moreover, we can perform two or three inoculations in different parts, if we are

fearful one will not succeed. Mr. Bell's objection, therefore, is utterly untenable.

It is farther said by Mr. Bell, that the specific and discriminating marks of vaccina, are so well understood by the experienced vaccinator, as to preclude the necessity of a test. I, however, must differ from this gentleman ; for I doubt much whether he himself, or any of the most experienced vaccinators in Europe or America, can possibly judge of the security of the constitution against smallpox, from having merely observed the appearances and progress of the cowpock vesicle.

The premature progress of the second inoculation, and the coincidence of its several stages with those of the original ; are convincing proofs of the latter having extended its influence through the system generally. I cannot, therefore, withhold earnestly to solicit my fellow practitioners throughout the United States, to afford the test proposed by Mr. Bryce, a fair and candid trial ; being convinced it will furnish an index pointing out the happy change wrought in the system by this operation.

All classes are particularly prejudiced against variolous inoculation in warm weather,* consequently, they conclude that vaccination, is equally improper. This will necessarily preclude me from putting the preceding test in practice till next autumn, when I shall afford it a fair investigation.

In many countries of Europe, laws have been passed to prohibit variolous inoculation. In the state of Massachusetts and the city of Baltimore, laws to the same purpose, have been adopted. Such regulations are highly praise-worthy, and ought to be copied by the guardians and legislators of every government: The result of which would be, the extermination from the world one of the most terrible and desolating maladies to

* Doctor Adams, the famous writer on Morbid Poisons, has ascertained by experiments in the smallpox hospitals in London, that fewer died who were inoculated with smallpox, during the summer, than at any other season of the year ; and, that during the cold of winter, the proportion was greatest.

which mortality is subject. It must, however, be recollected, that we ought to be in possession of some *certain* test of *perfect* vaccination; otherwise, should the source of the smallpox exist in the combination of certain physical causes, and arise spontaneously at some distant period, what destructive and uncontrollable ravages might it not commit!

SECTION IV.

Of the Medical Treatment of Cowpock.

AFTER having thus briefly treated of the origin, progress, specific marks, &c. of this affection, it will be naturally expected that some few observations should be offered in regard to its medical treatment.

We are scarcely within the limits of propriety, when we denominate cowpock a disease. So mild are all its symptoms, throughout every stage of its progress, when it

is genuine, that it will be found to require more attention and nice discernment to identify its specific and characteristic marks and symptoms, than in determining upon medicines proper to be prescribed. All that is necessary, in general, is a cooling purgative or two, with some little abstinence in diet and regimen. Cases, however, sometimes occur (though acknowledgedly very seldom) in which it becomes necessary to pay a little more attention to the medical treatment.

It is a vulgar prejudice, strengthened and kept alive by interested and designing physicians, that vaccina is oftener productive of bad sores at the place of inoculation, than smallpox. This I have never found to be the case ; and am convinced, if the necessary precautions be used, no ulceration at all will happen in one of a hundred cases.

Ill-conditioned sores succeeding to vaccine inoculation, originate from one of two causes. Either from mechanical irritation of the clothes, &c. or from the spurious disease. Therefore, if proper attention be paid

in directing the patient not to wear tight sleeves, or any bandages about the part, (which last, are too often employed by over careful mothers) and to avoid all accidental injuries, little trouble need be apprehended from this source, provided proper care has been taken in selecting the virus for vaccination. Sometimes, indeed, not only troublesome sores, but an actual prevention of its necessary effects on the system is produced, from the great degree of irritation, and total exhaustion of the vesicle, occasioned by some in procuring virus. We ought, therefore, to be careful not to make more punctures in the vesicle, than are absolutely necessary to obtain the quantity of virus required; otherwise, the virus may continue to discharge till the vesicle becomes completely exhausted of its contents; and the anti-variolous change in the system may thereby be utterly precluded. Should this unpleasant circumstance ever occur in the practice of any physician, he may easily restrain the farther effusion of the virus by a drop of the aq. lytharg. acetat. or diluted

sulphuric acid, applied to the surface of the vesicle, from the end of a probe.

From the intolerable itching which sometimes accompanies the areola, the patient cannot easily refrain from scratching it, and in this manner the vesicle is frequently ruptured, by means of his nails, giving rise to the unpleasant consequences mentioned in the preceding paragraph. By rubbing the part with a little ardent spirits, this unpleasant symptom is instantly allayed.

If from accident the vesicle be ruptured, or the crust prematurely removed, considerable inflammation not unfrequently ensues, accompanied with tumefaction in the adjacent parts and axillary glands, with restlessness, chills, pain in the head and back, with other general symptoms of fever, which latter, is more or less severe, according to the degree of irritation, &c. but it usually disappears in the course of a day or two. Some, indeed, have asserted, that in cases of greater violence, the fever has been known to protract itself from one to two or three weeks. A case of such inveteracy,

however, has never presented itself to my observation; neither have I heard of such an occurrence in the United States.

Few cases occur which do not speedily yield to a gentle antiphlogistic treatment. Attention must be paid to the local affection, which, shortly after such accident, assumes the appearance of a disagreeable phagedenic ulcer. When, from repeated and frequent irritation, the local affection shall have acquired such an augmentation of its symptoms, some means should be resorted to, in order to arrest its progress. The unguent. citrin. will very generally answer this purpose: we must be careful, however, not to extend its application beyond the limits of the sore, otherwise, if active, it may enlarge it, by corroding the sound skin adjacent. The unguent. hydrarg. fort. and the unguent. precip. rub. may sometimes be used with good effect. In milder cases, the aqua. lytharg. will answer every purpose.

In cases where the pain, inflammation, and swelling, shall become much aggravated.

ed, emollient poultices will be found to answer a very good purpose. The inflammation, in some rare cases, is so great as to extend itself nearly over the whole surface of the arm; in such instances keeping cloths, frequently wetted in a solution of acet. plumb. or even in simple cold water, applied to the part, will be attended with very good effects.

The local remedies above mentioned, will be found amply sufficient in the most obstinate cases, if properly applied. If the fever should run high, it will be necessary to administer a smart purgative every day or two; those of a cooling nature are most proper, as sulphas sodæ, tart. sodæ, with manna, &c. These, combined with the free use of diluents and abstemious regimen, will soon accomplish a cure.

It has been proposed, and I believe practised, by some, in order to avoid the unpleasant effects induced by irritation of the vesicle, to destroy it, by means of the sulphuric acid, or some other caustic, so soon as it shall have produced the necessary

effects in the system. But the difficulty of fixing on any exact time, when the disease shall have accomplished this end, without any farther objection, will ever render this an unjustifiable proceeding.

In weak and debilitated children the progress of the affection will frequently be very tardy; in such instances the application of artificial warmth will be found to accelerate it very much. This is easily effected by holding the inoculated part towards the fire.

CONCLUSION.

PREVIOUS to taking leave of my readers, I hope they will indulge me in drawing the contrast between vaccina and smallpox, shewing the advantages that will result to mankind from an universal adoption of vaccination.

When, upon calm unbiased examination and reflection, we take into consideration how many thousands of the human race have been snatched from untimely and inevitable death, what parental pangs, inconsolable grief, and poignant sufferings have been averted, by the introduction of the

inestimable discovery of vaccine inoculation: the mind, warm in unabating and never-ceasing gratitude for its author, cannot but bestow everlasting benedictions on the head of the happy Jenner.

The human system, after having experienced the impression of vaccine action, is forever after unsusceptible of smallpox, either by inoculation or contagion.

This position has been satisfactorily proved by the vast number of well authenticated cases in England and other parts of the world, many of which are related by Doctor Jenner, some even of sixty years duration, and others of twenty, thirty, forty, &c. Besides, the prophylactic virtue of cowpock has been traditional among the peasantry and dairy people of particular shires in Great-Britain for unknown ages. I might adduce a volume of proofs of the happy effects of cowpock in shielding the system against smallpox, but so much has already been said on the subject, not only by others, but in the former part of this treatise, that it would seem like an act of

supererogation to attempt any thing farther. I therefore dismiss all argument, not apprehending that any well informed person will presume to entertain a doubt on the subject.

The cowpock, in its most inveterate form, is infinitely more easy to be borne, and less dangerous, than the smallpox in its most mild and benign state.

For the proof of this I will appeal to every candid and experienced vaccinator upon the globe. In my own practice, and in that of public institutions, I have always found that the sore subsequent to variolous inoculation, in cases where there were no eruptions, except at the place of inoculation, much more severe than that induced by the vaccine.

The cowpock is not contagious under any form or stage of its existence. Even, if a person who has never experienced the complaint should sleep in the same bed with those that are affected with it, the disease will not be communicated to them. They may even breathe over and smell to the vesicle after it has been punctured and the virus is oozing out, with impunity.

The fever that succeeds to vaccine inoculation is frequently so slight as not to be perceptible, and when it does manifest itself, in its most aggravated form, it is never productive of those alarming convulsive fits which so frequently accompany the variolous fever, even in the most mild cases of the disease.

Vaccination may be performed at all seasons of the year and at all ages, upon pregnant women, and children during dentition, with perfect safety, and requires no previous preparation with medicines, or change in diet or regimen.

Deformity, lameness, deafness or loss of sight, are never the consequences of cow-pock. Neither does it excite into action the latent seeds of scrophula or other incurable diseases. On the contrary, it frequently improves the health of weakly children; has been known to cure tinea capitis, and other inveterate complaints.

In Duncan's Annals of Medicine, vol. i, lustrum 2, p. 327, there is a case related of

a very singular and obstinate chronical affection of the arm, which, after a lengthy and ineffectual treatment, with all the various medicines that could be devised, was completely cured by vaccine inoculation. More cases might be adduced in corroboration of the position above stated, but it would be trespassing on the time of the reader. I have only to request that every vaccinator will pay particular attention to his own practice, in order to ascertain whether similar cases do not occur with him.

Vaccina is of peculiar benefit to the indigent part of the community, whose subsistence depends on their daily labour, as it very rarely obliges a person to lay by for a single hour.

The sum paid for vaccination is the only expense attending the cowpock. Medicines, nurses, the care and expenses of a sick bed are here unknown.*

*In many of the large towns and cities throughout the world, where vaccination has been adopted, institu-

Upon the most moderate calculation, not less than ten millions of the human race have experienced the salutary and happy effects of vaccina. Now, suppose this immense number had received the variolous infection, even by inoculation, *one out of every two hundred, at least*, must have fallen a victim. This proportion of deaths by inoculated smallpox, which is founded upon the most accurate observations, will make the deaths in ten millions, amount to no less than fifty thousand ! Suppose this number to have received the smallpox by *contagion*, as the *greatest part of them*, no doubt, would,

tions have been established by public patronage, for the purpose of vaccinating the poor gratis. Institutions for the gratuitous inoculation of smallpox are extremely rare. Indeed, I believe there is not one of the kind in America. Is it not enough to chill the mind with horror, to reflect on the indescribable sufferings and destruction it must have occasioned, previous to the introduction of vaccina ; particularly among the poor. Our bills of mortality for former years, will shed a faint light on the subject.

where *one in every six* dies ; what an astonishing number of our fellow creatures would have found an untimely grave !

Mistakes having occurred in conducting vaccine inoculation, cannot be considered as an objection to its introduction, or to militate against it in the least. Mistakes in inoculating for smallpox frequently occur, notwithstanding near a century has elapsed since its introduction into Europe. I was an eye-witness to no less than three cases in the practice of a physician, in one winter. These patients all had sore arms, and their inoculations worked well, apparently ; however, shortly after having cleaned up, as is the custom in the country ; these persons sickened in the usual way, and had the complaint severely, one of whom died. I am well convinced that we have arrived at a more complete knowledge of the nature and properties of cowpock, and of the manner of conducting it, than we possess relative to the smallpox ; and, that if the test proposed by Mr. Bryce

be properly employed, it is scarcely possible for a mistake or failure to occur.

Let us now, after having enumerated the principal advantages resulting from inoculation with the cowpock, take a cursory view of the effects produced by variolous inoculation.

That inoculation with smallpox has been the means of preserving the lives of vast numbers of the human species, will be denied by no one. At the same time that this improvement has such happy effects upon those subjected to its operation, it has, from its contagious quality, kept alive the seeds of infection, and spread the disastrous scourge far and wide, to the destruction of millions. Consequently, instead of having, upon the whole, proved a benefit to man, it has operated as a most grievous destroyer. The smallpox was unknown to the aborigines of America, till introduced by the Europeans, in the form of inoculation. The direful ravages, accumulated distress and horror it occasioned

among these poor creatures, are sufficiently depicted in the history of the original settlement of this country.

The human system, after have experienced the smallpox, cannot, in every instance, be considered *forever after unsusceptible of the infection*. We have on record a number of instances, from the most unquestionable authorities, wherein the smallpox has invaded the system with much severity a second time; and in some cases, has absolutely proved fatal, even to persons whose face and other parts of the body, exhibited sad deformities previously committed by its ravages.

The smallpox, when it does not *destroy* life, very often renders it *miserable* through the remainder of existence, by producing *irremediable* affections, as *lameness, blindness, deafness, scrophula, fits, permanent mania, and many other anomalous diseases*.

That the smallpox, in its most *mild* form, is *infinitely more dangerous*, and *produces greater suffering and pain*, than the cow-

pock, is so well known, to all who have had the least experience in them, that it requires no additional reasoning to establish the fact.

That the smallpox is *contagious, under every form and shape*, is certain. This property is what renders it prejudicial to man in place of proving serviceable, when propagated by inoculation.

The eruptive fever of smallpox, is *frequently so violent*, particularly in *infants*, as to *produce alarming, and sometimes fatal*, spasmodic fits. I have seen a number of instances myself, and every physician, who has had much practice in variolous inoculation, must have frequently witnessed the same.

Inoculations for smallpox, cannot, with *equal safety*, be performed at *every season* of the year, neither is it by any means *prudent, or even safe*, to inoculate children under *two years of age*, or *while teething*, and no one would attempt to inoculate a woman during *gestation*: the most unfortunate

consequences have arisen from such incautious proceeding. Previous preparation of the system, to receive variolous infection, by diet, regimen, and medicine, has ever been deemed essential, by all prudent and experienced inoculators.

The smallpox, under its *most favourable form, produces distress, loss of time, and considerable expense*, to all classes; and is, therefore, particularly hard upon the poor.

That previous to the practice of vaccination, it destroyed in every century, FORTY MILLIONS of human beings! This vast number may appear astonishing, and even incredible to many, but it has been ascertained by fair and unprejudiced calculation.

Added to all these another, and which may be considered by many as an imaginary evil of smallpox, is the deformity of the skin which it frequently induces, even under the inoculated form. In the view of philosophy and reason, this may indeed be said to be an imaginary evil, unworthy of regard; but,

until the world shall become peopled with philosophers and wise men, mankind will shudder at the contemplation of a disease which robs the most lovely part of creation of all their beauty.

Having made a general contrast between vaccina and smallpox, I shall close this treatise with a recapitulation of the same.

THE DISADVANTAGES OF VARIOLOUS INOCULATION are the following, viz. That it does not, in *all* cases, protect the system against a recurrence of the disease ; that it has operated as the *principal* mean of diffusing the infection to the destruction of millions of our fellow creatures ; that it not only *proves fatal*, but *frequently renders existence miserable*, by inducing painful and incurable maladies ; that in its most *mild* form, it is infinitely more *painful* and *dangerous* than cowpock ; that it is *contagious* under *every circumstance and form* ; that it produces *alarming and fatal convulsions* ; that inoculation can only be *safely* performed at *certain seasons* of the year, and *in certain*

situations of the subject ; that the constitution requires *previous preparation* by medicines, diet, &c. that it occasions *expense, loss of time, and much distress* to all classes, bearing more particularly hard upon the *poor* ; that previously to the introduction of vaccination, the smallpox destroyed annually, in Great Britain and Ireland alone, 40,000 inhabitants ; an average of *one in fourteen*, of all that were born ; and in New-York, of *all* that were buried, *one in ten* died of this disease ; and that, upon the globe, were sacrificed in every century, *forty millions* !

THE ADVANTAGES OF VACCINE INOCULATION, are, that it affords *effectual and lasting* security to the human system against the effects of smallpox ; that in its most *inveterate* form it is *not dangerous* or *so painful* as the latter in its most *mild* state ; that it is not *contagious* ; that it *never produces fits* : that vaccination may be performed at *all seasons of the year*, at *all ages*, and in *every situation and circumstance* of the subject ; that it produces *no painful or incurable disor-*

ders ; but, on the contrary, frequently induces the most salutary change in the system of weakly children ; and has cured several inveterate and disagreeable diseases ; that it is attended with little or no expense, no loss of time or suffering.

To the above *eminent and characteristic advantages* of cowpock may be added, as mentioned in the former part of this treatise, that in Bombay the smallpox has been *completely extirpated* by a general adoption of vaccination ; that in the island of Ceylon it has been *so far subdued* that the smallpox hospital is *given up to the army* ; that the smallpox is *utterly unknown* among the people in Vienna, and is there considered as being *completely exterminated* ; that in Swedish Pomerania the deaths from smallpox have been *diminished in the proportion of fourteen to one* ; and, that in Mexico and Peru, where the smallpox produced the most terrible ravages, and almost annually desolated these extensive and beautiful provinces, the

deaths from it have been *diminished in the proportion of nine to one*; that in New-York, in the short space of two years, it preserved 276 of our fellow-citizens; that if universally adopted in Great Britain and Ireland it would preserve to the government 40,000 of its subjects; and, that if it were adopted throughout the world there would be saved annually 400,000 lives!

So highly is it thought of in England, that, after eight years trial and scrupulous investigation of its merit, the parliament, entertaining a proper sense of gratitude for its worthy author, voted him an additional sum of 20,000 pounds, making in all 30,000 sterling, as a remuneration for his unparalleled services. The Spanish government considered it of so much importance to their colonies, that, in 1803, an expedition was fitted out for the sole purpose of conveying it thither.

If the preceding are the advantages which have been already derived from *only a partial introduction* of this invaluable discovery,

how immense would be the benefits resulting to mankind from its *universal adoption*, and with what ardour must every friend of humanity look forward to this thrice happy period.

If the happiness and security of individuals, in person and property, ought to be the first great object of all governments; and if there exist among the members of a government any cause, whereby such happiness and security shall be placed in jeopardy, is it not the duty of such government, if within their power, to remove the cause with all practicable expedition.

Now, that smallpox is the most terrible and destructive scourge that has ever assailed the human species, that more have fallen victims to it than to sword pestilence and famine; and that we can scarcely look about us without beholding some poor invalid who has escaped from its merciless fangs, is too solemn a truth. That it jeopardizes, frequently, the inhabitants of whole towns and villages; that, by invading

the habitations of the poor, protracted suffering and distress is the general consequence ; thereby utterly depriving them of the means of subsistence ; and, that it destroys the domestic happiness of thousands in bereaving them of their *last fond hope*, is too lamentable a fact.

“ Dear is the tie that links the anxious sire
To the fond babe that prattles round his fire ;
Dear is the love that prompts the gen’rous youth
His sire’s fond cares and drooping age to soothe ;
Dear is the brother, sister, husband, wife,
Dear all the charities of social life :—
Yet, all the endearing springs that fondly move
To filial duty and parental love ;
And all the ties that kindred bosoms bind,
And all that friendship’s holy wreaths entwin’d,”
By this fell malady’s o’erwhelming pow’r,
Are broke and sever’d, to exist no more !

These being the facts, and the preventive power of cowpock being so completely established, would it not be justifiable, nay, is it not the indispensable duty of every government or community to prohibit by strict

injunctions and severe penalties, inoculation with the smallpox? The punishment should not only be inflicted on the inoculator, but also on those who should suffer themselves to be inoculated, or upon parents and guardians who suffered it upon those under their charge.

This may appear to some as an exercise of power which no government possesses over its subjects. But, if they will consider that a single person labouring under this fatal disorder endangers the lives and destroys perhaps the happiness and repose of a great proportion of the community wherein he may reside, these restrictions will be found perfectly consonant to true liberty and justice. What individual in any government has a right to introduce a nuisance in his own house or set it on fire, thereby endangering the lives and property of his neighbours?

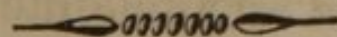
To the preceding regulations there might be added an admonitory clause earnestly requesting the parents or guardians of every child to have it vaccinated before it arrived

at the age of one year. This, aided by the advice and influence of the clergy would, in a short time, render vaccine inoculation universal.

An enforcement of these salutary measures, in the vast and extended empire of America, would be followed by most singular and happy events; a country, where every means of increasing the population ought to meet with the most decided and unqualified encouragement from its government.

I anticipate with emotions of satisfaction and delight, the period when the rulers of our land, will adopt measures of a tendency equivalent to those I have ventured to suggest. We shall then banish forever from our happy shores, a pest, whose overwhelming and desolating career has annually swept away so large a proportion of the inhabitants of this country.

FINIS.



ERRATUM. Page 36—7 and 8th lines—read *identity* for *nidentity*.



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