

**Observations on the different kinds of small pox, and especially on that which sometimes follows vaccination. Illustrated by a number of cases / By Alexander Monro.**

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London School of Hygiene and Tropical Medicine

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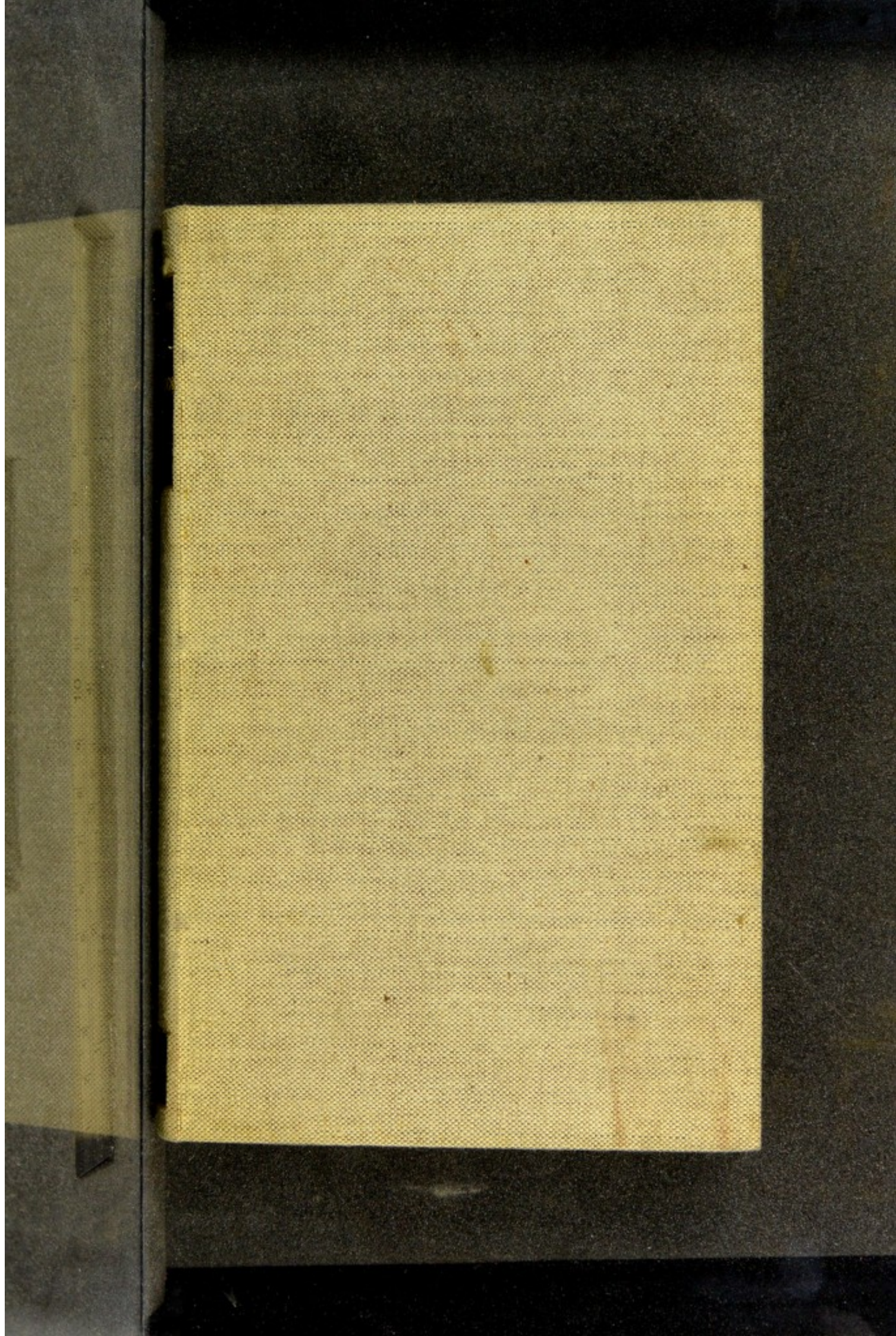
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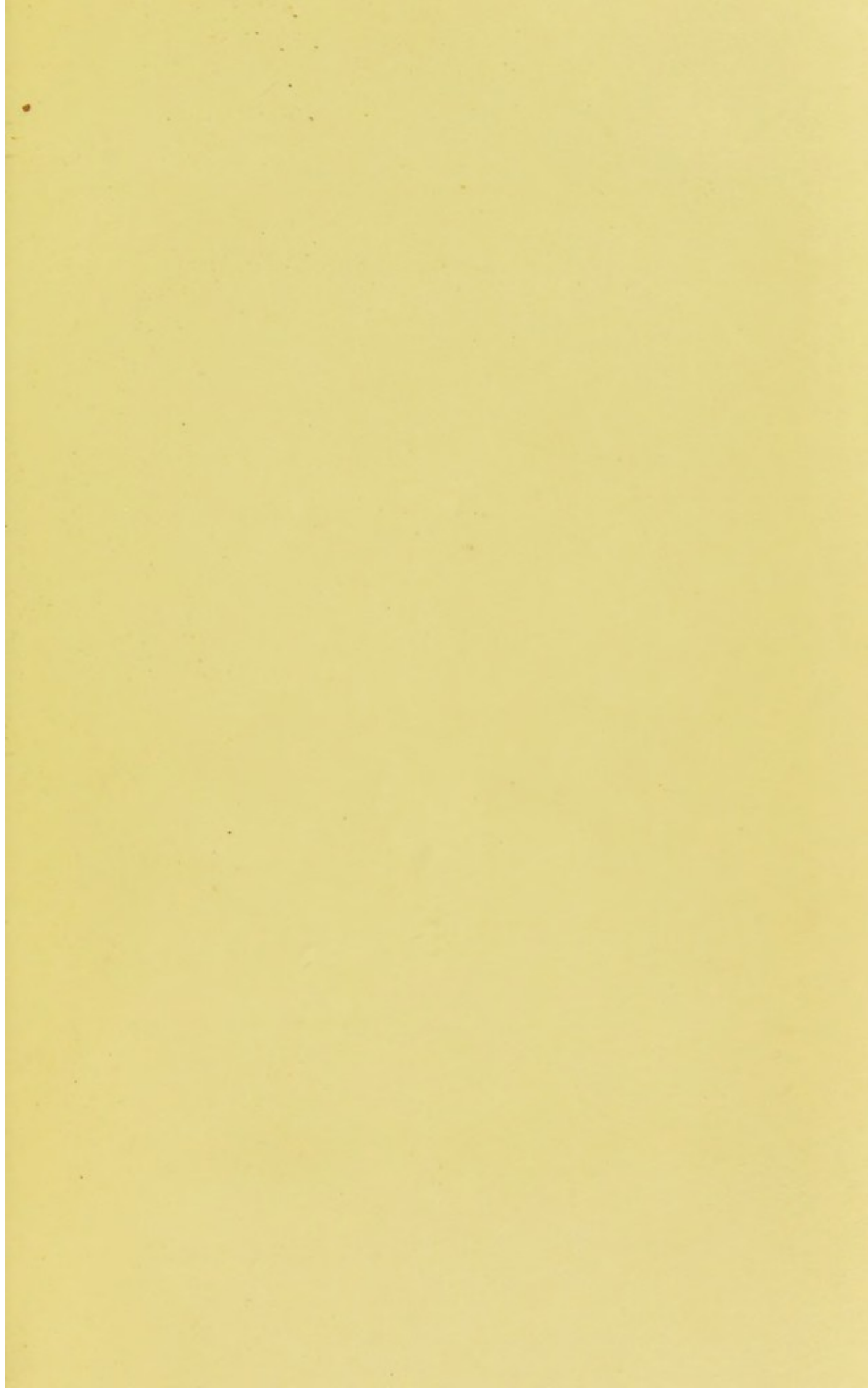
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*Dr. H. A. MacEwen, D.B.E.*

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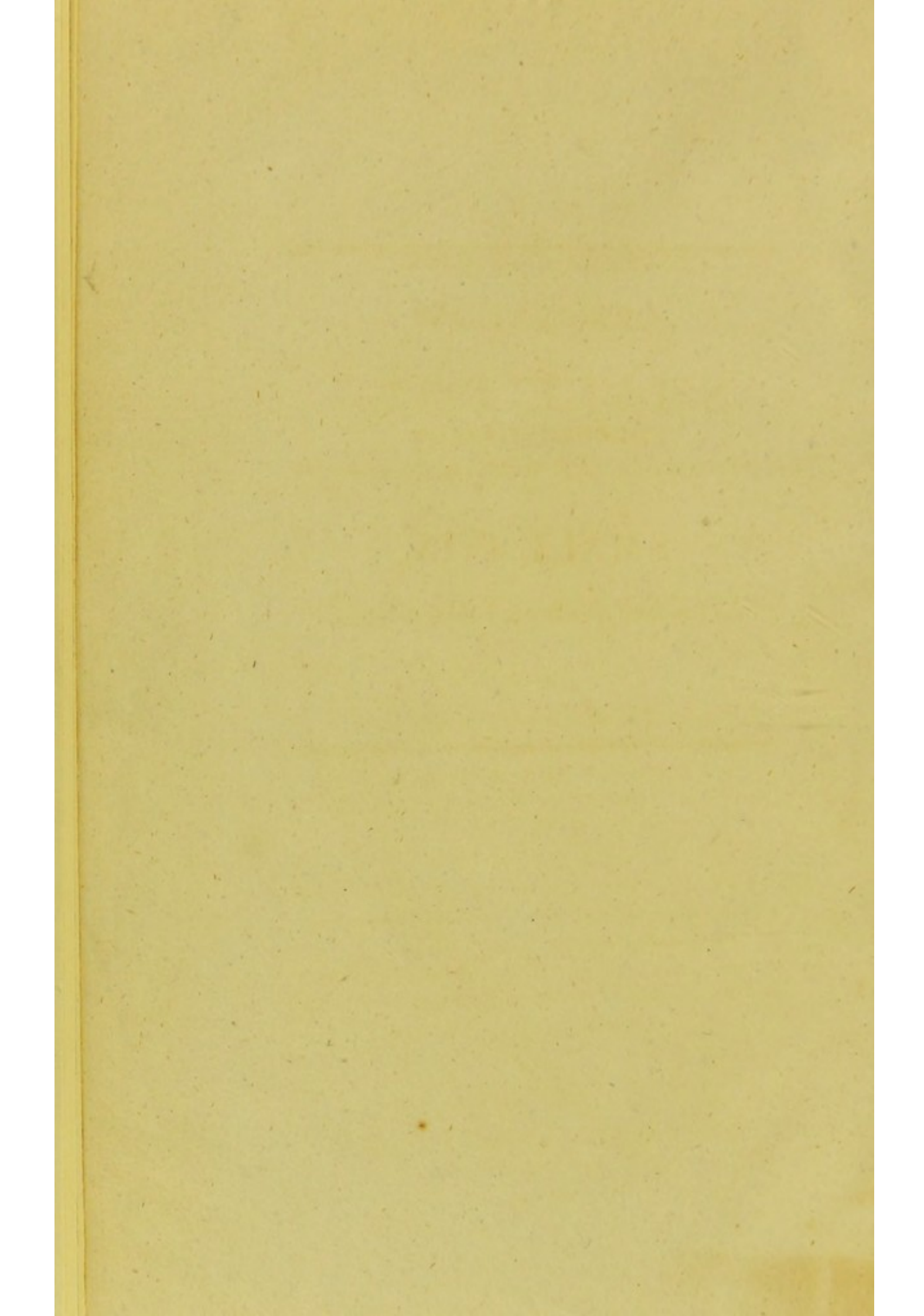
DIFFERENT KINDS

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ILLUSTRATED BY A NUMBER OF CASES.

BY

ALEXANDER MONRO, M.D. F.R.S.E. 1773-1859

PROFESSOR OF ANATOMY AND SURGERY IN THE UNIVERSITY

OF EDINBURGH, FELLOW OF THE ROYAL

COLLEGE OF PHYSICIANS,

&c. &c. &c.

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*Salus populi suprema lex esto.*

CICERO *De Legibus.*

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EDINBURGH:

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EDINBURGH:  
PRINTED FOR ARCHIBALD CONSTABLE AND COMPANY.

1818.



TO THE

RIGHT HONOURABLE

ROBERT DUNDAS,

LORD CHIEF BARON OF HIS MAJESTY'S COURT OF

EXCHEQUER FOR SCOTLAND,

&c. &c. &c.

THESE PAGES

ARE MOST RESPECTFULLY INSCRIBED

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## INTRODUCTION.

I have been emboldened to give them to the public, under a conviction that the facts which they contain may, by tending to point out the greater safety of vaccination than of small pox inoculation; and by rousing those

**V**ACCINATION, generally speaking, is a preventive of small pox, and hence one of the greatest benefits that has been conferred on mankind by any individual; but it has been proved by experience not to be invariably so, for even when the inoculation for the cow pox has been performed in the most skilful manner, it has sometimes failed to give the desired security.

It is the object of the following pages to give a detailed account of the mitigated Small Pox, which sometimes follows Vaccination. They were originally drawn up less with a view to communicate information to the medical pro-



fession, than to assist me in giving a deliberate answer to the numerous inquiries of several medical practitioners and others, concerning the small pox which, after perfect vaccination, occurred in my own family in March last, as well as to afford substantial relief to the minds of many anxious parents, not a little alarmed by the recent frequency of small pox under new combinations.

I have been emboldened to give them to the public, under a conviction that the facts which they contain may prove useful, by tending to point out the greater safety of vaccination than of small pox inoculation ; and by rousing those parents who have neglected to get their children vaccinated, to have recourse, without delay, to that expedient, as the only certain means of insuring their lives against all the dangers attendant on small pox.

As connected with the more immediate subject of these pages, it may not be improper to make a few remarks on the mortality of the casual small pox,—on the means by which the disease is propagated,—and also on such measures as are calculated to reduce the constant annual mortality occasioned by this scourge, which, if adopted, may ultimately lead to the extinction of one of the severest physical evils that ever afflicted mankind.



This very desirable object, calculated to preserve the lives of individuals, and to increase population, is not of private only, but of public concern: it cannot, however, be attained without the interference of the Legislature. "*Salus populi lex suprema est.*" The increase of deaths by small pox has not roused the attention of mankind so much as might have been expected, considering the importance of the subject. Many hints have been at different times thrown out, but no effectual means have as yet been taken to remedy the evil.

At the present time, such a measure seems to be imperiously called for, when the small pox prevails in the metropolis, and almost every village around it, — when we frequently see mothers carrying their children through the streets, covered with the eruption of the small pox.

The small pox being a disease of a very contagious nature, is rapidly propagated where it once obtains a footing from one to another.

When the small pox appears in the higher orders of society, the progress of the contagion may be arrested, and it is easy to prevail upon well-informed persons to adopt those means which are best calculated to destroy or to stop the progress of the infection; but when the dis-



ease breaks out in the cottage of a poor man, who has but one or two small and ill-ventilated rooms to lodge his large family, and whose children have no change of linen, the contagion becomes very active, and by accumulation acquires great virulence ; and it is almost impossible to persuade persons of this rank of the necessity of adopting means to stop the contagion, and hence the disease is rapidly communicated to the whole family.

Among the poor there is an insensibility, an apathy even, on this most material point, to be accounted for, only by recollecting their ignorance, and that total want of reflection which naturally springs from ignorance. The small pox is not an unavoidable calamity : it is not natural to the human constitution : though called the *natural small pox*, it is a foreign contagion, of which the progress may be arrested by a few simple precautions, and thus many useful lives may be annually saved for society.

Sufficient care has not been generally taken to destroy the contagion of small pox, in the apartments of the sick, by the use of nitrous vapour, according to the plan of Dr CARMICHAEL SMYTH. It is now ascertained that these vapours are as efficacious in destroying the contagion of small pox, as that of other febrile disorders.



The very short and simple rules for preventing the propagation of small pox, proposed by Dr HAYGARTH of Bath, and which have been found by ample experience to be of so easy application, and of so great efficacy, have also generally been disregarded.

Far different has been the practice in the Eastern World in former times, and also at this day.

So great was the degree of terror which the appearance of the small pox excited there, that the people immediately implored PATRAGALI, the Goddess of the Spots, who was supposed to have the superintendence of the disorder, to preserve them from its power ; and, with a spirit of consistency, which religious belief has not always produced, they resorted at the same time to the most effectual means of stopping the progress of the contagion.

Captain TURNER, ambassador to TISHOO LAMA, has stated, that those who are attacked by small pox are abandoned by all ; that every avenue to an infected place is barred, to prevent the escape of the patient, or the admission of strangers ; and that when the small pox actually broke out, the TISHOO LAMA left the city for three years, until it was supposed to be free from the infection.



Mr SAUNDERS, surgeon to the same embassy, has added, "The small pox was seldom met with, and when it occurred, it was always checked by the vigilance of the natives."

In the same manner, when a South American Indian is attacked with small pox, all his attendants leave him and fly to the woods.

The burning of a house endangers the lives of a few persons only; the plague may prove fatal to a few thousands during the time it prevails; whereas the small pox in Britain and Ireland alone has been proved, at the bar of the House of Commons, to be fatal to forty thousand persons annually.

The plague, when it visited this country, appeared only in London, Bristol, and a few others of the larger towns; whereas not a city, small town, village or hamlet is exempted from the small pox; so that by undoubted records it may be shewn, that, in the course of one century, *no less than four millions, five hundred thousand persons have, in the united kingdoms, perished by this fell scourge, and as great or a still greater number in other countries*, as appears by the subjoined extract of a letter written by Dr SERVANDO DE MAR Y NORIEGA, an Ecclesiastic.



*Dated London, 10th January 1813.*

“ The small pox, as well as the measles, were unknown in New Spain before the conquest. They were brought there, says TORQUEMADA, by a negro from Pamfilo of Narvaez ; and they occasioned such destruction, that he does not hesitate to affirm, that the greatest part of the Indians died, among whom was the Emperor CUITLAHUATZIN, who succeeded MONTEZUME. It is stated, that according to the reports, which CORTES ordered to be made to him, there died in the Empire of Mexico alone three millions and a half. It was not long before fresh variculous infection was brought over, and according to TORQUEMADA, eight hundred thousand Indians perished.

Europe has continued to communicate this scourge at intervals of thirty, twenty, or a less number of years ; and the infection, extending itself from Vera Cruz to the most remote parts, has, like a destructive plague, spread terror, death and desolation over that continent. The longer it is retarded, the more fatal it becomes, because the danger increases with the age of the sufferers. Thirty-three years ago there were carried off more than ten thousand persons in the towns of Mexico and Puebla alone by this contagion, which was the last but one



that has visited that kingdom, and was brought there after an interval of nineteen years. It was from this last attack that I was a sufferer in my native country, Monterry, the capital of the new kingdom of Leon: and there was not a family who did not put on mourning. Some of these families disappeared altogether, because they were all adult persons, and had been seized by the epidemic in the city. Those who lived in the country were preserved from its influence by banking the dunghills of the large and small cattle around their dwellings.

*Influenza  
light*

“ The small pox acts with the greatest virulence upon those parts of the body most exposed to the sun, such as the face and hands; and as the Indians are more exposed by their habit of life and manner of clothing, the havoc which it makes among them is more horrible.

“ TORQUEMADA says, speaking of the first introduction of the infection, that the reason why it killed so many, was, because the Indians were ignorant of the nature of the disease, and bathed and scratched themselves.

“ In the new kingdom of Leon there were several wandering nations, so warlike that the Spaniards could not with arms in their hands resist their attacks upon their towns; the small pox, however, extirpated almost all of them;



and fifty years ago heaps of bones, like so many trophies of the disease, were to be seen under the old tufted oaks in the fields. At this present time, when a savage sees one of his companions attacked with the infection, he leaves him, his horse, and his provisions, and flies to a great distance in the woods.

“It has never happened that the Spaniards have secured themselves against infection by stopping their communications with the Indians.”

The small pox has also been propagated by inoculation. Upon this head it is necessary to make a few remarks.

This branch of the subject has already engaged much of the public attention: it has been canvassed in various publications, not only by the members of the medical profession, but also by several very eminent clergymen; and upon this question of infinite magnitude and importance to the public, there has been much contrariety of opinion. The question may be thus stated, Whether by the inoculation of the small pox in large cities, at the private houses of the inhabitants, contagion is not more likely to be diffused, and, consequently, whether the community, upon the whole, is not more likely to be injured than benefited by the practice?



The advantages of inoculation were very highly rated at the time of its introduction, both by medical authors, and by the clergy; and, at a later period, the rapid progress which it made, in every civilized country, has been cited as a strong presumption of its safety and great utility, and much has been written respecting the most fit period of life and most proper season of the year for inoculation. But, notwithstanding the eloquent discourses of Dr MADDOCKS, Bishop of Worcester \*, Dr DODDRIDGE †, and other divines, it has by no means been proved, that inoculation has tended to the preservation of human life, or that its private advantages have compensated the wider malignity of its public operation. It no doubt mitigates the disease in the individual inoculated, and probably saves his life; but this individual is a centre of contagion, and propagates the disease far and wide. In short, it is neither wise, nor politic, nor humane to encourage the continuance of the practice,—a practice of which the inoculated reap the whole benefit, at a heavy and indeed incalculable expense of suffering to all those ranks which form the basis of the public strength.

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\* Sermon by Dr MADDOCKS, Bishop of Worcester, for the benefit of the Small Pox Hospital.

† Vide Sermon published 1750.



The most distinguished medical gentlemen who recommended general inoculation for the small pox, and the establishment of a dispensary for the purpose, and offered their services without fee or reward, were Drs WATKINSON, SIMS and LETTSOM. I shall not detain my reader by an enumeration of the arguments which have been advanced by the advocates or abettors of the inoculation of the small pox, but choose rather to refer the reader to the writings of the authors above named, being persuaded that this question respecting inoculation can be determined only by an appeal to facts, which are all against the practice of inoculation as a general good.

In the Russian Empire, for example, where inoculation was much practised, and where an inoculation hospital was established by the desire of the celebrated Empress CATHARINE, so great was the mortality by small pox caught by infection, that *one child in seven has been stated by Dr CRICHTON to be carried off by that disease*; whereas, on the other hand, no country in Europe has suffered so little by small pox as Spain, and there inoculation was but rarely performed.

Deeply convinced of the great risk, I might even say the great evil of inoculating small pox, in consequence of its tendency to multiply and



keep alive the virulence of contagion, I am anxious to give circulation to the following remarks of Baron DIMSDALE, who has ably stated its mischievous effects.

“ Though the loss under inoculation is very inconsiderable, almost the whole of those that are inoculated recovering, yet, by spreading the disease, a great proportion take it in the natural way : more lives are now lost in London than before inoculation commenced, and the community at large sustains a greater loss : the practice, therefore, is more detrimental than beneficial to society. In the last four years preceding 1776, the London bills, from small pox, arose at a medium to two thousand five hundred and forty-four : this increase is truly alarming.

“ The disease, by general inoculation throughout London, spreads by visitors, strangers, servants, washerwomen, doctors and inoculators ; by means of hackney-coaches, in which the sick are sent out to take the air, or by sound persons approaching them in the streets.

“ The poor in London are miserably lodged ; their habitations are in close alleys, courts, lanes, and old dirty houses : they are often in want of necessaries, even of bedding. The fathers and mothers are employed constantly in laborious occupations abroad, and cannot at-



tend the inoculated sick : should they neglect their occupations, food and necessaries would be deficient, and the medicines and diet ordered by the physicians would not be regularly complied with. The air in their houses is impure : they have neither areas, gardens nor carriages for the convenience of ventilation and taking fresh air.

“ Sailors and seafaring people, many of whose lodgings are miserable in the little houses bordering on the river, would be liable to catch the distemper, and either to fall sick there without friends or assistants ; or perhaps being infected on shore, to carry it to sea in their contaminated clothes, and afterwards falling sick without care or attendance, might spread the disease in foreign climates.

“ Country people coming to town for markets, visits, or pleasure, would all be subject to the danger of infection. Persons coming from the sick to the general (inoculating) Dispensary, for medicines or advice, by intermixing in the streets, the public danger, from their infected apparel, would be great and inevitable : the whole neighbourhood would be exposed, and in imminent danger, by having the small pox brought to their doors. The gossiping disposition of the poor will spread it further, and af-



ter the sick recover sallying forth in their infected clothes is certain to add to the mischief. The children, who are able to run about, will intermingle in the streets, immediately upon their recovery, with their play-fellows : the success, therefore, derived from general inoculation, will be beneficial to a few only, but involve a great number of others in danger, to which they would otherwise be less exposed.

“ The rich, (continues Baron DIMSDALE,) availing themselves by timely inoculation, secure their families, but the loss falls chiefly on the offspring of the inferior trades people and labouring poor. To encourage partial inoculation amongst them, would be only spreading the disease amongst their neighbours, and increasing the evil.”

From this eloquent statement, it is perfectly evident, that unless the individual, who has the casual or inoculated small pox shall be precluded from all intercourse with society, the disease cannot fail to be propagated. This salutary measure is too often neglected even by the most humane, whose whole attention seems to be absorbed in the safety of their own children, whereby they lose sight of a due regard to the welfare of society, and do not seclude their chil-



dren so conscientiously as they ought from intercourse with others.

There are also some men who are too selfish, voluntarily to submit to restraint and seclusion from society.

Many instances have been recorded of persons afflicted with the plague, concealing their disorder, or clandestinely getting into populous cities. And in this country a strange curiosity multiplies all the other causes of risk, that strange curiosity which leads the neighbours to crowd into the apartment of a sick person, to look at the symptoms of death, be the nature of the disease ever so contagious.

Parents are certainly bound to watch over the health and lives of their children, by every means in their power, and to avoid every source, by which pain, misery, or death, may be introduced into their own families; but they are no less undoubtedly bound to see that they do not communicate contagion to their friends or neighbours; and every good citizen ought to conform to those wise laws which, in this view, have been enacted.

It were much to be wished, that those salutary measures which have been proposed, and in one case only enforced, against a woman, convicted of carrying her child covered with the



eruption of small pox abroad, should be universally extended, and firmly executed, as general means of public preservation. In the case alluded to, eleven persons were infected with small pox, eight of whom died, and one became blind. The court declared, in the above case, that the exposure of a person labouring under a contagious disease, which endangers the lives of others, *is a criminal act punishable by law.*

It is much to be regretted that the judicious proposals which, from time to time, have been submitted to the wisdom of the legislature, for preventing the unceasing communication of the small pox contagion to the children of the poor, should not have engaged that deliberate attention which they so imperatively demand.

In the year 1807, a very well-written pamphlet, addressed to the Right Honourable SPENCER PERCIVAL, was published, entitled, "On the Expediency and Propriety of regulating, by parliamentary authority, the practice of Small Pox Inoculation, with the view to the extermination of that disease." The author, writing under the influence of strong but perverted feelings of national hostility, regrets, that the population of France should be increased by restraining variolous, and encouraging vaccine



inoculation ; and has well observed, “ It would, I apprehend, be no rigorous or arbitrary decree of the legislature, that should wholly prohibit variolous inoculation ; but longer to forbear to regulate and limit that practice, would be a vicious acquiescence in individual caprice to the public detriment.” A very severe punishment should await those men, who, deaf to all remonstrances, and the sufferings of their fellow creatures, continue to inoculate the small pox. At the period the inoculation for the small pox was introduced, it was objected to it, that a man had no right to submit to the inoculation of a poison by which he might lose his life : if he did so, he was guilty of suicide ; and if a father consented to the inoculation of his child, if death followed, he was privy to the death of the child. Still more guilty, without doubt, is that man, who, aware of the dangerous effects of the small pox, still perseveres in inoculating that poison.

The last and strongest argument in favour of the restrictions which, in my humble opinion, ought to be imposed, is, that by the calculations of Drs JURIN \*, HEBERDEN†, BLANE‡, and

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\* Letter to Dr COLESWORTH.

† Observations on the increase and decrease of different diseases.

‡ Evidence before the House of Commons,



others \*, it has been proved, that during eleven or twelve centuries, the mortality by small pox has gradually increased, *and that during the last thirty years of the eighteenth century, the mortality had increased to one-tenth.*

After these pages were written, and during the time they were passing through the press, I received the Report of the National Vaccine Board, published May 1818, in which there are the following paragraphs, tending to corroborate what has been above stated, and which are too important to be omitted.

“ The pernicious practice of small pox inoculation, now very generally relinquished by the medical profession, is only persisted in by a very few of the least creditable class of practitioners, and is usually carried on clandestinely ; yet the Board are concerned to state, that this destructive operation is now performed for gain, by itinerant empirics, farriers, publicans, nurses, low cunning people of both sexes, and of various descriptions. And such is the infatuation of the poor and ignorant, that many of them carry their infants to be inoculated by those, who only know how to inflict, but not how to assuage

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\* Evidence before the House of Commons, respecting Dr JENNER's discovery, &c.



the violence of the small pox. The consequence has been, that many have perished under their management ; and the disease, in particular districts, has been widely disseminated.

“ As this iniquitous conduct prevails much in London, an epidemic small pox was last year excited among those who were not secured by vaccination ; for it appears by the bills of mortality, that 1051 persons died of this disease ; a number which, according to a probable calculation, includes only two-thirds of those who actually fell victims to the small pox in the capital. Complaints of the same injurious practices have been sent to the Board from various parts of England, and applications made for means of putting a stop to them.

“ In answer to these applications, the Board have transmitted a statement of the legal decisions which have taken place in those criminal prosecutions instituted by their direction, in which the solemn opinions of the learned Judges of the Court of King’s Bench were pronounced upon this subject.

“ From the above facts, however, it is but too evident, that, notwithstanding these decisions, the existing laws are insufficient to prevent the propagating of a destructive pestilence throughout the land, by those who, from interested or



mistaken motives, are thus inclined to disseminate a loathsome and mortal disease.

“ And after the experience of nearly twenty years in the efficacy of vaccination as a preventive,—when by the united opinions of the most eminent in every civilized country, it is declared capable of wholly eradicating the small pox,—the Board cannot but regret that the progress of this invaluable discovery should be retarded, and an afflicting waste of human life occasioned in this enlightened empire by the designing and the ignorant.

“ They therefore feel it a duty again to submit, Whether, with a view to correct so great an evil, it might not be expedient to adopt some effectual legislative provisions, calculated to prevent the spreading of small pox by promiscuous inoculation.

J. LATHAM,

(President of the Royal College of Physicians.)”

If compulsory regulations are necessary to counteract the propagation of the plague, a disease which is not so fatal as the small pox, surely similar regulations ought to be passed against the negligent or wilful propagation of the small pox.

Can a stronger illustration of the dreadful



effects of this be given, than that which has been published by the National Vaccine Board?

Under the authority of that respectable body, it is stated, “that in the year 1807, the small pox was brought into Norwich by a vagrant from London, who, before the magistrates were apprized of it, or before the salutary advice given by the faculty to provide a place where such person might be secluded from intercourse with the inhabitants could be adopted, communicated the contagion.

“*Of 1200 who took the infection, 203 died.*”

Dr LIND, in his Book on Fevers and Infections, p. 295, has published a still stronger case, which happened to some American Indians. The disease was communicated by an old blanket given in a present to one of them, by which a whole tribe was nearly extinguished \*.

Besides the strong argument against the inoculation of the small pox, as being a means by which the contagion of small pox is spread, there is still another equally forcible, I mean the example of a neighbouring kingdom, France, in which the small pox became epidemic in the year 1763. This created very great alarm: the Parliament investigated the cause of the unusual

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\* See similar cases mentioned by Dr MEAD in his Book De Variolis et Morbillis.



mortality—was persuaded it was owing to the inoculation : accordingly a decree was issued *prohibiting inoculation in Paris.*

Lastly, it may also be added, that I have been informed by Professor OTTO from Germany, who was in Edinburgh within these few days, that in consequence of the very wise precautions taken by the Austrian government to prevent small pox, only three cases of small pox have occurred for many years in that large and populous empire.

In the annals of medicine, the year 1798 forms an era never to be forgotten. At that period Dr EDWARD JENNER published to the world his great discovery, and erected a trophy that must carry his name to the remotest ages, so long as the science of physic is cultivated amongst men.

Vaccination possesses the inestimable property of being communicated by inoculation only, and without any risk of spreading by infection. The inoculation may be practised at all seasons, and on persons of all ages, even on infants two or three days old, and without any immediate or consequent risk, or even blemish.

The introduction of the cow pox has therefore been justly ranked with the most brilliant



discoveries of modern times. The promulgation of this very remarkable and no less interesting discovery, by which the lives of thousands have been saved, strongly excited the attention of all ranks of society.

The inoculation of the cow pox, like that of the small pox, was at first much opposed. The effects were so remarkable and unexpected, that medical men hesitated for some time to give them full credit, and yielded only to the force of more extensive observation. The subject has been investigated in all its bearings by professional men, by the clergy, and by the House of Commons, and the very favourable opinion formed, in consequence of their extensive and accurate inquiries, has been confirmed by the experience of many years.

Notwithstanding the mass of evidence produced in favour of vaccination, many misconceptions, and many unfounded objections, not altogether unconnected with malice and envy, have been proposed and circulated with great industry, tending to mislead the ignorant and those who do not take the trouble of weighing the force either of argument or of evidence. But there cannot be the smallest doubt as to the comparative safety of the small pox and vaccination: in fact, it is impossible to employ



language too strong in contrasting the virulence of small pox, whether casual or inoculated, with the greater safety and greater mildness of vaccination.

The public confidence in vaccination as a preventive of small pox has of late been very much shaken, in consequence of the frequent appearance of the small pox after supposed perfect vaccination.

All the cases of small pox which have lately occurred have been imputed to the inefficacy of the cow pox ; whereas I have ascertained, upon grounds perfectly satisfactory to myself, that a few only of them have originated from that cause, as in a great majority of the instances of small pox now to be observed among the lower orders of society, vaccination had never been performed, and in others it had been imperfect.

It ought not to be forgotten, that, in the first instance at least, Dr JENNER's discovery appeared, in one important respect, to be rather incomplete : it did not furnish, to the inexperienced eye, a certain means of distinguishing whether the disease be genuine or not, and also whether the constitution of the patient had been actually subjected to the influence of the cow pox,—a great desideratum. That desideratum



was still required, I mean *a test for distinguishing whether or not the influence of the cow pox has been constitutional or only local.* This was supplied by the ingenuity of Mr BRYCE, who discovered, that by re-inoculating on the fifth day on the other arm, the pimples on both arms follow exactly the same course, and arrive at maturity at the same time, if the disorder has been constitutional; and this is what I understand by *perfect vaccination.*

*Bryce's  
Test*

But though it cannot be denied that vaccination has failed to give perfect security against the small pox, yet in the cases where it has failed to do so it has modified and mitigated that loathsome and dangerous disorder in a most remarkable manner, so that the small pox after cow pox can scarcely be said to form one of the class of mortal diseases.

In the above statement, I am borne out by the high authority of the Vaccine Board of London. They have stated, "that vaccination still rests upon the basis on which it was placed by the reports of the several colleges of the physicians and surgeons of the United Kingdom, which were laid before Parliament in the year 1807: That the general advantages of vaccination are not discredited by the instances of failure which have recently occurred; the



proportion of failures still remained less in number than the deaths which take place from the inoculated small pox: They are led by their information to believe, that since this practice has been fully established, *no death has in any instance occurred from small pox after vaccination*: That in most of the cases in which vaccination has failed, the small pox has been *a disease remarkably mild*, and of unusually short duration.

I am aware that Mr MOORE of London, Director of the National Vaccine Establishment, has mentioned lately two cases in which small pox after vaccination has proved fatal; but I have not met with any such case, nor has any such one been communicated to me by the very respectable list of medical gentlemen who have favoured me with their opinions, or correspondence, on this very interesting subject, with the exception of Mr CHRISTIAN of Liverpool.

It will not be supposed that I have been indifferent to the discussions which have never ceased to agitate the public since the first intimation of the discovery of vaccination.

I have examined the productions of the contending parties with all the attention in my power, and I hope with impartiality. I have



endeavoured carefully to sift every fact relative to the dispute that came under my own knowledge, and have anxiously sought to fix my conclusions on the foundations of experience.

During the course of the present year, my attention was still more particularly directed to this subject, in consequence of three of my own children having been in succession attacked with small pox after vaccination.

Of the perfect vaccination of all these patients, I had no doubt ; and the reader may not be disposed perhaps to think that the assurance obtained was the less to be relied on, when he is told, that, in addition to the judgment of the medical gentlemen, my Father charged himself with the task of observing the progress of the vaccination, the form and colour of the vesicles, and the changes through which they passed, and also made drawings of these.

During the indisposition of these children, I was naturally led to read every book on which I could lay my hands, and daily to note, at the bed-sides of the patients, the symptoms as they occurred. I called in the assistance of my much esteemed friends Dr RUTHERFORD and Mr BRYCE, and by their aid recorded every concomitant fact, and the periods of recovery were exactly fixed. Drawings were made in



different stages of the disease, by those distinguished artists, Messrs P. SYME and LIZARS, which being faithfully copied, and coloured from nature, may perhaps to some convey a more distinct impression of the more minute and characteristic features of the eruption than verbal description, besides being representations to which a preconceived opinion cannot be supposed to give a false colour.

The interest thus excited, naturally led me to extend my inquiries, to apply for further information from my medical friends in different quarters, to endeavour to methodize the accounts which I had received, and to state the inferences they appeared to warrant.

To the liberality of several medical friends, and in an especial manner to that of Mr BRYCE, I am indebted for many valuable facts and details which are not to be found in any author.

I have been pressed by several friends, and also by some of the medical gentlemen who visited my children, to submit the result of my observations and researches to the judgment of the public, with the view of removing those apprehensions, insinuations, and objections, which have been raised, and industriously circulated against the cow pox inoculation, and which already, in some instances, have led to



the substitution of the small pox for the cow pox.

In yielding to their wishes, I had no other object in view, but that of furnishing all the materials in my possession for assisting opinion, and directing practice, in a point of no small importance to the peace of private families and the general interest of society.

There is another point to which I am anxious to invite the attention of the reader. Dr JENNER, in his observations on the cow pox, has remarked, that those who have already had the small pox are still susceptible of cow pox, though not to the same degree as those who have not previously had small pox. This observation has suggested the question, as to the comparative security which small pox and vaccination give against a second attack of small pox.

The result has been, according to the observations in France, that no greater security against a second attack of small pox is derived from the inoculation of the small pox than from that of the milder inoculation of the cow pox. The report above alluded to states: "A central institution was soon established at Paris, to encourage and to promote the practice of vaccination; and a similar plan for the same purpose was adopted in every consider-



able provincial town. These provincial institutions were not long ago ordered to make a return to the government of the state of vaccination in their several districts. From these documents a report has been drawn up by Mr BERTHOLLET, PERCE and HALLE, philosophers of the first reputation, and submitted to the class of physical sciences of the Imperial Institute ; in which it is affirmed, that of 2,671,662 subjects, properly vaccinated in France, only seven cases appear of patients having afterwards taken the small pox ; which is as 1 to 381,666. It is added, *that the well-authenticated instances of persons taking the small pox after inoculation for that disease had perfectly succeeded, are proportionably far more numerous ; and also that in Geneva, Rouen, and several other large cities, where the Jennerian system has not been circumscribed by popular prejudice, the small pox is no longer known ; and the registers exhibit strong evidence of consequent increasing population. The report concludes with expressing great hopes that this pestilential disorder will ultimately disappear from society."*

In short, as it is not possible to look for or to conceive a milder or more certain antidote to small pox than vaccination, it has a strong claim to the attention of all those who regard the



health and lives of their children and of their posterity, the safety of their friends and neighbours, or the good of the community at large.

Before concluding, it may not be improper to add an explanation of the terms employed.

By *mild casual small pox*, is meant the milder form of the disorder, received by contagion through the medium of the atmosphere, by clothes, &c.

By *malignant confluent small pox*, is meant the more malignant form of the same disease, and which is received in the same manner as the milder form of the disease.

By *inoculated small pox*, the contagion artificially introduced by inoculation.

*Modified small pox*, means that modified and mitigated form of small pox which sometimes follows the cow pox.

*Perfect vaccination* implies, that the constitution has been affected with the specific vaccine action, in contradistinction to the mere local affection of the arm, such as may be occasioned by any other irritating cause.

By *pimple*, is meant a small red coloured body on the surface of the skin, and which feels hard when the finger is drawn along it.

This pimple, a short time after the eruption of small pox, contains a small quantity of a wa-



tery or serous fluid : in these circumstances it is called a vesicular pimple, but when, in the progress of the pimple to maturity, it contains yellow purulent matter, like a common boil, it is called a pustular pimple.

By *scab* is meant a hard substance covering a superficial ulceration, and which is formed by the concretion of the fluid discharged from the ulcer.

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As it is of much moment in the description of eruptive disorders to avoid ambiguous terms, I have employed, in the subsequent Treatise, the names given to the several colours by Mr P. SYME, in his book entitled WERNER'S Nomenclature of Colours, which seems to me to be a good standard for reference.



## CHAPTER I.

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OF THE PLAN OF THE SUBSEQUENT WORK.

BEFORE proceeding to the more immediate object of inquiry, it seems necessary to premise a very short historical sketch of the origin, causes, and progress of small pox through the different parts of the world.

We have still occasion to study the casual small pox, as many of the lower orders do not avail themselves of the benefit of vaccination, and also as the small pox which sometimes follows perfect vaccination bears a resemblance to the casual small pox, both in its mild and malignant form.

We shall proceed, in the second place, to describe briefly the chicken pox, which also resembles the casual small pox, and more especially the small pox which sometimes follows vaccination.



In the third place, it is proposed to give a detailed account of that species of small pox which is the more immediate object of this work ; and,

In the fourth place, to compare together the symptoms, progress and terminations of the above disorders.

Fifth, To subjoin some observations with regard to the treatment of the small pox which sometimes succeeds vaccination.

Lastly, To submit to the reader a plan, by which it is hoped the small pox may in the course of a few years become extinct in the British dominions.



## CHAPTER II.

### SECTION I.

#### *Of the Origin, Causes and Progress of Small Pox.*

IN this chapter, it is proposed to give, in as condensed a form as is consistent with perspicuity, a very general outline of the origin, causes, and progress of the small pox, which seems to be a necessary prelude to the more immediate subject of this book; for though the small pox which sometimes follows vaccination, and the casual small pox, be different disorders, yet they agree in some general particulars.

The small pox has been usually described as taking its rise from a specific contagion, generated in the pustules of the disease itself.

A late distinguished author, Colonel WILKS,



has stated \*, that the disease arises spontaneously. “ It is evident (says he) that small pox was either coeval with the creation, or had a subsequent beginning ; and it is an inference deducible from the first principles of reasoning, that the same causes which originally produced, may reproduce it without contagion.”

Every part of the world has, I believe, at one time or other, been visited by this dreadful scourge. In some countries the disease constantly prevails, but in others only occasionally ; and its symptoms are at particular times, (to make use of the language of Dr ROBERTSON†,) so violent, its operation so rapid and fatal, as to baffle all the efforts of medical skill :

“ Astonishment and terror accompanied this affliction in its progress, and men began to dread the extinction of the human race by such a cruel visitation.”

There are some diseases which, in the progress of time, become less virulent, but the malignity of the small pox is as yet unabated. In proof of what has been stated, Mr JOHN STRACHAN has lately informed me, that when the small pox appeared in the Isle of France, in the

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\* Vide Historical Sketches of the South of India, Lond. 1817.

† History of America.



years 1793 and 1794, 5400 persons died from it in the course of six weeks.

Mr C. J. LATROBE, in his visit to Southern Africa, (published London 1818,) has made mention of a similar incident.

Mr LATROBE visited an old German watch-maker, who gave him an account of the dreadful plague, the small pox, by which this colony (the Cape of Good Hope) was visited four years ago. A great number of people of all ages were carried off. Flags were hung out from the windows of the houses where the disorder raged, to mark them as pestiferous.

Thus for three months he lived quite alone in a dreadful state of mind, not expecting to survive.

His friends placed victuals at the threshold of the door, but not one of the family dared to approach or visit him in his affliction.

But, added he, "*it was this affliction that first taught me to know and to fear God, and to consider the state of my immortal soul.*"

Many different opinions and conjectures have been proposed respecting the origin of the small pox,—a subject still involved in much obscurity; and it is much to be regretted that the writings of AHRON, the first author who professedly wrote on small pox, and who lived in Alexandria du-



ring the time it was besieged, are lost, as they probably would have thrown much light on the earlier part of the history of the small pox. According to RHASES, who has often quoted AH-RON, *the small pox was then not a new disease.* Much information on this point is not to be gleaned from the earlier authors; they called every disorder which proved fatal *the plague, pestis, lues.* The disease which prevailed at Athens, and which has been described by THUCYDIDES, was not the real plague.

There is clear evidence that the disorder we call plague, was by the earlier authors confounded with the small pox; and also that different disorders of the skin were confounded with each other, particularly the measles and small pox; indeed, even to the time of DEIMERBROEK, the small pox and measles were considered *to be varieties of the same disease.*

Very different opinions have been entertained respecting the country in which the small pox took its rise.

According to JOHN HAHN\*, the small pox first appeared among the Greeks and Romans; and he has quoted many authorities in support of his opinion, not only from the medical wri-

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\* Variol. Antiq. Brigae 1733.



ters, but even from ARISTOPHANES, HORACE, QUINTILIAN, &c. This opinion, however, has been most ably refuted by Dr WERTHOFF \*

Mr CHAIS † and Mr HOWELL ‡ have endeavoured to prove that the small pox is of very great antiquity in Hindostan and other parts of India. According to Father D'ENTRECOLLES ||, a missionary Jesuit at Peking, the small pox took its rise in China; whereas GRUNER §, REISKE ¶, and others, have affirmed that the small pox originally broke out in Arabia.

Dr REISKE adopted the above opinion in consequence of having perused an old Arabic manuscript preserved in the public library at Leyden; according to which, the small pox and measles appeared first in Arabia within a month or two of the birth of MAHOMET.

This opinion has been confirmed by Mr BRUCE, who has observed that the small pox

\* Disq. Med. de Variol. et Anthr. 1733.

† Essai Apolog. sur la Method de communiquer la Petite Verole par inoculation.

‡ An Account of the Manner of inoculating of Small Pox in the East Indies.

|| Lettres Edif. et Curieuses, tom. xxi, p. 33. ed. 1781.

§ Dissert. Variol. Antiq. ab Arabib. Jenae 1773.

¶ Disput. Inaug. Lugd. Batav. 1746. Vide also TODE. De Variol. Antiq. ex Arab. Monument. Hafn. 1782.



first appeared among the Abyssinians when they besieged Mecca in the year 569, with the view of destroying Caaba or the Holy Temple, and of introducing the Christian religion; and that the Abyssinian army, commanded by ABRAHAH, were the first victims of the disease. This besieging army was defeated \*.

If the siege of Mecca and birth of MAHOMET took place the same year, the Arabian manuscript cited by Dr REISKE, and that of the Arabian author HAMEESY, mentioned by Mr BRUCE, coincide,

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\* According to Mr GIBBON, "The kingdom of Yemen was subject to the Christian princes of Abyssinia; their vassal ABRAHAH was provoked by an insult to avenge the honour of the cross; and the holy city was invested by a train of elephants and an army of Africans. The want of provisions, or the valour of the Koreish, compelled the Abyssinians to a disgraceful retreat. Their discomfiture has been adorned with a miraculous flight of birds, who showered down stones on the heads of the infidels; and their deliverance was long commemorated by the aera of the elephant \*. HAMEESY, an Arabian author, quoted by Mr Bruce, (Book II, chap. 8.) observes, "that it was at this time the small pox and measles broke out in Arabia, and almost destroyed the army of ABRAHAH." The first appearance of the small pox is supposed to be allegorically represented by the miraculous flight of birds.

\* Decline and Fall of the Roman Empire, vol. v. quarto, p. 197.



According to the Jesuit Missionaries \*, the *sowing* or inoculation of the small pox had been practised for many centuries in China.

The small pox is said † to have appeared in the dynasty of TCHEOU, about 1122 years before Christ : it was called by the very odd name of *TAI TOU*, or *venom from the mother's breast*.

THE SOWING, (as it was called,) the small pox, has been stated to have been invented in China, so early as the dynasty of SONG, fifty-nine years after Christ ; but this method is evidently different from that of the Bramins in India, and hence is not borrowed from them.

It was called sowing, because the powdered small pox crusts were snuffed up the nose, or they were mixed with water into a paste, and put into or planted in the nose ; a bit of musk was added to perfume the crusts, and on other occasions the entire crusts were wrapped up in a piece of cotton cloth, and put into the nose.

Dr WOODVILLE, in his very instructive His-

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\* Lettres Edifiantes et Curieuses par des Missionnaires.

† Vid. Mem. concernant l'histoire, &c. des Chinoises, par les Missionnaires de Pekin, tom. iv, p. 392. The substance of this memoir is extracted from the medical authors of China, and especially from the TEOU-TCHIN-FA, a book written for the instruction of the physicians of the Chinese empire.



tory of the Small Pox, has stated several facts which seem to throw doubt upon the supposed origin and antiquity of the small pox in India; and he particularly insists, that if so contagious a disease as the small pox had existed for so long a period in the East, it must have been propagated, especially to the Greeks and Romans, by the very frequent intercourse \* between these countries; and hence concludes that the disease was introduced into India by the Arabians.

But I will no longer detain the reader with an enumeration of opinions on a subject with regard to which the deficiency of satisfactory evidence affords so much latitude for conjecture. I shall therefore conclude by subjoining the following extract from Colonel WILKS's Account of Southern India, lately published, which appears to me to comprise many important observations, and to render further details superfluous.

“ The early antiquities of China and India have become nearly synonymous with fable. In China † the first appearance of small pox is fixed by one authority with specious accura-

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\* Vide Dr ROBERTSON's Historical Disquisitions concerning the knowledge which the Ancients had of India.

† MOORE.



ey, at 1122 years anterior to the Christian æra, before which period it was unknown; and at least as remote an origin is claimed by the legends of India. In that country, we find apparent indications of long experience in the treatment, rather than the legendary history of the disease. That the presiding deity is a low-bred goddess, whose temples are never approached by a Bramin, and are frequented exclusively by the outcasts, furnishes little ground of inference; but the immemorial practice of the Bramins of Orissa, near Ganjâm, of inoculation by means of a sharp steel instrument, of exposure to the cool open air, to prevent the confluent disease, and even of the cold affusion for a day or two before the eruptive fever is expected—although indicative of successful experience, affords no evidence of antiquity beyond the sixth century.

“ Mr MOORE ascribes to the deserts, which separate India from Persia, the long exemption of the latter country from infection; and assigns satisfactory reasons, why contagious diseases should rather follow the irruption of an invading army than its return. He seems, however, to lean to the opinion, that the eruptive disease mentioned by QUINTUS CURTIUS, which carried off great numbers of ALEXANDER’S army, at the



mouths of the Indus, may have been an ill-described small pox ; and was prevented by the intervening deserts, from making its way into Persia. Now the fleet, with which NEARCHUS navigated the Persian gulf, was not built by ALEXANDER, but chiefly found \* upon the Indus ; the facts of the voyage shew, that these vessels were equal to the coasting trade, and even to a communication with the opposite and not distant shores of Arabia ; a country which, from the earliest periods of history or tradition, possessed the productions of India. The neighbourhood of the Indus, near its mouths, and particularly the northern vicinity, is shewn by the historians of ALEXANDER to have possessed a considerable population ; which must have received from ALEXANDER's fleet and army the contagious disease described by QUINTUS CURTIUS ; or the small pox, at an earlier date, if it had previously existed in the interior. And it is difficult to conceive its being arrested at that spot, without extending northwards into Persia by land, or coastwise, by means of the Arabian trade. The hardships sustained by the army of ALEXANDER, in its march through Gedrosia, were unquestionably severe ; but the daring tra-

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VINCENT'S Voyage of NEARCHUS, p. 11.



vels of Lieutenant POTTINGER have recently established the existence in that route of the ruins of cities and palaces, which now half covered by the encroaching sands, must, in the days of ALEXANDER, have sustained a population, at least, sufficient to receive and transmit a contagious disease, by its shores, or inlands, although producing too little surplus food to meet the wants of the Grecian army.

The Arabian trade is described by the earliest authors as a coasting \* voyage, more likely perhaps than a direct one to afford the means of successive infection; and other authorities supply the intermediate links of an unbroken chain, extending from the earliest to the latest periods of authentic history, to support the uninterrupted existence of an intercourse between India and Arabia, sufficient for the propagation of an infectious disease.

MOSES † specifies the appropriation to religious uses, and in large quantities too, of cinnamon and cassia, the productions of Ceylon and Malabar, which shows that a communication of some kind or other was open between India and Egypt, even in that early age. From that pe-

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\* Vincent's Periplus, p. 45.

† Exodus, verses 23, 24.



riod, until about two centuries before the Christian aera, the aromatic productions of India were supposed, in the West, to grow in Arabia. Whether the chintz and other fabrics introduced into Media, may have referred to their proper country, before the age of ALEXANDER, does not distinctly appear. After that period, the information becomes more precise. AGATHARCIDES, who wrote 146 years after the death of ALEXANDER, and 177 A. C. tells us, not only that the Sabeans possessed the trade from India to Arabia, as the Egyptians monopolized the same trade from Arabia to Europe ; but is the first to relate that ships from India were met with in the ports of Sabea ; that the mariners of Sabea \* sail in very large vessels to the country where the odoriferous productions grow, and *plant colonies there* (the progenitors of the Mapillas of Malabar.) The embassies of PORUS and PANDION to AUGUSTUS ; the incident of the freedman of Plocamus being blown off the coast, and carried by the monsoon to Ceylon, his return from that island, accompanied by ambassadors from its king to Claudius ; the voyage of HIPPALUS, consequent on that discovery, in the first century of the Christian aera,

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\* VINCENT'S Periplus, p. 35.



and the more direct communication which ensued, are so many links in a chain of incessant and immemorial intercourse ; and even before the discovery of HIPPALUS, the direct proof of the arrival at Rome of bales of muslin from Bengal, in the earliest part of the first century, (and probably long before,) is furnished by the reproaches of a licentious poet, PETRONIUS, addressed to the Roman matrons, of their public semi-nudity “ *in garments of woven wind,*” or *a texture of cloud*. Excluding then the abundant proofs of earlier date, we find, that for seven centuries at the least, before the introduction of the small pox into Arabia from India, the ships of each country were received into the ports of the other ; and for upwards of five centuries before that period, we have testimonies of an intercourse in its first stage, exclusively between India and Arabia, which brought into Italy the productions of Bengal : the whole exhibiting authentic evidence of an increasing intercourse, apparently sufficient for the transmission of infectious disease. The inference, therefore, appears to rest on something more than probability, that in the sixth century, the small pox was a new disease in India, and, according to a similar chain of probability, in China also : and in reverting to our first proposition, that the



causes which originally produced, may reproduce it without contagion, I am persuaded that the members of a liberal and estimable profession will distinguish between the suggestion of a new and interesting subject of research, and those dreams of planetary influence, or medical theory, equally visionary, which disgraced the literature even of the seventeenth century."

From the year 569 to the year 640, the date of the conquest of Alexandria, an aera in history called *the war of the elephant*, no mention is made of the small pox. Towards the end of the sixth and seventh centuries, the small pox spread from Arabia into Palestine, Egypt, and Persia, and was probably imported into these countries by MAHOMET and his followers.

There has been much diversity of opinion as to the time the small pox was introduced into Europe.

This happened, in the opinion of some authors, in the eighth century, when the Saracens invaded Italy, France, Spain and Sicily.

About the ninth century, the small pox is said to have appeared in England ; but Baron DIMSDALE, Dr MEAD, and some other respectable authors, are of opinion, that the disorder did not appear until two centuries afterwards, upon the return of the Christians from the Crusades,



It is a remarkable circumstance, that the exact period of the introduction of so dreadful a disorder as the small pox should have escaped observation.

In the HARLEIAN and COTTONIAN manuscripts\*, the word *variola* is often employed; and in the first-named manuscript, the subjoined very pious exorcism of the Anglo-Saxons, who lived in continual dread of the small pox, is to be met with: "In the name of the Father, of the Son, and of the Holy Ghost, Amen. N°. May our Saviour keep us, N°. Lord of Heaven, hear the prayers of thy men-servants, and of thy maid-servants, O Lord Jesus Christ. I beseech thousands of angels, that they may save and defend me from the fire and power of the small pox †." Hence it is evident, that the small pox was not imported into Europe by the Cru-

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\* NO. 585. of the Harleian Catal. vol. i.

See Bib. Cotton. CALIGULA, A. xv. NO. 30.

† "In nomine Patris et Filii et Spiritus Sancti, Amen. No. \* in adjutorium sit Salvator noster N°. Dominus coeli, audi preces famulorum famularumque tuarum, Domine Jhesu Chrispte, adque peto angelorum milia aut (ut) me N°. salvent ac defendant doloris igniculo et potestate variola, ac protegant mortis a periculo; tuas Jhesu Chrispte aures tuas nobis inclina.

\* The mark N°. denotes where the exorcist made the sign of the cross.



saders, for the above manuscripts were written before the year 900.

It has been already stated, that the practice of inoculation in Hindostan is of great antiquity, and, according to SHAW \*, DE LA CONDAMINE †, inoculation has for a long time been practised in Georgia, Circassia, and Greece. It is not well known where this operation had originated. Mr COLDEN ‡ is of opinion that it came from Africa originally : he says, “ I have lately learned from my negroes, that it is a common practice in their country, so that seldom any old people have the disease. They generally inoculate all their young as soon as the infection comes in to the neighbourhood. They tell me, that in the regimen under it, they only abstain from all flesh meat, and drink plentifully of water acidulated with juice of limes.” The above statement has been confirmed by Mr MUNGO PARK.

The inoculation of the small pox has been performed in somewhat a different manner in different countries.

The small pox in India was propagated by inoculation in the following manner.

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\* Travels into Barbary and the Levant.

† Mém. sur Inoculation.

‡ Vid. Med. Obs. and Inq. vol. i, p. 228.



The Bramins, or Priests of India, usually perform the operation early in the month of February, to avoid the hot months March, April and May, when the small pox is apt to be very severe ; but on some occasions, the priests did not begin to inoculate until the months of March, postponing the operation till they got information as to the mildness or virulence of the small pox. They travel through the different provinces of India for the purpose. It is known by the inhabitants when the inoculators are to arrive at a certain place. The parents who mean to have their children inoculated keep them for a month on vegetable diet.

The Bramin, after rubbing the part with a dry cloth for eight or ten minutes, makes a few slight scratches upon the skin, which is rubbed immediately with cotton previously soaked in the matter of small pox, a little moistened by the water of the Ganges. The men are inoculated in the arm, and the girls low down in the shoulder, lest the arm should be disfigured. A bandage is applied upon the inoculated part, which is kept on for about six hours.

Next morning buckets of cold water \* are

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\* Mr HOWEL bears testimony to the beneficial effects of this practice, and has observed, that when the pustules



poured upon the patient's head and shoulders, and this is repeated daily, every morning and evening, until the fever begins.

During the consequent small pox, the patient is kept upon the strictest vegetable diet, consisting of plantains, sugar-cane, water-melons, rice, or gruel made of rice.

The patient's confinement to bed is not enjoined, but *free exposure to the air*; and, *when the fever is severe, the patient is desired to lie on a mat at the door*. When the eruption appears, the cold bathing is resumed every morning till the crusts fall off, and all the pustules are opened with a small pointed thorn, which, according to the Bramins, prevents inflammation, boils, and other eruptions which follow small pox; and each pustule, after being opened, is wiped with a linen rag, which has been dipped in warm water.

Upon the termination of the disease, the Bramin received a *pund of cowries*, about one penny, for his trouble.

The inoculation has been thus described by DE LA MOTRAYE, who saw it performed upon a Circassian girl four years old.

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sunk, and the patient seemed to be in the most imminent danger, he had seen wonderful effects from throwing a few gallons of cold water on the head.



The girl, after being purged with dry fruit, was carried to a young boy, who had the natural small pox, in a state of suppuration, and an old woman, the operator, took three needles fastened together, and pricked, first, the pit of the stomach ; secondly, directly over the heart ; thirdly, the navel ; fourthly, the right wrist ; and fifthly, the ankle of the left foot, till the blood came ; at the same time, she took some matter from the pustules of the boy and applied it to the bleeding part, which she then covered with dried angelica leaves, and afterwards with some of the youngest lamb skins ; and having bound them all well on, the mother wrapped up her daughter in one of the coverings.

The inoculating the small pox was practised, not only in Asia and Africa, but also in Wales and Denmark, according to BARTHOLINE, before it was introduced into England.

The inoculation is mentioned by Dr WILLIAMS, Mr OWEN and Mr WRIGHT, and was called *buying the small pox*, (as it was supposed the inoculation would not take effect, unless the person from whom the inoculation was taken received money.)

The inoculation of the small pox was not always practised in the same way in Wales. Dr WILLIAMS observes, “ They either rub the mat-



ter taken from the pustules when ripe on several parts of the skin, &c., or prick these parts with pins, or the like, first infected with the same matter." Mr OWEN, and five of his school-fellows, scraped the skin with a penknife until the blood began to flow, before they applied the matter of the small pox.

Mr DE LA CONDAMINE and BOSCOWICH have stated, that at Naples and Pavia it was the custom from time immemorial, amongst nurses, to communicate small pox to children by rubbing the palms of their hands with recent matter of small pox.

In this country, (Scotland,) a different mode of communicating the small pox had been long practised, of which the following account has been published by my grandfather.

"When small pox appear favourable in one child of a family, the parents generally allow commerce of their other children with the one in the disease; nay. I am assured, that in some of the remote Highland parts of this country, it has been an old practice of parents whose children have not had the small pox, to watch for an opportunity of any child of their neighbours being in good mild small pox, that they may communicate the disease to their own children, by making them bed-fellows to those in



it, and by tying worsted threads wet with the pocky matter round their wrists."

In the island of St Kilda, the small pox, according to Dr MACAULAY, is communicated by rubbing the matter of small pox upon the skin of the elbow joint.

It is a remarkable circumstance, that these different ways of communicating the small pox *were probably suggested by accident* ; for they did not originate with the learned, or with the medical profession, but with old women and nurses, and independently of any intercourse with each other.

Lady MARY WORTLEY MONTAGUE brought this useful invention into fashion in England. She has observed, in her 31st Letter, dated Adrianople, April 1. O. S. " The small pox, so fatal and so general amongst us, is here entirely harmless, by the invention of *ingrafting*, which is the term they give it. There is a set of old women who make it their business to perform the operation every autumn, in the month of September, when the heat is abated.

" People send to one another to know if any of their family has a mind to have the small pox ; they make parties for this purpose ; and when they are met, (commonly fifteen or sixteen together,) the old woman comes with a



nutshell-full of matter of the best sort of small pox." She adds, "The children are in perfect health to the eighth day, then the fever begins to seize them, and they keep their beds two days, very seldom three." "They have very rarely above twenty or thirty in their faces, which never mark, and in eight days' time they are as well as before their illness."

Europe is also indebted to Dr TIMONI, a Greek physician, who had graduated at Oxford, and had been for some time resident at Constantinople, for the information respecting the inoculation of the small pox, which he communicated by a letter, dated 1713, to Dr WOODWARD: he states, that the inoculation introduced into the capital of Turkey from Georgia and Circassia, was at first rejected by the Turks, obstinately attached to the dogmas of the Al-koran; it was however adopted, not only by the Greeks and Armenians, but also by the Christians.

Lady WORTLEY MONTAGUE, while at Constantinople, had her son ingrafted with small pox by Mr MAITLAND. The event was successful. In consequence of which, she resolved to have the same operation performed on her daughter, then an infant only three months old,



On account of some family occurrence, the operation was fortunately postponed until her return to her native country in 1721, so that this child was the first that was inoculated in England. But notwithstanding the example of Lady W. MONTAGUE, many strong prejudices existed against so novel a practice.

The following anecdote shews the dangerous light in which the inoculation was regarded. Six criminals, who had forfeited their lives to the laws of their country, were, by the royal prerogative, to receive full pardon, on condition of submitting to be inoculated.

The inoculation was accordingly performed, and all of them had the disease in a mild form excepting one, on whom it entirely failed, he having previously had the disease.

In the month of February 1722, inoculation was practised in various parts of England; and in the April following, amongst others, after much discussion, the Princesses AMELIA and CAROLINA were inoculated, by desire of the Princess of WALES, after a consultation with the state physician, Sir HANS SLOANE\*.

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\* London Phil. Trans. vol. xlix.



Sir HANS, when asked his opinion respecting the safety and propriety of the measure, told her Royal Highness, "That by what appeared in the several essays, it seemed to be a method to secure people from the great dangers attending the small pox in the natural way: That the preparations by diet, and necessary precautions taken, made that practice very desirable; but that, not being certain of the consequences which might happen, he would not persuade nor advise the making trial upon patients of such importance to the public." The Princess then asked him, "if he would dissuade her from it," to which he answered, "he would not, in a matter so likely to be of such advantage." Her reply was, that she was resolved it should be done, and ordered Sir HANS to wait upon the King, (GEORGE the First). Sir HANS then told his Majesty, "that it was impossible to be certain, but that on raising such a commotion in the blood, there might happen dangerous accidents not foreseen." To this the King replied, "that such might and had happened to persons, who had lost their lives by bleeding in a pleurisy, and taking physic in any distemper, let ever so much care be taken." In this opinion Sir HANS coincided with his Majesty, and the two Princesses were inoculated.



The inoculation was performed by Mr AMYAND, sergeant-surgeon, and the small pox proved favourable \*.

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\* For a farther account of the progress of inoculation through Europe, see WOODVILLE's History of Inoculation, and KILPATRICK's Essay, London, 1743.—Murray's Hist. Insitior. Variol. in Suecia.—An account of Inoculation by Sir H. SLOANE, given to Mr RANBY for publication in the year 1736, Phil. Trans. vol. xlix.—Mem. sur l'Inoculation par M. DE LA CONDAMINE.—MAITLAND's Account of inoculating the Small Pox, 1722.—MONRO on Inoculation.—Baron DIMSDALE's present method of inoculating for the Small Pox.—JURIN's Account of the Success of inoculating the Small Pox.—BOYLSTON, An Historical Account of the Small Pox inoculated in New England, 1726.

See arguments against the inoculation of the small pox in the following writings.—Dr WAGSTAFFE's Letter shewing the danger and uncertainty of inoculating the Small Pox.—Reasons against the practice of inoculating the Small Pox, by LEGARD SPARMAN.—MASSEY's Sermon, July 8. 1722. The text was, "So went Satan forth from the presence of the Lord, and smote JOB with sore boils, from the sole of his foot unto his crown," Chap. xi. Verse 18.



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SECTION II.*Of the Cause of the Small Pox, and of the Nature of the Contagion of that Disease.*

THE Arabian physicians have published some very absurd opinions concerning the origin of small pox which scarcely merit to be mentioned. It was supposed to be owing to the foetus having been contaminated by the menstrual impurities of the mother; and according to PROSPER ALPINUS\*, the plague and small pox were concocted by the putrid waters of the Nile, which has inundated Egypt for thousands of years before the small pox appeared.

A more modern opinion regarding the small pox is, that it has been communicated from some domesticated animal; but this opinion has not yet been proved.

It has been already observed, that the small pox is occasioned by a specific contagion, and therefore we shall now proceed to consider the nature of that contagion, and the mode of its operation upon the human frame.

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\* De Medicina Ægyptior. cap. xiii.



Notwithstanding the great progress which has lately been made in animal chemistry, very little has been discovered respecting the nature of the contagion of small pox.

We have, however, become acquainted with several of the laws by which it is regulated, and also with several means by which it is modified and mitigated.

It is of much moment to know the various means by which the contagion of small pox may be communicated. The contagion of small pox is propagated by actual contact, by the clothes of the sick, and it often adheres to them for a considerable time. We are told, that in the year 1718, it was communicated to the Hottentots at the Cape of Good Hope, by some linen sent on shore to be washed, from a Dutch East Indiaman, in which a few boys had had the small pox during the passage, but had all recovered. A great number of Hottentots, however, died in consequence of the small pox.

The contagion of small pox may also be communicated by wood and other articles of furniture, and may escape from these in the form of vapour; but it does not appear that they imbibe the contagion from an infected atmosphere, and, therefore, communicate the small pox only when the contagion adheres to them;



and it has not yet been determined how long the contagion will adhere to the clothes, or to different articles of furniture.

The influence of the contagion of small pox, according to Dr HAYGARTH, is limited to a short distance; a fact which seems to be proved by the experiments of Dr O'RYAN at Montpellier \*.

The action of the contagion of small pox is considerably modified by age, sex, manner of living, the season of the year, and peculiarity of constitution.

Infants of one or two months old are undoubtedly less liable to be infected by casual or inoculated small pox than when two or three years old; and indeed Dr UNDERWOOD has gone so far as to state, that he had observed that the small pox was not communicated, on some occasions, even by contact in the cradle with a child afflicted by small pox.

Pregnant women are not fit subjects for inoculation, as the small pox often causes miscarriage, and, what is remarkable, when the disease has proved mild to the mother, it has sometimes been very severe and fatal to the child.

Dr LAIRD has described the case of a pregnant woman who was seized with severe small pox. "About the end of August she felt the

\* Vid. Dissert. sur les Fievres Infect.



motion of the child till the month of October, and on the 28th of that month she was delivered of a dead child, which was thought to be of six months' growth. On the back, shoulders, and side, and particularly upon the upper parts of the thighs, where the integuments were perfectly sound, *there were several pustular elevations, with central depressions, strikingly characteristic of the appearances which distinguish small pox.* The foetus was placed in the Museum of GUY'S Hospital, and still distinctly exhibits the characters of the eruption \*."

If the mother be seized with small pox near to her time, the eruptive fever appears in the child two or three days after birth †; and, in a few cases, the child in the womb has been seized with the small pox, but not the mother ‡."

There are also instances in which the foetus in utero has been attacked with small pox, in consequence of the mother having been exposed to the contagion of the small pox. This fact is mentioned by Dr JENNER. "A lady, a few days previous to her confinement, met with a very disgusting object, whose face was cover-

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\* See Edin. Med. and Surg. Journal for April 1807.

† Vid. Edin. Med. Com. vol. xiii. and xix.

‡ Vid. VOGEL.



ed with the small pox. The smell and appearance of the poor creature affected her much, and though she mentioned the circumstance on her return home, she had no idea that her infant could suffer from it, having had the small pox herself when a child. On the fifth day after birth the child became indisposed; and on the seventh the small pox appeared. Dr CROFT, who attended her, being curious to know the effect of the inoculation from one of the pustules, put some of the matter into the hands of a gentleman eminently versed in that practice, which produced the disease correctly."

Another case is mentioned by Dr JENNER, in which the child in utero was infected with small pox contagion, and born with the eruption upon it, five weeks after the mother had been vaccinated, and a month after she had been exposed to the contagion of small pox from three of her children. Whence Dr JENNER infers, that the small pox may affect the human frame even to its inmost recesses, although apparently secured from its effects, and give no evidence of its presence, by exciting any perceptible disorder\*.

The small pox is a disease which is common

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\* Vid. Med. Chir. Trans. vol. i.



to all climates, and in all, or the greater number of these, it has sometimes assumed a very malignant appearance, but at other times it has proved much milder.

Not even the colder climates are exempted from the small pox.

According to Sir G. MACKENZIE, the small pox broke out in Iceland in the year 1707, and proved fatal to 16,000 persons, a fourth part of the whole population; and CRANTZ informs us, that the same disease appeared in Greenland, for the first time, in the year 1733, and almost depopulated the country.

The season of the year has a considerable influence upon the small pox.

SYDENHAM, BOERHAAVE, and many other authors, have remarked, that the small pox generally appears in spring, becomes more frequent in summer, and abates in winter, and generally is more mild in the colder part of the season than in the warmer. This circumstance is familiar to all nations, and led the Bramins of India to begin inoculating in the month of February, so as to avoid the warmer succeeding months; and before and during the disease the patient was kept upon cooling vegetable diet, and freely exposed to the air.



The natural irritability may be increased or diminished by various circumstances.

The greater severity of small pox, in full-grown persons, may, perhaps, be explained; they are more robust, live more fully, and are thereby more liable to suffer severely from the disease than children.

By intemperance, violent exercise, by indulgence in spiritous liquors, and by confinement in a warm room, and by having a number of blankets on the bed, the malignity of the small pox is most prodigiously increased; for Dr CULLEN has proved, in the clearest manner, "that the inflammatory state of the whole system, and more particularly of the skin, is the cause of the multiplication of the pustules."

Upon the above principle, we may, perhaps, explain the cause of the very fatal nature of the small pox among the American Indians, whose skin, from being uncovered, is exposed to the influence of a burning sun.

On the other hand, by abstinence from animal food, violent exercise, and all spiritous liquors, by perfect ventilation, by washing with cold water, and by light dress and slight bed-covering, much may be done to mitigate the severity of the small pox.

There is great difference, in different constitu-



tions, as to the susceptibility to receive the contagion ; and hence a great many escape even during an epidemic, though it must be supposed that the contagion is diffused in the air, and when there was reason to suppose they must have probably come into contact with some one labouring under the disease. Thus, there are two of the servants in my own family, who, though much exposed to the contagion of small pox, during the indisposition of my children, and who never had either the small pox or the cow pox, and have yet escaped the contagion.

My pupil, Mr ELKINGTON, surgeon to the forces, told me, that he had been inoculated by Mr SLOPER, surgeon, five different times, at different intervals, for small pox, and three times for cow pox, but never got the one disease or the other ; and also, that he had been very frequently exposed to the contagion, but never suffered from it. And Mr BRYCE stated to me, that he had inoculated a child ten times, at different periods of life, for cow pox, but could not communicate the disorder ; he also endeavoured, but in vain, to infect by inoculation the same child with small pox.

There is still another peculiarity of constitution well meriting attention. Some are susceptible of small pox, but not of cow pox, and



*vice versa* \*, and there are some in which inoculation occasions erysipelas †, or phagedenic ulcer ‡.

There are some who do not receive the infection at one time of life, but who are not unsusceptible of it many years afterwards. I am acquainted with a lady, who was inoculated seven or eight times for small pox, during the earlier part of her life, but in vain : she, however, took the cow pox when forty years of age by inoculation ; and it may be proper to add, that it has been found impossible to communicate the small pox or cow pox by inoculation to this lady's daughter.

Dr HUXHAM has made mention of a case somewhat similar. “ I know an old nurse,” (says he,) “ and an apothecary, who, for many years, attended persons, and a great number too, in the small pox, and yet never had them ; nay, many that have industriously endeavoured to catch the infection, by frequenting the chambers of the sick, have done it without effect, and yet some of those persons, some months or years after, had been seized with the small pox.

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\* Vide Dr JENNER's Inquiry, p. 60, 61 ; and Farther Observat. p. 117 and 122.

† Vide Dr BARRY's and Mr MADDOCKS's Cases, Med. and Phys. Journal. Feb. and Nov. 1801.

‡ WILLAN on Vaccine Inoculation, p. 21.



In further illustration of peculiarity of constitution, it may be added, that the malignity of the disease does not depend upon the source from which it has been derived. The inoculation of the contents of the pustules of a malignant kind of small pox does not give rise to the same malignant small pox ; on the contrary, a mild small pox is frequently thereby produced, and, on the other hand, even the small pox which has *been modified and mitigated by vaccination, sometimes occasions a malignant small pox.*

Particular situation has also an effect in mitigating the small pox. In the country, and at a distance from large cities, the small pox is much milder than in a crowded city.

MORTON, in several of his histories, has described a very mild kind of small pox. His third history, in which he has described the case of his only son, merits particular attention. He tells us, that the pimples on the fourth day whitened, on the fifth began to get yellow, and on the seventh the crusts began to be formed, and there was no secondary fever. May not some of these cases have been examples of chicken pox ?

Dr JENNER has also described a very mild kind of small pox which prevailed in Gloucester.



tershire in the year 1791. "A fatal instance was scarcely ever heard of, and consequently the disease was so little dreaded by the lower orders of the community, that they scrupled not to hold the same intercourse with each other, as if no infectious disease had been present among them." He adds, "The harmless manner in which it shewed itself, could not arise from any peculiarity either in the season or the weather, for I watched its progress upwards of a year, without perceiving any variation in its general appearance. I consider it then as a *variety* of the small pox \*."

The small pox is a disease which is modified, and occasionally arrested in its progress, by other disorders.

The small pox is influenced by the measles appearing at the same time.

The measles have been said† to arrest the progress of the small pox : the course of the small pox is interrupted until the eruption of the measles is finished.

During the epidemic and fatal small pox described by SYDENHAM, which prevailed in Lon-

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\* Inquiry published in 1798, p. 54.

† Vide SIMS's Treatise on Epidemical Disorders.



don in the years 1670, 1671 and 1672, the measles also were very frequent.

The small pox continued for some time after the measles ceased, and gradually became milder, until the year 1674, when the measles became again epidemic. At that period the small pox proved as fatal as formerly.

The dysentery has also an influence upon the small pox. SYDENHAM informs us, that the small pox was apt to assume the form of that complaint.

On the other hand, the small pox has sometimes arrested the progress of an epidemic intermitting fever. Dr HEBERDEN has remarked, that when any of those labouring under intermitting fever were seized with small pox, the former ceased until the latter had run its course, and then went on as before.

The small pox is also modified in a remarkable manner by the cow pox.

Doubts have been entertained by some persons respecting the duration of the preventive powers of the cow pox.

These doubts have arisen from the cow pox, which is received by the milkers directly from the cow, being a more severe disorder than after it has passed several times through the human frame, by which it has been supposed to



be modified and mitigated, and also from the severity of small pox consequent to cow pox being supposed to be proportioned to the age of the individual.

With regard to the first of these arguments, it may be observed, that it is by no means difficult to explain the cause of the severity of the cow pox amongst the milkers in Gloucestershire. The poison is applied to considerable scratches or punctures on different parts of the fingers or hands ; and, besides, it is a matter of common observation amongst inoculators, that the cow pox is always more severe when received on the finger or fingers, than when inserted by inoculation in the usual manner into the arm.

Dr MACFARLANE, in giving the history of small pox after cow pox in his own family, has stated, page 6, “ In watching the progressive effect of these inoculations, the strength of which, with the exception of the eldest, it is a little singular to remark, was directly proportioned to the length of time which had elapsed since vaccination.”

A very intelligent correspondent entertains the same opinion, which he has thus expressed :

“ Though I have seen the variolous affection take place at all periods after vaccination, yet I



generally observed that the recent cases of vaccination *commonly resisted small pox, whilst those of longer standing did not.* I have had many opportunities of bringing this to the test, having inoculated between forty and fifty children at the express desire of their parents, without any influence having been used on my part to induce them to embrace such a measure ; all had of course undergone previous vaccination. Not more than *six out of the number* entirely escaped the variolous affection. All the others had the pustule and areola as completely formed as I ever saw previous to the introduction of vaccination. On the seventh or eighth day after inoculation, the eruptive fever took place, and generally continued with more or less violence till the tenth or eleventh, when the appearance of a few small pox put an end to the fever. In several instances there was a good deal of delirium, and in one it continued for five or six days.

“ Such are the facts which within these few weeks have occurred to me, and which I have endeavoured to state with all the impartiality in my power. I am perfectly aware that many may be dissatisfied with the statement I have given, and many more will probably not believe it. To this I can only reply, that time and obser-



vation alone will settle the point. There are perhaps many phenomena connected with vaccination and its influence over small pox with which we are still unacquainted; and much experience is still wanting to enable us to appreciate properly a discovery of such vital importance to the best interests of humanity."

There is no direct evidence of the preserving influence of the cow pox gradually and insensibly wearing away without any obvious cause \*.

The measles and hooping-cough generally confer a permanent immunity, which is not gradually destroyed by the lapse of years.

There are instances in Gloucestershire of the preventive powers of the cow pox having exerted its influence for sixty years, according to Dr JENNER.

Besides, the small pox after cow pox has taken place at very different distances of time, in some at the distance of a few months only, but in others at the distance of eighteen and twenty years; and, in my own family, the severity

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\* The observations of Dr WILLAN, (vide his book on Vaccination, p. 66 and 72,) and of Mr CREIGHTON of the Foundling Hospital of Dublin, and the Reports of the Vaccine Institution of this city, give great weight to such an opinion.



of the small pox was not proportioned to the ages of the children.

From what has been stated, I should rather say, that in some peculiar constitutions, the cow pox imparted an imperfect power of resistance, which is overcome by a virulent and powerful contagion. Thus, for example, in the case from which fig. 2. Plate I. was taken, the small pox seized in the first place a child that had not been inoculated either for the small pox or cow pox. Four others of the family were in a short time taken ill. Two only of the five had been vaccinated, and to these the disease proved much milder than to the others, who had not been previously vaccinated.

The following history of a family, communicated to me by Mr SCRYMGEOUR of Falkirk, seems to me equally in point.

“ The family consisted of seven. The three eldest had been vaccinated by me upwards of twelve years before. About two years ago, the four youngest were seized with the small pox in a very virulent form. They were confluent, and I considered every one of their cases as being accompanied with great danger. They all, however, recovered, though they remained for a long time in a very weak state, and on several of them large abscesses took place in



different parts of the body, after the small pox had disappeared. Every one of them are pitted.

“ During the time these four were labouring under the disease, those who had been vaccinated were seized with considerable fever, and at the usual time a small eruption took place, not more than four dozen of pustules on all the three. That they were small pox admitted of no doubt. They had the depression on the centre, and run the usual course. Upon the eruption taking place the fever immediately subsided. They had no affection of the throat, no interstitial swelling, no secondary fever, and no marks were left. I need hardly add, that these cases, instead of injuring the cause of vaccination, tended to give the people additional confidence in the practice.

“ Ages of the children at the time the small pox made their appearance.

Vaccinated.

17, 14, 11

Confluent Small Pox.

9, 7, 6, 4 years.”

It has also been stated, that the inoculation, with a mixture of the vaccine and variolous matter, does not produce a *hybrid disease*, but sometimes the cow pox distinctly, and at other times the small pox only.



MR BRYCE informed me, that he has taken the contents from the vesicle of the cow pox, whilst that person has been labouring under the eruptive fever of the small pox, and thus produced the cow pox only.

Another peculiarity as to the contagion of small pox is, that that disorder sometimes occurs twice in the progress of life.

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### SECTION III.

#### *Of Small Pox occurring twice during the progress of life.*

It has been stated by the enemies of vaccination, that the small pox very seldom or never has appeared twice in the same individual in the progress of life; and, on the other hand, by the advocates for vaccination, that independently of the cow pox being a much milder and safer disease, it gives as great a security against the return of small pox, as the inoculation of that disease itself.



Upon this very important question, Dr JENNER's sentiments merit peculiar attention. "In three districts in the county of Gloucester, embracing a circle of about twenty miles, I can engage to produce a very considerable number of well-authenticated cases of small pox, which occurred at different periods after small pox inoculation. Within the same circles, a larger number of persons have been inoculated with the vaccine than with variolous matter, some of them above eight years ago, yet it has never come to my knowledge that a single instance of failure, in the vaccine inoculation, has taken place, although it appears that thousands of the vaccinated have been exposed to the variolous infection, after vaccination. Cheltenham, Berkeley' and Easington, may be considered as the centres of the above circles. Within them, a considerable number of well-attested cases of small pox, after supposed security from small pox inoculation, have already been made public by professional gentlemen of eminence, as by Mr EARL of Frampton, Mr FEWSTER and Mr SCOTT of Thornbury; Mr WOOD of Cheltenham, (in whose narrative appears the melancholy recital of the death of his own sister of confluent small pox after inoculation,) Mr BANCKS of Winchcomb, Mr JENNINGS of Chep-



stow, Mr WILLIAMS of Dursley, and Mr TRYE of Gloucester.”

From the report which has been published in France upon the above very important question, it appears that a greater number of persons have been afflicted twice by small pox as by small pox after cow pox ; and it may be proper to add, that the medical gentlemen of the Gloucester Infirmary, Doctors BARON, H. SHUTE, R. FLETCHER and W. COTHER, entertain the same opinion, which they have published in an address, dated March 13. 1817.

This opinion has also received the sanction of the late Dr WILLAN, who not only has stated that the vaccine inoculation gives as great security as the small pox, but also has this advantage over it, that even imperfect vaccination has always a certain effect in modifying and mitigating the subsequent small pox, whereas the imperfect inoculation of the small pox is admitted to have no subsequent effect whatsoever.

Farther, even after the contagion of small pox has been received, the inoculation of the cow pox modifies the small pox in a striking degree.

Within these few months I have undoubtedly had occasion to visit a much greater number of persons who have had small pox after cow



pox, than who have had small pox after small pox, a circumstance which was to be expected, as a much greater proportion of persons have been inoculated with the cow pox than with the small pox; and besides the public have been as much alive to every eruptive disorder that followed the cow pox, as they have been negligent of those which succeed the small pox.

Many of the older authors, as RHASES \*, FORESTUS †, DIEMERBROEK ‡, JOHN of Gaddeston ||, DU HAEN §, and VAN SWIETEN ¶, have described the small pox to have occurred twice during the life of the same individual.

\* Et possibile est quod (variolae) accidunt bis vel ter. Contin. RHASIS, lib. xviii, cap. 8.

† PETRI FOREST. Oper. lib. vi, ob. 43., et nos in hoc nostro filio, qui bis variolas habuit, licet puer, et in *aliis multis aegris* observavimus.

‡ Anatomy of the Human Body. He saw *many cases* in which small pox occurred twice.

|| Ros Anglic.

§ Ratio Medend. tom. iv, also Respons. ad Epist. Apolog. R. L. TRALLES, tom. ix.

¶ Comm. in BOERH. Aphor. GERARD. VAN SWIETEN, tom. v, art. Variolae.



But as much credit may not be given by some readers to the statement of the older authors, regarding the recurrence of small pox during the life of the same individual, as they were not aware of the distinctions between the small pox and chicken pox \*, I have therefore subjoined, at the bottom of the page, a list of the more modern authors, who have described the small pox as having occurred twice during the life of the same individual †.

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\* BORELLI<sup>1</sup>, BURSERIUS<sup>2</sup> and others<sup>3</sup>, have certainly mistaken some other cutaneous disorder for small pox, for it cannot be credited that small pox should recur five or six times during the life of the same individual.

<sup>1</sup> Hist. Med. Phys. Cent. 111. Obs. 10.      <sup>2</sup> Inst. Med.

<sup>3</sup> PAULINI Obs. Med. Cent. 111. Obs. 27. Ephem. Natur. Cur. Dec. 11. Ann. 4. Obs. 29.

† Vid. WILLAN, KITE<sup>4</sup>, WITHERS<sup>5</sup>, MILLS<sup>6</sup>, ADAM<sup>7</sup>, RING<sup>8</sup>, BRYCE<sup>9</sup>, LAIRD<sup>10</sup>, BATEMAN<sup>11</sup>, National Vaccine Board<sup>12</sup>, WOODVILLE<sup>13</sup>, MOORE<sup>14</sup>, Edinburgh Review, vol. ix, p. 62; BURSERII Inst. Pract.; and the letters of Mr HENEN, Drs RAMSAY and SMITH, which are inserted in a subsequent part of this book.

<sup>4</sup> Mem. of Med. Soc. of Lond. vol. iv.

<sup>5</sup> Ibid.

<sup>6</sup> Ibid.

<sup>7</sup> Thesis de Variola et Vaccina, Edinburgh, 1814.

<sup>8</sup> He has published sixty such cases. Vid. Answer to Dr MOSELEY, and Treatise on Cow Pox, Lond. 1801.

<sup>9</sup> Vid. Appendix to his Observations on Cow Pox, 2d Edit.

<sup>10</sup> Medico-Chirurg. Trans. vol. ii.

<sup>11</sup> Ibid.

<sup>12</sup> This fact is mentioned in several of their reports; I



The following history of a family in Edinburgh, which Mr BRYCE was lately so kind as to give me for insertion, is very interesting and curious, in so far as it places the inoculation for small pox and cow pox on the same footing, with regard to the prevention of a future attack from small pox, and affords an example of the milder kind of small pox succeeding the small pox.

—— BENNET, smith in Crosscauseway.

His family consists of five children. The oldest, a girl of sixteen years of age, was inoculated, and had the small pox when seven months

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have subjoined a part of the last : “ The small pox occurs occasionally twice in the same individual ; and since the last Report of this Board to his Majesty’s Government, twelve cases of small pox occurring after small pox, in this country, were communicated to the Board by medical practitioners.

“ Two of these cases were individuals who had had small pox from inoculation, and who caught the second attack from being in houses where mitigated small pox after vaccination had appeared.

“ Both of them, and one in particular, had the disease more severely than those who had been vaccinated.”

<sup>13</sup> History of the Inoculation of the Small Pox, London, 1796.

<sup>14</sup> History of Small Pox, London, 1815.



old, in a very satisfactory manner, and several marks are visible on her face. The next is a girl of nine years of age, who was vaccinated at the Dispensary in December 1803. She was only brought back once for examination, but there is a good mark on the arm, and the mother says that the pock rose well. The remaining three were neither vaccinated nor had the small pox. The oldest of these three was at school, and contracted small pox, of which she had a full load, and the eruption run through the regular course of that disease. This girl slept with her oldest sister, who had the small pox in her youth. About fourteen days after the eruption appeared on the third child, the oldest girl became feverish, and very sick and uncomfortable: this state continued three days, and was followed by an eruption of pimples on her head, face, neck, shoulders, arms and thighs. The second child, who had been vaccinated, also sickened about the same time, and after a slight fit, an eruption of pimples also appeared on her face and body, rather more numerous than on her oldest sister, but not of a larger size. The eruption blackened about the fourth or fifth day in both, or rather dried into hard pimples without suppurating, and



both were presently quite well again. The fourth child had a complete load of distinct small pox, with very considerable fever, but recovered. The fifth child was vaccinated fully three weeks after the small pox first appeared in the family. The vaccine vesicle appeared regularly, and she wholly escaped the small pox.

There are some constitutions very liable to receive the contagion of small pox, and on which that contagion operates very violently.

I have lately had occasion to meet with four persons, who have had small pox twice in the progress of life, and three of these were very much marked by the first attack of the disease.

The second attack of the small pox is on some occasions mild, but in other instances malignant and fatal \* ; and of both varieties I have lately had occasion to see examples.

In the milder, the pimples pass at once from the state of vesicle to that of incrustation, therefore the disease has been called *Horn Pock*, on

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\* The reader would do well to consult on this head the chapter in Dr ADAMS's Thesis, entitled, "De Febre cum Eruptione in iis etiam Variolas passis."



account of the smooth horny appearance of the crust elevated on a hard warty-looking base \*.

This form of small pox is of a mild nature, is attended with no secondary fever, though the crusts do not fall off so soon as in the casual small pox, when the contents of the pustule become purulent.

I have made mention of this kind of small pox on the authority of Dr FARQUHARSON, one of the surgeons appointed to conduct the Vaccine Inoculation at the Public Dispensary, and of Mr BRYCE; the former of whom has assured me, that in the course of his extensive practice, he had had occasion to meet with upwards of one hundred cases of it; and the latter gentleman has informed me that he has seen several cases of the same disorder; and he regards the horn pox which occurred before the introduction of vaccination, as a kind of small pox modified by a previous attack of that disease, exactly in the

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\* In the case of small pox, which has been described by Dr BATEMAN, (Medico-Chirurg. Trans. vol. ii, p. 33.) the Doctor has observed, "There were about fifteen spots on the face, approaching to the pustular character, some of them *rather horny and tuberculated*."

DE HAEN supposes that the second attack of small pox will generally prove milder than the first.—Vid. Ratio Medendi, pars 9<sup>na</sup>, p. 125.



same manner as is now sometimes observed after the cow pox.

This *horny appearance* is particularly mentioned by the medical gentlemen of Forfarshire in their subjoined report of the small pox which has sometimes followed vaccination; and the same thing has been observed by a great many others, in describing this eruptive disease after vaccination, which seems to afford proof of an analogy between the effects of small pox and cow pox on the constitution.

There is, however, this essential difference, that the small pox which succeeds the former has sometimes proved fatal. I had lately occasion to see such a case along with Dr GRAHAM of Dalkeith. The patient, a man of twenty-two years of age, had had small pox severely when three years old, and was marked by them. After considerable fatigue he was seized with malignant small pox, and died on the twelfth day. Several such have been mentioned by Mr RING \*, Dr BATEMAN †, and others.

It is a singular fact with regard to the contagion of small pox, that though the system be

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\* See his Answer to Dr MOSELEY, and also his large Treatise on Cow Pox, London, 1803.

† Medico-Chirurg. Trans. vol. ii.



unsusceptible of the contagion when it is floating in the air, yet the disease may occasionally be communicated even to those who previously have had the small pox by inoculation ; hence several surgeons who have practised inoculation for years, by unguardedly pricking their fingers with the point of a lancet charged with the variolous matter, have got the disease for a second time \* ; and in this manner students, in dissecting the bodies of persons who have died from small pox, have received the contagion of that disorder for a second time.

Nurses who suckle children with small pox are frequently seized, not only with fever, but also with the eruption of small pox over the breasts and trunk of the body, though they have previously had small pox.

It is of moment to observe, whether the fever precedes or follows the eruption in a case of the above description. If the fever precedes the eruption, the constitution is affected ; but if the fever follows the eruption, which most generally happens, the affection is to be considered as local, the fever being merely symptomatic of the eruption.

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\* Vide Edin. Med. and Surg. Journ. Oct. 1811, p. 415.



## CHAPTER III.

### OF SMALL POX.

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#### SECTION I.

#### *Of the Symptoms of the Variola or Small Pox.*

IN a former part of this work it has been stated, that the small pox was unknown amongst the Greeks and Romans. Hence the word *Variola* does not occur in any of the classical authors, but is of modern date, and its etymology is unknown.

When the small pox made its first appearance in Europe, the Latin language was in universal use amongst the learned, and the disease, in common with other epidemics, was called *pestis* and *lues* ; but in a short time the word *variola* was coined to describe this peculiar disease.

According to some authors, the word *variola* is derived from the word *vari*, which is employed by *PLINY* and *CELSUS* as denoting small tumours, which sometimes appear on the face



about the period of puberty; and the words *pocks* and *pox*, from the Anglo-Saxon *pocca*, signifying a pouch, as being descriptive of the pustules; and the term small pox has been added to distinguish this disorder from the *lues venerea*.

RABELAIS, and the old French authors, called the small pox *piquote*; and the Saxons, instead of employing the Latin word *variola*, used the vernacular word *poccadl*, derived from *pocca*, a pouch \*.

The small pox is a disease in which an eruption of a peculiar kind succeeds an attack of fever, which has thus been defined by Dr CULLEN: “*Synocha contagiosa cum vomitu, et, ex epigastrio presso, dolore* †.

“*Tertio die incipit, et quinto finitur eruptio papularum phlegmonodearum, quae, spatio octo dierum, in suppurationem, et in crustas demum abeunt, saepe cicatrices depressas, sive foveolas in cute, relinquentes* ‡.”

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\* Vid. Dict. Gothic. Latin. ed. LYE.

† Small pox, contagious, inflammatory fever, with vomiting, and, upon pressure of the epigastrium, attended with pain.

‡ The eruption of small red pimples begins on the third day, and ends on the fifth; which pimples, in the course of eight days, suppurate, and at last fall off in crusts, often leaving depressed scars, or little pits in the skin.



The same author has also described the distinct and confluent small pox in the following terms :

1. “ *Variola (discreta) pustulis paucis, discretis, circumscriptione circularibus, turgidis ; febre, eruptione facta, protinus cessante \**.”

2. “ *Variola (confluens) pustulis numerosis, confluentibus, circumscriptione irregularibus, flaccidis, parum elevatis ; febre post eruptionem perstante †.*”

But the distinctions deduced from the number of the small pox pimples, is not in all instances well marked ; for, in some instances, the pimples, though numerous, are quite distinct ; and, on the other hand, when they are but few, they run together : Besides, the pimples are in some instances distinct and few in number upon the trunk of the body, but they run together or are confluent on the face ; and, on the other hand, there are sometimes few pimples on the face, but a great number on other parts of the body which, in many places, are collected into clusters. Besides, the mild small pox is

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\* *Distinct small pox*, with few pustules, and those distinct, with circular margins, turgid ; the fever ceasing upon the eruption breaking out.

† *Confluent small pox*, with numerous pustules, confluent, with irregular margins, flaccid, and but little elevated ; fever remaining after the eruption.



occasionally confluent as well as the malignant.

In the subsequent pages, I have therefore described, and very briefly, the milder form of the disease, in which the pimples sometimes, though rarely, run together, and the malignant confluent small pox. But it is entirely foreign to the object of this book to enter minutely into all the varieties of small pox, which have been described by different authors.

The eruption of small pox is preceded by many symptoms which are common to many febrile disorders.

The characteristic symptoms are, pain at the stomach, increased on pressure, pain in the head and back, accompanied by languor, drowsiness, vomiting of bile, and sometimes by purging of the same fluid, and in adults there is disposition to sweat. A short time before the eruption appears, that is, in the course of two or three days from the first attack of fever, the patient is much more uneasy, passes very restless nights, starts frequently from his sleep, grinds his teeth, has a convulsive twitching about the mouth, and some have an attack of epilepsy.

The fever, at this period, becomes more acute, the skin is hotter, the throat more dry, the eyes red and glaring, and the patient can-



not bear the light, and is tormented by cramps in his legs, and severe pain in the back. On the evening of the third, or morning of the fourth day, the eruption increases. The eruption generally begins on the face, and extends first to the breast, and afterwards to the extremities of the body, and is generally completed on the fourth day.

The above symptoms are very various as to severity in different cases; in general, the severity of the symptoms is proportioned to the quantity of the eruption.

When the eruption has come out, the fever remits, and disappears entirely on the fifth or sixth day, when the eruption is generally complete.

The eruption appears at first like a number of small red points, not unlike flea-bites, which scarcely rises above the surface of the skin, but by degrees it is changed into distinct prominent pimples, which are distinct on the face; and at this period the patient sneezes occasionally, but ceases to do so when the eruption is fully out.

The pimples next day appear clear or vesicular, and depressed in the middle; and if the pimple be opened, a small quantity of serum is discharged. Around each little pimple, there



is a red border, about a line in breadth, and a diffused redness of a much paler hue, of the breadth of a quarter of an inch; and hence, when the pimples are numerous, the skin between them assumes a rosy hue.

On pressing the skin, a small hard round body is perceptible, which rolls under the finger, and which, when pressed, is somewhat painful.

For two or three days, these vesicular pimples increase in breadth, and their contents become of a light yellow colour, or are converted into pus, or the pimples become pustular.

On the eighth or ninth day of the disorder, the eruption is supposed to be perfect, the pustular pimples are prominent, spherical, hard, and somewhat itchy, excepting when the eruption is very copious: in these circumstances they are more flat, and there is slight fever.

About the same period, the face generally swells, and is painful, and the swelling, in a few cases, extends over the whole head.

The eyelids also partake of the swelling, so as to cover the eye-ball.

The pimples on the extremities follow a similar course, but a little later, so that when the face is rough and yellow, the pimples in the extremities are whiter and paler.

In a few cases, when the eruption is consider-



able, the throat is somewhat painful, which is followed by hoarseness, and a slight degree of spitting or salivation, and of difficulty in swallowing.

On the tenth or eleventh day, the swelling of the face and inflammation begin to subside, and this is sometimes succeeded by swelling of the feet and hands, which goes off in a few days.

On the eleventh or twelfth day from the commencement of the fever the pustules spontaneously burst, a small quantity of their contents issues out, in consequence of which the pustular pimples shrink, the matter that has oozed out dries, becomes rough, and a small dark brown crust forms over each pustule; and this takes place first on those pimples on the face, and afterwards on those on the arms, hands, legs and feet.

On some occasions very little oozes out from the pustular pimple, and the purulent matter which remains within the pustules becomes thicker, and at length forms a scab.

Generally about the fifteenth or sixteenth day the crusts and hardened pustules fall off; the subjacent skin is then found to be of a lake colour, and it continues of the same colour for many days.

When the disease has been mild, pits are sel-



lone left on the skin; but when the pustular pimples have been numerous on the face, the parts which they cover suffer desquamation, so that pits are formed.

In a few cases the contents of the pustular pimples are absorbed, hence the pustules seem as small empty bags.

When the eruption has been very copious, the fever generally returns about the eleventh day; but, in general, when the small pox has been distinct, the fever is inconsiderable, and goes off in the course of a few days.

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## SECTION II.

### *Of Varieties of Mild Small Pox.*

WHEN the small pox has not its usual characters, particular names have been employed to express those deviations from the usual appearances.

When there are empty vesicles between the pustular pimples, or when the pus of the pustular pimples has been absorbed, so that these are left empty, the disease has been named *variola discreta siliquosa*.



When the pimples continue during the whole progress of the disease, vesicular, instead of being pustular, the disease is named *variola discreta crystallina*.

When vesicular pimples appear in the interstices between the pustular pimples, this species has been called *variola discreta vesicularis*.

When, instead of vesicular or pustular pimples, the eruption is solid, this kind has been called warty small pox, or *variola verrucosa*.

Twelve varieties of distinct small pox have been described by SAUVAGES, but the symptoms of these are not so distinct that they can be regarded as different species: besides, these varieties have been deduced from the various forms, contents and duration of the eruption.

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### SECTION III.

#### *Of the Malignant Small Pox.*

THE fever which precedes the eruption of the malignant small pox is nearly similar, excepting in degree, with that which precedes the distinct small pox. The principal difference consists in the eruption being preceded by a more acute headach, greater anxiety, more severe



sickness and vomiting, sometimes by delirium, epileptic fits, especially if the patient be young, or a rosy efflorescence, as in the measles. The pimples appear at a more early stage of the disease, sooner becoming clear at the top, and many of them run together, and never become equally prominent, but form a flat surface; and when the pustules are distinct, they continue flat, instead of rising and becoming spherical, (*vide* Fig. 2. Plate I.), and the skin between the pustules is flaccid, and of a dirty purplish colour.

The pustules contain a brownish fluid, instead of yellow purulent matter.

The face swells at a more early period of the disorder, and is often so great as to change the appearance of the patient completely.

On the ninth or tenth day the pustules burst spontaneously, a fluid is discharged from them which concretes into brown or black crusts, which frequently do not fall off until the twentieth day.

This kind of small pox is often attended by a very copious and distressing salivation, which is in some cases very thin and copious like that occasioned by mercury, but in other instances very viscid and ropy, so that it is discharged with considerable difficulty.



The secondary fever, as in some cases of the confluent small pox, assumes the typhoid type.

The eruption on the face, which is much swollen, is in some instances so confluent, that from the matter which is discharged from the pustules concreting, a crust is formed over the face, not unlike a covering of parchment.

It often happens, that though the eruption be confluent in the face, it is distinct in other parts of the body.

In some instances the crust is of a brown or black colour.

There is always a desquamation, which is sometimes protracted beyond the twentieth day, and which leaves pits.

The period of maturation, like that of the eruption, is less certain in the malignant than in the milder distinct small pox, and the crusts are longer in falling off, and almost uniformly succeeded by pits.

In the milder small pox there is no return of fever on the sixth day, but in the confluent the fever scarcely abates : it continues till about the sixth or seventh day ; and on the tenth or eleventh day it becomes much more severe, the patient's pulse becomes quicker, the heat of the body increases, the patient suffers much from thirst, anxiety, restlessness, headachs,



inflammation of the throat, salivation, hoarseness, difficulty of breathing and swallowing, and watchfulness, purple spots or *petechiae* on the skin, and by a discharge of blood from the kidneys, or from the bladder or intestines, which are frequently the forerunners of delirium and death.

According to SYDENHAM, death generally takes place on the eleventh day from the commencement of the disorder, but in a few instances it does not take place until the sixteenth day.

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#### SECTION IV.

##### *Of the Varieties of the Malignant Small Pox.*

SEVERAL varieties of the malignant small pox have been described.

When the pustular pimples are of a very dark hue, or almost black, the disorder has been named *variola confluens nigra*; when the pimples are filled with blood, *variola sanguinea*; and



when the pustular pimples are collected into groups, with few intermediate spaces, the term *variola confluens corymbosa* has been employed to express that form of the disease; and when petechiae appear between the pustular pimples, the disease has been called *variola confluens petechialis*.

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## SECTION V.

### *Of the Causes of the Present Frequency of Small Pox.*

THE frequency of small pox at present may be imputed to the following causes:

1st, To the neglect of vaccination.

2dly, To the inoculation for cow pox being performed in an imperfect manner.

3dly, To the atmosphere having of late been so much contaminated by the contagion of small pox, that neither perfect vaccination, nor the small pox itself, have proved, in all cases, a sufficient barrier against the contagion of that pestilence.

4thly, To the inoculation of small pox.



Those who are not conversant with the habits and opinions of the lower orders of society may not perhaps be disposed to give credit to the assertion, that there is a very considerable number of the poor who have never been inoculated, either with the small pox or the cow pox, notwithstanding the facilities that are held out for vaccination. This circumstance has proved a great barrier to the propagation of the cow pox inoculation; and, what is much to be lamented, this indifference on the part of the poor with regard to the getting their children vaccinated has of late become greater, their dread of small pox being considerably diminished, by the greater rarity of that disorder.

Parents cannot be persuaded to take the trouble of getting their children vaccinated, though it costs them nothing; they flatter themselves, that by carefully secluding their children from all occasions of infection, they may escape the disease. But this will not apply to a future period, when they are compelled to join in the more active business of life, to intermix much with other men, and of course to incur greater risk of contagion.

There are others who still retain religious scruples against vaccination, as well as against the inoculation for the more severe dis-



order the small pox. They still hesitate to expose their children to the risk of any disease artificially produced.

2dly, Another very fertile source of the small pox is *imperfect vaccination*.

The seeming simplicity by which the inoculation of the cow pox is performed, together with the mildness of the disease, has led midwives, nurses, gardeners, and many others not at all conversant with the appearances or progress of the genuine cow pox, to practise vaccination; and the same description of people, having gained confidence by their experience, still continue to inoculate a much greater number of the poor than medical practitioners.

That many mistakes should be committed by such a class of vaccinators, even were the operation much more simple than it in reality is, cannot excite wonder, especially when it is considered that there are many causes which may render inoculation for the cow pox abortive.

Besides, such inoculators do not take the trouble of visiting their patients during the progress of the disorder, or the parents neglect to bring back their children for the inspection of the inoculator. From the above causes, many who have been inoculated with



the cow pox are at a future period of life seized with small pox.

By the multiplication of such failures, the faith, even of the higher orders, in the preventive properties of the cow pox, has been much shaken.

Far different was the practice when the inoculation of the small pox was introduced into Britain: it was confided almost exclusively to the SUTTONS, BARON DIMSDALE, and other professed inoculators, who simplified and materially improved the Turkish method of inoculating. If vaccination were performed by professed vaccinators, who have particularly directed their attention to the subject,—who are carefully instructed as to all the necessary precautions in conducting the inoculation through its various stages,—who are fully acquainted with the causes of its failure, (more numerous than in the case of the small pox inoculation,) and who, by long observation, have become capable of *distinguishing with certainty the genuine from the spurious infection*,—the operation of vaccination would, in the great majority of cases, give the desired security against small pox.

Unless vaccination shall be generally adopted, and be performed in a perfect manner, many of the community must still be exposed to be in-



fectured by the small pox, and some may thereby fall victims to its influence.

It is melancholy to observe, that by comparing the reports of the National Vaccine Institution for 1816 and 1817, many more have died from small pox during the year 1817.

Six hundred and fifty-three died during 1816, and one thousand and fifty-one during the year 1817, “ a number which, (it is added,) according to probable calculation, includes only two-thirds of those who actually fall victims to the small pox in the capital.”

In consequence of the bills of mortality not being accurately kept in this city, I have not the means of ascertaining the proportion of deaths by the small pox : several have fallen within my notice. Mr BRYCE, and several other gentlemen who devote their attention to this subject, have met with several others, so that I should suppose some thousands of the inhabitants of the British dominions have, within these eighteen months, perished from the small pox.

It may not be improper in this place to make a very few remarks relative to the cow pox, before enumerating the several causes which tend to render vaccination imperfect.



The anti-variolous influence of the cow pox, according to Dr BARRY \*, Mr BRAGGE, and Mr DREW †, have been long known in Ireland and Gloucestershire.

Dr JENNER had the singular merit of introducing the vaccine inoculation into general practice, and of proving that the vaccine poison is regenerated in the human constitution.

The above very remarkable discovery attracted universal attention, and soon after its promulgation it was doubted by some, denied by others, and held out by a third party as introducing a bestial humour into the human frame. Those who commenced their opposition to the cow pox, were supported by the testimonials of several persons, who pretended that new diseases had thus been introduced.

These unfounded assertions have been refuted by Mr BRANDON TRYE, a gentleman placed in the most favourable circumstances for that purpose ‡.

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\* Vide Med. and Phys. Journal for 1801.

† Vide Report of House of Commons on Cow Pox.

‡ He states, " A more healthy description of human beings does not exist, nor one more free from chronic cutaneous impurities, than that which suffers most from cow pox, by reason of their being employed in dairies.

" The Gloucester Infirmary, one of the largest provin-



I have not been a supine or inattentive observer of the nature of the vaccine disorder, or as it ought to be called equine, as Dr Lox has shewn that it originated with the horse.

I enjoyed an opportunity, at an early period, of knowing the nature and value of Dr JENNER's discovery, while the subject first engaged the attention of the profession at large, and of the public.

About twenty years ago, I had the honour to accompany Sir JOSEPH BANKS, the late Dr GARSHORE, and other gentlemen of the Royal Society of London, to the extensive Dairy in Gray's Inn Lane, to examine the cows with the disease, and afterwards saw the celebrated Dr JENNER perform inoculation, and got much information from him on the nature of the cow

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cial hospitals, situated in a county, in which accidental cow pox has been prevalent from time immemorial, many hundreds among the labouring poor have had the cow pox since the establishment of that institution, *and that more severely than is generally the case in artificial vaccination*; and yet not a single patient, in half a century, has applied to the Infirmary for relief of any disease, local or constitutional, which he or she imputed, or pretended to trace to the cow pox; and be it repeated and remembered, that the artificial in no respect differs from the accidental cow pox, except in being generally less virulent."



pox. I carefully watched the progress of the disease, and thereby became convinced of the superiority of the cow pox inoculation.

Upon my return from London in 1799, I inoculated more than fifty or sixty children with cow pox, in order that I might justly appreciate the facts and arguments which have been advanced in favour of or against the cow pox; and had the pleasure not only to arrest the progress of a very severe small pox, which proved fatal to a number of children, but also to find, *that those I vaccinated did not take the small pox, though they lay in the same bed with their brothers or sisters with the confluent small pox.*

The objections proposed to the cow pox were removed, chiefly by the interference and wisdom of Parliament, who in the year 1802 appointed a committee to examine into the nature of Dr JENNER's discovery. The committee published a report highly favourable to the cow pox. The chairman stated, "That they sought for the testimony of all those who were hostile to the new practice, and who were most keen to detect its fallacy. This rigorous proceeding, which may have appeared to bear hard upon the petitioner, has only confirmed his triumph." The result of the proceedings of the House of Commons was, that they bestowed on Dr JENNER



their approbation, and a reward of L. 30,000 for his discoveries respecting cow pox. "Happily," said Lord SIDMOUTH, the then Chancellor of the Exchequer, "there is no difference of opinion on the merit of Dr JENNER. That he is the discoverer, and that the value of the discovery exceeds all calculation, are incontestably proved by concurring evidence \*."

Vaccination, to make use of the words of JENNER, "flourished for several years," and the benefits of it have been diffused over almost every part of the globe.

There are many causes which lead to the failure of the vaccine inoculation, of which the following are the chief†.

1st, The matter for inoculation has sometimes been taken from a spurious sore, which, though it occasioned a vesicle, and excited inflammation in the inoculated patient, did not

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\* Vide Debates in Parliament respecting the Jennerian Discovery, including the late Debate on the future grant of L. 20,000 to Dr JENNER, together with the Report of the Royal College of Physicians of London, with Introductory Remarks by CHARLES MURRAY, London, 1808.

† Much valuable information on this head is to be found in Dr WILLAN's Chapter on Imperfect Vaccination, and also in Mr BRYCE's Practical Observations on the Inoculation of Cow Pox, 2d edition, which the limits of this book prevent me from inserting.



communicate the genuine disease, or it has been taken from the true sore at too late a stage of its progress ; and hence, though it occasioned acute inflammation, it did not communicate the true cow pox.

*2dly*, If the lancet on which the matter of cow pox is preserved shall become rusty, the rust of the steel decomposes the poison.

*3d*, If the vaccine vesicle has been repeatedly punctured or drained for two or three successive days, the inoculation generally fails ; for the poison which, in the progress of the disease, is deposited into the cells of the vesicle, is thus exhausted, or may be so much diluted as to be incapable of producing the disease.

*4th*, The matter taken from the genuine cow pox vesicle may be injured by heat, exposure to the air, or moisture.

*5th*, If the matter be taken after the thirteenth day from the cow pox vesicle, it “ does not, according to WILLAN, produce the genuine cellular vesicle, but is in some cases wholly inefficient, while in others it suddenly excites a pustule or ulceration, in others an irregular vesicle, and in others erysipelas.”

*6th*, If the crusts employed for cow pox inoculation be kept in a high temperature, or in a damp place, they soon acquire, as Mr BRYCE



has well observed, a peculiar smell, which marks their loss of power to reproduce the cow pox.

7th, The inoculation for cow pox does not take effect, when the child labours under other cutaneous disorders, as measles, scarlatina, itch, herpes, tinea capitis, or crusta lactea.

“ Imperfect vaccination,” says Dr WILLAN, “ is not characterized by any uniform sign or criterion, but exhibits, in different cases, very different appearances, as pustules, ulcerations, or vesicles of an irregular form. The vaccine pustule is conoidal; it increases rapidly from the second to the fifth or sixth day, being raised on a hard inflamed base, with diffuse redness, extending beyond it on the skin. It is usually broken before the end of the sixth day, and is soon after succeeded by an irregular yellowish brown scab. The redness disappears within a day or two, and the tumour gradually subsides. According to Dr JENNER, “ its commencement is marked by a troublesome itching, and it throws out a premature efflorescence, sometimes extensive, but seldom circumscribed, or of so vivid a tint as that which surrounds the pustule, (vesicle,) completely organized, and (which is more characteristic of its degeneracy than the other symptoms) it ap-



pears more like a common festering produced by a thorn, or any other small extraneous body sticking in the skin, than a pustule (vesicle) excited by the vaccine virus. It is generally of a straw colour, and when punctured, instead of the colourless transparent fluid of the perfect vesicle, its contents are found to be opaque." In short, when the vesicles are irregular or imperfect, there is commonly premature itching, which is so great as to provoke scratching, inflammation, or the formation of matter. The progress of the vesicle is too rapid, its texture is soft, and it is apt to be broken ; the border is not well defined, the middle is raised, and the contents discoloured or purulent, and it is encircled by a premature efflorescence of a dirty purple hue, and the scab is of an amber colour.

It may be difficult to determine by the eye whether perfect vaccination have actually taken place or not, a circumstance of which the reader may be perhaps convinced, by perusing the above observations of the late Dr WILLAN, on the various forms and appearances of the spurious as well as of the genuine vesicle ; and, besides, the local affection may be mistaken for the constitutional one.



It has been mentioned by Messrs DAWSON\* and KITE†, that the part into which the variolous poison has been inserted, inflames, and a pustule is produced, which is filled by an active variolous poison, capable of exciting the disease in others, without the person himself being constitutionally affected by small pox, *or being by this pustule on his body* rendered unsusceptible of variolous contagion at a future period of his life. The same has been observed by several others, and this may undoubtedly also happen in cow pox as well as in the small pox inoculation, and thus prove a fruitful source of disappointment in conducting vaccination.

All of these difficulties have been removed by the ingenuity of Mr BRYCE, who has supplied us with a certain test, for determining these important points, which consists in reinoculating the child on the other arm, on the fifth day after the first inoculation. If the constitution has been affected, the vesicles on both arms arrive equally soon at maturity, and also fade together.

The arguments advanced in favour of Mr BRYCE's Test are founded on the most rigorous

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\* Vide Transact. of College of Phys. vol. iii.

† Mem. of the Medical Society of London.



investigations, and in my mind amount to a complete demonstration of its importance, and have been confirmed both by the testimony of experience, and of public opinion \*.

My Father, in his Lectures, used always to express his utmost confidence in Mr BRYCE's Test as a mark that the constitution has been affected, and also his opinion that its ingenious author merited a public reward ; as without this improvement, he considered Dr JENNER's discovery to be incomplete. The following account of this TEST, in the author's own words, will convey to the reader a more distinct idea of its nature and importance than any description I can presume to offer †.

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\* The directors profess themselves utterly incredulous of danger from small pox after vaccination, conducted with due attention to infection, to TESTING, ACCORDING TO MR BRYCE'S PLAN (when practicable) ; to the formation of the areola, and of the scabbing process, from the twelfth to the thirteenth or fourteenth day on an average. To the formation of the areola and scab, however, they have reason to believe, that many practitioners are not sufficiently attentive. —Vid. Annual Report of Cow Pock Institution of Dublin for 1817.

† “ I am thoroughly convinced, that some clear and well-defined mark of a constitutional affection in cow pox, different from what has hitherto been observed by those who



It has been stated to me by several surgeons in the country, that they do not adopt Mr

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have written on this subject, is still to be regarded as the grand desideratum in conducting this new inoculation; for until this be established, our judgment of the efficacy of the cow pox inoculation in preventing small pox must often be formed with doubt and anxiety, and too frequently prove ultimately erroneous. The truth of these remarks will be best known to those most conversant with the cow pox inoculation, and who are accustomed to observe the great variety of appearances which the affection at the part inoculated often assumes.

“ For some time after the introduction of the cow pox inoculation into medical practice, many cases were related in which an eruption of pustules, more or less numerous, was said to take place, similar to what happens in small pox. While these reports were propagated, and certified by men who seemed worthy of credit, even although no instance of the kind had come under my own observation, I entertained hopes of so conducting the new inoculation in every case as to obtain a certain and well-defined mark of a constitutional affection; for if an eruption of pustules belonged to cow pox in any case, as a consequence of the peculiar fever or constitutional ailment thereby induced, I thought that one or two pustules might be made to appear in every case. It is well known, that by irritating any part of the skin, by the application of heat, of a stimulating plaster, or various other substances, we can produce a greater number of pustules in small pox upon that particular part than would otherwise have appeared; and, judging from analogy, I expected that the same thing might have been effected in cow pox. Such trials I have made; and although they were



BRYCE's test, on account of the difficulty of procuring vaccine lymph, and also owing to the

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conducted with as much anxiety and care to produce pustules as other persons seem to have taken to avoid producing them, yet they have constantly failed; nay, these trials have now been made under such a variety of circumstances without effect as to confirm me in the opinion, that an eruption of pustules, as a consequence of a constitutional affection, does not belong to the cow pox.

“ Foiled in my attempts so to conduct the inoculation of cow pox as to produce pustules, I recollected some experiments which had been made with regard to the inoculation of small pox. It was found, that if the same person was inoculated every day until the fever induced by the first inoculation supervened, all the other punctures quickly advanced in their progress; and that, in the course of a day from the time the fever or general affection began, even that puncture which had been last made, perhaps only twenty-four hours before, equalled in maturity the one first made, perhaps eight or nine days before, and from which the fever had arisen.

“ In this case, it appears to me evident, and I think must be admitted by every person, that even had no other pustules appeared on the body than those occasioned by the repeated inoculations, nay, had there even been no fever observed in consequence of the inoculation, yet as the pustule occasioned by the last puncture had been suddenly accelerated in its progress to maturation, at the time the general or constitutional affection should have appeared, this alone was a sufficient proof of the presence of the variolous action in the system.

“ Judging again from analogy, I expected that the same



great distances of patients from each other. But the second inoculation may be performed

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thing, which thus happened in the small pox inoculation, might also take place in that for the cow pox ; and the unexpected appearance of one or two vesicles upon children that I had inoculated, which vesicles were quite characteristic of the ailment, and the appearance of which I could only account for from a second and accidental inoculation during the course of the disease, as mentioned page 101, strengthened my hopes. And certainly, if we find in cow pox, where the inflamed and hard areola does not take place, at least in the regular course of that affection, until the end of the seventh or beginning of the eighth day from inoculation, that a second inoculation, performed for example at the end of the fifth or beginning of the sixth day, is so much accelerated in its progress, about the time the general affection of the system usually takes place, as to have an areola formed within a few hours, or very shortly after the first, and that this areola increases with the first, and again fades at nearly the same time, we must be struck with the similarity, and be forcibly led to draw the same conclusion in this case as in the former, respecting the small pox, viz. that although the inoculated affection had appeared very slight, and no fever had been observed, yet that a certain action had been excited in the constitution. That this was the true constitutional affection of cow pox, may be judged by the acceleration of the second vesicle to a state of maturity, five days before this could have happened, had there been no consentaneous general action or change in the system.

“ The truth of this opinion was also soon put to the test of experience ; and I have now much satisfaction in decla-



with lymph taken from the first inoculation ; and it surely would be well to visit the patient more than once, in order to determine whether the vaccination has run its regular course. To

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ring that the result appears to answer my most sanguine expectations."

Mr BRYCE has added, " In short, my observations on this point lead me to conclude, that, in order to obtain the proposed criterion in the greatest perfection, the second inoculation should be performed between thirty-six and forty-eight hours before the areola of the first inoculation begins to appear. This is necessary, in order that the secondary affection may have proceeded some length, and that a small vesicle containing virus may have been formed by it, before the constitutional action from the first inoculation begins, otherwise no areola, but merely a slight degree of hardness, will take place from the second puncture.

" As, on the one hand, the acceleration of the second inoculation in the manner above mentioned is to be regarded as a certain mark of a constitutional affection in cow pox, so, on the other, if it shall be found that no such acceleration takes place, but that the second inoculation proceeds by a slow progress through all the stages, and has the duration of a primary affection, it is to be concluded, that no constitutional action has taken place from the first insertion of the virus ; and when this is the case, the second inoculation must be regarded as a primary affection, and a third puncture be made according to the plan laid down for conducting the second inoculation ; and thus we may go on until the proper test be obtained, or until we be satisfied that the constitution completely resists the action of cow pox."



the neglect of this precaution, many of the failures are to be attributed.

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## SECTION VI.

### *Of the Comparative Advantages of the Inoculated Small Pox, and of Cow Pox.*

THE small pox, when received by inoculation, has been universally acknowledged to be a much milder disorder than when received by the medium of the air, as is evident from the subsequent quotation from my Grandfather's account of the first inoculation of small pox in Scotland: " It appears from this table, that scarce one of seventy-eight dies of small pox thus artfully excited ; whereas, from Dr JURIN's and Dr SCEUCHZER's accounts of the proportion of deaths to those who recover of small pox, taken by the common natural infection in several parts of England, we see that *one of six dies* ; and of those inoculated in England, during the first eight years after inoculation was practised there, one of fifty died, when no allowance was made for other causes."

But of late, in consequence of the improve-



ment in the method of inoculating, a much smaller proportion dies, not above one in five hundred; and in the London Small Pox Hospital, of the last five thousand that were inoculated, only one in six hundred died.

Whether, by inoculation for small pox, as mild and as safe a disease is communicated as by vaccination, is a question upon which it is not necessary to say much. There is, I believe, but one opinion upon this subject, and especially since the publication of the very valuable Report of the House of Commons upon Dr JENNER's claim. For the sake of such readers as have not the report at hand, I have transcribed it.

“ As a comparison between this new practice and the inoculated small pox, forms a principal consideration in the present inquiry, some facts with regard to the latter engaged the attention of your committee; and they have inserted in the appendix statements of the mortality occasioned by the small pox in forty-two years before inoculation was practised in England, and of the forty-two years from 1731 to 1772; the result of which appears to be, an increase of deaths, amounting to 17 in every 1000; the general average giving 72 in every 1000 during the first forty-two years, and 89 in the forty-two years ending with 1772, so as to make the



whole excess of deaths in that latter period 1742. The increase of mortality is stated by another witness to be as 95 to 70, comparing the concluding thirty years with the first thirty of the last century, and the average annual mortality from small pox to have been latterly about 2000 ; for though individual lives are certainly preserved, and it is true that a smaller loss happens in equal numbers who undergo the small pox now than there was formerly, yet it must be admitted, that the general prevalence of inoculation tends to spread and multiply the disease itself; of which, though the violence be much abated by the modern mode of treatment, the contagious quality remains in full force. It deserves also to be noticed, that the deaths under the inoculated sort of small pox, with all the improvements of modern experience, are not inconsiderable. It is stated by one of the witnesses at about 1 in every 300 throughout England ; by another as about 1 in every 100 in London ; while the loss in the natural small pox is probably not less than 1 in 6. Nor ought it to be overlooked, that mistakes have been known to arise in the inoculated small pox ; and instances are cited by some of the witnesses, in which persons supposed to have gone through the small pox by inoculation have caught it af-



terwards in the natural way. The general laws of vaccine and variolous disease are extremely similar; and it is not surprising that they should resemble each other in their anomalies."

In addition to the above very important document, there is subjoined the following statement, which shews the astonishing effect of vaccination.

"For this purpose, we shall state the number of deaths by small pox from the bills of mortality of parish clerks of London during the twelve years since vaccination was introduced, viz. from January 1799 to January 1. 1811, and also during the twelve years immediately preceding the vaccine practice, viz. from the 1st January 1787 to January the 1st 1799. But, in order to judge more accurately, we shall arrange the two periods of twelve years under three heads, each comprehending four years. This distribution affords the underwritten tables.

1. Deaths by Small Pox preceding Vaccination in the first four years.

1. In 1787,	2418
2. 1788,	1101
3. 1789,	2077
4. 1790,	1617
	<hr/>
	7213

2. Deaths by Small Pox during the Vaccine Practice in the first four years.

1. In 1799,	1111
2. 1800,	2409
3. 1801,	1461
4. 1802,	1579
	<hr/>
	6560



Deaths, &c. in the second four years.		Deaths, &c. in the second four years.	
1. In 1791,	1747	1. In 1803,	1202
2. 1792,	1568	2. 1804,	622
3. 1793,	2382	3. 1805,	1685
4. 1794,	1913	4. 1806,	1158
	<hr/> 7610		<hr/> 4667

In the third four years.		In the third four years.	
1. In 1795,	1040	1. In 1807,	1297
2. 1796,	3548	2. 1808,	2257
3. 1797,	522	3. 1809,	1163
4. 1798,	2237	4. 1810,	1198
	<hr/> 7347		<hr/> 5915

The total number of deaths by small pox in twelve years previously to vaccination, amounts to		-	-	22,170
Ditto, subsequently to vaccination,				17,142
				<hr/> 5,028

The number of deaths in the first twelve exceeding the number in the twelve succeeding during vaccination, *i. e.* 419 persons *per annum* fewer for twelve years died since than before vaccination.

May not the above circumstance in part account for the remarkable increase in the population which took place between the years 1801



and 1811? It is thus stated by the report published July 2. 1812, by order of the House of Commons :

“ The absolute increase of the population from 1801 to 1811 appears to be *one million, six hundred and fifty-four thousand*, or about 15 in 100 ; or, setting aside the increase of the army and navy, the population of England appears to have increased  $14\frac{1}{2}$  *per cent.*, Wales and Scotland 13 *per cent.* \*.

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\* Mr BRYCE has stated, “ According to the report of the Royal College of Surgeons of London, which was made to the Royal College of Physicians of that place, it appears that of 164,381 persons vaccinated by members of that body, 56 were afterwards affected with the small pox ; that is, about 1 in 3000 ; a proportion certainly extremely small, when all circumstances are considered, and a number which, even allowing the proportion of failures to continue the same, would still render the practice of vaccination invaluable to society. For, if we allow that 40,000 persons die annually from the small pox in Great Britain and Ireland, and that this is 1 in 14 of all that are born in these countries, then  $40,000 \times 14$  gives 560,000 persons born, or that may be vaccinated yearly in the united empire ; and if 1 in 3000 be still left liable to the small pox after vaccination, 187 only will remain unprotected ; of which number, allow that 1 in 14 shall die from the small pox \*, then will 13 persons only suffer annually in Great Britain and Ireland from the small pox, in place of *forty thousand*.

\* This is thought a large allowance, when it is considered



The great advantages of vaccination in France have been already stated, (*vide* page 30 of the Introduction.)

A Report concerning the state of vaccination in Sweden has been published by the National Vaccine Board, of which the following extract is subjoined, which in a peculiar manner merits the attention of the reader, not only as it is decisive as to the importance of vaccination, but also as it shews by what means the small pox may be rendered extinct.

“ The Government, already attentive to the inestimable advantage, which the inoculation of the cow pox seemed to promise, directed the College to examine Dr JENNER’S discovery with the greatest accuracy, for which the proper means were immediately afforded ; and the College was ordered, after collecting the results, to present its report to the King.

“ This report, which fully confirmed the excellence of the Jennerian discovery, occasioned the salutary law which was first enacted in 1803, by which vaccination was established

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that the small pox succeeding to vaccination is generally greatly milder than when the person has not been vaccinated ; (see Report of College of Physicians,) and also, that from the rareness of small pox, the whole of that number can scarcely be supposed to be exposed to its baneful contagion.



throughout the kingdom ; and the College was commanded to promote its adoption by all possible means. The King was pleased to appropriate nine hundred dollars, spec. banco, to be *divided into premiums, which were to be distributed* among such medical men as could exhibit the greatest number of vaccinated persons.

“ A particular regulation was made for the metropolis, *imposing a fine of three dollars on any one, who should fail to announce to the medical officer of the district, the appearance of the contagion of the small pox ; and in every such case, the person infected was to be carried to the Small Pox Hospital*, where every measure was adopted for his being properly nursed ; and the same precautions have been continued to the present time.

“ It was long a question, Whether new-born children could be vaccinated with success, and whether the matter taken from them might be employed with as much security as if taken from adults ?

“ This doubt has been altogether removed, and in the General Lying-in Hospital all the children are now vaccinated within nine days from the time of their birth ; so that, by means of this progressive vaccination, fresh matter remains constantly in existence.



“ The want of a sufficient supply of vaccine matter for the extensive provinces of the kingdom, was long an obstacle to the universality of vaccination in Sweden. This obstacle no longer exists ; since the Royal College of Health, in consequence of the humble representations which it made to the King, obtained the adoption of a very effectual measure for this purpose, in the appointment of a particular establishment for the general regulation of vaccination throughout the kingdom, which took place in the year 1812.

“ This establishment consists of a director, and several inspectors of the stations for vaccination in the provinces. The director is a member of the Royal College of Health, whom the King has graciously commanded to receive and examine all reports, to answer all inquiries, to conduct the distribution of vaccine matter, which is delivered, free of postage, to all persons who apply for it ; and, lastly, to report to the College every thing relating to vaccination that requires further regulation, and to propose to it, as proper persons to receive rewards, all those who appear to be the most deserving. He has also the immediate inspection of all the medical men, who are appointed to conduct the business of the stations, established in almost



every province ; the progressive vaccination performed at these stations being calculated to maintain a constant supply of fresh matter, which is also distributed, free of postage, to those who require it ; and their proceedings being registered in proper catalogues and journals.

“ In Stockholm, three several stations of this kind have been appointed, whence fresh matter may always be procured with certainty, if it happen to be wanting in any particular province.

“ The archbishop, bishops, and the whole of the clergy throughout the kingdom, having, from the time of the happy discovery of vaccination, embraced it with the most distinguished zeal ; and many of this respectable body having not only employed the most effectual means for the removal of vulgar prejudices against it, but having even actually practised vaccination themselves ; the King, assured of the continued exertions of the clergy in the same cause, was pleased to direct, that every minister should superintend the progress of vaccination within his parish ; and should be empowered to call to his assistance one or more inspectors of vaccination, according to circumstances, for the purpose of causing all children



to be properly vaccinated within the first year after their birth, and keeping proper documents of the performance of the operation. In each parish or district there must be an accredited vaccinator, whose duty is to perform vaccination, and to give a report of his proceedings to the Royal College of Health.

“ The College has also published, by the King’s command, a Book of Instructions for vaccinators and inspectors of vaccination, which has been distributed gratis to all the churches in the kingdom. This Treatise, adapted to the use of the public, affords an accurate knowledge of the true and false cow pox ; of the varieties which most frequently occur in it ; and of the cutaneous diseases, which occur so often in Sweden, very nearly resembling the small pox.

“ *For the more effectual encouragement of the practice of vaccination, the King has been graciously pleased to appoint rewards of two different kinds, pecuniary premiums and honorary medals. The latter are distributed, commonly in silver, but sometimes in gold, to those who have particularly distinguished themselves. In all cases, those who have deserved rewards, are humbly pointed out to the King, by the College of Health ; and his Majesty has reserved to himself the right of assigning the proportions in*



which those rewards shall be distributed. *It is also in the King's name, and with a certain degree of publicity, that these marks of his approbation are bestowed.*

“ For the honour of the medical profession in Sweden, it must not be forgotten, that *although inoculation for the small pox was one of the most lucrative branches of their private practice, and has been entirely superseded by the simple process of vaccination*, no one individual of the profession has raised any obstacles against the cow pox ; but every one has contributed to its advancement, by giving advice, information and assistance, to the utmost of his ability. No single publication has appeared to call in question its high importance \*, and its superiority to variolous inoculation ; which has been entirely discontinued ever since the year 1802,

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\* The answer which the undersigned returned the 1st November 1801, to a letter addressed to him, by the Vaccine Committee of the Society of Medicine at Paris, and which is inserted in the Second Report of that Committee, cannot justly be considered as a publication of this kind. It was not quite three months after this time, that having acquired perfect confidence from inoculating a cow, with the cow pox, and transferring the operation to the human subject, he published the before-mentioned Essay, entitled, “ The Small Pox may be extirpated.”



rather by a tacit and universal consent, than in consequence of any royal prohibition.

“ It may therefore be asserted, that the small pox, that equally disgusting and destructive pestilence, which for many ages continued annually *to send out of the world an immense number of young children, is now, through the influence of Dr JENNER’S inestimable discovery, so perfectly extirpated in Sweden, that it never can become epidemic, even if at any time, notwithstanding all the orders and all the vigilance employed for its exclusion, the infection should make its appearance.* Such, in the last twelve years, has been the effect of the King’s wise and humane attention, of the unanimity and disinterestedness of the medical profession, of the patriotic zeal of the clergy, of the good examples so promptly exhibited by the upper classes, and of the progress of information and civilization in the lower.

“ The undersigned, who has drawn up this short account at the request of the Royal College of Health, has also the honour of sending with it, in the name of the College, a copy of the Book of Instructions, and an impression in silver of the Honorary Medal, which was struck by the King’s command, under the direction



of the College, and which is distributed in the King's name, for the promotion of vaccination.

*Stockholm,* } FR. HEDIN, M.D.  
10th February 1814. } First Physician to the King, &c.

It seems quite unnecessary, after what has been already stated, and after what has been written by many authors, to enlarge upon the beneficial influence of vaccination, by which, in the Spanish settlements in America, in Ceylon\*, Bombay, and in some other places, the small pox has almost entirely disappeared. I shall therefore only add an extract from a letter of A. BELLO, giving an account of the result.

“ In the year 1803, the Spanish Government,

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\* The Report concerning Ceylon merits peculiar attention, as its insular situation resembles our own. After the dreadful ravages which the small pox made in this island have been described, it is added, “ That, agreeably to the most certain information I have been enabled to procure, that destructive malady has not existed in any part of the British possessions on this island during the year 1808, except in the district of Galle, into which it was brought on the 31st of January by a Maldivian boat, last from Bengal. A large proportion of the crew of this boat died; and the disease was communicated by a fisherman, who visited it on its first arrival, to two or three inhabitants in the neighbourhood of Galle, but it spread no further; which must be attributed chiefly to the favourable influence of vaccination, which has been so extensively diffused in that and the other districts of the island.” *Report 1809.*



prompted by a most laudable desire of communicating the benefits of vaccination to their colonies, fitted out an expedition, for the purpose of transmitting to the Spanish establishments in America and Asia, this inestimable antidote against one of the most fatal scourges that has afflicted mankind, and which, in the Spanish colonies of America, has been particularly destructive.

“Dr A. FRANCISCO XAVIER BALMIS, private physician to the King, was appointed chief of the expedition, and to his care, and that of others of the faculty, were intrusted a number of children, sufficient to preserve the invaluable germ, communicated from arm to arm. One of the first places at which the expedition touched was the Caraccas, where the small pox was reviving every spring, and committing no small ravages during that and the summer season. Inoculation had been long known in the Caraccas ; however this practice, indisputably beneficial to those individuals who employed it, was most fatal to the people at large ; the majority of whom, either from superstition, or want of the means, could not enjoy its benefits ; so that the higher classes, recurring constantly to inoculation, contributed to perpetuate and extend the contagion, of which the people were the victims.



The nature of the Colonial Government of America, afforded the Spanish Government particular advantages towards the establishment, and the universal propagation of the variolous vaccine. Thus it was, that at the expiration of a few months after the arrival of the expedition, *the small pox was entirely exterminated in the department of Penezuela.* The authority of the government, the influence of the clergy, and especially the experience of its salutary effects, together with the mildness of the operation, concurring, it was soon made general, and the children of every class were brought to the house established for the purpose, under the inspection of the Junta, to which I was some time secretary.

As the institution of this Junta was to watch over the effects of vaccination, for which purpose they communicated with the Faculty of Physic, and the curates of all the parishes in the Department, I was enabled to ascertain, with the greatest certainty, *that the success of this establishment has been in the Caraccas, the most complete that can be imagined ;* and that only on some parts of the coast, where the population was so thin, that they could not keep up yearly the vaccine fluid, the common small pox has appeared twice. It however only attacked those who had not received its antidote.



Equally good effects have been attested in the other parts of Spanish America, and thanks to the illustrious JENNER, *the population of this part of the world yearly receives an augmentation of 1,000,000 of lives*, which, but for his glorious discovery, had fallen a prey to the small pox.

One of the objects to which the Juntas employed in this branch have devoted their attention, was to promote investigation of the cow pox, in those districts in their respective provinces, where large herds of cattle are kept; and in the district of Calabozo, belonging to that of the Caraccas, they have had the satisfaction of finding it in the cows \*. The effect produced by the cow pox, originating in Calabozza, were entirely of the same nature with that brought from Europe; only it was observed, that the irritation was something greater when they administered the indigenous fluid.

(Signed) A. BELLO.

*London, Jan. 11. 1813."*

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\* Since I received the proof of this sheet, Dr BARON of Gloucester has been so good as to communicate to me the following very interesting case. About two months ago, a lad in this neighbourhood, who dressed a horse with the grease, had no less than fifty pustules on his hands, which had the genuine cow pox character; the matter had never passed through the cow.



It has been already stated, that, in Russia, every seventh child died annually of the small pox. Let me entreat the reader to compare with the above statement, what has happened since vaccination was introduced. Dr CRICHTON has observed the whole number of children inoculated, (with the vaccine, from the year 1804 to 1812,) concerning whom the government has received certain information, amounts to 1,235,597. Now, supposing, according to a well-founded calculation, that before the introduction of (vaccine) inoculation, every seventh child died annually of the small pox, vaccination has saved the lives in the empire of 176,514 children \*.

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\* Vid. Minutes of the Board of National Vaccine Establishment, 1812.



## CHAPTER IV.

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### OF VARICELLA OR CHICKEN POX.

FROM a perusal of the older authors on the chicken pox, it would appear that this disorder had been at that period of a much milder nature than it is now-a-days.

RIVERIUS, who practised medicine in the sixteenth century, is the first author who has published a good account of the chicken pox.

His words are : “ *Est et tertium pustularum genus pueris familiare, variolis simile, quoad magnitudinem et figuram, sed in eo ab iis distinguitur, quod variolae cum rubore et inflammatione appareant, haec vero albae sint, et veluti vesiculae seroso humore repletae, quae inter triduum disrumpantur et desiccantur, nullumque afferre solent periculum, et plerumque sine febre erumpunt. Id pustularum genus a nostratibus jæminis la Verolette nominari solet ; ab Italis, Ravaglione.*”



Dr CULLEN's definition of chicken pox is, "*Synocha. Papulae post brevem febriculam erumpentes, in pustulas variolae similes sed vix in supurationem euntes; post paucos dies in squamulas, nulla cicatrice relictas, desinentes* \*."

Dr HEBERDEN considers the chicken pox as a mild disorder; and in confirmation of the milder nature of the disorder, has observed, "Until lately the chicken pox was passed over as an indisposition so slight as hardly to require a physician's attention." And he has added, that he never had seen the number of the pustules exceed 200, whereas several instances have lately occurred, in which there were four or five times as many vesicles on the body.

The above definition of Dr CULLEN applies only to the milder form of the disease: it is by no means descriptive of the more severe form of chicken pox, in which the fever is considerable, the vesicles pass on to suppuration, and pits are left by them, which, in a few instances, have disfigured the face fully as much as those of

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\* Inflammatory fever. Pimples breaking out after short and slight fever, which run into pustules like those of the small pox, but seldom suppurate; in a few days ending in crusts, without leaving any scar.



the confluent small pox, and which pits bear a resemblance to those of the small pox.

There are three varieties of chicken pox, which have been commonly named *chicken pox*, *swine pox*, and *hives*.

Dr WILLAN more properly has distinguished these varieties by the form of the vesicles: he has described these under the names of the *conoidal*, *lenticular* and *globate*.

The fever antecedent to the eruption of chicken pox is of longer continuance than that of mild small pox; for in chicken pox there are successive crops of pimples.

Drs HEBERDEN and WILLAN mention hoarseness and soreness of the throat, attended by slight cough, as a characteristic of the varicella; but in the common small pox, when the pimples are numerous, and on the seventh or eighth day of the disorder a soreness of the throat, accompanied by hoarseness, is not an uncommon symptom, which, in severe cases, is followed by very considerable difficulty in swallowing.

There is no secondary fever in varicella as in the small pox; for after the fever, antecedent to the successive crops of vesicles have abated, it never reappears.

The chicken pox pimple, at its commence-



ment, is not so red and inflamed as that of the small pox, is of a paler colour, flatter, and less painful, and a greater proportion of it is filled by a fluid; whereas coagulable lymph forms a broad wall around the small pox pimple.

The eruption generally appears, in the first place, on the breast, and extends to the back and face. The tender scarf skin of the vesicles is often broken by the rubbing of the bed-clothes, or by the scratching of the patient to allay the itching which attends the eruption. Many of the vesicles which are broken become inflamed, and afterwards have been said to suppurate.

In the chicken pox there is no salivation as in the small pox, and I have not met with an instance of bloody urine, which is by no means a rare symptom in the small pox.

On the second day of the eruption of chicken pox, when the finger is drawn along the pimple, it feels somewhat hard, and like a small hard flat body under the skin, and the skin between the vesicles is not so much inflamed as in small pox. On the second, or sometimes on the first day, a very small vesicle may be observed in the centre of the pimple; on the third day, the vesicle is larger; and during its increase it frequently assumes an oval or irregular form, not unlike a small blister; like this, it is



easily broken when rubbed, and when broken, the cuticle has a shrivelled appearance, as when a blister has burst.

The colour of the contents of the vesicles is various. Generally it is clear at first, or like whey, the watery fluid being collected below the cuticle, and afterwards becomes of a wax-yellow, but never so yellow as in cases of small pox, and the clear part becomes a little broader, so that on the fourth day it occupies the whole front of the pimple. In the chicken pox, we seldom observe that characteristic feature of the small pox pustule, a depression in the center, and that only happens when the vesicle is drying up ; whereas in the small pox the depression is perceptible at a more early stage of the disease, and goes off in the progress of the disorder, when the pimples assume a hemispherical form, after which the incrustation takes place. The vesicles are various as to size, shape, and progress, are of more irregular form than the small pox pustules, and the crimson ring is neither so broad, nor of so deep a red colour around the vesicle. Compare fig. 3, 4, 5 and 6 of Plate II.

Some of the pimples become larger and sometimes pustular after the fourth day : after which they decline. The vesicles on the face, in the



first place, dry up, when there has been but a small quantity of eruption ; but when the eruption is copious and confluent, I have seen those on the extremities dry up as soon as those on the face. On the third or fourth day, the vesicles begin to subside, and are puckered at their edges. In many of the vesicles there are furrows which follow a radiated course, at the apices of which there is a slight incrustation : and on the fifth day, there are small yellow scabs on the vesicles.

There are in chicken pox successive crops of vesicles, during three or four days, and each successive crop follows the same course.

On the fifth and sixth days of the disease, the different sets of vesicles on the breast, face and limbs, are in different states of progress, as they advance independently of each other ; some of the pimples are vesicular, others are pustular ; some are shrivelled, broken, incrustated, and disappearing\*.

On the third or fourth day of the eruption the greater number of the vesicles dry into a thin flat crust of a honey-yellow colour : these crusts do not fall off entire, but in small

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\* Vide Plate II. fig. 5 and 6.



grains ; for they are not composed of layers like the crusts of small pox pustules, but of small yellow grains cemented together.

In a few cases of chicken pox, some of the vesicles attain a much larger size than the others, and have distinct necks, or the different species of chicken pox are intermixed, as in the following very distinct case which Mr COLVILLE, surgeon at Ayton, was so polite as to communicate to me : “ After a smart eruptive fever of between two and three days’ duration, pox appeared, and continued to come out for five days ; they all stood only four days, so that the first crop were beginning to dry before the last appeared. She had no secondary fever ; and though some of the pustules became as large as a pea, they wanted the depression in the centre, and the interstitial swelling ; they were not uniformly round and of all sizes, from a minute point to the size of a pea. Some were clear, others yellow, and generally high and pyramidical : they all left a hard prominent scab, the colour of the skin, which did not separate for several weeks, and left no pits, but slight marks on the face only, as if it had been pricked with a pin.”

There is no instance, according to Dr HE-



BERDEN, in which the same individual has had chicken pox twice in the progress of life.

There is no instance in which varicella has proved fatal, excepting from fits induced by the irritation of the pimples.

In a few instances chicken pox has proved a very troublesome disorder; and this peculiarity is proper to certain families.

The spots on the skin left by the chicken pox are small, and somewhat like the pricks of a pin, and of a mahogany colour; but those left by small pox are crimson-coloured stains, are much larger, and very unequal in point of size, and of much longer duration.

The chicken pox is a contagious disorder, but is not communicated by inoculation with the contents of the vesicles. Dr BARTLETT, at my particular request, inserted fresh drawn lymph into the arms of seven children who had neither been vaccinated nor inoculated for small pox, but did not communicate chicken pox. The same gentleman also made four experiments with the crusts of the chicken pox made into a paste with water; but that also failed to communicate the disease.

Dr BATEMAN, in his very valuable book on cutaneous diseases, has observed: "From some experiments made in his own family by an emi-



nent surgeon, and from others performed at the Small Pox Hospital, it appears that varicella is communicable by inoculation with the lymph of the vesicles; that it may be introduced while the constitution is under the influence of vaccination, without impeding the progress of the latter, or being itself interrupted; that small pox, inoculated during the eruptive fever of varicella, proceeds regularly in its course, without occasioning any deviation in that of the latter; but that, when variolous and varicellous virus is inserted at the same time, the small pox proceeds through its course, while that of the chicken pox is in a great degree interrupted. But the experiments have not been sufficiently numerous to warrant the accuracy of these general conclusions."

Another circumstance in respect to the history of the chicken pox, which merits mention, is, that the course of small pox has in some cases been arrested by this disorder, as by measles and scarlet fever. Of this fact Dr FARQUHARSON assured me he had seen several illustrations.



## CHAPTER V.

### OF SMALL POX AFTER PERFECT VACCINATION.

HAVING in the preceding chapters given a very general account of the symptoms of the casual small pox, and also of chicken pox, I now proceed to describe that peculiar kind of small pox which sometimes follows perfect vaccination.

Ever since the publication of Dr JENNER's discovery respecting the cow pox, there have been various rumours afloat of small pox occurring after cow pox. In consequence of the experience which I myself have had as to the antivariolous effects of cow pox, I confess I was led to suspect that some mistake had been



*failures in a given number of vaccinated persons, committed, either as to the nature of the disease, or as to the previous vaccination.*

At length, about nine years ago, all doubt from my mind was removed, in consequence of my having had ocular and very distinct evidence of perfect vaccination having failed to produce the promised security.

I had occasion to visit two boys who were seized with the small pox, after having been vaccinated at the Public Dispensary ; and after a time two others of the same family were also attacked with small pox.

The public at large have been led to believe that the cow pox is invariably an antidote to small pox ; whereas the College of Physicians of London, in their Report made to Parliament respecting vaccination, have stated, that “ the security derived from vaccination against the small pox, if not absolutely perfect, is as nearly so as can perhaps be expected from any human discovery ; for amongst several hundred thousand cases, with the results of which the College have been made acquainted, the number of alleged failures has been surprisingly small ; so much so, as to form certainly no *reasonable objection to the general adoption of vaccination ; for it appears that there are not nearly so many*



*as there are deaths in an equal number of persons inoculated for the small pox.*

According to the Report of the Royal College of Surgeons of London, made to the Royal College of Physicians of that place, it appears, that of 164,381 persons vaccinated by the members of that body, 56 were afterwards affected with the small pox, that is, about 1 in 3000.

But according to my own observation, and also that of my correspondents, the proportion is considerably greater than above stated.

Messrs COOPER, CHRISTIAN, and DAWSON, of Liverpool, have done me the favour to communicate their sentiments on this subject.

The first of these gentlemen has informed me, that “cases of small pox after cow pox are now daily occurrences.” The second gentleman above named says the proportion is not above one in two hundred; and Mr DAWSON has stated, that the pustular eruption, improperly called small pox, occurs in about three cases in every two hundred\*.

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\* See also the subjoined report of the medical gentlemen of Forfar, and the letters of Dr RAMSAY of Dundee, Mr SMITH of Dunse, and Mr THOMSON of Alloa.



The small pox after cow pox has not been equally prevalent in every part of this country. About four years ago this kind of small pox prevailed in the northern parts of Forfarshire. So great an alarm prevailed, as to induce the Sheriff of the county to call a meeting of the physicians and surgeons in the neighbourhood, who were requested to publish a report upon the nature of the prevalent epidemic, which they accordingly did, and which seems to me to be too important to be omitted.

*“ Forfar, November 25. 1813.*

“ 1. We find, that for some months past the small pox has been prevalent, and still continues to prevail in the town and neighbourhood of Forfar.

“ 2. That in a number of children who had been previously inoculated with cow pox matter, the small pox contagion has produced a slight disease, marked by the following appearances : For two or three days, symptoms of general fever have taken place, followed by an eruption of small pustules, not numerous, *and in a few days terminating in hard horny crusts.* In no instance has any secondary fever follow-



ed, similar to that from small pox, nor has the slightest dangerous symptom made its appearance. In almost the whole of these cases, we have observed, that the previous vaccine inoculation had been performed by some private individual, and not by a regular medical practitioner.

“ 3. The occurrence of this particular eruptive disease has in no degree diminished our confidence in the vaccine inoculation; for it has been known to occur in other parts of this country, and in different places of England; but in no one instance in the whole British empire has death ensued from it. It was indeed reported to us to-day, that two children in the town of Forfar, who had been previously vaccinated, had died from small pox; but on investigation we were satisfied, that although the cow pox matter had been inserted, it had not produced the proper effect.

“ Lastly, From all that we have seen to-day, and from what has frequently occurred in our own private practice, we beg leave to recommend to the Sheriff, and to the public at large, to use every means in their power to promote the establishment of parochial associations, for the purpose of having the children of the labouring poor



*annually vaccinated at their own parishes by regular medical practitioners.*

(Signed) ROBERT HENDERSON, M. D. Dundee.  
 ALEXANDER STORMONTH, M. D. Dundee.  
 JOHN CRICHTON, Surgeon, Dundee.  
 WILLIAM GIBSON, M. D. Montrose.  
 DAVID ALEXANDER, Surgeon, Montrose.  
 DAVID OGILVY, Surgeon, Brechin.  
 ALEXANDER GUTHRIE, Surgeon, Brechin.  
 WILLIAM ARROTT, M. D. Arbroath.  
 JOHN STEVENSON, M. D. Arbroath.  
 JOHN ADAM, Surgeon, Forfar.  
 JOHN SYME, Surgeon, Forfar."

As far as I have been able to learn, the small pox after vaccination became prevalent about the beginning or the end of the year 1816 in Dundee; of which epidemic I received lately the following very instructive letter from Dr Ramsay.

"DEAR SIR, Dundee, 27th June 1818.

"My time of late has been so much occupied, that I have had little leisure for reply to your favour of the 6th instant.

"In the report of the governors of our Infirmary, published in the Dundee newspaper herewith sent \*, you will find what goes far to anti-

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\* "For nearly twenty years the valuable discovery of JENNER, it is almost universally admitted, had banished the



cipate any further remarks of mine relative to the subject of your inquiry.

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small pox from this island; of late, however, it is painful to state, this dangerous malady has again assumed an epidemic form, and has committed considerable ravages in many parts of Britain.

“Dundee has not been exempted from its share of this severe visitation, as at this moment the small pox prevails extensively, in a form quite unequivocal, *without altogether sparing even those who had undergone the cow pox in a distinct and satisfactory manner*: this has spread alarm among all classes of people, and has excited the attention of the Governors of the Infirmary, who, at their last general meeting, on the 8th September last, nominated a Committee, consisting of DAVID BLAIR jun. Esq.; ALEX. RAMSAY, M.D.; ALEX. STORMONTH, M.D.; and JOHN CRICHTON, Esq. surgeon, to report on this interesting subject; and particularly to point out what confidence may yet appear due to the preventive power of vaccination, and whether any means hitherto not generally adopted, may tend to render these more effectual.

“These Gentlemen, in compliance with this request, have submitted the following observations to the weekly Committee, and which were ordered by them to be published in the Dundee Newspapers:—

“1. That the practice of vaccination has certainly failed of late to prove a perfect security against the contagion of small pox in its epidemic form; but that there has appeared the most marked distinction in its attacks betwixt those who have and those who have not been previously vaccinated: In the former, though the eruption has been sometimes ushered in with smart fever and threatening symptoms, yet in



“ We have had no reason since that time to alter our sentiments as to the efficacy of vacci-

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almost every case the disease has terminated abruptly on the sixth or seventh day, without going through the usual stages, even in the mildest form of this loathsome distemper; while in the greater number of cases it has hardly deserved the name of disease—so safe and mild is its course.

“ On the other hand many have fallen victims among those who have never been inoculated either with small pox or cow pox.—Several instances of death thus occasioned have come under our immediate observation, and preceded, as usual, by the severest sufferings.

“ 2. Though there have been in this place several well-authenticated cases of small pox in its most distinctive form, having succeeded to vaccination apparently perfect in its character, as determined by skilful observation ; yet such instances have been rare, and have had, without exception, a safe termination.

“ 3. *The virulence of the present contagion, which would threaten to subvert the practice of vaccination, is strongly illustrated by its attacking for the second time several in this town and neighbourhood who had gone through its regular form several years ago.* In one instance, a young girl who had the misfortune to lose both of her eyes, and to have her constitution entirely broken without hope of remedy, under a former attack of small pox, came under the full influence of the present epidemic.

“ 4. It does not appear to our observation that there is any ground for the assertion, that the *preventive influence of cow pox diminishes by lapse of time, or ceases altogether to exist.*—Many interesting facts have come to our knowledge in the



nation. Though our confidence, no doubt, is limited, yet it does appear to us of great value,

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*course of this epidemic which are at complete variance with this opinion.*

“ 5. Though the exemption of the higher classes from the more general attack of this epidemic may afford some presumption in favour of the opinion that vaccination has among them been more carefully performed, yet many arguments may be urged to invalidate this flattering view of the subject ; still there can be little doubt that much must depend *upon careful selection of the matter for vaccination, and upon observing the regular progress of the pustule through its different stages, as characterised by the best writers on this subject.*—This accords equally with analogy, with experience, and with common sense. It is the opinion of some of the best qualified to judge on this subject, that vaccination promises to be most efficient when one pustule leaving the peculiar character of cow pox is preserved perfectly entire.

“ 6. As no danger whatever attends the practice of vaccination ; and as it evidently mitigates in a most extraordinary manner the severity of small pox, where it fails to prevent altogether its attack, we are fully warranted to recommend in the strongest manner the continuance of a practice which has hitherto proved so great a blessing. This, at all events, seems expedient, until farther observation, in a manner that will no longer admit of doubt, shall unfortunately have proved its inefficacy.—This we are the more warranted to do, on considering the many fatal instances resulting from the practice of inoculating with small pox ; which is the more to be dreaded as it so often entails the misery of long protracted existence with the loss of general health, or of particular organs, without which life ceases to be de-



and to possess many advantages over variolous inoculation. We are inclined to think that much depends on effecting the vaccine disease in its most perfect form, and preserving the pustule entire, which hitherto has not been the case.

“ It must indeed be admitted, that facts do not bear us out fairly in the conclusion, that vaccination has resisted the attack of this eruptive disease in proportion to the perfection of its character. On the contrary, several of the most distinctly marked cases of small pox have occurred in those who had been vaccinated, apparently in the most satisfactory manner, and where the cellulated marks on both arms are still as perfect as possible.

“ In most cases, however, the pustules had not been preserved entire, but in several they

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sirable. This practice will not, and ought not, to be resumed, without reasons far more satisfactory than have yet been advanced on this important subject. It may also be remarked, that the contagion of small pox is cherished by inoculation for the destruction of thousands who might otherwise, perhaps, escape its dreadful ravages by another and a better practice.

(Signed) DAVID BLAIR jun.

ALEX. RAMSAY, M. D.

ALEX. STORMONTH, M. D.

JOHN CRICHTON, Surgeon.”



were so ; and in those no circumstance whatever could be found, on the strictest examination, to invalidate the evidence of small pox in its perfect form having succeeded to vaccination in its perfect form.

“ We have seen at least four instances of this eruptive disease having attacked those who had undergone small pox in the most satisfactory manner many years ago. I saw the blind girl mentioned in the Infirmary report. The eruption had then just begun to decay on the sixth or seventh day, as in most instances of this epidemic. The pits left by this are numerous, and distinct from those left by the small pox at a former period. These cases might, without stronger evidence, have given currency to a former opinion, that we had a new disease to add to the catalogue of cutaneous eruptions, distinct in its nature, and character, from either chicken pox or small pox.

“ This opinion cannot, I apprehend, be longer maintained, without violating every principle of reasoning. It is certain, that those who had formerly undergone the casual or inoculated small pox, have very generally escaped.

“ In one case which lately came under my observation, this disease went through all the characteristic stages of small pox, where vario-



lous inoculation had been performed by the late Dr Stuart eighteen years ago, and where the parents assert a considerable number of pustules had, in their regular order, taken place, to the satisfaction of all the parties.

“ My friend, Mr BELL here, says, he has never yet known any, in which Mr BRYCE’s test held, attacked by this disease ; and he has been the only person, so far as I know in Dundee, in the uniform practice of employing that test.

“ On the appearance of this eruptive disease in one of a family, I have inoculated the rest of the children, in some instances with variolous matter, in other instances with vaccine matter. I cannot very certainly determine the value of this practice where this eruptive disease had already established itself in the family. But certainly, in several such instances, the children thus vaccinated or inoculated have escaped ; in other instances they have not.

“ In one example, the eldest son of a family, a student at the University of St Andrew’s, was seized with undoubted small pox, after exposure about fourteen days before to the contagion of this disease, in a young man there who had never been inoculated or vaccinated. He came over at Christmas to visit his friends on this side the river. As soon as the disease ma-



nifested itself, I vaccinated the rest, six of the family. Inflammation took place, a vesicle formed, and a crust as usual, but to much less extent than in those who had never been vaccinated before. The third of the family, a boy about ten years of age, about fourteen days after his brother came home from St Andrew's, was seized with fever. On the third day, an eruption of small pox took place, but it has proved slight; only a dozen of pustules appeared, but they terminated, as usual, in this epidemic, on the fifth day, in crusts.

“ Many facts are at variance with the notion, that vaccination is efficacious only in the order of time. This certainly does not seem to have held here. In general the attack has been promiscuous,—in the order of susceptibility among the individuals, not in that of time. And the severity of the disease has held no such ratio. This seems very certain under my own observation, as well as that of the other practitioners here.

“ As to the course of the disease in this epidemic as it prevails in this district: In a very great majority, the disease has run a very mild and short course. Very generally it has been ushered in by smart fever, violent headach, pains flying through the body, cold and hot fits,



great heat of skin, rapidity of pulse, nausea, retching and vomiting, pain at stomach, very white tongue, urgent thirst, delirium, often sore throat and inflamed eyes. On the appearance of the eruption at the end of the third, or beginning of the fourth day, these signs rapidly subsided, and the papulæ, if I may use that term, filled with lymph, and suddenly terminated on the fifth to the seventh in brown or black crusts, which soon fell off, and often left permanent pits.

“ In many instances there has scarcely been any general affection of the system more than in chicken pox, from which I should think it difficult indeed to determine a difference. But, for the most part, this difference has been sufficiently manifest to satisfy the mind of the most sceptical. In other cases prevailing, at the same time, in the same family, the eruption has gone through all the stages of small pox, from which it has been as impossible to determine a difference.

“ Without a single exception, the disease in all cases, whether vaccinated or inoculated, has gone through a safe course, but many have fallen victims to the disease in a form of small pox as virulent as ever has been seen or described at any former period of its history. This



has been of no rare occurrence among those who had never been vaccinated or inoculated. I saw such an instance last week in a young ploughman. I must remark what is singular, that in a number of instances signs of fever with general loss of strength and health, languor, headach, &c. have appeared from eight or ten days prior to the eruption, when all at once the disease seemed to terminate with a speedy return of health. Indeed, the abrupt termination of the fever on the appearance of the eruption in most cases, is the most remarkable phenomenon in the whole history of the disease.

“Several years ago, in the northern districts of Forfarshire, a similar epidemic occurred, which, from anomalies new and embarrassing, led to great doubt and difference of opinion among the profession as to its nature.

“I saw many at that time, and did refer the disease to the contagion of small pox operating on a constitution modified by vaccination. This is certainly difficult of explanation. I have now no doubt as to the correctness of that opinion.

“If you still desire any farther information which it may be in my power to give, you may freely command me. I am, dear Sir, yours very truly.

ALEX. RAMSAY.”



## CASE I.

ABOUT the beginning of February last, the small pox began to prevail in this city, and on the 28th of February my eldest Son, now fifteen years of age, was attacked with the small pox. He had been vaccinated, according to my father's notes, (of which the subjoined is a copy,) on the left arm by Mr BRYCE with cow pox matter, on Saturday, October 29. 1803.

On Thursday, November 3., a pustule had formed containing clear matter, and with this, the other, the right arm was inoculated.

On Monday, November 7., the pustule on the left arm was large and surrounded by a red circle, and the pustule on the right arm was smaller than it, and had scarcely any red circle around it. The child was thought to have been a little more fretful, but not sick nor feverish.

On Tuesday, November 8., the left arm got a broader red circle.

On Wednesday the 9th, pustule and hardness similar, but larger on the left arm.

Thursday the 10th, redness on the left arm



rather increased and pustule larger, but pustule and redness of the right diminished.

Friday, Saturday, and Sunday, redness on both continues to diminish, and the red circle to grow smaller. The pustules continue to adhere and gradually grow harder. In all, progress of 10 days described.

*Edinburgh, February 28. 1818.*

A. M. aet. fifteen, was this morning seized with headach, lassitude, drowsiness, and considerable general oppression.

He went to church, but on returning home from the morning service was still more oppressed; his face was much flushed, and his eyes red—had severe headach—was very drowsy—threw himself on the sofa, where I found him sleeping at one o'clock P. M.

His skin was then hot; pulse but little affected. Had no appetite, and took no dinner. In the evening his pulse became quick: he was more flushed. Eyes redder, and headach more severe. Got ʒi. of the compound powder of jalap. Passed a very restless night; frequently started up, and talked a great deal in his sleep.

*Monday.*

Pulse 110. Still more flushed, and oppressed.



Had hot and cold fits. Had a stool from the jalap, which was natural as to colour and quantity. Was frequently sick. 10 grains of ipecacuanha were prescribed. Vomited freely a considerable quantity of yellow-coloured fluid like bile. Passed a still more restless night than the preceding, and talked a great deal in his sleep. Was occasionally sick during the night.

*Tuesday.*

Pulse 120. Skin hotter; face still more flushed and swollen; more thirsty. Tongue white; complained of cold. No stool. Got 3i. of compound powder of jalap, and 4 grains of calomel. Complained much of coldness of his feet.

*Wednesday, (1st day of eruption.)*

Skin hot and red; much thirst; had three or four stools from the medicine. He sneezed frequently. There are several small red round spots, like flea-bites, on the back of the left hand, and of the little finger; and also on the forehead, the red colour of which is not removed by pressure, and pressure is painful. Tongue white; still complained much of cold, especially of the extremities. There is a slight moisture on the face. Pulse 120.



*Thursday, (2d day of eruption.)*

The number of red spots on the forehead is now much greater, and there are also a number on the cheeks, nose, ears, lips, arms, and legs; the skin between these is of a florid red colour. The cheeks and eyelids are swelled and red. Eyes slightly inflamed; he cannot bear the light, and sneezed a good deal. Pulse 60. Passed a good night. Little appetite. Starting in sleep; much disturbed by dreaming; and talked a great deal during his sleep.

*Friday, (third day of eruption.)*

The red spots on the skin are considerably broader, and not of uniform size over the whole body, nor equally prominent; those on the face and neck are farthest advanced. Each spot has a distinct red line round its basis; in the centre of many of those on the face, neck, and breast-bone, there is a small quantity of a serous fluid, with a depression in the centre. Eyes more inflamed, and more tender. There are a number of pimples among the hair, especially on the back of the head, which are very itchy. Had a good deal of sneezing. Tried to sit up, but it produced acute headach, and he could not do so above ten minutes. Has slight soreness of his throat, which he refers to the larynx. Has



no difficulty in swallowing. Several pustules on the face have run together. No stool. A table spoonful of syrup of senna was prescribed at 11 o'clock, A. M., and a second similar dose given at half-past 11 at night.

*Saturday, (4th day of eruption.)*

Nearly in the same state as yesterday. Had three or four loose stools from the medicine.

*Sunday, (5th day of eruption.)*

Passed a good night ; no thirst ; no fever. He had a free motion in the morning. Appetite improved. The pimples on the face and lobe of the ears are of different sizes, and filled by a watery fluid. These transparent vesicles have distinct necks, and are very like blisters occasioned by boiling water.

I conceive that the transparent vesicles were formed on the top of the original pimples. Dr RUTHERFORD, however, holds a different opinion as to the origin of the transparent vesicles, and supposed, that in consequence of inflammation of the skin, a serous fluid was suddenly effused under the scarf skin, and formed vesicles at the side of the small pox pimples.

The vesicles filled by transparent water are more numerous on the face than those filled by



pus, for there are not above half a dozen of pustules on the face filled by pus, which have a manifest depression in the centre. The pimples on the breast, those on the back, arms, thighs, and legs, are exactly like the pimples of the small pox, and are filled with pus. The progress of the pimples on the face has been quicker than that of those nearer to the centre of circulation. The pimple over the breast-bone, which had made the greatest progress, was punctured with a lancet by Mr BRYCE, and was found to contain pus; and Mr BRYCE said, he had no doubt but that it would, by inoculation, communicate the small pox.

Skin not so itchy to-day. The vesicles which were filled by a watery fluid, in the course of four or five hours lost considerably of their prominence, were less tense, and were by no means so transparent, and seemed filled with whey, and some of them burst on turning the head and pressing on them. This day Mr LIZARS made a drawing from the face, which conveys a more accurate idea of the appearances than verbal description. (Vide Plate I. fig. 1.) Got at 12 o'clock P. M. a table spoonful of syrup of senna.

*Monday, March 2. (6th day of eruption.)*

Slept a good deal yesterday afternoon; pass-



ed a good night ; took his breakfast with appetite. The pustules on the face are not so tense as yesterday. The medicine has operated twice. No thirst ; no fever. The pimples on the arms and legs are now become pustular, and Dr RUTHERFORD and Mr BRYCE think them perfectly like those of small pox. Mr BRYCE punctured one of them, which was found to be filled with thick viscid pus. The cuticle over the pimples on the arms and legs is thicker than that of those of the face ; and hence the pustules are more of a grey colour. The cuticle of those vesicles of his face which were filled with a watry fluid, is shrivelled, of a yellow colour, and in some of them there are a few opaque white spots. Many of the pimples on the leg seem to have gone back. The face and legs are now less swelled. The spaces between the pustules of the face are less red than yesterday.

I observed about nine in the evening, that the vesicles on the face which had been filled by a transparent fluid, had shrunk very considerably. Pulse 60. Was at nine in the evening in a sound sleep, from which he did not awake though a candle was held near to his eyes. Pulse 64.

*Tuesday, March 3. (seventh day of eruption.)*

Passed a good night. Pulse 60, and regular.



The greater number of the larger vesicles which contained the clear fluid have burst. On some of them, the scarf skin is much shrivelled, and these are filled by a small quantity of yellow fluid. No stool. Eyes less tender. There is now but little redness on the skin of the body between the pimples.

The progress of the pimples has been very irregular; those on the left hand are to the touch hard, and of a light grey colour, though they first appeared. The progress of these pimples has not been nearly so rapid as of many in other parts of the body. On one of them being opened, it was found to contain purulent matter. Many of the smallest pimples on every part of the body have gone back, and on pressing the skin, no hardness is perceptible. The pimples on the breast have not gone on to supuration faster than those of the extremities of the body.

There is a diffused redness between the pimples on the extremities, but it never was so great as between the pustules on the face.

None of the pimples which resembled those of small pox were above a quarter an inch in diameter, and many as small as pin points.

Mr SYME made his drawing between 11 and 12 o'clock from the pustules on the left arm,



(Vide fig. 1. Plate II.) and also of the one on the back of the hand. (Vide Plate II. fig. 2.)

No headach, thirst, or heat of skin.

*Wednesday, March 4. (8th day of eruption.)*

Passed a good night. Pulse 64. Skin cool; no thirst. A small crust of a deep brown colour is formed over many of the pustules; in a few on his forehead there is no matter. The skin between the pimples of the face is now of the natural colour, and the swelling of face and lips is gone. The pimples on the left hand and fingers which appeared first are still of a grey colour, feel hard are painful when pressed, and there is no matter now in them; but there are other pustules on the back of the hand which evidently still contain matter. Mr BRYCE opened one of them, and found it filled by very viscid yellow matter. Many of the pimples on both thighs are still filled by matter; in the centre of others, there is a slight scale, which gives the appearance as if the pustules were depressed in the middle. Skin still very itchy.

*Thursday, March 5. (9th day.)*

Passed a very good night. Appetite to-day very keen. Pulse 60. The greater number of the pustules have now dried up; there are, how-



ever, still a few containing purulent matter upon the hands and thighs. The crusts of the pimples on the face, which resembled the blisters from burns, are of a light yellow colour, and are surrounded by crusts of a dark brown colour formed on the pustules, which resembled those of small pox. Many of these crusts on the face have now fallen off, but the skin under them is rough, and slightly elevated. Dr RUTHERFORD supposes that a little crust was formed upon the skin after the larger crusts had fallen off.

*Friday, March 6 (10th day.)*

Passed a good night. Pulse 64. No head-ach; no thirst; appetite good.

*Saturday, March 7. (11th day.)*

All the pimples are now dry in the outer layers. A great many of the dry crusts have fallen off. On drawing the fingers along the skin, there is an evident elevation where the pimples were; for a few of the layers of the dried vesicles still remain. Pulse natural; no headach; feels himself now much stronger.

*Sunday, March 18. (2th day.)*

The crusts still continue on the face, and



those on the thighs, arms, and hands, have a considerable degree of hardness, and transparency. Is in all other respects quite well.

*Saturday, March 14. (16th day of eruption.)*

There are still some crusts on his face, and a great many on the thighs, arms, and hands, though he took the warm bath last night. There are three very evident pits of a triangular form on the left temple, the bottom of which is very irregular. The cuticle over the crusts on the hands has burst, and now forms a white line around the basis or rather circumference of the dried crust.

*March 17.*

Many of the crusts on the extremities of the body, and especially those on the arms, have not fallen off.

*March 19. (21st day since eruption appeared.)*

There are still many of the crusts on the arms and legs.

*March 22. (the 22d day since the eruption appeared.)*

Three pimples of different sizes and in different states of progress, were observed to-day on



the right thigh, and at no great distance from each other. One was like a flea-bite, of a pale red colour, and felt globular when the finger was drawn along. A second has a circle of a deeper red within the paler red, and there is a clear spot on the top; in a third the crimson ring is still more apparent, and the centre of it seems filled with a liquor like whey, evidently depressed, and had every appearance of the genuine small pox pimples.

### *March 23.*

The pimples which have appeared on the thigh continue to follow the usual course of the pimples of the modified small pox.

A number of crimson-coloured blotches appeared on the skin after the crusts fell off, and these were not obliterated at so late a period as the 2d of June. During the progress of the disorder, a dish with nitrous fumigation was constantly kept in the room.

## CASE II.

### *History of the previous Vaccination.*

J. M. was inoculated in his left arm on



Wednesday, December 17. 1806, when three months and three days old. A pustule has formed about one-sixth of an inch in diameter, which is red at the edges, and its middle rises into a point, from which matter has oozed out, and by drying, formed a yellow crust. On Monday, December 22. 1806, five days after the inoculation, Mr BRYCE inoculated him with matter taken from his left arm: instead of laying the lancet flat upon the arm, and rubbing off the matter while the point of the lancet was under the cuticle, he punctured the arm with the point placed perpendicularly three or four times.

December 23. Thirty-two hours afterwards, a pimple about one-tenth of an inch in diameter and of a red colour, had formed on his right, or last punctured arm.

The vaccination was at the time considered complete.

*Monday, March 16. 1818.*

J. M. æt. 11. had yesterday morning a headach; white tongue, and skin was hot and dry, and he is thirsty. P. 100. He had been costive for two days. I therefore gave him an enema, and afterwards  $\text{ʒi}$ . of compound powder of jalap. In the evening he was much flushed



and uneasy ; passed a sleepless night. To-day his tongue is more white ; he is more thirsty, and his skin is dry and hot, and his face is much more flushed, and of a motled red colour. Eyes slightly red. P. 100. When he attempted to sit up, the headach became more severe and he became faint. Has been very drowsy all day, and has slept occasionally for a short time.

*Tuesday March 17. (1st day of eruption.)*

Passed a restless night, frequently starting in his sleep,—was very thirsty during the night.—P. 114. Skin hot ; has still slight headach. He sneezed a good deal this morning, and became very faint when sitting in a chair. There are now about forty or fifty small red spots of different sizes in different parts of his body, and when the finger is drawn along these, a small hard body of a round shape is felt under it. Cheeks are still flushed, and now slightly swelled.

He had no stool yesterday, or this morning. Therefore he was ordered to take a table spoonful of the syrup of senna every two hours, until it produced the desired effect ; he got four table spoonfuls, but had no passage until a common clyster was thrown up, immediately after which, he had a free evacuation.

6 o'clock P. M. Has been very drowsy all



day. Face still much flushed and somewhat swelled. Has been able to take no kind of food.

*Wednesday, March 18. (2d day of eruption.)*

Was very restless in the fore part of the night. His face is considerably flushed, and of a mottled red colour, and his tongue is still a little white. Pulse soft, and not quicker than in health; skin cool; no headach, or thirst. All the pimples on the body have advanced, and the centres of many of those on the face are depressed; a pimple a little above the os ilium was further advanced than any other on the body or face, from which Mr SYME made a drawing between three and four o'clock, (vid. Plate II. Fig. 4.); it was surrounded by a deep crimson-coloured border, and an oval-formed inflammation of the skin, which run transversely across the body, but which is of a much paler colour than the circumference of the largest pustule.

Near to this pimple there is another no nearly so far advanced, and a third in its incipient stage, and not larger than a pin's head. Several more pimples have appeared, especially on the arms and back.



*March 19. (3d day of eruption.)*

The pimples on different parts of the body have advanced regularly ; they are now larger, the serum in them is yellower. Pulse 100. Cheeks still flushed—no headach—little heat of skin—no passage to-day. Two table-spoonful of syrup of senna were ordered.

*March 20. (4th day of eruption.)*

Pimples now fuller, and more of a Sienna yellow colour. Eyes heavy. Pulse 80 ; no headach or thirst ; appetite good. The crimson line around the pimple is now deeper in colour. The smallest pimple which Mr SYME represented on Wednesday has disappeared.

*March 21. (5th day of eruption.)*

The face now much less flushed, and the swelling has abated. A few of the pimples on the face, which are of very different sizes, have a slight crust on them, and the others on the face and over the rest of the body, which also are very different as to size, are of a honey-yellow colour, excepting those on the hands, which are of a pearly colour, and nearly of the same size. The pimples are now of a hemispherical form, and the depressions in the middle of them are no longer perceptible.



*March 24. (7th day of the eruption.)*

General incrustation has now taken place.

### CASE III.

#### *History of the previous Vaccination.*

K. M. was inoculated with cow pox in her left arm on Saturday, June 1. 1805, by Mr BRYCE.

June 2. and 3. hard around the puncture, one-eighth of an inch in size.

June 4. and 5. rather smaller, and scab covering the puncture.

June 6. Larger, and vesicle in the middle with some liquor in it.

June 9. Vesicle now very large, hollow in its middle. Small vesicle full of matter visible in the circumference of the pustule.

A red circle surrounds the pustule.

N. B. Mr BRYCE pressed down the skin after inserting the vaccine matter with the flat side of the point of the lancet; but in withdrawing the lancet, punctured the skin a second time, and in consequence of this, another or second pustule formed within a quarter of an inch



of the first, and has gone through the same changes, but is smaller than the first pustule.

June 6. Mr BRYCE took matter on his lancet from the first pustule, and inoculated the child's right arm with it.

June 7. or next day, the edges of the puncture were red; and on Sunday June 9., three days after the inoculation, a pustule was evidently forming.

This child was supposed at the time, by Mr BRYCE, my Father, and myself, to have gone through perfect vaccination.

*March 15. 1818.*

K. M. aet. 13., on Saturday last, on returning home from walking, complained much of fatigue; was very cold and pale. Between five and six in the afternoon, she had a shivering fit of but short duration. In the evening, her skin became hot, and her face was considerably flushed. Pulse 90 and soft. She passed a restless night, and occasionally vomited.

On Sunday, she was very uneasy, felt feeble, and occasionally vomited a yellow fluid. She got ten grains of ipecacuanha, by which a good deal of a yellow fluid was discharged. There is slight moisture on the face.



*Monday (1st day of eruption.)*

Pulse 100 ;—face more flushed, skin hotter, but not dry.

On several parts of the face, there are pale red spots, about the size of pins' heads ; and on drawing the finger over these, they are to the touch like little knots. On the right side of the neck there is a small pimple, the centre of which, when examined by the aid of a magnifying glass, appears filled by a transparent fluid. There is a similar one on the lip, on the right knee, and also three or four such on the right fore arm.

Half an ounce of cream of tartar was given in the morning, which operated freely.

*Tuesday March 17. (2d day of the eruption.)*

She passed rather a restless night ; face slightly bedewed with perspiration ; skin of moderate temperature ; little thirst. Pulse 72. Tongue white. There are in all about twelve red pimples of a small size, but not of an uniform size on different parts of the body, which seem advancing. No headach. Body open. She sneezed occasionally during the night, and also in the morning. She attempted to sit up, but on



doing so became very sick. Head very itchy, owing to the pimples amongst the hair. The pimple on the neck, which yesterday was filled by a clear watery fluid, has now assumed a yellow hue, but none of the other pimples have advanced so far; some of them seem to contain in their centre a small quantity of a transparent fluid.

*Wednesday March 18. (3d day of the eruption.)*

Passed a restless night; pulse natural as to frequency and strength; skin cool; tongue still a little white. No appearance of more pimples, and those which exist are to the touch globular. Some of the pimples have died away.—There is a distinct pustule on the corner of the upper lip, of which Mr SYME took a very faithful portrait about four o'clock to-day, (Vid. Plate II. fig. 3.) There is lymph in the centre of it, and a depression, and it is surrounded by a crimson-coloured border, and also by a slight inflammation of the skin. Has sneezed a good deal to-day; throat sore.

*March 19. (4th day of eruption.)*

All the larger pimples are now evidently depressed in the centre, and are filled by yellow



matter. Skin cool; no headach. Pulse 76. She has had a good deal of pain in her throat shooting up to the ears, which is owing to a slight inflammation of the tonsils. As she is still costive, syrup of senna was ordered. Very few of the pimples are above the size of NO. 3. patent shot.

*March 20. (5th day of eruption.)*

The pimples are now of a buff-orange colour, and the depression in the centre is scarcely perceptible.

*March 21. (6th day of eruption.)*

There is a crust on all the pimples, which, in some of them, is of a honey-yellow colour, but on others of cochineal-red colour.

*March 23.*

All the pimples on the face are now incrust-ed. Yellow pus is still contained in some of the pustules on the extremities.

Dr RUTHERFORD and Mr BRYCE, who daily visited my children, perused the above reports, and have permitted me to add, that they consider them to be accurate.

For the farther illustration of the disease, I



have subjoined the following very important communications from different friends.

I am deeply indebted to Mr BRYCE for Cases IV. and V. ; and to Dr WIGHT, for the reports of the Cases marked VI, VII, VIII, IX, and X. I had occasion to visit the family only three or four times, whereas Dr WIGHT saw them every day during the whole progress of the disease. And to Mr HENNEN I owe the history of his son's case.

#### CASE IV.

Mr A. S———'s son, aet. eight years, was vaccinated by Mr ANDERSON, Surgeon, when three or four months old. On the 1st April 1811 he became sick and feverish. On the evening of the 4th, the fever continued, with great drowsiness ; and he complained of sore throat. On turning down the bed-clothes to examine whether there was any scarlet eruption on his body, I observed several pimples on his legs, thighs, and arms, with considerable surrounding inflammation of the skin or cuticle. On examining the face narrowly, several petechiae or flea-bite looking spots were observed



about the lips, but there was no prominence of, or inflammation about them. On the 5th, he was free from fever, the pimples on the extremities were larger and more inflamed, and the spots on the lips were now become pimples, and several more were making their appearance. Those first observed contained a limpid fluid. They were, however, very small in size. On the 7th, the pimples which first appeared were shrivelled and drying. On the 9th, the greater part of all the pimples were quite dried up, and their appearance then was a small round yellowish crust on the apex, and a small hard, warty-looking base, without any surrounding inflammation.

#### CASE V.

ON the 20th of April, a Girl, sister of the above boy, about two years younger, and who had been vaccinated by myself, became feverish, and had fever and vomiting on the 21st and 22d. On the 22d, an eruption in every respect similar to that on her brother appeared; and it was particularly remarked, that it was observed equally soon on the legs and arms, as on the face. On the 24th, several of the pimples evi-



dently contained a limpid fluid : on that day and the 25th fresh pimples continued to appear. On the 26th, those which had first appeared were quite dry ; their appearance was a small round yellowish crust elevated on a warty-looking base. Those which had come out on the 24th and 25th were still fresh, and they had the appearance of containing pus ; but when punctured with a lancet the contents were limpid, nor did they ever become purulent. Few were larger, but by far the greater part were smaller than the head of an ordinary sized pin ; and there might be fifty or sixty of them on the face, arms and legs,—very few, if any on the body.

A medical gentleman from the West Indies, who saw the boy on the second day of the eruption, said it was the small pox, and that he would return in a few days and take matter for inoculation from him. When he returned on the fourth day of the eruption for this purpose, the pimples were all dried up ; he then declared that he had been mistaken, and that the eruption was not the small pox.

*Edinburgh, 1st May 1811.*



## CASE VI.

MARY PEA, aged thirteen years, was vaccinated, the proper cicatrix remaining,—

On Saturday, the 4th of April, began to complain of violent headach; slight delirium; face and eyes very red; much thirst; tongue very white; respiration quick and anxious; pulse very quick and somewhat irregular; great heat of skin, accompanied with shivering and feeling of cold; belly bound; urine high coloured, and small in quantity. These symptoms continued all Sunday, and on Monday severe sickness and vomiting came on. This day she got some calomel, which operated well. On Tuesday the 7th the eruption began to appear, and went on increasing till Sunday, when the pustules arrived at maturity.

The eruption was general and copious, somewhat confluent on the face. The pustules were surrounded with an inflamed base. Considerable fever continued during the whole of this stage. On the afternoon of this, the 5th day, the pustules began to flatten on the face, the fever to abate, and the appetite to return. On this day she ate voraciously.



The food excited some sickness, and a slight degree of fever, which was removed by a cathartic. From this time she continued to get well; and on the tenth day of the disease, the pustules were almost all shrunk into dry horny crusts. Convalescence is now rapidly advancing. On the 17th instant she was assisting her mother in managing her household affairs.

#### CASE VII.

BARBARA, aged nine years, vaccinated when seven weeks old, and the proper cicatrix remaining,—

On Monday, the 6th of April, was attacked with cold shivering, while the skin was hot, dry, and red; headach; violent delirium; great thirst; white tongue, and sore throat; respiration quick and irregular; belly bound; urine scanty and deeply coloured. These symptoms continued two days, when they were succeeded by severe sickness and vomiting, which continued till the eruption appeared, when they were somewhat moderated. The eruption continued increasing from Thursday till Sunday, when it seemed to have arrived at its height; at this time



the fever almost entirely abated, and the appetite became very keen. In consequence of having overloaded her stomach, sickness, vomiting, and high fever came on, which went off next day. The eruption was distinct, except on the brow, and the pustules had not inflamed bases. On Tuesday, the 6th day of the eruption, the pustules on the face were quite blackened, and contracted into dry horny crusts; on the rest of the body they were rapidly diminishing. 17th, She is up to-day with her sister, and appears in a complete state of convalescence.

### CASE VIII.

JAMES, aged seven and a half years, not vaccinated,—

On Saturday, the 5th of April, began to complain of violent headach, and throbbing of the pimples; eyes red; face pale; skin hot; urgent thirst; tongue covered with a thick white fur; lips covered with a black crust; respiration quick and laborious; pulse very quick, with intermissions; belly bound, but the evacuations which were procured were of a natural appearance; urine very deeply tinged with yellow,



and thick ; a clammy sweat over the surface from the beginning.

On the third day (Tuesday) an eruption began to appear : it was preceded by severe sickness and vomiting, which abated considerably when the eruption came out.

The eruption was confluent on the face and head ; there were few pustules on the breast and abdomen. On the rest of the body they were numerous, but distinct. On the sixth day, the eruption of the pocks began to flatten on several parts of the body, the fever to abate considerably, and the appetite to return. Next day sickness and vomiting came on, accompanied with considerable fever, which lasted two days. On the thirteenth day all the pustules, with the exception of a few about the feet, had disappeared, and dry horny crusts only remain in their situation. He has some appetite. On the seventh day the heart was observed to palpitate violently. On the thirteenth day, that symptom had disappeared. His mother thinks that the palpitation had commenced previous to the seventh day, but she never observed it, and at that time no medical practitioner had seen him.



## CASE IX.

JOHN, aged three years, not vaccinated.

He was attacked, on the 7th instant, with symptoms precisely similar to those of his brother, with this exception, that he had black stools. The eruption was confluent. The disease ran its course in the same way. On the eleventh day of the disease, the pustules on the face were rapidly diminishing in size, most of those on the body still full. He is much oppressed, sick, and so uneasy that he cannot bear to be touched : he has considerable palpitation. Incrustation took place on the fifteenth day. From this time the symptoms gradually diminished, till at last he got perfectly well.

The contagion was supposed to have been introduced into this family by the servant of a gentleman, who, after labouring under typhus fever, was seized with oppressive headach and sickness. On the evening of the third, or beginning of the fourth day, small purplish puncta or spots broke out on the face and neck, and spread rapidly over the whole body.

In about two days, the eruption assumed the complete variolous form. The papulae were



slow in their progress ; and the fever continued severe to about the ninth or tenth day of the eruption, when the white apices appeared to flatten and incrustate. The eruption was of the confluent kind, and the whole body in a short time seemed covered with one continuous horny crust. The return, however, of general health was rapid from the very commencement of the blackening ; and in three or four days, he was able to walk out. The desquamation was very tardy, and left conspicuous marks on the face.

It is worthy of remark, that this gentleman, when a child, had had the natural small pox, caught by contagion from his sister.

N. B. These cases are curious, as no fever occurred in any of them at the period of incrustation \*.

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\* Fig. 2. of Plate I. was taken from this patient.



## CASE X.

MY DEAR SIR,

I am sorry that I was from home, on public duty, on Sunday last, when you and Mr BRYCE called at my house ; I only returned from Northumberland last night, and I lose no time in giving you the particulars of my son's case.

On Tuesday the 9th instant, he returned from school about four o'clock in the afternoon, complaining of an intense headach and pain in his right side. His pulse was nearly 100, hard and bounding ; his skin hot, dry and rough to the touch, and somewhat inclined to redness ; his eyes suffused, and his cheeks very much flushed ; his tongue was moist, and rather redder than usual, particularly in the centre ; the pain of his right side was considerably increased by pressure, but I was not sensible of any enlargement of the liver, and at first attributed his complaint to a blow on that part by some of his school-fellows of his own age, (about eleven,) particularly as there were marks of tears on his cheeks. I found, on examination, however, that this was not the case, but that he had been



siezed at the grammar-school in the morning with intense headach, and had been so unwell at the writing class as to be unable to continue his business. On further examination, I found, that in the morning before he went to school, although the weather was unusually warm, he had complained of cold and sleepiness, and did not eat his breakfast : this was in some degree attributed to his having walked out the evening before to Duddingston, to visit the family of a friend, and not having returned before dark.

When I saw him at four o'clock in the state above described, I did not particularly recollect that his younger brother, a boy of about eight years old, had had a very slight eruptive complaint, preceded by a degree of fever scarcely perceptible. The eruption consisted of a few detached papulae, one only of which became vesicular ; it was considered as varicella, a complaint under which the child of the nurse in the hospital close to my house had laboured a few days before, which it was supposed he had caught from a soldier who had been in the hospital under that complaint some time previous, and with which another soldier then in the hospital was supposed to be affected. The disease of this last person has, however, since been ascertained to be small pox, occurring a second



time, as there is every reason to suppose, both from the report of the man and from the marks of that disease, which are very apparent, on his face, breast and back.

My son, immediately on his arrival from school on Tuesday, was bathed in tepid water and put to bed, and I administered to him a bolus containing four grains of calomel, which before night produced several copious stools, consisting of highly offensive bilious matter. He passed, however, a most distressing night, being watchful and delirious. On Wednesday his skin still continuing extremely hot, he was occasionally sponged with vinegar and cold water. He was plentifully supplied with lemonade and orange juice, and in the evening his calomel bolus was repeated. That night he never slept, and was highly delirious, insomuch that I was about to put leeches to his temples, when on Thursday morning I perceived a papular eruption beginning to appear upon his feet and around his ankle joints: it then began to appear about his wrists and fingers, and in circular clusters on the inside of his thighs, (the clusters about the size of a half crown piece,) and then spread to his face, and soon almost covered it, particularly affecting his eyelids. As the eruption spread, his skin, which had continued



excessively hot, grew cooler and more soft, and the pain of his head, which had been most urgent, began to abate ; its heat, which had been intense, moderated, and he became perfectly collected. Before Thursday evening some of the papulae became distinctly vesicular, the vesicles being full, hemispherical, without any depression, and containing a watery fluid : they were pretty thickly spread over his face, hands, legs and thighs, and there were a few on his body, but none upon his breast ; his principal complaint on Thursday night was intense itching, and he was very restless and somewhat delirious that night : from this day to the present date he was seen by Dr THOMSON. On Friday morning I found his skin much cooler ; his tongue clean, but still rather more red than natural, and the vesicles prominent and full of watery fluid ; the intervals occupied with the red papular eruption. His bowels being costive, he had ʒij. of Epsom salts, which purged him freely. On Saturday all the appearances were the same, and on this day I took six charges of limpid matter from the pustules, for the purposes of experiment. On Sunday there was little change, except that the fluid in the pustules became thick and yellow. This day he was seen by Dr DUNCAN junior. Towards evening the pus-



tules began to dry up in many places giving an appearance to the skin as if it had been sprinkled with reddish half dried jelly, and the papular eruption to scale off. On Monday he was seen by yourself and Mr BRYCE. On my return home last night, (the seventeenth,) or the ninth night of his illness, I found him better in every respect,—no fever, and nothing but the marks of the eruption remaining. I should have mentioned that a ptyalism came on, on Thursday, and that a pustule formed on the inner part of the globe of his right eye, and a few very small ones on the margin of the lids: all these have now disappeared.

This boy was vaccinated by myself when three months old, and I had every reason to be satisfied with the genuineness of the matter: he has often since been exposed to variolous contagion in Spain, France and Portugal, and particularly last year at Portsmouth. The nature of his disease and its name I shall not presume to offer any opinion upon. The treatment consisted of the two calomel purges and the solution of Epsom salts above mentioned; of cooling acidulous drinks; and of frequent sponging with vinegar and cold water, the tepid bath having been premised on the first attack: his room was kept as cool as possible, and his bed-



ding consisted of a single sheet and light coverlet.

I shall be most happy to give you any further information upon the subject, either as it may refer to my son, or to the results of the experiments with the lymph taken from him. Believe me, my dear Sir, very truly yours,

J. HENNEN,

Deputy Inspector of Hospitals.

*Queensberry House, }  
June 18. 1818. }*

Extract from a Letter of Dr VERDEIL of  
Lausanne.

“ Vous savez qu’au nom du Conseil de Santé du Canton du Vaud, j’ai établi dans toute notre partie de la Suisse des vaccinations annuelles gratuites. Depuis une quinzaine d’années la chose marche ; mais depuis deux ans, la petite vérole c’est introduite, parceque vous comprenez qu’absolument tous les individus n’ont pas été vaccinés. Mais il est arrivé que des enfans qui avoient eu une vaccine preservatrice, puisque l’endroit de l’insertion avoit tous les caractères d’une vaccine régulière, ont cependant pris, durant cette epidemie varioleuse, des eruptions plus ou moins abondantes, qui avoient assez les apparences de la veritable petite



vérole, sans presenter, cependant, cette régularité de marche, qui lui est particulière. Les enfans non sont presque pas malades, et au bout de peu de jours les boutons sont secs, sans laisser après eux des *creux*.”

The above is what my father wrote me on this subject; but if you wish for more particular facts, I am sure he will be very happy in communicating them to you. I am, &c.

AUGUSTE VERDEIL.

*Friday morning, }  
3. Lothian Street. }*

For the subjoined valuable communication I am indebted to Mr SMITH of Dunse.

DEAR SIR,

*Dunse, 2d June 1818.*

When I look back to the date of your letter, I really feel ashamed it should have remained so long unanswered. The only apology I have to offer for this seeming inattention is, that I had not then attained the information requisite for replying to your different queries, with any thing like precision; and I did not like to commit myself upon a subject of so much importance, by a crude and hasty communication. I had indeed seen several cases of small pox su-



pervening upon vaccination, which I mentioned at the time to Dr FARQUHARSON ; but as he seemed to think lightly of them, I judged it prudent to take no further notice of the circumstance. Even now, though I have seen a multitude of cases in which small pox have, in every possible shape, taken place after vaccination, I feel myself placed in the painful situation of bringing forward many facts, to which gentlemen of the first eminence in the profession will probably give little or no credit. My object, therefore, has been, not to appear too forward in entering upon the investigation of a subject, which I foresee will occasion much disputation in the medical world. I have all along been, and still am, a warm friend to vaccination, and consider it as one of the greatest benefits that has for many centuries been conferred upon mankind. Still, however, every blessing has its limits ; and more, I am afraid, has been expected from vaccination, than we are likely to receive. In all important discoveries, where confidence and expectation have been wound up to the highest pitch, it is with reluctance we yield to facts, and allow sober judgment to take the rein. In the detail I am now to give, I most solemnly assure you, I have no bias one way or other, but will strictly ad-



here to a rigid statement of facts that have fallen under my own observation.

It is now about three months since small pox appeared in the east coast of Berwickshire, particularly at Coldinghame, Eyemouth and Ayrton. Several young people who had not been vaccinated fell victims to the disease. In the course of a few weeks afterwards, this pestilential malady extended itself over other parts of the country, and whole families were in consequence promiscuously laid up, whether vaccinated or not. I have seen a number of cases wherein great crops of small pox took place after vaccination. I attended two in particular that were confluent, and watched the progress of the disease with much anxiety. In both cases the face was covered with one uniform blister; and on the eighth day after eruption, when I looked forward to the most alarming symptoms taking place, the small pox all at once disappeared, as if by enchantment, without secondary fever, or any other bad symptom. In a few days they were able to go about. Their face still retains a rosy inflamed appearance, but without disfiguration. So much for the happy influence of previous vaccination. Without this, in all probability, both must have fallen a sacrifice.

I am perfectly sensible I may have incurred



much odium in the opinion of many, for having had recourse to inoculation after it has so long been exploded. It will no doubt be urged, that it is wrong to continue the propagation of a disease, which it is so much the interest of humanity to banish entirely from the face of the earth. In this I acquiesce ; but when the natural small pox are an epidemic in the country, I cannot see how inoculation can add materially to the general danger, especially when it is considered how much more mild the inoculated are than the natural small pox. Vaccination either does, or it does not resist the variolous affection. If the former, vaccination cannot possibly do harm ; but if the latter, we are imperiously called upon to communicate the small pox in the mildest way we can, and not leave the rising generation to the scourge of a loathsome and dangerous disease.

I have but seldom made use of Mr BRYCE's test. The difficulty of procuring vaccine lymph, joined in country practice to the great distance of the patients from each other, render it but seldom practicable.

In all the subjects I have inoculated, I have uniformly made use of matter taken from children that had not been vaccinated.



I have not for many years met with any person who has had small pox twice.

I do not consider the small pox which succeeds vaccination to be a peculiar disease. They undoubtedly undergo a great modification, and are rendered much more mild and safe by previous vaccination. In former times I have often seen the inoculated small pox equally mild.

The chicken pox are not often prevalent in this place. Transient cases occur now and then, but they are generally easily distinguished from small pox by those who have been long in the practice of seeing both. I remain, &c.

J<sup>N</sup>O. SMITH.

The following extracts from letters which I received from Mr DAWSON of Liverpool and Mr THOMSON of Alloa, merit peculiar attention.

“ Out of about three thousand five hundred poor children that have been registered at my surgery, as having undergone regular vaccination, during the last five years, I know of very few that have had genuine small pox afterwards; perhaps six or seven of these, too, were children belonging to the same family, who had the disease at the same time, which was propagated by contagion, was of the confluent kind, ran its



course in eight days, and terminated without danger, but left marks behind it.

The pustular eruption which appears after vaccination, which is so frequently and improperly called small pox, and which occurs perhaps in about three cases in every two hundred, most commonly commences with indisposition of a slight character, and with scarcely any affection of the mucous membrane of the mouth, throat and nose. On the second day of this eruption the pustules are sometimes depressed, and appear dark-coloured on the centre; at other times they are more or less acuminate, and are at their bases slightly inflamed, and somewhat fleshy, but no areola around them. The pustules commonly dry up on the fourth or fifth day; and while the first crop is dying, a second is ready to appear. JAMES DAWSON.

*Liverpool, 27th April 1818."*

DEAR SIR, *Alloa, 23d April 1818.*

Inclosed I send answers to the queries contained in your letter of the 29th ult. I remain, &c.

WILLIAM THOMSON.

*Answer to Query 1.*—While the small pox and chicken pox prevailed at the same time epidemically in this vicinity, ten cases of small pox



occurred in children, with the usual depressed marks and pittings in their arms, vaccinated by surgeons and midwives at various periods. In some of these cases, the operation, though frequently repeated, was suspected by the parents to be imperfectly performed.

The eruptions continued to the 12th, 13th and 14th day, before crusts were formed. The central depressions also took place before the pustules assumed the spheroidal form. In short, these had all the characteristics of small pox mentioned by systematic writers; and to this day these patients are very strongly marked with numerous pittings in the face.

Above a hundred cases of eruptions appeared in children at same time formerly vaccinated; desquamation took place in these on the fourth, fifth and sixth day after the eruption, which I judged to be either chicken pox in every instance, or, if any exceptions occurred, small pox very much modified. These, as well as the ten cases formerly specified, recovered.

None of these children were vaccinated according to Mr BRYCE's test.

*Answer to Query 2.*—A woman having casual intercourse with a child dying of small pox, never inoculated, apparently carried the contagion to a girl in another house, formerly vaccinated,



and distinctly marked on the arm; of which disease that girl recovered.

*Answer to 3d Query.*—In the ten cases mentioned, the crop of pustules was very large, but, generally speaking, the number of pustules was not great.

*Answer to 4th Query.*—The symptoms in all the ten cases were severe, but never dangerous.

*Answer to 5th Query.*—The pustules in the ten cases already stated continued till the 12th, 13th and 14th day before the crusts were formed, and during their course had the usual central depression; *but in the other cases supposed to be chicken pox*, the crusts formed in the 3d, 4th, 5th and 6th days, but few of them possessed the central depression in any degree.

*Answer to 6th Query.*—In the ten cases the throat was more or less affected with pain, hoarseness, swelling, and difficult deglutition; in the other cases the throat was not at all affected.

*Answer to 7th Query.*—It does not appear to me that any of these, strictly speaking, were confluent, although the patients continue very much marked in the countenance with pittings.

*Answer to 8th Query.*—In the ten cases mentioned, the interstitial swelling and inflammation appeared to me equally great as in the distinct small pox.



*Answer to Query 9.*—In several of the ten cases there were an increase of the fever in the 10th and 11th days, but do not remember any distinctly marked rigours or shiverings at that period. None of the ten cases proved fatal, but nine children died of small pox that were never vaccinated during these epidemics.

The ten patients appeared to me to be cases of genuine small pox.

Extract of a letter from Mr CHRISTIAN of Liverpool.

*Answer to Query 1.*—Several cases of small pox have occurred to me after vaccination had (as I conceived) been practised according to the instructions of the best authorities. The proportion, however, has not been greater than one in two hundred patients. As I have but seldom adopted Mr BRYCE's practice, I can say but little as to its security; but certainly no case of small pox has occurred wherever I have adopted it.

*Answer to Query 2.*—The small pox was in every instance received by contagion.

*Answer to Query 3.*—In general the crop of pustules has not been large.

*Answer to Query 4.*—The symptoms in general which preceded the eruption were more mild



than what occurs when vaccination had not preceded.

*Answer to Query 5.*—The pustules have usually run their course in about six days from their first appearance, and the central depression has occasionally occurred as distinctly as in the common small pox.

*Answer to Query 6.*—The throat has not, to the best of my recollection, been much affected.

*Answer to Query 7.*—It has never occurred to me to see a case of confluent small pox after vaccination.

*Answer to Query 8.*—The degree of interstitial swelling and inflammation has generally been in the proportion of the size and contiguity of the pustules; and in this respect no striking difference was observed between these and the common small pox.

*Answer to Query 9.*—It has occurred to me to have known of two fatal cases of small pox succeeding vaccination; but I did not see either case in the progress of the latter disease; but, from the information I was enabled to collect, the disease was of the confluent kind. One case was vaccinated by myself, and the other by a colleague in one of the public charities to which I belonged, and was registered in the book as having gone regularly through the disease. It is remarkable that another child in



the same family died under the same circumstances and at the same time, who was vaccinated at a distant period by another person, and that a third child in the same family also had the small pox, who was vaccinated at the same time as the second. This is not a solitary instance that has come to my knowledge of a family of three or four children who have been vaccinated at different periods of life, and by different practitioners, being afterwards affected by the small pox.

*Answer to Query 10.*—None of the patients who have had small pox after vaccination have been permanently marked by the variolous pustules.

*Answer to Query 11.*—The small pox pustules which appeared after vaccination might resemble some of the worst kind of chicken pox ; but, in general, the base was more indurated and circumscribed, the progress more slow, and the form more regular and less transparent than the chicken pox pustule, which, in its early stage, is, strictly speaking, an irregular vesicle.

THOS. CHRISTIAN.

DEAR SIR, *Stirling, 21st March 1818.*

I have received your letter to-day, containing the queries respecting variola.



I never had any cases of the disease, having, in fact, scarcely ever seen it ; but I subjoin the answers to your queries, as they were exemplified in my father's practice ; and which, indeed, will furnish you with a complete account of the disease as it occurred in Stirling and its vicinity.

*Query 1.* My father, in the space of two years, has met with upwards of a dozen cases of variola after vaccination.

*Query 2.* The small pox has been propagated by contagion after vaccination.

*Query 3.* The crop of pustules was in general small, and numerous only in a very few instances.

*Query 4.* The eruptive fever was, in all cases, as severe as when vaccination had not been performed.

*Query 5.* In some instances, the pustules stood out to the ninth and tenth day of the disease ; a few dried up on the fourth or fifth day ; and in two or three instances only, the central depression was very evident.

*Query 6.* The throat has never been so much affected as in common variola.

*Query 7.* The confluent small pox was never observed after vaccination.

*Query 8.* The interstitial swelling was very slight and inconsiderable.



*Query 9.* There have been no cases of secondary fever. We have heard of fatal cases, but none occurred in our practice.

*Query 10.* The patients were very slightly marked.

*Query 11.* In some cases the variola resembled the chicken pox very strongly.

*General Remarks.* My father never observed any danger in cases where vaccination had been previously used, nor, in the greater number of instances, did medical aid appear necessary. In consequence of their having taken the natural small pox after vaccination, it has fallen into great disrepute in this quarter of the country. I have the honour to be, &c.

W<sup>m</sup>. LUCAS.

I sincerely regret that the limits of this book do not permit me to insert several other valuable communications of a similar description, which I have lately received, and which, in every respect, corroborate what has been above stated.



## CHAPTER VI.

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### OF THE EFFECTS OF INOCULATING THE CONTENTS OF THE PUSTULES OF THOSE WHO HAVE THE SMALL POX AFTER THE COW POX.

THE modifying and mitigating effect of the cow pox inoculation does not extend beyond the individual. About six years ago, a boy two years old, son of a friend of mine, resident at Inverness, who had been vaccinated by cow pox matter, sent by Dr Davidson of this city, took the secondary small pox, after having passed through the cow pox in its most perfect state.

This created considerable agitation : some of the medical gentlemen said it was small pox, but others pronounced the disease to be chicken pox.

This contrariety of opinion led the parents to request Dr Robertson to inoculate a child from



their son that had not been vaccinated, which was accordingly done, and the child so inoculated passed through the common small pox, and to the entire satisfaction of all parties concerned, and had the disease severely.

Dr SMITH of Dunse informed me, that he had repeatedly practised inoculation with matter taken from those who had the small pox after the cow pox, and found that those inoculations were attended with the same appearances, and produced the same effects, as the inoculation with the matter taken from small pox caught by contagion.

Dr Adam, in his valuable thesis, has described the results of several experiments which he had made.

He found, first, that by inoculating with the matter taken from persons afflicted by small pox after cow pox, those who had been vaccinated, he produced, in one case out of five, well-marked small pox in a child not vaccinated, and in two others a pustular eruption of shorter duration \*.

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\* Vide Thesis, page 33. et seqq. I have inserted only Dr ADAM's fourth and fifth cases, with his reflections.



2. That the inserting matter of small pox produced in three vaccinated children, out of

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“ IV.—J. B. Tres menses natus ; nondum Vaccinae subjectus, nec ullam febrem cum eruptione passus.

*Februarii vicesimo et octavo.*—Humorem ex ejusdem, ut casu priore, pustulis in brachium inserui.

*Martii secundo.*—Circum circa rubent vulnera.

*Quarto.*—Circum vulnera, cutis elevata, solito rubrior.

*Sexto.*—Vulneribus hodie insident vesiculae duae orbiculatae, coloris caerulei, utriusque media depressa ; margo elevatus foveolis pluribus notatur ; ultra vesiculas oculis obviam veniunt puncta quaedam, vix superficie elatiora ; solita valetudine gaudet aeger.

*Septimo.*—*Vespere.*—Auctae vesiculae, et quae marginem tenent, melius cernuntur, foveolae ; latior facta areola, et puncta inter hanc dispersa nunc clarius patescunt, et medias non aliter quam ipsae vesiculae depressas ostendunt. Praeter consuetudinem hodie aeger evomuit ; caetera valet. Crusta nivis instar linguam totam obducit, quam tamen, ab die natali mater extitisse affirmat.

*Octavo.*—Solito magis inter noctem calebat ; se tollunt vesiculae et harum foveolae numerosiores in conspectum ferunt ; rubor ambiens pollicis plusquam dimidium aequat. Papulae nonnullae apud poplites, et femorum posteriores erupisse videntur, exiguae, summis coloris caerulei, et unius media depressa ; occupant faciem una et altera.

*Nono.*—Nocte superiore aeger maxime inquietus, solito calidior, et vomitu affectus est ; nunc minus urgent incommoda ; sed cibum non appetit, oculique illachrymant ; lingua fulva. Areola latitudine augetur, et magis albescunt vesiculae ; has quae ambiunt elevationes hic et illic coeunt, sin-



fifteen, an eruption which, he says, was similar to small pox after vaccination, in all respects but in being smaller.

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gulis tamen centrum depressum; papulae nondum vesiculares, membris inferioribus magis scatent, et cacuminibus humoris speciem praebent.

*Decimo.*—Vomitibus adhuc, et alia premunt. Corpus universum efflorescit, id quod primum mane conspiciebatur. Scarlatinae instar, sed vix tactu aspera cutis. Papulae brachii minores ad vesiculae conditionem jam pervenerunt, et paucae grandiori conjunctae (binis prius inter se connexis) unam largam effecere.

*Undecimo.*—Per noctem aeger maxime inquietus, sed mala nunc minus urgent; brachii vesicatio plana est; ad marginem fulva; adest efflorescentia; papulae super corpore subrubrae sunt, aliae summis planae, aliae acuminatae, illis media depressis; nitent aliquantum; sed, paucis faciei exceptis, nihil humoris habent. Membro inferiore sitae sunt triginta.

*Duodecimo.*—Ad valetudinem bonam restitui videtur; latiores fiunt papulae; haud multum eminent; decessit penitus efflorescentia, minorum pluribus conjunctis, vesicatio multum aucta et margine minime definita est.

*Decimo tertio.*—Papulae omnes vesiculares sunt, facie magnitudinis maximae, et centris paululum nigrescere videntur; vox rauca.

*Decimo quinto.*—Circa pustulas rubor cutis, et brachii vesicationis superficiem occupat crusta flava; novendecim pustulae facie sitae sunt, et quarum paucae lineis latitudine tribus pares sunt, minores caeterae, sed generaliter eas casu J. D. aequant varioloso, bene definitae, et ad imum matura-



Dr WILLAN had also performed inoculation, and gives the result of these in pages 5, 52, 55,

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tae; et humor omnium quoad colorem et spissitudinem J. D. iis haud diversus est; numero circiter centum.

*Decimo sexto.*—Facie sunt crustae sublimes, sed membris inferioribus magis maturatae; ibi paucae adhuc ad imum solidae; caetera valet.

*Decimo octavo.*—Brachio inoculato est crusta formae abnormis, specieique squamosae, magno sine circa rubore. Exaruerunt quae faciei insidebant pustulae, et crustas reliquerunt duras, prominentes, superficie asperas, et omni in re quae his variolosis observatis respondent.

*Maii quarto.*—Nunc apud nates conspiciuntur cicatriculae perpaucae; toti corpori insperguntur maculae purpureae.

V.—J. L. Quatuor menses natus; nondum inoculatus nec eruptionem ullam subiit. Hujus in brachium similiter inserui humorem, et madidum, qui ex fratris vaccinati pustulis morbo tunc laborantis sumptus erat. Paucos post dies partes inflammatas fuisse notatum est; et secuti sunt effectus iis in priore casu (IV. sc.) consimiles, febris efflorescentia, papularumque eruptio; has numero circiter octo vel novem tantum per dies tres vel quatuor permansisse, nec humoris multum habuisse mihi refertur. Postquam omnes morbi recentis notae jamdiu decesserunt, humorem variolosi in brachium inserui, neque vulnus propterea tardius sanatum est, neque secuta affectio generalis.

In horum uno J. B. (IV. sc.) morbus omnia Variolae indicia prae se tulit, et duobus aliis, nisi breviori papularum duratione (quod subinde Variolis inoculatione factis eventis) credatur huic signa convenisse. Inoculatione secunda, ubi hu-



and 70 of his Treatise on Vaccination ; they accord with the above observations of Dr ADAM.

When Mr BRYCE and I visited Mr HENNEN'S

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*mor variolosus insitus fuit, nullus aeger factus, nec his vulnus omnino inflammatum. Concludere igitur cogimur vaccinatos contagione Variolarum implicitos esse ; cum inoculatio pustularum humore in iis nunquam passis uno morbum illum induxerit, et caeteros ad resistendum effecerit. Haec postea suscepi experimenta. Inoculavi humore varioloso quindecim natu inter se diversos, et qui tenera aetate a Chirurgo, Vaccinae subjecti fuerant. In horum sex casibus vesiculae brachio formatae, quae in quatuor Vaccinae magis imitatae, sed caeteris duobus Variolae, ut minores huic jamjam annexendae ampliorem circa ortae sunt. Quinque per dies, duos vel tres febricitabant, et de faucium dolore questi sunt. In tribus, die circiter nono, vel decimo, papulae paucae membris praecipue inferioribus eruperunt, quas bene perspectas, me certiores feci, nisi minoris magnitudinis, nostro non alienas esse. Hae tamen amplius dies tres, vel quatuor perstare non solitae sunt, nec omnino suppuraverunt. Memoratu dignum, in una familia, duobus, qui prius morbo post vaccinationem affecti erant, inoculationem cum veneno varioloso nullum produxisse effectum : dum soror haud recens capta vesiculam bene definitam exhibuit, et febriculam cum una, vel altera papulis passa est. Tres omnes ejusdem Variolosi humore inoculati sunt.*

*Magis, hinc, argumentum confirmant horum effectus ; cum, varioloso humore in vaccinatis inoculatio morbum nostro similem fecerit. Nec oppugnat omnes non febre, et eruptione affectos esse, siquidem antea Variolarum contagioni expositi essent, nec tamen in morbum inciderint.*



son, we pronounced the disease to be the modified small pox. Mr HENNEN, who supposed (as he has stated) his son to have been attacked with chicken pox, took six charges of matter from the pustules, and with these, six children were inoculated by Dr BARTLET, who happened never to have been vaccinated or inoculated with small pox.

I had an opportunity, as well as Mr BRYCE, Dr FARQUHARSON, Dr DUNCAN junior, Dr HOME, and several other medical gentlemen, of daily visiting those children; but I choose rather to give the results as stated by Dr BARTLET, which, in my opinion, are very faithful, lest it might be supposed that my account of the consequences of the inoculations have been biassed by preconceived opinion.

### CASE I.

ROSANA O'NEIL, aged 9 months,

*13th June*, was inoculated in two places on the arm.

*June 17. (5th day of the inoculation.)*

A small papula had appeared on each of the



punctures ; it was of a hemispherical shape, rather acuminate, and had an inflamed base.

*June 18. (6th day of inoculation.)*

The papulae were increased in size ; their bases were more inflamed, and minute pearly coloured vesicles had appeared on their apices.

*June 19. (7th day of inoculation.)*

The vesicles were larger ; their centres were depressed, and of a brownish hue, while the margins were of a pearly colour, turgid, and overlapping the bases, which should now be more properly named areolae ; they were, in short, very similar to vaccine vesicles, but instead of being exactly circular, they had angular projections from their circumference.

*June 20. (8th day of inoculation.)*

The vesicles have increased in circumference, but not in elevation, being, on the contrary, flatter than yesterday ; they retain their pearly colour, and the areolae are but little increased.

The child is somewhat fretful, but quite free from fever.

*June 21. (9th day of inoculation.)*

The vesicles retain the appearance and size



they had yesterday. The areolae are narrower, and of a duller red colour. On puncturing one of the vesicles, clear lymph exuded, but in small quantity until different punctures were made, when fresh lymph issued, denoting the cellular structure of the vesicle. The child is still fretful, but cool.

*June 22. (10th day of inoculation.)*

The vesicles are increased in size, but unaltered in shape and colour; the areolae are wider and of a more florid red. The child was more fretful throughout yesterday, had some vomiting towards evening, and was hot and uneasy during the night; to-day she is cooler, but still somewhat feverish. In the course of yesterday, two or three minute points appeared in the areolae, and on the child's getting up this morning several others were observed on the body. This eruption consists of minute vesicles, which are of a pearly colour, have depressed centres, and are raised on slightly elevated inflamed bases; the vesicles are in number three on the face, two on the chest, and two on each thigh.

*June 23. (11th day of inoculation, 2d of eruption.)*

The original vesicles on the arm are not al-



tered in appearance, but their areolae are increased in width.

She had occasional vomiting through the course of yesterday, and was hot and fretful. More vesicles, possessing the same characters as those mentioned yesterday, have appeared on the face, trunk of the body, and in the areolae ; they are in number upwards of forty.

*June 24. (12th day of inoculation, 3d of eruption.)*

The original vesicles on the arm have lost their pearly colour, and become of a more chalky white, but are not in any other respect altered. The child was hot, and fretful towards the evening, and is rather more so this morning than yesterday at the same hour. More vesicles of the same character have appeared on different parts of the body, particularly on the face, where they are now confluent.

*June 25. (13th day of inoculation, 4th of eruption.)*

The original vesicles on the arm are flatter, are more of a greyish hue, and have coalesced with several of the small vesicles which are in the areolae. The child is quite cool, and takes



its food pleasantly. More of the eruption has appeared. The vesicles which first came out are larger, but retain the pearly colour and depressed centres, which the more recent ones possess.

*June 26. (14th day of inoculation, 5th of eruption.)*

The brownish depressed centres of the original vesicles on the arm are gradually extending themselves towards the circumference of the vesicles, and the areolae are becoming of a less vivid red. The skin is rather hotter than natural, but the child is not fretful. Several new vesicles have appeared on the extremities, which are of a pearly colour, while those that first appeared have acquired a yellowish hue, and throw out a thick purulent-looking fluid when punctured.

*June 27. (15th day of inoculation, 6th of eruption.)*

The brown coloured centres of the vesicles on the arm have now almost extended themselves to the circumference of the vesicles, and are quite horny and semi-transparent; the areolae are narrower, and of a brownish-yellow co-



lour. The child is somewhat hotter, and more fretful than she was yesterday, and several new vesicles have appeared since last night.

On the face, part of the eruption which was pustular yesterday, has now dried into semi-transparent amber-coloured crusts, which seem to be raised on indurated bases, and are of the size and shape of the pustules themselves: in this progress of drying, there does not appear to be any rupture of the pustules, but a gradual inspissation and change of colour of their contents. On the trunk, a considerable share of the eruption, partly in a pustular, and partly in a vesicular state, has followed the course of that on the face; but many on the trunk, and more particularly on the extremities, have not yet begun to dry up.

*June 28. (16th day of inoculation, 7th of eruption.)*

The crusts on the arm are exactly like those of the vaccine disease, and the areolae are almost gone.

The child is in perfect health and in good spirits. No fresh vesicles have appeared, and with the exception of a few pustules on the hands and feet, the eruption, partly in a vesi-



cular, partly in a pustular state, has followed the same course of disappearance as was mentioned yesterday.

*June 29. (17th day of inoculation, 8th of eruption.)*

The whole of the eruption has now dried up.

*June 30. (18th day of inoculation, 9th of eruption.)*

A few crusts have come off the face, leaving behind them fleshy tubercles.

*July 8.*

Most of the crusts have come off, leaving generally tubercles, which are soon absorbed, but in one or two places pits.

## CASE II.

THOMAS HOGG, aged 5 months,

*June 13.* Was inoculated in two places on the arm.

*June 17. (5th day of inoculation.)*

A small papula had appeared on each of the



punctures. The papulae were hemispherical in shape, and raised on inflamed bases.

*June 18. (6th day of inoculation.)*

The papulae were increased in size, and minute pearly coloured vesicles had appeared on their apices; the centres of the vesicles were depressed, and of a brown colour.

*June 19. (7th day of inoculation.)*

The vesicles were broader, but flatter, they contained more evidently a fluid, and retained their pearly colour, the centres were still depressed, and their bases were thicker and harder. Areolae like those of the vaccine vesicle on the tenth day had appeared around each.

*June 20. (8th day of inoculation.)*

The vesicles were not altered in appearance, but the areolae were wider, and of a more florid red. The child was hot and fretful.

*June 21 (9th day of inoculation.)*

The vesicles were increased in size, and were more depressed in their centres; they retained their pearly colour, and, on being punctured, threw out a clear lymph, which (like that of the vaccine vesicle) was contained in separate cells.



The child has remained hot and fretful. No eruption has come out over the body, but the areolae (now very large) are studded with minute pearly-coloured vesicles with depressed centres.

*June 22. (10th day of inoculation, 2d of eruption.)*

The original vesicles are not altered since yesterday, but the areolae are larger, more irregularly circumscribed, and of a rosy red. The child continued to be hot and feverish throughout yesterday : in the evening the febrile symptoms were considerable, and vomiting came on. After this exertion, three or four red points appeared on the breast, which, in the course of the night, have been followed by five or six on the extremities, a like number on the neck, and many in the areolæ. This eruption consists of pearly coloured vesicles with depressed centres, which are raised on inflamed bases.

*June 23. (11th day of inoculation, 3d of eruption.)*

The original vesicles are larger, but flatter ; they still retain their pearly colour, and have coalesced with several of the minute vesicles which are in the areolae. The skin was burning



hot during the night, and there was occasional vomiting : to-day these symptoms have almost gone off, but he moans and cries a good deal. More of the eruption has appeared on the body : the vesicles that had come out yesterday are larger, but not altered in character.

*June 24. (12th day of inoculation, 4th of eruption.)*

The original vesicles have quite lost the turgescence around their circumference, and have, in coalescing with the smaller vesicles of the areolae. formed a pearly crust, which has a stellated appearance.

The child is cooler and less fretful. Much more of the eruption has appeared, particularly on the face, where the vesicles are now confluent. The vesicles which first appeared are large, hemispherical, and semi-transparent, while the more recent ones are depressed in their centres, smaller, and of a pearly hue. The bases of all of them are a little indurated, red, and almost regularly circumscribed.

*June 25. (13th day of inoculation, 5th of eruption.)*

The vesicles on the arm are now more completely dried into crusts, which are of a chalky



white. The child is quite cool, and in good spirits. More of the eruption has appeared, particularly on the extremities. The vesicles which first appeared are larger, and more of a straw colour; the others are in different states of progression.

*June 26. (14th day of inoculation, 6th of eruption.)*

The crust on the arm becomes thicker, and there exudes a little purulent matter from under it. The child is free from fever. Some few more vesicles have appeared; the greatest part of the eruption on the face and trunk is now evidently pustular; that on the extremities is yet chiefly vesicular. The pustules have a brown mark in the site of the depressed centres. The whole face, more particularly the eyelids, are much swollen, and there is a degree of ptyalism.

*June 27. (15th day of inoculation, 7th of eruption.)*

The crusts on the arm have acquired a brownish tinge; the brown specks in the centres of the pustules are increasing towards the circumference, but do not on the body generally form complete crusts as yet: in the areolae, however,



that process is completed, the vesicles in them having perfectly dried into semi-transparent, polished, amber-coloured, hemispherical crusts.

*June 28. (16th day of inoculation, 8th of eruption.)*

The crusts of the original vesicles are now completely of a horny consistence, and brown colour: the areolae have disappeared: the child is perfectly cool and in good spirits: no fresh eruption has appeared. The greatest part of the pustules on the face and trunk have dried into brown, semi-transparent horny crusts, and all of the eruption which remains is now pustular, nowhere vesicular. The swelling of the face is less. Ptyalism still profuse.

*June 29. (17th day of inoculation, 9th of eruption.)*

The child is cool and in good spirits: the swelling of the face and ptyalism are almost gone, and, with the exception of a few pustules on the extremities, the eruption has dried up into the polished crusts already described.

*June 30. (18th day of inoculation, 10th of eruption.)*

The remaining pustules have all dried up.



*July 3.*

Many of the crusts have come off, leaving small brownish fleshy tubercles behind them.

*July 8.*

One of the crusts has separated from the inoculated part, leaving a considerable depression.

*July 13.*

All the crusts have separated : the tubercles seem gradually to be absorbed ; but brownish coloured maculae, in some places slightly depressed, mark where the eruption has been.

### CASE III.

JAMES HUGHES, aged 1 year and 10 months,

*June 13.* Was inoculated in two places on the arm.

*June 17. (5th day of inoculation.)*

A small acuminate papula, with an inflamed base, had appeared at the upper puncture ; the mark of the lower one had disappeared.

*June 18. (6th day of inoculation.)*

The papula is larger than yesterday, but is small when compared with those on the arms of the other children, who were inoculated at



the same time ; it is also more conical, and wants that pearly vesicle on its top, which they now possess.

*June 19. (7th day of inoculation.)*

The papula is still more pointed, and its base is much more inflamed than those of the other children. A very minute vesicle can now be seen on its apex.

*June 20. (8th day of inoculation.)*

The vesicle is larger, its centre is depressed, and it has a pearly colour ; the base is thicker and harder than in the cases of the other children, and it is surrounded by an irregular areola nearly half an inch broad.

*June 21. (9th day of inoculation.)*

The depressed centre of the vesicle is raised ; the vesicle itself should now be more properly called a pustule, its colour being a bright yellow ; the areola is larger, and of a deeper red.

*June 22. (10th day of inoculation.)*

The pustule has been rubbed, and a purulent-looking matter has been discharged from it ; the areola is of a still more deep or livid red.

The child has been very hot and fretful during the night, and continues so to-day.

A few vesicles can be seen on the face, and



one or two on the arms ; they are raised on inflamed bases.

*June 23. (11th day of inoculation, 2d of eruption.)*

A brownish irregular scab has formed on the arm ; the areola is contracted in size, and of a paler red colour.

The child was not so restless during last night as he was the night before ; he is quite cool and free from fever this morning.

The vesicles which were visible yesterday are no longer so, but their bases can be seen, and their hardness and elevation felt by drawing the finger over them.

*June 24. (12th day of inoculation, 3d of eruption.)*

There is no alteration in the appearance of the inoculated part, unless that the areola is rather of a brighter red.

The child has been hot and fretful during the night.

The vesicles are again visible on the face, occupying their original seat on the inflamed bases mentioned yesterday. Some fresh ones have appeared on the back and breast, and two or three in the areola ; they are of a pearly colour, have elevated red bases, and depressed centres.



*June 25. (13th day of inoculation, 4th of eruption.)*

The crust on the arm has been almost rubbed off, and a little purulent-looking matter is discharged from under it; the areola remains as yesterday.

The child is still a little feverish. The vesicles generally are larger, but still of a pearly colour; their centres are yet depressed.

*June 26. (14th day of inoculation, 5th of eruption.)*

The appearance of the arm is not altered. The child is still peevish, and has some degree of fever. Fresh vesicles appear daily, more particularly about the scrotum, and upper part of the right thigh, where there is some redness of the skin, the remains of an herpetic eruption. The vesicles which first appeared on the face are now of the size of small peas, almost globular, and of an opaque yellowish colour. On the other parts of the body they retain their pearly hue and depressed centres.

*June 27. (15th day of inoculation, 6th of eruption.)*

No alteration in the appearance of inoculated part. There is still a little fever. Fresh vesi-



cles have appeared on different parts of the body, more particularly on the scrotum and extremities. The eruption on the face, and in the areola, is now to be called pustular; on the other parts of the body it is still vesicular.

*June 28. (16th day of inoculation, 7th of eruption.)*

The arm is still unaltered. The febrile symptoms are milder, but not altogether gone.

More of the eruption has appeared on the trunk of the body. It is now chiefly pustular, even the last which has appeared.

*June 29. (17th day of inoculation, 8th of eruption.)*

The areola has almost faded. The fever is almost gone. The pustules in the areola have dried into brown, semi-transparent, polished conical crusts; and on the face, the process of drying is commencing, as detailed in the cases of O'NEIL and HOGG.

*June 30. (18th day of inoculation, 9th of eruption.)*

The child is free from fever. The greater part of the eruption has dried into polished-brown crusts, without any rupture or exuda-



tion ; some few pustules, however, are but yet commencing that process, and a still smaller number have as yet shewed no symptoms of it. Of those that have dried, the greatest part were pustules, but some few were vesicular.

*July 1. (19th day of inoculation, 10th of eruption.)*

The whole of the eruption may now be said to be in a state of crusts.

*July 5.*

Some few of the crusts have come off, leaving small tubercles behind them, of a brownish, somewhat purple colour.

*July 8.*

There is a depression in the inoculated part, but not in any other part of the body.

*July 13.*

Purplish blains mark where the eruption has been, but no where are pits visible.

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The other cases were so similar to the preceding, that I have thought it superfluous to insert them.



## CHAPTER VII.

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RECAPITULATION OF THE MORE STRIKING FEATURES OF THE SMALL POX, WHICH SOMETIMES FOLLOWS THE COW POX, TOGETHER WITH A FEW INFERENCES FROM THE PRECEDING HISTORY OF THE DISEASE.

THE symptoms which precede the eruption of the modified small pox, are of the same kind and duration, as those of the casual small pox, with the exception of the dryness of the tongue, which is rare in small pox after cow pox.

The headach is, in some cases of small pox after vaccination, so very acute as to *cause delirium*, as in malignant small pox.

The eruption of the small pox after vaccination is not preceded, like that of malignant small pox, by a rash on the face, neck, and breast.

In the preceding cases, the eruption appeared on the third day, as in the mild small pox, and



*was first perceptible on the hands and legs, and gradually extended to the face and trunk of the body ; whereas that the casual small pox follows the contrary course, appearing first on the face and neck, from which it extends to the breast and extremities of the body, and was accompanied by sneezing, a very common symptom of the casual small pox, during the coming out of the eruption.*

The symptoms which preceded the eruption were most severe in Case I., and bore a ratio to the number of the pimples.

The patients complained much of the legs and feet being cold during the whole progress of the disorder, as in the common small pox.

During the eruptive fever, I have not (excepting in two cases) met with an example of bilious purging, a symptom by no means unfrequent in the mild, and also in the malignant small pox, when the patient has not arrived at puberty.

The eruption is accompanied by swelling and redness of the face, and sometimes also by redness of the extremities of the body, which is not so remarkable as in the malignant small pox. In some cases, there is an efflorescence on the extremities of the body, not unlike to that of the scarlet fever, or to that of the measles, ex-



cepting that it does not feel rough when the finger is drawn along it.

I have not seen the legs and feet swelled as after the casual small pox.

The throat and tonsils were considerably inflamed and swelled in Case III., which, though rare in the common mild small pox, is not unfrequent in the chicken pox; but the tonsils were not covered with white crusts, as frequently happens in small pox.

None of my patients, in small pox after vaccination, had that degree of spitting or salivation, accompanied by slight difficulty in swallowing, which are by no means uncommon and distressing in the malignant small pox.

A slight inflammation of the eye-balls sometimes attends small pox after vaccination, and pimples never form on the fore clear part of the eye, *called by anatomists, cornea*, which occasions blindness, as in severe small pox.

Bloody urine very rarely occurs in the mitigated small pox after cow pox.

As soon as the eruption was fairly out in the above cases, *the quickness of the pulse, thirst, and other febrile symptoms, suddenly disappeared, and did not return on the tenth or eleventh day, as frequently happens in common, mild, and also in the malignant small pox.*



The eruption in the modified small pox, at its commencement, bears a striking resemblance to flea-bites, is of a pale red colour, each pimple is to the touch hard, globular, and painful when pressed, and becomes gradually larger and redder.

The centre of the red pimple becomes most prominent, and the circumference assumes a light red colour, what Mr SYME has called *aurora red*.

The centre of the summit of the pimple assumes a yellow or pearly colour on the second day. The base of each pimple is surrounded by a red ring, which is not above a line in breadth; and, on the third day, this ring becomes of a scarlet red. There is a diffused redness of the skin around the pimple, which a slight wash of what Mr SYME calls *arterial blood red* would imitate; but in Case I. the redness between the pimples was very considerable, (Vide Plate I. fig. 1.) and the face and eye-lids were much swollen. The size of the pimples is very various; generally the more severe the disease, the larger the pimples. The pimples may be observed to be of very different sizes and states of advancement. The smaller pimples are red and hard, or in the state of inflammation; the larger are vesicular, and the largest



are pustular; and it often happens that the pimples of very different sizes, and in these different states, are in the immediate vicinity of each other. (Vide Plate II. fig. 4. and 5.) Many of those advanced no farther than the inflammatory stage. Hence the small pox, which appears after vaccination, bears a strong resemblance to the chicken pox.

On the trunk of the body, the redness in the skin around the pimple is of an oval form, but in the extremities nearly circular, and is about half an inch broad, and became paler, the greater the distance from the pimple.

When the pimples are numerous, they are less raised, are not so nearly circular, and the circumference of the base is more irregular; and owing to the redness of the skin between the pustules, the red circle around the base of the pustule is by no means so distinct as when the pustules are few in number, and when the skin between them is little affected.

The central clear part of the pimples is evidently depressed on the fourth and fifth days, (Vide Plate II. fig. 3. or 4.), which depression *is not to be perceived in all the pimples in the same light*, but by turning the body it can be seen in those vesicular pimples in which it had not been



previously perceptible. This fact is generally overlooked, and has often led to the denial of the existence of the central depression, when it was present.

On the seventh day, the centre of the pimple acquires a yellowish green colour, (Vide Pl. II. fig. 1.), *the wax yellow colour* of Mr SYME, or the pimple at that period becomes *pustular*, and, at the same time, the crimson ring became of a still deeper red colour.

This particular colour is owing to the cuticle, which is raised, having been soaked for some time in purulent matter, and in part also to the colour, purulent matter shining through the semi-transparent cuticle.

When the pus is formed, in a short time the pimple undergoes a remarkable change in its form; it becomes hemispherical; after which the crusts are formed. (Vide Plate II. fig. 1.)

Mr BRYCE has remarked, that the pustules have more generally advanced to suppuration in the small pox after cow pox which has of late prevailed, than he has observed on any former occasion.

It merits particular attention, that *the greater number of the pimples do not pass on to suppuration in the small pox after vaccination, for many*



*of the smaller die away on the third or fourth day.*

The matter within the pimples consequent to vaccination is thick, tenacious in most of the cases, and assumes a yellow green hue, (Vide Drawing of Arm of Case I. Plate II. fig. 1.); whereas, the contents of the pustules of the malignant small pox never become thick, but assume a dirty white opaque colour, (Vid. Pl. I. fig. 2.), and in the worst kind become black, owing to an admixture of blood, and which have been particularly described by SYDENHAM.

I have never observed in the small pox which follows vaccination, purple spots in the interstices of the eruption, as sometimes happens in the casual small pox, and which he has regarded as a fatal symptom.

DE HAEN has made particular mention of the case of a girl of six years of age, who died on the 5th day of the fever; her sides and back were purple, with a few scattered and hardly perceptible pimples.

Nor have I seen, in the modified small pox which sometimes follows vaccination, black spots, or those marks on the skin which have been called vibices.

It is a striking circumstance in the history of



small pox after cow pox, *that many of the pimples never become pustular, but pass from the vesicular state at once to the state of incrustation.* This happens to a number of the pimples on the extremities of the body, and gives the crust a hard shining reddish look, implanted on a horny base, so that they somewhat *resemble horn*; hence the introduction of the term **HORN POX**.

In many instances a partial suppuration takes place at the top of the pimple.

The rapidity of the progress of the pimples to incrustation is very different.

In Case I. there was no appearance of crust until the eighth day; in Case II. on the fifth day of the eruption; and, in Case III., on the sixth day of the eruption; and sometimes it takes place at a later period.

It may be remarked, that those pimples on the *hands, which first appeared in Case I., did not pass on to maturity most rapidly*; on the tenth and eleventh days the crusts were not fully formed; and many of these had not dried up on the fourteenth day.

The crusts fell off in the first place on the face, but remained longer on the extremities.

In Case I. many of the crusts on the extremities did not fall off until twenty-five days were elapsed.



*sed*, dating from the commencement of the disorder; but in Cases II. and III., which were much milder, they fell off on the fifteenth and sixteenth days.

After the crusts fell off, they were succeeded by a growth of new crusts, of a gall-stone yellow colour.

Though the period of the eruption is not so precise and determined as in the milder kind of small pox, *and though there are fresh crops of pimples*, yet the concomitant symptoms of the small pox after vaccination are very mild when compared with those of the malignant small pox; for instance, there was no degree of the low fever commonly called *typhus*, though the eruption was confluent in several of the above cases; nor have I met with fits of epilepsy, which sometimes precede or follow the eruption of the malignant small pox.

An exception to the above observation was communicated to me by letter, by Mr JOHN COOPER of Liverpool.

The patient, a boy between three and four years, and of a robust and plethoric habit, was attacked with vomiting and great drowsiness. The comatose state was removed by calomel, and the application of a blister to the head.



The general febrile symptoms ran high, which led Mr COOPER to inquire whether his patient had been inoculated. There was a large cicatrix left on one arm by vaccination. On the following day, says Mr COOPER, "I was much surprised by the appearance of an eruption, which had the peculiar seedy feel of small pox. Between the eighth and ninth days the pustules were perfectly filled, and the eruption nearly confluent, — at least scarcely any interstice could be discovered on the face, which was greatly swollen. *The secondary fever was sufficiently marked, though the symptoms were not severe.* Several pits were left on the forehead and temples.

In short, the most striking difference between the common casual small pox, and the small pox which follows perfect vaccination, consists in the disease passing with unusual rapidity and mildness through its latter stages, when in the common casual small pox life is in danger. The progress of the symptoms, to employ Mr SMITH's appropriate phrase, is checked "as it were by enchantment."

The progress of the pimples to incrustation *was more rapid than in the common small pox*: it took place on the seventh or eighth day from



the first attack, instead of the tenth or eleventh, as in common small pox.

In the mild small pox, where vaccination has not been previously performed, the crusts usually fall off on the twelfth or fourteenth day; whereas, in the small pox which follows the cow pox, the crusts are, as in the malignant small pox, much longer of falling off; but pits are very rarely left, as after the malignant small pox.

It may be said that Case I. was a case of chicken pox, but not of small pox after perfect vaccination, because, on the ninth day of the disease, and fifth of the eruption, many vesicles, like *blisters filled by a watery fluid*, appeared on the face, (Vide Plate I. fig. 1.); and hence the disease was supposed, by one or two of the medical gentlemen, to bear a resemblance to the chicken pox. But there were many differences between this eruption and chicken pox.

The period at which these watery vesicles appeared did not correspond with the period of the eruption of the chicken pox.

The vesicles in chicken pox, according to the descriptions of the best authors, increase in size for three days at least; whereas in the above case *the vesicular pimples began to change their*



*colour and to shrivel on the very day they appeared ; of which fact I am perfectly certain, in consequence of my attention having been drawn to and fixed upon the appearance of the vesicles, whilst Mr LIZARS was engaged in making his drawing from these between one and two o'clock of that day.*

The watery vesicles were in this case limited to the face and lobes of the ears ; whereas in the chicken pox they extend over the whole body, and appear generally in the first place on the back and breast, according to Dr HEBERDEN.

The vesicles were not itchy, and there was not a successive crop of these vesicular pimples as in the chicken pox ; and slight yellow crusts covered these larger ones on the third day, instead of the fifth day, as in the chicken pox.

If these were the vesicles of the genuine chicken pox, there is no such instance to be found in the annals of physic ; for there is no instance of the same individual having the chicken pox *twice* in the course of his life, according to HEBERDEN.

Besides, the pimples in all parts of the body, excepting the face and ears, resembled those of the mild small pox, as to their progress and termination.



Beside, this boy *communicated the small pox to one of his brothers and one of his sisters.*

The crusts of the watery vesicles on the face in Case I. did not resemble those of the pimples of the other parts of the body: the former were of a lemon colour, the latter of a deep red brown colour: the former did not exceed a line in thickness, were nearly uniform as to thickness; whereas the crusts of the other pimples were considerably thicker, especially in the centre, and had a laminated structure.

A very remarkable circumstance occurred in Case I., of which I believe there is no mention in the history of physic; *I allude to the appearance of three distinct small pimples on the twenty-fifth day from the commencement of the disorder; which pimples became pustular.*

The above pimples had, in the opinion of Dr RUTHERFORD and Mr BRYCE, as well as in my own, every appearance of small pox; but, as inoculation was not practised by matter taken from them, I do not choose to affirm that they were actually small pox pimples.

The small pox which follows perfect vaccination very seldom gives occasion to pits in the skin; and when that happens, instead of being angular indentations, they are like depressions made in the skin by the head of a large pin.



Such is the general course of the small pox which follows vaccination. I have met with several exceptions to the usual train of symptoms, which I shall now proceed to enumerate.

The small pox which sometimes succeeds the cow pox is in some instances of equal duration as the casual small pox, but the pustules are smaller. Of this variety I have lately had occasion to meet with three examples. Dr RUTHERFORD informed me that he had seen the small pox consequent to cow pox shorter by one day only than the casual small pox.

In Case I., there were three very striking deviations from the usual phenomena of the disease. Of these, the eruption of vesicles on the face on the 5th day of the disorder, between the small pox pimples, which were quite unlike those of the chicken pox, was the most remarkable. The fresh crop of pimples at so late a period as the 25th day is an anomaly in the history of this disease, of which I had not met with another example. It was also remarkable that the pustular pimples were a day later of scabbing than common.

The case of the Honourable Mr GROSVENOR, which has made so much noise, was of peculiar severity, not, however, more so than several of



the cases described by Drs RAMSAY and SMITH. It was, however, very remarkable in this respect. On the evening of the sixth day of the disease, it is stated he began to make bloody urine, and he continued to do so for the two following days.

The pustules, we are informed, on the tenth day " began to dry upon the face, (which is two or three days later than is usual,) which was swollen to a considerable degree, but not to the extent of closing his eyes, and was attended by a salivation, which lasted several days. Petechiae had occurred in the interstices of several of the spots, particularly on the limbs ; and there was that particular smell from the whole frame which is remarked in bad cases of confluent small pox.

It was obvious that the first symptoms of which Mr GROSVENOR complained, were such as indicated a violent disease about to follow ; and Sir HENRY HALFORD confesses, that he entertained a most unfavourable opinion of the issue of such a malady, when it was fully formed, having never seen an instance of recovery under so heavy an eruption attended by such circumstances. It seemed, however, that the latter stages of the disease were passed through more



rapidly in this case than usual ; and it may be a question, whether this extraordinary circumstance, as well as the ultimate recovery of Mr GROSVENOR, were not influenced by previous vaccination."

I am indebted to Dr RAMSAY of Dundee for mentioning to me some other exceptions from the usual course of the mitigated small pox.

He has observed to me, (in a letter dated 21st March 1818,) " In many cases, however, the colour, figure and duration have been undistinguishable from what we observe in regular variola. I do not know that I have ever seen the eruption entirely confluent, so as to form one large crust over the face and body, as in the confluent small pox, but very nearly approaching to this.

The secondary fever I have never seen to any extent."

The small pox after vaccination, according to Dr WILLAN \*, is sometimes of the chrystalline kind, minute and indented, and severally bounded by a red line of a purplish colour, without any intervening redness. The eruption was, however, extensive, and in many places cohe-

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\* Vide p. 54.



rent, and the fever was at first violent enough to excite considerable alarm among the child's friends. At the period when the greatest danger was apprehended, the eruption dried, and there was no corresponding fever.

These cases were somewhat similar to two cases stated by Dr ABERDOUR, (Med. and Phys. Journal, Feb. 1804, p. 132), in which vaccination was employed rather too late to supersede the small pox by infection, yet in which it appears to have mitigated the eruption. A boy, two years old, had, on the eleventh day after inoculation, about eighteen pustules, "all of which died away in a few days, and never put on a purulent form. In his sister, aged seven months, the punctures were, for the first five days, surrounded by considerable inflammation, which disappeared on the seventh day. On the following day an eruption of the confluent small pox appeared on the face and other parts of the body.

"The pustules contained a reddish kind of serum, but none of the brown yellow purulent matter of the small pox. Their figure was a medium between the flattened surface of the vaccine pock, and the conical apex of the distinct small pox. Out of several hundred cases



of confluent small pox, which I have had occasion to see, this case was the mildest \*."

Mr RING has described two cases which contained more matter than is usual, but were not surrounded by inflammation.

I had occasion to meet with another peculiar modification of the small pox which follows cow pox. Three of the children of a family were attacked with the small pox after cow pox. A fourth child of the same family, who had been vaccinated four years before, and who slept in the same room as two of the other children, had no eruption of small pox at the time, but was repeatedly attacked with fever of two or three days' duration. For several weeks after exposure, though previously a very healthy child, he was occasionally unwell, and every now and then he had crops of boils on different parts of his body.

At length, at the distance of three months, he became unusually fretful and feverish, and had a crop of pimples, which the nurse, an intelligent woman, who was perfectly conversant with the appearance of the small pox, from having seen it in his brothers and sister, assured me, (for I did not see the child at this period,)

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\* Medical and Physical Journal, August 1805.



was the small pox. The eruption stood out only five days.

Since that period the child has enjoyed perfect health.

Pustular eruptions, attended with slight fever in persons who had small pox, is by no means rare: it is mentioned by Mr MAITLAND, the first inoculator in Britain, and also by Dr WAGSTAFFE. (Vid. Letter, page 31.)

Eruptions, as has been before observed, are by no means unfrequent on the breasts of nurses who suckle children with confluent small pox.

I have hitherto described the above eruptive disease as modified small pox: I shall now proceed to enumerate the distinctions between it and the chicken pox.

If the eruption had been that of the chicken pox, those children who had been vaccinated would have been equally subject to the complaint as those who had not been vaccinated. This eruption was undoubtedly connected with the small pox; for in many of the above instances the confluent small pox appeared at the same time in the same family as this eruptive disorder which followed vaccination; and besides, this eruptive disorder was comparatively



more rare amongst children who had been previously vaccinated.

The eruption was preceded by more severe febrile symptoms, and by febrile symptoms of a more determinate duration than those which precede the eruption of the chicken pox. The eruption in many of the cases was confluent, which very rarely happens in the chicken pox. The pimples had the same form, and were filled by the same kind of fluid, and followed the same progress as those of the small pox \*.

The pimples contained a smaller proportion of a watery fluid than those of chicken pox, which are very like to small blisters: they had a more solid appearance, being surrounded at their bases by coagulable lymph. Some of the pimples passed at once from the state of vesicle to incrustation: they did not break, hence exhibited somewhat of a horny appearance, were longer of falling off than the crusts of common casual small pox; and in by far the greater number of the cases, pimples might be observed in very different states, some in the state of inflammation, and others in a suppurative state.

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\* Vid. Plate II. fig. 3. & 4:



The crystalline small pox bears the strongest resemblance to chicken pox ; but in the former, a very dangerous disease, the eruption comes out at once, and is often confluent, but in the latter there are successive crops of pimples, some of which never advance beyond the first or inflammatory stage : the eruption is very seldom confluent, and the disease is seldom fatal, excepting from the irritation of the eruption occasioning fits, which sometimes happens in feeble and irritable children.

In the eruptive disease after vaccination, the pimples are in different states of advancement, and are attended with much greater inflammation, more interstitial swelling, and a greater degree of closure of the eye-lids, than is common in chicken pox.

That this eruptive disease appearing after vaccination was really small pox, was ascertained by inserting the contents of the pustules into the arms of six children that had not been vaccinated, or previously inoculated with the small pox : thus the small pox was generated.

Lastly, The spots on the skin left by the chicken pox are like the pricks of a pin, and of a mahogany colour ; but those left by small pox are crimson-coloured stains, which are much larger and of longer duration.



It may be inferred, from the above experiments, that we cannot join MORTON, and some other of the older authors, in considering the chicken pox as a milder kind of small pox ; for the chicken pox was not produced by inoculating with the matter of small pox, nor was the small pox produced by inoculating with the contents of the vesicles of the chicken pox.

From the preceding facts, it follows, that even the most perfect vaccination is not always a safeguard against an attack of small pox, which, however, is generally mitigated and modified by such a precursor.

There is no evidence of the small pox, which sometimes follows cow pox, *being a disease sui generis* : it seems to be a modification of the small pox, being occasioned by the same contagion. The eruption exhibits the same features, and communicates to others who have not been vaccinated as severe a kind of small pox as the ordinary contagion ; and Dr RAMSAY has well observed, “ In other cases prevailing at the same time, in the same family, the eruption has gone through all the stages of small pox, from which it has been impossible to determine a difference.

There is no part of medical history more obscure than that which respects contagion, and in



this disease several inexplicable circumstances occur. For example, some that have been vaccinated are seized with small pox, but others escape the contagion, and this susceptibility to receive the contagion is peculiar to some families, so that the disease occasionally attacks in succession every member of the family. Is this to be imputed to a peculiarity of constitution, or to imperfect vaccination? To me, it seems rather to be owing to the former of these causes, as the previous vaccination, in several of the above instances, had been performed with due care, by skilful persons, and according to Mr BRYCE's plan.

Besides, I very lately visited two soldiers, who were attacked with small pox for a second time, who received the contagion by carrying a child that lived in the same room with them. The child got the small pox in consequence of having been inoculated with matter taken from a boy who had small pox after cow pox. The father and mother of the child were not seized with small pox, nor were Dr FARQUHARSON, Dr BARTLET, or Mr HENNEN, who inoculated themselves from that very child.

This greater susceptibility to receive the contagion, inherent in some constitutions, is not peculiar to small pox : there are many instances



of persons of certain constitutions being attacked a second or even a third time by the scarlet fever, measles \*, and even by the whooping cough †.

But when two or more of the same family, who had not been inoculated with small pox or cow pox, have been seized with the small pox, the contagion, by being concentrated, becomes so virulent as sometimes to overcome the influence of previous vaccination, which does not prove a safeguard against the small pox.

That the contagion of small pox is occasionally very virulent, does not admit of doubt; hence the greater frequency and greater mortality of the disease at particular seasons; and hence, even those of a certain habit of body who have been previously attacked with small pox have not been exempted from a second attack of the same disease.

From what has been above stated, it seems,

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\* Vide Trans. of a Society for improving Medical and Chirurgical Knowledge, vol. iii.

† Mr BRYCE has informed me, that he lately had occasion to visit two children in a family who had had this disorder twice, and the father stated that he had undoubtedly been afflicted with the same disorder three different times during his life.



that the kind and duration of the small pox after cow pox indicate whether the previous vaccination be perfect or imperfect; if the former, the small pox is mild and shorter in its course; but if the latter, the attack of small pox is altogether similar to the casual small pox: and from what I have seen, it appears to me, that imperfect vaccination is, among the poor of Scotland, the most frequent source of small pox; and considering that vaccination is performed generally on that description of society by unskilful persons, such an opinion becomes the more probable.

As it may be difficult, by mere inspection, to determine whether vaccination has been perfect or not, hence the great value of Mr BRYCE's test.

A most important question in the history of vaccination seems to be determined by the above statement, viz. that the preventive power of the cow pox does not wear out; and also, that it is not proportioned to the ages of the patients.

The eldest of the family PEA had the disease in the mildest form.

In my own family, the severity of the disease was not proportioned to the ages of the individuals; my second son had a much larger crop



of pimples than his sister, who is two years older.

These facts correspond with the statements of Dr WILLAN, and Messrs BRYCE and CREIGHTON of Dublin, and also with the observations made at the Public Dispensary of this city.

Dr BARON of Gloucester, who is placed in the most favourable circumstances for determining this curious and very important point, has lately stated to me by letter, " There is not the slightest reason for believing that the protecting power of vaccination is diminished by time. Very active small pox matter was recently inserted into the arm of PHIPPS, the man whom Dr JENNER first vaccinated, but nothing but a little irritation was produced. The same experiment has been made more than a dozen of times on this individual."

By the report which has been published in France, it appears that a greater number of persons have been afflicted twice by small pox than by small pox after cow pox.

In pages 80 and 81, I have made mention of a number of cases of small pox having appeared twice during the life of the same individual ; and in pages 82, 83 and 84, the history of a family is given, which places the inoculation for small pox and cow pox on the same



footing with regard to the prevention of a future attack from small pox, and affords an example of the milder kind of small pox succeeding the small pox.

I have had occasion to meet with two additional instances of small pox having occurred twice in the same individual since the preceding sheet was printed, in which the disease seemed to me to have been modified to a remarkable degree. The eruption in the second attack of small pox was somewhat similar to that of the small pox after the cow pox, that is, the pimples were of very different sizes, and even those in the immediate vicinity of each other were in different states of advancement; some were very small, and only in the first or inflammatory stage, others were three or four times larger, and evidently contained a fluid resembling whey, or had passed on to the vesicular state; and, what was very remarkable, the patient had feverish symptoms before the eruption came out, but no secondary fever. The eruption was very copious, and confluent in different parts of the body; and on the feet and hands, the eruption had assumed a horny appearance where the scarf skin is thickest, in one of the cases; and in the other many of the pimples



passed at once from the state of vesicle to that of incrustation. and in the course of six days ; and it was remarkable that a man living in the same house, who never had had small pox or cow pox, was seized with a very severe small pox, which had very nearly proved fatal to him.

From the above circumstances, I apprehend Mr BRYCE has, with great justice, concluded, that what was called the horn pox, which prevailed before vaccination was introduced, was a variety of small pox modified by the previous attack of small pox.

It seems fair to infer, that the contagion of small pox, in some constitutions, gives rise to a second and modified attack of the same disorder, somewhat similar to the modification the small pox undergoes by previous vaccination.

From the above, the following practical conclusions may be drawn.

1st, That a considerable majority of persons who have been vaccinated escape the small pox.

2d, That the small pox which succeeds vaccination is much milder, and a much less fatal disorder than the inoculated small pox ; for in the annals of physic, there are not above six or eight fatal cases of small pox after cow pox, whereas, at an average, one in four hundred dies from the inoculated small pox.



3d, Though small pox and cow pox may be upon the same footing as preventives of a future attack of small pox, yet they are by no means so as preservatives of life ; for THERE HAVE BEEN A GREATER NUMBER WHO HAVE DIED FROM A SECOND ATTACK OF SMALL POX, THAN FROM SMALL POX AFTER COW POX.

I have not met with a single fatal case of small pox after vaccination, nor been informed of such an event by any one of my numerous correspondents in Scotland, and but two only from England, which were communicated by Mr CHRISTIAN of Liverpool.

4th, The result of the experience of the preceding two or three years, when the small pox has been unusually frequent and fatal to a great number who had not been vaccinated, is most highly favourable to cow pox ; FOR THOSE THAT HAVE BEEN VACCINATED, LIVING IN THE SAME HOUSE,—SLEEPING IN THE SAME APARTMENT, AND EVEN IN THE SAME BED,—USING THE SAME SPOON, AND EATING FROM THE SAME DISH WITH OTHERS WHO HAD NOT HAD COW POX, AND WHO WERE WITHIN A FEW DAYS, OR EVEN A FEW HOURS OF DEATH, FROM MALIGNANT SMALL POX, HAVE EITHER ESCAPED THE SMALL POX, OR HAVE BEEN AFFLICTED WITH A FORM OF THAT DISEASE, WHICH, THOUGH AT FIRST SEVERE, HAS, AFTER THE SIXTH



OR SEVENTH DAY OF THE ERUPTION, ALMOST INVARIABLY DISAPPEARED WITH A RAPIDITY WHICH PERHAPS FORMS THE MOST STRIKING FEATURE OF THE DISEASE.

THE EVENTS, THEREFORE, OF THE ABOVE PERIOD, SO FAR FROM MILITATING AGAINST DR JENNER'S DISCOVERY, HAVE PROVED, IN THE CLEAR-EST MANNER, ITS INCALCULABLE VALUE, AND MAY BE SAID TO HAVE CONFIRMED THE TRIUMPH OF VACCINATION.



## CHAPTER VIII.

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### OF THE TREATMENT OF THE SMALL POX WHICH SOMETIMES FOLLOWS VACCINATION.

As the treatment of this kind of small pox has been mentioned in the detail of the cases, and is similar to that of the inoculated small pox, it seems necessary to add only a few general observations on the subject.

RHASES, who practised at Bagdad, in the tenth century, in his very valuable history of small pox has laid down rules as to the treatment of the patient, when the disease may be expected to come on, which are well worthy of imitation. He strictly prohibits animal food and wine, and has highly recommended cupping, bathing, drinking iced water, and a vegetable diet ; which rules are also applicable to small pox which sometimes follows vaccination, and tend, in a remarkable degree, to mitigate the confluent disorder.



The beneficial effects of such regimen have been known and long felt in Hindostan.

SYDENHAM had the merit of introducing the cooling regimen into Britain. He urged strongly the necessity of free ventilation, and of exposing the patients to the cold air when the fever was violent. He strictly prohibited animal food, wine, and all sweating medicines, and instead of these he prescribed small beer, barley-water, acidulated drinks and fruits. Can there be a stronger confirmation of the beneficial effects of cold, than the following, which have been mentioned by my Grandfather? “ I have good information,” says he, “ of one hundred and twelve people being inoculated in the middle of winter, in some of our most northern isles, where there was scarce fuel enough to prepare victuals, and many of the inoculated went abroad bare-footed in snow and ice ; and yet not one of the whole number died.”

The following case is equally decisive of the value of fresh air. “ On the evening of the fifteenth or sixteenth day, the patient’s life was entirely despaired of. On the next morning, when I went rather to inquire after him, than to visit him, the nurse’s report was, That he had grown worse and worse till two or three o’clock in the morning ; at which time that he ceas-



ed to breathe, became insensible and motionless, and appeared to be absolutely dead. About five or six o'clock in the morning, the body was removed, and placed on a large table, near an open window, with no covering except only a shirt. No sign of life appeared, but the body continued hotter than common after death. This heat, however, the nurse attributed to the weather. In this state he had remained about an hour, when the nurse heard a sort of sigh, or faint breathing; and it was observed, that he had moved his arm across his stomach. Being raised up with some difficulty, he took a spoonful of a cordial medicine, ordered for him on the preceding day; and as soon as he was able to speak, he said that the cold air was very refreshing. Being carried back to the bed, he fell into a sweat, and slept three or four hours. About this time, I saw him. His pulse was now equal and strong; his respiration better than it had been for several days before; and his senses perfect. The door and windows were left open, and in a few days the man was quite out of danger \*."

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\* An Enquiry into the Merits of a Method of inoculating the Small Pox, &c. p. 43—45.



Within these few weeks, the good effects of cold bathing have been very clearly proved. As the typhus fever has lately prevailed in Edinburgh, to a considerable extent, before the eruption of the small pox came out, several of the patients I have visited were treated as labouring under that disorder; and, accordingly, cold water was administered. The cold affusion has been generally employed, according to the plan of the late Dr CURRIE of Liverpool, and with the happiest effects. In my own family, it always appeared to me that the quantity of the eruption, in the case of my eldest son, was increased by his having taken the warm bath twice during the first and second days of his indisposition, which was supposed to have originated from exposure to cold.

The temperature of the patient's apartment should always be moderate, and such, that the patient rather has the sensation of cold than of heat, and it ought to be regulated by the state of the weather and the severity of the symptoms. Thus the free admission of cool air is more necessary when the external air is warm, than in cold weather, and when the fever runs high, than when it is moderate; every means should be taken to keep the patient cool, and he should have few bed-clothes, and should



rather sleep upon a hard matrass than upon a thick and soft feather-bed, by which he is oppressed and overheated, and the quantity of the eruption is increased.

A frequent change of linen is not only very grateful, but also extremely beneficial to the patient.

As the fever which precedes the eruption in the small pox subsides when the eruption has come out, it was formerly supposed, that the greater the quantity of the eruption, the greater the relief; and hence it was the aim of the physician, in former times, to support the fever by external warmth and stimulating medicines; but more modern observation has fully exposed the fallacy of such reasoning, and shewn, that the most copious eruption does not afford the greatest degree of relief; on the contrary, the relief is most perfect when the eruption is most scanty: and it is well observed by Dr CULLEN, “that the measures taken for moderating the eruptive fever and inflammatory state of the skin afford the greatest improvement which has been made in the practice of inoculation.”

In several of the preceding cases, the cold bath or the cold affusion was employed, not only before, but also during the eruption, as is the practice with the American Indians, and al-



ways seemed to have the effect of mitigating the disorder.

Mr HENNEN sponged his son with vinegar and water.

The milder emetics, as ipecacuanha, are very useful in this disorder, and especially during the fever which precedes the eruption ; they diminish the fever, and relieve the patient much by unloading his stomach.

A diarrhoea or purging is very frequent in the different kinds of small pox, and especially when the patient does not perspire.

Many of the older authors dreaded the effects of this evacuation, from an apprehension that the morbid humours would be diverted from the surface ; and hence MORTON, the rival and cotemporary of SYDENHAM, was a great enemy to the use of purgative medicines.

SYDENHAM, on the other hand, had the discrimination and good sense to perceive the benefit of aperient medicines, but was deterred from employing these freely by the prejudices of the times.

He has insisted particularly on the danger of checking purging, and goes so far as to add, it had proved fatal to thousands, "*Multa infantium millia letho dedit.*"

Such was also the practice of Dr MEAD, Dr



THOMAS SIMSON of St Andrews \*, WINTRINGHAM †, HILLARY ‡, DIMSDALE §, and Sir G. BAKER §.

Purgatives, when administered with due caution, and in reference to the strength and habit of the patient, lessen the violence of the small pox, and avert its danger.

The more cooling neutral salts have been much employed, and by some calomel, but I have not observed any particular advantage to result from the use of this remedy.

I have generally given the syrup of senna in preference to other remedies, as it is easy to get a child to take a sufficient quantity of it, a couple of desert spoonfuls, and, besides, it in a short time produces the desired effect, and is, I believe, one of the most certain purgatives that can be given.

When the syrup of senna does not produce the desired effect, which is very seldom the case, a teaspoonful of the tincture of jalap may be added to it.

It may be also observed, that in this kind of

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\* Ed. Med. Essays, vol. iii. † Com. Nosolog. p. 63.

‡ Essay on Small Pox. Observ. on Inoculation.

§ See Cases xv, xvi, xvii, xviii and xix.

§ Med. Trans. vol. ii, p. 303 and 304.



small pox it is necessary to exclude the light in a great measure, as the eyes of the patient are tender, from slight inflammation.

SYDENHAM, in consequence of the pain, anxiety, and restlessness that attends malignant small pox, was led to employ opiates, but I have never used these, dreading the stimulant effects of the opiate, and the consequent constipation; and I apprehend that opiates should only be prescribed with the view of easing pain, obviating watchfulness, and removing cholic and flatulence.

If the plan above laid down be rigidly followed, there is no use of opiates in any stage of the disorder, which are evidently calculated to do away the good effects of purgatives.

Towards the conclusion of the disorder, and when the crusts are formed, it is necessary to give a dose or two of a purgative.

As children, after this kind of small pox, as well as after the common small pox, are extremely liable to catch cold, that, therefore, ought to be guarded against.

To prevent the contagion from spreading, the nitrous fumigation should be constantly kept up in the apartment of the sick, by pouring oil of vitriol upon pounded saltpetre.



## CHAPTER IX.

### OF A PLAN FOR RENDERING THE SMALL POX EXTINCT.

AFTER all that has been said of the occasional appearance of small pox after cow pox, I conceive that it is not necessary to abandon all hope of eradicating the disease, though it may not be possible to bring about that very desirable object so soon as could be wished.

In different parts of the world, the same susceptibilities to the contagion of small pox, and the same means by which the contagion of that disease is propagated, must be presumed to exist ; and in some countries, experience has shewn the effect of the establishment of proper regulations in eradicating the small pox.

It is surely a matter of regret, that whilst, in many other parts of the globe, the full benefit of vaccination is reaped, the inhabitants of Bri-



tain, where the discovery originated, should enjoy it only partially, through the neglect of those measures calculated to arrest the propagation of the contagion of small pox.

In this important work, the cow pox promises to be a very powerful auxiliary, and if properly employed, seems to me well calculated to assist in producing the desired effect.

The plan which I am about to propose is not new; I only suggest what the wisdom of the rulers of other countries has put in force, and what has been found by experience to be effectual in eradicating the small pox.

It may perhaps be the opinion of my reader, that it is great presumption in me even to appear to dictate to the Government on the subject of the laws which ought to be enacted for the preservation of general health. Such is not my province or intention. I merely presume to submit to public consideration what has, after much reflection, occurred to me, with regard to a subject that cannot fail to interest deeply every parent, and every well-wisher to his country.

In order to prevent the propagation of small pox, it is required, 1st, To prohibit, by law, the very pernicious practice of communicating the disease by inoculation; a regulation which



seems to be fully warranted by the documents already quoted, and by the many deaths which are occasioned by the inoculation of small pox.

Besides, this practice often entails the loss of an eye, of a limb, or of general health.

It is quite superfluous at present, after what has been stated upon this head, to enlarge upon the very dangerous consequences of inoculation of the small pox, which could never be carried into general effect in any large and populous city, and which, when performed partially, must invariably do much more harm than good. I shall, therefore, only add the sentiments of Mr S. BOURNE, delivered on this head, in the House of Commons. " I think (said he) the Legislature would be as much justified, in taking measures to prevent this evil (the inoculating out-patients at the Small Pox Hospital in London,) by restraint, as a man would be in snatching a fire-brand out of the hands of a maniac, just as he was going to set fire to a city."

If it shall not be deemed expedient entirely to put an end to the inoculation of small pox, rigorous measures to prevent the dissemination of the contagion arising from the practice, ought, at least, to be more rigidly enforced throughout every part of the kingdom.

In a preceding part of the book, (pages 61,



and 62.) a few general observations were made respecting the nature of this contagion. It then appeared, that the contagion of it is limited in its operation, and that contact, or a very near approach to the subject, is necessary to propagate it ; and also that the contagion loses its activity and power of propagating the disease by diffusion in the air, or that the small pox, like some epidemic disorders, does not originate from what may be called a variolous, or pestilential atmosphere.

That a certain state of the atmosphere (the nature of which is unknown) may become an occasional cause of adding to the severity of the disease where it has already taken place.

That the contagion of small pox is very apt to adhere to soft porous substances, as wool, feathers, silk, or the bed-clothes of the sick ; and that these latter may become so impregnated by the contagion, especially when put aside before being washed, as readily to communicate the infection even at a considerable distance of time.

By keeping the above facts in view, it follows, that the following means may be conducive to prevent the propagation of the small pox.

1st, In the case of a person with small pox coming into a village or ship, where that disease



does not prevail, (as happened at Norwich, Vid. p. 21.) he should be immediately turned out, or confined, or sent on shore. By the neglect of this expedient in the case alluded to, two hundred persons lost their lives, and one thousand got the disease.

*2d*, As the small pox is very contagious, and occurs generally but once in the progress of life, those only who have had the disorder should be permitted to frequent the chamber of the sick.

*3d*, Those labouring under small pox should be most strictly confined to their own houses, or within an hospital appropriated to the purpose, until all the crusts have fallen off, and as long as it is thought they may communicate the infection to others, and their clothes should be well washed and fumigated before they mix again in society.

*4th*, If such a law were passed and rigidly enforced, the small pox, for want of victims, would necessarily decline, and in a short time become extinct. Similar regulations are also necessary in the case of small pox after cow pox, for small pox of a virulent kind may be caught from such a source.

*5th*, The bed-linen of the patient should, as soon as it is taken off, be put into cold water



for some time, and afterwards well washed, and also the chamber and the furniture.

6th, The fumes which arise from a mixture of powdered saltpetre and oil of vitriol should be constantly diffused through the chamber of the sick, as these are respirable, and destroy the contagion of small pox.

At our sea-ports still more vigilance may be required, in order to guard against the importation of the contagion of small pox ; and hence, besides adopting those measures which have already been proposed for arresting the progress of the contagion, it might be well to hold out a suitable reward to those who discover the source of the contagion, and are most active in restraining and destroying it.

Every means should be taken to encourage vaccination ; for experience has shewn, that the more generally vaccination has been performed in any country, the more rare the small pox has become ; and also that when small pox has been accidentally introduced, it does not spread \*.

I have published at considerable length the plan which has been followed in Sweden for that purpose, which appears to be a good mo-

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\* Vide Report stated with respect to Ceylon, p. 131.



del for imitation, having been found to have produced all the good that could have been reasonably expected.

The provisions of this plan have been already enumerated, and therefore I shall at present mention only the chief of them.

By this plan, it is not left to the option of parents to vaccinate their children ; they must do so when they arrive at a certain age : but in this country, many of the lower orders do not get their children vaccinated, though every facility for the purpose is held out, and though it costs them nothing. Example, precept and entreaty have been found inefficacious in removing the prejudices, and in overcoming the indifference or the dislike to innovation, which are so prevalent amongst many of the poor ; hence vaccination, instead of having been generally adopted, has been but partially performed, and hence the prevalence of the small pox, and the loss of late of many useful lives.

There is one part of the plan followed in Sweden which merits particular attention.

The vaccine establishment consists of a director, and several inspectors of the stations for vaccination in the provinces, who have the immediate inspection of all the medical men, who



are appointed to conduct the business of the stations \*.

Mr BRYCE has also proposed, that certain persons should be appointed to perform vaccination ; to which proposal many objections have been made by different persons ; but it seems to me that this part of the plan has contributed in a greater degree than any other to eradicate the small pox. for, if vaccination were performed by those of the medical profession only, the failure of the vaccine inoculation would become much more rare.

The other parts of the above plan may perhaps be considered by some of my readers to be open to several material objections.

It may be stated against the first of the proposed regulations, that in a country with a government like ours, where the inhabitants are accustomed to liberty in every thing, it could not be enforced.

If quarantine laws † are daily enforced with

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\* Vide a fuller account of this establishment p. 125, 126, 127, &c.

† Many years ago government established “ a Board of Health, to prepare and adjust rules and regulations for the more speedy and effectual mode of guarding against the introduction and spreading of infection, and for purifying any ship or house, in case any contagious disorder shall manifest itself in any part of the united kingdom, notwithstanding



rigour, why should not similar enactments be provided against the propagation of small pox, which has proved, and continues to prove much more fatal than the plague itself? for, as has been shewn already, when the plague broke forth in Britain, it appeared only in London and some of the larger cities, whereas no city, no village, or even hamlet, is exempted from the small pox; and a much greater number have died from the former than the latter.

Besides, it may be argued, that it is extremely hard that those who have vaccinated their children should suffer from the neglect of others in adopting a similar precaution.

In the second place, there is a precedent for establishing such compulsory regulations.

SIR EDMUND CARRINGTON, late Chief Justice of Ceylon, has shown, (in a letter to the late Mr PERCEVAL,) from the statute books, the legality of restraining every infectious disease.

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ing the precautions taken to guard against the introduction thereof, and to communicate the same to all magistrates, medical persons and others, his Majesty's subjects, who may be desirous, and may apply to be made acquainted with the same \*."

\* London Gazette, Council Office, Whitehall, May 28. 1805.



It may be also stated, that the idea of the liberty of the subject being trenched upon by the regulations above proposed, does not correspond with the definition of civil liberty given by the late justly celebrated Dr PALEY, who has stated that \*, “ To do what we will, consistently with the interest of the community to which we belong, is civil liberty ; that is to say, the only liberty to be desired in a state of civil society.”

Lastly, From what has been stated, it must, I think, be obvious to the reader, that without the interference of Parliament, it is vain to think of ever eradicating the small pox from the British empire. It cannot be done by the exertions of any individual, or by those of private societies; and it may be added, that such an interposition of government seems to be called for at this time, when many of the inhabitants of Britain have, by the want of proper regulations, been, to a considerable extent, deprived of the benefit of vaccination, and have been afflicted by a kind of small pox, which has proved to some a severe disorder, and has communica-

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\* Moral Philosophy, vol. ii, p. 179.



ted to those who have not been previously vaccinated, a virulent and fatal disease \*.

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\* Mr BRYCE's excellent plan for eradicating small pox well merits the attention of the reader. It was so much approved of by Dr JENNER, that after having spent much pains in preparing a plan of his own, he laid it aside after Mr BRYCE's plan was published, and had the candour to state his perfect approbation of every part of it, and his utmost reliance in its efficacy in rendering the small pox extinct.

For a further account of the means of destroying the contagion of fever, &c. see Dr SMYTH's Account of the Jail Fever, as it prevailed at Winchester; also Dr FERRIAR's Account of Fever Wards, vol. iii. of his Medical Histories and Reflections.







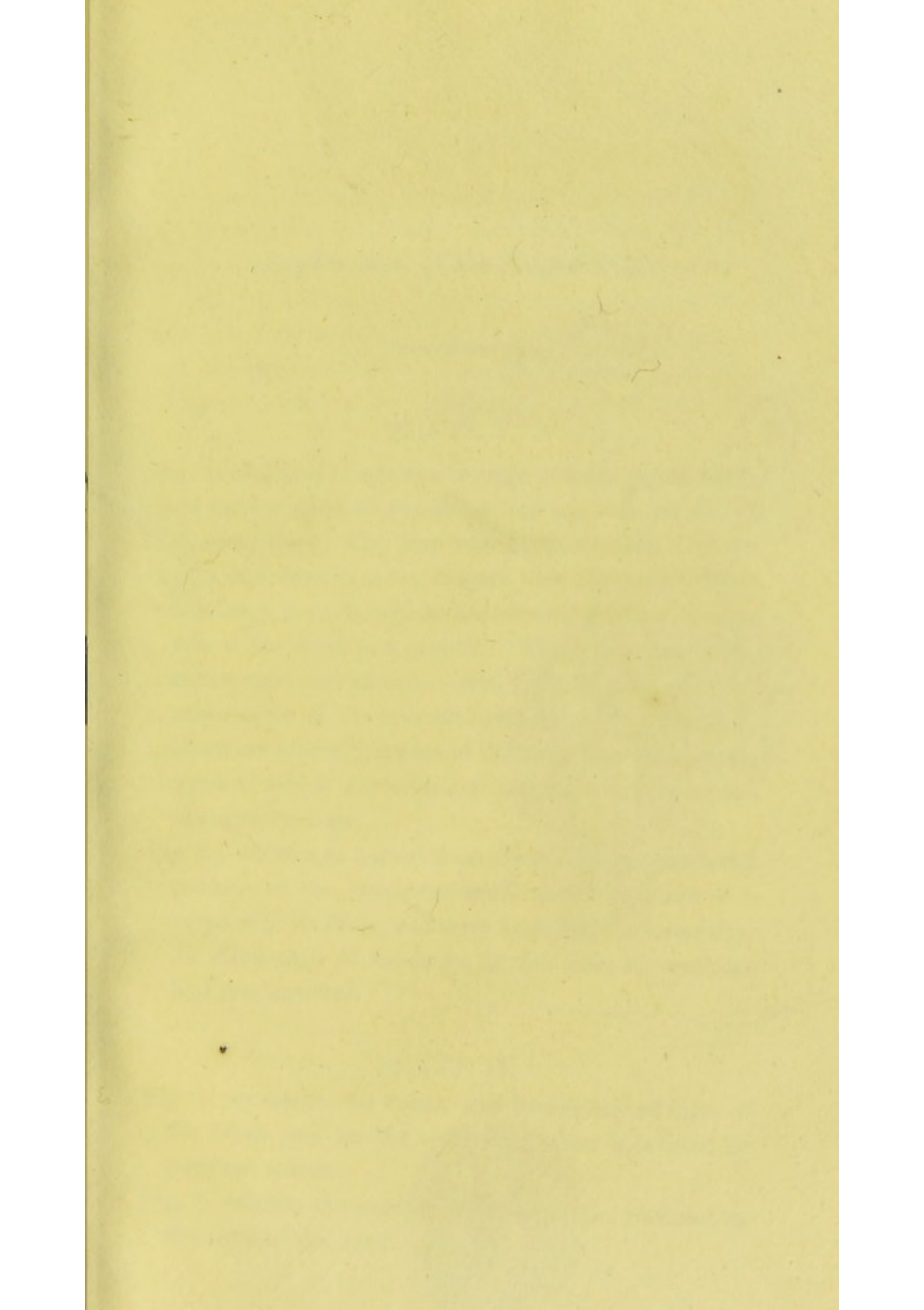




Fig. 1.

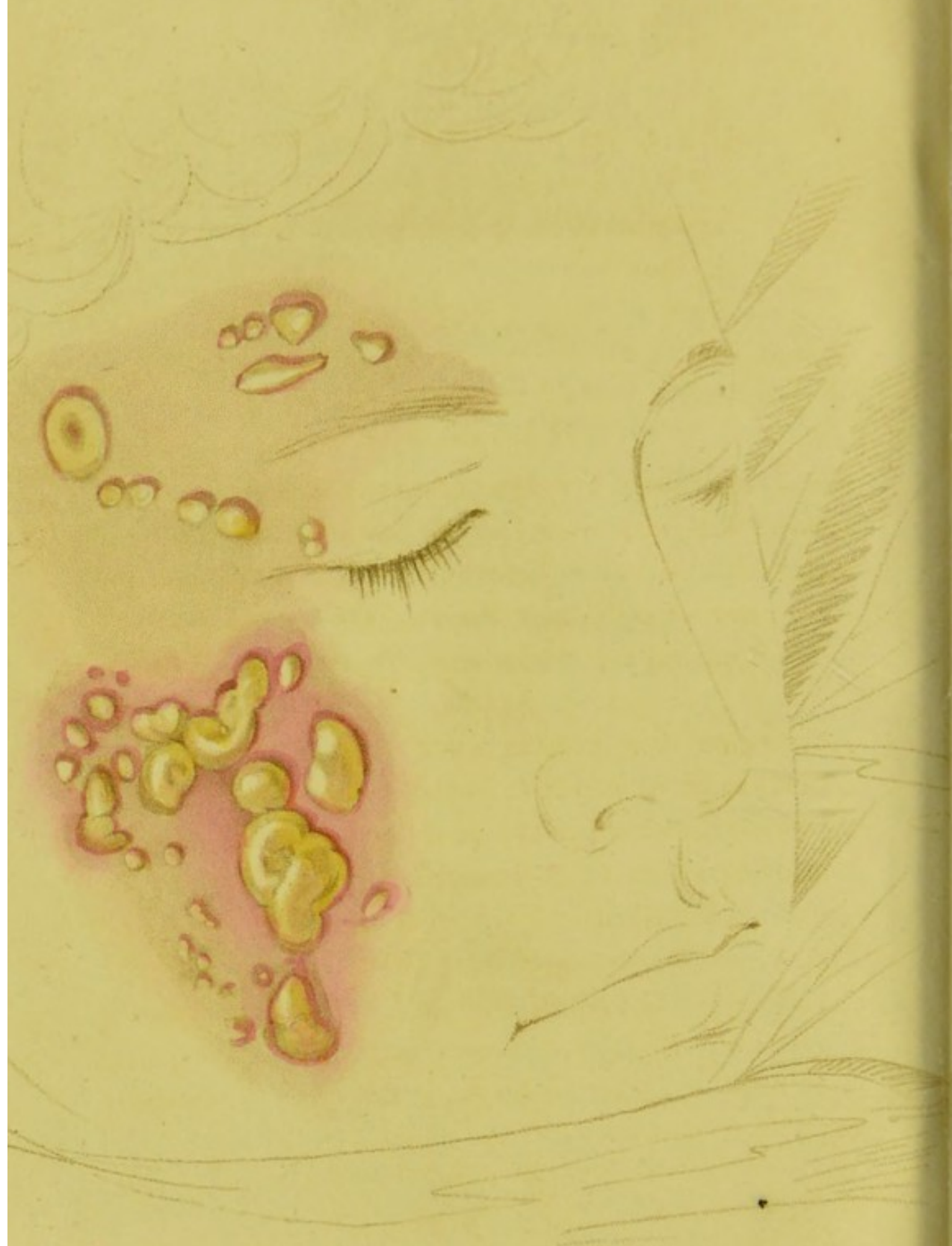


Fig. 2.





*Explanation of the Engravings.*

PLATE I.

Fig. 1. of Plate I. represents large vesicles which formed on the cheek of my eldest Son on the 5th day of the eruption. The face was much swollen, and the skin of a deep crimson colour. On the temple there is a large pustule, which has all the genuine characters of the small pox pustule. The depression in the centre was very obvious; and between this and the outer angle of the eye, and also above the eye-brow, there are several pimples of different sizes and forms, some of which never passed beyond the first or inflammatory stage.

Fig. 2., which was copied from Case IX, represents the pustules of the confluent small pox, which are of a very irregular form, and were nearly of the same size. In many parts of the body, in this case, the pustules had run together.

PLATE II.

Fig. 1. represents the colour and hemispherical form of the small pox on the sixth day, when it is filled by purulent matter:

Fig. 2. exhibits the same appearance of the pustules on the back of the hand.



### *Explanation of the Plates.*

Fig. 3. was copied from the lip of the patient, whose case is described as the third; and on the third day of the eruption, there is an evident depression in the centre of the pimple, and a red red ring around it.

Fig. 4. was copied from Case II., and exhibits a pimple in the vesicular state, which formed on the right hip, and nearly in the same stage as in the preceding figure.

The figure was taken on the second day of the eruption.

Fig. 5. and 6. represent the vesicles of the chicken pox, the different pimples of which, in both figures, are in different states of advancement; fig. 5. was taken from vesicles on the breast, and fig. 6. from those of the neck.

Fig. 7. represents the crust of a chicken pox vesicle, which formed over the eye-brow, and which is of a granular structure. A small pimple may be observed near to the crust, and two others in an incipient state a little above, and to the right of the crust.

THE END.



Fig. 7.

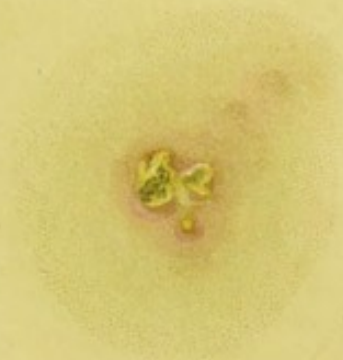


Fig. 5.



Fig. 3.



Fig. 1.



Fig.



Fig. 6.

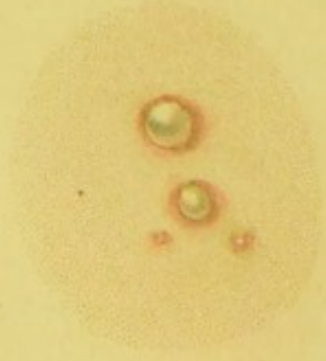


Fig. 6.









