

New observations on inoculation / by Dr. Gatti ; Translated from the French, by M. Maty.

Contributors

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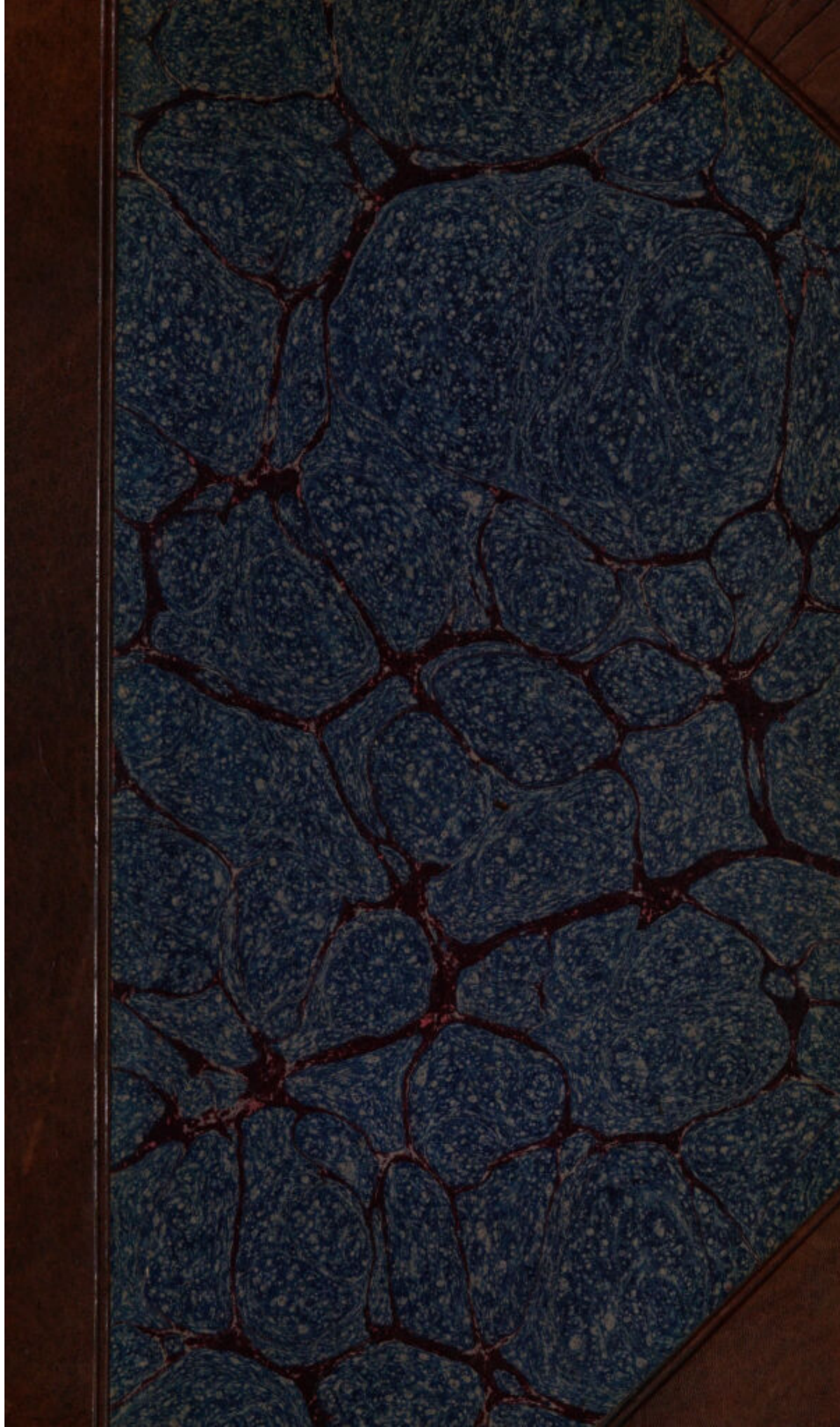
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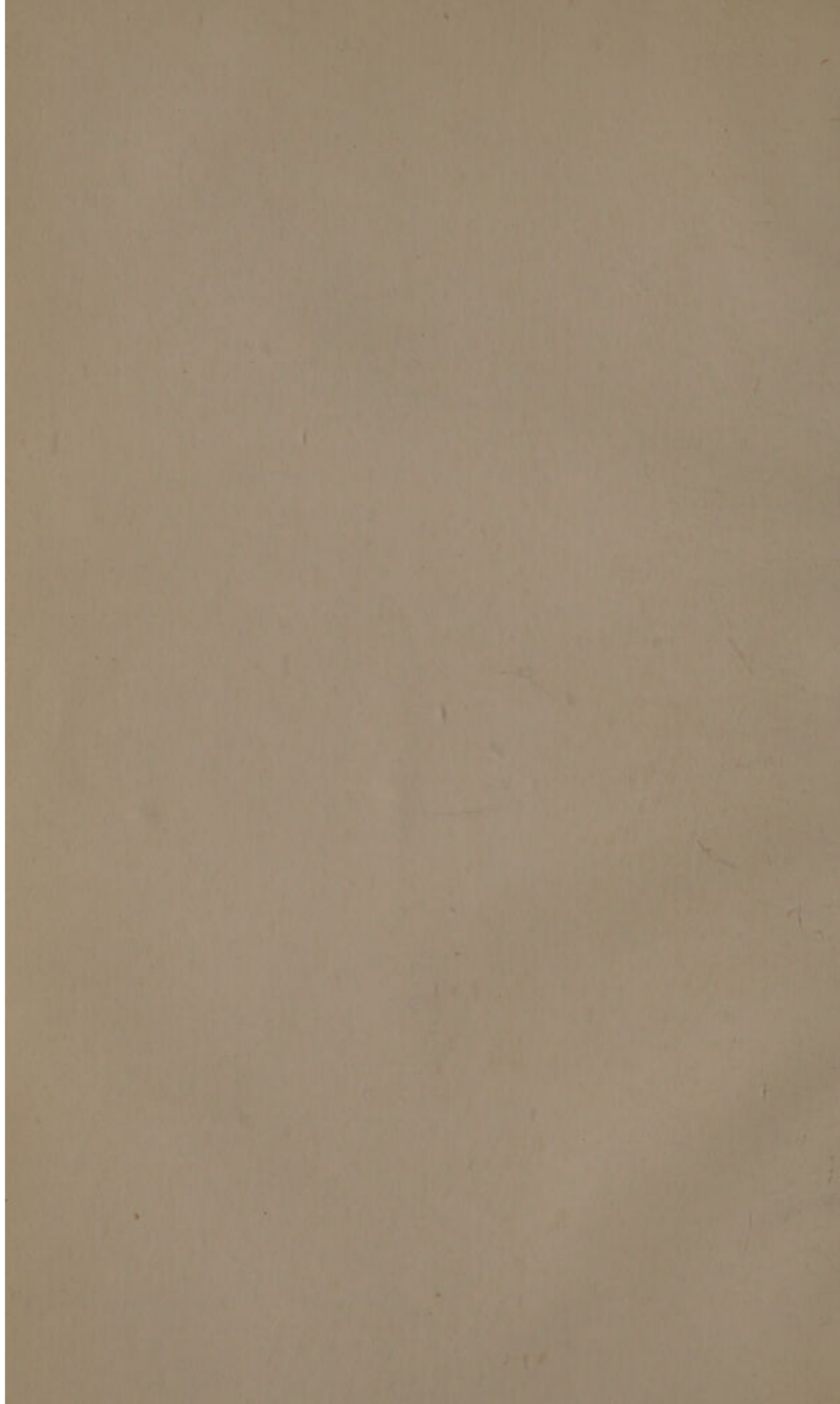


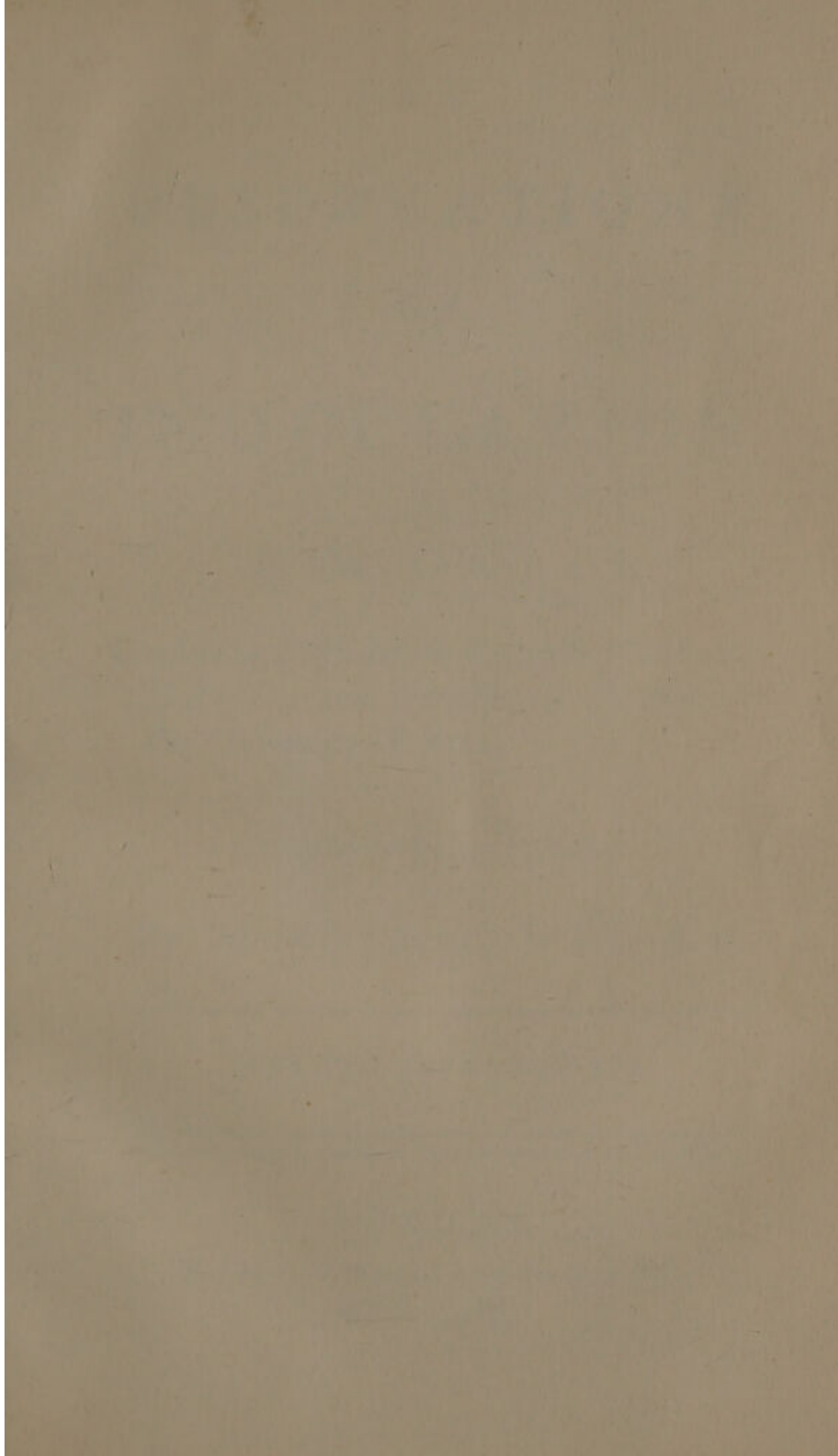
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NEW
OBSERVATIONS
ON
INOCULATION.

By DR. GATTI,

Consulting Physician to his most CHRISTIAN
MAJESTY, and Professor of Medicine in
the University of PISA.

Translated from the FRENCH,

By M. MATY, M. D. Sec. R. S.

SUBLATO JURE NOCENDI.

LONDON,

Printed for P. VAILLANT, in the Strand,

MDCCCLXVIII.

40527



TO

DR. GATTI,

DEAR SIR,

YOUR last offspring, which came to me in rich French drefs, is now fent back in a plain Englifh frock. You, who have read the Tale of a Tub, though a follower of Lord Peter, will not be offended, if, in taking off fome of the trimmings, I fhould here and there have made rents in the cloth. If but few, you'll overlook them, fince they were the effects of honeft zeal in,

DEAR SIR,

Your faithful friend
and fervant,

British Museum,
Dec. 7. 1767.

M. MATY.

THE HISTORY OF THE

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PRELIMINARY DISCOURSE,

CONTAINING

A short Account of the present State of
Inoculation in FRANCE.

I Received this little tract from the author, towards the beginning of last spring, when I was confined to my bed by a severe fit of illness¹. The seasonable relief which it gave to my mind, induced me to employ my sleepless hours in translating it; and I thought my labour not ill bestowed, if it could afford any entertainment or instruction to English readers.

Whether this piece will be received as well as my ingenious friend Mr. de la Condamine's Discourse on Inoculation, I shall not pretend to determine. To me they appear equally valuable; and the singularity of the present work may recommend it to a people, amongst whom those writers are peculiarly held in esteem, who thinking for themselves dare to print what they think.

¹ Quum me ægritudo non solum somno privaret, verum ne vigilare quidem sine summo dolore pateretur. Cic. ad Att. ix. 2.

In another country, indeed not his own, Dr. Gatti suffered for his boldness. Upon the recommendation of a French lady of distinction ², whose son he had most happily inoculated, he was invited over to the court of France. The minister thought him a proper person to establish the practice in that kingdom; and the inhabitants were supposed inclined to receive it from any quarter rather than from a nation at that time engaged in war with them.

Our Italian physician had, like his countryman Pylarini, learned the art of inoculating in the Levant. There he had seen the operation in its primitive dress, performed by Greek women, and recommended by Greek priests. The hand of surgeons was unemployed, the pen of physicians not desired. A needle was the sole instrument; a little matter imbibed in cotton, or dried in powder, the only *apparatus*. No accidents were known to happen; no troublesome ulcer or disorder to succeed. A gentle fever, during four-and-twenty-hours, was the only symptom; and a small crop of pustules, chiefly upon the part where the pock was rubbed in, without

² Spouse to the Count de Durfort, Ambassador at Naples.

out ruffling, lowering, or endangering the patient, secured his life, his organs, and his features.

To great sagacity my friend joined an open and beneficent mind. What he had seen, he proclaimed every where. He was in hopes that a people equally fond of novelty and ease, would readily adopt this new and elegant mode. The great, and especially their leaders, the ladies, he imagined, would be allured by being put to no fright and no pain, unrestrained in their diet, undisturbed in their joys; the people would be drawn in by an operation neither chargeable nor confining; all would be glad to enjoy the benefits of inoculation without its risks, and to spread it new fashioned all over the continent.

That eloquence of heart, which never fails to please, and seldom to convince, gave our professor great advantages over his rivals. In defiance of vulgar opinion and physical authority, he attempted to change an operose process into a mere amusement. Dr. Tronchin had had his short, his brilliant day, and Dr. Hosty, instructed in London, inoculated with care, and slowly made some converts. Our Italian was more prevailing than either. Every
body

viii PRELIMINARY DISCOURSE.

body would be inoculated by Gatti; and while he himself declared that any nurse could do as well as he, the public imagined nothing well done without him.

This uncommon success soon excited envy. Those, whose trade he obstructed, became his enemies. Rumors were propagated, and scruples were infused. To some it was said that he gave not the small-pox; to others, that his patients would carry it every where. The churches and play-houses were now no longer safe, whispered the delicate Abbé; and the still more insinuating doctor, shrugging his shoulders at the toilet, exclaimed against public infatuation.

Perhaps this might have been avoided, if Dr. Gatti had been more reserved, and observant of forms. A dutchess, whom he had inoculated, and who, upon equivocal symptoms without any eruption, had been declared secure against future infection, after three years caught the natural disorder, which, though not hurtful to her, became fatal to him. He displayed the utmost candor in publishing the case; but could by no means recover what he had lost, the support of the great, the confidence of the town. All his former patients took the
4 alarm;

alarm ; he became the object of public abuse, as he had formerly been of general applause ; and that salutary practice, which he had endeavored to render popular, by making it more easy and more safe, fell as it had risen with him.

Indeed, it had already received a severe blow. The discouragement it met with from some eminent physicians, the impetuous attacks of a justly celebrated professor at Vienna³, and above all, the religious scruples of a Saxon princess, influenced the parliament of France, then, and almost ever, at variance with the court. Upon the representations of the attorney-general, they thought proper to prohibit inoculation in the capital ; and having thus prejudged the cause, gave orders to the faculties of divinity and physic to make inquiries into the merits of it.

The physicians took the lead, and doubtless with good reason, as the legality of the thing must ultimately depend upon its usefulness. The college, a numerous body, consisting of above one hundred and twenty doctors, appointed twelve commissaries,

³ Dr. de Haen.

commissaries, to make new researches, and prepare a report, upon this interesting subject. This committee, composed of the leaders of both parties, agreed upon five queries ⁴, to be sent all over Europe, in order to obtain new lights, and render, if possible, their judgment decisive and unanimous.

This, however, was not the case ; for, though the answers which came, at least from those who were really qualified to give any, were greatly in favor of inoculation, an equal division of opinions still took place amongst the members of the committee ; six declared against, and six for, the English practice. The former were the first in giving and publishing their report ⁵. This libel, for it deserves no other

⁴ It may not be amiss to insert here these queries.

I. *Quæstio ; an à longo tempore invaluerit in vestra regione institutionis variolarum methodus & quo successu ?* II. *An nonnulli inter inoculatos occubuerint ?* III. *An quidam variolarum inoculationem perpeffi variolas naturalis postea contraxerint & quo tempore ?* IV. *An vobis compertum fuerit simul cum variolis alios diversi generis nonnunquam insertos fuisse morbos ?* V. *An post inoculationem plurimi variis laboraverint ægritudinibus, quæ ex hoc fonte derivari viderentur, & an hoc frequentius rariusve fuerit quam à variolis sponte contractis ?*

⁵ *Rapport sur le fait de l'inoculation de la petite vérole lu en présence de la faculté de Médecine de Paris & imprimé par*

other name, written with great art and no less disingenuousness, contains, besides the old and exploded objections of Wagstaff, Blackmore, Cantwell, and De Haen, a number of facts collected both in France and in Great Britain. The book no sooner appeared, but the most material of these facts, said to have happened in the first of these kingdoms, were publicly contradicted, and proved to be mistakes; and it would be no difficult task to do the same, with respect to most of those sent over from this island, were this a proper place for such a discussion.

Later, but not less keen, were the favourers of inoculation in their answer⁶. The college were induced by this last report, to declare, by a great majority of votes, that inoculation deserved to be to-

b 2

lerated.

par son ordre, pour être communiqué à tous ses docteurs, avant qu'elle donne sur cette question l'avis que le parlement lui a demandé par son arrêt du 8 Juin 1765. In 4to. The six opposing doctors were, DE L'ESPINE, ASTRUC, BOUVART, BARON, VERDELHAN, and MACQUART.

⁶ *Premier & second Rapport en faveur de l'Inoculation lus dans les Assemblées de la faculté de Médecine de Paris en 1764. & 1766. & imprimés par son ordre. Par M. A. PETIT, Docteur Régent de la Faculté de Médecine en l'Université de Paris, &c. Paris 1766. 2 vols. in 8vo. The commissaries who signed this report were, besides the author, Dr. GEOFFROY, THIERRY, LORRY, and MALOET: the sixth, Dr. COCHU, published a separate report equally in favor of inoculation.*

lerated. The parliament, however, have hitherto not recalled their first order; the practice remains under the same unnatural interdiction; and it is only out of the walls of Paris, and especially in the provinces, that the people are suffered to save their lives in their own way.

Both to reclaim the thinking part of Paris, and to vindicate his own operations from the contemptuous treatment of his antagonists, Dr. Gatti, at my request, published the present Essay. Uncertain of its effect upon that lively and volatile nation, who received inoculation upon trust, and upon trust rejected it, he was desirous, by this translation of his work, to appeal to their neighbours, in hopes that, if they approve, his method will in time get the better of prejudice and clamor.

Indeed the English have already decided in his favor. Inoculation is very near universally, in this island, what he wished it in France. The choice of the matter, the manner of the operation, the simplicity of the treatment, the attention to amusements, and the injunction of exercise, are so many points, in which his practice coincides with that which is here generally recommended.

Had

Had Dr. Dimisdale's performance (in which this doctrine, for some time industriously concealed by interested operators, was first brought to light) preceded the discourse of Dr. Gatti, or could the one have borrowed from the other, I should not have taken the trouble of translating that of my Italian friend. But his piece was prior; and in a former treatise printed three years ago⁷, the same principles were already, though less explicitly, contained.

But still it may, I know it will, be said, that if nothing was to be found here but what we knew before, the Public might have dispensed with this publication, as well as with three-fourths of the many ephemeral pamphlets on the same subject, which this insect-producing summer brought forth. I can only answer, that the different way of considering the same objects, the closeness of the method, and the strength of reasoning, which distinguish the author's manner; the extensiveness of his views, and the novelty of his hints, were my motives for publishing his Essay in English. May I add, that I was besides

⁷ Reflexions sur les préjugés qui s'opposent aux progrès & à la perfection de l'inoculation par Mr. Gatti. A. Bruxelles (Paris) 1764. en 8vo.

besides animated by the desire of doing justice to an amiable character cruelly misrepresented, and not in France only injuriously traduced ?

In one article, however, he differs from modern, as well as ancient, inoculators. He opposes what they recommend, a formal preparation. Yet as the mode of this preparation remains still unsettled, and where required, must vary according to the difference of constitutions ; and as quicksilver and antimony, so much commended, and so indiscriminately given, by some, are not less warmly condemned, or at least slighted, by others, our author may perhaps trust his apology with the ingenious writer of the *Trial of Mr. Daniel Sutton, for the high crime of preserving the lives of his majesty's liege subjects, by means of inoculation*. He only exclaims against empiric or other medicines, when the subject is in full health ; and expressly avers that, if he is not well, his cure ought to precede inoculation.

I am well aware that some other notions of Dr. Gatti may be objected to ; but they seem to be of little importance to, and not intimately connected with, the main subject. Hypotheses, I know, are almost

almost universally exploded ; but few are the men, who do not except their own from this proscription. It is a matter of some difficulty to destroy old theories, without substituting new ones; to tread upon enchanted ground, and not be tempted to build, and to indulge and leave to posterity no visions of our own.

In translating this work, I allowed myself the liberty of abridging it in some parts, of supplying some things from the preceding treatise of our author referred to by himself, and of adding a few notes. In doing this, I had the advice of some of Dr. Gatti's friends, together with his leave; I followed my own taste, and hope to obtain the approbation of those who may compare the original with this copy.

PRELIMINARY DISCOURSE.

almost universally exploded; but few are the men, who do not except their own from this prohibition. It is a matter of some difficulty to destroy old theories without substituting new ones; to tread upon incumbered ground, and not to stop, but to build, and to inhabit and leave to posterity the wisdom of our own way. In carrying this work, I allowed myself to follow the path of least resistance.

TABLE of CONTENTS.

<i>Introduction</i>	P. I
CHAP. I. <i>On Preparation.</i>	II
CHAP. II. <i>On Insertion.</i>	26
CHAP. III. <i>On Treatment.</i>	44
<i>Conclusion.</i>	77

NEW
OBSERVATIONS
ON THE
PRACTICE of INOCULATION.

INTRODUCTION.

MANY books have been published within half a century, about inoculation ; the authors of which being mostly intent upon proving the benefits of the method, and paying no attention to the improvement of it, have neglected to determine and direct the best way of giving and treating the disorder communicated in this manner.

2 INTRODUCTION.

The rules laid down by the first introducers of the operation in Europe, have been exactly repeated ; the way of inoculating taught in books remains what it was fifty years ago ; and every where we find nearly the same directions with regard to the preparation, the manner of inserting the variolous matter, and the treatment of the artificial small-pox. I say the same, for it seems of no great consequence, whether the preparation is a little more or less rigorous ; the insertion effected by an incision or a blister ; the incision somewhat flighter or deeper ; whether it is made in the legs or arms ; whether the matter is used alone, or dried and powdered, or inhibited in a thread ; and lastly, whether the purging is more or less repeated : these differences are too inconsiderable to make any essential distinction between the methods hitherto taught, or to occasion much variety in the success.

The apology of inoculation ought, however, to be attended with, if not preceded by, researches on the best method of inoculating : for if it is a salutary practice, when carried on in a certain way, but becomes fatal to many patients when differently managed, this defence will not be properly supported, unless the particular

mode of the operation is previously determined and exactly pointed out.

From the inattention of those who have written upon the subject, might it not be concluded, that there really is but one method of inoculating; or if more, that they are equally good? that, provided the variolous matter be inserted, and the small-pox conveyed, all the rest is of no consequence; and if the operation should be more or less successful, or even if fatal accidents should happen after it, that these effects are to be imputed to nature, to chance, to inoculation itself, but by no means to the particular method which has been followed?

Superficial observations may seem to strengthen this opinion. In looking over the accounts of inoculations performed in different times and countries, it appears, that much the same method has been pursued, both in happy and unfortunate cases; and even that the rules prescribed have been more closely attended to in the latter than in the former.

There is, nevertheless, a safe way of inoculating, and there are improper methods. By the one the disorder is attended with no danger while it lasts, nor any bad

consequences when it is over. By the other, the patient is either exposed to a real danger, and a grievous illness, or may apprehend bad, and sometimes lasting, consequences after the termination of the disorder. There is a method by which thousands may be inoculated without the loss of any; and there are modes of acting by which the proportion, between those who die and those who escape, is considerable enough to startle the fond parent with regard to his children, and the courageous man with regard to himself.

The following facts will prove this assertion. In the little town of Blandford, 384 persons were inoculated; of whom thirteen died, a great number laboured under a confluent small-pox, and several were in the utmost danger of their lives.

In the course of the two last years, upwards of 9000 persons have been inoculated in Essex, without the loss of a single life, or the appearance of any accident.

I have made choice of these two facts, because they lay before us at one view a great number of inoculations. They are recent^(a), and happened in a state where all

(^a) These facts have been related in the English newspapers; and a more distinct account of the Essex inoculations will be found in a pamphlet intitled, *Inoculation made*

disputes about the utility of the method itself are at an end, and consequently where truth has nothing more to fear from party-spirit.*

Were we to pass a judgment from these two facts, on the supposition that in both cases the method was the same, and the difference in the success the mere effect of chance, we should be apt to conclude, that what has been said for, and against inoculation is equally true. It is a salutary practice; it is a murderous scheme; † and in this opposition of facts, the wise man might remain in suspense.

But if the methods were not the same, the two propositions ought to be altered into these: inoculation, when managed in a certain manner, may be dangerous; but if managed in another way, it is useful and salutary.

This last conclusion will be admitted by every unprejudiced mind. If the Essex people were inoculated differently from those

made easy, &c. The notice of the Blandford miscarriages is to be seen in Dr. Baker's excellent *Inquiry into the merits of inoculating the small-pox, which is now practised in several counties of England.*

* The translator would by no means vouch for the exact truth of these facts. A foreigner is not obliged to know the motives which in this country too often affect human testimony.

† This is somewhat exaggerated.

those of Blandford, as in fact they were, we shall be able to assert, that the former were inoculated in a proper, and the latter in an improper, manner; and consequently, that there is a right as well as a wrong method of inoculating.

The history of this practice will hardly furnish any other instance of so great an inequality; but a number of facts may be found differing enough to warrant the same inference; and my own experience would have led me to the same conclusion.

I have attended above a thousand inoculations, either performed by other people, or managed by myself; I have tried every known method; the rules prescribed have sometimes been observed, and sometimes neglected by me. By singular good luck, I have lost not one patient; but all the other accidents imputed to inoculation have fallen under my inspection.

Some have had a confluent small-pox, and been in danger; others have suffered, besides the small-pox, an additional infectious disorder. Many have had troublesome complaints after the operation; wounds not easily healed, erysipetulous tumours, abscesses, imposthumes; and lastly, some thinking themselves safe after having
gone

gone through what was thought inoculation, have since caught the distemper in the natural way.

Notwithstanding these inconveniences, I have continued recommending and practising inoculation, both because they are far less considerable than those which attend the chance of the natural small-pox, and because the worst of these mischances happened to me more rarely than to most other inoculators.

I now think, I have discovered the cause of all these accidents. Had I from the first made choice of the best method, every one of my patients would have had a true small-pox, both slight and kind, and attended with no bad symptoms, adventitious disorders, or consequential complaints. I was misled by the rules generally laid down; and an opposite way of acting would always have conducted me safely, as in fact it did, whenever I kept to it.

The following tract is the result both of my experiments and of my reflections. My design is not to apologize for inoculation, but to enquire into the best method of managing it.

I write for gentlemen of the profession, and especially for such as have acquired
some

some experience in the art of inoculating. They alone are capable of forming a true judgment and estimation of my assertions, and can induce the public to adopt my practice. In medical matters, the generality of mankind think not from themselves, but from physicians; and the method which I propose will not be regarded, unless authorized and adopted by them.

But how can I hope for their approbation? My notions seem totally different from those which are commonly received; my rules directly opposite to those which have hitherto been laid down; and, in one word, my aim is to prove that we should think the contrary of what has been thought, and do the reverse of what has been done.

Ever since inoculation has been received in Europe, the practitioners have been of opinion that the essential advantages of artificial over natural small-pox were, 1. the preparation; 2. the discharge of the variolous matter by means of the wounds; and 3. the assistance of art in a disorder which is known as soon as it appears.

In opposition to these principles, I shall attempt to prove, that these three pretended
advan-

advantages have hitherto been so many bars to the perfection of the method, and the source of almost all the miscarriages which have retarded its establishment.

All inoculators have said, prepare your subjects ; procure an outlet to the venom ; be attentive to administer every help of art, when the disorder shews itself.

I, on the contrary, say, prepare not at all ; think of no outlets ; and when the disorder comes, trust to nature.

These propositions I purposely premise, that the reader, startled at their seeming absurdity, may the more attentively examine what I have to offer to support them.

Though I should be right, I hardly expect that all operators will, at least for a long while, come into my way of thinking. But I entertain better hopes from those physicians, whom knowledge and virtue place above prejudice. I trust to time, which sooner or later silences passion, and gets the better of prepossession ; and should I be disappointed, I flatter myself to find a sufficient reward in the testimony of my conscience, that I have always fought the good of mankind, and laboured for the discovery of truth.

The doctrine which I endeavour to demonstrate is so plain, that I might have brought it within the compass of a few pages; but it is necessary to explain it, and to establish it upon proofs, in order to remove the prejudices still entertained by many people.

All I have to say will be reduced to three heads. The first regards the preparation; the second, the insertion; the last, the treatment of the disorder. I intend, as much as possible, to forbear any enquiry which does not directly tend to my object, viz. the best method of inoculating.

C H A P. I.

O N P R E P A R A T I O N.

PREPARING a subject for inoculation is endeavouring to give him such dispositions, as it is thought will fit him to go through the small-pox, with as little prejudice to his health as possible.

These dispositions, thus intended to be procured, are understood to be relative to the small-pox, and so peculiar to that disorder, as not to be preparatory to any other.

The preparation, by which these particular dispositions are to be procured, should therefore be particularly adapted to the disorder which is expected. It ought to be founded upon some known analogy between certain dispositions of the animal œconomy and the effects of the variolous virus upon the said œconomy; or at least upon an experimental knowledge, that such or such dispositions are always productive of a slight and mild small-pox.

It follows from this explanation, that, in order to prepare for inoculation with any degree of certainty, we should be ac-

quainted with some dispositions in the animal œconomy distinct from a general state of health, and particularly relative to the small-pox; such as, on the supposition of two subjects enjoying an equal share of health, and every circumstance being in other respects the same in both, he who has those particular dispositions should constantly, or mostly so at least, have a mild and safe small-pox; and he, who has the contrary dispositions, should have it dangerously, and often mortally.

To illustrate this: suppose it had been constantly observed that lean people had fewer and kinder small-pox than fat ones; these last might be prepared for inoculation, by lessening their fat, and reducing them by means of a strict diet to a state of leanness. It is, however, plain that, in order to attempt such a preparation, it must have been demonstrated from repeated experiments, that leanness is a favourable disposition for receiving the small-pox with as little detriment as possible to health.

But if no observation has discovered that such or such disposition is more favourable than the contrary one to have the small-pox in the most harmless manner;

ner; if the observations made for 1100 years upon the natural, and for upwards of fifty upon the inoculated small-pox, leave us in that respect under the greatest uncertainty; what are we to think of preparations intended to procure particular dispositions, which no body knows with certainty to be more favourable than the contrary ones? Now this is by no means a supposition, but a fact, which every ingenuous physician will readily agree to.

We see this disorder severe or slight, dangerous or harmless, indiscriminately in strong or weak, lean or fat people; in constitutions called hot, or in those which are said to be cold; in dry and in moist habits; in bilious and in phlegmatic subjects. Let us but examine impartially the observations, which have been transmitted to us upon this distemper, let us recollect the small-pox we have seen, whether natural or artificial, and we shall be obliged to confess that the constitutional dispositions, on which the mildness of the disorder depends, are to us entirely unknown, either because they have not been observed, or are beyond the power of observation.

Hence I think myself entitled to conclude, that there is no disposition, at least known

known to us, particularly relative to the small-pox, and enabling a subject to receive it in that manner, which is least detrimental ; and consequently that there is no such thing as preparation for inoculation, in the sense we have affixed to that word.

But if we are ignorant of any particular disposition, we are certainly acquainted with a general one, which is absolutely requisite towards going through the small-pox with as little danger as possible ; and that disposition is health itself. The venom applied, and the disorder consequent upon this application, are attacks upon health ; and the hurt must be greater or less, as the constitution is weaker or stronger. Experience has shewn, that this disposition is always attended with a kind small-pox, provided other causes, or some error in the insertion or treatment of it do not increase the disorder, and disturb nature in her operations. Health therefore is all we want in a subject intended for inoculation.

Granting this, it is evident that there is no need of preparation for a person in full health ; and that for one who is not well, the only preparation must be to make him so.

The

The art of preparing for inoculation is, therefore, no other than the art of curing ; and the rules which might be given for the one, are the same which the art of healing prescribes for the other. But to cure a sick person, or to defer giving him the small-pox till he is well, is not properly preparing him for inoculation ; on the contrary, it may fairly be said that no intended patient wants any preparation. If he is well, inoculate him ; if he is ill, cure him as you would in any other case.

All previous preparation relative and peculiar to inoculation is not only needless, but dangerous, on account of the mischief which may be done, by altering the state of a person in health.

But to remove all doubt, it may not be amiss to answer some objections, which might be started, and which contain the most plausible arguments which have, or might have been, urged in favour of a particular preparation.

FIRST OBJECTION. “ Granting that
 “ health is the only requisite in your intend-
 “ ed patient, you must allow that what is
 “ called so admits of great latitude. Ma-
 “ ny degrees may be conceived from
 “ strong to weak health, and from thence
 “ down

“ down to sickness. A man in the most
 “ perfect state is an imaginary being ; and
 “ between compleat health and the priva-
 “ tion of it, or sickness, there are number-
 “ less middle states, in each of which a
 “ man may be said to be well. Therefore,
 “ though he is so, some preparation may
 “ be proper if not absolutely necessary,
 “ to mend his constitution, and bring it as
 “ near as possible to the most perfect state.”

ANSWER. The care of our health
 ought, at all times, to be attended to ;
 it is the chief of all blessings. Prepa-
 ration is extremely useful in that view ; it
 is even necessary for those, who, from
 their duties in life, the pursuit of plea-
 sure, or other circumstances, are apt to
 live so as to injure their health ; and on
 such an occasion as inoculation, it behoves
 them to be more particularly careful than
 they can well be in the common course of
 life.

Preparation, thus explained, implies a
 closer attention to avoid whatever might
 be detrimental ; it is negative, consist-
 ing of privations, not remedies ; and as
 those privations only relate to excesses of
 any kind, such as labour, eating, drink-
 ing, &c. it is plain that this is no par-
 ticular

particular preparation, according to our former definition.

We often see people enjoy excellent health, though living in a different or quite opposite manner with regard to their diet, exercise, or, in short, to what physicians call the six nonnaturals. We see, on the other hand, that they are not well, whenever they attempt to change their way of living for that of another. Custom, which is a second nature, can never be altered without danger, even in trifling things, though the change be from worse to better. If any alteration was to be made in a healthy man's way of living, under the notion of improving his health, this ought to be tried at any other time rather than at the eve of inoculation. The good expected is uncertain ; the ill that may ensue, though at another time of no great consequence, might at this prove very pernicious.

Were it even certain that any change or positive preparation, would be attended with an increase of health, still this advantage ought to be balanced with the hazard arising from the dread which this previous process often occasions ; and of what

D consequence

consequence this may be, will appear in the sequel of this work.

If, after a serious perusal of these considerations, any inoculator will attempt to give rules for a health-increasing preparation; if he chuses to prescribe a diet, or to order medicines; his preparation will probably bring on a more considerable disorder than would otherwise have appeared; and some one of his patients will deserve the epitaph,

*Stavo bene ;
Ma per volere star meglio
Sto qui.*

SECOND OBJECTION. “ The idea of
“ health is a complicated one. Two persons
“ equally healthy may have very different
“ constitutions. The small-pox is an in-
“ flammatory disorder; and the more a
“ constitution inclines to inflammation,
“ the more dangerous the distemper
“ will prove. Thus a stout and sanguine
“ man, as healthy at least as a weakly or
“ delicate one, shall have a more severe and
“ dangerous small-pox. This tendency to-
“ wards inflammation must therefore be
“ lessened; preparation is necessary for that
“ pur-

“ purpose, and cannot be dispensed with
 “ without rashness.”

ANSWER. 1st. The small-pox is not absolutely an inflammatory disorder. Inflammation, which constitutes the essence of some disorders, in this is only a symptom; indeed, a necessary one, since there can be no pustules without it. 2. Granting that the small-pox was in itself an inflammatory disorder, we have no certain criterion to know, whether a subject has a disposition towards inflammation. 3. If we had such a criterion, we should still be at a loss to determine to what degree this disposition ought to be lessened. 4. Lastly, the means employed for that purpose, which are chiefly bleeding and purging, may, and often have, a contrary effect.

These two objections are the only rational and intelligible ones, that can be alleged against my assertion with regard to the inutility and dangers of preparation. As to others, grounded upon the necessity of sweetening the humors, purifying the blood, cooling it, &c. (forms of speech unfortunately in vogue in the world) I own I do not understand the meaning of these words, and I am convinced no body does. I may therefore spare myself the trouble of shew

ing the absurdity of all rules founded upon these notions; and shall take it for granted, that all sensible people must be satisfied that a subject who is not well should be cured, and not inoculated; and that one who is well ought to be inoculated, but never be prepared.

Many inoculators, being aware of the inconveniencies of regularly preparing a healthy person, have contrived specific medicines, in order to diminish the energy of the virus, and in consequence to lessen the disorder. I have tried some of these specifics; such as mercury, antimony, the bark; but always found they did more harm than good. I may, indeed, have used them in an improper manner, or there may be other species that I am not acquainted with; but since those patients who did use them, had not a slighter disorder than those who did not, I cannot help looking upon them as bordering upon quackery. May they not be deemed a contrivance to secure to operators that advantage, which perhaps gave rise to preparations, by inducing the public to attribute the success of inoculation to the skill of the inoculator?

I shall close this article by appealing to
expe-

experience, the great, and perhaps the only, test in medical matters. It strongly confirms the principles I have laid down.

In those countries, where inoculation has been most successful, where it is attended with little or no danger, where thousands are inoculated, and are hardly sick at all, in a word, throughout the East, the operators only enquire, whether the person is in full health.

The history of inoculation in Europe must convince any man, who does not wilfully shut his eyes against light, both of the inutility and danger of preparations; by shewing, in the several countries where inoculation has prevailed, how these preparations have been productive of untoward consequences, in proportion to the use that has been made of them; and how accidents are become less frequent, in proportion as preparations have been more simple, or quite laid aside.

In the first period of the London inoculations, great stress was laid upon preparation; the method was complicated and tedious, the patients were worse, and more of them died. But since preparation has been more disregarded, the disorder has been slighter, and fewer have been lost. I
could

could quote some of the most eminent and successful inoculators, who wholly omit preparation, and some who openly declare against it.

Even in France it is visible that, within these five or six years, inoculation is become more successful, and is attended with fewer bad consequences, since less stress has been laid on long and severe preparation. Let those physicians, at Paris, who, practise inoculation, declare, whether it is not strictly true, that they have relaxed from the severity of their preparations; and whether inoculation is not now more prosperous in their hands, than it was some few years ago?

Give me leave here again to alledge what I have met with in my own practice. I may safely say, that those of my patients, who have fared best, have been such as had been no otherwise prepared than by stating or restoring their health; and when the disorder has been more violent, or has left any bad remains, it has constantly been in such as I had more or less prepared, according to rules.

Lastly, of all the cases where inoculation has proved mortal or dangerous, not one perhaps will be found, upon enquiry, where

where the patient had not been previously prepared ; and to the excessive care in this article, physicians themselves have often imputed their ill success. This being the result of all I have read or observed concerning inoculation, let the consequence be drawn ; I think it cannot be favourable to the doctrine of preparation.

This doctrine has not only been laid aside or softened by physicians in their practice, but if you look into the works published from time to time both in England and France, you will find, that even in theory, the severity and importance of preparation is much less insisted on ; and the latest writings come very near to my opinion.

One of our most eminent physicians, in a work printed four years ago*, asserts, that every subject must be prepared at least for one month ; and that during that time he is to be bled, physicked, and vomited, &c. But in later times Dr. Petit, the author of the excellent *Report in favour of Inoculation*, says, that if the subject is healthy, strictly speaking, he wants no preparation ; and that if he is sick, the preparation

* Observations sur la petite verole naturelle & artificielle.

tion consists in the curing of him. Could the contrast between the two methods be more striking?

But it would be trespassing upon the patience of my readers, to take up any more of their time in proving this self-evident truth, that the best disposition for having the small-pox safely is health; and that this disposition, when found in any subject, ought by no means to be disturbed under pretence of preparing him.

All that is requisite is to ascertain this disposition, and this is easily done. Health, we all know, is the faculty of exercising constantly, and with ease, all the functions suitable to the age, the sex, or the constitution of each individual. Now any one is able to judge whether a subject has, or has not, that faculty; and the person himself, or those about him, can tell that with more certainty than any physician whom they could consult. A man is in health when no pain or weariness warns him of any disorder in his frame.

Although it is impossible to determine geometrically the degree of health requisite for inoculation, you may safely trust to that indeterminate judgment we commonly pass,

pass, when we say, such a one is well: we mean that nothing amiss is observable, nothing at least that attacks the vital functions, nor any tendency to sickness, as in children during dentition, or women during pregnancy, &c.

But besides this general rule, the fitness for inoculation may be determined with greater certainty by a few plain and easy signs; viz. 1. the sweetness of the breath; 2. the thinness of the skin; 3. the facility of cicatrization. I do not know whether these signs only indicate the state which we call health, or whether they denote those unknown qualities, which are favourable to the action of the virus; but certain it is, that I have always found them to be attended with a mild small-pox, in proportion to the degree in which they were observed.

C H A P. II.

O N I N S E R T I O N.

INSERTION is the application of the variolous matter to some part of the human body. It is well known, that this application takes effect only on some sensible part; therefore, if it is made externally, it must be under the cuticle or scarf-skin, which is an insensible membrane. It is likewise known, that the activity of the virus is so prodigious, that the smallest atom, imperceptible either by sight or feeling, conveys the small-pox equally well with a large quantity.

Hence the most obvious way to perform this operation seems to be, to prick the skin slightly with a pin or needle dipt into a variolous pustule. As nothing is requisite to infuse the poison into the animal system, but to introduce it beyond the scarf-skin, a slight puncture, which divides that membrane, must have appeared sufficient to the earliest operators. The dreadful effects of the poison, which these inoculators had observed in the natural small-pox, could not
but

but make them sparing of it in their first attempts; and tender parents would naturally be equally fearful, and unwilling to put their children to unnecessary pain.

Accordingly we find that, at the first origin of inoculation, in several countries, but especially in those where it was performed by women, the insertion was made in that simple manner. The famous Theſſalian, who first introduced it in Constantinople, did nothing more; neither did several women who carried it into the islands of the Archipelago, where to this day it is performed in the same manner.

In the dutchy of Urbino in Italy, a grievous epidemical small-pox, that raged in the year 1746, induced several mothers, alarmed at the havock it made, to try to save their children by inoculating them; they had only been told that the thing was practicable; and could think of no other way than to prick the skin with a pin dipt in matter.

Such was the voice both of nature and reason; such the practice of the first inoculators; fathers and mothers inoculated in this manner; and so it is that women have always gone about it. Let us now see what art has added, what physicians have done. Soon

did they forsake this plain and natural road ; soon they devised new and intricate by-paths. Instead of a puncture, an incision was made ; the depth was gradually increased ; both arms were cut, then the two legs, sometimes all the four limbs. Instruments were contrived for making these incisions ; and to a simple operation, which required no care nor apparatus, a variety of inventions were substituted, requiring a long and close attendance, and productive of most evils charged upon inoculation, though merely owing to the way of inoculating.

These several methods, after having deviated from the former simplicity, are gradually become less complicate : I shall therefore only examine that which is least faulty, and comes nearest to the original practice. By shewing the inconveniencies which attend it, I shall evince the still greater absurdity of more complicate methods, and the necessity of returning to the primitive operation, as being the most natural, the easiest, safest, and the only one that can be recommended.

Most inoculators actually proceed in the following manner. They make a slight incision or two, only skin-deep ; and apply to the wounds either a thread impregnated with

with matter, or the powder of variolous scabs, and secured with a plaister.

This method, simple as it appears, still differs widely from the former, both in itself and in its effects. 1. The first mischief is its being attended with an apparatus and solemnity both needless and hurtful. The business may be done in an instant upon a sleeping child, with little or no pain, if you prick him with a needle, without acquainting him that you are going to give him a distemper. By the other method he must undergo a painful incision, or more than one; a surgeon is employed; sometimes the physician is present; and an operation thus ushered in cannot fail to terrify the child, and set him a-crying. These impressions, though seemingly slight, may greatly affect the success of the whole, as will be shewn hereafter.

2. The infected thread contains an infinite number of those atoms, one of which is sufficient to give the small-pox; is it likely that so great a difference in the quantity of this poison, should occasion none in the nature of the future wound? Is it not rather certain, that, *cæteris paribus*, both the inflammation and suppuration, as well as the number of pustules raised round
about

about the incision, are proportionable to the size of the thread? Every inoculator, as well as myself, must have observed this difference, especially when the insertion is made in two places.

Undoubtedly a greater inflammation, and a more copious eruption about the wound, must add to the violence of the disorder. Dr. Lunadei, an Italian physician, is the first who has taken notice, that those whom he inoculated with a pin, were neither so full nor so sick as those, who underwent the common operation. I observed the same thing; and am now far from thinking, as I formerly thought and said, that it is all one whether you put in more or less matter, just as it is whether a mine is set on fire with a spark or a live coal. It is all one as to giving the small-pox, but not so as to the other effects it will have upon the animal system.

3. When the puncture is once made, you have nothing more to do, either before or after the eruption: the little orifice is soon closed, and one or more pustules appear upon the scar, of the same nature and duration with those of the other parts, and requiring no farther care; whereas in the usual method, the eruption

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the effect of the needle, or of the infected matter. In the common way, you must take in the effects of the thread and of the putrid matter itself, not merely as conveying the infection, but as extraneous and offensive bodies: and to these are to be added the action of the plaister and of the air. These last causes may produce an inflammation, and about the edges of the cut that white eschar, which inoculators look upon as a decisive sign of the success of their operation. This inflammation often becomes erysipelatous, as in any other wound covered with a greasy plaister; and it may equally bring on pustules, which break out, suppurate, and vanish in one day.

The imperfect likeness of these effects to those of the *virus*, has sometimes misled inoculators; who, imagining that the venom had acted upon the body, and seeing no ensuing small-pox, hastily concluded, that either the subject was not susceptible of infection, or that these appearances were in him equal to the distemper, or the small-pox itself. Hence they pronounced him safe from ever catching it, and neglected to repeat the insertion. But a subsequent natural small-pox shewed that the inocu-

lator was deceived by equivocal signs; and inoculation suffered from his oversight, or rather from the unavoidable uncertainty of the common method.

The enemies of the practice have never failed, upon these occasions, to depreciate it with the public; as most people are ignorant of the difference between being inoculated, and having the small-pox by inoculation; between equivocal signs and a real infection; the accidental suppuration of a wound, and that which necessarily succeeds the variolous fever; and lastly, between pimples that fill and dry off almost in one day, and the true pock, which keeps out nine days at least.

But the cicatrix remaining at the place of insertion, will be a standing monument of the success or failure of it. When the patient has really had the small-pox, this scar is either round, like the mark of a pustule, or oval; but always large enough to be evidently that of an ulcer, and not of a mere incision, as it is when the operation has failed.

By the puncture all these errors are avoided. If it brings on ever so slight an inflammation, a few days after it was made, it is a sure sign of its efficacy; and

the succeeding pustules, having all the characteristics of the true small-pox, can leave no doubt of a genuine infection.

Thus have I summed up the chief disadvantages we meet with in practice. They have hitherto been placed to the account of inoculation; but I am confident they are solely owing to the manner of performing it. When time, the great restorer of truth, brings us back to the good old method, we shall hear no more of them, and inoculation will be fully vindicated.

I am sensible that many objections will be made against this doctrine. The two principal ones deserving any answer are these.

FIRST OBJECTION. “An insertion
“made by a puncture cannot make way
“for that copious outlet, which a wound
“affords to the variolous matter, and
“which constitutes the greatest benefit
“of inoculation.”

I have in a former work declared my opinion as to the supposed benefit of an outlet, during the course of the distemper. I still think, that this whole doctrine is founded upon superficial notions of the animal œconomy, and a want of due attention to the phenomena of inoculation.

Most physicians will, I believe, upon duly weighing my reasons, think, and, what is more, speak as I do.

For, first, it appears from what has been said, that the discharge at the place of the incision is only occasioned by the matter, which would in that part have produced a cluster of pimples, and not from those of the other parts of the body.

2. Pierce one of the pustules with a needle, so as to let out all the matter, after ten or twelve hours it will be found full again; and by repeating this operation ten or twelve times, the discharge will be proportionally increased, and yet the same quantity remain in all the other pustules.

3. Opening every pustule in order to discharge all the matter, has been frequently attempted, and would certainly be a salutary practice, were the doctrine I oppose founded upon truth. But far from answering the end of thus exhausting the variolous *fomes*, or preventing the translation of the matter upon nobler parts, new matter was formed as fast as the old was evacuated; the discharge from each pustule was as great as if only one had been opened; the disorder full as dangerous, and much more troublesome; and this

this process, which in theory appeared excellent, was universally laid aside, as useless, if not pernicious.

4. Lastly, It has never been observed, that a plentiful discharge from the incision was a sign of a slighter disorder. It is, on the contrary, never so considerable as when the discharge is so; and this always keeps pace with the number of the pustules. He therefore, who desires a copious outlet, wishes for a considerable degree of danger; and whoever is uneasy at the scantiness of the discharge, shews himself ungrateful to nature, and complains of art, when he has most reason to praise it.

SECOND OBJECTION. "So slight an insertion does not communicate the small-pox so certainly as the other method."

Several answers may be made to this objection.

1. The inconveniency of missing the small-pox, is of less consequence than the accidents, which may arise from giving it in the common way. When the operation fails, it produces no other effect than the pricking of a pin, and must be repeated.

2. This insertion may be made in several places, without introducing so much of the variolous poison as is conveyed by the
the

the usual method, or having the same mischiefs to fear. I have inoculated in this manner in five or six places, without the least inconveniency; I only thought the patient had rather a more plentiful crop, and the disorder was somewhat more considerable, than when I made but one puncture. Two or three of these will more effectually communicate the small-pox than the common incisions.

3. In fact, inoculation is sometimes known to fail, whatever method is used; nor do I think this will happen oftener by this than by any other. We see many patients inoculated with fresh matter, in the usual and strongest manner, yet without any eruption, who afterwards have the small-pox, either in the natural way, or upon a second trial. We likewise daily see people, often and long exposed to the infection, thinking themselves safe, who have afterwards caught the natural disorder. It is certain, there are some who never have it; whole families are free from it for many generations; and it has been observed, that upon a hundred persons dying of old age, five or six had escaped it, though equally exposed with their contemporaries. Inoculators have met with
much

much the same proportion of fruitless attempts. A person in this case can never have an absolute certainty of being for ever safe, but only a probability proportionable to the number of experiments, the goodness of the matter, &c.

It certainly is a *desideratum*, to be able constantly to communicate the small-pox, if the subject is capable of receiving it; or to know, in case of failure, where the fault lies. It is to be hoped this problem will one day be solved, when all disputes about the expediency of inoculation are at an end, and we fix our whole attention on the improvement of it.

In order to attain this desirable end, I would recommend the following rules.

I. The freshest matter is the most effectual^(a). Whenever therefore it can be done, the insertion should be made immediately with a needle just dipped in the pus of a pustule. The beginning of supuration is preferable to a more advanced state,

(^a) I have long suspected, that the variolous matter became milder by inoculation; and consequently, that a repetition of the like operations would still render it more harmless, though not less efficacious. This conjecture is now to me become a truth, from the experiments I have tried, and those which were made in England by the most experienced inoculators.

state, as the matter is then more fluid, and comes off easier from the needle into the wound.

2. Instead of barely pricking the skin, the point ought, if possible, to be introduced between the cuticle and the inner skin, to the length of a quarter of an inch, which is easiest done with a flat-pointed needle. The impregnated needle will keep its virtue for several days, provided it is not rubbed against any thing; but it is always safest to use it soon.

3. Instead of the needle thus dipped, a cotton or silken thread may be used, that has lain some time, and been rubbed with pulverized variolous scabs. This thread may be drawn in with a needle, between the scarf and the true skin, to the length of two or three lines, but not left in. This is the method throughout the Indies.

4. A lancet may be used instead of a needle; and if only scabs are to be had, the scarf skin should be separated from the true skin, and a little of this powdered matter rubbed against it; the raised cuticle is then to be let down again, and pressed with the finger to make it stick to the skin.

5. Whether

5. Whether a needle or a lancet is employed, care must be taken to apply the matter to the live skin, without going through, or tearing, it.

6. The variolous virus being thus transferred from the needle, thread, or lancet, to the live skin, which lies under the cuticle, this last will sufficiently keep it in, and no plaister is ever to be used.

7. The fittest part for insertion seems to be between the thumb and fore-finger, on the outside of the hand. They do it so in India, Syria, Egypt, and Barbary; and it is preferable on many accounts: the hands are always exposed to the air; the inflammation, which the insertion necessarily brings on, is *cæteris paribus* smaller, and less troublesome, where the skin is least stretched, as in this wrinkled part; the insertion is more easily made there than any where else, because the scarf-skin is thicker, and harder to break; and lastly, the symptoms attending the insertion are more easily observed.

8. These advantages, however, are not so considerable as to make one apprehensive of any great risk from the choice of another place. In general, some part of

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people have already been inoculated in this manner*.

I now come to the method of treatment I would recommend; and likewise hope to advance some new truths upon this head.

* The authenticity of these numbers must rest upon the credit of the operators.

C H A P. III.

O N T H E T R E A T M E N T.

TH E object of inoculation is to give the small-pox with as little prejudice to health as possible, or, in other words, to bring on as slight a disorder as we can.

What has been said on preparation and insertion, tends directly to that end; but the subject before us is still more closely connected with it, and consequently must be the most important part of our enquiries.

Indeed, if the patient is healthy; if he has not been hurt by any preparation; if, lastly, the insertion has been well performed; the ensuing disorder will almost infallibly be favourable, whatever pains may be taken by art to render it dangerous, either by neglecting the means of mitigating, or by substituting such as must increase, it.

But though not dangerous, the disorder may be more severe to some people; and it would be both unreasonable and inhuman not to afford them all the helps
which

which may abate it, and remove the very suspicion of danger ; and the more so, as, of all acute disorders, of which the small-pox is one, none perhaps will admit of such effectual, and yet simple and natural, helps.

Four periods are distinguishable in the inoculated small-pox. The first is that of *insertion* ; the second, that of *local eruption* ; the third, that of the *fever* ; and the fourth, that of the *general eruption*.

The first period lasts from the time of insertion to the first visible effect of the infectious matter, which shews itself by a slight inflammation at the place of insertion.

The second extends from the first effect upon the part, to that upon the whole animal system, or the first feverish symptoms.

The local inflammation at the place of insertion, is a real eruption of one or more variolous pustules, of the same nature with those that appear in other parts of the body when the eruption begins. Sometimes there is a red spot, or a cluster of spots, like flea-bites, which afterwards rise into real pustules. Sometimes a single pimple appears, having the little orifice

fice for its center ; and at other times it is a cluster or group of pustules, like the confluent small-pox.

Hence it appears, that the venom acts first upon that part where it was applied, and there produces a variolous eruption, as it does in other parts.

When, instead of a puncture, an incision is made, the eruption appears both upon, and round about, it ; and brings on that inflammation, which is esteemed a sign that the infection has taken effect. But as this incision, and the treatment of it, prevent the variolous humor from shewing itself under a pustular appearance, inoculators have not sufficiently attended to the nature of this inflammation, or to the period of this local eruption.

The third period takes place from the beginning of the fever to the general eruption. Indeed, the first sensible effect of the venom upon the whole frame, is not commonly a fever, but a pain at the groin, *axillæ*, or loins, and a heaviness in the head ; but as these sometimes fail, are always slight, and are soon followed by the fever, which is the only constant symptom of the variolous ferment acting upon the whole animal system, the first appearance

ance of this fever fixes the beginning; and its cessation, when the eruption begins, the end of this period.

The fourth takes in the whole time of the general eruption to the falling off of the scabs.

This eruption once come out, the fever goes off, as do all the other symptoms of the foregoing period; those which now succeed are no longer the effect of the immediate action of the virus, which spent itself by the eruption, but are owing to the inflammation and suppuration of the pustules. Each of these is a small inflammatory tumor. When there is a large crop, and the whole body is covered with them, their inflammation and suppuration must of course bring on a fever, with all the symptoms incident to inflammatory disorders. These would equally take place, were a patient's body covered with such a breaking-out, though of another nature, and from a different cause.

When the pustules are few, the inflammation and suppuration have very little effect; when there are none at all, this last period of inoculation does not exist, and the disorder ends with the eruptive fever.

The description of these four periods plainly shews the progress of nature in inoculation. The matter applied by insertion produces the small-pox upon the spot; this local eruption then acts upon the whole body, and brings on the general disorder.

The animal system is by no means affected in the two first stages of inoculation; and therefore no alteration need be made in the patient's usual way of living, and no treatment is requisite during that time. But in the two last periods, the patient is really ill, and must conform to such rules as may lessen his disorder.

But though these last periods constitute what is called the disease of the small-pox, that appellation really takes in two disorders, distinct from each other, as well in their nature and their cause, as in their symptoms and duration. The one is the effect of the immediate action of the venom; the other of the inflammation and suppuration of the pustules. The first is nervous; the second inflammatory.

It is necessary to observe, that the local inflammation and suppuration, which preceded the first stage of the real disorder, and sometimes are prolonged and even increased

creased during its progress, combine their effects with those, which arise from the universal variolous affection. This remark is the more important, as it points out the most essential difference between the natural and artificial disorder.

Inoculation shews that the part, where the matter is applied, is constantly the first affected, and is more so than any other. This part becomes the seat of an eruption, and consequently of inflammation.

In the natural way, the venom dispersed in the air is mostly conveyed by respiration into the lungs, or by deglutition into the stomach. That part of these internal organs which first received the infection, must be affected in the same manner as the external part is by inoculation. But an eruption and inflammation, which affect the animal œconomy but little, if at all, when produced upon the skin of the arm or hand, must be of the utmost consequence when they take place in organs whose action is so necessary to life. Their influence extends over all other parts, and they are of such a nature, that an inflammation upon the least spot of them often brings on an universal inflammation of the whole.

The symptoms of the small-pox, when it is violent, indicate that the seat is in the stomach or lungs; and dissection constantly shews the cause of death to have been an eruption in these *viscera*, like that which appears outwardly.

An eruption and inflammation, though ever so slight, either in the lungs or stomach, must produce effects, which being combined with those of the *virus*, will in this first period render the disorder inflammatory, which it could not otherwise have been. Accordingly, in the natural small-pox, so early as the second or third day of the fever, the pulse, heat, &c. indicate an internal inflammation, and the blood is fizy, as it is in inflammations of the lungs. But in the artificial small-pox, as the local inflammation is always slight, especially if the insertion has been well performed, and as it does not affect a delicate organ essential to life, it may be considered as next to nothing; and consequently the fever, and other symptoms incident to this period, are only occasioned by the immediate and hidden working of the venom, without the intervention of other causes. Hence we observe, during this

stage of inoculation, none of those inflammatory symptoms which seldom fail to show themselves in the natural disorder.

Having now explained the nature and difference of these two last stages, which are properly the small-pox, I shall proceed to the treatment; and begin by the rules to be observed during the first, viz. from the appearance of the fever to the eruption. These rules are the more important, as the two periods always correspond. It is universally allowed, that the higher the fever is, the fuller the eruption will be. When that once appears, it must have its course; the business of art is therefore to check it beforehand, by endeavouring to mitigate the disorder in the first stage, whence depends the degree of it in the second.

Our rules are simple, easy, and equally applicable to the natural and artificial small-pox.

R U L E I. *Fresh and cool air is to be respired.*

THE least attention to the phenomena of this disorder will convince us, that its process tends to assimilate part of our li-

quids to the primary variolous atom applied to any part of the body, either by inoculation or natural contagion. The result of this process is an eruption, the matter of which is exactly like that of the first applied atom. The reproduction therefore, and the multiplication of this atom, or the assimilation of our humors with the variolous matter, constitute the essence of this disorder.

Now, as the whole danger is known to consist in this assimilation, or in the quantity of pustules ; the object of the treatment ought to be the reducing of it. The free admission of cool air fully answers this purpose ; for as heat is the most powerful and universal agent in nature in propagation, vegetation, fermentation, and in general in every process where one substance is to be converted into another ; so cold must check and retard the assimilation of our humors with the variolous matter, as it checks the growth of a plant, or the fermentation of a body.

Other reasons might be alledged to explain the salutary effects of cool air in this disorder * ; but reasonings are needless, where experience is so sure a guide.

* It might, for instance, be said, that of all the bodily organs, the nerves are most particularly attacked in
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In all countries, and at all times, it has been found that cool air is the most powerful antidote against this disorder ; and hot air, on the contrary, the chief cause of the fatal accidents too commonly observed in it,

I might quote the observations of the most famous physicians, who taught this doctrine, and to theirs join my own ; but it will be sufficient to appeal to Sydenham, that oracle in physick, especially with regard to the small-pox. Read the works of that great man, and you will find, that whenever he treats of this distemper, he insists upon the necessity of breathing fresh air. Compare his various writings, and even the several editions he published, and you will be sensible that he was led to this opinion, not by reasoning or prejudice, but by degrees, and a long train of experiments.

The best writers since his time have added but little to what he said ; but one and all confirmed his doctrine as to the benefit of fresh air. Some indeed went farther,

this disorder, and that cold is the most powerful specific in all nervous affections. This begins to be understood in some parts of Europe, and will be more so in time, as the weakness of these organs seems daily to increase in the polished part of the human species.

4 ON THE TREATMENT.

ther, and asserted that the cooler the air, the better it is. They were induced to think so from some desperate cases in the small-pox, where the patient, thought to be dead, revived upon being exposed to the cold and open air, in the depth of winter.

The great success of inoculation in some parts of England, for these two or three last years, is by several eminent physicians ascribed chiefly to the courage of inoculators, who have ventured farther than Sydenham himself; and the event seems to warrant even excess in this article. Of this the following fact, related by professor Monro, is a sufficient proof. One hundred and twelve persons were inoculated in the depth of winter, in some of the most northern islands of Scotland, where there was hardly fuel enough to dress victuals; several of the patients, during the whole course of the disorder, went out bare-footed upon the ice and snow, and not one of them died.

By quoting this instance of boldness, I do not pretend to advise the imitation of it; but this I dare affirm, with that assurance which intimate conviction alone can give, that every thing is to be feared from
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the heat of the air, and little or nothing from cold; that a physician may safely have recourse even to excess of cold in a confluent and dangerous small-pox; and that many a one who dies of the natural disorder, after having been thoroughly nursed and covered up in bed in a hot and close room, would have escaped, had he been so lucky as to be seized with it in the open fields, and had crept into the meanest hut, which could hardly afford a shelter from the inclemency of the winter.

What I have now been saying relates to the natural, rather than to the artificial small-pox. This last is so mild of itself, that, when nothing is done to render it dangerous, seemingly harsh means need never be used. I only desire that every patient under inoculation avoid both excesses of heat and cold; that they breathe a cool air; and that their own sensations be the measure of this temperature. Let them act in this respect as if they were in health, and consulted their conveniency alone in the choice of their air. The heat of their body, increased by the disorder, will, it is true, increase their desire of cool air; and
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such a degree of cold as would be rather disagreeable in health, will be extremely grateful in the small-pox. But this very desire is the voice of nature, and the relief, which immediately follows the gratifying of it, shews that this voice is not deceitful.

I cannot help observing, that every physician must know this to be the doctrine of Sydenham, Boerhaave, and all the great masters of our art. Not one of them would dare to avow the contrary opinion in print; and yet how many suffer their patients to be stifled up in hot rooms, and debarred from the benefit of cool air, merely in compliance with vulgar prejudice, founded on a mistaken notion that heat drives the humors towards the skin, that cold repels them, and consequently that warmth is beneficial, and cold hurtful in the small-pox?

Now, though this popular error can have no abettors among physicians, yet, lest any should inadvertently be led astray, it may be worth our while to refute it.

1. It is contradicted by experience, which is above all reasonings.

2. It rests upon vague and confused notions, and falls to the ground as soon as

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we come to a definition of the words used to express it.

3. The hot air taken in by the breath is so far from driving the humors outward, that it rather carries them more forcibly to the internal parts, and especially to the lungs, by dilating the pulmonary blood-vessels; whereas cold contracts the diameter of those trunks, and forces the humors towards the external parts.

4. When the eruption is compleated, and the pustules have once appeared, the cold surrounding air of the atmospheres never strikes them in. This has been observed by many physicians, and may be so by all, as well as by myself. On the contrary, the eruption is always most copious in those parts, which are most exposed to the air, viz. the face and hands, even in the coldest weather.

5. If cold did really drive back the pustules, it would be an advantage in a disorder, where the danger arises from their number. Hence, in some cases, pustules are often seen to disappear soon after the eruption; and this phenomenon, when attended with no bad symptom, is looked upon by skilful physicians as a sign that the disorder is very slight.

6. What induces people to imagine that pustules which disappear do really strike in, and that the humor which was to have filled them, is driven back towards the internal parts, and brings on the terrible symptoms sometimes attending this disorder, and even death itself, is, that the vanishing of the pustules is often the consequence of a fatal turn of the distemper. But the effect is here mistaken for the cause. When life is immediately attacked by some internal enemy, such as an eruption on the lungs or stomach, too great an inflammation of these parts, too copious a suppuration, a mortification, &c. nature, sinking under this attack, is unable to carry on the external eruption, and the pustules disappear of course. But the threatening symptoms always go before; and the dissection of the bodies after death shews that the causes, which brought it on, began long before the sinking of the pustules.

In any other distemper, the discharge of an issue, of a blister, of a wound, or of an ulcer stops, when death draws near. We might just as well say, that the suppression of this discharge was the cause of death, as that the striking in of the pustules is so in the small-pox.

How absurd then is the doctrine which these few observations overthrow ; but to how many thousands has it not proved fatal !

R U L E II. *The patient's mind must be diverted as much as possible.*

STRANGE as this rule may appear, it is of the utmost importance. We all know what influence the affections of the soul have upon the disorders of the body ; and in none is this so conspicuous as in the small-pox. From the apprehensions of the patient, his fate is often pronounced ; hence great care is commonly taken to conceal from him the nature of his ailment ; and many people decline inoculation, from a persuasion that they should not be terrified by the natural small-pox ; so well is every one convinced that fear constitutes the greatest danger of this disorder.

If we examine things narrowly, and analyse the sensations of the mind in the first period, we shall find some other feelings, which cannot come under the denomination of fear. A dejection will be observed, a sadness, an uneasiness, and anxiety ; these symptoms more or less appa-

rent, seem to indicate that the active principle which presides over our preservation, is threatened with some imminent danger, and as it were feels the presence and influence of a cause ready to attack health and life in a manner the more alarming, as it shews itself less by external signs. Indeed as to the pain, or heat, the hardness or quickness of the pulse, by which we commonly judge of the intenseness of other disorders, they are very far from keeping pace with the lowness of spirits, weariness and uneasiness, so often observable in this. Now these symptoms, and their disproportion with the former, are the principal signs of pestilential distempers, among which the small-pox may be ranked; and it is chiefly by this difference that a skilful physician presently distinguishes the variolous fever from all others. May it not, at the same time, afford an additional proof, that all these disorders have their seat in the nerves, which of all other organs are most immediately connected with the soul?

The existence of these feelings being thus proved, our business must be to excite their opposites by means of amusement.

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I was always struck with the resemblance of the earliest symptoms of this disorder with those of the sea-sickness. The anxiety, nausea, weariness, dejection, head-ach, are in both cases the same, and only differ in point of duration. It even happens sometimes, when a person is long and violently sick at sea, that some small degree of fever will appear at times, and the pulse shall be heavy and intermittent, as in the first period of the small-pox.

Sea-faring people know that dissipation is the best remedy for, and even a preservative against, these complaints. They advise such as are apt to be sick to keep upon deck, and to help in the working of the ship. I have many a time seen people violently sea-sick, instantly relieved by some strong impression on their mind. A ship passing by, the sight of land, any object that strikes unexpectedly, will in a moment perform a compleat cure.

Neither this comparison, however, nor all my preceding reasonings, would so strongly convince me of the truth and utility of the rule before us, as the facts which I have been witness to.

I have seen children in the first period, left to themselves in bed, suffering all the
anxieties

anxieties of this state; and at once have observed all their ills to vanish, as soon as their attention was drawn off to an amusing tale, or to a pleasing toy. This amendment was still more perfect if they were taken up, and enticed to walk about, to dance, to play, and if moderate exercise was added to the recreation of the mind. I aver that, whenever I have managed my inoculated patients in this manner, by keeping them out of bed, and contriving to divert and keep them in constant motion, they have slipped through this period, and hardly have known they were sick. I will not take upon me to determine whether this efficacy of exercise, during that period, is altogether owing to the diversion of the mind, to its increasing and facilitating the secretions, or to any other cause; but certain it is, that it constantly gives relief, and never has any bad effect.

It is easy to divert and amuse children; but how to manage with grown people, is by far a more difficult task. They require more interesting objects, and the choice can only be determined by the knowledge of their taste, and by particular circumstances. In general, one may recommend any moderate exercise attended with some diversion

diversion of the mind ; such as walking, riding, &c. I say attended with diversion; for a man, who only walks to comply with the prescription of his physician, will be much sooner tired than one who is upon a hunting-match.

General directions cannot be given on this subject ; those who have the care of the patients, and the patients themselves, are the best judges of what is most proper in each particular case. By their prudent management, they will be astonished to see a disorder, which would have been severe, if the patient had been nursed and kept in bed, turn out a mere trifle.

Some of the inoculators, who have succeeded so wonderfully in various parts of England, make their patients walk out in the fields, as soon as the fever comes on ; they oblige them to go themselves and pump the water they are to drink, and constantly expose them to the open air in all weathers and at all seasons, not only during the feverish, but throughout the eruptive, state.

The two rules here laid down, contain all that is material in the management of the first period. Fresh air and amusement will greatly alleviate the illness, and prevent all bad symptoms.

But

But to be still more explicit in an affair of such importance, I shall specify some farther directions, included in, and flowing from, the two foregoing rules.

1. *The cool air which is inspired ought, if possible, to be free, and constantly renewed.*

2. *The drink should be cool, and pleasant to the taste.* Cool, for the same reasons with the air; pleasant, to prevent the sickness and reachings so common in this disorder.

3. *The palate of the patient may in general be trusted to for the quantity and quality of the food.* The call of nature is a truer and safer guide than any directions. If the patient loaths his food, it is a sign he does not want it; if, on the other hand, his appetite should be but a false craving, he will soon be satisfied.

4. *The cloathing and bed-covering ought to be the same as in health.*

5. *The patient must not be allowed to lie in bed, except at the hours of sleep.*

These directions, which ought to be observed from the beginning of the fever to the end of the eruption, are dictated by nature, and confirmed by experience.

What

What does nature call for, by that inward heat, thirst, anxiety, retching, heaviness, lowness of spirits, uneasiness, which attend the first period? What; but free and open air, cool and pleasant liquors, entertaining objects, &c.?

Does not experience confirm the same thing? What set of men come off best in the small-pox? The lower class, undoubtedly; the poor country people, who, left to the care of nature, blindly follow her dictates.

Particular observations may be still more convincing; let any one therefore alternately follow our rules, and those which are commonly practised; and first try them upon the inoculated small-pox, as being so mild in itself, that some little errors in the management can hardly make it very dangerous or mortal.

But I would not be misunderstood. When I propose trying the rules commonly practised, I am far from meaning what is too often done in the natural small-pox, when, under the notion of *throwing out the variolous humor, driving it to the skin, drawing it down to the legs, removing it from the nobler parts, and easing the stomach* of those humors which occasion

anxieties and retchings, the poor patient is covered up warm in bed, in a hot close room, vomited, bled, blistered, and plied with cordials, apozems, &c. This indeed would be enough to make even inoculation fatal. By common practice I mean that, which is generally followed by the wisest and most humane inoculators, and which consists in treating this disorder as they would any gentle fever of much the same duration, though of a different nature. A patient would in that case be kept in bed, in a room moderately warm; fed with broth, eggs, milk-porridge, and allowed any of the cooling and aperitive drinks.

Let this method, I say, and mine be tried upon two different patients, and I will warrant the success of this double experiment to be such, that the latter will be thought preferable, even in the natural small-pox; and we shall shudder to think how much the ills that nature sends us may be aggravated by mismanagement, a worse evil than those which it pretends to cure.

Although the observance of the above rules may alone suffice to render the inoculated small-pox always mild and absolutely safe, yet I will not omit mentioning

two helps, which art might afford to concur to the same end.

The first is the use of antispasmodics^(a), the efficacy of which has been experienced by the ablest practitioners, and I may say by myself. I have constantly found their effect to be easy, without any bad consequence. I observed that they might safely be given in larger doses in this distemper than in any other, or even in health; and their effect afforded me a farther demonstration, that the nerves are of all the organs the most affected in the small-pox. But these remedies must only be used in the first period, and not after the eruption.

The second expedient is new, and I only propose it as a hint deserving of farther experiments.

By a constant law of nature, the local eruption at the place of insertion breaks out at least three days before the fever; and the later the fever comes on, the milder the disorder will generally be. Hence I concluded that the cause, which immediately acted upon the whole of the animal system, was by no means the matter which had been inserted, but that which was contained in the pustules of the first

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eruption.

(^a) I could have wished our author had specified what antispasmodics he meant.

eruption. I therefore thought, that if any means could be contrived to retard the action of this matter, the disorder might prove flighter, and that cold applied to these pustules might answer this purpose.

Accordingly I desired two of my patients inoculated in the hand, to hold it in cold water as often and as long as possible, from the first appearance of the local eruption to that of the fever. In both cases the fever came on ; but only the sixth day after, it was hardly perceptible, and lasted but four or five hours.

I am sensible that two facts are not sufficient to establish a general rule ; as other causes may have influenced the event. But by repeating and varying this experiment, useful discoveries may be made, and more attention will be paid to this topical eruption, and its relation with the general one.

Be that as it will, an inoculated patient, treated according to the foregoing rules, during the first period, will have hardly any fever in the next, and certainly a very slight eruption, and perhaps none at all.

In the first case, the inflammation and suppuration of a few pustules will not sensibly affect the animal œconomy, nor bring on the suppurative fever, which is the necessary consequence of a large crop, nor any of those dreadful symptoms, which attend the confluent sort. In short, the second period will be no illness at all ; the patient is quite well as soon as the eruption appears.

He is surely no less so in the second case, when there is no general eruption ; for the variolous infection having spent itself in the pustules that first came out at the place of insertion, these can no longer act upon the rest of the body, but are a sure sign that inoculation has produced its whole effect.

It has indeed been questioned, whether a patient who had but very few pustules, or only one, has had the small-pox as truly as one who has been very full, and whether he is equally safe from catching it.

He certainly had it, since the characteristic of the small-pox, that from which it is denominated in all languages, and by which it is distinguished from all other diseases, is the variolous eruption, not the number of pustules. He is equally safe
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from a return ; for no reason can be alledged why we should have the small-pox but once, that will not equally hold good for one as for ten thousand pustules.

The instances, true or false, of a return are given out as having happened after a severe, as well as after a slight, small-pox. If a single pustule is no security, why should two, or a hundred? Or how many will be requisite? Were the probability of being safe from catching the small-pox again proportioned to the quantity of the eruption, inoculation, together with the rules given for the management of it, would be highly absurd ; since both the rules and the practice, being intended to lessen the crop, would thereby tend to lessen the probability of never having it again.

A more palpable argument of this truth may be drawn from the very nature and course of the disorder. The inoculated small-pox is the ultimate effect of the variolous particle, which was applied to the skin. Now he, who has one pustule, undergoes an application to his skin of all the matter contained in the pustule ; he is, in effect, inoculated on the spot, where the pustule is, and that much more power-
fully

fully than by the bare insertion of the atom of matter. The contents of this pustule being derived from the patient's own body, are more intimately united to it, in greater quantity, and for a longer time, than the particle inserted by inoculation. If therefore a subject, after having once undergone the action of the variolous atom, was still liable to a fresh infection, his own pustule would inoculate him; this second infection would bring forth a third; and this a fourth; and so on, till he had exhausted the whole stock, or fell a victim to such a load of infection.

A man covered with variolous pustules, has all over his body a *stratum* of the very same matter, an atom of which gave him the small-pox a few days before, and the smallest particle of which will inoculate another, if applied to his skin, or, if conveyed with the air into his lungs, may give him a mortal small-pox. Yet this man, so thoroughly coated with the venom, finds no alteration in his health when the suppuration is over, but what proceeds from his past illness; and the matter he is still covered with has no farther power over him.

Suppose

Suppose a body of such a nature as to be set on fire by a single spark ; if, after having seen it in a blaze, you should observe it surrounded with flames, yet neither burnt nor so much as heated by them, would you not say that it is become *incombustible* ? In like manner, when you have seen the smallest variolous atom, by its bare application, infecting a human body, and afterwards behold the same body covered with the same kind of matter, and not in the least affected by it, will you not conclude that it is no longer susceptible of infection, and, if I may so say, that it is become *inviolable* ?

This property of the variolous matter, so active the first time it is applied to a human body, and so inert as to the same body, when it has produced its effect, and been propagated and multiplied, ought always to be kept in view, if we would understand any thing of the hitherto unknown nature of this strange disorder.

This indeed is not our present object ; and it may suffice for our purpose to conclude, that whoever has one pock is in the same case with one that has a full crop ; each has had his share ; and if the disorder
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can attack the same subject but once, both will for ever remain equally free.

But notwithstanding the obviousness of this truth, many people, accustomed to judge more from their own argumentations than from facts, will hardly be brought to believe that one pustule has the same effect as ten thousand. Though approvers of inoculation in general, the bulk of mankind will be afraid of a copious eruption, and uneasy after a sparing one.

In order to satisfy these, it were to be wished, that inoculation could be so managed as to procure an eruption sufficient to remove all apprehensions of a return, and yet so moderate as not to endanger the patient.

The rules, which I have laid down, are intended to lessen the number of pustules; those which I have been opposing, tend to increase it. If two subjects presented themselves alike in health and disposition, I am apt to think one might engage to give the one but few pustules, perhaps but one, and to the other a very full crop, if not a confluent small-pox.

In order to produce an eruption neither too small nor too great, a middle course

should be steered between the two methods. But it is no easy matter to find out this middle way; nor can any exact rule be prescribed, so as neither to go beyond, nor fall short of, the mark. By keeping to the usual way of preparing, or of inserting, or of treating, or else to all three, the operator may bring on more pustules than the patient would have had, if left to nature; but then he may possibly raise a fuller crop than he wished for, perhaps something worse; and on the other hand, some patients may chance to be so well disposed by nature, that in spite of physical art they may have no small-pox, but at the place of insertion.

If one was absolutely bent upon giving a certain number of pustules, I could propose one way, though I must own I would not do it myself, and that is, to make the insertion with a needle, in twenty, thirty, or fifty places; then you would be sure of one pustule at least at each puncture, and probably of many more in other parts.

This method is the least dangerous I can think of, in compliance with common prejudice; but for my part, I cannot think a physician, merely to humor his patients, is at liberty to do them more harm

harm than is necessary; and they, who will act at that rate, are less scrupulous than myself.

To be serious; I am satisfied that, notwithstanding the doubts which may arise as to the sufficiency of a single pustule, every wise man will run the venture of this inconveniency, and embrace the method here laid down. He can but be inoculated again, if he has any scruples; and by this experiment, he will find that one pustule is a sufficient security against any new infection, as has appeared in England, where this trial has often been made.

Again it may be asked, whether one can, indeed, have the small-pox but once? This question has been much canvassed, and perhaps not yet fully decided; but its being a matter of debate, shews that the case of a relapse, if real, is exceedingly rare; and those who pretend to say that it is frequent, and yet make no scruple of exposing themselves to the infection, either say what they do not think, or do not think of what they say. For my own part I declare, I have never seen a true small-pox twice in the same person; and were it true that a very small number of people

are liable to catch it again, I still believe that inoculation, rightly managed, would preserve the far greater part of those who fall victims to the natural small-pox, and consequently must be judged a most important discovery for the good of mankind.

CONCLU-

CONCLUSION.

IN order to fulfil my plan, I shall briefly sum up the few propositions, which, in my opinion, contain the whole doctrine of inoculation, and offer some general observations upon the whole.

From what has been said, it appears that the best method, and consequently the whole practical art, of inoculation consists in these three things; 1. the choice of a healthy subject; 2. the applying to the skin, under the cuticle, a well chosen variolous atom; 3. fresh air and amusement.

This method is natural, simple, easy, convenient, and safe. Natural, both as it springs from the very nature of the small-pox, and as it readily occurs to every sensible and unprejudiced person. Hence it was practised by those barbarous people, who, for aught we know, were the inventors of inoculation; and by tender fearful mothers, who were desirous of preserving their children from a cruel distemper, by hurting them as little as possible.

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It is simple ; for what can be more so than a method, which prescribes but three rules, and these so plain as to be easily understood by every one ?

Easy it certainly is, since a woman, a mother, a nurse, can practise it as well as the best physician. Who is a better judge than the mother, of her child's health ? who more dexterous in performing the operation ; who less likely to frighten the child, or more fit to divert it ?

How convenient must that method be, which requires no confinement either before or after the disorder, if a slight indisposition can be called so, which lasts but three or four days at most, and requires no assistance from art, no operator, no expence ?

Lastly, it is safe, both as it has been constantly successful, when and wherever practised, and as the few miscarriages of inoculation have been owing to a deviation from it.

Other methods have been invented. These were the result of much thinking ; they require no small degree of attention and sagacity to comprehend them, can only be practised by skilful persons, are tedious, and require much care and patience ;

ence : they not unfrequently render the distemper severe, or even mortal, add other needless disorders to the small-pox, and often leave troublesome, and sometimes dangerous, remains.

From this comparison between a simple, easy, and safe method, with those complicated, difficult, and unsafe practices, who can hesitate upon the choice ?

Inoculation will never become universal, unless it has that simplicity, that ease, and above all, that safety, which it can acquire by no other method than ours. Methinks the advocates for the practice should have been aware that, till it is quite safe, it can never become general ; and all computations to shew that a lesser risk ought to be incurred rather than a greater, will be found of little weight with the multitude. Mankind will always be more affected by a present danger, though exceedingly small, than by a much greater one, if remote, and in some degree uncertain.

But if inoculation can be brought to be absolutely safe, and the disorder to be constantly mild, and only an indisposition, the practice will be cleared of all the imputations it has lain under, and must become universal.

As truth finally triumphs over error, I am in hopes that the method, which I have been recommending, will one day be the general and settled one; and it will then be matter of wonder how it came to be so long unknown, or neglected, when known.

The time will come when health will not be impaired, under pretence of preparing one that is already well; when sores will no longer be made at the place of insertion, to give a vent to the variolous matter; and when the disorder will not be made worse by the usual helps intended to cure it. Then, I repeat it, inoculation will no longer be charged with the mischiefs done by injudicious preparation, insertion, and treatment.

F I N I S.



