Cow-pox ; Inoculation ; Small-pox / [by John Ring, and Abraham Rees?].

(12.)

REECE
COLLECTION

COW-POX

By

John Ring

from Abraham Rees's The Cyclopaedia; or universal dictionary of arts, sciences, and literature. 1808, 10,

Also: INOCULATION, and SMALL-POX
from the same work, 1811, 19, and 1816, 33

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Dear Barnard,

I return your extracts herewith. They are not from the Encyclopaedia Britannica but from Abraham Rees's The Cyclopaedia; or Universal Dictionary of Arts, Sciences, and Literature. There are 39 volumes of this work, all with titlepages dated 1819, but it was in fact issued in instalments from 1802 to 1819. The instalment of vol.10 containing Cow-Pox was issued in May 1808; that of vol. 19 containing Inoculation some time in 1811 or 1812; that of vol.33 containing Small-Pox some time in 1816.

As for the question of authorship, Cow-Pox was written by John Ring, as appears from the final paragraph of the article itself. The other articles may have been by him too. The editor's remarks on his contributors in the preface to vol.1 are too vague to be of any help. More information was, I believe, given

was buried in St. Edmund's chapel, in Dereham church, where a tablet is raiſed to his memory by his affectionate friend and relation, lady Heſketh.

The perſon and mind of Cowper ſeem to have been formed with equal kindneſs by nature; and it may be queſtioned, if ſhe ever beſtowed on any man, with a fonder prodigality, all the requiſites to conciliate affection and to inſpire reſpect. He was beloved and revered by all who knew him, with a ſort of idolatry. "I may," ſays Mr. Hayley, "be ſuſpected of ſpeaking with fond partiality the unperceived exaggerations of friendſhip; but the fear of ſuch a cenſure ſhall not deter me from bearing my moſt deliberate teſtimony to the excellence of him whoſe memory I revere, and ſaying, that as a man he made, of all men whom I have ever had opportunities to obſerve ſo minutely, the neareſt approaches to moral perfection. Indeed, a much more experienced judge of mankind, and Cowper's aſſociate in early life, lord Thurlow, has expreſſed the ſame idea of his character; for being once requeſted to deſcribe him, he replied, with that ſolemn air of dignified elocution, by which he was accuſtomed to give a very forcible effect to a few ſimple words, "Cowper is truly a good man." Hayley's Life and Poſthumous Writings of William Cowper, eſq. Gen. Biog.

Cowper, William, a celebrated ſurgeon and anatomiſt of London, was born about the middle of the ſeventeenth century, but in what year, or in what place, is not known. Of his firſt work, "Myotomia Reformata, or a new adminiſtration of all the Muſcles of the Human Body," which was publiſhed in London in 1694, in 8vo. Haller ſays, "Although it may not be compared with the later works of Albinus on the ſubject, yet it far excels all that had preceded it, in correctneſs, and as containing delineations and deſcriptions of ſeveral muſcles that had not been before obſerved." A ſplendid edition of this work was publiſhed by Dr. Mead in 1724, in folio, ſeveral years after the death of the author, with an introductory diſcourſe on muſcular motion, and ſome but not very important additions. More attention, on the whole, appears to have been paid to the elegance, than to the correctneſs of the figures, in this edition. In 1697, the author publiſhed, at Oxford, in folio, "The Anatomy of Human Bodies." The greater part of the plates, with which this magnificent work is illuſtrated, was purchaſed by ſome London bookſellers, in Holland, and belonged to Bidloo's anatomy. Our author added 40 figures, from drawings made by himſelf. He alſo very much improved, and corrected the deſcriptions of the figures, given by Bidloo, and added ſome ingenious and uſeful anatomical and chirurgical obſervations. Bidloo, and with reaſon, complained of the plagiariſm. Cowper anſwered his complaints, in a publication, called "Euchariſtia," in which he gives a deſcription of ſome glands, ſeated near the neck of the bladder, which have obtained the name of Cowper's mucous glands. He pretended to believe that the plates belonged to a work, projected by Swammerdam, but this excuſe, for which there was no foundation, gained little credit. Two later editions of this work, which is ſtill in great requeſt, have been publiſhed, the one at Leyden, in 1737, the other at Utrecht in 1750.

Cowper was alſo author of ſeveral communications to the Royal Society, on the ſubjects of anatomy and ſurgery, which are printed in their Tranſactions, and of ſome obſervations inſerted in the Anthropologia of Drake. He died in the year 1710. Haller Bib. Anat. General Biog.

Cowper's *Glands*, in *Anatomy*, are two glandular bodies, varying in ſize, and ſituated at the bulb of the urethra.

Cow-*Pox*, or *Cow-Pocks*, in *Medicine*, the popular name of a diſeaſe which, till lately, was never deſcribed by medical writers.

§ 1. *Its Deſcription and Origin.*

This diſeaſe, in the brute animal, is commonly called the cow-pox; in the human ſubject the cow-pock. It appears on the teats of cows, in the form of irregular puſtules, ſurrounded with inflammation. The colour of the puſtules is a paliſh blue, approaching to livid. The animals become indiſpoſed; and the ſecretion of milk is much leſſened. Solutions of ceruſſa acetata, vitriolum zinci, vitriolum cupri, and other aſtringents, are a ſpeedy remedy for the puſtules; otherwiſe they degenerate into troubleſome and obſtinate ulcerations.

Similar effects are produced on the hands of the milkers; attended with febrile ſymptoms, and tumours in the armpits. The diſorder is alſo ſometimes communicated to other parts of the body by the nails of the patient, or ſome other cauſe.

It is the popular opinion in the county of Glouceſter, and ſome other counties, that the cow-pox derives its origin from the heel of a horſe; and that men who are employed in dreſſing horſes, and alſo in milking, from want of cleanlineſs, transfer the virus from the horſe to the cow. Dr. Jenner, however, is of opinion, that it is the thin fluid, of a darkiſh colour, oozing from a recent crack in the heel, and not the thick matter of greaſe, which poſſeſſes the property of exciting this diſeaſe; and that there is no other ſource to which the genuine cow-pox can be traced.

Many inſtances of this diſorder in the human ſubject, together with the moſt authentic and ſatisfactory evidence of its originating from the horſe, may be found in Dr. Jenner's "Inquiry into the Cauſes and Effects of the Variolæ Vaccinæ," publiſhed in 1798, in the London Medical Review, the Medical and Phyſical Journal, and in Ring's "Treatiſe on the Cow-pox," of which the firſt volume was publiſhed in 1801, the ſecond in 1803.

It appears by the writings of Dr. Jenner, that farriers are frequently inſuſceptible of the ſmall-pox, in conſequence of their having been infected with this diſeaſe from the horſe. It is, however, not always confined to the heel of the animal. Dr. Jenner relates a caſe, in which matter from the ſhoulder, and Dr. La Font of Salonica one, in which matter from the leg produced the genuine affection.

One ſtrong argument, that it never proceeds from any other origin than the horſe, is, that it has never been obſerved in Cheſhire; where it is not cuſtomary for men, who have the care of horſes, to be employed in milking.

Matter taken from the horſe by Dr. Loy of Whitby, proved equally efficacious with that from the cow, both in the inoculation of the cow, and of the human ſubject. Dr. Sacco of Milan alſo made the ſame experiments with the ſame ſucceſs. A portion of the ſame virus was tranſmitted by him to Dr. de Carro of Vienna, and by Dr. de Carro to Dr. Frieſe of Sileſia; both of whom uſe it indifferently with vaccine matter, and find it produces a ſimilar effect.

Some people ſuppoſe, that the cow-pox derives its origin from the ſmall-pox; and that the infection is communicated to the cow by the hand of the milker; but this hypotheſis is neither warranted by reaſon, nor confirmed by fact. There is no analogy to render it probable, that any poiſon is thus mitigated by tranſmiſſion through the brute animal. The experiment has often been tried in many parts of the world. A local puſtule has ſometimes been excited; but the matter which it yielded has not ſucceeded in ſubſequent inoculations.

Were the cow-pox thus communicated to the cows, it

would be as common in Cheſhire as in Glouceſterſhire, as common in Scotland or France as in England, and as common in Aſia or America as in Europe. As an additional proof that it is not thus produced, it will be ſufficient to ſtate the information received from Mr. Dalton, a ſurgeon at Madras. After obſerving, that he had not been able to procure genuine matter in India, in order to make experiments, or even to learn that horſes in India are ſubject to the greaſe, he gives the reſult of repeated experiments which he made in the government gardens at Madras, by order of the governor, earl Powis, and in his preſence.

To render theſe experiments as complete and ſatisfactory as poſſible, ſeveral milch-cows were ſelected; and ſome of them were inoculated by Mr. Dalton, in their teats and udders, with the moſt active variolous matter; while the teats of others were rubbed with it for a conſiderable time, till they became highly inflamed. No puſtule was excited in any one of them; but ulcerations appeared on thoſe teats, into which matter had been rubbed, the third day after the friction. Several young children were inoculated with the matter thus produced, and their arms inflamed and feſtered. They had alſo a ſlight degree of fever, which gave Mr. Dalton hopes that his experiment had ſucceeded, and that he had generated a mild ſpecies of ſmall-pox; but on putting them to the teſt of variolous inoculation, they all had the ſmall pox in the moſt indubitable manner, and regularly went through the diſeaſe. Mr. Dalton concludes with remarking, that all theſe circumſtances will bear the ſtricteſt ſcrutiny; as they are well known to ſeveral medical practitioners at Madras.

§ 2. *On the Diſcovery and early Practice of Vaccination.*

It has been juſtly obſerved, that, for the diſcovery of this excellent art, we are indebted, under providence, to a fortunate concurrence of circumſtances; firſt, to the talents of Dr. Jenner, ſecondly, to his education under the celebrated Hunter, and thirdly, to his ſituation in the vale of Glouceſter. His inquiry into the nature of the cow-pox commenced about the year 1776. His attention to this ſingular diſeaſe was firſt excited by obſerving, that among thoſe whom he inoculated for the ſmall-pox, many were inſuſceptible of that diſorder. Theſe perſons, he was informed, had undergone the caſual cow-pox, which had been known in the dairies from time immemorial; and a vague opinion had prevailed, that it was a preventive of the ſmall-pox.

He met with many apparent exceptions to this rule; which led him to aſk the opinions of other medical practitioners in the neighbourhood, who all agreed, that the prophylactic power of the cow-pox was not to be relied on. This for a while damped, but did not extinguiſh his ardour; for he had the ſatisfaction to learn, that the cow was ſubject to various eruptions, called by that name, all of which were capable of infecting the hands of the milkers. Having ſurmounted this obſtacle, he formed a diſtinction between the different kinds of puſtular eruptions, to which the cow is liable; denominating one ſpecies the true, and all the others the ſpurious cow-pox.

This impediment to his progreſs was not long removed, before another, of far greater magnitude in appearance, ſtarted up. Inſtances were not wanting to prove, that when the genuine cow-pox broke out in a dairy, ſome perſons who had experienced the diſeaſe reſiſted the ſmall-pox, and others continued ſuſceptible of that diſtemper. This obſtacle, as well as the former, gave a painful check to his fond aſpiring hopes; but reflecting that the operations of nature are for the moſt part uniform, and that when two perſons have had the cow-pox, it is not probable one ſhould be perfectly ſhielded from the ſmall-pox, and the conſtitution of the other remain unprotected, he reſumed his labours with redoubled ardour.

The reſult was fortunate; for he now diſcovered that vaccine, as well as variolous matter, undergoes a change; and that when it has loſt its ſpecific property, it is ſtill capable of producing a puſtulous eruption. Hence, a perſon who milks a cow one day, may receive the infection of the genuine cow-pox, and be rendered for ever ſecure from the infection of the ſmall-pox; while another, who milks the ſame cow the next day, may have a puſtulous eruption, and perhaps a conſtitutional indiſpoſition to a conſiderable extent, yet ſtill remain ſuſceptible of the variolous contagion.

While thus inveſtigating the nature of the cow-pox, he was ſtruck with the idea, that it might be practicable to propagate the diſeaſe by inoculation, after the manner of the ſmall-pox; firſt, from the cow, and then from one human ſubject to another. The firſt caſe in which he put his theory to the teſt inſpired him with confidence; and a regular ſeries of experiments, which he afterwards inſtituted for that purpoſe, was crowned with ſucceſs. Several perſons were ſucceſſively inoculated from each other with vaccine matter, and afterwards expoſed, in a variety of ways, to the infection of the ſmall-pox, which they all reſiſted.

This happy diſcovery was communicated to the world by Dr. Jenner, in a treatiſe publiſhed in June 1798, entitled, "An Inquiry into the Cauſes and Effects of the Variolæ Vaccinæ, a Diſeaſe diſcovered in ſome of the weſtern Counties of England, particularly Glouceſterſhire, and known by the name of the Cow-pox." The reſult of his further experience was alſo brought forward in ſubſequent publications, in the courſe of the two ſucceeding years; and the whole work has been ſince republiſhed in one volume. He has alſo written a ſmall tract, entitled, "The Origin of Vaccine Inoculation;" from which the preceding account of this moſt ſingular improvement of the healing art, is, in a great meaſure, extracted.

It has been juſtly remarked, that the ſame fortune which has attended all other great diſcoveries, and all other great benefactors of mankind, attended Dr. Jenner on this occaſion. Envy aſſailed his fame; his diſcovery was firſt depreciated, then denied; and as he ſurpaſſed Harvey himſelf in glory, ſo he alſo ſurpaſſed him in the oppoſition which he had to encounter. Truth, however, ultimately prevailed. Vaccination obtained a complete triumph; and the foes of Jenner and humanity were covered with confuſion.

In July 1798, Mr. Cline inoculated a child with vaccine virus, received from Dr. Jenner; which ſucceeded. He afterwards put the child to the teſt of inoculation with ſmall-pox matter in three places; which he reſiſted. On this occaſion, Mr. Cline informs Dr. Jenner, that Dr. Lifter, formerly phyſician of the Small-pox Hoſpital, and himſelf, are convinced of the efficacy of the cow-pox; and that the ſubſtitution of this mild diſeaſe for the ſmall-pox, promiſes to be one of the greateſt improvements ever made in medicine. He adds, the more I think on the ſubject, the more I am impreſſed with its importance. This inſtance of the *firſt* introduction of vaccine inoculation into the metropolis, it was neceſſary to mention; becauſe another medical practitioner has laid claim to that honour. Attempts were made by Mr. Cline to continue the practice, by vaccinating other ſubjects with the virus thus produced; but they proved abortive; probably from the matter not being taken at an early period of the diſeaſe.

In November 1798, Dr. Pearſon publiſhed his "Inquiry concerning the Hiſtory of the Cow-pox, principally with a view

view to ſuperſede and extinguiſh the Small-pox." In this work he brings forward the reſult of an extenſive correſpondence with medical practitioners, and others, in different parts of the kingdom; tending to confirm Dr. Jenner's opinion, that the cow-pox is a preventive of the ſmall-pox. He had been informed of this diſcovery of Dr. Jenner by Mr. Hunter, nine years before; and had conſtantly mentioned the circumſtance, in every courſe of his lectures, from that time. The fact had been mentioned in three publications: by Dr. Adams, in his "Treatiſe on Morbid Poiſons;" in 1795, and by Dr. Woodville, in his "Hiſtory of Inoculation," in 1796; having been communicated to them by Mr. Cline, and to him by Dr. Jenner. It had alſo been mentioned by Dr. Beddoes, in 1795, in his "Queries concerning Inoculation," in a letter from Mr. Rolph, who was acquainted with Dr. Jenner.

Information concerning the prophylactic property of the cow-pox had been given to ſir George Baker, many years before, by his relation, the Rev. Herman Drewe, of Abbots, in Dorſetſhire, and ſeveral medical practitioners; but not gaining credit, it was never publiſhed. The ſame circumſtance had alſo been noticed in a weekly paper, called "General Amuſements," publiſhed at Gottingen in 1769. The author, whoſe name was not announced, ſpeaking of the diſeaſes ſaid by Livy to be common to men and cattle, obſerves that the cow-pox prevails in the neighbourhood of Gottingen, and infects the milkers; and that thoſe who have had the cow-pox, flatter themſelves they are perfectly ſecure againſt the infection of the ſmall-pox. He alſo tells us, he had made many inquiries, and was well aſſured by very reſpectable perſons, that this opinion of the milkers was well-founded.

But the moſt ancient reference to the prophylactic power of this diſorder on record, is probably that in "Ring's Treatiſe on the Cow-pox," p. 167. It is as follows: "Being deſirous of knowing, whether there was any alluſion to this diſeaſe in any ancient author, I wrote to Dr. Jenner on that ſubject; who favoured me with the following anſwer:" "I know of no direct alluſion to the diſeaſe, in any ancient author; yet the following ſeems not very diſtantly to bear upon it. When the ducheſs of Cleveland was taunted by ſome of her companions, that ſhe might ſoon have to deplore the loſs of that beauty which was then her boaſt, the ſmall-pox at that time raging in London, ſhe replied, that ſhe had no fears about the matter; for ſhe had had a diſorder, which would prevent her from ever catching the ſmall-pox. This was lately communicated to me by a gentleman in this county; but unfortunately he could not recollect from what author he derived his intelligence."

In the Medical Journal for March 1799, it is ſtated, that the cow-pox had broken out at ſome farms in the environs of London, about the latter end of December; and that matter had been taken for inoculation. This alludes to the commencement of the practice of vaccination by Dr. Woodville.

In the ſame work for the enſuing month, is a letter from Dr. Pearſon, dated March 12th, in which he ſtates, that upwards of a hundred and ſixty perſons had been inoculated by Dr. Woodville and himſelf, ſeparately; and that none of the patients had been conſidered to be dangerouſly ill. He alſo obſerves, that ſo many caſes of the ſevere kind did not occur in this practice, as uſually occur in the ſame number of caſes of the inoculated ſmall-pox; but he nevertheleſs acknowledges, that although many of theſe patients were leſs indiſpoſed, yet "the whole amount of their conſtitutional illneſs ſeemed to be as great, as in the ſame number of patients in the inoculated ſmall-pox." He alſo ſtates, that "in many of the caſes, eruptions on the body appeared; ſome of which could not be diſtinguiſhed from the ſmall-pox."

The next article in the ſame publication is a letter from Mr. Lawrence, a veterinary ſurgeon; in which he adviſes us not to be very ſanguine in our hopes reſpecting this diſcovery; and expreſſes an opinion that the cow-pox will prove only a temporary preventive of the ſmall-pox. Hence it is evident, that he has a right to diſpute the palm of priority with Dr. Moſeley, who confeſſedly advanced the ſame opinion before he knew any thing of the cow-pox; and with Mr. Birch, who, as well as Dr. Moſeley, boaſts that he was, for a long time, the only opponent of the practice. Be this as it may, Mr. Lawrence obſerves, that "ſome of Dr. Pearſon's accounts make the cow-pox a more ſevere diſeaſe than the inoculated ſmall-pox;" and that "if theſe accounts are to be depended on, the cow-pox has already had its day."

In one reſpect Mr. Lawrence has proved himſelf a much better prophet than either of the other gentlemen in queſtion. He ſays, "whatever may be the fate of cow-pox inoculation, it has given, and will give occaſion to a pretty large and open diſcuſſion; which is always beneficial, as having a tendency to produce diſcovery, and promote improvement; and when the public ardour for the preſent topic ſhall have become a little cool and ſatisfied, I hope it will be turned by enlightened men towards another, perhaps of nearly as great conſequence, namely, *the prevention of the original malady in the animals themſelves*. Thoſe who have witneſſed, or only reflected on, the exceſſive filth and naſtineſs, which muſt unavoidably mix with the milk in an infected dairy of cows, and the corrupt inſalubrious ſtate of their produce in conſequence, will ſurely join with me in that ſentiment." How well this hope has been realiſed, and this prediction fulfilled, is evident from Dr. Jenner's account, that the cow-pox is already become ſo rare in Glouceſterſhire, where it uſed to be ſo frequent; and from its never having re-appeared in the neighbourhood of London, ſince the farmers there have known its origin, now a period of nine years. This is no ſmall proof of the rectitude of Dr. Jenner's opinion, that it originates from the greaſe.

In the ſame number of the Journal, is a communication from Dr. John Sims, containing the caſe of Mr. Jacobs of Briſtol; who is there ſtated to have had the cow-pox twice, and yet to have had the ſmall-pox afterwards in ſo ſevere a manner, that his life was deſpaired of. This caſe has ſince been proved by Mr. Henry Jenner, and acknowledged by Dr. Sims to have been the ſpurious cow-pox; and Dr. Sims, who publiſhed the account of it from the moſt honourable motives, is ſo perfectly convinced of it, that he is become one of the moſt zealous advocates of vaccination.

He tells us, that Mr. Jacobs deſcribed the cow-pox which he had as the moſt loathſome of diſeaſes; and obſerves, that Dr. Jenner had entirely overlooked this circumſtance, although in itſelf ſo formidable an objection to the practice, even if it ſhould be found to anſwer the purpoſe for which it was introduced. He alſo remarks, that it was impoſſible to know how far ſuch a diſorder might prove injurious to others, as well as to the individual who ſubmitted to inoculation.

All theſe unfavourable accounts of the new ſpecies of inoculation deterred numbers of medical practitioners from adopting it. But perhaps no author ſounded a louder alarm on this occaſion than Dr. Moſeley. This gentleman boaſts of his having been the firſt who warned parents againſt vaccination; and he ſeems determined to perſiſt in his

his oppoſition, in ſpite of any evidence that can poſſibly be advanced in its favour. Among the number of thoſe who publiſhed adverſe evidence, was alſo the celebrated Dr. Beddoes; the reſpectability of whoſe name added conſiderable weight to that ſide of the queſtion. As a proof, however, that this gentleman was influenced in his conduct only by the moſt pure and upright motives, he has ſince voluntarily come forward as a zealous advocate of the practice, and pronounced the moſt flattering panegyric on Dr. Jenner.

Not ſo Dr. Moſeley; he is ſo far from being convinced of the utility of vaccination, that he ſeems to be more and more exaſperated againſt it, by every new account of its ſucceſs. This, however, is not any great wonder, when he confeſſes that he wrote againſt it before he knew what it was; when he pretends that inoculation has diſarmed the ſmall-pox of its terrors; that accidents in the inoculated ſmall-pox are uncommon, and that under proper treatment, it leaves nothing behind injurious to the conſtitution. After this, we cannot be ſurpriſed at his endeavouring to terrify parents with the idea of beſtial humours; and of the ill conſequences which may ſpring from that ſource, after a lapſe of years.

A publication like this, although ill calculated to bear the teſt of criticiſm, was very well adapted to inſtil prejudices into the minds of the vulgar and ignorant; who are at all times averſe from innovation in the practice of phyſic; and not yet reconciled to the idea of engrafting diſeaſes. But whatever effect this publication might produce on vulgar minds, it produced much leſs effect on the minds of medical practitioners, and of all other learned and ſcientific men than ſome of the firſt reports of thoſe, into whoſe hands vaccination, on its ſecond introduction into the metropolis, happened to fall.

In addition to what is already ſtated, Dr. Woodville's work on this ſubject appeared ſoon after; in the dedication of which he informs ſir Joſeph Banks, that it *does not afford the ſatisfactory evidence which he expected.* It did not, indeed, afford the ſatisfactory evidence which others expected. Many people were of opinion, that in his account, he rather exaggerated the ſymptoms of thoſe caſes which had fallen under his care, in order to prevent vaccination from being eſtabliſhed; as it tended to exterminate the ſmall-pox, and to cut off the principal branch of his practice. This ſuſpicion was perhaps natural when it was conſidered, that the cow-pox was repreſented by Dr. Jenner as a mild diſorder, and by Dr. Woodville as a violent one; and that it was conſiſtent with his intereſt to repreſent it as ſuch. The truth is, that the phyſician of the Small-pox Hoſpital was the laſt man in the world who ſhould have made the experiment of inoculating for the cow-pox; and the Small-pox Hoſpital the laſt place in which it ought to have been made.

By peruſing Dr. Woodville's publication, any one may diſcover, that when he commenced vaccination, he commenced it not only in the moſt improper place, but alſo without any competent knowledge of the nature of the diſeaſe. He did not know whether it was puſtular, or veſicular; general, or local; contagious, or not contagious. He alſo commenced it without any precaution; for he confeſſes, that many of his patients were in apartments where they were compelled to breathe a variolous atmoſphere; and he even added to this danger of infecting them with the ſmall-pox, that of inoculating them for the diſeaſe, at almoſt every period, while they were under vaccination! The conſequences were ſuch as might well be apprehended. Many of them had the ſmall-pox at the ſame time with the cow-pox. In a conſiderable number of caſes, the cow-pox and ſmall-pox matter were mixed together, in order to gratify curioſity, and ſee whether it was poſſible to create a new diſeaſe; but happily providence has ſet bounds to the power of doing miſchief, and fruſtrated ſuch attempts. In ſome inſtances one of thoſe diſeaſes is ſaid to have prevailed, and in ſome the other; but in none of them was any hybrid diſorder produced.

Dr. Woodville tells us he ſent Dr Jenner ſome of his cow-pox matter; which, at firſt, in ſome inſtances, occaſioned a trifling eruption; probably the relics of the variolous matter, with which it had been contaminated by one of the circumſtances already mentioned. He tells us, Dr. Jenner attributed the puſtulary eruption to ſome peculiar influence of the town air; but he informs us, that ſeveral of his patients, in whom theſe puſtules appeared, were inoculated at the diſtance of eight miles from London; and that eighteen others, at a ſtill greater diſtance, were inoculated with the ſame matter, in all of whom it produced a ſimilar puſtulous eruption. Nevertheleſs, he was ſo far from believing this eruption to be the ſmall-pox, that he ſtrenuouſly labours to prove it was the cow-pox.

In one reſpect he is rather inconſiſtent with himſelf; for at page 145 he ſays, "the cow-pox, in every caſe which we are acquainted with, has been introduced into the human conſtitution through the medium of external local inflammation; and is therefore to be conſidered as an inoculated diſeaſe. The virus of it ſeems alſo to affect a ſimilar mode of action, and to be governed by the ſame laws as that of the ſmall-pox." But at page 153, after obſerving that the cow-pox is not infectious by effluvia, he ſays, "this is certainly true, when the diſorder is confined to the inoculated part; but where it produces numerous puſtules upon the body, the exhalations which they ſend forth are capable of infecting others in the ſame manner as the ſmall-pox. Two inſtances of caſual infection in this way have lately fallen under my obſervation. In one the diſeaſe was ſevere, and the eruption confluent; in the other the diſeaſe was mild, and the puſtules few."

It muſt be allowed that Dr. Woodville, in ſome inſtances, excited the cow-pox; ſince he has given a very accurate deſcription of it. He ſays, "if the inoculation be performed by a ſimple puncture, the conſequent tumour, in the proportion of three times out of four, or more, aſſumes a form completely circular; and continues circumſcribed, with its edges elevated and well defined, and its ſurface flat throughout every ſtage of the diſeaſe; while that which is produced from variolous matter either preſerves a puſtular form, or ſpreads along the ſkin, and becomes angulated and irregular, or diſfigured with numerous veſicles."

"Another diſtinction, ſtill more general and deciſive, is to be drawn from the contents of the cow-pox tumour; for the fluid which it forms, unleſs from ſome accidental circumſtance, very rarely becomes puriform; and the ſcab which ſucceeds is of a harder texture, exhibits a ſmoother ſurface, and differs in its colour from that which is formed by the concretion of pus." So far Dr. Woodville purſues the deſcription of the cow-pox; but ſuddenly he loſes ſight of that object, and again relapſes into his former error, in the following words: "All the appearances here deſcribed, however, do not conſtantly attend the diſeaſe; but are ſometimes ſo much changed, that they can in no reſpect be diſtinguiſhed, from thoſe which ariſe from the inoculation of the ſmall-pox. When the diſeaſe thus deviates from its uſual appearance, at the inoculated part, its effects on the conſtitution have commonly, though not always, been felt more

more ſeverely, than where the tumour was diſtinctly characteriſed."

Dr. Woodville acquaints us, that ſince his table was compoſed, an infant at the breaſt died on the eleventh day after the cow-pox matter had been inſerted in its arm. In this caſe, he tells us, the local tumour was very inconſiderable; and the eruptive ſymptoms took place on the ſeventh day; when the child was attacked with fits of the ſpaſmodic kind, which recurred at ſhort intervals, with increaſed violence, and carried it off at the time above-mentioned, after an eruption of eighty or a hundred puſtules."

Thus, he tells us, it appears, that out of about five hundred caſes of the inoculated cow-pox, one proved fatal; while in the variolous inoculation, at the Small-pox Hoſpital, only one caſe proved fatal in ſix hundred. Many reſpectable members of the medical profeſſion were deterred from vaccination by the foregoing ſtatement; but it has ſince been proved that the child died of the ſmall-pox.

Dr. Woodville indeed acknowledges, that vaccination in general produces much fewer puſtules, and leſs indiſpoſition, than the inoculation of the ſmall-pox; but at the ſame time he contends, that in ſeveral inſtances, the cow-pox has proved a very ſevere diſeaſe; that in three or four caſes out of five hundred, the patient had been in conſiderable danger, and that one child had actually died of the diſorder. He confeſſes, that if one out of five hundred caſes of cow-pox proved fatal, he ſhould not be diſpoſed to introduce the diſeaſe into the Inoculation Hoſpital; but that he is inclined to think, if matter for the vaccine inoculation were only taken from thoſe in whom the diſeaſe appeared in a mild form, the reſult would be more favourable than in the ſtatement which he had given. He ſays, it had occaſionally happened, that matter taken from the arm of a patient, in whom the diſorder neither produces fever nor eruptions, had in others produced both; yet it had much more commonly produced a milder diſeaſe, than matter taken from ſecondary puſtules, or from a patient who had the diſeaſe in a ſevere manner.

He tells us, that out of ſixty-two of his patients who were inoculated with the puſtule matter, fifty-ſeven had an eruption; and that thoſe who received the diſeaſe from any of theſe fifty-ſeven patients alſo had puſtules in nearly the ſame proportion. He alſo informs us, that the diſorder which proved fatal to one of his patients, was excited by matter of this deſcription; that is, by matter of the *ſmall-pox*. So far, however, was he from being aware of this, as to draw from theſe caſes the following inference; that the cow-pock, from certain circumſtances, is not only liable to loſe the characters which diſtinguiſh it from the ſmall-pox, but alſo to continue to propagate itſelf under this new and caſual modification. From theſe erroneous premiſes he, therefore, draws a concluſion equally erroneous, that the ſmall-pox and the cow-pock ought to be conſidered only as varieties of the ſame diſeaſe.

In the London Medical Review for Auguſt 1799, p. 626, Dr. Pearſon expreſſes an opinion, that the puſtules reſembling the ſmall-pox, which occurred at that time in vaccination, afforded matter, which, he believed, in ſome caſes, produced the cow-pock in its uſual mild way. This opinion, however, is not ſupported by any proof, and is now perfectly exploded.

In the Medical Journal for the ſame month, Mr. Ring publiſhed a defence of vaccination, in anſwer to Dr. Moſeley, in which he brings forward evidence to prove, that it is much milder and ſafer than it had hitherto been repreſented to be by ſome London practitioners, and affirms that the ſucceſs of it had, on the whole, been ſuch as to gratify every reaſonable expectation. He alſo cautions medical men not to take matter for inoculation from any but an original puſtule; and not to make uſeleſs experiments, or wantonly expoſe the lives of their fellow-creatures to unneceſſary danger, by inoculating them with one kind of matter, before another had produced its final effect. This caution, unfortunately, has been too often diſregarded.

He alſo advanced an opinion, which he has ſince fully confirmed in his treatiſe on the Cow-pox, that two morbid actions may take place in the body at the ſame time, notwithſtanding the contrary had been maintained by Mr. John Hunter, and was conſidered in the ſchools of medicine as an unqueſtionable doctrine.

About the ſame period, Dr. Jenner publiſhed the ſecond part of his work, entitled "Further Obſervations on the Variolæ Vaccinæ;" in which he tells us, that ſoon after the publication of the former part of his work, he clearly perceived that his theory, which promiſed to be ſo beneficial to mankind, was likely to fall into diſrepute, owing to haſty concluſions. He therefore requeſts medical practitioners to be a little more careful in their obſervations, and the public to ſuſpend their judgment till they had more ample information.

In the courſe of the following year, he republiſhed theſe two parts of his work, together with a third, in which he ſays, he has the pleaſure of ſeeing the feeble efforts of a few individuals to depreciate the practice, ſinking faſt into contempt.

He there obſerves, that upwards of ſix thouſand perſons had then been vaccinated, and that the far greater part of them had ſince been inoculated for the ſmall-pox, and expoſed to the infection of the diſorder in every rational way that could be deviſed, but to no purpoſe.

He then alludes to the experiments of Dr. Woodville, the reſult of which, he obſerves, eſſentially differed from his own in a point of much importance, three-fifths of Dr. Woodville's patients having had eruptions reſembling thoſe of the ſmall-pox. Theſe Dr. Jenner could not aſcribe to the inſertion of vaccine virus, when he conſidered, that in his own neighbourhood, out of the great number of caſual and other caſes which he had ſeen and heard of, although the matter was derived from different ſources, nothing like a variolous puſtule had ever appeared He therefore juſtly concluded, that thoſe which had occurred in the practice of Dr. Woodville, and of others to whom Dr. Woodville had given matter, were occaſioned by the *variolous* matter with which he had inoculated his vaccine patients, on the third or fifth day after vaccination.

In the Supplement to the Encyclopædia Britannica, under the article VARIOLÆ VACCINÆ, or COW-POX, are ſome erroneous, if not miſchievous, opinions, which ought to be corrected. Vaccination is there repreſented as a more ſevere proceſs than what Dr. Jenner gave us reaſon to expect: an eruption exactly reſembling the ſmall-pox is ſtated to be a very common occurrence; and in ſome caſes the febrile ſymptoms are ſaid to be conſiderable and alarming. In one inſtance it is aſſerted that the diſorder proved fatal. It is there alſo ſtated, on the authority of Dr. Woodville, that the cow-pox is ſometimes infectious by effluvia, like the ſmall-pox, and has a ſimilar appearance on the arm.

Dr. Woodville has ſince acknowledged, that the infant whoſe caſe is above referred to, died of the ſmall-pock, and not of the cow-pock; but as there are ſtill ſome perſons who endeavour to prove that the cow pock is an eruptive diſeaſe, it is neceſſary to enter a little further into the inveſtigation of this point.

In the ſame article of the Supplement to the Encyclopædia,

dia, as well as in other publications, we are told, that from the occurrence of ſuch puſtulous eruptions, in the practice of Dr. Woodville and others, Dr. Pearſon draws the following concluſions; that in certain conſtitutions, or under the circumſtances of certain co-operating agents, *the vaccine poiſon produces a diſeaſe reſembling the ſmall-pox*, and of courſe the puſtule in the inoculated part *is very different from that of the vaccine-pox ordinarily occurring*, and the eruptions *reſemble very much, if not exactly, ſome varieties of the ſmall-pox*; that in ſome inſtances theſe eruptions had occurred, although the inoculated part had exhibited the genuine vaccine puſtule; that the matter of ſuch eruptive cow-pocks, whether taken from the inoculated part, or from others, univerſally, or at leaſt generally, produces ſimilar eruptive caſes, and has not, as Dr. Pearſon believes, been ſeen to go back, by paſſing through different conſtitutions, to the ſtate in which it produces what is called the genuine vaccine diſeaſe.

In the ſame article it is ſtated, that Dr. Woodville ſays, if the inoculated part aſſumes a puſtular form, though it continues only *one* or *two* days, the inoculation is as effectual as where it proceeds through its regular courſe. This, as well as the former opinion, being founded in error, the more widely it is diffuſed, the more neceſſary it is to correct it. One inſtance, proving its fallacy, may be ſeen in the Medical Journal for February, 1801, in a letter from Dr. Harriſon to ſir Joſeph Banks; and many others in the various authors who have written on vaccination.

Here it may not be ſuperfluous to remark, that the term *puſtule*, however common, is not expreſſive of the cow-pock, which is a *veſicle*, of a cellular conſtruction.

With regard to the other opinion advanced in the Encyclopædia, namely, Dr. Pearſon's, that in certain conſtitutions, and under certain circumſtances, cow-pock matter is capable of producing a diſeaſe reſembling the ſmall-pox,—it is proper to lay before the reader ſuch arguments and facts as may enable him to form his own judgment.

In the London Medical Review for April, 1800, Mr. Blair called the attention of the faculty to an examination of this queſtion, and contended, that either the matter uſed in theſe inoculations was contaminated, or the cow-pox is a puſtulous diſeaſe, and capable of communicating infection by effluvia. That concluſion he founded on two caſes which occurred in the practice of Mr. Ring, and which Mr. Ring had related to the Medical Society. With matter taken from one of theſe patients Mr. Blair inoculated a child, and produced a puſtular diſorder, which, like the former, was not diſtinguiſhable from the ſmall-pox, and, like the ſmall-pox, proved infectious by effluvia; for another child in the ſame apartment caught the diſeaſe!

The matter which occaſioned this eruptive diſorder, was obtained by Mr. Ring from Dr. Pearſon, and by him from Dr. Woodville; and this event furniſhes one proof, out of many, of the melancholy effects of practiſing vaccine inoculation at the Small-pox Hoſpital. In the Medical Review for May, 1800, Mr. Ring obſerves, that the appearance of a conſiderable eruption, in the two caſes referred to by Mr. Blair, occaſioned a variety of conjectures at the time; but no one who had ſeen much of the practice with genuine cow-pock virus, could then poſſibly entertain a doubt that the matter was variolated by ſome means or other. Whether this contamination took its riſe from a variolated lancet, or a variolated atmoſphere, he does not pretend to determine, not having ſeen the matter, nor the lancets, till the moment when inoculation was about to be performed.

He then ſtates, that for the ſpace of ſix months he had uſed matter from the ſtock of Dr. Jenner, which had not produced puſtulous eruptions, and quotes an extract of a letter from Dr. Jenner, to prove that the cow-pock is not infectious by effluvia; adding, that even the caſual diſeaſe, when moſt ſevere, has never been ſuſpected to be capable of infecting any perſon, except by contact.

In the Medical Review for June, 1800, Mr. Ring ſtates, that the opinion which he had ventured to advance in the Medical Journal for Auguſt, 1799, in oppoſition to the hypotheſis of Mr. Hunter, and other celebrated phyſiologiſts, that two morbid actions in the ſame ſubject, at the ſame time, are incompatible, was then confirmed by two additional caſes, publiſhed by Dr. Tracey in the New York Medical Repoſitory; and alſo by a caſe of co-exiſtence of the cow-pock and meaſles, which had lately occurred in his own practice. In this caſe, which he ſhewed to Dr. Jenner, Dr. Marſhall, and other medical practitioners, the meaſles appeared on the eighth day of vaccination; yet the cow-pock was neither ſuperſeded nor retarded by that diſeaſe. This, and many other inſtances of the co-exiſtence of eruptive diſorders, which he has related in his treatiſe on the Cow-pox, corroborate the opinion, that the puſtular eruptions in patients under vaccination at the Small-pox Hoſpital and elſewhere, owed their origin to the ſmall-pox and not to the cow-pox.

In the Medical Review for July, 1800, he publiſhed ſome additional obſervations on this ſubject, in which he ſtates, that he had lately ſeen three inſtances of the ſmall-pox, in conſequence of the inſertion of matter obtained from the Small-pox Hoſpital as cow-pock matter. In the ſame letter he expreſſed his ſurpriſe, that Dr. Woodville was not yet convinced of his error. Dr. Woodville having advanced an opinion, that in thoſe places where *the ſmall-pox* is epidemic *the cow-pox* produces puſtules, Mr. Ring obſerves, that where the ſmall-pox prevails, it is more reaſonable to aſcribe theſe eruptions to the action of variolous matter, than to ſay, that where *the ſmall-pox* prevails, *the cow-pox* produces puſtules.

In the ſame publication for September, he inſerted ſome further remarks on the ſame ſubject, in which he ſtates, that he had ſince known ſeveral inſtances in which the ſmall-pox was excited, inſtead of the cow-pock, by ſuppoſed vaccine matter procured from the Small-pox Hoſpital, and from Dr. Woodville; and expreſſes his doubt whether it was of advantage to the public, that any ſpecies of inoculation ſhould ſtill be practiſed at the Small-pox Hoſpital. He adds, "for my own part, I muſt confeſs, that however uſeful it has heretofore been in this reſpect, its utility ceaſed on the introduction of the new practice by Dr. Jenner. Either that Augæan ſtable ought to be cleanſed, or to ſerve as a mere peſt-houſe for the reception of ſuch as are ſeized with the natural ſmall-pox. It was not deſigned to propagate that diſeaſe, nor to diſſeminate a deadly poiſon."

In the ſame paper he aſſerts, that when perſons already infected with the ſmall-pox are vaccinated, the cow-pock ſometimes appears to mitigate, and at others to ſuperſede the ſmall-pox; but that this rule was not without an exception, on which account he thought much greater caution neceſſary in the practice of vaccine inoculation than had hitherto been obſerved.

In his treatiſe on the cow-pock, he has given a full detail of the riſe and progreſs of vaccination in the metropolis, and an analyſis of Dr. Woodville's publications; proving that the diſorder which had created ſo much alarm, and ſo greatly retarded the progreſs of the new inoculation, was, in reality, not the cow-pock, but the *ſmall-pox!*

§ 3. *The comparative Advantages of Vaccination.*

The following comparative ſtatement of the advantages of

of the new practice is, in a great measure, taken from Ring's Compendium of Vaccination.

The natural small-pox is a loathsome, infectious, painful, and fatal disease. It is confined to no climate; but rages in every quarter of the world, and destroys a tenth part of mankind. Those who survive the ravages of that dreadful distemper, often survive only to be the victims of other maladies; or to drag out a miserable existence worse than death. This cruel and lamentable disorder leaves behind it pits, scars, and other blemishes; and bodily deformities which embitter life.

The inoculated small-pox also is loathsome, infectious, painful, and sometimes fatal; and when partially adopted, spreads the contagion, and increases the mortality of the disease. It sometimes occasions the same maladies as the natural small-pox. It frequently leaves behind it the same blemishes and deformities as the natural small-pox; which are the more deplorable, as they were brought on by a voluntary act.

The inoculated cow-pock scarcely deserves the name of a disease. It is not infectious; and, in the opinion of the most experienced practitioners, has never proved fatal. It occasions no other disease. On the contrary, it has often been known to improve health; and to remedy those diseases under which the patient before laboured. It leaves behind no blemish, but a blessing—one of the greatest ever bestowed on man—a security against the future infection of the small-pox.

§ 4. *The Manner of taking and inserting Cow-pock Matter.*

The following instructions for the practice are also taken from Ring's Compendium. Cow-pock matter may be taken at any period, from the first appearance of the vesicle, till the areola begins to form, by small punctures; allowing it time to flow; or promoting the discharge by gentle pressure with the lancet. It must be taken with great caution; otherwise the intention of the inoculator may be frustrated, or violent inflammation and ulceration of the arm may ensue.

The cow-pock matter is to be inserted, by a superficial puncture, into the middle of the arm, between the shoulder and the elbow; or, when the arm is likely to be much used, into the inside of the leg. Fluid matter is preferable to dry; but those inoculators who have not a constant succession of patients, and cannot readily procure a fresh supply of matter, should preserve it on vaccinators for future occasions. In this manner, when kept in a cool place, it may be preserved several months.

§ 5. *The Manner of preserving Cow-pock Matter.*

Cow-pock matter may be preserved, and conveyed, on the point of a vaccinator; that is, a bit of ivory, shaped like the tooth of a comb, and pointed like a lancet.

When the matter is intended to be sent to a distant place, or to be kept long, the vaccinator should be charged several times. It should not be dried before the fire; and, when suffered to dry on a lancet, should not be kept above two or three days. When dry matter is used, it should not be moistened previously to insertion; but the longer it has been kept, the longer the point of the instrument ought to remain under the cuticle, that it may have time to dissolve. When fluid matter is used, the lancet should be washed in cold water, and wiped dry after every puncture.

Various other methods have been contrived for the preservation and conveyance of cow-pock matter; but the ivory lancet, invented by Dr. de Carro, and the vaccinator above-described, invented by Mr. Ring, which is generally considered an improvement of it, being much cheaper and more portable, are now commonly preferred. When vaccinators are to be sent to a moderate distance, they may be wrapped in paper; but when they are to be sent to a great distance, they may be inclosed in a quill, to be stopped with white wax. Sealing wax is not proper for this purpose; because it cannot be employed without heat, which is extremely prejudicial to the matter. When a vaccinator is to be used for inoculation, a small oblique puncture is first to be made with a lancet; then the point of the vaccinator is to be inserted, and held in the puncture some time, and afterwards repeatedly wiped on the part; in order to insure, if possible, the lodgment of the matter.

General Observations on the Practice.

One cow-pock is generally supposed to be a security against the future infection of the small-pox; but when the patient resides at a distance, or is in danger of catching the small-pox, it is proper to inoculate in both arms. Another reason for inoculating in both arms is, that a more copious supply of matter is thus afforded for future inoculation.

Those who have been exposed to the infection of the small-pox, ought to be inoculated with the cow-pock; which seldom fails to supersede, or mitigate, the small-pox.

§ 6. *The local Symptoms of Vaccine Inoculation.*

On the third day, the day of inoculation being reckoned the first, a red spot commonly appears; and, on the fourth or fifth, a cellular vesicle, of a light pink, sometimes with a blueish tint, gradually changing into a pearl colour. The margin is elevated, the centre depressed, the contents are limpid. It increases till the tenth day.

About the ninth, the inflammation surrounding the base spreads rapidly, and forms a circumscribed areola, which, in a day or two, commonly begins to fade. When the areola is complete, the vesicle soon begins to decline. First, it turns brown in the centre; it is then gradually converted into a hard, smooth, shining scab, of a dark mahogany colour, approaching to black; which falls off about the end of the third week, leaving a scar, which is generally round and circumscribed, and some degree of indentation.

§ 7. *Spurious Pustules.*

A spurious pustule is more elevated and opake than the genuine; and more rapid in its progress. It is not cellular; nor surrounded with a distinct circumscribed areola; nor converted into a dark shining scab. Spurious pustules often occur in those who are vaccinated after having had the small-pox. They are sometimes also produced in those who have not had the small-pox, by blunt or rusty lancets, by matter taken from a spurious pustule, or from a genuine pustule at too late a period; or by that which has been kept too long, or dried before the fire. When there is any irregularity, or doubt of success, the patient ought to be inoculated again.

§ 8. *The constitutional Symptoms.*

Sometimes a drowsiness appears on the second or third day of vaccination. Febrile symptoms also sometimes commence early; but more frequently about the eighth day. They are commonly slight and transient. In many cases there is no apparent constitutional indisposition; yet the patients are rendered secure from the future infection of the small-pox.

The superiority of vaccine inoculation being now fully ascertained, some restriction ought to be imposed on the inoculation of the small-pox; and those mercenary practitioners who prefer their own private interest to that of the

public, ſhould no longer be ſuffered to diſſeminate a malignant poiſon, or to ſcatter the ſeeds of death with impunity.

§ 9. *Prejudices againſt Vaccination.*

The prejudices againſt vaccination are ſimilar to thoſe which formerly prevailed againſt the inoculation of the ſmall-pox. They proceed partly from ignorance; but ſelf-intereſt has alſo a conſiderable ſhare in exciting them, as is too evident in the conduct of certain individuals, who wiſh to profit by the credulity of the public, and to enrich themſelves by the inoculation of the ſmall-pox.

One of the prejudices againſt vaccination is, that it produces other diſeaſes; another, that it is no ſecurity againſt the future infection of the ſmall-pox. With reſpect to the firſt, it may perhaps be ſufficient to obſerve, that no ſuch diſeaſes are produced by the cow-pox in the caſual way, though much more ſevere than under inoculation, nor in the children of perſons in a reſpectable ſituation of life. Thoſe which are aſcribed to this cauſe occur chiefly in the children of the lower claſs; and are occaſioned by want of care, and of cleanlineſs or other cauſes to which the poor are, in all countries, in ſome meaſure, unavoidably expoſed.

Theſe diſorders, which uſed to be concealed as much as poſſible by parents, and other parties concerned, have lately been dragged into light; and accounts of them have been circulated with great induſtry, and with the moſt ſhameful exaggeration and miſrepreſentation. It has, however, been proved, that they are leſs frequent than they were before vaccination was introduced into practice; and that even in Glouceſterſhire, where the natural cow-pox has been moſt known, and beſt underſtood, no perſon has ever applied to the Infirmary for any diſeaſe, ſuppoſed to be occaſioned by the cow-pox.

We ſhall conclude this article with an extract from the Report of the Royal Jennerian Society for the Extermination of the Small-pox, dated October 1, 1807.

"The Directors congratulate the public on the very favourable opinion which the Royal College of Phyſicians of London, after a moſt minute and laborious inveſtigation, made by command of his majeſty, have a ſecond time expreſſed on the ſubject of vaccination, in their Report laid before the houſe of commons, in the laſt ſeſſion of parliament; in conſequence of which the ſum of twenty thouſand pounds was voted to Dr. Jenner, as a remuneration for his diſcovery, in addition to ten thouſand pounds before granted.

"In this Report, the college of phyſicians, after premiſing that they advance nothing but what is ſupported by multiplied and unequivocal evidence, aſſert, that the teſtimonies before them are decided in declaring, that the cow-pox is much milder, ſafer, and much leſs apt to cauſe other diſeaſes than the ſmall-pox: that the monſtrous diſeaſes attributed to vaccination, are either the inventions of deſigning, or the miſtakes of ignorant, men; and that the prints and publications which have been ſo widely circulated, in order to alarm timorous and uninformed parents, originate either in groſs ignorance or wilful miſrepreſentation.

"They are alſo of opinion, that if due encouragement were given to vaccination,—if the public were fully informed of its advantages, and the benefits of this ſalutary operation were every where offered to the poor free of expence, it would in time ſuperſede the inoculation of the ſmall-pox. One particular advantage of the cow-pox is, that it protects thoſe individuals who ſubmit to the operation, without endangering the health of the community at large; whereas the inoculation of the ſmall-pox keeps up a continual ſource of contagion, and increaſes the fatality of the diſeaſe."

In fine, the college of phyſicians declare, "that they feel it their duty ſtrongly to recommend the practice of vaccination; that they have been led to this concluſion by no preconceived opinion, but by the moſt unbiaſſed judgment, formed from an irreſiſtible weight of evidence which has been laid before them; and that when the number, the reſpectability, the diſintereſtedneſs, and the extenſive experience of its advocates, are compared with the feeble and imperfect teſtimonies of its few oppoſers,—and when it is conſidered that many who were once adverſe to vaccination have been convinced by further trials, and are now to be ranked among its warmeſt ſupporters, the truth ſeems to be eſtabliſhed as firmly as the nature of ſuch a queſtion admits; ſo that the College of Phyſicians conceive that the public may reaſonably look forward with ſome degree of hope to the time when all oppoſition ſhall ceaſe, and the general concurrence of mankind ſhall at length be able to put an end to the ravages, at leaſt, if not to the exiſtence of the ſmall-pox."

"It is highly ſatisfactory to obſerve, that theſe opinions of the royal college of phyſicians of London are ſupported by the concurrent teſtimony of the other colleges of phyſicians and ſurgeons in the United Kingdom.

"The Royal Jennerian Society, aware of the neceſſity of uſing their utmoſt exertions for accompliſhing the great object of their inſtitution, continue to offer gratuitous vaccination to all deſcriptions of perſons, at their Central-houſe, No. 14, Saliſbury-ſquare, Fleet-ſtreet, and at their other ſtations in different parts of the metropolis: as well as to afford their utmoſt aſſiſtance in extending its benefits, by the diſtribution of vaccine matter, with proper inſtructions, and by all other means in their power; and, they truſt, a generous public will enable them further to promote a practice, which is ſo eſſential to the proſperity of the Britiſh empire, and to the welfare and happineſs of mankind."

We refer thoſe who wiſh for further information on this important ſubject, to Dr. Jenner's Inquiry into the Cauſes and Effects of the Variolæ Vaccinæ, or Cow-pox; Dr. Pearſon's Inquiry concerning the Hiſtory of the Cow-pox; Dr. Woodville's Reports on Vaccine Inoculation; Dr. Willan on Vaccine Inoculation; the Evidence at large, by the Rev. George Jenner; Practical Obſervations on the Inoculation of the Cow-pox, by Mr. Bryce, member of the Royal College of Surgeons of Edinburgh; the London Medical Review; the Medical and Phyſical Journal. Alſo, A Treatiſe on the Cow-pox, 2 vols. with plates; a Compendium of Vaccination; an Anſwer to Mr. Goldſon; an Anſwer to Dr. Moſeley; an Anſwer to Mr. Birch; and A Rowland for an Oliver, containing an Anſwer to Dr. Moſeley and Mr. Birch, by Mr. Ring, member of the Royal College of Surgeons of London, to whom we are indebted for this article.

~~COWRING, in *Falconry*, the quivering of young hawks,~~ who ſhake their wings, in ſign of obedience to the old ones.

COWRY, or KOWRY, in *Commerce*, a ſmall ſhell uſed in Hindooſtan, particularly at Calcutta, as a ſmall coin, and brought from the Maldives in exchange for rice. Cowries are alſo uſed as current coin in Africa. It is ſaid that about 100 tons of cowries are annually ſhipped from England alone to Guinea. Theſe are originally imported from the Maldive iſlands to Bengal, and from Bengal into England. In Bengal 80 cowries make a *poni*, and 60 or 65 ponies, as there are few or many cowries in the country, make a rupee. There is, however, a great variation in the value of cowries in Bengal. Ricaud ſays, that 2560 make a rupee; Bolts ſays, 4000 to 4800 are of the ſame value; and Stavorinus makes a rupee equal to 4800, and as high as

colmars, and winter bonchrêtiens, which keep much longer than beurrés, craſanes, &c."

But for ſtandards that have been grafted in the ſpring and have miſſed, he adviſes that they ſhould be cut below the graft, as, when ſo treated, they throw out a great number of ſhoots, which ſhould by no means be too ſoon thinned, as in that caſe they will be liable to be broken by the wind. The weakeſt ſhoots may be begun to be taken off about the latter end of May or beginning of June. About the middle of the latter month they will have acquired conſiderable ſtrength, then thin them, leaving as many ſtrong regular ſhoots, and of thoſe neareſt the top of the ſtem, as will form a handſome head. If the ſtem be very ſtrong, it will be neceſſary, perhaps, to leave more than are intended to be inoculated on purpoſe to receive the ſap, which will flow in great abundance from a large trunk, and without this precaution be apt to burſt the ſhoots. He has often ſeen ſhoots as large as his arm burſt by a ſuperabundance of ſap. When that is likely to happen, the beſt thing is to ſcarify the ſhoots and rub a little of the compoſition into the wound. See Bud, Budding, and Grafting.

INOCULATION, among *Gardeners*, ſignifies an operation in the management of ſome ſorts of fruit-trees, which is frequently denominated *budding*. See Budding, and the preceding article.

Inoculation, in a *ſurgical* and *medical* ſenſe, denotes the practice of deſignedly communicating from one perſon to another certain diſeaſes, which is generally done by introducing ſome of the infectious matter into a ſmall wound, or puncture, made with the point of a lancet. The common purpoſe of ſuch operation is to diminiſh the ſeverity and peril of a diſtemper, which, taken in a caſual way, proves exceedingly deſtructive, and the hazard of catching which, at ſome period of life or another, is very conſiderable. A chief object of the plan is alſo, in general, to render the patient incapable of being again affected by the dreaded contagion. Hence inoculation is ſeldom performed, but for a diſeaſe with which the human conſtitution can only be affected once, as the ſmall-pox and cow-pox. The latter, which is ſo mild as ſcarcely to deſerve the name of a diſeaſe, being only communicable by contact, and exiſting originally no where except upon the teats and udders of cows, would never perhaps have troubled any other perſons than a few milkers, had it not been for the diſcovery of the important fact, that perſons who had undergone the complaint were made completely unſuſceptible of the ſmall-pox contagion. The cow-pox inoculation has now, therefore, been very generally ſubſtituted for that with variolous matter, and the beneficial conſequences of this change are ſo truly important that the Jennerian diſcovery will ever be regarded as a moſt memorable event, not only in the annals of medicine and ſurgery, but in the hiſtory of the world. See Cow-Pox and Vaccination.

Although it is our intention to devote this article to the hiſtory of the ſmall-pox inoculation, we may here remark, that the meaſles have been propagated by inoculation. Dr. Home, of Edinburgh, was the firſt who actually made the experiment. Not being able to collect either matter, or a ſufficient quantity of broken cuticle at the time of deſquamation, to produce the diſeaſe, he drew blood from a ſuperficial cutaneous vein, where the eruption was thickeſt. Cotton was then dipped in this blood, and applied to a wound made in each arm of the perſon about to be inoculated. In this manner Dr. Home inoculated twelve perſons. The eruptive fever generally began ſix days after inoculation; the ſymptoms were leſs ſevere; the cough was milder, or entirely abſent; and the inflammation of the eyes was trifling. Notwithſtanding Dr. Home's ſucceſs, inoculation for the meaſles is ſeldom or never practiſed, others, who have made the experiment, not having given reports equally favourable.

Inoculation for the plague has likewiſe been tried, in order to aſcertain whether that diſtemper might not be rendered leſs fatal and leſs prevalent in particular parts of the world. In Egypt, Dr. Whyte inoculated himſelf with matter taken from the buboes of an infected perſon. The attempt failed twice; and the third proval fatal in three days after the commencement of the ſymptoms. See ſir R. Wilſon's Hiſt. of the Expedition to Egypt.

In the preſent ſtate of our information, inoculation for the plague appears unjuſtifiable. It was aſcertained in Egypt, that many of the convaleſcents took the plague a ſecond time; nor, in all probability, does inoculation render this diſtemper milder. Indeed, what M. Sonnini obſerves, ſeems to lead to a contrary concluſion; for he mentions, that a Ruſſian ſurgeon, who was a priſoner at Conſtantinople, with a number of his countrymen, took it into his head to inoculate theſe unfortunate men with the plague, under the idea of rendering the contagion leſs deſtructive; but the reſult was, that two hundred loſt their lives, as well as the ſurgeon, who had alſo inoculated himſelf. See Sonnini's Travels into Greece and Turkey, p. 497.

The idea of intentionally imparting any kind of diſeaſe to the human body would appear, to perſons unacquainted with the reaſon of the thing, equally extraordinary and cruel. But the deſign and utility of the inoculation for the ſmall-pox are now ſo fully known among all claſſes of ſociety, as ſcarcely to need explanation. When it is remembered, that the ſmall-pox contagion has, at various periods, nearly depopulated extenſive kingdoms, and occaſioned greater deva ſtation than the moſt deſtructive wars, any meaſure, calculated to render milder ſo terrible a diſeaſe, muſt be looked upon as a diſcovery of the very higheſt importance. It has been eſtimated, that, upon an average, before the introduction of inoculation, one out of every ſix perſons affected with the natural ſmall-pox, or ſometimes even a half, periſhed; but that the proportion of deaths, among ſuch as have been inoculated in the moſt improved manner, does not amount to more than one in ſeveral hundreds. Beſides this circumſtance, we have to mention, that before inoculation became common, the ſmall-pox frequently committed ravages like the plague, and the fury of the diſtemper was always dreadful whenever the contagion made its firſt viſit to a country. If, then, we are to hail the ſmall-pox inoculation as a general and momentous benefit to ſociety, on the principles juſt now ſpecified, with what joy and admiration muſt we behold the diſcovery of a complete ſecurity againſt the ſmall-pox infection, in the new and perfectly ſafe kind of inoculation with vaccine lymph. The ſmall-pox inoculation materially alleviated the calamities ariſing from that contagion, by making the diſeaſe milder, and leſſening its mortality. But, ſtill, the diſtemper was not unfrequently ſeen in a ſevere form; at leaſt one out of every three or four hundred inoculated died; and the countenances of thoſe who ſurvived were often miſerably pitted and diſfigured. On the other hand, the vaccine inoculation hardly ever produces any ſerious indiſpoſition, and being followed by no eruption, cannot deform the face. Its ſafety and efficacy are daily receiving more and more confirmation from all quarters of the world, and we have no doubt that, after prejudices have had time to ſubſide, the ſmall-pox inoculation will be univerſally ſuperſeded.

The original introduction of inoculation, however, will always conſtitute a moſt memorable event in hiſtory, and is

a ſubject too intereſting to be omitted in our work. After a few obſervations on the commencement of the ſmall-pox, we ſhall therefore endeavour to give ſome account of the riſe and progreſs of the practice.

Origin of the Small-pox.—The ſmall-pox, like the meaſles, and ſeveral other diſeaſes, is produced by a matter *ſui generis*, or, in other words, by a ſpecific contagion, and it has originated from cauſes ſo perfectly incomprehenſible, as to ſet at defiance all rational conjecture. From the ſilence of the ancient Greeks and Romans reſpecting a diſeaſe ſo very fatal, and of ſuch peculiarity, as the ſmall-pox, it is reaſonable to conclude, that its date is ſubſequent to their times, and, conſequently, that the world exiſted ſeveral thouſand years before it was viſited by this dreadful peſtilence. Rhazes, an Arabian phyſician, who practiſed at Bagdad in the beginning of the tenth century, is one of the oldeſt writers on the ſmall-pox, whoſe works are ſtill extant. On this ſubject, however, he quotes ſeveral of his predeceſſors, the moſt ancient of whom is Ahron, who was a prieſt and phyſician at Alexandria, when that city was beſieged by the Saracens. Ahron's book has, therefore, been deemed the firſt in which any notice is taken of the ſmall-pox. The introduction of the diſeaſe, at that time, into Egypt, might have been by the armies of Amrou, which, in the kaliphate of Omar, poured in thither from Arabia.

The celebrated Dr. Friend conceived, that the Arabians might originally have derived the contagion from ſome of the more diſtant regions of the Eaſt, and Père D'Entrecolles, a miſſionary jeſuit at Pekin, informs us, that, upon looking over ſome Chineſe books, he found the ſmall pox mentioned in them as a diſeaſe known in very ancient times. See "Lettres edifiantes et curieuſes," tom. 21. p. 33. ed. 1781.

Mr. Holwell, a Bengal ſurgeon, has likewiſe endeavoured to confirm the accuracy of Dr. Friend's opinion, obſerving, that, "at the period in which the Aughtorrah Bhade ſcriptures of the Gentoos were promulged, (according to the Bramins 3366 years ago,) this diſeaſe muſt then have been of ſome ſtanding, as thoſe ſcriptures inſtitute a form of divine worſhip, with poojahs, or offerings, to a female divinity, ſtyled by the common people Goote ka Tagooran, the Goddeſs of Spots, whoſe aid and patronage are invoked during the continuance of the ſmall-pox ſeaſon; alſo in the meaſles, and every cutaneous eruption that is in the ſmalleſt degree epidemical. See "An Account of the Manner of inoculating the Small-pox in the Eaſt Indies," p. 7.

On the other hand, Dr. Woodville is unwilling to admit, that the ſuppoſed antiquity of the ſmall-pox in India is at all proved by what D'Entrecolles and Mr. Holwell have obſerved. He remarks, that the former has adduced no direct fact, ſhewing, that the diſeaſe was really deſcribed by the ancient Chineſe phyſicians; while Mr. Holwell's reaſons muſt be inconcluſive, not only as founded on the verity of the Hindoo chronology; but becauſe the Goddeſs of Spots was not ſuppoſed to preſide over any particular eruptive diſorder, but over all cutaneous affections that were epidemical. Beſides, as Dr. Woodville juſtly notices, had the ſmall-pox exiſted in India more than 3366 years, it could not fail to have been tranſported in early times both to the Greeks and Romans, by the conſtant intercourſe, which they indirectly maintained with the Indian nations.

Dr. John James Reiſke mentions, that, in an old Arabic MS. preſerved in the public library at Leyden, he read, that, in the year of the birth of Mahomet, the meaſles and ſmall-pox made their firſt appearance in Arabia. Diſp. inaug. Lugd. Bat. 1746. Now it appears alſo from ſome Arabian annals, procured by that adventurous traveller, Mr. Bruce, that the era of the firſt appearance of the ſmall-pox in Arabia attaches to that of the ſiege of Mecca, and that the Abyſſinian army, commanded by Abrahah, was the firſt victim of its fury. Mr. Gibbon ſtates, that the ſiege of Mecca happened only two months before the birth of Mahomet; a fact, which Dr. Woodville points out as deſerving very particular notice; for if the year of the birth of Mahomet be aſcertained to be alſo that of the ſiege of Mecca, the Arabian MS. cited by Dr. Reiſke, and that written by Hameeſy, the Arabian author mentioned by Mr. Bruce, perfectly coincide. According to Gibbon, Mahomet was born A.D. 569; which, on the above independent authorities, is to be conſidered as the period when the ſmall-pox firſt made its appearance in Arabia.

From this era, to that of the conqueſt of Alexandria in 640, no traces of the exiſtence of the ſmall-pox are to be diſcovered; but the diſeaſe certainly ſpread into that city at the time it was inveſted by the Saracens; and, as Dr. Woodville ſtates, it may therefore be ſuppoſed to have been brought into Egypt by the Mahometan army, which, ſix years before, had invaded Perſia and Syria, where this deſtructive peſtilence probably had already made a conſiderable progreſs.

After this period, to the revival of literature in the 15th century, ſucceeded that general ſtate of ignorance and barbariſm, during which the preſent ſubject, in common with many others, is ſo obſcured in the darkneſs of the times as to elude the moſt diligent reſearch.

It is manifeſt from the works of Rhazes, that many of the Arabian phyſicians had written on the ſmall-pox before the 10th century; and notwithſtanding the Saracen hiſtory is ſilent on the ravages which muſt have accompanied the general diffuſion of the ſmall-pox during the empire of the caliphs, the progreſs and prevalence of the diſtemper are to be inferred from collateral evidence. Thus, the caliph Yezid, who died in 683, is mentioned as being pitted with the ſmall-pox; and the caliph Abul-Abbas Alſaffah actually died, in 753, of this diſeaſe.

The time when the ſmall-pox contagion firſt ſpread into Great Britain is involved in doubt. Moſt writers ſuppoſe that the diſtemper was imported into Europe by the cruſaders, upon their return from the Holy Land in the 13th century. The improbability of this ſtatement is inſiſted upon by Dr Woodville, who adverts to the known activity of variolous matter, the long time it retains its infectious quality, and the unlikely circumſtance of the ſmall-pox prevailing ſix or ſeven centuries over various parts of Aſia, having free intercourſe with Europe, before it was conveyed into this kingdom. It is indeed ſurpriſing, that the dreadful effects which muſt have attended the firſt introduction of the ſmall-pox into this as well as any other country, have eſcaped the notice of all our hiſtorians and medical writers. But, by examining ſome of the MSS. of the Harleian and Cottonian collections, preſerved in the Britiſh Muſeum, and bearing indubitable evidence of having been written before the year 900, Dr. Woodville ſucceeded in tracing the exiſtence of the ſmall-pox in our iſland, and on the neighbouring continent, long before the cruſades took place. In theſe curious records the word *variolæ* occurs ſeveral times in the ſame ſenſe in which it is now uſed. We likewiſe learn from the MSS. that the people in thoſe early times lived in continual dread of the ſmall-pox, as ſeveral prayers, exorciſms, and incantations, to which they had recourſe for preſervation, are to be found. Dr. Woodville refers us to No. 585, of the Harleian Catal. vol. i, and Bibl. Cotton. Caligula A. 15. No. 30.

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The firſt Britiſh medical writers of any note were thoſe of the 13th century, and they, as well as all their ſucceſſors, from John of Gaddeſden to the immortal Sydenham, &c. have beſtowed much attention on this important diſtemper.

Hiſtory of Inoculation of the Small-pox.—The exact part of the world where inoculation was firſt adopted is quite unknown; nor do we poſſeſs any information of the circumſtances which originally ſuggeſted the benefit that might reſult from the practice. From the Arabian phyſicians having been the firſt informed of the nature and treatment of the ſmall-pox, it has been ſuppoſed that inoculation had its origin among them. (See Second Memoire ſur l'Inoculation par M. de la Condamine.) Avicenna, who lived at Bokhara on the eaſt coaſt of the Caſpian ſea, or his diſciples, have in particular been ſuſpected of being the authors of this valuable invention, in conſequence of the countries between the Caſpian and Euxine ſeas being the ſuppoſed centre from which inoculation ſpread to other places. Dr. Woodville, however, conſiders this conjecture as very ill-founded. He contends that we have no evidence that any of the people near the Caſpian ſea were the firſt practiſers of inoculation. Had the invention originated in this part of the world, the Tartars could hardly have been ſo ignorant of the practice, as, according to D'Entrecolles, they actually were in the year 1724. Nor is it probable that the method ſpread from weſt to eaſt; for as the ſame author has obſerved, inoculation is more ancient in the eaſtern parts of China than it is in the weſtern provinces of that empire. Dr. Woodville remarks that inoculation was certainly firſt introduced into Conſtantinople from the Morea; but as the event did not take place till towards the end of the 17th century, we may conclude, that, had the art been practiſed for many ages, at ſo ſhort a diſtance from that metropolis, it would have been known there much ſooner. Beſides, in various countries, very remote from the Caſpian ſea, it is proved to have been an immemorial uſage.

Inoculation was introduced into London as a foreign invention, and, from its ſucceſs upon the younger branches of the royal family in 1722, became the ſubject of public converſation, when, to the great ſurpriſe of the learned, ſeveral communications proved that it was already a practice known in South Wales, where it had exiſted under the denomination of buying the ſmall-pox as far back as tradition could be traced. The manner of inoculating, or buying the ſmall-pox, here alluded to, was ſubject to variety. Some perſons either rubbed the matter, taken from the puſtules, when ripe, on ſeveral parts of the ſkin of the arms, &c. or pricked ſuch parts with pins, or other pointed things, firſt infected with the ſame matter. Some ſcraped the ſkin with a knife, until the blood began to flow, before they applied the variolous pus. Others produced the diſtemper by holding a certain number of dried puſtules, for a conſiderable time, in the palm of the hand. (See the Letters of Dr. Williams, Mr. Owen, and Mr. Wright, in the Philoſophical Tranſactions for 1722, and Dr Jurin's account of the ſucceſs of inoculation in 1723.) The inhabitants of the Highlands of Scotland have alſo for many ages performed a kind of inoculation by tying worſted threads, moiſtened with variolous matter, round the wriſts of their children. (Monro on Inoculation in Scotland.) The ſame cuſtom likewiſe prevailed in many other parts of Europe, Aſia, and Africa; and, what is highly curious, the practice was, in ſeveral of theſe diſtant countries, termed *buying the ſmall-pox*, juſt as it was in South Wales; for it was ſuperſtitiouſly imagined that inoculation would not produce the proper effect, unleſs the perſon from whom the variolous matter was taken received a piece of money, or ſome other preſent, in exchange. The practice of buying the ſmall-pox has been found to have prevailed from time immemorial, not only in South Wales, but alſo at Naples, Pavia, in Auvergne and Perigord, and among the peaſantry in many parts of Germany, Denmark, and Sweden. See Second Mem. ſur l'Inoculation, par M. de la Condamine; Murray's Hiſtoria Inſitionis Variolarum in Suecia; Schultz's Account of Inoculation, &c.

In Barbary and the Levant the variolous matter was alſo purchaſed, and inſerted in a ſmall inciſion made in the fleſhy part of the hand between the thumb and the fore-finger. (See Shaw's Travels into Barbary and the Levant.) In Tripoli, Tunis, and Algiers, an inciſion was made on the back of the hand, between the thumb and fore-finger, and a little of the variolous matter put into the wound. According to Dr. P. Ruſſel, inoculation is ſo ancient in theſe laſt kingdoms that nobody remembers its firſt riſe; and it has been practiſed not only by the inhabitants of the towns, but alſo by the wild Arabs. (See Phil. Tranſ. vol. lvi. p. 140.) It appears, moreover, from this gentleman's account, that buying the variolous matter and inoculating have been ancient cuſtoms at Bagdad, Moſul, and Baſſora, in Armenia, at Damaſcus, and all along the coaſt of Syria and Paleſtine. The Arabs aſſured Dr. Ruſſel that the puncture might be made indifferently in any fleſhy part; but he moſtly found the mark between the thumb and fore-finger. Some of the Georgians had been inoculated in the ſame part, though moſt of them in the fore-arm. Some of the Armenians had been inoculated in both thighs; but the greater part, like the Arabs, bore the mark upon the hand.

D'Entrecolles, by obtaining acceſs to ſeveral medical books at Pekin, diſcovered one in which an account was given of the introduction of inoculation into China. The author of the book here alluded to, lived in the latter part of the dynaſty of Ming. Hence it has been concluded that inoculation has not yet been practiſed in China 200 years. But in Hindooſtan the cuſtom can be traced much farther back. The methods of practiſing this art by the Chineſe and Hindoos are alſo ſo widely different, that they cannot have been derived from the ſame origin. The Chineſe take from two to four dried variolous puſtules, or ſcales (according to their ſize), between which they place a ſmall portion of muſk; the whole is then wrapped up in cotton, and introduced into the patient's noſtril. The ſcales before uſed are kept in a cloſe jar for ſeveral years, and when the Chineſe are obliged to employ recent puſtules, they think it neceſſary to correct the acrimony of the matter, by expoſing it to the ſteam of an infuſion of the roots of ſcorzonera and liquorice. They ſometimes reduce the dried ſcales into powder, and form them into a paſte for the purpoſe of inoculation.

Dr. Woodville very properly obſerves, that the application of variolous matter, wrapped in cotton, within the noſtrils, muſt be an exceedingly precarious mode of communicating the ſmall-pox, and may perhaps afford a reaſon why inoculation in China is leſs ſucceſsful than in other countries; for if the matter acts in the way of inoculation, a troubleſome inflammation of the Schneiderian membrane muſt enſue; and, ſhould not this take place, the variolous effluvia, by being inhaled into the lungs, will produce the natural ſmall-pox.

In Hindooſtan inoculation is performed by a particular tribe of Bramins. They do not refuſe to inoculate on any part; but, in males, they prefer the outſide of the arm, midway between the wriſt and the elbow, and, in females, the ſhoulder. The operator firſt rubs the part with a dry cloth for eight or ten minutes, and then ſlightly pricks it

at many points. He next takes a ſmall pledget of cotton, charged with the variolous matter, moiſtens it with two or three drops of the Ganges water, applies it to the punctured part, fixes it there with a bandage, and orders it to be kept on for ſix hours. The bandage is then to be taken off, the pledget being left to fall off of itſelf. The matter in the cotton is always taken from puſtules of the preceding year, freſh matter, and ſuch as is the product of the natural ſmall-pox, being conſidered improper. See Holwell's Account of the Manner of inoculating in the Eaſt Indies.

It was immediately from Conſtantinople that the Engliſh firſt derived a full knowledge of the advantages of inoculation. The beneficial conſequences of the practice among the Turks, were detailed by Dr. Emanuel Timoni, communicated by Dr. Woodward to the Royal Society, and publiſhed in the Tranſactions of that body for the year 1714. The Byzantine mode was to take ſome freſh variolous matter in a glaſs veſſel, and drop it on punctures or ſcratches made with a needle or lancet in any fleſhy part, but eſpecially in the arm and fore-arm. The matter, which was dropped on the punctured place, was well blended with the drops of blood iſſuing from the wounds, by means of a blunt ſtile or ear-picker. The part was then kept covered with a walnut ſhell for a few hours, in order to prevent the matter from being rubbed away.

Another account of the Byzantine mode of inoculation was afterwards publiſhed by Dr. Pylarini in the ſame volume of the Tranſactions of the Royal Society for 1716. But the year before this gentleman's obſervations appeared, ſurgeon Kennedy had printed an account of the new method of inoculating at Conſtantinople, in his "Eſſay on External Remedies," and he ſeems to be the firſt Britiſh author on the ſubject of inoculation. Soon afterwards, lady Mary Wortley Montague, the wife of the Engliſh Ambaſſador at Conſtantinople, in her letters, confirmed the accounts of the remarkable manner in which the ſeverity and mortality of the ſmall-pox were diminiſhed among the Turks by means of inoculation; and, in one of her epiſtles from Adrianople, ſhe expreſſed her intention to try the experiment upon her own little ſon. See vol. ii. let. 31.

The mode of performing the operation at Conſtantinople gradually became more and more ſimple. We learn from Pylarini, that, in 1701, inciſions were made in the forehead, cheeks, chin, and alſo in the extremities, for the purpoſe of inoculation. Timoni likewiſe, twelve years afterwards, mentions, that the operator is to make ſeveral little wounds in one or more places of the ſkin, and theſe ſucceed beſt in the fleſhy parts of the arm. In the year 1717, the inſertion of variolous matter, at a ſimple puncture in each arm, ſeems to have been the prevailing method of inoculation, as will appear by the following relation: Mr. Maitland, ſurgeon to the honourable Wortley Montague in his diplomatic character at the Ottoman court, informs us, that the ambaſſador's lady, being convinced of the advantages of inoculation, determined that her only ſon, then ſix years of age, ſhould undergo the operation. For this purpoſe, ſhe deſired Mr. Maitland to procure the variolous matter from a proper ſubject, which being done, an old Greek woman, many years in the conſtant habit of inoculating, was employed to inſert it. "But (ſays Mr. Maitland) the good woman went to work ſo awkwardly, and, by the ſhaking of her hand, put the child to ſo much torture with her blunt and ruſty needle, that I pitied his cries, and therefore inoculated the *other arm* with my own inſtrument, and with ſo little pain to him, that he did not in the leaſt complain of it." (Maitland's Account of Inoculating the Small-pox, p. 7.) The conſequent diſeaſe was very mild, and, if the mode of buying the ſmall-pox be excepted, this inoculation, which was done at Pera, near Conſtantinople, in March 1717, was the firſt ever practiſed upon any Engliſh ſubject.

The inoculation of the ſmall-pox was firſt regularly adopted in England in the month of April 1721. The practice, in all probability, would not have been ſo ſoon purſued by the faculty, had it not been for the enlightened and philoſophic mind of lady Mary Wortley Montague. After this celebrated lady had witneſſed the good effects of inoculation upon her ſon at Pera, ſhe determined alſo to try it upon her daughter, then an infant three months old; but for certain domeſtic reaſons, the operation was at that time deferred, ſo that this child was fortunately reſerved to be the firſt example of inoculation in England, which was done by Mr. Maitland, in April 1721. According to Dr. Woodville, writers have univerſally erred, in dating this event in April 1722, and making it ſubſequent to the inoculation of the malefactors at Newgate. He notices that Mr. Maitland's pamphlet, in which all the circumſtances are ſtated, was publiſhed in February 1722, as appears by the advertiſement prefixed to the work. Therefore Mr. Maitland, in ſaying April *laſt*, could mean no other than that in the year 1721. Beſides, Mr. Maitland expreſsly mentions, that this was the firſt example of inoculation in England.

After the ſucceſsful reſult of this caſe, Mr. Maitland performed the ſecond inoculation ever done in this country, in the month of May 1721, upon the ſon of Dr. Keith, and with the beſt effects. Notwithſtanding theſe confirmations at home of the favourable accounts of the practice which had been already received from Conſtantinople, and notwithſtanding the firm and powerful patronage which the Byzantine inoculation met with in lady Mary Wortley Montague, it is a fact, that ſuch was the ſuſpicious caution with which the method was received, that ſeveral months elapſed before a third trial of it was made in London. Indeed, the very next experiment that was undertaken ſtrikingly evinces the dangerous light in which inoculation was ſtill regarded; for it was determined that ſeveral culprits in Newgate, who had forfeited their lives to the laws of their country, ſhould, on ſubmitting to be inoculated, receive full pardon by the royal prerogative. Six condemned criminals were inoculated by Mr Maitland, on the ninth day of Auguſt 1721, in the preſence of ſeveral eminent phyſicians and ſurgeons. Theſe malefactors all obtained a remiſſion of their ſentence on very eaſy terms. None of them had the diſeaſe ſeverely, and one, who had already had the ſmall-pox, was of courſe not affected a ſecond time. A ſeventh criminal, a young woman, was next pardoned, on condition of having the Chineſe method of inoculating tried upon her, at the wiſh of Dr. Mead. Conſequently, ſome cotton, moiſtened with variolous matter, was introduced in her noſtrils; the diſtemper followed in a mild form: but the patient ſuffered violent pains in her head, from the commencement of the eruption to the maturation of the puſtules.

After theſe public proofs of the ſafety and advantage of inoculation, objections and doubts were ſtill adduced againſt the method. Some conſidered the caſes too few, while others, in conſequence of the ſmall number and mildneſs of the puſtules, thought it doubtful whether the genuine ſmall-pox had been at all communicated. Hence, in the courſe of the following ſix months, Mr. Maitland inoculated only eight ſubjects, who all recovered, though two, it muſt be confeſſed, had the ſmall-pox ſo ſeverely, as to be for ſome time in danger. See Maitland's Account of Inoculating the Small-pox, 1722.

Maitland's publication was immediately afterwards followed by a letter from Dr. Nettleton, who, in December 1721,

1721, and the two ſubſequent months, had inoculated with ſucceſs upwards of forty perſons at Halifax, in Yorkſhire. This relation influenced the public very conſiderably in favour of the new mode of communicating the ſmall-pox.

Early in the ſpring of the year 1722, inoculation began to be adopted in various parts of England; and by order of her royal highneſs the princeſs of Wales, it was practiſed firſt upon ſix, and afterwards upon five charity children, belonging to the pariſh of St. James's. The ſucceſs of theſe trials induced her royal highneſs to have the princeſſes Amelia and Carolina inoculated on the nineteenth of April 1722, by ſerjeant ſurgeon Amyand. Both theſe younger branches of the royal family paſſed through the ſmall-pox, in a very favourable manner; and inoculation, in conſequence of this illuſtrious example, was now making a rapid progreſs: when unfortunately the practice received a great check, by the death of the earl of Sunderland's ſon, and by that of lord Bathurſt's ſervant, after being inoculated. A Miſs Rigby alſo died, about eight weeks after her inoculation, making the third death. Therefore, out of 182 inoculations, in 1721 and 1722, three died; or nearly one in ſixty.

About the time when the firſt death happened in London, accounts were received in town, ſtating that the practice had been tried to a much greater extent in New England. It appears that, after an abſence of nineteen years, the ſmall-pox had broken out with a great mortality at Boſton, in April 1721. This induced the Rev. Mr. Mather to publiſh the account of inoculation, as related in the Philoſophical Tranſactions by Timoni and Pylarini. This publication, which was diſtributed to all the medical practitioners at that place, was the means of inciting Dr. Boylſton to commence the practice of inoculation upon his own child, and two negro ſervants, at the latter end of June 1721. In the courſe of ſix months, he inoculated in and about Boſton 244 perſons. Of this number ſix died.

The reports which came from New England, were employed with great exaggeration by the opponents of inoculation, who ſeized with avidity every circumſtance that might have the leaſt tendency to retard the progreſs of the improvement.

During 1723, the practice of inoculation became much more general in England, the number of inoculated this year far exceeding the numbers in the two preceding years taken together. It amounted to 292, which, added to 182, makes the whole number of inoculations in the years 1721, 1722, and 1723, to be 474, of which number, according to Dr. Jurin, nine died.

It deſerves notice, that ſeveral of theſe nine caſes were not generally admitted as deaths altogether in conſequence of inoculation. But even allowing that they were ſo, the chance of recovering from the inoculated ſmall-pox muſt appear infinitely greater than from the caſual. For it was proved, that at this time, out of 14,559 perſons who had been affected with the natural ſmall-pox, 2351 died; nearly one in ſix, or five out of thirty-one.

In 1724, there were only forty perſons inoculated. Their royal highneſſes prince Frederick and prince William, however, were in this ſmall liſt. Dr. Jurin accounts for the ſeeming decline of inoculation this year, by the fact that people will not eaſily ſubmit to a practice in which they apprehend riſk, unleſs impelled by the dread of a greater danger. Now it appears that in 1724, the natural ſmall-pox was much leſs fatal than in 1722 and 1723, and it is to this cauſe we are to refer the above ſmall number of inoculations. That the practice had not fallen into diſrepute is manifeſt; for Dr. Jurin informs us that in 1725 the natural ſmall-pox was very mortal, and of courſe, people being frightened, reſorted to inoculation again in a larger number. Of the above-mentioned forty, one is recorded to have died.

In 1725 and 1726, 256 perſons were inoculated, of which number four died.

In the years 1727 and 1728, the practice of inoculation did in reality begin to decline; for, though the ſmall-pox was very prevalent and fatal, only 124 inoculations took place in theſe two years, and three of the caſes proved fatal.

We find that up to 1729, 897 perſons had been inoculated in England, of whom ſeventeen are reported to have died. But on the other hand, the records ſhew, that of 18,229 perſons, who had been affected with the natural ſmall-pox, during the firſt eight years of inoculation, 3008 died under the diſeaſe; or about one in ſix; whereas, the deaths by inoculation, admitting the utmoſt number contended for, does not exceed one in fifty. The reaſon why more died of inoculation at this early period of the practice than has been the caſe of late years, is juſtly aſcribable to the better manner lately adopted of treating inoculated patients. Beſides, formerly it was common to inoculate adults, in whom the diſeaſe is more diſpoſed to aſſume a ſevere form than in children.

Inoculation was not regularly practiſed in Scotland till the year 1726, when Mr. Maitland performed this operation upon ten perſons; but as one of theſe caſes was unſucceſsful, the practice was diſcontinued in that country for twenty years afterwards, and was not revived again without conſiderable difficulty. At Dumfries, indeed, where the caſual ſmall-pox had committed great ravages, inoculation was had recourſe to in 1733; but in moſt other parts of North Britain the method was not introduced till 1753.

In Ireland, inoculation was firſt performed at Dublin in 1723. Twenty-five perſons were inoculated in that and the three following years. Of this ſmall number, three caſes terminated fatally.

Inoculation at Hanover was firſt performed in 1724, by Mr. Maitland, upon his royal highneſs prince Frederick, and afterwards upon eight children of the Baron de Schulenberg. The example and ſucceſs of theſe caſes had the effect of eſtabliſhing the practice in that country.

After 1729, inoculation was ſeriouſly on the decline in England; but it made conſiderable progreſs in the tranſatlantic world. In South Carolina, about the year 1738, not leſs than 800, or 1000 perſons were inoculated, of whom only eight died. The account of this ſucceſs contributed materially to revive the practice in Great Britain. In Philadelphia, likewiſe, inoculation proved ſoon afterwards ſtill more favourable; and in St. Chriſtopher's 300 ſlaves were inoculated, without the loſs of one.

Such facts in favour of the practice, and the great fatality of the natural ſmall-pox in Britain, ſoon led people to adopt inoculation more extenſively than ever, and from the year 1738, this beneficial method may be regarded as having been completely and generally eſtabliſhed, though partial oppoſition prevailed long afterwards.

In the year 1746, the inſtitution called the Inoculation Hoſpital had its riſe, though it was not at firſt ſo conſiderable an eſtabliſhment as at preſent. Here the ſucceſs of inoculation did not diſappoint the hopes and zeal of its patrons; for out of 593 caſes of perſons ſucceſſively inoculated, from the year 1751, only one proved unſucceſsful.

In 1754, it was determined to inoculate the three royal children, who had not yet had the ſmall-pox. In the mean time, his preſent majeſty took the diſeaſe caſually, ſo that only the prince Edward, and the princeſs Auguſta, were

inoculated. Theſe great examples, and the public approbation of the practice declared by the College of Phyſicians, gained numerous advocates to the cauſe, which never afterwards loſt ground, till the ſtill ſafer and milder mode of inoculation with vaccine lymph was brought into notice by the immortal Jenner.

In France, Dr. Boyer is the firſt writer who has noticed inoculation, which he did in 1717. In 1723, the ſucceſsful trials of inoculation in England were publiſhed at Paris by Dr. de la Coſte, and the conſequence was a declaration by the phyſicians of that city, "that for the benefit of the public, it was lawful to make trials of inoculation." The practice was on the point of having a beginning in the hoſpitals, under the ſanction of the duke of Orleans, the regent, when, unfortunately for the experiment, this nobleman died, and ſoon afterwards Dr. Hecquet publiſhed his "Raiſons de doute contre l'Inoculation." The ſentiments contained in this publication, and in a theſis written at Paris in 1723, the reports of the ill ſucceſs of inoculation at Boſton, and the great mortality of the natural ſmall-pox in London, in 1723, falſely aſcribed to the new practice, ſoon brought the method into diſrepute in France, and the deſign of trying it there was laid aſide.

The French paid little attention to the ſubject again till 1752, when Dr. Buttini, of Montpelier, publiſhed at Paris his "Traité de la Petite Verole communiquée par l'Inoculation." Two years afterwards, M. de la Condamine read his excellent memoir upon the advantages of inoculation, before a public aſſembly of the Royal Academy of Sciences at Paris. But, according to Dr. Woodville, the practice was not introduced into France till the 1ſt of April 1755, when, at the deſire of M. Turgot, a child, four years old, was inoculated at Paris. On the 14th of May, M. Chaſtellux, aged 21, voluntarily ſubmitted to the operation. About this time, Dr. Hoſty, who had been attending the ſmall-pox and inoculation hoſpitals in London, at the requeſt of the French miniſter, publiſhed at Paris the following report:—"That out of 463 caſes of perſons laſt inoculated in the hoſpital, only one had been unſucceſsful; whereas, in the Small-pox hoſpital, it appeared by the regiſters, that nearly one in four had died of the natural ſmall-pox."—"That Mr. Ranby, principal ſurgeon to his majeſty, had inoculated 1600 perſons; and that Mr. Bell, pupil to Mr. Morand, had inoculated 903, without the loſs of one."—"That in order to form a juſt comparative view of the fatality of inoculation and of the natural ſmall-pox, it is only requiſite to viſit the two hoſpitals in London, the difference of their reports being ſo remarkable, that it muſt convince the moſt incredulous of the advantages of inoculation." Laſtly, "with reſpect to the inoculation of other diſeaſes along with the ſmall-pox, that no inſtance of the kind has ever been produced; and that perſons have been inoculated with variolous matter, taken from a patient affected with the venereal diſtemper, yet have thereby received the infection of the ſmall-pox only."

This ſtatement had immenſe effect in promoting the introduction of inoculation into France; and in the year 1756, the family of the duke of Orleans, and great numbers of the firſt rank, were inoculated by Drs. Tronchin, Hoſty, and others. In 1758, the practice had diffuſed itſelf over various parts of France. The inoculated were not, however, very numerous, and one or two unſucceſsful caſes, joined with falſe reports, that ſome perſons had taken the natural ſmall-pox after undergoing inoculation, once more caſt diſcredit upon the plan, and excited a violent controverſy. The great fatality of the ſmall-pox at Paris in 1763, being imputed to inoculation, the practice was forbidden by parliament. At length the faculty of phyſic, and that of theology, were called upon to decide, whether inoculation ought to be tolerated or proſcribed. This meaſure ſerved to increaſe the diſputes; nor was it till a very late period that inoculation was extenſively practiſed in France.

In Holland, inoculation was begun at Amſterdam in 1748 by Dr. Tronchin, who, on finding one of his ſons ſeized with the natural ſmall-pox, immediately inoculated the other. This phyſician, after his return from Geneva, in 1754, inoculated a great many perſons in Holland. Dr. Schwenke, at the Hague, likewiſe promoted the practice; and ſo did a ſociety of phyſicians and ſurgeons at Rotterdam, who were aſſociated for the purpoſe in 1757. The method was not, however, very generally adopted by the Dutch, till after 1764, about which time Morand and others had practiſed it at Amſterdam with ſtriking ſucceſs.

Inoculation was firſt introduced into Denmark in September 1754, when the counteſs of Bernſdorff underwent the proceſs. In 1758, two inoculation houſes were eſtabliſhed at Copenhagen; and, in 1760, the prince royal was inoculated with ſucceſs.

In Sweden, the firſt trial of inoculation was made by Haartman in 1754. The rapid progreſs of the method in Sweden was owing to the encouragement afforded by the Swediſh court. Dr. D. Schultz was deputed to enquire into the ſucceſs of the plan at the inoculation hoſpital in London, and the accounts which he gave upon his return to Stockholm in 1755, led to the eſtabliſhment of inoculation houſes in different parts of Sweden. In 1757, the benefits of inoculation were commemorated by a medal.

Inoculation was firſt introduced at Geneva in 1751, whence it paſſed into Switzerland in 1753. In the latter country, it was firſt performed at Lauſanne by a lady on her own child.

Inoculation commenced in Italy during the great mortality occaſioned in Tuſcany and Rome by the ſmall-pox in 1754. Dr. Peverini was the firſt inoculator, putting out of conſideration the cuſtom which had long prevailed in the interior of the country, of women ſometimes artificially communicating the ſmall-pox to their children. In 1755, M. de la Condamine was at Rome, where, by his writings and perſonal influence, he ſucceeded in reconciling many to the practice. Before 1765, inoculation was practiſed with ſucceſs at Venice, Padua, Verona, Breſcia, Mantua, Bologna, Milan, Parma, &c. In ſhort, Naples was the only important place where the method had not been introduced.

Inoculation was begun at Hanover almoſt as ſoon as in England. The oppoſition of De Haen, however, kept back the improvement in moſt other parts of Germany. The Pruſſians and Auſtrians were the laſt to adopt it. At Vienna, inoculation did not make any progreſs till 1765. The younger branches of the imperial family were inoculated in 1768, and ſhortly afterwards the emperor eſtabliſhed an inoculation hoſpital in the ſuburbs of Vienna.

Owing to ſome unfortunate events of the firſt inoculations at Berlin, the practice was ſoon diſcountenanced in Pruſſia, nor was it revived till 1774, when Dr. Baylies was invited from Dreſden to ſuperintend the method.

Although ſome perſons had been inoculated in Livonia by Dr. Schulenius at an earlier period, the practice was unknown at St. Peterſburgh till 1768, when it was eſtabliſhed there under baron Dimſdale. This event muſt have been to the Ruſſians an immenſe bleſſing, ſince in their country, the natural ſmall-pox uſed to rage with ſuch ſeverity, that it is ſaid to have annually deſtroyed two millions of ſubjects. On the 28th of July, 1768, baron Dimſdale inoculated the empreſs and the grand duke, both of whom ſpeedily recovered.

The

The practice made rapid progreſs; an inoculation hoſpital was eſtabliſhed; and at length Dimſdale returned to England loaded with wealth and honours.

In Spain, inoculation was not extenſively adopted before 1771, though it had been introduced by a ſurgeon forty-two years before at Jadrique, a ſmall town in that kingdom, and had not been diſcontinued in that particular place. Dr. Don Miguel Gorman viſited London for the purpoſe of learning the Suttonian method of inoculation, and returned to Madrid in 1772, where he practiſed the art upon ſeveral of the nobility to the great ſatisfaction of the court.

Of the Objections which were urged againſt Inoculation.—Having related the riſe and firſt progreſs of inoculation in ſeveral parts of the world, it ſeems proper, before reciting the particular methods purſued by the Suttons and baron Dimſdale, to notice the various objections and arguments which were adduced for the purpoſe of ſuppreſſing the practice of inoculation altogether. The clamour againſt the method, indeed, was for many years exceſſively violent; both phyſical and moral reaſons were brought forward againſt the ſyſtem, and men of different profeſſions entered into the controverſy.

1. To the objection that inoculation did not produce the genuine ſmall-pox, and conſequently could not ſecure any one from having the diſeaſe afterwards, the celebrated Dr. Mead made the following judicious reply. "Now I own I cannot underſtand how contagion, that is the very ſeed of the diſeaſe, ſhould produce not its own proper diſtemper, but another of a different kind. Neither, certainly, does it matter by which way the infection is received, provided it brings forth manifeſt marks of the diſeaſe. And as to thoſe, who, after having been inoculated with ſucceſs, are, notwithſtanding this, ſaid to have ſuffered the ſmall-pox, I muſt proteſt that, after the moſt diligent enquiry, I have not been able to find out one convincing proof of this kind. But to ſpeak plainly, if ſuch a thing happened once, why do we not ſee it come to paſs oftener? Or, what can a ſingle example, ſuppoſing it to be true and certain, avail, when innumerable have produced nothing like it?"

2. One formidable objection was, the ſuppoſed danger that inoculation might be the means of communicating other terrible and fatal diſeaſes, when the matter was taken from unhealthy ſubjects. The variolous matter being a poiſon *ſui generis*, it cannot by inoculation communicate any other diſtemper. The venereal diſeaſe is known to be as communicable as any, yet ſeveral perſons have been inoculated from patients labouring under conſiderable degrees of the venereal diſeaſe, and no ill conſequences were ever yet known to follow. Mr. Burgeſs informs us that he knew of one inſtance where the matter was inadvertently taken by a ſurgeon from a young woman, who fell ill of the ſmall-pox, after being admitted into St. Thomas's hoſpital to be ſalivated. Three patients were inoculated from this matter, and had the ſmall-pox in the moſt favourable manner. Nothing particular happened about the wounds, and the patients all grew up healthy ſubjects. See Burgeſs's "Account of the Preparation and Management neceſſary to Inoculation, 1754." Dr. Kirkpatrick alſo mentions in his "Analyſis of Inoculation," that he was aſſured by a reſpectable ſurgeon, that a young lady was inoculated by an apothecary from a gentleman's ſervant, who had a venereal bubo together with the ſmall-pox. The lady, notwithſtanding, did very well, and never had the ſlighteſt ſymptom of venereal infection. The aſſertion, then, that other diſeaſes may be communicated by inoculation remains quite unproved. That other diſeaſes may follow the ſmall-pox no man of common ſenſe will deny; for it is no ſecurity againſt them. Nay, the debility which it ſometimes induces, may even promote the acceſſion of ſcrofula, conſumption, &c.; but ſince inoculation tends ſo materially to diminiſh the ſeverity of the ſmall-pox, it muſt alſo have a great effect in leſſening and preventing any circumſtances, which are to be regarded as conſequences of ſuch ſeverity.

3. Perhaps the diſeaſe may never attack in the natural way. This objection, one would think, muſt give way to the bare ſtatement, that, previous to the practice of inoculation, the caſual ſmall-pox annually deſtroyed about two millions of lives in the Ruſſian empire alone, and committed equal devaſtation in ſeveral other parts of the world. It has been obſerved by Dr. Jurin, in an ingenious paper inſerted in the Philoſophical Tranſactions, that it is difficult to aſcertain the exact number who die without having the ſmall-pox; but that of all the children that are born, there will, ſome time or another, die of the ſmall-pox one in fourteen; and that of perſons of all ages taken ill of the ſame diſtemper, two in eleven will fall victims to it.

From a table of burials it appears that in Edinburgh and St. Cuthbert's pariſh, during ten years, about one-tenth of the dead was killed by the ſmall-pox.

It may likewiſe be noticed, that no individual is originally unſuſceptible of the ſmall-pox, and though a proportion of mankind might poſſibly eſcape the contagion, ſtill the number of victims to the diſorder caſually taken would be very conſiderable. During the controverſies concerning the advantages and diſadvantages of inoculation, enquiries were made from houſe to houſe, in ſeveral towns, in order to aſcertain the number of people, who had had the ſmall-pox in one twelvemonth, when it appeared that nearly one died in every five who had taken the diſeaſe; and that of eighty-two perſons who were inoculated in theſe places in the ſame year, not one died.

Dr. Nettleton, Dr. Whitaker, and ſome others, made an attempt to find out how many perſons had had the ſmall-pox, and how many had died of it in the year 1722. The reſult was as follows:

	Sick of the Small-pox.	Died.
In ſeveral towns in Yorkſhire	3405	636
Chicheſter - -	994	168
Haverfordweſt - -	227	52
Total -	4626	856

This table will ſerve to depict the general event of the caſual ſmall-pox. The mortality was conſiderable; but it was even much greater at ſome periods, and in particular parts of the world. On the other hand, inoculation has ſometimes been purſued with ſuch remarkable ſucceſs, that out of a thouſand perſons inoculated one after the other, ſcarcely one has periſhed.

We ſhall not ſwell this article with a detail of the numerous phyſical reaſons urged againſt inoculation, the preſent ſtate of knowledge renders ſuch a taſk unneceſſary; and all the objections alluded to, have been ſo often and completely proved to be frivolous and unfounded, that of late years the practice has encountered no oppoſition, if we put out of preſent conſideration the praiſeworthy endeavours to ſubſtitute every where the vaccine for the variolous inoculation.

4. The moral and religious objections which were adduced againſt the practice of inoculation, gave riſe to as much diſpute as the medical differences of opinion, and certainly operated ſtill more perniciouſly in prejudicing the maſs of

people againſt the art. The plan of bringing diſeaſes upon ourſelves, was repreſented as a Circaſſian impiety, altogether irreconcileable to a Chriſtian conſcience. Thoſe who adopted the practice were branded with the appellations of poiſoners and murderers, and were ſaid to be inſtigated by atheiſm, quackery, and avarice. One anonymous writer implored the interference of parliament. He obſerves, "while this helliſh principle has ſo much hold upon mankind, 'tis highly neceſſary that there ſhould be no doors left open for the practice, at leaſt none that can be ſhut; that there ſhould be no room for the covering of ſuch horrid things from the reach of the law. Phyſicians they have already too much latitude in practice, to make havoc of mankind for the ſatisfaction of their judgment in phyſic, and increaſe of their experience; but every quack now may be a hireling to the devil, and, like that banditti in Italy, be ready to do the drudgery of removing heirs, and other obſtructing incumbents of many kinds, and to do this under the maſk of a cure, inoculating death inſtead of a diſeaſe, and making uſe of an art never before practiſed, in a manner not foreſeen, and by the laws not yet ſufficiently guarded againſt." See a pamphlet entitled "The new Practice of Inoculation conſidered, and an humble Application to the approaching Parliament for the Regulation of that dangerous Experiment, 1722."

A ſermon was preached on Sunday, July 8th, 1722, againſt inoculation, at St. Andrew's church, Holborn, by the Rev. Mr. Maſſey. His text was "So went Satan forth from the preſence of the Lord, and ſmote Job with ſore boils from the ſole of his foot unto his crown," chap. ii. v. 78. In this diſcourſe, the Devil was depicted as having firſt put inoculation in practice upon Job. Inoculation was ſtigmatized as a diabolical operation, and an anti-providential project, that inſults our religion, and baniſhes providence out of the world.

It is almoſt unneceſſary for us to ſay, that Job's being afflicted with the ſmall-pox was nothing more than an unwarrantable aſſertion, and a whimſical conceit of the Rev. Divine. The following epigram on the ſubject appeared in the Monthly Miſcellany for March 1774.

> We're told, by one of the black robe,
> The Devil inoculated Job;
> Suppoſe 'tis true, what he does tell,
> Pray neighbours, *did not Job do well?*

Dr. Wagſtaffe had aſſerted, that it never came into men's heads to take the work out of nature's hands, and raiſe diſtempers by art in the human body. (See "Letter ſhewing the Danger and Uncertainty of inoculating the Small-pox.") To this Mr. Maitland replied in his Vindication, "that the practice of phyſic is founded upon the principle of curing *natural* by raiſing *artificial diſeaſes*. What is bleeding, but an artificial hemorrhagy; purging, but raiſing an artificial diarrhœa? Are not bliſters, iſſues, and ſetons, artificial impoſthumations?"

The virulence and ſarcaſm by which the oppoſers of inoculation were actuated, are well exhibited in the rejoinder, made by another writer, to the foregoing very ſenſible obſervation. "Very good, ſir, but go on,—what is correction at the cart's tail, but the noble art of muſcular phlebotomy? What is burning in the hand, but the art of applying a cauſtic? What is hanging but an artificial quinzy, which makes the patient feel for the ground, and chokes him? What is breaking on the wheel, but the art of making diſlocations and fractures, and differs from the wounds and amputations of ſurgeons only by the manner and intention?—A Short and Plain Account of Inoculation, &c. by I. Maſſey.

Dr. Maddox, biſhop of Worceſter, was an able and zealous friend to the cauſe of inoculation, and preached an excellent ſermon in ſupport of the practice. He obſerved, that it was needleſs to enter into a diſquiſition, which is the moſt proper method of deſignedly raiſing the ſmall-pox in the human frame, by carrying the perſon that is to receive it to the contagious ſteams, or effluvia; or bringing to him the infected matter. Religious difficulties (if any ſtill remain, concerning a practice that has preſerved ſo many lives, and prevented the heavieſt grief in ſo many families,) are exactly the ſame, in either method of voluntary communication.

For it is no more invading the prerogative of heaven to occaſion one eaſy and voluntary conveyance of the infection than another, by a ſlight and hardly ſenſible raſure upon the arm, than communicating the ſame diſtemper, by inviſible particles, to that tender organ the lungs, which are ſo frequently affected by the venom of this diſeaſe, when contracted by the breath, or receiving into the body infected particles in what is called the natural way.

Were this preventive method (continues the learned prelate) univerſally ſucceſsful, and never once to fail in any inſtance whatſoever, it is ſcarcely to be preſumed that any objection would be raiſed againſt a ſalutary expedient, to preſerve from deſtruction ſo great a part of the human ſpecies as daily fall by this mortal enemy, when it attacks men as it were in the dark, ignorant of, and unprepared for the aſſault.

This method of inoculation would then be no more liable to cenſure than the making a voluntary wound, by inciſion, to form a neceſſary drain; or adminiſtering any operative medicine, which, upon repeated trials, had proved an unfailing ſecurity againſt any other dangerous and prevailing peſtilence or contagion.

But, in order to excite and ſecure a dependence upon his divine providence, the great Governor of the world has appointed that no human affairs, not even our neceſſary ſuſtenance, ſhould be attended with ſuch abſolute certainty: a very wiſe appointment, that vain man might not fancy himſelf an independent being; but, among all the changes and chances of this mortal life, ſhould ſtill look up unto, becauſe he can only be defended by, God's moſt gracious and ready help.

Experience alone muſt determine the good or bad conſequences of this artificial infection, as it ought to do in all other medical attempts, which, in many inſtances, are, in reality, little more than curing or alleviating one diſtemper, by exciting or introducing another. And, in this view, the method now under conſideration, of leſſening the hazard of a very mortal diſeaſe, ſhould be conſidered in the ſame light as every other antidote, or preventive attempt in phyſic or ſurgery, againſt any probable, almoſt certain malady, internal or external.

The philanthropic prelate forebore to derive any ſtrength to the argument, from the great number of noble, venerable, and worthy perſons, of every rank and profeſſion, who were in his time the public advocates of this compaſſionate deſign: he wiſhed to ſtand upon its own proper evidence and foundation.

He remarked, that a ſafe paſſage through this diſtemper, like the emancipating ſlaves, is a deliverance to vaſt numbers of people kept, as it were, in bondage; who, before they have undergone this abhorred diſeaſe, are excluded from many offices in life, and prevented from purſuing their neceſſary buſineſs; and it gives tranquillity and cheerfulneſs

to perſons of better condition, who, under apprehenſion of this loathſome and infectious diſorder, were all their former days ſubject to great anxiety and conſtant fear.

The biſhop commented with great ability upon the advantage that inoculation affords of communicating the ſmall-pox at the moſt favourable time of life, *viz.* infancy, when the diſeaſe is moſt inclined to put on a mild form. He mentioned, authentically, that, out of 1500 perſons inoculated by Mr. ſerjeant Ranby, Mr. ſerjeant Hawkins, and Mr. Middleton, only three died.

He ſtated to his congregation, that, from the annual account within the bills of mortality, (in which many places in and near the city were omitted,) it appeared that, in twenty years, *viz.* from the year 1731 to the year 1750, incluſive, no leſs than 39,115 perſons died of this fatal diſtemper; which, including the places not inſerted in the weekly bills, muſt have been conſiderably more than 2000 every year, that fell in the two adjoining cities and parts adjacent. And, he noticed, that if only one in ſeven is ſuppoſed to die by the diſtemper taken in the natural way, then the whole number of perſons who, in this period of twenty years, were thus infected, muſt have amounted to 280,000, of which number no leſs than 40,000 periſhed. But if one in every 200 ſhould be ſuppoſed to die under inoculation, which is really more than fall by that artificial infection, inſtead of 40,000, only 1400 would have died in one diſtrict in twenty years, had inoculation been univerſally adopted. Thus the difference in that ſhort period, in one ſpot, would have been no leſs than 38,600 lives preſerved, beſides the numerous poſterity that might have been derived from them.

The learned divine inſiſted, that humanity, regard to our country, the dictates of reaſon, and the precepts of religion, are all in favour of the ſyſtem of inoculation.

During the oppoſition to the introduction of inoculation, many affected to be actuated againſt it by religious ſcruples, and the practice was alleged to be unlawful.

In anſwer to this, the ſcriptures aſk, Is it lawful to ſave life, or to deſtroy it? Luke, vi. 9. We ſhould alſo remember, that, as the fall of man brought the danger of diſeaſes into the world, ſo to evade, oppoſe, or deſtroy it, is not only his right, but duty, if in his power. When danger ſurrounds us, no conduct is more proper than to inquire into, and purſue the means of eſcape. To neglect our ſafety is to ſink below brutes, which are taught by inſtinct to ſhun the evil to which they are expoſed. Inoculation is certainly in many inſtances a means of ſaving life, and of moderating the ſeverity of affliction. And, in a moral point of view, wilfully neglecting the means of preſerving life muſt appear almoſt as bad as the guilt of murder.

The bringing of a diſtemper on ourſelves was likewiſe repreſented by bigotted individuals as uſurping the ſacred prerogative of God.

As to the firſt part of this objection, if by diſtempers are meant ſickneſs and pain, the ſame thing is practiſed daily in other inſtances, in concurrence with the ſcripture dictate, *viz.* of two evils chooſe the leaſt. Inoculation is not done from a mere wanton deſire of imparting any diſeaſe, but is performed in order that the patient may go through an unavoidable diſtemper with the leaſt difficulty, and the greateſt chance of recovery. The natural ſmall-pox being highly perilous, it muſt be a great deſideratum to avoid it, and inoculation enables us to do ſo, by deſtroying that diſpoſition in the body, without which the diſeaſe cannot take place.

Reſpecting the offence given to God, a reliance on providence does not imply that we are not to prevent or oppoſe the evils which we foreſee, and which we have it in our power to guard againſt by prudent precautions. Would theſe objectors, in other inſtances, refuſe the means of leſſening the malignancy and danger of diſeaſe, than which the practice of inoculation is no more? Let the aſſertors of the rights of God ſay, whether, when God permits the diſcovery of preſerving ourſelves, he forbids our uſing it? If our Maker offers us a remedy, it is offending him to reject it.

It was moreover objected, that the decrees of God have fixed the commiſſion of every diſeaſe, and that our precaution cannot prevent what He has determined.

To this it was anſwered, that, however true it is, our days are determined, &c. yet it is God's revealed will, and not his ſecret purpoſes, which we are to regard as the rule of duty. God has required of us to have a tender regard of our lives; and they who diſobey him therein are guilty of a degree of ſelf-murder, and will never be acquitted of that guilt by the ſecret determination of Heaven concerning them. Beſides, God, who has ordained the end, has alſo determined the means leading to it. St. Paul, in his dangerous voyage, had a ſpecial revelation to aſſure him, that all who were with him ſhould eſcape; and yet, when the ſeamen were getting out of the ſhip, he declares, that if they did not ſtay in it they could not be ſaved. Acts, xxvii. 31. God purpoſed to preſerve them in the way whereby they were afterwards delivered.

It was likewiſe contended that we ought not to do evil, that good may come.

On the other hand, it was acknowledged, that if inoculation is, in its own nature, a moral evil, it certainly ſhould be rejected, however great its advantages may ſeem to be. The proſpect of relief from any calamity in life ſhould not tempt us to offend God. But they who make the foregoing objection proceed upon a miſtake. Their principle is true with regard to moral evil, but is not ſo when applied to phyſical. It is certainly lawful to pull down one houſe to ſave a great number from being burnt. This is a phyſical evil, which can hardly take place without ſome degree of moral evil; and many other inſtances may be pointed out, where, for a greater good, a leſſer ill is ſubmitted to.

It was further objected, that the patient might die, and then his laſt moments would be diſtreſſed, and the future reflections of his friends grievous.

This objection led many to decline the practice of inoculation, even while they allowed the theory of it to be reaſonable. They entertained hopes of eſcaping the diſtemper in the natural way, and they had fears of dying in this, and thus they were prevented from undergoing the diſorder. But they ſhould have conſidered what grounds they had for either their hopes or fears, and what was to be advanced to balance the account, in an examination of the different degrees of probability attendant on what they hoped for, and what they were afraid of, in the neglect or adoption of inoculation. Dying is an awful thing; but if inoculation was a *probable and lawful* means of preſerving life in a time of danger, it was a duty to comply with it; and what reflection could be more peaceful than that of dying in the way of duty?

It was further objected by the religious oppoſers of the new practice, that fear was a dangerous paſſion in the ſmall-pox, and that inoculation increaſed the cauſes of fear, by leſſening our faith and truſt in God.

When the ſmall-pox was left to nature, ſuch were its ravages, that, not to fear, would have been to ſink beneath humanity: its conſequences were too grievous to be viewed with indifference. Experience manifeſted the advantages

and

and general ſafety of receiving the diſeaſe by inoculation, and ſo far the practice was a remedy to that juſt alarm which enhanced the danger, when the diſtemper was left to itſelf. As to faith in God, none was deſirable, except that which was agreeable to the ſcripture, and which could never have the effect of creating a diſregard to calamities and danger. Inoculation was well proved to be a means of ſafety, and it would have been as rational to conclude that our lives could be preſerved without eating and drinking, as that we ſhould be delivered from danger without a prudent care for our own ſafety. We are to depend on the care of providence only in the way of duty. To boaſt of courage and truſt in God, while we omit the means of eſcaping danger which ſurrounds us, is not faith but preſumption.

Thus, when inoculation became a probable means by which life might be ſaved, the neglect of it, ſo far from being truſt, was preſumption.

We ſhall now take our leave of theſe theological diſputes and ſcruples, which have now been long removed by the influence of right reaſon and found ſenſe. When it was once well aſcertained and univerſally believed that inoculation was really a means of preſerving life, the idea of its being criminal to adopt the practice could not have much duration. A very able diſcuſſion of moſt of the foregoing objections was publiſhed in a pamphlet, entitled "Inoculation impartially conſidered, and proved to be conſiſtent with Reaſon and Revelation," by the Rev. David Some, edited by Dr. Doddridge, 1750.

Of Inoculation, as practiſed by the Suttons, Baron Dimſdale, &c.—The introduction of the Suttonian practice was regarded quite as a new era in the hiſtory of inoculation, from the novelty of the method, and its unparalleled ſucceſs.

Mr. Robert Sutton, the firſt of this name, who acquired celebrity as an inoculator, reſided at Debenham in Suffolk, where he practiſed ſurgery and pharmacy. From the year 1757 to 1767, he inoculated 2514 perſons.

Two of his ſons, Robert and Daniel, followed the medical profeſſion, and after aſſiſting him during the three firſt years of his practice of inoculation, Robert eſtabliſhed himſelf as an inoculator at Bury St. Edmund's, while Daniel became aſſiſtant to Mr. Bumſtead, a ſurgeon at Oxford. Daniel, on his return to Debenham, in the year 1763, ſuggeſted to his father a new plan of inoculation, in which he propoſed to ſhorten the time of preparation to a few days, and not to confine the inoculated patients to the houſe, but to oblige them to be in the open air as much as poſſible during the whole progreſs of the diſtemper.

The father condemned this ſcheme as raſh and dangerous. Its advantages, however, ſoon becoming manifeſt to patients, they evinced a deſire of being ſolely under the management of Mr. D. Sutton. The conſequence was, that the father and ſon ſeparated about the end of the year 1763, when the latter opened an inoculating-houſe near Ingateſtone, in Eſſex. Here, by public advertiſements, he made known his plan of inoculating in an improved way peculiar to himſelf. The encouragement which he met with may be eſtimated from his receiving, during the firſt year, 2000 guineas, and above 6000 the ſecond. His fame ſpread to the moſt diſtant parts of the kingdom; and the numbers that reſorted to him for inoculation, conſtantly filled the village of Ingateſtone, ſo that accommodations could hardly be procured for the purpoſe. His practice in Kent being alſo very extenſive, he was obliged to employ ſeveral medical aſſiſtants. In 1767, Mr. D. Sutton removed to London, in hopes of reaping ſtill more emolument; but his receipt fell far ſhort of his expectation.

According to Mr. Houlton's ſtatement, the number of perſons inoculated by Mr. Daniel Sutton in the year

1764	was	1629
1765	—	4347
1766	—	7816
		13,792

"To the above number," ſays he, "ſhould be added 6000 that have been inoculated by Mr. Sutton's aſſiſtants; ſo that he may be ſaid to have inoculated, within theſe three years, 20,000 perſons."

Of this number, not one was allowed to have fairly died of inoculation. The venal pen of the preceding writer certainly exaggerated every thing, and great boaſt was alſo falſely made of the Suttons having a ſpecific medicine for preventing too many puſtules. However, no doubt was entertained that the Suttonian practice was incomparably more ſucceſsful than any other.

Medical practitioners, ſtruck with the advantages of the new treatment, ſet about the inveſtigation of the cauſes. Sir George Baker publiſhed the following account of the manner in which Mr. D. Sutton practiſed inoculation. "All perſons are obliged to go through a ſtrict preparatory regimen for a fortnight before the operation is performed. During this courſe, every kind of animal food, milk only excepted, and all fermented liquors and ſpices are forbidden. Fruit of all ſorts is allowed, except only on thoſe days when a purging medicine is taken. In this fortnight of preparation, a doſe of a powder is ordered to be taken at bed-time, three ſeveral times; and on the following morning a doſe of purging ſalt. To children, only three doſes of the powder are given, without any purging ſalt. The compoſition of this powder is induſtriouſly kept a ſecret. But, that it conſiſts partly of a mercurial preparation, is demonſtrated by its having made the gums of ſeveral people ſore, and even ſalivated others. The months of May, June, July, and Auguſt, are preferred as the moſt ſeaſonable for inoculation. But healthy people are inoculated at any ſeaſon of the year indifferently. The autumn is held to be the worſt ſeaſon; and an aguiſh habit the leaſt proper for this operation. No objection is made to any one on account of what is vulgarly called a ſcorbutic habit of body, or bad blood. The perſon who is to be inoculated, on his arrival at the houſe uſed for this purpoſe, is carried into a public room, where, very probably, he may meet a large company aſſembled under the ſeveral ſtages of the ſmall-pox. The operator then opens a puſtule of one of the company, chuſing one where the matter is in a crude ſtate; and then juſt raiſes up the cuticle on the outer part of the arm, where it is thickeſt, with his moiſt lancet. This done, he only preſſes down the raiſed cuticle with his finger, and applies neither plaſter nor bandage. What is extremely remarkable, he frequently inoculates people with the moiſture taken from the arm before the eruption of the ſmall-pox, nay, within four days after the operation has been performed. And," ſays ſir G. Baker, "I am informed, at preſent he gives the preference to this method. He has attempted to inoculate by means of the blood; but without ſucceſs. If the operator happeneth not to be at home when the new patient arriveth, this is looked upon as a matter of no importance. And ſo far is he from any apprehenſion of accumulating infection, that it is very common for perſons, juſt inoculated, to lie in the ſame bed with a patient under any ſtage of the diſeaſe, as it may happen; nay, ſometimes in a room where four or five people are ſick. On the night following the operation, the patient takes a pill. This medicine is repeated every other night, until

until the fever comes on. All this time, moderate exercise in the air is ſtrongly recommended. In twenty-four hours after the inoculation, the operator can often diſtinguiſh whether or no the patient be infected. He every day examines the inciſion; and from hence ſeems to prognoſticate, with ſome degree of certainty, concerning the degree of the future diſeaſe. In three days after the operation (provided that it has ſucceeded), there appears on the inciſion a ſpot like a flea-bite, not as yet above the ſkin. This ſpot, by degrees, riſes to a red pimple; and then becomes a bladder full of clear lymph. This advanceth to maturation like the variolous puſtules, but is the laſt which falleth off. In proportion as the diſcolouration round the place of the inciſion is greater, the leſs quantity of eruption is expected. And, therefore, whenever only a ſmall diſcoloured circle is obſerved, purging medicines, more than ordinary, and more frequently repeated, are held to be neceſſary.

"The preparatory diet is ſtill continued. If the fever remains ſome hours without any tendency to perſpiration, ſome acid drops are adminiſtered, the effect of which is to bring on a profuſe ſweat; but in ſome caſes where the fever is very high, a powder or pill, ſtill more powerful, is given. In general, during the burning heat of the fever, the inoculator gives cold water. But the perſpiration beginning, he orders warm balm-tea or thin water-gruel. As ſoon as the ſweat abates, the eruption having made its firſt appearance, he obliges every body to get up, to walk about the houſe, or into the garden. From this time, to the turn of the diſeaſe, he gives milk gruel, *ad libitum*.

"On the day following the firſt appearance of the opaque ſpot on the puſtules, to grown people he gives an ounce of Glauber's purging ſalt. To children he gives a doſe of it proportioned to their age. Then, if the eruption be ſmall, he allows them to eat a little boiled mutton, and toaſt and butter, and to drink ſmall beer. But in caſe of a large eruption, he gives them, on the third day after their having taken the firſt doſe, another doſe of the ſame ſalt, and confines them to the diet ordered during the preparation."

Sir George, after repreſenting this as the practice of Mr. D. Sutton, aſcribes its ſuperior ſucceſs to the free uſe of cold air. Dr. Glaſs, of Exeter, in a publication which appeared ſhortly after that of the preceding gentleman, imputed the advantages of the Suttonian method to the patient being ſweated; while another author, Mr. Chandler, differed from both the former writers, and referred the chief benefit of the plan to the infecting humour being taken in a crude ſtate, "before it has been ultimately variolated by the ſucceeding fever." Baron Dimſdale likewiſe thought, that although the whole proceſs might have ſome ſhare in the production of the ſucceſs, yet he believed the chief good was owing to the method of inoculating with recent fluid matter, and the management of the patients at the time of the eruption.

In November, 1766, baron Dimſdale publiſhed his well known work, entitled "The preſent Method of inoculating for the Small-pox." The inſtructions contained in this book have deſervedly continued ever ſince, almoſt without exception, to regulate the practice of inoculation.

The baron, when the age is left to his choice, avoids inoculating children under two years of age. The ſubjects conſidered by him improper for the operation, are ſuch as labour under any acute or critical diſeaſes, or their effects; and alſo ſuch as have evident marks of corroſive acrimonious humours, or manifeſt debility.

As for the moſt eligible ſeaſon of the year, he thought, that perſons generally had more puſtules in the ſpring than any other time; and epidemic diſeaſes (eſpecially fluxes, intermittents, and ulcerated ſore throats) being moſt frequent in the autumn, the baron did not look upon this as in general the moſt favourable ſeaſon. But he was of opinion, that we might ſafely inoculate at all ſeaſons, provided care were taken to ſcreen the patients as much as poſſible from heat in ſummer, and to prevent them from keeping themſelves too warm, and too much ſhut up from the weather in winter. He thought it prudent, however, to avoid inoculation while any peculiar epidemic diſeaſes were prevalent. He recommended a preparatory regimen, ſo as to reduce the patient, if in high health, to a low and more ſecure ſtate; to ſtrengthen the conſtitution if too low, to correct what appears vitiated; and to clear the ſtomach and bowels as much as may be from all crudities and their effects. Young or middle aged perſons, enjoying a good ſtate of health, were ſtrictly confined to a milk and vegetable diet for nine days previous to the operation, during which period they were ordered to take the following powder three times at bed-time, and a doſe of Glauber's ſalt each ſucceeding morning. The powder was compoſed of eight grains of calomel, the ſame quantity of compound powder of crabs' claws, and $\frac{1}{4}$th of a grain of emetic tartar. For women or children the doſe was leſſened, according to their age and ſtrength. For thoſe who were of a tender delicate conſtitution, or valetudinarians, he preſcribed a milder medicine, and rather of the alterative than the purgative kind; indulging ſome with light animal food, and in caſe of lowneſs, with a glaſs or two of wine. The baron preferred the following method of inoculating. The patient to be infected being in the ſame houſe, and if no objection is made to it, in the ſame room with one who has the diſeaſe, a little variolous matter is taken from the place of inſertion, if the ſubject is under inoculation, or a puſtule, if in the natural way, on the point of a lancet, ſo that both ſides of the point are moiſtened. With this lancet an inciſion is made in that part of the arm where iſſues are uſually placed, deep enough to paſs through the ſcarf-ſkin, and juſt to touch the ſkin itſelf, and in length as ſhort as poſſible, not more than one-eighth of an inch. The little wound being then ſtretched open between the finger and thumb of the operator, the inciſion is moiſtened with the matter by gently touching it with the flat ſide of the infected lancet. The baron generally performed the operation in both arms, and ſometimes in two places in one arm, a little diſtance from each other. Neither plaſter nor bandage is to be applied to the inoculated part. The baron preferred uſing ſuch matter as was taken during the eruptive fever, it being then in his opinion endued with moſt activity. When the diſeaſe was to be communicated from an inoculated perſon, he took the matter, not from the ſecondary puſtules, but from the place of inoculation. The ſecond day after the operation, if the inoculated part is viewed with a lens, he ſays, there generally appears a kind of orange-coloured ſtain about the inciſion, and the ſurrounding ſkin ſeems to contract. At this time the baron uſed to preſcribe the following medicine to be taken at bed-time: calomel and compound powder of crabs' claws, of each three grains, emetic tartar $\frac{1}{16}$th of a grain. On the fourth or fifth day a hardneſs is perceptible to the finger. The part itches and appears ſlightly inflamed. He remarks, that a little clear fluid may be ſeen under a kind of veſication, the part reſembling a ſuperficial burn. In general, about the ſixth day ſome pain and ſtiffneſs are felt in the arm-pit. This was regarded as a very deſirable ſymptom, as foreboding the near approach of the eruptive ſymptoms, and the favourable progreſs of the diſeaſe. Sometimes on the ſeventh, more often on the eighth day, the ſymptoms of the eruptive fever appear; ſuch as ſlight remitting

remitting pains in the head and back, ſucceeded by tranſient ſhiverings and alternate heats, which continue in a greater or leſſer degree till the eruption is perfected.

The inflammation in the arm at this time ſpreads faſt, and upon viewing the inciſion with a good glaſs, it appears for the moſt part ſurrounded with an infinite number of ſmall puſtules, which increaſe in ſize and extent as the diſeaſe advances. On the tenth or eleventh day a circular or oval efflorescence is uſually diſcovered ſurrounding the inciſion, and extending ſometimes nearly half round the arm, but more frequently to about the ſize of a ſhilling, and, being under the cuticle, is ſmooth and not painful. This efflorescence was alſo regarded as favourable; it accompanies the eruption, every diſagreeable ſymptom ceaſes, and the pain and ſtiffneſs in the axilla go off.

When the eruptive ſymptoms came on with more ſeverity, baron Dimſdale uſed to direct a repetition of the laſt-mentioned powder, and on the following morning three or four ſtools were procured by a laxative draught.

The baron notices that ſometimes the ſtate of the inciſion is ſuch for ſeveral days, that the effects of the inoculation can barely be perceived, the colour about the wound remaining pale inſtead of changing to red; the edges of the inciſion ſpread but little, they remain flat, and are attended neither with itching nor uneaſineſs of any kind. Nay, ſometimes on the fifth, and even on the ſixth day, the alteration is ſo little, as to make it doubtful whether the infection has taken place. Dimſdale ſets down ſuch appearances as unfavourable, and implying a late and more untoward diſeaſe. To prevent this, he uſed to direct the powder or pill to be taken each night, and in caſe it failed to operate by ſtool, or there was the leaſt diſpoſition to coſtiveneſs, an ounce of Glauber's ſauce, or a laxative draught, was given in the morning, once or twice, as the caſe might require. The baron believed that theſe meaſures forwarded the inflammation, which he always wiſhed to ſee, as he had conſtantly obſerved, that an early progreſs on the arm, and an early commencement of the eruptive complaints, portended that the diſtemper would be mild and favourable; and on the contrary, that when both were late, the ſymptoms proved more irregular and untoward. The patient, inſtead of being confined to his bed or room, when the ſymptoms of the eruptive fever came on, was directed, as ſoon as the purging medicine had operated, to keep abroad in the open air, be it ever ſo cold, as much as he could bear, and to drink cold water, if thirſty, always taking care not to ſtand ſtill while abroad, but to walk about with moderation.

In certain caſes, notwithſtanding baron Dimſdale found the eruptive ſymptoms extremely violent, and the patients almoſt incapable of motion, and apprehenſive of cold as the greateſt evil, yet he perſuaded them to riſe out of bed and go out of doors, often ſupported by aſſiſtants, and he allowed them to drink as much cold water as they choſe. No ſiniſter accident was the conſequence, but, on the contrary, the patients' ſpirits were revived, and every ſymptom ſeemed benefited by the method.

When any uncommon languor happened, a baſin of thin broth, or a glaſs of wine, was allowed in the day, or ſome white-wine whey at bed-time. Indeed, ſuch things were allowed at any time to tender, aged, or weakly perſons. After the eruption was completed, if occaſion required, they were indulged in a little well-boiled meat of the lighteſt kind, as chicken, veal, or mutton.

The practice of baron Dimſdale was certainly, in a great meaſure, an imitation of the method purſued by Mr. D. Sutton.

We ſhall conclude this article with a few neceſſary inſtructions and references.

1. The age of the perſon to be inoculated for the ſmall-pox ſhould be as little advanced as poſſible; but (if it can be avoided) not leſs than four months.

2. The matter, when convenient, ſhould be taken from a young ſubject who has the ſmall-pox in a favourable way, and freſh matter ſhould have the preference to ſuch as is old. It deſerves particular attention, however, that it is chiefly for the ſake of avoiding unprofeſſional blame that we chooſe matter from patients labouring under the diſeaſe mildly, ſince experience rather proves, that the lenity or malignity of the ſmall-pox depends very little on whether the matter is taken from one patient who has the diſtemper favourably, or from another who has it ſeverely. Nor can we wonder at this fact, ſince the contagion can only be of one ſort. Therefore, were a patient much expoſed to the caſual ſmall-pox, and no matter could be procured from any ſubject that had the diſtemper mildly, the ſurgeon ſhould recommend inoculation with ſuch matter as it would be in his power to obtain.

3. In inoculating, the operator is to make the ſlighteſt puncture, or ſcratch, imaginable in the arm over the place where the inſertion of the deltoid muſcle terminates. That part of the lancet which is beſmeared with the matter, is to be repeatedly rubbed over the wound, and leſt the matter be wiped away, it is beſt not to pull down the ſhirt-ſleeve till the part is quite dry. Some operators prefer introducing the lancet, armed with the matter, obliquely beneath the cuticle. When this mode is followed, it is proper at the time of withdrawing the lancet to preſs the wound with the finger, ſo that the parts in contact with the matter may wipe it off the lancet with more certainty.

The works on the inoculation for the ſmall-pox are too numerous to be even mentioned: we would, however, particularly refer to Friend's Hiſtory of Medicine. D'Entrecolle's Lettres Edifiantes et Curieuſes. Avicennæ Opera. Mémoires ſur l'Inoculation par M. de la Condamine. Philoſophical Tranſactions for 1722. Monro on Inoculation in Scotland. Holwell's Account of the Manner of inoculating in the Eaſt Indies. Maitland's Account of inoculating the Small-pox. Mead de Variolis et Morbillis. Kirkpatrick's Analyſis of Inoculation. Some's Small-pox impartially conſidered, &c. Murray's Hiſt. Inſitionis Variolarum in Suecia. Dimſdale's preſent Method of inoculating for the Small-pox. Jurin's Account of the Succeſs of inoculating the Small-pox in 1721, &c. and his letter to Dr. Cotesworth. Woodville's Hiſtory of the Small-pox, &c.

For an account of the inoculation for the cow-pox, now ſo deſervedly preferred to the preceding practice, ſee Cow-pox and Vaccination.

A particular deſcription of the Small-pox will be found under that word.

Inoculation, *Hoſpital for*. See Hospital.

~~Inofficious Testament, in *Law*.~~ See Testament.

Inom Barley, in *Agriculture*, a term applied to ſuch barley as is ſown the ſecond crop after the ground has been fallowed, or cleaned from weeds.

Inordinate Proportion, is where three magnitudes being in one rank and three others proportional to them in another, you compare them in a different order.

E. gr. If there be in one rank theſe three numbers, 2, 3, 9; and in another rank, theſe other three, 8, 24, 36, which are proportional to the precedent, in a different order; ſo that 2 be to 3 as 24 to 36, and 3 to 9 as 8 to 24; then caſt-

ing

which are produced by different plants of a low ſhrubby growth, as thoſe of the gooſeberry, currant, and raſpberry kinds, when grown alone, and in a ſeparate ſtate. See STANDARD *Fruit-Trees*.

SMALL *Key*, in *Geography*, a ſmall iſland in the Eaſt Indian ſea. N. lat. 10° 37′. W. long. 247° 16′.

SMALL *Oat*, in *Agriculture*, a name applied to a particular kind of black grain of this ſort, in ſome places. It is hardy, and capable of being grown with ſucceſs on poor land of the chalky and other kinds. Other names are alſo given to it; and there is a ſort of oat termed the ſmall ſhort, or ſmall ſhorts, in the farmer's language. See OAT.

SMALL *Point*, in *Geography*, a cape on the coaſt of Maine, forming the eaſt point of Caſco bay.

SMALL *Repeat*. See REPEAT.

SMALL *Sallad Herbs*, or *Sallading*, in *Gardening*, are ſuch young tender herbs as are made uſe of through the year, for the purpoſe of furniſhing ſallads. For this uſe, ſeveral young ſeedling herbs of a warm nature are in requeſt to mix with the larger principal ſallad herbs, as lettuces, endive, and celery, in order to improve their flavours and wholeſome qualities. The ſorts moſtly in uſe are creſſes, muſtard, raddiſh, rape, and turnep; alſo ſometimes cabbage-lettuce for winter and early ſpring uſe; all of which, for this uſe, are in perfection when quite young, that is, while not more than a week, or ten or twelve days old, whilſt they remain moſtly in the ſeed-leaf, being then cut up cloſe to the ground for uſe; for, being moſtly of a warm reliſh, in which conſiſts their chief excellence for winter and ſpring ſallads, if ſuffered to grow large, and run into the rough leaf, they become of a diſagreeable, ſtrong, hot taſte; but when uſed as above, they are exceedingly criſp and tender, with an agreeable warm flavour. For the purpoſe of ſallading, theſe plants may be obtained young at all times of the year, in the ſpring and ſummer in the open ground, and in winter under the ſhelter of frames and glaſſes, and occaſionally on hot-beds. This ſort of ſallading is procured by ſowing the ſeeds of the different plants at different times, throughout the whole year.

Winter and Spring Culture.—In the winter and ſpring it may be raiſed either in hot-beds, or in the open borders, and, according as it may be required, early or late; but when it is required as early as poſſible, it muſt be ſown in hot-beds, under frames and lights, &c. or in a bed or border of natural earth under glaſſes. The ſowing ſhould be made on hot-beds any time in December, January, or February; and where a conſiderable ſupply is daily required, it may be continued ſowing every week or fortnight, in hot-beds, till March, or during the cold weather, for which a moderate hot-bed of dung ſhould be made for one, two, or more garden-frames; but only half a yard or two feet depth of dung, according to the temperature of the ſeaſon, as the heat is only required to bring up the plants quickly, and forward them a week or two in growth, placing a frame directly thereon, and moulding the bed all over with light rich earth, five or ſix inches thick, making the ſurface level and ſmooth: when, if it is to be forwarded as much as poſſible, directly ſow the ſeed, which may be done either in drills as ſhallow as poſſible, about two or three inches broad, and flat at the bottom, and three inches aſunder, ſowing the ſeeds of each ſort ſeparately, and very thick, ſo as almoſt to cover the ground, only juſt covering them with earth; or, to make the moſt of the bed, it may be ſown all over the ſurface, previouſly ſmoothing it lightly with the back of the ſpade, the different ſorts ſeparately, and all very thick; and after preſſing them all even and lightly down with the ſpade, covering them very thinly with earth, by ſifting over as much light mould as will only juſt cover the ſeed; and as ſoon as the ſowing is performed in either method, putting on the lights. The ſeeds ſoon come up, as in two or three days, or leſs, being careful at this time to give vent to the ſteam ariſing in the bed, as well as to indulge the plants with plenty of free air daily, either by tilting the lights in the back or front, according to the temperature of the weather, or by drawing the lights a little down, or taking them quite off occaſionally in mild days at firſt; for the hot-bed being yet new, there will be a conſiderable ſteam ariſing; and the ſallading coming up very thick, unleſs due vent be given to paſs off the ſteam, and admit freſh air, the plants will be apt either to burn or fog, (as the gardeners term it,) and mould off as faſt as they come up. Such hot-beds, however, as are not freſh made, do not require this precaution; but in new-made beds it muſt be ſtrictly obſerved, till the ſallading is all fairly come up, and as long as the ſtrong ſteam continues. The plants will moſtly be fit for uſe in a week, or ten or twelve days, from the time of ſowing the ſeed.

But in order to have a proper ſucceſſion, the ſowing in the hot-beds ſhould be repeated every week or fortnight during the cold weather; the ſame hot-bed ſometimes retaining its heat, will admit of two ſowings, by ſowing again as ſoon as the firſt crop is gathered: however, to obtain a regular ſupply daily, it is neceſſary to continue making freſh hot-beds occaſionally. Where only a ſmall quantity may be wanted at a time, and there is the convenience either of cucumber and melon hot-beds, or a hot-houſe, &c. ſome ſeed of each ſort may be ſown in pots or boxes, and placed in theſe hot-beds, or the ſtove, juſt to bring up the plants fit for uſe. And where there are not frames and glaſſes, hand or bell-glaſſes may be uſed, or the bed be arched over with low hoop-arches, in order to cover it with mats every night, and in bad weather.

Where, however, there are no hot-beds, in cold weather, early in the ſpring, part of a warm border, or a bed of light earth in a ſunny ſituation, may be prepared for garden-frames and lights, hand-glaſſes, &c. raiſing the ground ſomewhat to the ſun; and having dug it, and raked it fine, ſow the ſeed as above, covering it lightly with earth; and having ſet on the frames and glaſſes, the ſeeds will ſoon come up, and the ſallading be ready a conſiderable time ſooner than in the open ground.

Culture in the full Ground.—From about the end of February, or beginning of March, according to the forwardneſs or mildneſs of the ſeaſon, ſmall ſallading may be ſown in the open ground, repeating the ſowings every week or ten days; the firſt ſowing being performed on a warm border; continuing the ſowings in that ſituation till the beginning or middle of April, when it may be ſown in any of the open quarters, and in which the ſowings may be repeated weekly, or once a fortnight, as required; but according as the hot weather approaches, ſowing in a ſomewhat ſhady ſituation. The ground for each ſowing in the different ſituations ſhould be properly dug, and the ſurface raked ſmooth and even.

Theſe ſowings are moſtly made in ſhallow drills, which ſhould be drawn with a ſmall hoe, either with the corner, or held edgeways downward, horizontally, drawing the drills along evenly, as ſhallow as poſſible, and flat or level at bottom, at three or four inches aſunder, in which the ſeeds ſhould be put evenly all along the bottom, each ſort ſeparately, and very thick, covering them in evenly with the fineſt of the mould, not more than a quarter of an inch deep; or if the ſmaller ſeeds are but juſt covered, it is ſufficient;

for when ſown very thick, if deeply covered with mould, the plants do not riſe regularly. In theſe early ſpring ſowings, on cold nights, and in all bad weather, it is proper to cover the ground, both before and after the plants begin to riſe, with large mats; which will be better, if ſupported on low hoop-arches, or ranges of pegs ſtuck in the ground juſt high enough to ſupport the mats a little from the earth, by which a more effectual as well as forward crop is produced.

But in the latter ſowings, when dry warm weather commences, it is proper to give occaſional waterings. It is likewiſe ſometimes neceſſary, where the ſurface of the ground becomes cruſted from wet, &c. as the plants riſe thick, to ſlightly bruſh over the ſurface with the hand or a ſoft broom, ſo as to reduce the ſurface mould a little, and promote their coming up.

Summer Sowings.—When the ſowings are practiſed in ſummer, they ſhould be made more frequently, and the ground be kept watered occaſionally, both before and after the plants are come up.

Autumn Sowings.—The ſowings may be continued in the open ground all September and October, alſo occaſionally in November, in mild ſeaſons; and until towards the middle of October, they may be made in any open ſituations; but from the middle or latter end of October, and in November, they muſt be on warm ſouth borders, performing the ſowings as above; and in cold nights, beſtowing a covering of mats or hand-glaſſes, &c. repeating the ſowings every week or ten days, or a fortnight, as required.

In gathering young ſallading, it ſhould be cut carefully cloſe to the ground, while quite young; in performing which, a large pair of ſciſſors is very convenient.

In order to have good ſeed, ſome plants ſhould be preſerved annually for the purpoſe.

SMALL *Stones*, among *Jewellers*, denote diamonds under the weight of a carat.

SMALL-*Work*, is uſed to denote the ſtar and ſhell-facets of diamonds.

SMALLAGE, in *Botany*, a ſpecies of *apium;* which ſee.

Smallage grows naturally by the ſides of ditches, in many parts of England, and is therefore rarely cultivated in gardens: it is biennial, and flowers in Auguſt. Care ſhould be taken to diſtinguiſh ſmallage from the poiſonous water-hemlock, which grows naturally in the ſame places with it: the latter has its leaves deeply divided, quite to the pedicle, into three long narrow ſharp-pointed ſegments; whereas thoſe of ſmallage are only ſlightly cut into three roundiſh obtuſe ones.

The root is that part which was formerly uſed in medicine: it is about the thickneſs of a thumb, whitiſh, fibrous, of a warm taſte, and a fragrant ſmell; and was reckoned one of the five greater openers of the ſhops. It was reputed to be grateful and detergent, to promote urine, and to diſlodge gravel; and it was alſo recommended in diſorders of the breaſt, and for promoting expectoration.

The freſh roots, eſpecially when produced in their native watery places, are ſuppoſed to participate, in ſome degree, of the ill quality of thoſe of the hemlock kind, and to be particularly hurtful to epileptic perſons and pregnant women.

Its ſeed was alſo of the number of the leſſer hot ſeeds, and was thought to poſſeſs greater virtues as a carminative and aperient than the root; its leaves having been given in decoction, or the expreſſed juice of them in nephritic complaints. The root was greatly recommended againſt ſuppreſſions of the menſes, and of the lochia, and was even ſaid to be alone a remedy for the king's evil; but this wants proof.

Smallage is now wholly exploded from the materia medica.

SMALL-POX, in *Medicine*, the *Variola* of authors, a highly contagious and formidable eruptive fever, which occurs in general but once during the life of any individual, and is diſtinguiſhed by the appearance of puſtules on the ſkin, on the third or fourth day of the fever.

As we have already entered into a brief detail of the little that is known reſpecting the origin and early propagation of ſmall-pox, (ſee INOCULATION,) it may be ſufficient to mention in this place, that it is generally believed that this contagious malady exiſted in China and Hindooſtan, perhaps for ſome centuries previous to its appearance in Europe; but that there are no very authentic records of its travelling to the weſt, until the period of the ſiege of Mecca by the Abyſſinians, in the year 572, when it deſtroyed the invading army. Alexandria being at that time the great mart of Indian commerce, was ſoon infected with the contagion, and the firſt deſcription of the diſeaſe was given by Ahron, a phyſician of that city, in the beginning of the following century. From that time it accompanied the Arabs or Saracens in their progreſſive expeditions, and Europe was contaminated by their invaſions of Spain, Sicily, Italy, and France in the eighth century. Previous to this period, it is generally believed that this deſtructive peſtilence was unknown in Europe. This is principally inferred from the ſilence of all the ancient phyſicians, Greeks and Romans, who have left us accurate deſcriptions of many of the diſeaſes, with which we are now familiar, but who have not deſcribed the ſtriking and peculiar ſymptoms which characterize this ſevere and often fatal malady. Some authors, however, and not without a ſhow of probability, have maintained that ſuch an inference is not ſtrictly deducible from this circumſtance. For the ancients were apt to confound every ſpecies of fatal fever under the term *peſtilence*, and were miſled, by their hypothetical doctrines about the four humours, to make no diſtinctions from a view of the ſymptoms. Some of the ancient plagues, and particularly that of Athens, deſcribed by Thucydides, were manifeſtly not *the plague* properly ſo called, but were connected with extenſive ſores and eruptions on the ſkin. (See PLAGUE.) It has been urged, too, that in a fragment of the works of one Herodotus of Rome, preſerved by Aëtius, there is a deſcription of various fevers, accompanied by eruptions, in which the ſmall-pox appears to be diſtinctly included. It is remarkable, too, that the firſt Arabian phyſicians, even Ahron of Alexandria, do not mention the diſeaſe as a new malady, but ſpeak of it as one familiarly known; and Rhazes refers to Galen, as having mentioned many of its ſymptoms. The evidence in ſupport of this opinion is certainly very imperfect, and ſcarcely ſufficient to build a controverſy upon; nor is it of any farther importance than as an object of curious inquiry.

All that relates to the hiſtory and practice of *inoculation* (which, indeed, ſhould now be ſuperſeded by vaccination) has been alſo detailed in the article already referred to. At preſent, therefore, our object is to give only the medical hiſtory of ſmall-pox, as it occurs in the caſual, or, as it is often called, the natural way; deſcribing, firſt, its ſymptoms, with the prognoſtics, and various tendencies of the diſeaſe, and afterwards the beſt methods of treatment.

The term *variola*, which is of modern origin, is ſuppoſed to be derived from *vari*, which are ſmall inflamed tumours of the face, occurring about the period of puberty, and noticed firſt by Celſus under that appellation. The words *pock*, *pocks*, and *pox*, from the Anglo-Saxon *pocca*, ſignifying a pouch

pouch or pocket, and applicable to any puſtule or puſtular diſeaſe, were appropriated early to this formidable malady; and the epithet *ſmall* was ſubſequently added to diſtinguiſh it from a ſtill more recent diſeaſe, the *lues venerea*, to which the ſame appellation was applied.

Several varieties of the ſmall-pox have been noticed by different writers, but they may be all included under the two principal forms, which were ſo ably pointed out by Sydenham, and which ſince his time have been commonly recognized under the appellations of the *diſtinct* and the *confluent* ſmall-pox. Although originating from the ſame contagion, and not differing from each other eſſentially, they exhibit a different ſeries of ſymptoms, purſue a ſomewhat different courſe, and require a different mode of treatment, and therefore it is convenient to treat of them ſeparately.

1. *Of the Diſtinct Small-Pox:—Variolæ Diſcretæ.*—In this form of the diſeaſe, the eruptive fever is moderate, and not eaſily diſtinguiſhed from an ordinary attack of common inflammatory fever. It generally begins about mid-day, with a chilline ſs and ſhivering, accompanied by a conſiderable languor and drowſineſs, which are ſoon followed by a great heat, pains in the head and back, ſickneſs at the ſtomach, with a ſoreneſs or preſſure in that part, and in adults, eſpecially if they are kept in bed, with a great diſpoſition to perſpiration. In children the ſweating does not occur; but they are liable to frequent ſtartings from their ſlumbers, and on the third day are ſometimes affected with one or two fits of convulſion. Sydenham conſidered this ſymptom as rather favourable; having obſerved that it was commonly ſucceeded by an eruption of a large and mild ſmall-pox. On the evening of the third, or the morning of the fourth day, the eruption appears, and gradually increaſes during the fourth and fifth days, ariſing firſt on the face, and ſucceſſively on the inferior parts, ſo as to be completed over the whole body on the laſt-mentioned day. With the appearance of the eruption, the febrile ſymptoms abate, and nearly or altogether ceaſe on the following day, with the completion of the eruption. This appears firſt in ſmall red ſpots, ſcarcely eminent, but which, by degrees, riſe into minute pimples, which are ſeparate and diſtinct from each other, and generally not very numerous. The day after their appearance, a ſmall veſicle, containing a clear or ſlightly whey-coloured fluid, ſhews itſelf on each of the ſpots. For two days theſe veſicles increaſe in breadth only, and there is a ſmall depreſſion in their centre. As they extend, they continue to be ſurrounded with an exactly circular inflamed margin, which, when the puſtules are numerous, covers the greater part of the intervening ſkin, and diffuſes ſomewhat of a damaſk hue over the ſpaces between the puſtules. Under the touch they are hard, and rather painful, and give the impreſſion of ſmall round ſeeds under the cuticle to the finger; a circumſtance which tends to diſtinguiſh them from the veſicles of chicken-pox, which feel like ſmall ſeeds flattened by preſſure.

About the *eighth* day, the eruption is elevated into ſpheroidal puſtules; and if theſe are numerous, the increaſe of their ſize and the fullneſs of the ſurrounding parts occaſion a conſiderable ſwelling of the whole face, and eſpecially of the eyelids, which are ſo diſtended as entirely to cloſe the eyes, and often ſhine like an inflated bladder. Sometimes, where numerous puſtules fix upon the eye-lids, the blindneſs comes on before the eighth day. The eruption now aſſumes a whiter appearance; for, as the diſeaſe proceeds, the matter in the puſtules becomes by degrees more opaque, and at length, as the ſuppuration increaſes, of a yellowiſh colour. A ſimilar progreſs is obſerved in the hands, but a little later; ſo that when the face is becoming rough and yellow, the extremities are becoming ſmoother and whiter. On the *eleventh* day the ſwelling of the face is much abated, and the inflammation diminiſhed: the puſtules are now at their height, and ſeem quite full. On the top of each a darker ſpot appears; and at this place the puſtule, on the eleventh day or ſoon after, is ſpontaneouſly broken, and a portion of the matter oozes out; in conſequence of which the puſtule is ſhrivelled and ſubſides, while the matter oozing out dries, and forms a cruſt upon its ſurface. Sometimes very little of the matter oozes out, but remains in the puſtule, becoming thick, and even forming a hard little ſcab. After ſome days, generally about the fourteenth or fifteenth, both the cruſts and the hardened puſtules fall off, leaving the ſkin on the points which they covered of a brown red colour; and it is only after many days that theſe red marks are effaced. The diſtinct ſmall-pox ſeldom leaves any pits in the ſkin; but in ſome caſes, where the matter of the puſtules has been more liquid, the cruſts formed by it are later in falling off, and the points which they covered undergo ſome degree of ulceration, which partially deſtroys the ſubſtance of the ſkin, and produces a ſmall excavation or pit. Sydenham and Cullen aſcribe this erroneouſly to the deſquamation which enſues.

As the eruption is ſucceſſive, ſo the maturation on the body and extremities follows the ſame courſe as above deſcribed, but a little later. On the tenth and eleventh days, as the ſwelling of the face ſubſides, a ſwelling ariſes in the hands and feet, which again ſubſides, as the puſtules come to maturity. In the puſtules of the hands and arms, indeed, the matter is frequently abſorbed; ſo that at the height of the diſeaſe, theſe puſtules appear as empty veſicles.

When the puſtules on the face are numerous, ſome degree of feveriſhneſs appears on the tenth and eleventh days, but it ceaſes again after the puſtules are fully maturated, or continues only in a very ſlight degree till the laſt puſtules on the feet have finiſhed their courſe. In the diſtinct ſmall-pox this ſecondary fever is never conſiderable, and ſeldom continues longer than the period juſt mentioned. Under the ſame circumſtances, an abundant crop of puſtules on the face, ſome uneaſineſs in the throat, and a hoarſeneſs of voice, occur about the ſixth or ſeventh day, and a thin fluid is poured out from the mouth. Theſe ſymptoms increaſe with the ſwelling of the face; and the diſcharges from the mouth and throat becoming thicker and more viſcid, are more difficultly ejected. Some difficulty of ſwallowing alſo occurs; ſo that liquids taken in to be ſwallowed are frequently rejected, or thrown out by the noſe. But all theſe affections of the fauces abate as the ſwelling of the face ſubſides.

Some varieties of the diſtinct ſmall-pox have been deſcribed by different authors under ſpecific appellations, ſuch as the *contiguous*, the *coherent*, the *warty*, &c. ſmall-pox (ſee Walker's Inquiry into the Small-pox, chap. viii. and Roe's Treatiſe on the Natural Small-pox, chap. i.); but theſe are merely more violent degrees of the diſeaſe, partaking more or leſs of the character of the confluent ſpecies, and requiring to be treated accordingly.

2. *Of the Confluent Small-pox.*—This form of the ſmall-pox follows a ſimilar courſe with the preceding ſpecies, but the ſymptoms of every ſtage are more violent, and ſeveral of the circumſtances are alſo different. The eruptive fever eſpecially is much more violent; the pulſe is more frequent, ſharp, and contracted; the head-ache, and the pain and anxiety at the præcordia, the ſickneſs and vomiting, are more ſevere; the coma is more conſiderable, and there is frequently a delirium. In adults there is leſs diſpoſition to perſpiration than in the other ſpecies, and ſometimes a diarrhœa occurs; and in children epileptic fits are frequent on the firſt days of the diſeaſe, and ſometimes prove fatal before any eruption appears,

appears, or they uſher in a very confluent and malignant ſmall-pox.

The eruption appears more early than in the benign ſmall-pox; commonly early on the third day, or on the evening of the ſecond, and ſcarcely ever ſo late as the fourth day; except, as Sydenham remarks, in a few rare caſes, where it appears to be delayed by ſome violent ſymptom, ſuch as an acute pleuritic or rheumatic pain, or a violent pain in the ſtomach, with ſickneſs and vomiting, which manifeſtly indicate the confluent and dangerous nature of the forthcoming diſeaſe. The eruption too is often preceded by an extenſive erythematous efflorescence, like a commencing eryſipelas; and ſometimes it comes out in little irregular cluſters, like the meaſles, conſiſting of many crowded red points or pimples. The pimples are always moſt numerous on the face, and at the ſame time ſmaller and leſs eminent. The little veſicles which form on the tops of the pimples, appear ſooner than in the diſtinct ſpecies, and while their diameters extend, they do not retain a circular form, but are of very irregular figures. Many of them run into one another, forming a flat irregular ſurface, ſo that the face very often appears to be covered rather with one extended veſicle, than with a number of puſtules. And when there is any diſtinct ſeparation of the puſtules, they do not riſe to a ſpheroidal form, but remain flat, and their circumference is not bounded by an inflamed margin, the part of the ſkin that is free from puſtules being commonly pale and flaccid, and not exhibiting the damaſk hue of the diſtinct ſmall-pox. The fluid included within the puſtules changes about the eighth day from a clear to an opaque appearance, being firſt whitiſh and now browniſh, but never acquires the yellow colour and thick conſiſtence that appear in the mild ſpecies.

In the confluent ſmall-pox, the ſwelling of the face, which is ſometimes abſent from the diſtinct ſpecies, but is generally preſent when the puſtules are numerous, never fails to appear, and it comes on more early, and ariſes to a greater degree, ſometimes annihilating every appearance of the features. It abates, however, on the tenth day, and on the eleventh ſtill more. At this time the puſtules or veſicles, or rather the extended pellicle, which from the eighth day had become rough and brown, is ruptured; and, ſhrivelling, pours out a fluid, which concretes into brown or black cruſts, which do not fall off for many days, even till after the twentieth day; and, in conſequence of the ulceration which takes place under them, pretty certainly leave the ſurface of the face conſiderably pitted. On the other parts of the body, and on the extremities, eſpecially the hands and feet, ſtill more than on the trunk, the puſtules of confluent ſmall-pox are larger and more diſtinct than upon the face; but they never acquire the ſame maturity and conſiſtence of pus as in the properly diſtinct kind.

The confluent ſmall-pox is attended by two other ſymptoms of conſiderable importance, the one in adults, the other in children. The former is ſalivation, or exceſſive ſecretion of ſaliva, which never fails to accompany the confluent form of the diſeaſe in grown perſons, and is ſometimes ſeen in a ſlight degree in the diſtinct kind. It ſometimes begins as ſoon as the eruptions appear; and ſometimes not till a day or two after. The ſaliva is for ſome time thin and copious, and eaſily diſcharged, having very much the appearance of the ptyaliſm excited by mercury, except that it does not ſmell ſo offenſively; but about the eleventh day it becomes thick and more viſcid, and is expectorated with great difficulty. The patient is very thirſty, and coughs while he attempts to drink, expelling the liquor through his noſtrils. The affection of the throat is alſo generally aggravated at the ſame time. The ſalivation often ceaſes after the eleventh day, about which time the hands commonly ſwell (or at leaſt, Sydenham ſays, ought to do ſo); but ſometimes, after a complete ceſſation for a day or two, it returns again.

In children, a diarrhœa occurs frequently in the place of the ſalivation; but it does not ſeize them ſo early as the ſalivation attacks grown perſons. Whenever it begins, however, unleſs it be checked by art, it attends the diſeaſe to its termination.

In the diſtinct ſmall-pox, as we have already ſtated, the fever commonly ceaſes with the completion of the eruption on the fifth day; but it is not ſo in the confluent ſpecies. In the latter, the febrile ſymptoms only ſuffer a remiſſion at the time of the eruption, which continues to the period of complete maturation, that is, to the eleventh day, in the latter part of which day it is often renewed with conſiderable violence, conſtituting what has been called the *ſecondary fever*, which is the ſource of much danger, and is of various duration. The pulſe quickens, the heat of the body increaſes greatly, much thirſt, with great anxiety and reſtleſſneſs, ſevere head-ache, ſhort and confuſed ſlumbers, delirium, and ſometimes coma, enſue. Theſe ſymptoms, indeed, are often ſo ſudden and violent, being accompanied alſo with ſuppreſſion of the ſalivation, and a difficulty of breathing and of deglutition, that, if nothing has been done to alleviate the early inflammatory action, death ſoon follows. Whence Sydenham ſpeaks ſo often about the danger of the eleventh day. In other caſes, however, this fever is protracted to the fourteenth and ſeventeenth days, and ſometimes even later, and yet terminates fatally. In ſome inſtances, theſe ſevere forms of confluent ſmall-pox are accompanied by ſymptoms of great malignancy or putreſcency, as it has been called: purple ſpots, or *petechiæ*, appear in the interſtices of the ſkin between the puſtules; and ſometimes ſmall black ſpots, ſcarcely ſo large as pins' heads. ariſe on the top of the eruptions in different places: or a diſpoſition to gangrene under ſerous veſicles ſhews itſelf: or laſtly, various ſpontaneous hæmorrhages take place from the internal parts, as from the kidneys and bladder, whence bloody urine is diſcharged; or from the lungs, in bloody expectoration; and ſometimes from the inteſtines, in bloody ſtools.

From a conſideration of the preceding detail of the various circumſtances which accompany the different forms and ſtages of the ſmall-pox, the degree of danger under the various ſymptoms, and the probable event in particular caſes, may be eſtimated. The following points of prognoſis will be obviouſly inferred. In general, the more exactly the diſeaſe retains the form of the diſtinct kind, it is the ſafer; and the more it approaches or takes the form of the confluent kind, it is the more dangerous. It is only, indeed, when the diſtinct kind exhibits a great number of puſtules in the face, which are contiguous or coherent, that it is attended with any danger: for it muſt be obſerved, that it is chiefly from the crowd of puſtules on the face, and not from thoſe on the body, that the danger of the diſeaſe is to be apprehended. Particular ſymptoms will enable us to anticipate particular occurrences. Thus, if the previous or eruptive fever be very violent in its attack, and be accompanied with great proſtration of ſtrength, anxiety, and lowneſs of ſpirits, with ſevere head-ache, weeping and redneſs of the eyes, great pains in the back, a burning heat of ſkin, and a quick hard pulſe;—the occurrence of a confluent eruption may be expected. The more early the eruption, the more danger is to be anticipated; but a retardation of the eruption beyond the fourth day, alſo implies a probability of a confluent diſeaſe. The more gradual the eruption of the puſtules, the more favourable; provided

vided the time of their riſing be not protracted beyond the uſual limits by diarrhœa, pain, or depreſſing paſſions. The more diſtinctly ſuppuration takes place about the eighth day, and the more roſy the interſtices around the puſtules, the leſs danger is to be apprehended. A ſudden ceſſation of the ſwelling of the face about the eleventh day, and the non-appearance of that ſwelling about the eighth day, when the puſtules are very numerous, are indicative of great danger; as are alſo a ſudden ſuppreſſion of the ſalivation in adults, and of the diarrhœa in children, at the former period; eſpecially if the hands and feet have not exhibited any ſwelling about that time. If, in the diſtinct ſmall-pox, convulſions occur in children after the eruption is come out, or after incruſtation has taken place, death commonly enſues; or, if the patient ſurvives, a paralyſis of ſome of the limbs often remains. The diſcharge of pale and clear urine, with frequent urging to paſs it, in any period of the diſeaſe, denotes great danger.

On the other hand, regular gentle ſweats, and a free diſcharge of urine, which depoſits a ſediment, are favourable ſymptoms in every ſpecies of ſmall-pox. If, in the turn of the confluent ſmall-pox, the puſtules, which were before pale and flat, ſhould acquire a redneſs or damaſk-roſe colour round their baſes, and ſuppuration come on, the patient generally recovers.

When the ſmall-pox attacks women in a ſtate of pregnancy, it is attended with conſiderable danger, and commonly produces miſcarriage or premature labour. It has been a queſtion among pathologiſts, whether the connection between the child in the womb and the mother was ſuch as to admit of the infection of the former with the ſmall-pox under theſe circumſtances. Whatever hypothetical differences might exiſt upon this topic, experience has proved that ſuch infection often takes place in the fœtus *in utero*, though not invariably. It would appear, too, that the child is not affected at the ſame moment with the mother, but ſoon afterwards by ſubſequent infection. For, in a caſe related by Dr. Laird, a woman in the fifth month of her pregnancy paſſed through a ſevere ſmall-pox, which commenced about the end of Auguſt: ſhe felt the motion of the child till the month of October, on the 28th of which month ſhe was delivered of a child, which was thought to be of ſix months' growth, and which had been dead ſome days. "On the back, ſhoulders, and ſide, and particularly about the upper part of the thighs, where the integuments were perfectly ſound, there were ſeveral puſtular elevations, with central depreſſions, ſtrikingly characteriſtic of the appearances which diſtinguiſh ſmall-pox. The fœtus was placed in the muſeum of Guy's Hoſpital, and ſtill diſtinctly exhibits the characters of the eruption." See Edinburgh Med. and Surg. Journal, for April, 1807.

A ſtill more extraordinary circumſtance, in reſpect to the infection of the child in the womb, occaſionally occurs; namely, the production of ſmall-pox in the child, in conſequence of the mother's expoſure to the contagion, although the latter may have been prevented from ſuffering the diſeaſe herſelf, by having previouſly undergone that diſeaſe, or the cow-pox, and therefore eſcapes the influence of the infection. Dr. Jenner relates the following caſe, which came under his obſervation, in the inſtance of a lady in London. "A few days previous to her confinement, ſhe met a very diſguſting object, whoſe face was covered with the ſmall-pox. The ſmell and appearance of the poor creature affected her much at the time; and though ſhe mentioned the circumſtance on her return home, ſhe had no idea that her infant could ſuffer from it, having had the ſmall-pox herſelf when a child. During a few days after its birth the little one ſeemed quite well; but on the fifth day it became indiſpoſed, and on the ſeventh the ſmall-pox appeared. The puſtules, which were few in number, maturated completely. Dr. Croft, who attended her, being curious to know the effect of inoculation from one of the puſtules, put ſome of the matter into the hands of a gentleman eminently verſed in that practice, which produced the diſeaſe correctly. Mrs. W. was not ſenſible of any indiſpoſition herſelf from this expoſure, nor had ſhe any appearance of the ſmall-pox." Another caſe is mentioned by Dr. Jenner, in which the child *in utero* was infected with ſmall-pox contagion, and born with the eruption upon it, five weeks after the mother had been vaccinated, and a month after ſhe had been expoſed to the contagion of ſmall-pox from three of her children. Whence, as Dr. Jenner juſtly infers, it is obvious, "that the ſmall-pox virus may affect the human frame, even to its inmoſt receſſes, although apparently ſecured from its effects, and yet give no evidence of its preſence by exciting any perceptible diſorder." (See Medico-Chirurgical Tranſactions, vol. i. p. 272. Alſo, Van Swieten, Comment. ad Aphor. 1381; and Dr. Mead's Diſcourſe on Small-pox, chap. iv.) Dr. Mead ſtates the following analogous fact. "A certain woman, who had formerly had the ſmall-pox, and was now near her reckoning, attended her huſband in the diſtemper. She went her full time, and was delivered of a dead child. It may be needleſs to obſerve, that ſhe did not catch it on this occaſion; but the dead body of the infant was a horrid ſight, being all over covered with the puſtules; a manifeſt ſign that it died of the diſeaſe before it came into the world."

Though the confluent ſmall-pox ſhould not be immediately fatal, yet the more violent kinds are often followed by a morbid ſtate of the body, under which various diſagreeable and dangerous complaints ariſe. Whether theſe conſequences may be aſcribed, with Dr. Cullen, ſometimes to an acrid matter, generated by the preceding diſeaſe, and depoſited in different parts, and ſometimes to an inflammatory diatheſis produced, and determined to particular organs of the body, is a theoretical inquiry, which we are not diſpoſed to puzzle ourſelves and our readers by purſuing. It is manifeſt, in general, that the conſtitution is often left in a ſtate of great debility; does not thrive under the ordinary nutrition; and in many caſes exhibits a great tendency to ſcrofulous inflammation, eſpecially of the glandular ſyſtem, to chronic derangements of the lungs, meſentery, and other viſcera, and to various local affections of the ſkin, membranes, and bones. Another ſeries of evils, which the confluent ſmall-pox is liable to inflict, is the various degrees of injury and deſtruction which it occaſions in the organs of ſenſe, eſpecially in the eyes and ears. Deafneſs of one or both ears, and the loſs of ſight in one or both eyes, is no uncommon reſult of this formidable malady. It appears indeed, from the records of the humane "Inſtitution for the indigent Blind," that a very large proportion of all that claim its protection have been blinded by the ſmall-pox.

Cauſes of Small-pox, and of its Varieties.—The only exciting cauſe of ſmall-pox is the ſpecific contagion, generated in the puſtules of the diſeaſe itſelf. In what manner, or at what period of time, this great depopulator of the human race was generated, or what phyſical circumſtances concurred to give it exiſtence, hiſtory affords us no means of aſcertaining. The abſurd ſpeculations of the Arabian phyſicians, reſpecting the origin of the diſeaſe from ſome contamination of the fœtus with the menſtrual impurities of the mother, deſerve no notice. The obvious origin of a diſeaſe, (ſo analogous to ſmall-pox, as to ſuperſede the influence of its contagion on man,) from a diſeaſe of the ſkin

of

of the heels of a horſe, of which the cow-pox has recently afforded an example, has led ſome ſpeculators to the more probable conjecture, that the poiſon of ſmall-pox may have been communicated to the human from ſome domeſticated animal. The camel has been ſuggeſted: but it was forgotten, that, though Arabia was the country from which Europe probably received the contagion; yet that that country appears to have received it from the moſt eaſtern nations, by its early commerce, among whom it had previouſly exiſted from remote antiquity. (See Moore's intereſting "Hiſtory of the Small-pox," 1815.) At preſent we can only attend to the operation of this contagion, and inveſtigate its qualities from the effects which it produces.

It is evident, that the contagion of ſmall-pox is capable of being communicated, and of exciting the diſeaſe in others, both by the actual contact of the fluid of the puſtules, and the dried cruſts, and by diffuſion in a ſtate of ſolution in the atmoſpheric air. It may be alſo fixed and adherent to various ſubſtances, ſuch as woollen, linen, cotton, and other materials of clothing, as well as to wood, and other articles of furniture; from which alſo it may exhale in a ſtate of vapour. Whence a perſon may be infected, without actual contact either of the diſeaſed, or of *fomites*, that is, of infected ſubſtances. We have already ſtated, however, at great length, under the article CONTAGION, (which ſee,) the proofs and experiments by which it is rendered manifeſt, that the influence of this, and probably of moſt other contagions, by diffuſion in the atmoſphere, is limited to a very ſmall diſtance from the ſource of infection. We refer eſpecially to the experiments of Dr. O'Ryan, of Montpellier, upon that ſubject, which are related in the article juſt referred to. See alſo Dr Haygarth's Plan for the Extermination of Small-pox in Great Britain.

One property of the contagion of ſmall-pox, which it poſſeſſes in common with the contagion of meaſles, ſcarlet fever, and chicken-pox, but which does not belong to the contagion of gaol-fever, or typhus, nor to that of the plague, nor to the chronic contagious maladies, ſyphilis, and ſcabies, is its power of affecting the conſtitution *but once during the life of the individual*. The occurrence of the diſeaſe, under the mildeſt or the moſt ſevere form, equally renders the body incapable of receiving the diſeaſe again. This is the general fact; but in regard to none of theſe eruptive fevers can it be affirmed, without many exceptions: and the ſmall-pox preſents many anomalies in this reſpect. The extreme rarity of a ſecond attack of ſmall-pox was noticed by the Arabian writers; and their admiſſion of ſuch a fact would ſcarcely be admitted as a proof of its occurrence, ſince they deemed the ſmall-pox and meaſles to be but varieties of the ſame diſeaſe. They attempted to explain the occaſional recurrence of the diſeaſe upon their abſurd theory of its origin, ſuppoſing that the whole of the menſtrual blood, which contaminates the child, is not thoroughly depurated and expelled by the firſt attack. Even Boerhaave ſeems to have believed, that the *diſtinct* ſmall-pox did not invariably ſecure the individual from a ſubſequent attack of the *confluent* form; though the latter effectually prevented a recurrence. (See his Praxis Medica, § 1381.) This, however, is not conſiſtent with fact: for ſome of the moſt formidable and even fatal attacks of *ſecond* ſmall-pox have occurred in perſons previouſly much pitted and diſfigured by the diſeaſe. It will not be neceſſary to enter, in this place, into a very minute detail of the caſes of ſecondary ſmall-pox: it will be ſufficient to ſtate the fact, and to refer to ſome of the authorities on the ſubject of recent date, ſince the diſtinctions between chicken-pox, and the modifications of ſmall-pox, have been fully eſtabliſhed. The celebrated Dr. De Haen has related ſeveral very clear inſtances of ſecond ſmall-pox, which occurred in his own practice. One young man, a ſtudent of law, received the contagion twice within three years; the firſt attack left him pitted, and the ſecond proved fatal. (See his Ratio Medendi, p. ix. ch. 7: alſo his Epiſt. Apolog. Reſponſ. ad B. L. Tralles.) One of the moſt ſtriking caſes of this ſort, is that of Mr. Langford, whoſe countenance was "remarkably pitted and ſeamed" by a former malignant ſmall-pox, "ſo as to attract the notice of all who ſaw him:" yet at the age of fifty, he was attacked again with confluent ſmall-pox, which proved fatal to him, and to another member of his family, five of whom received the infection from him. (See Memoirs of the Medical Society of London, vol. iv.) A caſe of diſtinct recurrence of ſmall-pox is related by Dr. Laird, in the Edinburgh Journal, already referred to; another by Dr. Bateman, in the Medico-Chirurgical Tranſactions, vol. ii. p. 31; and Mr. Ring has collected a great number, to the amount of ſixty or ſeventy, in his Treatiſe on Cow-pox, and in various numbers of the London Medical and Phyſical Journal, eſpecially in volumes 12, 14, and 15. We may add, that the recurrence of meaſles, in ſeveral caſes, has been lately authenticated, by the firſt medical authority now living, (we mean by Dr. Baillie,) in a paper publiſhed in the third volume of the Tranſactions of a Society for the Improvement of Medical and Chirurgical Knowledge. The ſcarlet fever appears to be alſo ſubject to the ſame anomalies occaſionally. The exceptions, however, are rare in all theſe eruptive fevers, and the general rule will ſtill hold good. Yet the conſiderations of theſe exceptions ſhould remove our ſurpriſe, that the cow-pox ſhould not invariably ſecure the conſtitution from a ſubſequent ſeizure by the ſmall-pox; ſince its influence on the ſyſtem is commonly leſs conſiderable, than that of the mildeſt diſtinct ſmall-pox. We believe, however, that the ſmall-pox, which, under the exceptions, has been occaſionally ſeen to follow the cow-pox, has *always* been much mitigated by the prior operation of the vaccine *virus*, both in the violence and duration of the ſymptoms, and that it has never, in theſe caſes, terminated fatally.

It appears, from the preceding hiſtory of the ſymptoms, that the ſafety and danger of the ſmall-pox depends almoſt entirely upon the ſmaller or larger number of the puſtules: it becomes very important, therefore, both with a view to the prevention and to the treatment of the diſeaſe, to inveſtigate the origin of this difference in the eruption, and in the ſymptoms which accompany it.

From the difference in the appearance, conſiſtence, colour, &c. of the matter produced, as well as in the number and form of the puſtules, and from the various degrees of fever, and other ſymptoms, which accompany the different ſpecies of ſmall-pox, it might be readily ſuſpected, that the contagion itſelf was different. Experience, however, has completely refuted this ſuppoſition: for there are innumerable inſtances of the contagion, ariſing from a perſon affected with the mild and diſtinct ſmall-pox, producing the confluent kind in others; and, on the other hand, it is extremely common to ſee the diſtinct kind produced by expoſure to the contagion ariſing from a perſon affected with the worſt confluent ſmall-pox. The practice of inoculation has ſtill farther demonſtrated this fact. For the ſame matter was not unfrequently obſerved to produce in one perſon the diſtinct, and in another the confluent ſmall-pox. And in order that no time ſhould be unneceſſarily loſt, where perſons have been in the moſt imminent danger from complete

complete expoſure to the contagion, inoculation has been immediately performed from a confluent ſubject; yet the ſubſequent diſeaſe has been diſtinct and mild. We remember to have heard Dr. Gregory, the able profeſſor of the practice of phyſic at Edinburgh, aſſert, in his lectures, that he had once taken matter from the confluent ſmall-pox of a dying child, with which he inoculated two of its brothers: they had both a very mild diſeaſe: one of them, however, had previouſly taken the caſual infection, for he ſickened in three days from the time of inoculation. Indeed we could ſtate other facts, from the ſame authority, to prove that matter, taken from the puſtules of the dead body, has produced even the mildeſt form of ſmall-pox. It is manifeſt, therefore, notwithſtanding the prejudices of mankind, that the nature of the original contagion has no influence in modifying the diſeaſe which it inflicts: and we muſt infer, that the various forms which the diſeaſe aſſumes, originate from ſome particular ſtate of the conſtitution in the individuals whom it thus variouſly handles. And this condition of the conſtitution muſt be the reſult of external cauſes, ſuch as the ſeaſons, and ſtate of the atmoſphere; or of internal and perſonal cauſes, ſuch as plethora, obeſity, irritability, or the contrary, depending on original conformation, or upon indulgence, intemperance, affections of the mind, and ſo forth. It is not the contagion of ſmall-pox alone, which is variouſly modified in this way by the exiſting condition of the conſtitution; almoſt all external agents are ſo modified. The ſcratch of a thorn will not be felt for an hour by one perſon; while in another it will inflame and form an abſceſs, even excite the abſorbents, and produce a bubo and fever; or it may run on to gangrene, and occaſion death. In like manner, if ſeveral people are expoſed to cold, by falling into water, for inſtance, and remaining wet: the effects will be very different individually. Many will eſcape without inconvenience; ſome with a common coryza or ſore-throat; another will be confined to bed for weeks with an univerſal rheumatiſm; another will be attacked with pleuriſy, or a ſpitting of blood, or an inflammation in the bowels. It is preciſely the ſame with the varieties of ſmall-pox: they are not the reſult of a difference in the cauſe, but ſolely of a difference in the ſtate of individual conſtitutions.

The effect of different ſeaſons upon the human conſtitution does not admit of very ſatisfactory explanation. Sydenham and Boerhaave, both able obſervers of nature, remarked, that the regular and diſtinct ſmall-pox uſually appears about the vernal equinox, when it is epidemic, increaſing through the ſummer, and attaining its height and ſeverity in the autumn, and commonly diſappearing with the approach of the winter's cold. They both alſo obſerved, that if it commences early, as in January or February, (and Boerhaave adds, more particularly if it has been abſent from the place ſix years,) the following ſummer will be diſtinguiſhed by an epidemic of a ſevere and fatal kind, ſparing none who have not previouſly undergone the diſeaſe, and proving extenſively deſtructive.

The internal peculiarities of conſtitution, which modify the operation of morbific cauſes in general, and of the contagion of ſmall-pox in particular, are more obvious and intelligible. Various hypotheſes about the fermentation excited in the blood, and the free exit or depoſition in the ſkin of the contagious matter, thus multiplied by that proceſs, have been formed to explain this point: and even Dr. Cullen has adopted this abſurd humoral notion, and endeavours to point out the circumſtances "which determine more or leſs of the variolous matter to *ſtick in the ſkin*, or to paſs freely through it." (Firſt Lines, § 598.) But theſe notions are inconſiſtent with facts. In the firſt place, there is no evidence that the contagion acts like leaven upon the blood, "and aſſimilates a great part of it to its own nature." (Cullen, loc. cit.) The blood, as far as its properties are cognizable by the ſenſes, poſſeſſes no qualities which are not common to all inflammatory diſeaſes. There does not appear, indeed, to be any thing analogous to fermentation in the proceſs. The pus that is generated is the reſult of the inflammatory action of the veſſels of the ſkin, and is generated in the ſkin only; it is not floating in the maſs of circulating fluids, and detained in the ſkin, as by a ſieve. Whatever, therefore, increaſes the inflammatory action, increaſes the number of puſtules. Thus, parts of the body that are much heated, as by lying upon them, or keeping them in long and cloſe contact, have a greater number of puſtules than others; and parts that are covered with plaſters, eſpecially thoſe of a ſtimulant kind, are always more thickly beſet with puſtules. If we extend this principle to the conſtitution generally, we ſhall find, that thoſe perſons who are by nature, their period of life, their mode of living, previous indiſpoſition, the ſeaſon of the year, or other cauſes of a more irritable and inflammatory habit, will be more liable to ſuffer ſeverely from the influence of ſmall-pox. An intelligent writer has ſtated, from his own obſervation, that perſons of a ſwarthy complexion, of a dry rigid fibre, not much diſpoſed to perſpire, with brown or black hair, which is of a ſtrong texture and in great quantity, are more liable to a ſevere ſmall-pox than thoſe of a fair complexion, with thin, weak, and light hair, and who are moderately fat, but perſpire freely. He remarks, too, that "perſons afflicted with the palſy, ague, dropſy, and rickets, have commonly a favourable ſmall-pox; and thoſe afflicted with the two former frequently recover from both." (Roe on the Small-Pox, p. 57.) But the natural irritability may be much augmented or diminiſhed by various circumſtances, and thus the danger from the attack of ſmall-pox in like manner increaſed or leſſened. Thus, to uſe the words of the ſame author, "if a perſon ſhould live intemperately, uſe violent exerciſe, drink much ſpirituous liquors, or give any occaſion whatſoever to inflammation, before the attack of the ſmall-pox, the diſeaſe will prove more virulent, although the natural habit be good. On the contrary, if a perſon be of an indifferent habit, and an unpromiſing temperament, but live temperately, eat little animal food, and lead a ſober and ſedentary life, before the diſeaſe attacks him, he bids fair for a happy recovery." We may add, that, upon the ſame principle, the adult age, as more robuſt and more connected with full living, is more liable to ſuffer the diſeaſe ſeverely than childhood.

It ſeems, therefore, ſatisfactorily proved, "that an inflammatory ſtate of the whole ſyſtem, and more particularly of the ſkin," is the cauſe of the multiplication of the puſtules, as well as of the other circumſtances, which belong to the confluent ſmall-pox, ſuch as the early eruption, the erythematous raſh, the continuance of the fever, the effuſion of a more ichorous matter, and from thence the peculiar form, hue, incruſtation, &c. of the puſtules. See Cullen, Firſt Lines, § 600.

Different cauſes have been aſſigned for the ſuperior mildneſs of the diſeaſe, when produced by inoculation, over that which occurs in the caſual way. Some have ſuppoſed that this advantage aroſe from having the choice of the matter of infection in the former caſe; and others have imagined that it was owing to the ſmall quantity of matter which was introduced by the lancet. But from what has been ſaid above, it is manifeſt that the choice of the matter is of

no importance; and we know not how ſmall a quantity is received when infection is communicated in the caſual way. But it is very obvious, that, by avoiding the cauſes of an inflammatory diatheſis, by leſſening this condition when it exiſts, by ſhunning the concurrence of other diſeaſes with the ſmall-pox, and by chooſing the proper ſeaſon and time of life, we gain many advantages; and probably theſe were the principal advantages which inoculation poſſeſſed.

Seat of the Small-pox.—It has been a ſubject of much diſpute, though eaſily determined by obſervation, whether the puſtules of the ſmall-pox affect the viſcera and other internal parts. The moſt reſpectable teſtimony in favour of their exiſtence internally, is that of Wriſberg, in the New Gottingen Commentaries, vol. lxvi: but ſome others have alſo maintained that they had ſeen the puſtules, upon diſſection, upon the internal organs. There is no doubt, however, that ſuch obſervations have originated in miſtake. For all the diſſections made by recent and more accurate anatomiſts have demonſtrated, that, beyond the extenſion of the cuticle, no variolous puſtules ever ariſe. Cotunnius, an Italian profeſſor of anatomy, diſſected above forty perſons, who died of ſmall-pox, for the expreſs purpoſe of aſcertaining what parts or organs were inveſted with the puſtules. Theſe examinations were conducted with great attention and accuracy, and in the preſence of a number of ſtudents: and the reſult was, that, though the mouth, tongue, palate, and top of the pharynx, were often full of puſtules, and in ſome few caſes the internal membrane of the trachea was inflamed, and exhibited ſome effuſion; yet not the leaſt veſtige of puſtules was found upon any of the internal parts, even in the œſophagus. "Etenim quod ſpectat interiores partes,—certè non viſcus, non membrana, non glandula, non pars demum interior ulla fuit, quæ in tot exemplis apparuerit puſtulata." (Cotun. de Sedibus Variolarum, § xxxix.) The truth is, as we have already obſerved, the puſtules are little *cutaneous* abſceſſes, the reſult of inflammation in the ſkin alone, and not depoſitories of contagious matter diſtilling from the blood.

Diagnoſis.—It is not eaſy, in general, to diſtinguiſh the fever, which is about to uſher in the ſmall-pox, from common ſimple fever, or from ſome other febrile diſeaſes; ſince its early ſymptoms are not materially different from theſe. It may be preſumed to be variolous fever, when the ſmall-pox is a prevailing epidemic, provided the individual has not undergone the diſeaſe; and eſpecially if he may have been in circumſtances which rendered the communication of infection probable, or if his expoſure to it were well aſcertained. On children, the occurrence of a convulſive fit, on the evening of the ſecond, or on the third day, will lead to a ſuſpicion that the ſmall-pox is about to appear. In all caſes, however, this doubt will commonly be cleared up by the fourth day, when the ſmall-pox will have appeared.

It is not eaſy to confound the eruption of ſmall-pox with any other febrile eruption, except the chicken-pox, which, indeed, has not been demonſtrated as a diſtinct diſeaſe more than fifty or ſixty years. It had been called *variolæ ſpuriæ*, *baſtard* ſmall-pox; and even Dr. Heberden, who has the merit of having given the firſt clear deſcription of the chicken-pox, (ſee Medical Tranſactions of the College of Phyſicians, vol. i. p. 433.) ſtill applied the term *variolæ* to it; calling it *variolæ puſillæ*. See his Commentarii de Morbis, cap. 96.

The eruption of ſmall-pox is ſlower and of longer duration than that of chicken-pox, the latter being commonly completed in three days, and being covered with ſlight brown ſcabs on the fifth day, at which time the ſmall-pox is at the height of ſuppuration. The inflammation round the chicken-pox is very ſmall, and the contents of them do not ſeem to be owing to ſuppuration, as in ſmall-pox, but rather to what is extravaſated immediately under the cuticle by the ſerous veſicles of the ſkin, as in a common bliſter; whence this fluid appears in a veſicle on the ſecond day, and, upon the cuticle being broken, is preſently ſucceeded by a ſlight ſcab. On the third and fourth days, the ſhrivelled or wrinkled ſtate of the veſicles which remain entire, and the radiating furrows of others, the ruptured tops of which have been cloſed by a ſlight incruſtation, fully characteriſe the chicken-pox, and diſtinguiſh its eruption from the firm and durable puſtules of ſmall-pox. Another circumſtance is alſo to be added to the diagnoſis of theſe two diſeaſes. If the whole eruption of chicken-pox on the face, breaſt, and limbs, be inſpected on the fifth or ſixth day, every gradation of the progreſs of the veſicles will appear at the ſame time, which cannot take place in the ſlow and regulated progreſs of the ſmall-pox. (See Willan on Vaccine Inoculation, p. 95.) We have already noticed the difference in the ſenſation excited by touching the early eruption of the two diſeaſes with the point of the finger, pointed out by the laſt-named author.

Since the introduction of the practice of vaccination, which may be deemed one of the greateſt benefits ever conferred upon mankind by any individual, the diagnoſis between ſmall-pox and chicken-pox has, however, been rendered a little more difficult. For in ſeveral caſes in which the ſmall-pox has occurred in perſons who had undergone the cow-pox (and we have ſeen that even ſmall-pox and meaſles are not always ſecurities againſt themſelves), a mitigated and modified ſmall-pox has commonly enſued, of a veſicular character, or of a ſmall horny appearance, which has not gone through the uſual ſtages; but, inſtead of proceeding to full ſuppuration, has begun to ſubſide and dry away on the ſixth day from the commencement of the eruption. It requires conſiderable attention, therefore, to diſcriminate between this variety of mitigated ſmall-pox and the chicken-pox; and deciſion cannot always be obtained without the experiment of inoculation with the matter of the puſtules. The impreſſion under the finger, the form, and regular progreſs of the ſmall-pox, may be generally recognized, however, up to the ſixth day, by careful obſervation.

Treatment of Small-pox.—Until the year 1798, when Dr. Jenner immortalized his name by the announcement of his great diſcovery of the properties of the cow-pox, no means of *prevention* could be ſuggeſted to any individual, by which he could avoid or protect himſelf from the ſmall-pox. In all large towns, and eſpecially ſince the introduction of the practice of inoculation, a conſtant collection of contagion ſubſiſted, which operated upon every one who viſited them, even for a ſhort time, from their more inſulated ſituations in the country, if they remained ſuſceptible of the diſeaſe. A preventive, however, is now diſcovered, and every one may be rendered ſecure from the influence of this baneful contagion. (See Cow-pox.) At preſent, however, this valuable preventive is not yet univerſally adopted, and the ſmall-pox has carried off in this metropolis, during the year which has juſt terminated (1815), no leſs than one hundred and twenty-nine perſons. We have ſtill, therefore, occaſion to ſtudy the beſt mode of treating the diſeaſe, under the different forms which it aſſumes, when it occurs in the caſual way.

From a view of the hiſtory of the diſeaſe, as above detailed, it appears very evident, that the danger and violence of the ſymptoms are nearly in proportion to the quantity of the eruption; which is again much connected with the degree

gree of fever that accompanies and precedes it. The firſt indication, therefore, is, to moderate the eruptive fever.

In the caſe of inoculated ſmall-pox, this proceſs may be commenced in the interval between the inſertion of the matter and the beginning of the diſorder, that is, ſeveral days previous to the origin of the fever; when, by a light and cooling diet, and by the uſe of laxative medicines, if the habit be full, the body may be brought into a leſs inflammatory ſtate; and thus rendered leſs ſuſceptible of violent inflammatory diſeaſe. But in the caſual ſmall-pox, we have commonly no warning of the malady, until the eruptive fever actually commences; nor, when it has already begun, can we be certain, from any peculiar ſymptoms, that it is any thing but an ordinary fever; unleſs it occurs in perſons who, not having previouſly undergone the diſeaſe, have been notoriouſly expoſed to the infection. It is fortunate, however, that our inability to diſtinguiſh the fever which is about to uſher in the ſmall-pox from common inflammatory fever, is of no moment; ſince the ſame remedies are the moſt appropriate in both caſes. The older practitioners, indeed, miſled by their humoral hypotheſes, about a fermentation in the blood, a ſtruggle of the conſtitution to rid itſelf of the ſcum and dregs that were ſeparated, and a ſalutary effort to diſcharge them by the ſkin, which was ſuppoſed to be manifeſt in the puſtules, unfortunately took an oppoſite view of the ſubject. They thought it neceſſary to aſſiſt and encourage the fever, and very dangerous to repreſs it; and therefore they excluded the cool air, kept the patient in a hot bed, and adminiſtered warm drinks and cordial medicines. The pernicious influence of this practice (which was extended to all febrile complaints) was firſt detected by the ſagacity of our great countryman, Sydenham, in ſpite of the hypothetical doctrines, in which he had himſelf been educated; and his prophecy, that, after his death, his opinion and practice would prevail, has been amply verified. In fact it is now univerſally admitted, that the more the previous fever is moderated, the more all the enſuing ſymptoms will be mitigated. According to the degree of violence with which the fever commences, the activity of the meaſures for moderating it will be various. If the ſymptoms are not ſevere, the patient may be recommended not to keep his bed, but to remain, according to the advice of Sydenham, in a cool apartment, having the benefit of cool air; and at the ſame time to diſcard animal food, and adopt that of a cooling nature, vegetable decoctions, acidulous fruits, and diluent drinks, ſuch as plain cold water, lemonade, whey, &c. All his drinks ſhould be given cold; and the bowels ſhould be freely opened by ſome cooling purgative, as by the neutral ſalts, with a little calomel. If theſe meaſures are adequate to keep down the fever, and if, at the ſame time, the eruption appears early, and in ſmall numbers, the ſafety of the patient may be conſidered as aſcertained; and no farther treatment, except a continuance of the antiphlogiſtic ſyſtem, is neceſſary. The practice of continuing to give purgatives as the eruption declines, appears to be altogether unneceſſary, and may in ſome caſes be hurtful; and it ſeems to be continued rather in compliance with the exploded hypotheſis of ſeparating the contagious matter from the blood, than from any rational inference of experience.

Where the fever comes on, however, with great violence, manifeſting early its character, by a quick, hard pulſe, intenſe heat, and thirſt, a flushed countenance, inflamed eyes, ſevere head-ache, a quick and oppreſſed reſpiration, with delirium, eſpecially in adult perſons, and in thoſe of vigorous or plethoric habits, very active meaſures ſhould be immediately adopted. In perſons of the latter deſcription, the firſt object would be to let ſome blood, the quantity of which muſt be determined by a conſideration of the patient's age, conſtitution, and habits of life, and of the violence of the ſymptoms. At the ſame time, although he cannot obey Sydenham's injunction of ſitting up, the cooling plan muſt be adopted to the fulleſt extent in reſpect to his apartment, which ſhould be freely ventilated by the admiſſion of the external air, through open windows and doors, and to his bed, which ſhould be a mattraſs, and as lightly covered as the ſeaſon and his feelings will permit. If the ſkin is intenſely hot and dry, much benefit will be obtained, in the moſt expeditious manner, by ſponging the ſurface occaſionally with cold water, or even by the uſe of the cold affuſion. We have known ſeveral inſtances, in which this fever, not being ſuſpected to be the variolous fever, was treated by the cold affuſion, with the moſt decided alleviation of the fever, and of the ſubſequent eruption. The benefits of this practice in ſcarlet fever, even during the extenſion of the eruption over the whole ſkin, are now generally acknowledged by all phyſicians who have witneſſed the ſalutary and rapid change which it produces, both in the feelings and in the malady of the patient; being, in fact, the moſt efficacious phyſical agent, as well as the moſt expeditious and grateful, that the whole art of medicine is poſſeſſed of; and the only expedient fully entitled to the commendation of the ancient empiric, that of curing "citó, tutó, et jucundé." It is, in truth, but the perfection of the cooling ſyſtem recommended by Sydenham; and when united with cool air, cool drinks, and light coverings, it affords the moſt certain means of controlling the inflammatory fever.

An active purgative will alſo contribute to relieve inflammatory action, and ſhould be ſpeedily adminiſtered, and repeated according to circumſtances. Diaphoretics are alſo recommended, and if they are not of a ſtimulating kind, they may be given with advantage: but the moſt effectual mode of inducing perſpiration is by reducing the dry and burning heat of the ſkin, by cool air and waſhing.

If, however, theſe ſalutary meaſures have been omitted, or have proved inadequate to prevent a numerous eruption, eſpecially upon the face; if the puſtules are not diſtinct; and particularly, if, on the fifth day, the fever does not ſuffer a conſiderable remiſſion; the diſeaſe will ſtill require a great deal of attention. It will ſtill be neceſſary to avoid heat and a heating regimen, and to continue to admit the free acceſs of cool air, although the more active applications of cold, by ſponging or affuſion with water, need not be continued. The beneficial influence of cool and freſh air, indeed, at all periods of the diſeaſe, is very manifeſt; and in order to impreſs this truth more ſtrongly, it may not be improper to relate a caſe or two, from among many that have been recorded, to ſhew the extent of that influence, even in the later ſtages. Sir George Baker, in his "Enquiry into the Merits of a Method for inoculating the Small-pox, &c." obſerves, "The hiſtory recorded by Sydenham, of a young man at Briſtol, who owed his recovery to his being laid out on a table, as if dead, is ſufficiently known. To this hiſtory there is a great reſemblance in a caſe which is mentioned by Dr. Kirkpatrick, as having happened in Carolina. Mr. Benjamin Marych had a violent natural confluent ſmall-pox in the hot weather. His attendants thought him dead; upon which the ſaſhes were immediately ſet open, and a freſh quantity of air, or poſſibly a wind, ruſhing in, produced a freſh reſpiration and motion in the perſon who was thought dead. When this was obſerved, they went to put them down again. The patient who ſaw it, and was ſpeechleſs, but ſenſible of the alteration

and benefit, beckoned with his hand to prevent them; and by degrees entirely recovered." Another caſe of the ſame kind is related by a gentleman of great veracity and experience. "In the year 1736, a man who lived as ſervant with Mrs. Broderep, one of the daughters of archbiſhop Wake, in Great Ormond-ſtreet, had the confluent ſmall-pox; and on the evening of the fifteenth or ſixteenth day, his life was entirely deſpaired of. On the next morning, when I went rather to enquire after him than to viſit him, the nurſe's report was, that he had grown worſe and worſe till two or three o'clock in the morning, at which time he ceaſed to breathe, became inſenſible and motionleſs, and appeared to be abſolutely dead. About five or ſix o'clock, the body was removed and placed on a large table, near an open window, with no covering except only a ſhirt. No ſign of life appeared, but the body continued hotter than is common after death. This heat, however, the nurſe attributed to the weather. In this ſtate he had remained about an hour, when the nurſe heard a ſort of ſigh, or faint breathing; and it was obſerved that he had moved his arm acroſs his ſtomach. Being raiſed up with ſome difficulty, he took a ſpoonful of a cordial medicine, ordered for him on the preceding day; and as ſoon as he was able to ſpeak, he ſaid the cold air was very refreſhing. Being carried back to the bed, he fell into a ſweat, and ſlept three or four hours. About this time I ſaw him. His pulſe was now equal and ſtrong; his reſpiration better than it had been for ſeveral days before; and his ſenſes perfect. The door and windows were left open, and in a few days the man was quite out of danger." (See ſir G. Baker's Eſſay, above quoted; and Dr. Walker's work on Small-pox.) Theſe facts require no comment. They demonſtrate the beneficial influence of cool air at all periods of the diſeaſe. It is, however, particularly beneficial at the period of which we are now ſpeaking, when a thick eruption is coming out, and the fever does not remit. At this time the expoſure to cool air, with the other antiphlogiſtic meaſures, will often greatly leſſen the indiſtinct crowd of puſtules that is ſpreading over the face, and occaſion a few regular ones to ariſe, the head will loſe its confuſion, and the breathing become leſs oppreſſed,

At this period of the diſeaſe, too, under the ſame circumſtances, it may be neceſſary, in adult and plethoric ſubjects, to take away ſome blood. This, however, ſeldom requires to be repeated. But a cooling purgative ſhould be adminiſtered and repeated, or aided by a frequent repetition of laxative glyſters; and the free uſe of diluent drinks ſhould be permitted.

Moſt writers from Sydenham downwards, and Boerhaave and Cullen among the reſt, have recommended the adminiſtration of an *opiate*, every night, under this febrile condition, that continues after the eruption of confluent ſmall-pox has appeared. Sydenham, however, only gave it to patients whoſe age exceeded fourteen years: but Boerhaave and Cullen ſpecify the fifth day as the time for the commencement of opiates, and mention no exception. It does not appear, that modern experience has confirmed the views of theſe great phyſicians: indeed, when Sydenham ſpeaks of uſing opium or bleeding to effect the ſame purpoſe, we are unable to conjecture what powers he aſcribed to the former remedy. "Jam non aliis auxiliis (cum in propinquo mors ſit) ægro ſubveniri poſſe autumo, quam vel *narcotica* affatim exhibendo, vel *ſanguinem* liberaliter *extrahendo*," &c. (Obſ. Medicæ, ſect. iii. cap. 2.) Dr. Walker has juſtly animadverted on this practice, which, however it may alleviate reſtleſsneſs and pain, in ſlight caſes, unaccompanied by acute fever, is well known to accelerate the circulation, to harden the pulſe, to augment the heat and thirſt, to increaſe delirium, to diminiſh the ſecretions; in a word, to aggravate all the ſymptoms of inflammatory fever, while it fails to produce the anticipated reſt, or rather baniſhes it more effectually. Such we know to be the effects of an opiate in all the *phlegmaſiæ*, or acute and viſceral inflammation; as well as in the active ſtages of common fever; and we know no circumſtance in the early ſtage of ſmall-pox, which conſtitutes any exception to this fact, or which modifies the ordinary operation of the medicine. A ſteady purſuit of the antiphlogiſtic plan is a much more effectual ſoother of the irritation which the patient ſuffers. Sydenham and other writers urge the impropriety of interfering with the ptyaliſm, that uſually occurs in confluent ſmall-pox ſoon after the eruption is out, and deem the ſuppreſſion of it highly dangerous. Yet the tendency of opium to leſſen the ſecretions is well underſtood: but the principal injury to be apprehended from it is the excitement which it produces. In the later periods of the diſeaſe, however, when the febrile excitement is low, and much irritation is kept up by the hardening cruſts, the moderate uſe of opiates is to be recommended.

The antiphlogiſtic practice, above recommended, ſhould be continued during the progreſs of the eruption to maturation, unleſs ſome particular ſymptoms of failure of the *vis vitæ* ſhould enſue. For in every caſe of ſmall-pox, where the eruption of puſtules is numerous, although ſome abatement of the fever is diſcernible upon the complete eruption of the ſpots, yet there is ſeldom a perfect remiſſion of the fever, the pulſe rarely deſcending below 90 or 100 in the minute. The *ſecondary fever*, therefore, which occurs about the eleventh day, upon the complete ſuppuration of the puſtules, or at leaſt when theſe are perfectly full and ſtretched to their utmoſt extent, whatever may be the nature of the fluid which they contain, is rather an augmentation of the exiſting fever than a new fever. The origin of this fever, in the opinion of Sydenham and moſt of the writers who followed him, was the re-abſorption of the virus of the puſtules into the blood, as well as the retention of the ordinary perſpirable matter, which could not paſs off by the ſkin. Whence they recommended blood-letting, which, they believed, was the moſt effectual mode of depurating the blood thus contaminated, as the means of cure for this fever. But not only was their theory very bad, (for ſurely drawing a few ounces of blood from the circulating maſs could have no effect in removing the corruption from that which remained in the veſſels,) but their practice was often injurious, by reducing the ſtrength of the patient, at a time when the powers of life were about to fail, and require all poſſible ſupport. Dr. Freind had the merit of pointing out the ſuperior advantages of gentle purgatives in mitigating the ſecondary fever. The bowels ſhould be gently but ſteadily opened, in all caſes, at the commencement of this fever, provided no diarrhœa has occurred. According to the ſtate of the pulſe, and the appearance of the matter in the eruptions, the ſtrength of the patient, and other ſymptoms, more or leſs of a cordial plan of treatment muſt, however, be combined with the laxatives. Light liquid nouriſhment, with a little wine and water as drink, ſhould be frequently adminiſtered; and a decoction or infuſion of cinchona, with the mineral acids and a ſlight aromatic, will be given with advantage. If the diſeaſe put on a more malignant character, with petechiæ and hæmorrhages, the cordial treatment muſt be increaſed both in quantity and ſtrength; but the ſtate of the bowels muſt ſtill be regulated. Under this cordial plan, the petechiæ will ſometimes diſappear; the empty veſicles will become filled with matter; and the ichorous fluid of others be changed into white thick

pus;

pus; the other ſymptoms of courſe improving in a ſimilar degree.

Such is the general plan of cure which experience has ſanctioned in the ſmall-pox. But in particular caſes particular ſymptoms are very urgent, modifying the character of the diſeaſe, and requiring ſome modification of the method of treatment.

Little can be done to controul effectually the *ſalivation*, when that diſcharge is exceſſive, nor to reſtore it when it ſuddenly ſubſides. In the former caſe, and when the patient is in danger of ſuffocation from the viſcidity of the ſaliva, and the difficulty of diſcharging it, the mouth and throat may be frequently waſhed or ſyringed with a gargle containing oxymel, or ſome of the mineral acids. And, as the ſaliva often begins to thicken on the eleventh day, Sydenham recommended a bliſter (which has been often found beneficial) to be applied between the ſhoulders, on the evening of the tenth day, by way of prevention. The *diarrhœa*, when it occurs ſpontaneouſly, being by all writers deemed rather ſalutary than injurious, ſhould not be interfered with. The *ſwelling of the head, face*, and *fauces*, when it is exceſſive, is highly dangerous, and commonly accompanied by viſcidity or ſuppreſſion of the ſalivary diſcharge. The ſteady purſuit of the antiphlogiſtic ſyſtem is the beſt preventive of this danger, and the free diſcharge occaſioned by laxatives affords the beſt means of drawing off the determination of the fluids to thoſe parts.

The *head-ache* and *delirium*, when violent and accompanied with intolerance of light, and other phrenitic ſymptoms, mark the violence of the fever from the beginning, as well as the too great fulneſs of the veſſels of the head, and therefore demand, not only the moſt rigid purſuit of the antiphlogiſtic plan, the free admiſſion of cool air, and active purgation, but alſo the particular application of cold to the head; the detraction of blood by leeches or cupping from the temples or nucha; or even general blood-letting. The pediluvium is ſometimes recommended for the purpoſe of relieving the head on the principle of revulſion; but we have more than once expreſſed our doubts both of the truth of the hypotheſis and of the advantages of the practice. When the determination to the head is ſuch as to produce actual *coma*, during the eruptive fever, a moſt dangerous ſmall-pox is to be apprehended; and the cooling evacuating meaſures juſt recommended ſhould be carried as far as diſcretion and experience will juſtify, and a bliſter ſhould be applied to the neck.

Inflammation of the throat is a common attendant on all the varieties of ſmall-pox, even the mildeſt; but in the latter it is ſlight, and eaſily relieved by any acidulous and mucilaginous gargle, ſuch as an infuſion of figs, acidulated with lemon-juice, apple-tea, or lemonade. But the angina, which accompanies the worſt kinds of ſmall-pox, is more acute and obſtinate, and from extending to the *glottis*, it frequently produces a conſiderable degree of hoarſeneſs. It is alſo increaſed by the general inflammation and tumefaction of the contiguous parts, and continues till theſe ſubſide. This ſymptom is moderated by the antiphlogiſtic regimen, by blood-letting in inflammatory habits, and eſpecially by the early courſe of laxatives, which contribute to prevent and diminiſh all the inflammatory ſymptoms.

Difficulty of breathing is an alarming ſymptom in ſmall-pox, and ſeldom occurs except in the worſt kinds, and in the laſt ſtage of the diſeaſe, eſpecially when it is left to nature, or improperly treated in the preceding periods. In caſes where the cheſt is narrow and contracted, or there is a conſtitutional prediſpoſition to diſeaſe in the lungs, this ſymptom may occur at an earlier ſtage. Its appearance implies a threatening or preſent inflammation or peripneumony, and requires more than any other ſymptom the free uſe of blood-letting, as well as the exhibition of cooling purgatives, and the whole antiphlogiſtic plan.

Some degree of *ſuppreſſion of urine* not unfrequently takes place in ſevere caſes of ſmall-pox, eſpecially from bad management in the beginning of the diſeaſe; it is commonly attended by coſtiveneſs, and is moſt effectually relieved by promoting the inteſtinal diſcharge, eſpecially by laxative glyſters. An immediate evacuation is ſometimes produced, as Sydenham remarked, by taking the patient out of bed, and ſupporting him expoſed to the cool air in his ſhirt, but ſtill more effectually by placing his feet on a cold floor or hearth, which commonly induces a ſpeedy diſpoſition in the bladder to contract and expel its contents.

It only remains that we allude to the means which have been deviſed to prevent the deformity which is too often produced by ſmall-pox by the *pits* which it leaves behind. As the pits have been aſcribed to the retention of the acrid matter under the cuticle, and the conſequent corroſion of the true ſkin; ſo it has been propoſed to open the puſtules, in order to allow the ichor to be diſcharged. (See Van Swieten, Comment. ad Aph. 1402.) This plan, however, has not proved ſucceſsful, and the theory is probably erroneous. Others have propoſed the covering of the face in the laſt ſtage of the diſeaſe, to ſecure it from the air, and the uſe of fomentations at the ſame time with warm milk, and inunctions with unſalted butter, hog's-lard, or oil. Dr. Walker, in his valuable work already often quoted, adopts a ſimilar method, but at a ſomewhat earlier period. He maintains that the pits do not originate either from the acrimony of the contained matter, from ulceration, or from any loſs of ſubſtance of the ſkin; but that they are, in fact, merely *impreſſions*, made in the tender ſkin by the preſſure of the hardened and deſiccated puſtules, or ſcabs, as a ſeal impreſſes melted wax. This, however, may be juſtly queſtioned; for the ſkin, tender as it may be, is probably not capable of receiving any impreſſions ſo permanent, and muſt be partially ulcerated, and loſe a portion of its ſubſtance by ſloughing, under each hardening puſtule. It is true, however, that the face is chiefly liable to be pitted, from the greater drying and hardening of the crowd of puſtules which cover it, and that this may probably be owing to its greater expoſure to the air. Whence the early prevention of ſuch expoſure, and the ſoftening of the drying puſtules, certainly promiſe the beſt ſecurity againſt ſevere pitting. About the tenth day of the diſeaſe, ſometimes ſooner, according to the kind of ſmall-pox, the apices of the puſtules on the face change colour, feel rough, and begin to harden, eſpecially about the mouth and chin, which are more chafed by the bed-clothes. At this time, therefore, Dr. Walker ſpread over the face a maſk, of fine old cambric, thinly ſmeared with a mild liniment, compoſed of oil, ſpermaceti, and a little wax. This maſk he renewed three or four times in twenty-four hours, and ſometimes oftener, eſpecially when urged by the patient, who generally felt an agreeable and refreſhing coolneſs for ſome time after each application. On removing the maſk, the face was gently touched with a ſoft cambric handkerchief, and expoſed to the air for as ſhort a time as poſſible. By this expedient, he affirms, the variolous matter is ſeen through the tranſparent maſk to be preſerved in a ſtate of fluidity as long as it remains in that ſtate on other parts of the body, or until it is gradually diſcharged by oozing out. The maſk is to be continued till the puſtules are perfectly emptied, which happens in the courſe of ten, twelve, or fifteen days, and in ſome kinds of ſmall-pox in a longer time. Dr. Walker

Walker affirms, "in the application of this theory of pits, in the varieties of ſmall-pox that have come under my care, I have conſtantly found the above mode of treatment to anſwer my higheſt expectation, not only in preventing pits in the worſt caſes of this diſeaſe; but muſt obſerve an agreeable and unexpected effect, which I have conſtantly found to accompany it, namely, a preſervation of the natural features. Many have experienced ſuch an alteration in the countenances of their friends and children, from the effects of this diſeaſe, that they could ſcarcely know them again. This diſagreeable effect has been completely prevented, in every caſe that I have met with, by the method above directed." (Loc. cit. p. 398.) He adds, however, that the ſucceſs of this application ſtands connected with the antiphlogiſtic and evacuant plan of treatment, which he judiciouſly recommends, and which accords with that which we have above detailed.

In ſome conſtitutions, as we have already ſtated, the diſturbance excited by the ſmall-pox is ſuch as to leave the patients in a ſtate of great prediſpoſition to diſeaſe, eſpecially in the glandular ſyſtem, and all the forms of ſcrofula are occaſionally ſeen to follow its ravages, as well as ſome other cachectic conditions. One of the moſt formidable conſequences, however, of confluent ſmall-pox is the loſs of ſight, which it frequently occaſions, and which is ſo common indeed in this country, that a large majority of the blind who are ſeen in the ſtreets owe their loſs of viſion to the ſmall-pox. This, however, is rather the reſult of the extenſion of inflammation to the eyes during the attack of the confluent ſmall-pox, than a *ſequela* of the diſeaſe, and therefore is to be prevented rather by the proper practice during the eruption above detailed, than by any ſubſequent treatment. With a view to anticipate the morbid conſequences, upon the ſuppoſition that they ariſe from the remains or dregs of the contagion ſtill contaminating the blood, it is uſual to adminiſter a ſucceſſion of purgatives, to clear the circulating fluids of theſe impurities. We do not profeſs to underſtand how, by exciting the actions of the exhalents of the inteſtines, we can draw out of the blood juſt the impure portion, leaving the reſt unpolluted; and conſider both the contamination and the purification of the blood as equally gratuitous ſuppoſitions. Where the patient comes out of the diſeaſe with every appearance of returning health, we do not perceive the neceſſity of reſorting to theſe hypothetical cleanſers, which, if violent, may do harm, and can only be productive of benefit by aſſiſting the digeſtion and propulſion of the aliments in a gentle way. And where there are appearances of a bad habit of body, or a ſlow convaleſcence, more advantages are probably to be obtained by a proper attention to diet and regimen, with a judicious courſe of alterative and gently tonic medicine, than by the repetition of cathartics. A diet of milk and vegetables, or very light animal fluids, with appropriate exerciſe, change of air, the tepid bath, and other means which medicine affords of regulating the functions and gradually reſtoring the ſtrength, ſhould be purſued with diligence, eſpecially where there is a diſpoſition to hectic fever connected with the debility. Some forms of ſcrofula and cachexia, however, which are more local and unaccompanied by fever, require a more nutritious and cordial plan of treatment, to be determined by the age and other circumſtances of the patient.

An able and ingenious project was propoſed ſeveral years ago by Dr. Haygarth for the extermination of ſmall-pox in Great Britain, turning upon the principle of a general inoculation. (See his Sketch of a Plan, &c. in 2 vols. 1793.) It is unneceſſary, however, now to enter into any diſcuſſion reſpecting the efficacy or importance of ſuch a plan; ſince the diſcovery of the influence of the cow-pox, by the immortal JENNER, has afforded us an antidote, which requires only a general adoption to ſuperſede altogether that fatal and formidable malady, and to preſerve mankind from all the miſeries and evils which it has ſpread over the earth for many centuries paſt. See COW-POX and INOCULATION.

SMALLS, THE, in *Geography*, rocks in the Iriſh ſea, on which a light-houſe is erected for the guidance of ſeamen, about 15 miles S.W. from St. David's Head. N. lat. 51° 44'. W. long. 5° 33'.

SMALRIDGE, GEORGE, in *Biography*, a learned Engliſh prelate, was the ſon of a dyer at Litchfield, in which city he was born in 1663. He was educated at Weſtminſter ſchool, where his fine talents and excellent diſpoſition rendered him a general favourite. In 1682 he was elected to a ſtudent's place in Chriſt's college, Oxford, in which he became in due time a tutor; and his reputation cauſed him, at an early age, to be ſelected, with others, as managers of the controverſy with Obadiah Walker, maſter of the Univerſity college, a convert to popery. In this connection he publiſhed, in 1687, "Animadverſions on the Eight Theſes laid down, and the Inferences deduced from them, in a Diſcourſe entitled 'Church Government,'" &c. About this period he diſtinguiſhed himſelf as a votary of polite literature, of which he gave ſpecimens in the "Muſæ Anglicanæ." He entered into holy orders in 1692, and was appointed miniſter of Tothill-fields chapel, and he alſo obtained a prebend in the cathedral of Litchfield. In 1700 he took the degree of D.D., and frequently acted as deputy to Dr. Jane, regius profeſſor of divinity at Oxford. On the death of Dr. Jane, in 1707, he was ſtrongly recommended by the univerſity for his ſucceſſor, but the Whig intereſt carried it againſt him. Being now a celebrated preacher, he was choſen, in 1708, lecturer of St. Dunſtan's in the Weſt, London, and he was alſo appointed a member of the lower houſe of convocation, and exerted himſelf very much to procure for his friend, Dr. Atterbury, the prolocutor's chair, on which occaſion he pronounced an elegant Latin panegyric on his friend, touching with much feeling and delicacy, as an apologiſt, upon the heat in controverſy imputed to him. Dr. Smalridge, though of the party, avoided the animoſities too prevalent in its diſputes. He held alſo a friendly correſpondence with Dr. Clarke and Whiſton, and was extremely uſeful in moderating the violent proceedings inſtituted by the convocation againſt them. He aſſiſted Whiſton in his tranſlation of the Apoſtolical Conſtitutions. He propoſed a conference with Dr. Clarke on the ſubject of the Trinity, which was held at the ſeat of Mr. Cartwright, at Aynho, in Northamptonſhire, and in which Dr. Smalridge was the advocate of orthodoxy. Theſe connections cauſed him to be ſuſpected of an inclination towards Arianiſm, from which he deemed it neceſſary to vindicate himſelf by a letter to biſhop Trelawny, a ſhort time before his death. In 1711, Dr. Smalridge was made a canon of Chriſtchurch, Oxford, and afterwards dean of Carliſle. When Dr. Atterbury was promoted to the biſhopric of Rocheſter in 1713, his friend ſucceeded him as dean of Chriſtchurch. In the following year he was raiſed to the epiſcopal bench as biſhop of Briſtol, and very ſoon after he was nominated lord-almoner to queen Anne. Upon the acceſſion of George I. he refuſed to ſign the declaration made by ſome of the biſhops, on occaſion of the rebellion in 1715, becauſe it contained a reflection on ſome of the clergy who had joined the jacobites. This ſtep cauſed the poſt of almoner to be taken from him, but he poſſeſſed the eſteem of the princeſs of Wales, afterwards queen Caroline, with whom he continued in favour