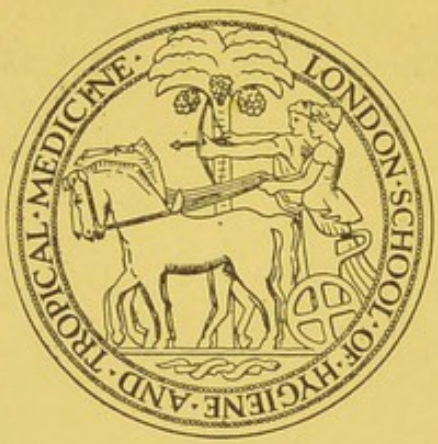
An inquiry how to prevent the small-pox. And proceedings of a society for promoting general inoculation at stated periods, and preventing the natural small-pox, in Chester / by John Haygarth.



BOUND BY WOOD, LONDON

R. J. R

from

G. S. B.

1922

Regiſter of the Small-pox in Cheſter, 1778.

i. PATIENTS. Order.	Name.	No	ii. Street.	iii. Occupation.	iv. Small-pox fever began.	v. Date of information.	vi. Gratis Rules, or Promiſſory Notes.	vii. Whence infected.	viij. Date of Death or Laſt Scab.	ix. Waſhed and aired.	x. Infection communicated to	xi. Rules obſerved or tranſgreſſed.
1.	E. Bryly's	2	Sty-lane.	Fiſherman.	1778 Janu.	Jan. 30.	P. N. Jan. 30.				none.	obſerved.
2.	M. Morris's	2	Bridge-ſt.	Flour-dealer	March 24.	April 3.	P. N. April 3		April 25.	April 26.	Coleclough's 4th Fam.	tranſgreſſed.
3.	A. Collier's	2	Northg-ſt	Bricklayer.	April 7.	April 14.	P. N. Ap. 14.		L. S. Ap. 29.	April 30.	none.	obſerved.
4.	H. Coleclough's	2	Bridge-ſt	Labourer.	1ſt Ap. 23. 2d May 3.	April 26.	P. N. Ap. 26.	Morris's 2d F.			none.	obſerved.
5.	Mr. Smith's	1	Bridge-ſt.	Watchmak.	April 22.	April 24.	G. R. Ap. 24.		L. S. May 4.	May 5.	none.	obſerved.
6.	A. Singleton's	2	Northg-ſt	Labourer.	May 6.	May 10.	P. N. May 10.	Liverpool.			Aſhton's 7th F.	tranſgreſſed.
7.	E. Aſhton's	2	Northg-ſt	Labourer.	1ſt May 30. 2d June 14.	June 4.	P. N. June 4.	Singleton's 6 F.	June 23.	June 24.	none.	obſerved.
8.	H. Price's	1	Gorſe St.	Shoemaker.	May 29.	June 8.	P. N. June 8.		July 6.	July 8.	none.	obſerved.
9.	E. Evans's	2	Bars.	Cobler.	May 30.	June 13.	P. N. June 13.	Croughton.	June 27.	June 27.	10, 11, 12, 13 Families.	tranſgreſſed.
10.	A. Conolly's	1	Bars.	Baker.	June 18.	June 23.	P. N. June 23.	Evans's 9th F.	July 10.	July 10.	none.	obſerved.
11.	C. Jones's	1	Bars.	Weaver.	June 22.	June 25.	P. N. June 25.	Evans's 9th F.	July 14.	July 15.	none.	obſerved.
12.	H. Huxley's	2	Bars.	Newſman.	June 20.	June 25.	P. N. June 25.	Evans's 9th F.	July 14.	July 15.	Smith's 17th F.	tranſgreſſed.
13.	Mr. Jenkin's	1	Bars.	Tanner.	June 16.	June 26.	P. N. June 26.	Evans's 9th F.	July 14.	July 15.	Morris 15th F.	tranſgreſſed.
14.	E. Alſop's	1	Bars.	Soldier.	July 9.	July 11.	P. N. July 12.	10th, 11th, 12th or 13th Families.	July 29.	July 29.	Downing 16 F.	tranſgreſſed.
15.	M. Morris's	1	Foreſt-ſt.	Shoemaker.	July 20.	July 23.	P. N. July 23.	Jenkin's 13th F.	Auguſt 3.	Auguſt 4.	none.	obſerved.
16.	A. Downing's	1	Bars.	Sailor.	July 23.	July 27.	P. N. July 28.	Alſop 14th Fam.	Auguſt 2.	Auguſt 4	none.	obſerved.
17.	A. Smith's	2	Bunce-la.	Glazier.	July 22.	Aug. 6.	P. N. Aug. 6.	Huxley 12th F.	Auguſt 21.	Aug. 21.	none.	obſerved.
18.	E. Tilſton's	1	Foreſt-ſt.	Shoemaker.	Sept. 10.	Sept. 26.	P. N. Sep. 26.		October 7.	Oct. 8.	none.	obſerved.
19.	E. Johnſon's	1	Gorſe St.	Labourer.	October 4.	Oct. 5.	P. N. Oct. 5.		October 14.	Oct. 15.	none.	obſerved.
20.	L. Bellis's	3	Crooks-l.	Coachman.	1. Oct. 21. 2. Nov. 2. 3. —— 3.	Oct. 29.	P. N. Oct. 30.		November 27.	Nov. 21.	none.	obſerved.

Wm. Gonge. — 1785

AN INQUIRY

HOW TO PREVENT THE SMALL-POX.

AND PROCEEDINGS OF A SOCIETY

For promoting GENERAL INOCULATION at ſtated Periods, and preventing the NATURAL SMALL-POX, in CHESTER.

—— culpam compeſce, priuſquam
Dira per incautum ſerpant contagia vulgus.

VIRG. GEORG. iij. 468.

Correctio ſpecifica niti dabet illi [variolarum] veneno contagioſo. Qualis inveniri poſſe, comparatio hiſtoriæ antidotorum, et indoles hujus mali, faciunt ſperare; et ad indagandum impellit ſumma hinc futura humano generi utilitas. BOERH. APH. 1390. 1391.

By JOHN HAYGARTH, M. B. F. R. S.

— 1813

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MDCCLXXXIV.

TO THE

MEMBERS

OF THE

SMALL-POX SOCIETY,

In CHESTER.

FRIENDS AND FELLOW-CITIZENS,

TO you, the following pages are addreſſed, with ſentiments of ſincereſt gratitude. To your humanity and munificence, the inſtitution, which is founded on the principles of this INQUIRY, owes its exiſtence. To you I appeal, as witneſſes intimately acquainted with the facts, on which the

 argument

argument depends, that they are ſtated with accuracy and fidelity.

To the medical members, I gladly return my thanks, for their candid acquieſcence in the propoſal of a Small-pox ſociety, and for their countenance and aſſiſtance in the execution. It is with peculiar pleaſure, that, upon this occaſion, I expreſs the high ſatisfaction which I feel, on reflecting, that I have had the happineſs to enjoy with you, a friendly intercourſe of mutual good offices, for more than *ſeventeen* years, without the ſmalleſt interruption. While emulation has excited among us the moſt ſedulous care of our patients, it has never, I believe, in a ſingle inſtance, produced invidious detraction, or diſſention, effects of thoſe malignant paſſions, which too often are ſo injurious and ſo diſgraceful to the profeſſion. This circumſtance claims particular notice on the preſent occaſion: becauſe,

becauſe, the ſlighteſt breath of medical oppoſition, from whatever motive it might have proceeded, muſt inevitably have deſtroyed ſo unpopular an eſtabliſhment. To you, I appeal, not only as witneſſes of the facts, but as judges, whether the argument deduced from them be concluſive. You can all bear teſtimony that the experience of the ſociety for ſix years has not excited a *medical* doubt, that the *Rules of Prevention* ſubmitted to your conſideration in the original propoſal, have proved fully adequate to their purpoſe. A public eſtabliſhment, for ſo long a period, has ſupplied more numerous and more authentic facts, than the private practice of any phyſician, during his whole life.

To the other members of the committee, I return my grateful acknowledgments, for their ſteady ſupport, amidſt all the prejudices and diſcouragements, which oppoſed this inſtitution.

tion. To the high opinion which your fellow citizens ſo juſtly entertain of your good ſenſe, and humanity, it is chiefly to be attributed, that the ſociety was eſtabliſhed. To your chairman, Thomas Falconer, Eſq; with whoſe intimate friendſhip I have been long bleſt, I owe the greateſt obligation, on this and many other occaſions. Being not more diſtinguiſhed by his great learning, and the excellence of his underſtanding, than by the benevolence of his heart, his aſſiduous zeal in this buſineſs, had the moſt beneficial influence.

I CANNOT but expreſs, with a painful recollection, my regret for the loſs of many deceaſed ſubſcribers, who were very ſincere and active friends to the charity; a loſs which will be long lamented in this place, and was particularly unfortunate in the infancy of this inſtitution.

It would be ungrateful not to return my peculiar thanks, as I do moſt ſincerely, for ſome contributions, which I have reaſon to think were intended as a perſonal favour.

Before this ſociety commenced, half as many children under ten years old, died of the Small-pox, in Cheſter, as of all other diſeaſes. It is, beyond all compariſon, the moſt mortal Peſtilence that has viſited this iſland for more than a century paſt. Your proceedings have clearly proved, that it is medically poſſible to exterminate this Peſtilence. You have ſeen, not only the medical principles, but the practical rules ſo firmly built, on the foundation of facts, that they can never be ſhaken by any temporary or local prejudice.

There is juſt reaſon to hope that the benefit of this inſtitution may extend

tend farther than this place. And it will ever be remembered, that ſuch benefit was derived from the humanity, the generoſity, and the enlightened knowledge of the citizens of Cheſter. A view of ſuch enlarged beneficence to mankind, will give the moſt cordial ſatisfaction to you, as well as to

Your ſincerely affectionate,

And faithful humble Servant,

J. H.

ARGUMENT.

§. VIII.

AN

AN

INQUIRY

HOW TO PREVENT THE

SMALL-POX.

INTRODUCTION.

WITH great diffidence, I venture to advance objections againſt generally received opinions, on a ſubject that has lain open to every man's obſervation above a thouſand years, and that has, for more than a century paſt, been frequently dicuſſed by the moſt judicious and ſagacious authors. But the ſmall-pox is of ſuch high concernment to mankind, that every effort, however inadequate, to check its fatal ravages, will be received, I truſt, with peculiar indulgence.

THERE are two opinions, which have ſo generally prevailed as to repreſs every attempt, in this country, to prevent the ſmall-pox. 1. Clothes, &c. expoſed to the variolous effluvia, are ſuppoſ-

ed, I believe univerſally, to retain an infectious quality. And 2. When the diſtemper is epidemical, the whole atmoſphere of the place is thought to be contaminated. To theſe points I particularly requeſt the reader's attention.

It may be neceſſary to ſtate, that, in this Inquiry, I do not conſider imaginary prejudices. 1. How long a time the clothes, &c. which have been expoſed to the variolous effluvia are ſuppoſed to retain their infectious quality, may be differently eſtimated, this ſubject having never been, that I know of, particularly conſidered. A phyſician of the moſt reſpectable authority, when aſked whether he thought that the doctrine, on this point, advanced in the Inquiry, was true, poſitively aſſerted, that 'he had known a medical wig, 'expoſed to the effluvia of a ſmall-pox 'chamber in London, which, after 'travelling to Plymouth, had retained

ſuch

'ſuch an infectious quality as to com-
'municate the diſtemper to a perſon in
'that town.' If clothes, &c. can be ſuppoſed to retain the peſtilential efflu-via, for ſo long a time and ſo diſtant a journey, no perſon liable to the diſtem-per can be ſecure from danger. It would be utterly impoſſible to guard againſt ſuch unthought of michief.

2. When a manuſcript copy of theſe papers, and the printed *Propoſal* of a ſmall-pox ſociety in Cheſter, were cir-culated among my acquaintance, I was favoured with the following remark, by a moſt intelligent medical friend: 'Strange it is that phyſical people 'ſhould have generally admitted, that 'the common atmoſphere was ſo affect-'ed, when the ſmall-pox became epi-'demic, as to be univerſally infectious! 'And yet true it is. When I firſt diſ-'courſed with — ——— on the papers, 'and told him how confined the effi-

cacy

'cacy of the poiſon ſeemed to be, and 'that, in the open air, I believed it 'would, in ordinary, ſcarcely extend to 'the boundary of a circle of a yard 'radius: He treated the aſſertion as in 'the higheſt degree abſurd, and at 'once ventured to affirm, that he had "known it to extend *thirty miles!*" "How looſely have theſe matters 'been conſidered!' Now if the variolous poiſon could render the atmoſphere infectious to the diſtance of *thirty yards* only, any human means to ſtop the progreſs of this peſtilence in a town or village would manifeſtly be moſt abſurd.

EACH of theſe opinions was advanced by a Phyſician of the moſt extenſive obſervation, and clear diſcernment, being juſtly celebrated as the moſt eminent in the profeſſion. And to ſuch a degree do theſe notions prevail, that, I believe, if other medical men had been witneſſes

witneſſes to the *facts* here alluded to, in both caſes, many would have drawn the ſame concluſions.

It will be moſt candid to confeſs that the *Theory* advanced in this Inquiry, in nearly every inſtance, ſuggeſted the obſervation of facts. This being the truth, it will not be deemed an unneceſſary caution that I have uſed, in adding the teſtimony of others, which may be thought more impartial than my own, concerning the facts that might appear moſt extraordinary, according to the prevailing idea on this ſubject. I allow that many falſe and even injurious medical Theories have been deviſed. But, on the other hand, I maintain, that unconnected facts afford no information; that facts are inſtructive and uſeful juſt in proportion as they are reducible to general rules or laws; and that true Theories, in this, as in other branches of natural philo-

ſophy

ſophy, lead to a more exact relation of facts. No perſon could deſcribe the effects of lightning ſo exactly as an electrician. Having obſerved that many medical theories are mere metaphors, and thinking all metaphorical language, on ſuch ſubjects, a deluſive and miſplaced kind of elegance, I have endeavoured to avoid every figurative alluſion. By this remark, I do not, however, mean to exclude arguments from analogy, a juſt mode of reaſoning, founded on the uniformity of nature's works.

In the year 1774, the natural ſmall-pox was ſo dreadfully fatal to the poor inhabitants of Cheſter, as to produce a deep impreſſion upon my mind, eſpecially when I conſidered, that it was poſſible to prevent ſuch deſtruction. Ever ſince that time, it has been an object of my moſt anxious wiſhes to preſerve their lives by inoculation.

In 1777, when the ſmall-pox was again epidemical, I ventured to propoſe a plan for this purpoſe; at firſt, for ſome months, privately, and in March 1778, publicly, which was not diſapproved by the Faculty, nor by our moſt intelligent citizens. But this buſineſs was beſet with ſo many difficulties, real and imaginary, that a general inoculation of the poor was not executed till 1780.

As I was meditating on ſome ſafe mode of general inoculation, I happened to write down my thoughts in order to conſider more diſtinctly, by what means infection might be prevented from ſpreading, if ſuch a meaſure were attempted. Doubts occurred to me concerning the opinions above mentioned. On farther conſideration, theſe doubts increaſed, and I gradually became thoroughly convinced that both the opi-

nions were erroneous, which have hitherto formed the bar, and, if they were true, the inſuperable bar to all human means of preventing the ſmall-pox. Though I have long acquired a perfect conviction upon theſe points, from the principles explained in the INQUIRY, yet a diffidence in diſputing opinions which had been admitted ſo long and ſo generally among phyſicians, induced me to ſolicit the unreſerved criticiſm of my friends, where ever I could take that liberty. For ſix years, theſe papers have been circulating among my medical and philoſophical acquaintance; I requeſted them freely to ſtate their objections, and to ſend me explicit anſwers to the *Queries* annexed to the INQUIRY: and to induce them to propoſe their remarks without reſerve, I engaged not to publiſh their names, whether they approved or diſapproved the doctrine I endeavoured to eſtabliſh. I return, to theſe obliging

correſpondents

correſpondents my grateful thanks, for this private favour, and acknowledge the cordial ſatisfaction which their approbation has afforded me. But, on this occaſion, I willingly obſerve the promiſed ſilence, being deſirous to convince by argument, not to perſuade by authority. It may ſuffice to ſay, in general, that every objection with which I have been honoured, is fully ſtated in the INQUIRY, for the reader to form his own judgment on the ſubject.

AN
INQUIRY
HOW TO PREVENT THE
SMALL-POX.

§ I.

The Small-Pox is an infectious diſtemper.

THE truth of this propoſition is proved, beyond all poſſibility of doubt, by the daily practice of inoculation.

§ II.

The Small-Pox was never known, ſince its original commencement, to be produced by any other cauſe than infection.

THAT at preſent it is occaſioned neither by climate, ſoil, nor ſeaſon, but by

by infection *only*, ſeems highly probable from the following facts: The world had exiſted between 4 and 5000 years before hiſtory takes any notice of this diſtemper. It is univerſally allowed to have been originally endemic in or near Arabia. All Europe was infected from this place, and all other parts of the world that were then known, or have ſince been diſcovered. It did not appear in Greenland till 1733: the infection was carried thither by a native returning home in the diſtemper from Copenhagen *(a)*. In Minorca, it entirely diſappeared from 1725 till 1742, that is, for 17 years. In 1745, it was again brought to Minorca by one of his Majeſty's Ships. And there can be no doubt that the former infection was imported by ſome ſhip, tho' unnoticed by the author *(b)*. At Boſton in New-England, the Small-pox had been epidemical

(a) Crantz's hiſtory of Greenland. B. 5. § 8.

(b) Cleghorn's diſeaſes of Minorca. Chap. vijth.

demical only eight times, from the firſt ſettlement of the province of Maſſachuſett's, till 1752, as appears from the following table, compoſed out of Dr. Douglaſs's (c) hiſtorical and political ſummary of North America:

Epidemical Small-pox at Boſton.	Years abſent.
1649	
1666	17
1678	12
1689	11
1702	13
1721	19
1730	9
1752	22

BEFORE the epidemic of 1721, the ſmall-pox was imported from Barbadoes; before that of 1730, from Ireland; and before that of 1752, from London.

AT

(c) Vol. 2. p. 392.

At Rhode Iſland in America, this diſtemper was *never* epidemical, according to authentic intelligence which I have received from Dr. Moffatt, who practiſed phyſic at Newport, their capital, from 1740 till 1765; and from Dr. Waterhouſe, a native of the Iſland. The former gentleman acquainted me with this fact, in theſe words, 'the ſmall-pox was never epi-'demical during my reſidence at Rhode 'Iſland, nor before that I ever heard 'of. As far as I can recollect, there 'never was, at the ſame time, more 'than 5 or 6 ill of the diſtemper.' Such an happy exemption is accompliſhed by regulations eſtabliſhed there for the purpoſe *(d)*. This propoſition is capable of many other proofs, unneceſſary to be here adduced, as at preſent, I believe, it is an opinion very generally received among phyſicians.

§ III.

(d) See Appendix to the INQUIRY.

§ III.

The variolous poiſon is ſoluble in air.

THE infection of the ſmall-pox is termed a *poiſon* by medical writers, and with ſtrict propriety.

IT is of importance to aſcertain the mode of combination between the variolous poiſon and air. I apprehend that they are united by *ſolution.*

WHEN a clear menſtruum has diſſolved any ſubſtance, it remains perfectly tranſparent. This *teſt* of ſolution is founded upon a very extenſive and uniform induction of facts, determined by accurate and numerous experiments in various kinds of menſtrua, ſaline, inflammable, watery and aireal, without a ſingle exception that occurs to my recollection. It may be imagined that the tranſparency of the ſolution does not depend on any chemical com-

bination, but on the natural tranſparency of the ingredients. But metals, earths, &c. are opaque bodies, yet, when diſſolved, in their proper menſtrua, the ſolution is perfectly tranſparent. On the contrary, if two tranſparent ſubſtances, that have no chemical attraction for each other, be agitated together, they will become opaque, as, water and oil, or air ſuperſaturated with watery vapour. So numerous and ſo uniform are the facts on which this obſervation is founded, that it may juſtly be denominated a chemical principle, or *law* of nature.----To apply this law to our ſubject.

1. It is univerſally allowed, in this country, that the natural ſmall-pox may be propagated without immediate contact of the patient or of the poiſon, and that the diſtemper is communicated from the infectious to the infected perſon thro' the medium of air. Variolous

olous matter applied to a wound, or to the inſide of the noſtrils *(e)*, or to the whole ſkin *(f)*, produces the inoculated ſmall-pox. So that the natural ſmall-pox appears to be *always* communicated thro' the air. Hence it is proved inconteſtibly that the peſtilential effluvia, or *miaſms* exiſt in the air near to

(e) Mead de variolis. Caput 5tum.

(f) " Quædam obſervata videntur docere, cuti adherere quandoque illud contagium, & deinde morbum producere. Vidi aliquoties, perfectâ ſanitate fruentibus, unicam in cute puſtulam attolli, rubere, dolere, ſuppurari, et cutim ſatis profunde exedere, cicatrice ſatis inſigni relictâ: paucis diebus poſtea variolarum morbus cum omnibus ſuis ſymptomatibus ſequebatur. Audivi de aliis medicis, quod et idem aliquoties obſervaverint; imo mulierculæ, quæ variolis decumbentium cuſtodiam agere ſolent, has puſtulas *Moederpokken* ſolent vocare, tanquam ſequentium brevi variolarum genitrices, & audacter prædicunt, ſecuturum morbum. Plerumque in facie, talis puſtula ſolet apparere, ferè ſemper unica, raro binæ vel plures; ſaltem non memini, me in praxi unquam plures quam binas vidiſſe, et ſemper fœdiorem cicitricem relinquunt quam ipſæ variolæ." Van Swieten Com. T. v. p. 27.

See alſo Phil. Tranſact. abridged, No. 375, and for 1768. xvij.

to a ſmall-pox patient, or to variolous matter.

ANOTHER, and no leſs evident a proof of the exiſtence of variolous miaſms in air, may be inferred from their *peculiar* ſmell. The impregnation of liquids may generally be diſtinguiſhed by the taſte. Air cannot be taſted; but ſmelling, the ſenſe appropriated to that element, diſtinguiſhes the preſence of variolous miaſms, by a peculiar and offenſive ſtench.

2. AIR, tho' ſtrongly impregnated with variolous miaſms, is perfectly tranſparent. The ſight is the moſt acute of our ſenſes, and could diſcover a very ſlight degree of opacity. If a ſingle grain of magneſia be agitated in a quart of clear water, its white particles are viſible in every drop of that water. A pound of bitter cathartic ſalt might be diſſolved in a quart of water,

water, and, when thus combined, cannot be diſcerned: we may therefore reaſonably conclude that it becomes inviſible; for a grain of this ſalt added after full ſaturation, remains viſible. Small particles floating in air, are as diſtinguiſhable as particles floating in water. Again, the quantity of air applied to the organ of ſmell is ſmall compared with what is pervaded by the organ of ſight. It is true, that a few particles of duſt, not viſible in a ſhaded chamber, being of the ſame colour as the ſurrounding objects, may be diſtinctly ſeen by a ray of ſun ſhine admitted into the chamber. The rays of the ſun render objects of every colour bright, and the dark ſhade behind them ſets off theſe bright objects moſt diſtinctly. I have, ſeveral times, expoſed the air impregnated with variolous miaſms, to a ray of ſunſhine, let into a dark chamber, but could never obſerve that it was viſible, not even

in

in the moſt infectious ſtate of the confluent ſmall-pox, immediately iſſuing from the puſtules. However, I would by no means maintain, that air is never ſuperſaturated, and conſequently rendered viſible, by variolous miaſms.

3. If a ſolvend be put into a leſs quantity of menſtruum than can diſſolve it, after fully ſaturating the menſtruum, the remaining ſolvend continues unchanged, and capable of impregnating a larger proportion of menſtruum. In like manner, when the variolous poiſon is put into a ſmall portion of air only, it continues capable of impregnating more air, and a part of the poiſon remains undiſſolved. Thus inoculators keep variolous pus cloſe corked up in ſmall phials, that the air may not diſſolve all the infection contained in it. I have ſeen the variolous pus remain, in a cloſe corked phial, in a half fluid ſtate, for ſeveral months,

months, not being incloſed with a quantity of air ſufficient to diſſolve the moiſture.

4. This theory is confirmed by a very extenſive and uniform *analogy*. The perſpiration of vegetables, which Dr. Hales has proved to be very copious, and the inſenſible perſpiration of animals, are perfectly inviſible. If the effluvia are ſuppoſed to conſiſt of ſuch minute particles, that the eye cannot diſtinguiſh the perſpiration of one man or one leaf; yet when we view, in one direct line from the eye, thouſands of men, or millions of leaves, their accumulated perſpiration muſt be diſtinguiſhed, if they diminiſhed, in the ſighteſt degree, the tranſparency of the air. Not only the well-eſtabliſhed theory, that water is ſoluble in air, confirms the doctrine here advanced, but, I apprehend that the phenomena of all volatile ſubſtances,

whoſe

whoſe vapour is inviſible, are manifeſtly explained on the ſame principle. The mode of combination between the variolous poiſon and air ſeems *extremely analogous* to the combination of all inviſible odours with air, that is, by ſolution. The air is rendered odoriferous without diminiſhing its tranſparency, by an infinite variety of ſubſtances, of which the variolous poiſon itſelf is one.

§ IV.

If TWO *perſons be expoſed, for the firſt time, to the variolous infection, they very rarely both eſcape catching the ſmall-pox; and, if* THREE *perſons be expoſed together, they much more rarely all remain uninfected.*

IF a perſon, who had not had the ſmall-pox, were *always* to catch the diſtemper, whenever expoſed to the variolous infection; it would follow, as

an

an undoubted concluſion, that if ſuch a perſon had not been attacked, therefore certainly he had never been expoſed to the infection. But the facts are more complex, and the concluſion leſs obvious. Indeed, in my opinion, a want of due conſideration of theſe facts, has occaſioned the moſt erroneous concluſions. I requeſt the reader's particular attention to this point, as many of the following arguments principally depend upon it.

PHYSICIANS allow, I believe univerſally, that neither inoculation, nor breathing the variolous miaſms will produce the ſmall-pox in every perſon who never had the diſtemper. The proportion of mankind incapable of infection has been eſtimated by authors of high authority to be 1 in 20 (g). There is an opinion very generally

(g) Sauvages Claſſis iij. Genus, 2dum. Roſenſtein's diſeaſes of children. Chap. xij.

rally prevails, which is probably well founded, that ſome perſons are incapable of infection at one time and yet are infected at another. I do not know a ſufficient number of facts of this kind to aſcertain what proportion of mankind is liable to this temporary incapacity of receiving the infection. It is certainly a very ſmall proportion; indeed ſo ſmall that ſome, of very extenſive obſervation, have doubted whether it exiſts at all. From a general recollection of the imperfect evidence produced on this ſubject, I ſhould conjecture, that it does not happen once in ſeveral hundred, or more probably in ſeveral thouſand inſtances: if ſo, the proportion above ſtated of 1 in 20 will be altered a very ſmall fraction only, by this temporary incapacity.

It occurred to me, that it might be computed arithmetically, by the doctrine of chances, according to theſe data,

data, if *one*, if *two*, or if *three* perſons were expoſed, for the firſt time, to the variolous infection, what degree of probability there was that one or more of them would catch the diſtemper. At my requeſt, a mathematical friend made the following computations, on each ſuppoſion.

'IF there be 1 perſon in 20 who is 'not liable to the ſmall-pox, it is 'therefore evident that, for any par-'ticular perſon, there are 19 chances 'that he may be infected, and only 1 'that he cannot. Hence we may rea-'ſon, however epidemical the ſmall-'pox has been in a town, that a child 'who has eſcaped the diſtemper, was 'never expoſed to the infection (un-'leſs we know the contrary) is proba-'ble, in the degree of 19 to 1. If 2 'in a family have eſcaped, the proba-'bility that they were never both ex-'poſed is above 400 to 1: if 3 in a

'family have escaped, above 8000 to '1 (*b*).

But

(*b*) My ingenious friend, Mr. Dawson, a truly mathematical genius, not unknown to some of the first philosophers of the age, favoured me with this calculation. To Dr. Stewart professor of mathematics at Edinburgh, and to Dr. Horseley late secretary to the royal society, he first suggested some mathematical doubts in regard both to their principles and calculations, for ascertaining the distance of the sun, by the theory of gravity. With Mr. Emerson, he had some mathematical disquisitions, concerning the precession of the equinoxes. I had intended to subjoin Mr. Dawson's demonstration: but, to the mathematical reader it would be superfluous, and to others useless. To mention the data and conclusions may be sufficient. 'This calculation de-'pends not only on the proportion of 1 in 20 naturally 'exempted from the small-pox; but likewise on the 'number of inhabitants in the place where the small-'pox is epidemical, who have never been previously ex-'posed to the variolous infection. This number varies 'greatly at different times and places, which produces 'some variation in the calculation. For example, let this 'number be supposed 350. If then 2 in a family have 'both escaped, the probability that they were never 'both exposed is as 422 to 1; if 3 have escaped, as '9496 to 1. If the number who have never been 'exposed to infection be infinite; when 2 or 3 toge-'ther have escaped the distemper, the chances that 'they have not been exposed to the infection are as '399 to 1, and 7999 to 1 respectively.'

But as theſe calculations may not produce general conviction, there is another method, by which any perſon, who will take the trouble, may ſatisfy himſelf that this argument has a juſt and true foundation. Let twice 20 or 40 white peas be put into a box, and mark 2, or every 20th pea, with ink, and take out 2 at a time without ſeeing them. He will *very rarely* take out the 2 marked peas together. If thrice 20 or 60 peas be put into a box, if 3 of them be marked, and if 3 peas be taken at a time, the 3 marked peas will *much more rarely* be taken out together. This is obvious to common ſenſe, and any one, who has patience to make the trial, may have actual proof.

Hence we may conclude, when 3 or more perſons together, in the ſame place, and at the ſame time, have all eſcaped the ſmall-pox, that they were not expoſed to the variolous infection.

I can

I CAN add an argument which ſtrongly confirms this calculation of chances, and may be regarded by many as more concluſive than any calculation. I have aſked the following queſtion, and obtained anſwers from 26 phyſicians and 5 ſurgeons, all eminently diſtinguiſhed for their medical knowledge and extenſive practice. 'Did you ever know '3 or more perſons, at the ſame time 'and place, all eſcape the ſmall-pox, 'after being certainly expoſed, for the 'firſt time, to the infection, either by 'inoculation with genuine freſh mat-'ter, or by breathing the air of a 'chamber in which the variolous ſmell 'was perceptible?' None of theſe gentlemen mention a ſingle inſtance of 3 together eſcaping, after expoſure to infection. And I have only been informed of two inſtances, where 2 together both eſcaped·----This obſervation is not applicable to young infants,

who

who are, it is well known, leſs liable to catch the diſtemper *(i)*.

§ V.

The period between infection and the commencement of the variolous fever is generally from the 6th to the 14th day inclusive, after inoculation: and this period is not much longer in the natural ſmall-pox.

The only proof that can be given of this propoſition is by an induction of facts. A great number of facts would be required to deduce any certain concluſion. No one probably has had more experience in inoculation than Baron Dimſdale, to whom mankind are ſo highly obliged for communicating the improved method of conducting this proceſs. In a letter from the Baron, I was favoured with the following important obſervation, and have leave to mention it in his name, which, on this ſubject,

(i) See Monro on inoculation, p. 25.

ſubject, will be allowed of the greateſt authority. 'In the improved method 'of inoculating with fluid matter, the 'eruptive fever, in every inſtance within 'my experience, commenced on ſome 'day from the 6th to the 14th, both 'incluſive. I have not known one 'inſtance later *(k)*.'

This period, in any particular caſe, can be accurately aſcertained in the inoculated, but with much more difficulty in the natural ſmall-pox. However, for the purpoſe of this inquiry, it would be uſeful to approach the truth as nearly as we can, in the natural infection. I will circumſtantially relate ſome facts to illuſtrate this point.

1ſt Caſe. A daughter of the late rev. Mr. Harwood's paſſed very near, but did not touch, a child who had the ſmall-

(k) See alſo the ſame remark in Monro on inoculation, p. 21ſt.

ſmall-pox, in the *row* (a kind of covered gallery, open on one ſide to the air) at the bottom of Northgate-ſtreet, Cheſter, and ſickened of the diſtemper on the *eleventh* day, after this infection.

2d Caſe. Nov. 21, 1780. Miſs M. Bennet, whoſe father is Maſter of a ſhip at Liverpool, went thither from Cheſter, where there was only one ſmall-pox patient, with whom ſhe had no connection. On the night of her arrival at Liverpool, ſhe went into a houſe among children who had the ſmall-pox; ſome of them, whoſe ſcabs were dry but not dropt off, touched her hand. She ſickened on the 3d of December, that is, on the *thirteenth* day after infection. As there might be ſome ſuſpicion that this patient was infected by her ſkin touching the variolous ſcabs, it may be neceſſary to mention that I examined her hands to ſee whether there was any appearance of inoculation, but diſcovered none.

3d Caſe. A daughter of Mr. Moſs, watch-maker, went on Sept. 21ſt, 1780, from Frodſham, in which town and neighbourhood there was not a ſmall-pox patient, to Liverpool, where the diſtemper was epidemical. She returned to Frodſham on Oct. the 1ſt, and on that day the eruptive fever began, that is, on the *eleventh* day from her arrival at Liverpool.

4th Caſe. A medical correſpondent informed me, that 'Plumb Simcock's 'eldeſt child was at ſchool where Tom. 'Moſs's child the clock-maker went, 'with ſome of the eruptions upon it, 'on the 21ſt of Dec.; on the 31ſt the 'the child ſickened,' that is, on the *eleventh*.

Caſes 5th and 6th. In Nov. 1781, two children of Mr. Burgeſs's of Helſby, who were to have been inoculated, were ſecretly

ſecretly taken by a ſervant to a patient in the ſmall-pox, on purpoſe to catch the natural infection. The eruptive fever commenced, in both, on the *eleventh* day of infection. Mr. Jackſon, ſurgeon, of Frodſham can witneſs that the 4 laſt caſes are accurately ſtated.

7th Caſe. On the 6th of Nov. 1777, Maſter H. A. met a child ill of the ſmall-pox on the walls of this city, as will be hereafter more particularly related; his eruptive fever commenced Nov. 15th, that is, on the *tenth* of infection:---In all theſe caſes, except the 4th, the dates were exactly aſcertained to me by the parents, at the time when they happened.

8th Caſe. Mr. Dawſon of Sedbergh in Yorkſhire, acquainted me, by letter, with the following fact: 'A child was 'prepared for the ſmall-pox. But the 'mother, averſe to inoculation, carried

'it to an infected houſe, about a mile 'off. This was Sunday afternoon a-'bout three o'clock, and Monday the 'firſt but one after, nearly about the 'ſame hour, the child ſickened;' that is, on the *ninth*.

9th Caſe. The widow of the late H. V. Eſq. had eſcaped the ſmall-pox till her 65th year. On a Saturday, ſhe was viſited by a female acquaintance, whoſe family had the diſtemper, who lay with her that night, and returned home on the Sunday. On the Tueſday ſe'nnight following, Mrs. V. ſickened of the ſmall-pox, that is, on the *eleventh* day after infection. I had this information from the family when the event was recent, and Meſſrs. Brodhurſt and Williamſon are alſo medical witneſſes of the fact.

To diſcover whether any difference could be obſerved in the period between

infection

infection and the variolous fever, in the natural, and inoculated ſmall-pox, I compared nine caſes, taken indiſcriminately by inoculation, with the nine caſes above related.

Fever commenced after infection in the

Inoculated Small-pox.		Natural Small-pox.
No. Caſes.	*Day.*	*No. Caſes.*
3	8th	0
5	9th	1
0	10th	1
1	11th	6
	13th	1
9		9

Hence it would ſeem, as far as theſe *few* facts bear evidence, that this period is about two days longer in the natural than the inoculated infection.

None of theſe caſes prove, that there is much difference. I have had, however,

ever, authentic information of two facts, that, at firſt view, ſeem exceptions to this propoſition, in regard to the natural infection, the one being apparently longer and the other ſhorter than the period here mentioned. 'A girl of 14 'years old came from a part of the 'country where there was no ſmall-pox, 'entered a chamber, unexpectedly, where 'there were ſeveral patients in the diſ-'temper, and was greatly alarmed. 'She was immediately ſtruck with a 'pain in her back, which continued 'ſeveral hours. This happened on 'Thurſday; ſhe was quite well on Fri-'day and Saturday, became feveriſh 'on Sunday, the *fourth* day from the 'interview, and the eruptions appeared 'on the Wedneſday.' Tho' I had this information from a moſt intelligent and faithful obſerver, yet it is poſſible that the girl might have been previouſly infected, which often happens without our knowledge. Beſides, there is great reaſon

reaſon to think that the period between infection and the eruptive fever is not ſhorter, but probably ſomewhat longer in the natural than the inoculated ſmall-pox; otherwiſe, the patients which often breathe infectious air at the time of inoculation, would be liable to the fatal effects of the natural ſmall-pox, and the event muſt much more frequently prove unfortunate.

I was acquainted by letter, with the following fact, from a phyſician juſtly celebrated for his medical knowledge and diſcernment. 'In 1757, the re-'mains of Sherley's and Pepperell's 'regiments were embarked at New-'York, where the ſmall-pox was, for 'Boſton, where the diſeaſe was not. 'On the the 20th and 21ſt day from 'their embarkation, eight men were 'ſeized with the ſmall-pox.' I inquired 'whether ſome ſhirt, handkerchief, 'cloth, &c. bedaubed with variolous matter

'matter might not poſſibly have been 'taken aboard a tranſport unwaſhed 'ſo as to infect the ſoldiers after their 'departure: and whether the eight 'infected ſoldiers were in the ſame 'quarters on ſhore, or ſailed in the 'ſame tranſport. If they were in ſepa-'rate quarters, and the ſame tranſport, 'it would increaſe the probability of 'their being infected after embarka-'tion.' I received the following anſwer. 'I do not know whether the ſoldiers were 'quartered in the ſame houſe, whether 'they belonged to the ſame company, 'nor whether they ſailed in the ſame 'ſhip, nor how their linen was waſhed.' Hence I infer, that tho' this fact is very curious, it affords no poſitive proof that the infectious period was longer than above ſtated. Some variolous matter might poſſibly have been conveyed aboard the tranſports, and infected the ſoldiers, *after* their embarkation.

As

As I could not obtain a competent number of facts, where the hour or day of infection was exactly known, I have attempted to determine this point by the following method. I requeſted Mr. Owens, inſpector to the ſociety, to note down, in his regiſter of the ſmall-pox, the day of the month, when each child of the family firſt complained of the eruptive fever. The accuracy of the regiſter I can confirm, in many inſtances, from my own knowledge. As opportunity offered, I collected other facts from information equally authentic. In that part of the regiſter, which will be inſerted in the ixth propoſition of this INQUIRY, the 7th family is noted down in this manner, column IIId. { 1ſt May 30 / 2d June 14 which ſignifies that the 2d child was attacked on the 16th day after the firſt, reckoning incluſively, in that family. The following arrangement of facts

comprehends 37 caſes that firſt occurred, and marks the day when the variolous fever began, after the firſt in a family was attacked.

Day	No. of Patients.	Day	No. of Patients.
3d - -	1	15th - -	6
7th - -	1	16th - -	5
8th - -	1	18th - -	7
11th - -	4	21ſt - -	1
12th - -	2	22d - -	2
13th - -	3	23d - -	1
14th - -	3		—37

In order to deduce a proper concluſion from theſe facts, it will be neceſſary to determine how ſoon after the commencement of the eruptive fever, the patient becomes infectious to others in the ſame family. In the proof of the next propoſition, it will appear probable, that bed-fellows, in ſome inſtances, do not receive the infection till the 6th day of the fever or later. Taking this

this point for granted, it follows, that 33 out of the 37 caſes, in this table, afford no proof that infection preceded the eruptive fever longer than the 12th day.

In regard to the four caſes, whoſe eruptive fever commenced on the 21ſt, 22d, and 23d days, it does not ſeem improbable that among ſuch a number as 37, ſo few as four might eſcape infection till the 7th, 8th, or 9th days, the period when the diſtemper becomes moſt infectious. I have the following reaſon to believe that it was actually ſo in the patient who was ſeized the 21ſt; this was in a family where there were four children who had never been expoſed to the infection. When the eruption appeared on the firſt patient, which was on the 4th day of the diſeaſe, the other three were ſeparated from it; two of theſe went out of the houſe on the 6th day, not infected; the 4th was kept

ſeparate till the 11th day and was ſeized on the 11th day after the interview, that is, on the 21ſt day after the firſt patient was attacked.----It is proper to explain that all theſe caſes were taken from the pooreſt families, among whom the intercourſe was very intimate, living in the ſame room, and generally lying in the ſame bed, and not kept at a diſtance, by fear either of their parents or themſelves, in any inſtance that I know of, except that above related.

MANY other caſes, to the ſame purpoſe, have occurred to me, which I have not arranged in the table, as theſe may give preſumptive evidence in ſupport of the propoſition, but it is incapable of abſolute proof by any number of facts that I could produce.

I HAVE received information of ſeveral well authenticated caſes where inoculated

culated patients have not become feverish till ſeveral days after the 14th, tho' I believe they were not inoculated with 'fluid matter.'

THE two following caſes appear not only curious, but inſtructive. Where the connection is the cloſeſt poſſible, that is, between a mother and the child in her womb, they ſhew at what diſtance of time after the mother is attacked, the diſtemper begins in the child.

'FÆMINA ſeptimo geſtationis menſe 'variolis malignis correpta eſt. Filium, nullis morbi notis in corpore ſe 'prodentibus, die undecimo enixa, decimo quarto e vitâ deceſſit. Infans 'autem, cum quatuor dies poſtea vixerat manè convulſionibus morbi prænunciis, correptus, veſperi protruſis 'variolis, interiit. Liquet hic, perfecta die undecimo, ut fieri ſolet, ali-

'quanta

'quanta ſuppuratione morbum mater-
'num in fœtum tranſiiſſe, diebus octo
'elapſis, in tenero corpore renaſciturum'
(l). Hence the child was attacked by the ſmall-pox on the 18th day after his mother. This caſe of the celebrated Dr. Mead, which, he ſays, that he had *lately ſeen*, is confirmed by one who is not a leſs judicious and accurate obſerver, John Hunter, Eſq. F.R.S. In the Philoſophical Tranſactions *(m)*, he relates the caſe of Mrs. Ford, whoſe ſmall-pox appeared on the evening of the 8th of December. She was delivered on the 31ſt, that is, on the 24th day from the eruption. The child had puſtules filled with matter, when born, which appeared about the 6th or 7th day of the eruption. Hence the eruption in the child muſt have happened about the 18th or 19th day after the mother's.

(l) Mead de variolis, p. 65.

(m) Vol. for 1780. § viij.

If we may take for granted, that infection does not precede the eruptive fever longer than the 14th or 16th day, it follows, in both theſe caſes, (1ſt,) that the child was not infected at the time the mother was infected, (2d,) nor during the mother's eruptive fever. It ſeems probable that the children were infected after the variolous ſerum or pus had been formed in the puſtules, and had returned into the blood by abſorption.

There is an opinion ſo utterly groundleſs, that it would never deſerve any notice, if it did not too generally and fatally prevail, ſo as to produce the miſchief it is intended to prevent. It is imagined that the *change of air*, even from an infectious to a healthy ſituation, occaſions the diſeaſe. As there cannot poſſibly be any juſt foundation for this ſuſpicion, we may inquire what falſe reaſoning has given riſe

riſe to ſo abſurd a notion. Between the time of infection, and the commencement of the diſeaſe, there is an interval of ſeveral days: during this interval, infected perſons may have removed, from the neighbourhood of the ſmall-pox, to a diſtance from it, and, ſoon after the removal, may have been ſeized with the diſtemper. But it cannot be doubted that the infection would as certainly have had this effect, if the patient had remained in the former ſituation.

§ VI.

Perſons liable to the ſmall-pox, are infected by breathing the air, impregnated with variolous miaſms: Either (I) very near a patient in the diſtemper, from about the time that the eruption has appeared 'till the laſt ſcab is dropt off the body, or (II) very near the variolous poiſon, in a recent ſtate, or (III) that has been cloſe ſhut up, ever ſince it was recent.

I. As

I. As no medical man, in this country, doubts that a patient in the ſmall-pox communicates an infectious quality to the air that ſurrounds him, we need only inquire, at what time of the diſeaſe, this peſtilential emanation from his body begins and ceaſes.

1. I HAVE not been able to obtain a ſufficient number of facts, to aſcertain, with preciſion, on what day of the diſeaſe a patient becomes infectious. But the following evidence will warrant a probable conjecture, that, before the eruption appears, the patient is ſeldom or never liable to communicate the diſtemper.

1ſt and 2d Caſes. I attended a little boy in the ſmall-pox, whoſe eruptions, of the diſtinct kind, appeared on the 4th day of the fever; his two ſiſters, on their appearance, were removed out

of the houſe. One of them became feveriſh on the 11th day after her removal; the other was not attacked till 7 weeks after, on being expoſed to another infection. As the former ſiſter was only removed to a neighbouring houſe, there may be ſome doubt whether ſhe might not be infected by ſome future communication; the other was ſent to a much greater diſtance.

3d and 4th Caſes. A gentleman's child became feveriſh on the Sunday; two others of his children were daily in the ſame room, and one of them lay every night with the patient 'till Friday (the 6th day) and were then removed; yet neither were infected, tho' the puſtules had appeared a day or two before: one of them was inoculated ſoon after and had the diſtemper.

5th Caſe. The fact related, p. 43d, to prove another point, may be adduced

duced in evidence again, on the preſent ſubject. 'In a family where there 'were four children who had never 'been expoſed to the infection, when the 'eruption appeared on the firſt pati-'ent, which was on the 4th day of the 'diſeaſe, the other three were ſepara-'ted from it' and eſcaped infection.

BUT, as I confeſs that the caſes which have come under my own obſervation are manifeſtly too few to diſcover the truth, I am happy to add the teſtimony of my moſt reſpectable and ingenious friend Dr. Heberden, in confirmation of what I had advanced. In a correſpondence with which he has long honoured me, he communicated the following obſervation, which I have leave to mention on his authority. 'Many inſtances 'have occurred to me, which ſhew, 'that one who never had the ſmall-'pox might ſafely aſſociate, and even 'lie in the ſame bed with a variolous

'patient, for the two or three firſt 'days of eruption, without receiving 'the infection.'

By comparing this obſervation with the facts contained in the table, (p. 42d) it appears, that when one perſon is accidentally ſeized with the ſmall-pox in a family where others are liable to it, the reſt may generally avoid the natural infection, either by ſeparation or immediate inoculation.

Maturation appears to be the ſeaſon, when the variolous miaſms are emitted moſt copiouſly; the poiſonous pus being expoſed, at that period, naked to the air, according to the accurate deſcription of the faithful Sydenham. 'Uſque ad hunc diem' octavum a primo inſultu 'puſtulæ, quæ 'faciem obſederant, læves ad tactum 'fuere atque rubræ, jam verò aſperio-'res evadunt (quod quidem primum 'eſt

'eſt incipientis maturationis indicium)
'et ſubalbidæ, paulatim inſuper *ſuccum*
'quendam luteum, colore a favo non
'abludentem, *evomunt.*' (n)

2. It is alſo of great importance to aſcertain, at what time a patient ceaſes to be infectious. As long as a variolous ſcab remains, it undoubtedly contains the poiſon in a concentrated form. After all the ſcabs have dropt off, I ſhould conjecture that no infectious quality could be ſuſpected to remain in the body, there being ſuch a quick diſcharge of every thing offenſive to the conſtitution by the numerous excretions. This conjecture has been confirmed by the uniform experience of the ſmall-pox Society. However, the ſkin, hair, &c. may have variolous matter adhering to them, unleſs they be ſufficiently cleaned.

(n) Syd. Opera, p. 134.

In

In an inquiry how to prevent the ſmall-pox, it is a point of conſequence to determine, *how long the variolous poiſon remains on the patient's body.* I have collected ſome authentic facts on this ſubject, chiefly from the regiſter of the ſmall-pox ſociety. Out of 90 *ſingle* patients, the ſhorteſt continuance of the poiſon was to the 10th, and the longeſt to the 40th day, from the commencement of the variolous eruption, till the laſt ſcab dropt off, and, of theſe, only 16 were later than the 28th day.

In a *family*, where *two* patients are liable to the ſmall-pox, one catching the diſtemper from the other; out of 31 caſes, the ſhorteſt duration of the poiſon was till the 18th, and the longeſt till the 53d day after the eruptions appeared on the firſt: and, of theſe, only two were later than the 43d day.

In

In a *family* where *three* patients were to have the ſmall-pox; out of 7 caſes, the ſhorteſt was the 23d, and the longeſt the 63d day.

These facts ſhew, for what length of time, a family, in the natural ſmall-pox, continues infectious; when, by their unreſerved intercourſe, they catch the diſtemper, as ſoon as it becomes infectious.---Indeed, I ſuſpect that there ought to be a conſiderable abatement of this period, in ſeveral inſtances. When the *variolous* ſcab is torn off ſooner than it would naturally drop, another ſcab ſucceeds, which probably contains no variolous poiſon: but I believe the time above noted is when the laſt of the latter ſcabs, dropt off.

That the ſerum pus and ſcab of the puſtules of the ſmall-pox are infectious, is univerſally allowed. That the breath

and

and inſenſible perſpiration of a patient are infectious, nobody diſputes. Are the breath and perſpiration impregnated with the poiſon, from the puſtules which ariſe in the mouth and on the ſurface of the ſkin? Neither the breath nor the perſpiration ſeem to be infectious till the puſtules appear, as was before rendered probable, (ſee p. 49--52.) What other fluids that are contained in, or diſcharged from, the body, may be deemed poiſonous, is a queſtion that I believe has never been conſidered, much leſs determined, tho' capable of determination; at preſent, the obſervations that have been made, are too few and too vague to form a probable conjecture. The ſaliva is moſt ſuſpicious; and indeed little doubt can be entertained of its infectious quality, eſpecially in the ſalivation produced by the confluent ſmall-pox. It may however be doubted, how far this infectious quality is occaſioned by the variolous

poiſon

poiſon which iſſues from the puſtules in the patient's mouth. The two caſes related in the proof of the laſt propoſition, where infants in the mother's womb were not infected, 'till the time of the diſeaſe when the variolous poiſon is abſorbed from the puſtules into the blood, ſeem to warrant a doubt whether the patient's blood becomes infectious any farther than by this poiſonous admixture.

However, all the diſcharges of a ſmall-pox patient, either of themſelves, or the probable mixture of ſerum, pus, or ſcab may be infectious; and ought to be deſtroyed by cleanlineſs, in order to prevent the propagation of the diſtemper.

If theſe obſervations be well founded, ſome important concluſions may be deduced from them. During the eruptive fever, there will be no danger of ſpread-

ing the diſtemper, by expoſing the patient to the open air; but, after the eruption, when maturation begins, due care muſt be taken to prevent any communication with thoſe who are liable to infection. Theſe circumſtances happen fortunately for the patient. The late practice of inoculation has evinced that expoſure to freſh air during the eruptive fever is of important ſervice. In the diſeaſe from inoculation, and the milder kind of natural ſmall-pox, as ſoon as the eruption is completed, all apprenenſion of danger to the patient generally ceaſes. But ſhould the number or kind of puſtules, or the remaining ſymptoms require any farther expoſure to the freſh air, it ought to be done in ſome unfrequented place, or, when that is impracticable, by opening the door and windows of the patient's chamber. At leaſt, it is certain, when the 2d fever is over, that the open air is in no reſpect neceſſary towards a perfect

fect recovery, all danger vaniſhing at that period of the diſeaſe. Yet, at this time, while patients remain in a moſt infectious ſtate, they at preſent have the moſt unreſerved intercourſe with children liable to the diſtemper, and become wantonly deſtructive to their fellow-creatures.

II. That 'perſons liable to the 'ſmall-pox are infected by breathing 'the air, very near the variolous poi-'ſon in a recent ſtate' is a medical opinion ſo well eſtabliſhed as to require no proof. Let us reflect how widely and fatally this poiſon is diſperſed among all ranks of people. It may be conveyed into any houſe, unobſerved, from a great variety of families, adhering to clothes, food, furniture, &c. as,

Clothes, 1. Linen. 2. Cotton. 3. Woollen, particularly flannel. 4. Silk.

5. Millenary goods. 6. Stockings. 7. Stays. 8. Gloves. 9. Shoes.

Food. 10. Bread. 11. Cakes. 12. Huxtery. 13. Fruit. 14. Butter. 15. Milk. 16. Sugar and other groceries. 17. Salt. 18. Tea. 19. Nuts. N. B. Food boiled or roaſted at home is probably not infectious.

Furniture, &c. 20. Earthenware, 21. Hardware. 22. Dolls and other toys. 23. Pens. 24. Paper. 25. Books. 26. Letters. 27. Money.—28. Medicines.

TEN fold more articles might be enumerated; beſides, ſeveral of theſe I have mentioned, as, linen, &c. include 4 families each, who, by this means, may communicate the diſtemper, namely, the ſeller, maker, waſher and wearer.

So

So minute a detail of ſelf-evident cauſes may be thought ſuperfluous. But I would rather ſuffer this cenſure, than leave a ſingle doubt in the reader's mind concerning the numerous means by which this fatal poiſon is diſperſed, ſo generally and ſo careleſsly among mankind.

The clothes of a patient generally contain the largeſt quantity of variolous poiſon. However, all the enumerated articles, and many more, that come out of an infectious houſe, or from an infectious perſon, find their way unſuſpected into all families of a certain rank.

The poiſon is quickly and univerſally diſperſed among the loweſt claſs of people, whoſe poverty renders them dirty.

It ſhould be remarked, that children, who are moſt liable to the ſmall-pox in all other reſpects, generally put every new thing that they can lay hold of to their mouth, and are taken into the arms of many in a family, ſo as to expoſe themſelves to infection from their clothes. Theſe conſiderations point out numerous and indubitable means of propagating the diſtemper. Indeed the cauſes of this kind are ſo various, that one would expect the diſeaſe to ſpread much more rapidly than it does in fact: an event not be accounted for, but by ſuppoſing, what is confirmed by other circumſtances, that the atmoſphere quickly diſſolves the contagion, and renders it harmleſs by dilution, as hereafter explained.

III. That 'the variolous poiſon, 'which has been cloſe ſhut up, ever ſince 'it was recent,' long retains an infectious quality,

quality, is proved by the moſt authentic evidence. This truth is clearly demonſtrated by the well-known practice of inoculators, who keep variolous matter in cloſe corked phials, for many months, without loſing its infectious quality. In China, the inoculators take the ſkins of ſome of the dried puſtules, which are fallen from the body, and put them into a porcelain bottle, ſtopping the mouth of it very cloſe with wax, by which method of preſervation, the contagion is ſaid to be retained for ſome years. Indeed theſe ſcabs ſeem particularly well adapted to retain the variolous poiſon. Their moiſture has been gently evaporated by the heat of the body. In this dry ſtate, they would not be likely to undergo any change by putrefaction, or other kind of fermentation.

'About 1718, a ſhip, from the 'Eaſt-Indies, arrived at the Cape of 'Good-

'Good-Hope: in the voyage, 3 chil-
'dren had been ſick of the ſmall-
'pox: the *foul linen* about them was
'*put into a trunk and locked up.* At the
'ſhip's landing, this was taken out,
'and given to ſome of the natives to
'be waſhed: upon handling the linen,
'they were ſeized with the ſmall-pox,
'which ſpread into the country for
'many miles, and made ſuch a deſo-
'lation that it was almoſt depopula-
'ted." *(o)*

From a variety of conſiderations, I am inclined to believe that the moſt uſual method of tranſfering the ſmall-pox to a diſtant place, is, by ſending to relations and acquaintance, clothes, &c. bedaubed with the variolous poiſon, either ſhut up in boxes; or, what has a ſimilar effect, folded up in clothes, paper, &c. ſo as to exclude all acceſs of

(o) Mead on the plague, p. 1. ch. ii.

freſh

freſh air. It has been remarked, that relations, at a diſtance, are infected by this diſtemper, nearly about the ſame time. This event, I believe, often happens, from a communication of dirty clothes, &c. and ſometimes poſſibly from a letter. Whoever reflects that a piece of paper on which a letter is written, may have lain on a bed, where there is, or has been, a ſmall-pox patient, or on a table, chair, &c. where the foul handkerchiefs, cloths, &c. are thrown, or may be beſmeared with variolous matter, by the unwaſhed hands of a ſervant, a correſpondent or a patient; that the letter is folded up carefully, ſo as to exclude the air; that, when opened, it is held near the mouth and noſe to be read; and afterwards a child puts it into the mouth; will not be ſurpriſed that it may ſometimes communicate the infection. 'Hujus rei ſat 'probabile exemplum reperire mihi vi-'ſus ſum, quum nullæ omnino, ante 'aliquot annos, hic loci notarentur va-

'riolæ. Puella *literas* aliunde a fratre 'ſuo, qui morbo iſto ibi tunc epide-'mio laborabat, acceptas geſtarat ſe-'cum, per aliquot dies : et en ! nil me-'tuens aut cogitans, ſubito eadem lue 'cæpit affligi, contagiumque deinde 'cum ceteris contubernalibus quatuor 'communicavit, unde id in aliam quo-'que domum tranſlatum eſt, eamque 'pervagatum ceſſavit.' *(p)*

That the cauſes above aſſigned for the propagation of the ſmall-pox are *true*, no medical man will doubt; namely, the near approach to a patient, or to variolous ſerum, pus, or ſcab, by any perſon ſuſceptible of infection.

That theſe cauſes are *ſufficient* to account for the diſtemper, in all caſes, will not appear improbable, to any one who duly conſiders the innumerable methods by which this poiſon is diſperſed among mankind.

(p) Werlhoffii opera, p. 487.

However

However, two objections will very generally be made to this concluſion, which ſhall be particularly conſidered in the two following propoſitions.

§ VII.

Clothes, furniture, food, &c. expoſed to the variolous miaſms, never, or very rarely become infectious.

That variolous miaſms may be retained in clothes, furniture, chambers, food, &c. ſo as to communicate an infectious quality to the neighbouring air, is the generally prevailing opinion, nor do I know that it has ever been diſputed *(q)*. But if we examine this point with attention, I truſt it will appear, that it is an opinion, nearly, if not entirely groundleſs. This concluſion may be deduced from the ſimpleſt and beſt eſtabliſhed principles of chemiſtry. It has been proved that the variolous poiſon is united to air by *ſolution*

(q) See the Introduction, p. 4.

(ſee § iij). Chemical attraction is the cauſe of ſolution, as appears from the clear evidence of innumerable experiments. Chemiſts have employed much labour and ingenuity to aſcertain the various degrees of this attraction, between almoſt all the different ſubſtances that nature preſents to their examination. The degree of attraction between the ſame ſubſtances, in the ſame circumſtances, is always uniformly equal. Now whether it be ſuppoſed that air attracts the variolous miaſms more ſtrongly than clothes, &c. do, or that clothes, &c. attract the miaſms more ſtrongly than the air does, the argument will be concluſive againſt this opinion. For if air attract the miaſms more ſtrongly than clothes, &c. do, it is evident that the miaſms could never be taken from the air in order to adhere to the clothes, &c. On the contrary, if clothes, &c. attract the miaſms more ſtrongly than air does, it follows

follows that ſuch miaſms could never be taken from them by the air, and conſequently they could never render it infectious.

It may not be improper to take notice of ſome facts, which, to an inaccurate obſerver, may ſeem exceptions to the chemical principle on which this argument is founded. Clothes, it is well known, after being expoſed, in a chamber, to the ſmoke of tobacco, will communicate theſe effluvia to freſh air, as is manifeſt to the ſmell. In a chamber where much tobacco has been ſmoked, a part only of the ſmoke is *diſſolved* in the air; and the reſt floats about in a viſible form, being in a ſtate of *diffuſion*. In this caſe, the fact ſeems to be, that tobacco ſmoke adhering to the clothes, is afterwards diſſolved by the air. The circumſtances of the effluvia of tobacco and the variolous miaſms are eſſentially different. The ſmoke attracted by

by clothes is not diſſolved in the air, but diffuſed in a viſible form, in which ſtate it has no chemical combination with air. Whereas the variolous miaſms are perfectly diſſolved in the air, and conſequently could not combine themſelves with the clothes, unleſs they had a ſtronger attraction to the clothes than to the air; in which caſe, they would remain in combination with the clothes. Beſides, it ſeems evident that the ſmoke of tobacco is not all ſoluble in air. This like all other ſubſtances whoſe inflammability depends on oil, probably leaves an indiſſoluble ſoot. The pipe, and the walls, cieling, &c. of a room where there has been much tobacco ſmoked, ſoon acquire a dark colour, probably from the ſoot which remains undiſſolved. A part of this ſoot may ſtick to the clothes, and continue to emit ſoluble effluvia. That the air diſſolves a conſiderable proportion of tobacco ſmoke is evident; a

chamber

chamber often ſmells ſtrongly of tobacco, tho' no ſmoke is viſible. In ſuch a chamber, do clothes acquire the ſmell of tobacco? I have received the following information from a very accurate and intelligent obſerver. 'In travelling, I have often breakfaſted in a 'room of an inn, where company has 'ſmoked the night before; and, after 'returning to my chaiſe, have perceived my clothes ſmelling of tobacco.' In this caſe, might not ſome ſmoke remain in a diffuſed ſtate? a ray of ſunſhine diſcovers ſmoke not viſible in the ſhade, as I have often obſerved. Or, did ſome ſoot ſtick to the gentleman's clothes by touching a table, chair, &c.?

Another apparent exception to the principle may be ſuggeſted by the following fact. Woollen clothes become damp in a moiſt air, and loſe their dampneſs in a dry air, that is, in the firſt caſe, the watery particles, which are

diffuſed

diffuſed in the ſuperſaturated atmoſphere adhere to the clothes, and in the laſt, the dry air *diſſolves* the water retained by them.

CLOTHES expoſed to the offenſive ſtench of a privy, generally retain no ſmell. However, I have been informed, on good authority, that ſome privies impart a diſagreeable ſmell to clothes. May not this fact be explained on the principles here advanced? If the air of the place be ſuperſaturated with this noiſome vapour, the effluvia, in a diffuſed ſtate, may be attracted and retained by clothes, till carried into freſh air where it may be diſſolved. To confirm this explanation, it is well known that this vapour is ſometimes viſible; and clothes acquire this ſmell in thoſe privies only whoſe ſtench is peculiarly offenſive; and wood, &c. expoſed for ſome time, to ſuch effluvia, acquire a dirty covering.

THERE

THERE is an obſervation, in the *humane* HOWARD's ſtate of priſons, that may be thought to argue againſt the doctrine here advanced. 'My clothes were,' he ſays, 'in my *firſt* journies, ſo offenſive, 'that, in a poſt chaiſe, I could not bear 'the windows drawn up; and was there-'fore often obliged to travel on horſe-'back. The leaves of my memoran-'dum-book were often ſo tainted, that 'I could not uſe it till after ſpreading 'it an hour or two before the fire: 'and even my antidote a phial of vi-'negar, has, after uſing it in a few 'priſons, become intolerably diſagree-'able.' *(q)* In this caſe, I ſuſpect that the air of the priſon was *ſuperſaturated* with noxious effluvia. He particularly diſtinguiſhes in italics the '*firſt*' journies. Tho' his benevolent remarks had happily effected reformation before his

(q) Howard's ſtate of priſons. 2d ed. p. 8.

ſecond viſits, yet it cannot be ſuppoſed that ſuch noxious effluvia were totally deſtroyed; but only that the quantity was ſo diminiſhed as not to ſuperſaturate the atmoſphere. It might be difficult to determine this point by the teſt of tranſparency, as it is probable that not a ſingle ray of cheerful ſunſhine ever did or could penetrate into thoſe gloomy manſions.

If this idea be well founded, it ſhould ſuggeſt a caution to keep the chamber, where there are patients in the ſmall-pox, well ventilated, in order to prevent the variolous miaſms from communicating, by ſuperſaturation, an infectious quality to clothes; and, fortunately, it is well known that freſh air is extremely ſalutary, and would be conducive to their recovery.

On this ſubject, the ſcenting of clothes, &c. by the effluvia of muſk obviouſly

viouſly ſuggeſts itſelf. The vapour of muſk is uncommonly penetrating and permanent, in a manner difficult to be explained, and, I believe, different from any other effluvia. It ſeems to be an exception to the general analogy of nature, which produces infinite variety of odours that are not ſuſpected to communicate any ſcent to clothes.

Dr. Lind, in his excellent papers on fevers and infection, in a maſterly and philoſophical manner, has detected the contagious nature of various fevers not before ſuſpected to have that peſtilential quality. His remarks, if properly attended to, might be of great importance to mankind, eſpecially to this nation, by preſerving the lives of our brave ſea-men. He has ſhewn that cleanlineſs and freſh air will not in all caſes deſtroy this poiſon, that it is retained in the beams of wood, &c. of ſhips in the ſervice, and in the decayed

timbers of old hulks (p. 39, 42). But I apprehend that this obſervation is in no reſpect applicable to the variolous miaſms, a poiſon *ſui generis*, never known or ſuſpected to be ſpontaneouſly generated ſince its original production. Whereas theſe peſtilential fevers probably admit of generation by human effluvia, in cloſe apartments, occaſioned perhaps by ſome particular modification of the putrefactive proceſs. In old hulks, the decayed timbers, and, in other ſhips, the beams of wood, in a decaying ſtate, may naturally be ſuſpected to exhale a poiſonous vapour. The fumes of burning brimſtone ſeem well adapted to check this kind of putrefaction. But we know too little of the nature of the variolous poiſon to inveſtigate its antidote :----unleſs, perhaps, in a certain ſenſe, it ſhould appear, that *dilution* may be deemed a ſufficient and practicable corrector of this poiſon.

On the whole, it is difficult to imagine how miaſms adhering to clothes ſhould convey infection. The quantity of air impregnated with variolous miaſms contained in the interſtices of clothes is ſo extremely minute, and, by paſſing thro' freſh air, would be ſo quickly diminiſhed, that a ſufficient quantity to do miſchief cannot be reaſonably ſuppoſed to remain at even a ſmall diſtance from the infectious chamber. The only clothes that ſeem capable of conveying variolous miaſms from one chamber to another are gloves or boots, if they be pulled off in air ſtrongly impregnated with this poiſon, and ſo ſtiff as not to collapſe, and a perſon liable to the ſmall-pox ſhould purpoſely inſpire all the air they contain. The hollow furniture of a patient's chamber, as, boxes, drawers, &c. are leſs ſuſpected, but more dangerous means than clothes, of conveying infection.

fection. They contain a conſiderable quantity of air impregnated with variolous miaſms, which, if ſhut up, might long remain there.

ANOTHER leſs obvious means of communicating infection ſeems not improbable. If a bottle, full of any fluid, be emptied in the ſmall-pox chamber, eſpecially near the patient, as often happens, it would be immediately filled with infectious air, that might retain its poiſonous quality at any diſtance of time or place, as, in that ſituation, it ſeems unlikely that any fermentation could change this quality. But the infectious air might eaſily and certainly be removed by filling the bottle again with any liquid.---However, I confeſs, that theſe are merely theoretical conjectures, which I cannot confirm by facts.

So much for theory and analogy.

Let

Let us next inquire if it can be determined, by actual obſervation, whether variolous miaſms adhering to clothes, &c. ſpread the ſmall-pox. It has often been obſerved that infection was caught from a perſon, who had viſited a patient in the diſtemper. So many inſtances of this kind are mentioned, and on ſuch good authority, that the fact cannot fairly be diſputed. The common explanation of this mode of ſpreading the ſmall-pox is to ſuppoſe that the variolous miaſms adhering to clothes convey the infection. But, if this were the cauſe, the infection muſt be much more frequently communicated by viſitors: becauſe the clothes of *every* viſitor, in an infectious chamber, muſt be expoſed to the variolous miaſms. On the contrary, we have innumerable proofs that clothes, &c. expoſed to the miaſms of a ſmall-pox chamber, and ſoon after approaching perſons liable to the diſtemper do not

always

always nor *generally* communicate infection. Caſes of this kind occur ſo very frequently, that it ſeems unneceſſary to relate particular facts: I could, if required, produce numerous proofs to eſtabliſh this point. Inoculators particularly have their clothes, &c. daily expoſed to the variolous miaſms, yet they do not convey the natural ſmall-pox to others liable to it, tho' during the time of preparation they approach very near them, for days and weeks previous to inoculation. We know *certainly* that recent variolous matter conveyed near to a perſon capable of having the diſtemper is generally infectious: if it approach *three* within the infectious diſtance, it is probable that one of them will be attacked, in the proportion of ſeveral thouſands to one, (ſee p. 27, 28). Now a perſon, who has been in the ſmall-pox chamber, may inadvertently convey the variolous matter either adhering to his

his clothes, hands, feet, &c. Theſe conſiderations ſhew, to a high degree of probability, that the ſmall-pox is always conveyed out of one houſe into another, not by miaſms adhering to clothes, but by variolous ſerum, pus or ſcabs.----A caution may hence be ſuggeſted to medical and other viſitors, never to ſit down in the chamber of a ſmall-pox patient.

A phyſician juſtly celebrated for his profeſſional knowledge, who honoured this Inquiry with a peruſal in manuſcript, makes the following remark, on this point, in anſwer to the 2d *Query* annexed to the INQUIRY. 'Do 'the rules of prevention comprehend 'every neceſſary reſtriction?'

'A. to Qu. 2. IF the theory be true 'that contagion cannot be carried out 'of an infected houſe by variolous '*effluvia* abſorbed in clothes, &c. of

'medical attendants, &c. no neceſſary 'reſtriction ſeems to be omitted. But 'I know many, whom no arguments 'will convince, that the ſmall-pox was 'not brought into their families by 'ſurgeons, apothecaries, &c.'

To this objection, I reply, that medical attendants, it is well known, carry variolous matter in their pockets for the purpoſe of inoculation, ſometimes perhaps not ſufficiently cloſed from the external air; and it may alſo, now and then, accidentally ſtick to their clothes, hands, feet, &c.

It is of much greater importance than it may ſeem, to a ſuperficial obſerver, to aſcertain whether the variolous miaſms are abſorbed by clothes, &c. ſo as to become infectious. If this were the caſe, no perſon could poſſibly go into an infected chamber, either on duty or by accident, but his clothes and

every

every thing around him would inevitably be rendered peſtilential. Nothing leſs than a total ſeparation of patients in the ſmall-pox, and all their attendants, from thoſe who are liable to the diſtemper, would be a ſufficient ſecurity from infection. To effect this, regulations would be required that are abſolutely impracticable in this free country. It may be imagined that a peſt houſe would anſwer the purpoſe. It has in fact been ſucceſsfully uſed for this end in remote ſmall towns, where the ſmall-pox rarely occurs, where it infects but a few, and thoſe generally grown perſons. But in large towns, where the diſtemper is conſtantly preſent, almoſt all the poor natives are infected while children. If an infant be attacked, and carried to the peſt houſe, the feelings of a mother would not ſuffer it to go alone, even in the moſt arbitrary government. If ſhe have other ſmall children, they would periſh at home without her aſſiſtance, and

muſt therefore go into the peſt houſe along with her. Unſurmountable embarraſment would ariſe, if we ſuppoſe only *ten* ſuch families to be admitted at the ſame time.

Let us farther conſider ſome of the innumerable difficulties of preventing the propagation of the ſmall-pox, if clothes expoſed to the variolous miaſms were rendered infectious. The *whole* external ſurface of the clothes and perſon of *every* viſitor, muſt be *always* contaminated, on returning out of the ſick chamber, and would convey the diſtemper to all liable to it who ſoon approach them after ſuch contamination. It is not pretended that this peſtilential quality can be diſcerned by any of our ſenſes. The miaſms adhering to clothes cannot be ſeen nor even ſmelt, that I ever heard of. No practicable reſtrictions could poſſibly be deviſed, much leſs executed, to prevent ſuch ſecret, ſubtile,

ſubtile, and unſuſpicious danger. Under a general conviction of theſe ſuppoſed difficulties, the point is given up in deſpair. No attempt is made to deſtroy the poiſon. It is allowed to be careleſsly ſcattered among mankind, tho' the well-known cauſe of a mortal malady; becauſe, according to the opinion which has long and univerſally prevailed, other means, utterly beyond our power to prevent, are equally capable of producing the miſchief.

But I argue; that the variolous poiſon in the form of ſerum, pus and ſcab, by impregnating the air near it, is the ſole means of infection. If this opinion be well founded, the difficulty of prevention, is leſs, than on the former ſuppoſition, beyond all compariſon. The poiſon, in this form, may be ſeen and eaſily deſtroyed. One viſitor in 10, or 20 may poſſibly convey out of an infectious room, ſome of the variolous matter

ter capable of doing miſchief. It may accidently adhere to ſome *part* of his clothes or perſon. But cleanlineſs alone, which the inſtinct of nature ſuggeſts, and ſocial habits improve, would be fully ſufficient to prevent the communication of infection, except by perſonal intercourſe with the patient. If this concluſion be admitted, may not the variolous poiſon be prevented from injuring mankind, with as much eaſe and certainty as arſenic, laurel, or any other poiſon.

§ viij.

The air is rendered infectious, but to a little diſtance from the variolous poiſon.

When the ſmall-pox becomes epidemical at any ſeaſon, it is thought by many to *infect the air of the place*, to a conſiderable diſtance *(r)*. And as this

(r) See the Introduction, p. 5, 6.

quality

quality of the air is ſuppoſed to be far above human power, or wiſdom either to avoid or correct, the danger is acquieſced in as inevitable. This opinion merits attentive conſideration, as, I apprehend, it ſuggeſts fear where there is perfect ſafety, and prevents caution where there is the greateſt danger.

I WILL ſtate the *train* of *argument*, which firſt ſuggeſted doubts concerning the truth of this opinion, and afterwards the *facts*, which ſeem to prove that the opinion is utterly falſe.

IN the chamber of a patient who has the malignant ſmall-pox, it is well known that the variolous miaſms occaſion a moſt offenſive ſmell, and to a much greater degree *near the patient*, than at a diſtance, even in the ſame room; tho', as far as I have obſerved, the miaſms are inviſible where the air is moſt ſaturated. This fact ſeems to prove,

prove, that the whole air contained in the chamber of a patient is ſeldom or never ſaturated, with the variolous poiſon, much leſs ſuperſaturated. Conſequently, when the infectious miaſms, diſſolved in a certain portion of air, are *diluted* with freſh air, the ſtrength of the poiſon is inverſely as the quantity of air. The infectious air that iſſues out of a chamber, which contains a ſmall-pox patient, by the doors, windows, and crevices, is a ſmall quantity compared with what is contained in the chamber, and leaſt ſaturated with the poiſon. But ſuppoſe the infected air contained in a *whole chamber* were to be mixt with the external air, *dilution* would probably ſoon render it harmleſs. The poiſon would be diluted with ſeveral hundred times more air, at the diſtance of a few yards, than in the patient's room. Suppoſe a chamber to be 10 feet in each dimenſion, it would contain 1000 cubical feet of air. A body

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of air including the chamber and 45 feet on each ſide of it, would be 1,000,000 cubical feet. But, if the chamber be on the ground floor, near one half of the cube muſt be ſubtracted, there being, in that caſe, few or no feet of air in a perpendicular direction from the patient downwards; there will therefore remain above 500,000 cubical feet. Hence the degree of dilution will be more than 500 times greater, at the diſtance of 45 feet, than in the patient's chamber.

The force of this reaſoning will be beſt underſtood by reflecting, what a wonderful effect *dilution* produces upon the moſt virulent poiſons. Thus, a ſingle drop of cauſtic fixed alkali will corrode a hole in a perſon's clothes or ſkin; yet, when diluted with a ſmall proportion of water, becomes a ſafe and wholeſome remedy. There is an illuſtration ſtill more appoſite to the

preſent ſubject. Fixed air breathed into the lungs is one of the moſt inſtantaneous and deadly poiſons known: yet fixed air, diluted with a ſmall proportion of atmoſpherical air, becomes not only ſafe, but, in ſome caſes, ſalutary. Theſe conſiderations ſeem to ſhew the improbability of the open air being infectious, even to a ſmall diſtance from a ſick chamber. In the ſame houſe, doors and paſſages may give a particular direction to the poiſon, ſo as to convey its influence to a greater diſtance. I know but one cauſe that can be likely to diſperſe the infection farther from the patient's chamber than as above eſtimated, that is, a ſtrong wind. But, to have this effect, the wind ſhould blow directly through the chamber, an uncommon circumſtance; and, even in that caſe, the miaſms would, by agitation, be ſoon mixed with a large proportion of atmoſperical air. In general, when

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the wind blows from an infectious houſe, there is at moſt a door or a window open, and conſequently not more than perhaps a tenth of the infectious air contained in the ſick chamber, may be mixed with the ſurrounding atmoſphere in an hour, during which time, a part of the poiſon would be blown to a great diſtance.

To diminiſh the force of this argument, it may be ſuggeſted, that the variolous infection is a ferment, which, by an admixture of a few of its particles with the blood, occaſions the generation of a large quantity of poiſon. It connot be denied, that, by inoculation, a very ſmall portion of matter, and, we may even allow, that by natural infection, perhaps a much ſmaller quantity of miaſms, diſſolved in the air of a ſmall-pox chamber, can produce, in ſome ſubjects, ſo much variolous poiſon as would communicate the

diſtemper to thouſands. But when the infectious air is again diluted, ſeveral hundred times, with freſh air, we cannot ſuppoſe it to retain any miſchievous energy. A fact reſpecting another kind of ferment, ſets this point in a true light. A pint of yeſt is ſufficient to excite a fermentation in a barrel of ale, but 100th, much leſs 1000th part of this quantity of yeſt, would not have the effect.

THESE *theoretical* conſiderations ſhew, to ſome degree of probability, that the infectious atmoſphere has ſome limit, and not far remote from the variolous poiſon; but cannot determine, with any exactneſs, to what diſtance the infectious quality extends. However, they ſuggeſted the obſervation of the following facts, which approach nearer to an inveſtigation of this important queſtion.

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The intelligent reader will remark that each fact here ſtated is a ſeparate proof of the doctrine above advanced. The ſmall-pox was epidemical in Cheſter from May, 1777, till January 1778, that is, for 9 months, particularly for the laſt 6; during which time I attentively marked its progreſs. 1. At the beginning two or three families were ſeized, not immediate neighbours, but in the ſame quarter of the town. 2. Then the children of a neighbourhood, comprehending an entry, had the diſtemper, but it did not ſpread from them as a centre. 3. In no part of the town it has ſpread uniformly from a centre, farther than thro' an entry or a narrow lane, where all the children of a neighbourhood play together. 4. Afterwards the poor children in ſeveral parts of the town were attacked, at a conſiderable diſtance, in ſome places half a mile, off each other. 5. Yet, many portions

portions of all the large ſtreets were not infected in November, but ſo late as December and Janua y, the diſtemper returned to attack many who had eſcaped, when it was in their neighbourhood ſome months before. 6. In Handbridge, a part of Cheſter, only ſeparated from the reſt of the town by the river Dee, not more than about 7 had been infected during the epidemic, tho' great numbers of children, in this quarter, are liable to the diſtemper. 7. In the middle of the city, in one ſtreet, (King's), of 24 who never had paſſed thro' the diſtemper, only *two*, both in the ſame houſe, were attacked. 8. During the ſummer and autumn of 1777, while this epidemic was general in Cheſter, many of the ſurrounding villages (as, Chriſtleton, Barrow, Tarvin, &c.) and ſome larger towns (as, Nantwich, Neſton, &c.) were viſited by the ſmall-pox in one or more families, yet the diſtemper did not ſpread generally

thro'

thro' any of theſe towns. As both the ſtate of the air, and the variolous poiſon were the ſame in theſe places as in Cheſter, why did it not equally *infect* their *air* as well as our's? 9. At Frodſham the ſmall-pox began in May, and gradually became more frequent, ſo as to be remarkably epidemical in one part for ſeveral months, yet nearly one half of the town, Nov. 18th, 1777, ſtill remained quite uninfected. On the contrary, at Upton, a ſmall village two miles from Cheſter, of 24 children who had never been attacked by the diſtemper, all except one (who was alſo certainly expoſed to the infection) had it in leſs than two months. The reaſon of its ſpeedy propagation I ſhall give in the words of Mr. Edwards, ſurgeon, a very intelligent inhabitant of the place. 'The diſtemper has not been 'propagated by the air, or contiguity 'of houſes, but has increaſed in pro-'portion to the communication which

families

'families had with each other; no care 'was taken to prevent the ſpreading, 'but, on the contrary, there ſeemed 'to be a general wiſh that all the chil-'dren might have it.' 10. It is univerſally allowed that the variolous infection attacks the children of the poor people firſt, and by far the moſt generally. But the air is equally breathed both by rich and poor, and, if infectious, would equally communicate the diſtemper to both, in proportion to their reſpective numbers. Many inſtances daily occur of a favourite child living in large towns, where the ſmall-pox almoſt conſtantly rages, who, by anxious care to avoid the diſtemper has eſcaped it, till arrived at maturity, and received the infection by inoculation, or by mixing with ſociety in a leſs cautious manner. Of many gentlemen's children liable to the diſtemper in Cheſter, not one was ſeized by the natural ſmall-pox, whoſe infection could not be

be accounted for, during the whole time of this epidemic.

11. These obſervations may be deemed too general to determine, with ſufficient exactneſs, to what diſtance from the poiſon, the air is rendered peſtilential. But, as the following fact will aſcertain, with ſome preciſion, in certain circumſtances, the limit where the variolous poiſon begins and ceaſes to be infectious, in the open air, I ſhall endeavour minutely to deſcribe every particular that could be ſuppoſed to influence this effect. A gentleman's family, of whom eight were children, all liable to the ſmall-pox, became inhabitants of Cheſter in November, 1777, having always till then lived in the country. On the 8th of that month, in the afternoon, the weather being ſhowery, cloudy, but not windy, and of a moderate temperature for the ſeaſon, the eldeſt, an intelligent young lady (Miſs Archer,

ſince married to Roger Comberbach, Eſq.), from whom I had this information, and three of her brothers, went out, for the firſt time after their arrival, to view the town. Aſcending the walls at the Northgate, they turned weſtward, and ſoon met a child of about a year old, in the ſmall-pox. The puſtules were pretty numerous on the face; ſome appeared freſh and full of matter, others were ſcabbed. A nurſe had the child on her left arm, paſſed on the north ſide, between them and the city wall, ſo that its face was toward the young lady and brothers. The clothes of neither nurſe nor child ſeemed dirty. The breadth of the path is a yard and quarter, between the wall of a building on the ſouth ſide two yards and an half high, and the city wall, on the north ſide, whoſe top is one yard and a quarter higher than the path, and ſix yards above the ground. The young Lady's face was nearly

nearly on a level with the child's; her brothers were rather lower. She is certain that ſhe paſſed within half a yard of the child, and doubts whether ſhe was not within half that diſtance of it. Her brothers, ſhe believes, were all as near it. The narrowneſs of the path between the two walls renders this opinion very probable. They all walked exactly, or nearly in the ſame line with the child, both before and after paſſing it. Both parties walked uniformly forward in oppoſite directions, at a moderate rate, except one of the brothers, who expreſſed a curioſity to look at the ſmall-pox patient, ſtopt a little moment when oppoſite to it, and about a minute when ſome yards paſt each other. The young Lady is certain that he did not touch, but thinks that he approached nearer the child than herſelf or any of the reſt. This brother was the only one of the party who was infected. He was ſeized with the eruptive fever

on the 15th of November, that is, on the 10th day after the interview; yet all the other *three* were ſuſceptible of the diſtemper, being infected by him. They were attacked on the 1ſt, 2d and 3d of December; that is, on the 24th, 25th and 26th day after meeting the child; a longer period than has ever been ſuppoſed to precede the fever. Another brother was ſeized Nov. 29th, and another ſiſter, Dec. 2d, who had not been on the walls. Tho' the *three* who met the ſmall-pox patient, paſſed ſo near it, yet it is highly probable that none of them, and to a much greater degree, ſeveral thouſands to one, (ſee § iv.) that all were not expoſed to the infection. Few medical concluſions can be drawn with ſuch a degree of probability.

As my informer cannot recollect the direction of the wind at this time, but believes that there was little or none, it may be imagined that the variolous miaſma

miaſms of the patient might be blown *from* the young party as they paſſed. But as they went on the ſouth ſide of the patient, and as, on this ſide, the wall was 2½ yards high, it will clearly be conceived impoſſible, if the wind was ſoutherly; if the wind blew from the ſouth or the eaſt, it muſt carry the miaſms *towards* them before, or after paſſing; if it was northerly, they would receive the miaſms as they paſſed the patient: if calm, they muſt breathe the air impregnated with miaſms for a conſiderable way after paſſing the patient, in walking between two ſuch walls. To ſome it may appear of importance, that the ſmall-pox was particularly epidemical at this time in Cheſter, and chiefly in this part of the town; the greateſt mortality from this diſtemper being in October, November and December. Beſides, all the party were juſt removed from the freſh air of the country; a change ſuppoſed to render

them

them particularly ſuſceptible of infection. The patient ſeems to have been in the moſt infectious ſtage of the diſtemper, as appears from the above deſcription. As all the *four* were nearly of the ſame age and had all their ſenſes perfect, it appears that the *three* who eſcaped infection did not, but the 4th who was attacked did inſpire a ſufficient quantity of variolous miaſms to produce the diſtemper, either by approaching nearer to the patient than the reſt, or by remaining longer in the poiſonous atmoſphere. In this caſe, the limit where infection commenced and ceaſed ſeems very nearly determined. However, I am very far from thinking that any general concluſion can be deduced from this ſingle fact. It appears reaſonable to ſuppoſe, that the infection would have been communicated at a greater diſtance, in the following circumſtances; namely, if the puſtules had been more numerous, and of a more

malignant

malignant kind; if the patient had been an adult; if the clothes of the nurſe and child had been bedaubed with variolous matter; if both parties had remained in the ſame place, and the wind had blown moderately from the patient towards the perſons liable to infection; and, perhaps, if the weather had been hotter and moiſter.

12. As the fact above related affords a good foundation to judge at how ſmall a diſtance, in the open air, a ſmall-pox patient exerts a peſtilential influence, ſo the following, which I know to be exactly true, ſeems to prove this important point, that *the variolous poiſon, in a houſe, is not infectious to any perſon out of it.* While I was anxiouſly meditating on ſome practicable method of inoculating the poor citizens of Cheſter, I received intelligence that the natural diſtemper had juſt appeared in a family in Handbridge, a quarter of the town, where

where I knew that a great number of children were liable to infection. I went to the mother, Elizabeth Bryly, who was very poor, explained to her the *Rules* of *Prevention*, (ſee the annexed PROCEEDINGS, No. v.) which I wiſhed to be obſerved, in order to prevent any of her neighbours from catching the diſtemper. They were left with her in writing; to conciliate her good opinion, I gave her a ſhilling, and promiſed ten more, if ſhe punctually followed their direction. Tho' 'two 'of her children were attacked by the 'ſmall-pox, and one of them died; 'yet, except a boy who had been in 'the ſick chamber before the directions 'were given, not a ſingle child caught 'the diſeaſe, altho' two were liable to 'it even at the next door, and not 'fewer than 26 in the near neighbour-'hood." (See the annexed PROCEEDINGS, No. vij.)------Mr. Owens, inſpector to the Society, can witneſs that theſe facts are accurately ſtated.

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The girl who died, was for a fortnight, during the day, in the room to which the outer door immediately opens. The path runs as close as possible by the door, where the children constantly passed and often played. The door was frequently open, and sometimes, tho' rarely, a window without glass, on the side of the room opposite to the door. The atmosphere at this time was not incapable of impregnation with the variolous poison and communicating the infection, because the girl's brother and a neighbour's child, the only two that had been in the sick chamber, caught it. Yet we may conclude, that of the 26 children and perhaps many more, who passed for a fortnight close by the outer door, not *three* were exposed to the infection is probable to the degree of *several thousands to one* (see § iv.) Few situations could be devised more capable of spread-

ing the infection. Two circumſtances only ſeemed wanting to produce this effect in the greateſt poſſible degree, that is, the patients were children, who do not generate ſo much infectious matter as adults, and the ſeaſon was cold. But even theſe circumſtances would be more than counterbalanced by removing the patients, or the perſons liable to infection, to a little more diſtance from the outer door, by which means the variolous impregnation would be ſo much *diluted* as to render it harmleſs. Hence we may fairly conclude, that this infection can very ſeldom, *if ever*, be propagated from the inſide of a houſe, eſpecially an inner chamber, to a perſon in the external air.

The facts here faithfully related, particularly the two laſt, ſo fully confirmed the train of argument which had ſuggeſted theſe obſervations, as clearly to convince me that *the variolous*

lous poiſon did not render the ſurrounding air infectious to ſuch a diſtance, as to fruſtrate all human attempts to ſtop its progreſs.

13. As a farther illuſtration of this important point, I will relate the following fact, of which Mr. Skerratt, ſurgeon, of Malpas, was witneſs as well as myſelf. A ſon of Mr. Lea near Emeral, in Flintſhire, was attacked by the ſmall-pox, on January 1ſt, 1780, had the diſtemper very moderately, about 20 or 30 on the face, and in proportion on the reſt of his body, and was removed out of the houſe on the 13th day of the diſeaſe for fear of infecting others in the family. The 2d was ſeized on the 19th, the 3d and 4th on the 23d of January. But the 5th, the mother, who was much afraid of infection, and probably more cautious than the reſt, did not perceive the variolous fever till the 11th of February, that is,

till the 43d day after the 1ſt began, and the 30th after his removal. All the family endeavoured to avoid any intimate intercourſe with the firſt patient, yet they all, particularly the mother, went every day into his chamber, which was a ſmall one. However, it is manifeſt, that ſhe was *not infected by approaching very near him. in a ſmall chamber, even during maturation.*

In the inveſtigation of this ſubject, it is not only curious but important to inquire, in what part of a room there is the greateſt danger of infection. A ſtriking fact, concerning another infectious diſtemper, which we have received on the beſt authority, may illuſtrate, if not determine, this point. Sir John Pringle *(ſ)* informs us, that, at the ſeſſions of the Old Baily, in 1750, the jail fever was communicated, from

(ſ) Obſ. on the diſeaſes of the army, p. 341.

the

the priſoners, to one part only of the court and jury, by a window at the other end of the room. 'The air from 'the window directed the putrid ſteams 'to that part of the court above men-'tioned.' May we not hence conclude, that there is the greateſt danger, where the infectious poiſon is placed between the perſon liable to infection and the open air?

§ IX.

Conſequently, the ſmall-pox may be prevented, by keeping perſons, liable to the diſtemper, from approaching within the infectious diſtance of the variolous poiſon, till it can be deſtroyed.

If the ſmall-pox be communicated by infection (§ i.) and by infection only, (§ ii.), if it be only caught by approaching very near to the variolous poiſon (§ viij.), in a recent ſtate or that has been

been cloſe ſhut up from the air ever ſince it was recent (§ vi.), and the variolous miaſms do not render clothes, &c. infectious (§ vii.); it follows, that the ſmall-pox may be prevented, by keeping perſons, liable to the diſtemper, from approaching within the infectious diſtance of the variolous poiſon, till it can be deſtroyed.

The variolous poiſon, if expoſed to the air for a ſufficient time, is probably deprived of its infectious quality, being diſſolved in the atmoſphere. I have known ſeveral inſtances (ſee p. 32---99) where the ſmall-pox was communicated in the open air by two perſons meeting and walking in oppoſite directions. Theſe facts prove that an infectious quality is *quickly* given to the air, and conſequently that it may *ſoon* be exhauſted. When the variolous poiſon ceaſes to diſſolve in the air, it ceaſes to produce the natural ſmall-pox. However,

ever, it is not impoſſible, if a large quantity of variolous pus were collected together, that a part of the poiſon might be ſhut up by dryneſs on its ſurface, and become again infectious, on being moiſtened, at a conſiderable diſtance of time. The moſt certain method of purification is by waſhing. Water, is well known to be the univerſal cleanſer of clothes, &c. from animal filth. Our ſenſes can diſtinguiſh when a very ſmall quantity of variolous matter adheres to clothes, &c. and if a few poiſonous particles ſhould remain, after waſhing, the air would probably ſoon diſſolve them.

The *epidemical* ſmall-pox, which has been attributed to a peculiar conſtitution of the atmoſphere, by the ſegacious Sydenham, and by moſt other phyſicians who have ſince written on this ſubject, may be ſuppoſed incompatible with this concluſion, but I think it can be explained

explained in a ſatisfactory manner, on the principles of this inquiry.

But as particular facts convey more certain conviction than general obſervations, I requeſt the reader to conſider the following table. The 1ſt and 2d columns are quoted on the authority of my very ingenious friends Dr. Percival and Mr. Aikin.

Deaths by the ſmall-pox, in 1781.

	Manchester.	*Warrington.*	*Cheſter.*
January	3	7	1
February	5	8	0
March	10	5	0
April	17	5	1
May	31	5	0
June	44	6	0
July	55	3	0
Auguſt	46	4	1
September	53	3	0
October	36	0	2
November	31	2	1
December	13	2	1
	344	50	7

In

In January, 1781, the ſmall-pox was brought from Dublin to Parkgate, where it was not propagated to a ſecond family. In the ſame January, it was brought from Liverpool to Neſton, where it continued to ſpread for ſeveral months. Yet Parkgate and Neſton are two towns, or rather two parts of the ſame town, not a ſingle mile diſtant from each other. I relate this fact on the beſt authority, Mr. Wolſtenholme's, ſurgeon, of Neſton.

Hncee we ſee, on ſurveying ſeveral large neighbouring towns, as Mancheſter, Warrington and Cheſter, that the diſtemper is very ſeldom abſent from any of them, but that it becomes generally epidemical at uncertain periods in each, and at times which hold no correſpondence with one another. In like manner, on comparing ſeveral neighbouring villages, we obſerve, ſome

entirely free from the diſtemper, others have a few only infected, others ſuffer a general ſeizure.---The obſervation is generally true in regard to this part of Great-Britain; but it will be thought ſufficient to have produced a particular inſtance.

WHOEVER conſiders the numerous facts here faithfully related, will perhaps be convinced, that the diſtemper becomes epidemical, neither thro' any peculiar ſtate of the air, nor of the human conſtitution. No ſuch difference can reaſonably be ſuppoſed to exiſt in large towns within 20 miles of each other, much leſs in neighbouring villages, and leaſt of all in different parts of the ſame town or village. If what is above advanced be true, the ſeeming myſtery may be explained in a few words. *The ſmall-pox continues ſpreading as long as perſons liable to the infection approach patients in the diſtemper or infectious*

ous matter, either in the ſame chamber or very nearly in the open air, and then ceaſes. When it has attacked none, or but a few in any place for ſome years, a large number of the young generation becomes liable to infection; if therefore it be introduced in theſe circumſtances, many of them nearly approach the infectious, become themſelves infectious, and propagate it to others, ſo that the diſtemper ſeizes all capable of having it, except a few who are kept from a free intercourſe with the reſt; this is called the *epidemical* ſmall-pox. In other places, the diſtemper does not ſpread from a ſmall-pox patient, none liable to infection approaching within the infectious diſtance, either becauſe it has lately been epidemical, ſo that nearly all have had it, or becauſe the patient is kept ſeparate from the reſt, through his own prudence or their fears. When only one or two families are infected by the ſmall-pox in any

town or village, no one will diſpute it is *poſſible*, that no perſon liable to the diſtemper may come within the infectious diſtance of the poiſon, before it be deſtroyed by waſhing or other methods of cleanlineſs. If this be done by accident or deſign, I maintain that the diſtemper will ſpread no farther. On the contrary, no one acquainted with the preſent habits of careleſsneſs in regard to this poiſon, and how generally it is diſperſed in clothes, furniture, and food, will doubt that ſome of it, while freſh, may come within the infectious diſtance of ſome perſons liable to the diſtemper, and, in conſequence, that theſe will be attacked. The more patients are infected the more poiſon will be generated, and, if many in the place are ſuſceptible of infection, the more quickly and generally it will ſpread. May not this view of the matter entirely explain the difference between the *ſporadic* and *epidemic* ſmall-

pox

pox, ſo often mentioned by medical authors?

II. I have hitherto conſidered '*how "the ſmall-pox may be prevented*,' merely as a medical queſtion. If the concluſion I have ventured to deduce, be true, we may next inquire, whether and in what manner it might be capable of a practicable application, either by civil regulations, or by a private ſociety, founded on principles of charity, and benevolence to mankind. What adequate method can be deviſed to counteract and correct the prejudices and habits that have long and generally pervaded ſociety? The precept, "*de-"ſtroy the variolous poiſon*," is ſhort and full. But as a popular regulation the directions ought to be more explicit. Do the following comprehend all neceſſary reſtrictions?

Mankind

" *Mankind are not neceſſarily ſubject to the ſmall-pox; it is always caught by infection from a patient in the diſtemper, or the poiſonous matter, or ſcabs, that come from a patient, and may be avoided by obſerving theſe*

RULES OF PREVENTION.

" I. SUFFER no perſon, who has not had the ſmall-pox, to come into the infectious houſe. No viſitor, who has any communication with perſons liable to the diſtemper, ſhould touch or ſit down on any thing infectious.

" II. No patient, after the pocks have appeared, muſt be ſuffered to go into the ſtreet, or other frequented place.

" III. THE utmoſt attention to *cleanlineſs* is abſolutely neceſſary: *during* and *after* the diſtemper, no perſon, clothes, food,

food, furniture, dog, cat, money, medicines, or any other thing that is known or ſuſpected to be bedaubed with matter, ſpittle, or other infectious diſcharges of the patient, ſhould go out of the houſe till they be waſhed; and till they have been ſufficiently expoſed to the freſh air. No foul linen, or any thing elſe that can retain the poiſon, ſhould be folded up and put into drawers, boxes, or be otherwiſe ſhut up from the air, but immediately thrown into water and kept there till waſhed. No attendants ſhould touch what is to go into another family, till their hands are waſhed. When a patient dies of the ſmall-pox, particular care ſhould be taken that nothing infectious be taken out of the houſe ſo as to do miſchief.

"IV. The patient muſt not be allowed to approach any perſon liable to the diſtemper, till every ſcab is dropt off, till all the clothes, furniture, food, and

all

all other things touched by the patient during the diſtemper, till the floor of the ſick chamber, and till his hair, face, and hands, have been carefully waſhed. After every thing has been made perfectly clean, the doors, windows, drawers, boxes, and all other places that can retain infectious air ſhould be kept open till it be cleared out of the houſe."

THO' the obſervance of theſe rules requires little trouble and no expence, yet every reſtriction is attended with ſome inconvenience, eſpecially to the poor; as a recompence and motive of obedience, ſome reward ſhould be given and probably their attention may be beſt ſecured by annexing to the rules a

" PROMISSORY NOTE.

DATED,

" *The* SOCIETY *for promoting general inoculation, at ſtated periods, and for preventing the natural* SMALL-POX *in Cheſter*, promiſe to pay the

the ſum of [half a crown or a crown, or] as ſoon as all the ſcabs are dropt off the patients in family, on condition that the ſaid and family exactly obſerve the foregoing rules; and allow any member of the ſociety, or their inſpector, to inquire whether they are exactly obſerved. And as a farther encouragement to follow theſe directions attentively and faithfully, the ſociety promiſe [double or] the reward, if no neighbour or acquaintance be attacked by the ſmall-pox, during the time it is in the family of the ſaid nor within 16 days after all the ſcabs have entirely fallen off the family.

" By order of the Society,

Inſpector."

To the inhabitants who are placed above want, it would be highly improper to offer a pecuniary motive: it may be ſufficient to annex to the rules the following requeſt.

" *The independent citizens, to whom the rewards of the Society will not be worth acceptance, are earneſtly requeſted to obſerve the regulations, through motives of humanity, in order to preſerve their fellow-creatures from ſo fatal a peſtilence as the natural ſmall-pox; and to permit the inſpector, if they have no other medical viſitor, to ſee that they are obſerved, leſt their ſervants inadvertently ſpread the contagion.*"

In order to aſcertain with what degree of accuracy and fidelity the rules of prevention are obſerved, it will be neceſſary to appoint an Inspector. His office would be to obtain information as early as poſſible, after the ſmall-pox had appeared in a family; to give them the *gratis rules* or the *promiſſory notes*; to viſit them frequently; and to keep an exact Register, on a plan that may include every neceſſary information, that can be required to inveſtigate the progreſs of the diſtemper thro' a town.

Regiſter

An actual and not an imaginary example of a regiſter is here given. To explain the utility of the intelligence contained in the different columns of the regiſter, I will anticipate from the Proceedings of the ſmall-pox ſociety at Cheſter, the following Certificate of their Inſpector.

" General Meeting of the Small-pox Society, Nov. 4, 1778.

" I Robert Owens, Surgeon and Apothecary, being the *Inſpector* appointed by the *Society for promoting General Inoculation at ſtated periods and for preventing the natural ſmall-pox in Cheſter*, do certify, that each of the following perſons has received, of the ſaid Society, the reward of Ten Shillings, for obſerving their rules to prevent the ſmall-pox from ſpreading; the numbers here marked referring to the place in their regiſter of the diſtemper.

" 1 Elizabeth Bryly, Sty-lane.
3 Anne Collier, Northgate-ſtreet.
4 Hannah Coleclough, Bridge-ſtreet.
7 Elizabeth Aſhton, Northgate-ſtreet.
8 Hannah Price, Gorſe-ſtacks.
10 Anne Conolly, Bars.
11 Catherine Jones, Bars.
15 Mary Morris, Foreſt-ſtreet.
16 Anne Downing, Bars.
17 Anne Smith, Bunce-lane.
18 Elizabeth Tilſton, Queen-ſtreet.
19 Elizabeth Johnſon, Gorſe-ſtacks.

" And I alſo certify that the Thanks of the ſociety have been given to
5 Mr. Smith, Watch-maker.
13 Mr. Jenkins, Tanner.
For obſerving their rules, tho' they would not accept any pecuniary reward.

" I believe that one, and perhaps another, of the above families did communicate the ſmall-pox to *one* other; but I can

I can certify that none of the remaining *twelve* families has communicated the diſtemper to a ſingle perſon in Cheſter, tho' one or more children, liable to the ſmall-pox, inhabited the next adjoining houſe in *five* inſtances (1, 3, 7, 13, 16) and tho' *many* were capable of infection in the near neighbourhood in *ten* inſtances (1, 3, 7, 8, 10, 11, 13, 16, 18, 19) who, with many others, would, I am convinced, have caught the diſtemper, if not prevented by the regulations of the ſociety.---I alſo certify, that, ſince the ſociety has been eſtabliſhed, only *ſeven* perſons (including the two above mentioned) have communicated the diſtemper to another family; of whom I know that *five* tranſgreſſed the rules, and believe that the other *two* alſo tranſgreſſed them: That the perſon who did the moſt miſchief, did it inadvertently; having communicated the diſtemper to many before,

but

but to none after, being acquainted with the rules.

"I farther certify, that the diſtemper has been ſtopped in *ten* different parts of the city; and that, as far as I can learn from minute inquiries, there are only three ſmall-pox patients in Cheſter. Theſe effects I believe to have been principally produced by the *Rules* and the *Rewards* of the ſociety.

R. OWENS, *Inſpector*."

As an illuſtration of the regiſter, the inſpector ought to write down as a comment on the vijth column what may be denominated *proofs of infection*. According to the doctrine which I have attempted to eſtabliſh in the INQUIRY, theſe proofs may be comprehended in the following queſtions.

1. DID any perſon, dog, cat, clothes, food, furniture, money, or other thing out

out of an infectious houſe come near the patient from the 6th to the 16th day before the ſmall-pox fever began?

2. Is there any evidence that the variolous poiſon did actually approach the patient during the period above ſpecified?

The latter would be a *poſitive*, the former a *preſumptive proof* how infection was communicated.

In the *ſeven* inſtances mentioned in the certificate, where infection was given to another family, it will be proper to ſtate the degree of proof which can be produced in what manner the poiſon was conveyed.

1. The 2d family was obliged to change their habitation during the diſtemper. One of their children with the ſmall-pox upon her, *ran againſt* a child

child of the 4th family, who probably carried home ſome of the poiſon on her clothes.

2. The 6th family were obliged to return to Liverpool in the diſtemper. They had the *ſingle* reward a day or two before their departure, for having ſo long obſerved the rules. When they had received the reward, the children were allowed, contrary to promiſe, to play about the ſtreet, and probaby tranſgreſſed other rules, ſo as to communicate the diſtemper to their next neighbour, the 7th family.

3. The Inſpector had no intelligence of the 9th family till the 14th day of eruption. Previous to this time, none of the rules were obſerved, and ſome, if not all, the children who caught the infection in this neighbourhood, had been in the infectious houſe. The *dates* of the regiſter prove that the 9th family com-

communicated the ſmall-pox before (yet only a little time before) being acquainted with the rules, to *four* families (10th, 11th, 12th, 13th,) but to none afterwards. This example ſhews the great probability that the diſtemper would have ſpread quickly, if it had not been prevented by the regulations of the ſociety.

4. A child of the 13th family, with the ſmall-pox upon him, was playing in a ſtreet window: he gave a *T totum* thro' the ſaſh to a boy (in the 15th family) unknown to the parents of either.

5. Two cloths that had been made foul by two children who died of the ſmall-pox in the 12th family, were ſent, in that ſtate, to the 17th family, in order to be waſhed, to a diſtant part of the town, near a mile off.

6. It is doubtful from whom the 14th family caught the diſtemper. None nearer than the tenth houſe had the ſmall-pox; and in the intermediate ſpace three children liable to it remained uninfected.

7. The 14th was next houſe to the 16th. The neareſt neighbour is moſt liable to tranſgreſs all the Rules. To be merely in the next houſe is not ſufficient to communicate the diſtemper, as appears by *ten* ſeparate proofs ſpecified in the certificate and regiſter. Whoever reflects on the whole train of evidence, will eaſily believe that in this and the laſt caſe there was ſome unobſerved tranſgreſſion of the rules.

In confirmation of the Inſpector's teſtimony, I can add my own, in moſt of theſe caſes.

ANOTHER circumſtance merits attention. In 4 inſtances (4. 7. 17. 20.), it is noted in the regiſter, that the 2d child caught the diſtemper from the firſt in the ſame family; this point is clearly proved by the dates when the puſtules appeared. The obſervation was farther confirmed by ſubſequent facts: of the 37 caſes compriſed in the table, p. 42, all except three appear to have been infected by the patient who was firſt attacked in the houſe. Theſe facts ſhew upon what a *caſual* circumſtance the infection depended. The poor children of the ſame family are almoſt conſtantly together, and very ſeldom in ſeparate apartments. Hence we may conclude that the *whole* air of the chamber in which they lived was not rendered infectious, at the time when the firſt was infected.

The ſummer was remarkably hot, and, for three weeks, very wet.

To give the facts ſtated in the regiſter and the certificate their due weight, it is proper to compare them with the following. During this ſeaſon the ſmall-pox was epidemical in ſeveral neighbouring villages. At Chriſtleton, a ſmall village, two miles diſtant from Cheſter, the diſtemper began in March, and continued there till October. At the commencement of the epidemic, 107 poor children had never been expoſed to the variolous infection; of theſe, 100 had the diſtemper, probably all who were capable of receiving the ſmall-pox.

After this ſhort explanation, may not the following concluſions be reaſonably deduced from the facts contained in the regiſter and certificate? 1. That they afford no proof that a patient

patient in the ſmall-pox renders the air of an adjoining houſe, or the external air infectious, even when aided by heat and moiſture. 2. That it does not appear from theſe facts that the variolous miaſms render clothes, furniture, &c. infectious. 3. That the ‘ *Rules of pre-* ‘ *vention*’ do not ſeem to have been inſufficient for their purpoſe in a ſingle inſtance.

It is highly probable that experience will diſcover ſome defects in the regulations: however it may be reaſonably hoped that ſuch defects will admit of a practicable correction. Theſe concluſions are deduced from well-authenticated facts; yet I am aware that they will only convince ſuch readers as diſcern the truth of the theoretical principles above advanced. But if theſe principles be true, our eſtabliſhment at Cheſter is likely to ſupply obſervations ſufficient to perſuade the moſt ſceptical.

I could

I could adduce many facts from other infectious diſtempers, in favour of the doctrine maintained in this INQUIRY, but ſuppoſe that argument from analogy will be deemed ſuperfluous, after ſo many direct proofs have been produced.

QUE-

QUERIES.

1. Do the *rules of prevention* contain no unneceſſary reſtriction?

2. Do they comprehend every neceſſary reſtriction?

3. Did you ever know *three* or more perſons at the ſame time and place, all eſcape the ſmall-pox, after being certainly expoſed, for the firſt time, to the variolous infection, either by inoculation with genuine freſh matter, or by breathing the air of a chamber in which a variolous ſmell was perceptible?

4. Did you ever know the ſmall-pox conveyed out of one chamber into another, by a perſon who certainly did not carry

carry any variolous ſerum, pus or ſcab on their clothes, hands, feet, &c.

5. On the contrary, have you not known numerous inſtances of perſons and clothes expoſed to the miaſms of of a ſmall-pox chamber, that ſoon after approached many liable to the diſtemper, who were yet not infected?

A P-

APPENDIX

TO THE

INQUIRY.

IN autumn, 1778, the preceding INQUIRY was ſubmitted to the conſideration of my judicious friends, the late Dr. Fothergill, and Dr. Waterhouſe. At that time, I did not know, that the ſmall-pox had been excluded from any civilized country in the world: and was not a little rejoiced to learn from Dr. Waterhouſe, that, what I conjectured to be practicable, had been actually accompliſhed, for a long ſeries of years, in Rhode-

Iſland. The annexed account was writen in anſwer to ſome queries I had propoſed. It is ſo clear and ſatisfactory as to require no comment.

A LETTER FROM DR. BENJAMIN WATERHOUSE.

" Lea-hall, 25th Sept. 1778.

" I HAVE not forgot the promiſe I made to Doctor Haygarth when we were laſt converſing upon the ſmall-pox, of ſending to him an account of the means uſed in my native iſland which ſo effectually ſecures us from the rage of that dreadful diſeaſe. As it is upwards of three years ſince I left America, it is poſſible I may have forgot ſome of the circumſtances, but I believe I retain the moſt material.---- It will be neceſſary to ſay ſomething of the ſituation of Rhode-Iſland, and the connection of its inhabitants with other parts.

RHODE-

RHODE-ISLAND is 14 miles long and 7 broad; about 6 miles from the continent on the weſt ſide; ſcarce half a mile on the eaſt, and open to the ſea on the ſouth. This iſland is the thoroughfare for all travellers from Connecticut, New-York, Jerſeys, Penſylvania, and all the ſouthern provinces. On the ſhore of the continent oppoſite the eaſt ſide, ſtand the towns of Briſtol, Warren, Tiverton and ſome others, none of them containing leſs than a thouſand inhabitants, ſome of them three times the number. Over this ferry come almoſt all the market people. To theſe add the great number of people who come by the great road from Boſton and parts adjacent to Providence; from which place boats are conſtantly carrying paſſengers to the capitol *Newport*. This town contains about eleven thouſand inhabitants; it is advantageouſly ſituated and eſteemed

very healthy, inſomuch that it is reſorted to every ſummer by great numbers on account of their health from the Weſt-Indies and the ſouthern provinces.

" THE meaſles, the chincough and ulcerated ſore throat have been ſeveral times epidemic. But I do not recollect that any of theſe diſtempers were frequent among us, without ſeizing, nearly at the ſame time, the inhabitants of the neighbouring provinces.

" NEWPORT is a very conſiderable ſea port; their ſhips viſit almoſt all the ports of Europe, the coaſt of Africa, the French, Spaniſh, Dutch and Portugueſe ſettlements in the Weſt-Indies. Ships from theſe parts do not ſo frequently bring the ſmall-pox as from the ports nearer to us.

" As inoculation is diſcouraged both in Boſton and Rhode-Iſland governments, thoſe who wiſh to be inoculated go to ſome of the ſouthern provinces, where it is tolerated. Different places in Penſylvania, New-York, and the Jerſeys, are annually reſorted to, by great numbers of the New-England people. Long-Iſland was a favourite ſpot with many. I have known the young people of half a dozen families ſet out together for theſe inoculating places, and return to their homes together, and yet we have ſo conducted matters as to prevent this dreadful diſeaſe from ſpreading among us * ; which is done by obſerving the following rules.

" Never to bring back any of their clothes worn during their ſtay at

* See the INQUIRY, p. 16, where this fact is farther authenticated.

the

the inoculating place. Never to quit it till a certain ſpace of time fixed by the inoculators, be the diſeaſe ever ſo ſlight. And, if they have any ſores about them, when they arrive in the harbour, not to come on ſhore till they are examined by the inſpector appointed for that purpoſe.

"When any perſon in the town is ſuſpected of having the ſmall-pox, they ſend for the inſpector. If he thinks it is probable the perſon is infected, he takes with him ſome of the *overſeers of the ſmall-pox*, and if they, in conjunction with a practitioner, pronounce it the ſmall-pox, the family has little more to do with the patient, who is, from that time to the concluſion of the diſeaſe, wholly under the direction of theſe officers, who remove him to an iſland where every thing convenient is already provided. This iſland is called *Coaſter's Harbour*:

it

it is a mile and a half in length, and about a mile in breadth : It is pleaſant and ſheltered by the continent from the north and eaſt winds, is about half a mile from Rhode-Iſland ſhore, which ſhore is between two and three miles from the town.

" FORMERLY, they carried the ſick perſon in a box, in form of a large cheſt, big enough to contain a ſmall bed. The cover was perforated with holes ſufficient to give the patient air. The box was put on an eaſy ſledge and drawn by a horſe, attended by the *overſeers* to the ſhore, when the box and ſledge together were put into a boat, and in a few minutes the patient was in his hoſpital. When the inhabitants found that this formidable apparatus did more miſchief, eſpecially to timorous minds, than the diſeaſe itſelf, they dropt the uſe of the box, and ſubſtituted a ſedan chair.

" IT

" It has happened more than once that the diſeaſe was ſo far advanced, before it was known to be the ſmall-pox, that the patient could not be removed without the utmoſt hazard. In that caſe, they boarded up the ſtreet, advertized it in the News-paper, and placed guards to prevent any perſon from coming within a certain diſtance of the houſe.

" When a veſſel arrives in the harbour, with the ſmall-pox on board, after the ſick are taken to Coaſter's Harbour, ſhe is obliged to perform quarantine, and to hoiſt a jack in her ſhrouds, in which caſe no boats will board her. But, in common, commerce ſuffers no reſtrictions on account of this diſtemper.

" I acknowledge ſome of theſe rules are unneceſſary and inconvenient, but the

the dread of this diſorder induces the people to adhere to them with chearfulneſs. A ſtranger would be ready to conclude that they could not be ſo ſcrupulouſly complied with, without exerting an authority diſagreeable to the people. But it is not the caſe. For the united voice of the people coinciding with the magiſtrate gives every regulation its wiſhed-for effect; ſo that it rather appears like a popular cuſtom than the reſtraints of law.

" THE *Overſeers* are generally perſons of conſequence, are very punctual in the duties of their office, and are intitled by law to ſomething for their trouble.

" If there is any thing elſe Dr. Haygarth wiſhes to know, and I can inform him of, he has only to direct a few lines to me, at Dr. Fothergill's,

and it will be communicated to him with the greateſt chearfulneſs, by his Friend,

B. WATERHOUSE."

PRO-

PROCEEDINGS

OF A

SOCIETY

FOR PROMOTING

INOCULATION,

AND PREVENTING THE

NATURAL SMALL-POX

IN

CHESTER.

PROCEEDINGS

OF A

SOCIETY

For promoting INOCULATION, and preventing the Natural SMALL-POX in CHESTER.

No. I.

ADVERTISEMENT.

March 13, 1778.

THE havock made on mankind, by that dreadful diſeaſe the natural ſmall-pox, cannot but excite the pity of every benevolent mind. From accurate regiſters it appears that 378 perſons have died of this diſtemper in Cheſter during the laſt ſix years, and that the deaths proceeding from this, compared with thoſe from all other cauſes united,

united, have been conſiderably more than as 1 to 6. It is chiefly deſtructive to the poor, who are not only deſtitute of the aſſiſtance that medicines would afford, but of all the comforts, and many of the neceſſaries, that a ſick family demands. Already oppreſſed with the various evils of poverty, their miſery is augmented to the higheſt degree of wretchedneſs by this loathſome malady, which, after many bitter ſufferings, bereaves them of their children unſeen and unlamented.

SEVERAL of the magiſtrates, and other reſpectable inhabitants of this place, being thoroughly apprized of theſe circumſtances, are deſirous that a view of the melancholy ſcenes ſhould be more fully exhibited to the public; in a well founded confidence, that the humanity and generoſity of the citizens of Cheſter would be exerted to provide every poſible relief. They requeſt, therefore, that a public meeting of the inhabitants may be held at the Pentice, on Monday the 16th of March, at eleven o'clock in the morning, for the purpoſe of inquiring into the degree of this calamity, and of conſidering whether *many lives* might not annually be ſaved by the

the eſtabliſhment of *a Society for promoting general Inoculation at ſtated periods, and for preventing the natural ſmall-pox.* And, to obviate any groundleſs apprehenſions that this propoſal might excite, they think it proper to declare, that this deſign will not be attempted, unleſs it ſhall appear (as they truſt it evidently will) that it can be executed upon a plan which cannot give any reaſonable alarm on account of thoſe who have never had the diſeaſe.

As the utility of ſuch an Inſtitution will be in exact proportion to the degree of approbation with which it is received, it is earneſtly requeſted that all who are touched with pity for their fellow citizens in ſuch complicated diſtreſs, will cummunicate their ſentiments fully and freely, either by themſelves or their friends, at the public meeting.

No. II.

At a public meeting of the inhabitants of Cheſter, held at the Pentice on the 16th of March, 1778, to inquire in what degree the natural ſmall-pox had been fatal to our fellow

low citizens, it was proved by the *certificates* of the *Clergymen* of each pariſh, that during the laſt ſix years 378 perſons had died of this diſtemper, that the whole number of burials, during the ſame period, was 2522, and of births 2706.

As there is reaſon to believe, that the weight of this calamity chiefly falls upon the poor, and greatly aggravates their complicated wretchedneſs, it was reſolved, to ſend the following PROPOSAL to our humane and beneficent fellow citizens, recommending to their attentive conſideration, whether the intended Society would not probably *relieve much miſery* and *ſave many lives.*

IT was alſo reſolved, that another public meeting ſhould be held at the Pentice on Monday, March 30, at eleven o'clock in the morning, to deliberate on the objections and improvements that may be made to the plan, and finally to determine whether it ſhall be carried into execution. At this meeting, all who are deſirous of promoting the eſtabliſhment, are requeſted to declare their intention, and to ſpecify the ſum they will give either

as

as a *benefaction* or as an *annual ſubſcription*. The *moderate* contributions of *many* would fix the Society on the firmeſt foundation. If the deſign merit approbation, there will never be wanting, in this place, a ſufficient fund to ſupply every neceſſary expence. On ſome occaſions ſecret acts of charity are deemed moſt laudable, but in order to accompliſh the benevolent purpoſe of this inſtitution, the names of the contributors are particularly deſired, as they will be requeſted to exert their farther kind offices of recommending patients, and explaining to their ignorant, or inattentive neighbours, the humane intention of the Society.

THO. FALCONER, Chairman.

IT is proper to declare, that general Inoculation is not intended to take place at the preſent ſeaſon, but at ſuch other time as will be moſt agreeable to the inhabitants in general.

No. III.

A PROPOSAL *to eſtabliſh, in* CHESTER, A SOCIETY *for promoting general Inoculation at ſtated periods, and for preventing the natural Small-pox.*

IT has been proved by the *moſt authentic evidence*, that during the laſt ſix years the ſmall-pox has been fatal to 378 perſons in Cheſter, and, that during the ſame period, all the births have amounted to 2706. Inoculation, ſince its late improvements, according to the moſt unfavourable computation, is not fatal to *one* in 100; conſequently, if the whole number had been inoculated, only 27 would have died, and therefore 351 lives would have been ſaved by this art, that have periſhed by the natural ſmall-pox, or above 58 annually. If we ſhould allow, in a general inoculation, even *twice* as great a fatality as above ſtated, on account of the leſs exact attention of the poor in obſerving directions, and other cauſes, yet ſtill it evidently appears, that not leſs than *fifty-four* deaths would have been annually prevented;—an important number, eſpecially when we reflect that they are all

cut

cut off in early youth, very few of them (only 1 native and three emigrants in 6 years) having attained ten years of age. By no other means can human power or ſkill ſo greatly diminiſh the preſent mortality of mankind.

[* NEXT to the probability of ſuch a meaſure being uſeful, it is important to ſhew the improbability of its being hurtful to this city. Some perſons are incapable of infection by the ſmall-pox. The proportion of mankind thus exempted has been obſerved to amount to 1 in 20. By a general ſurvey of Cheſter, taken after the epidemical ſmall-pox of 1774, it appeared, that all the inhabitants had actually paſſed thro' the diſtemper, except 1 in 14. (See the Philoſophical Tranſactions for 1778). The average number of births is 397, which, divided by 20, will nearly give 20, the number naturally incapable of infection; the births divided by 14 will nearly give 28, the number at preſent annually exempted, in Cheſter. Hence it clearly follows

* The argument contained in the crochets was written for, but not printed in the original PROPOSAL.

† See the INQUIRY, p. 25.

that all liable to infection are actually infected, except, perhaps, 8 annually: if these were also attacked, it would make less than two more deaths annually by this distemper. Consequently, if 9 were inoculated annually, by such an establishment, the advantage would fully compensate all the possible mischief, even if such a measure were to infect all capable of infection, a very improbable consequence. Besides, many who were uninfected with the distemper at the time of enumeration, have undoubtedly been since attacked, so that it appears that the small-pox does nearly the *greatest possible injury* to the inhabitants of Chester.]

A Hospital could never render inoculation general in this place. The age of admission into such a hospital is at seven years old. In the epidemic of 1777, out of 136 who died of it, only seven were arrived at that age, of whom only three were natives, and four emigrants. But if nurses were provided to attend younger children, yet only a few of the most indigent and least affectionate parents would allow their tender infants to be taken out of their own bosom, and inoculated in a hospital.

hoſpital. This is an inſuperable objection, not to mention the great expence of building and maintaining ſo large a hoſpital as would be required for this purpoſe.

BUT if all the patients be inoculated at home, the expence will be extremely moderate, and the above-mentioned difficulty entirely removed. No objection to this method can ariſe from the danger of propagating the infection; becauſe, if the inoculation be general, no ſubjects liable to infection would remain. But ſhould age, indiſpoſition, or prejudice occaſion a few exceptions, yet even theſe will run incomparably leſs riſk of infection from a general than a partial inoculation. For it will be performed only once in two years or perhaps ſeldomer, at a fixed time that will be *publicly* known; ſo that thoſe who never had the diſeaſe may eaſily avoid all intercourſe with the infectious. At any rate, they will be in much leſs hazard than at preſent from inoculation, which is performed at *various* times *every* year, and ſometimes *ſecretly*. Not to mention, that it would prevent in a great meaſure, the imminent danger of being infected by patients in all ſtages

of

of the natural ſmall-pox that we daily behold in the ſtreets, even in the crowded markets and fairs. If the purpoſe of the inſtitution can be fully accompliſhed in baniſhing the natural ſmall-pox from the place, this circumſtance will afford the greateſt comfort, and moſt pleaſing ſecurity to thoſe who are liable to the diſeaſe. At preſent this deſtructive peſtilence is ſeldom or never abſent: During the laſt ſeven years, and probably a much longer period, a ſingle year has not elapſed without a fatal proof of its preſence in this city, as appears from the regiſter of mortal diſeaſes.

IT is neceſſary, but painful, to remark, that the preſent mode of partial inoculation, though highly beneficial to individuals, is, on the whole, pernicious to the community. Not more than twenty, or fifteen, or perhaps ſtill fewer, are here annually inoculated; a number that cannot ſenſibly diminſh the mortality of the ſmall-pox in ſo populous a town, but yet ſufficient to propagate the diſeaſe, as many hundreds promiſcuouſly mixt with them through the town are incautiouſly expoſed to the infection. It appeared from the general

ſurvey,

ſurvey, that 1385 perſons had the ſmall-pox in 1774, though many ſtill remained uninfected; previous therefore to this epidemic, the chances were very numerous of catching infection from inoculated patients. And, in fact, many inſtances might be produced of the epidemical ſmall-pox, occaſioned by inoculation, in various places.—There is another miſchief ariſing from the preſent practice. Perſons alarmed by the natural ſmall-pox in their neighbourhood, are ſometimes inoculated after they have caught the natural infection. Many ſuppoſed failures of ſucceſs from inoculation are probably to be attributed to this cauſe, ſo that an unjuſt imputation falls upon this moſt ſalutary diſcovery.

IT may poſſibly be objected to general inoculation, that young infants muſt become the ſubjects of the operation, at a time of life when they are moſt liable to other fatal diſeaſes, and that the deaths occaſioned by other cauſes may be attributed to inoculation. This dangerous period reaches at leaſt to two years old. But in the epidemic of 1777, of thoſe to whom it was fatal, 63, nearly one half, were under two years old. The mortality of

the

the diſtemper in early infancy is confirmed by many other facts in this and other places. Hence it is evident that inoculation muſt be general in order to be moſt uſeful to the community. Indeed whenever young infants can conveniently be taken out of town, or otherwiſe certainly preſerved from infection, it may be adviſeable to defer their inoculation till the next general period.

IT will not be deemed unneceſſary to take notice of a groundleſs prejudice on this ſubject—that the ſmall pox by inoculation does not certainly exempt a perſon from the natural ſmall-pox. This diſeaſe has ſome ſymptoms common to others, and ſome peculiar to itſelf. Tho' no diſorder of the human body is generally more diſtinguiſhable from all others than the ſmall-pox, yet in ſome rare inſtances, both from the natural infection and inoculation, doubtful caſes occur, where the patient has only the common and not the peculiar ſymptoms. In a very few of theſe doubtful caſes, the ſmall pox has ſucceeded, otherwiſe they would not have been doubtful. But, in Britain, for 56 years, during which inoculation has been practiſed, not a *ſingle* example

ample has been produced where the diſeaſe was firſt *undoubtedly* had by inoculation, and afterwards by the natural infection. The plain inference from this obſervation is, that in doubtful caſes followed by the ſmall-pox, the former ſymptoms had been occaſioned by a different diſeaſe.

ANOTHER opinion concerning inoculation may require a few remarks. A prejudice too generally prevails that the matter taken from a ſmall-pox patient, for the purpoſe of inoculation, conveys not only this diſeaſe but others with which the patient is afflicted. If there were any foundation for this notion, it would afford the ſtrongeſt argument in favour of inoculation that could be produced. The natural ſmall-pox is alſo generated by matter that comes from the body of a ſmall-pox patient, and if it alſo convey all the other diſeaſes of the patient whence it comes, it is ſurely of the greateſt importance that the infectious perſon ſhould be determined on by choice, and not, as at preſent, by accident. It would be in vain to attempt particularly to refute every abſurd notion that prejudice has propagated on this ſubject. Every kind of

ailment, for many years after inoculation, is moſt prepoſterouſly attributed to this cauſe, as if it were expected to exempt the patient not only from the natural ſmall-pox, but every other diſeaſe. Some have imagined that even the ſcrofula has been propagated by inoculation, becauſe boils and other abſceſſes ſometimes follow both the natural and artificial ſmall-pox. But it is ſufficient to anſwer, what every medical practitioner muſt have obſerved, that the ſcrofula is not an infeſtious diſeaſe. However, on this ſubject, arguments will be leſs convincing than authorities; and, fortunately, one of the moſt reſpectable can be produced.

THE *learned delegates of the faculty of Medicine at Paris, appointed to inquire into the advantages or diſadvantages from inoculation of the ſmall-pox*, ſent in 1764, ſome queſtions on this important ſubject, to the elder Dr. Alexander Monro of Edinburgh. The teſtimony of this gentleman, near the cloſe of a long and illuſtrious life, muſt be of the greateſt weight both on account of his eminent ſkill in medicine, anatomy, and ſurgery, and the improbability that he could then be influenced

by

by any intereſted motives. But not contented with giving his own opinion, he ſent theſe queſtions to moſt of the medical practitioners in Scotland, being connected with them as their teacher in various branches of phyſic. His anſwers therefore are drawn from the united teſtimony of nearly the whole kingdom—from obſervations on 5554, caſes, by 90 phyſicians and ſurgeons, beſides thoſe of Edinburgh.

" *Q.* Do you know that other diſeaſes have been ingrafted with the ſmall-pox by inoculation?

" *A.* I never ſaw other diſeaſes communicated by inoculation; and my correſpondents agree with me in this negative.

" *Q.* Whether did other diſeaſes happen more frequently or ſeldomer after inoculation than after the natural ſmall-pox?

A. My correſpondents ſeem all to agree that there are not near ſo numerous or various bad conſequences after inoculation, as after the ſmall-pox by natural infection; and

when I aſſure you that I have been ſo fortunate, or perhaps timorouſly cautious, that not one of thoſe whoſe inoculation I adviſed, had a dangerous ſymptom during the diſeaſe, nor a bad conſequence from it, you will conclude that I muſt be of the ſame opinion with them."

INDEED the prejudice, even of the common people, againſt this ſalutary art, appears to be greatly abated by their ſeeing ſuch numerous examples of its wonderful ſucceſs. For whole villages in this neighbourhood, and many other parts of Britain, have been inoculated with one conſent. And it cannot be ſuppoſed that the inhabitants of towns are more ignorant or more obſtinate. There is not a reaſonable doubt that our poor fellow-citizens would eagerly and univerſally embrace a propoſal to preſerve their children from death and deformity, if the intelligent and opulent would humanely exert their influence and aſſiſtance to carry it into execution.

1. A PROPOSED PLAN FOR A GENERAL INOCULATION.

Suppoſe,

1ſt. THAT 5 ſhillings, or for each poor patient, be allowed to the inoculator *.

2d. THAT 2 ſhillings, or be given to the parents who are moſt indigent, as a reward for nurſing each of their children, properly during inoculation. [Or, ſuppoſe 5 ſhillings be appointed as a reward for nurſing a ſingle child, and 2 ſhillings for each of the reſt *.]

3d. THAT a ſubſcriber of a GUINEA ſhall have the privilege of recommending three perſons to be inoculated with the rewards, or

* The medical members of the ſociety unanimouſly declined to accept any pecuniary recompenſe for inoculating their poor fellow-citizens. And the reward for nurſing, after the firſt general inoculation, was thought improper. So that all the contributions of the eſtabliſhment are now expended in preſerving the town from the infection of the natural ſmall-pox.

four

four that do not require them; and ſo in proportion for any larger ſum. That a ſubſcriber of HALF A GUINEA ſhall recommend one patient with the reward, or two without; of SEVEN SHILLINGS, one patient with the reward; of a CROWN, one without it. Whatever alteration is thought proper in the rewards, &c. the number of patients to be recommended by each ſubſcriber muſt accordingly be changed.

4th. THAT a benefaction of TEN GUINEAS ſhall give the privilege for life of recommending the ſame number of patients as the annual ſubſcription of a guinea; and after the ſame rate for greater benefactions. Though this ſum, in ſo healthy a ſituation as Cheſter, be leſs than the calculated proportion, yet as ſuch benefactions, if ſufficiently numerous, might give a permanency to the eſtabliſhment, they would, on this account, more effectually promote the benevolent purpoſe of the inſtitution.

5th. THAT the Surgeons and Apothecaries of Cheſter, who are deſirous to aſſiſt in the execution of this charity, offer their ſervice

to

to the Society; that the ſubſcribers approve of thoſe who are known to have ſufficient ſkill and experience in inoculation. That the town be diſtributed into as many diſtricts as there are inoculators appointed, one of whom is to be allotted to each.

6th. THAT the Phyſicians attend gratis, whenever deſired by the inoculators.

7th. THAT a general inoculation may be performed every ſecond year, or perhaps at longer periods, taking care, in the interval, to prevent the natural ſmall-pox from ſpreading infection among the young generation.

8th. THAT the independent citizens, who do not want the aſſiſtance of this charity, be earneſtly requeſted to defer inoculation till the general period; and that the medical practitioners be deſired to uſe their influence for the ſame purpoſe: if circumſtances require this rule to be tranſgreſſed, to acquaint the Society, that they may take meaſures to prevent infection being propagated.

9th. THAT a contributor who does not reſide in Cheſter, ſhall have liberty to appoint a perſon to recommend patients in his name.

10th. THAT no innkeeper allow any perſon to be inoculated in his own houſe. This regulation is greatly for his own intereſt, as well as the public good. If it be ſtrictly obſerved, as it eaſily may, ſtrangers may paſs thro' the town during the time of general inoculation, without being expoſed to the danger of infection. At preſent, fear of the natural ſmall-pox prevents many of the neighbouring gentry and others from frequenting the place, greatly to the diſadvantage of the inns, as well as all the trading part of the town.

II. PROPOSED REGULATIONS FOR PREVENTING, AS MUCH AS POSSIBLE, THE PROPAGATION OF THE NATURAL SMALL-POX.

Suppoſe,

1ſt. THAT in the interval between the periods of inoculation, an exact account be kept of the name, ſtreet, and time when each family begins and ceaſes to be infected by the natural ſmall-pox. That in order to obtain the earlieſt information on this ſubject, a ſmall reward (as half a crown, or a ſhilling, or) be offered to the parents, or any other perſon, who firſt gives notice to the ſociety, that a freſh family is infected.

2d. THAT a promiſſory note of be given by the ſociety to the parents of the infected family, payable a month after the ſmall-pox has ceaſed in that family, on condition that they had practiſed faithfully the proper methods of preſerving their neighbours and acquaintance from infection, in which they ſhall be fully inſtructed. The reward

might be doubled, if their endeavours were ſucceſsful, which would always be the caſe, if the methods were ſtrictly obſerved. This diſeaſe is communicated by infectious perſons, clothes, &c. and the poiſon might certainly be deſtroyed by cleanlineſs, and other eaſy methods of purification. The ſmall additional expence of theſe rewards would probably be ſupplied by the ſurplus of the inoculating fund, as every ſubſcriber would ſcarcely recommend his full number of patients. But if there ſhould be any deficiency to ſupport theſe regulations, one Charity Aſſembly would ſupply a fund of rewards for many years, if it produced no larger a ſum than is here contributed by that method, once at leaſt every winter, to relieve a ſingle diſtreſſed family.

As perhaps there never was an attempt to keep ſo large a town as Cheſter free from the natural ſmall-pox, it might be apprehended, that the propoſed method of preſervation would be impracticable. The regulations, therefore, judged ſufficient for this important purpoſe, if *exactly* obſerved, are ſubmitted to the public conſideration. As they are neither

difficult

difficult nor expenſive, it is hoped that the well-diſpoſed will obſerve them from motives of humanity, and others, under proper inſpection, from motives of profit.

[The RULES OF PREVENTION, which are printed in the INQUIRY, p. 118, were inſerted here.]

N. B. ALL objections or improvements that relate to any part of this propoſal, are requeſted to be freely communicated to the public meeting.

No. IV.

FORMS OF CERTIFICATES.

1. I certify that No. is intitled to no reward; as I have ſeen this family tranſgreſs the *Rules of Prevention*, or received authentic Information of ſuch tranſgreſſion, during the time they were ill of the ſmall-pox, particularly in the following inſtances, namely,

Inſpector.

Dated

2. I certify that I have frequently viſited the family of No. during the time they were ill of the ſmall-pox, and that I never diſcovered, or heard, that they tranſgreſſed the *Rules of Prevention* in a ſingle inſtance. But there has probably been ſome unobſerved tranſgreſſion of the rules; as children of their neighbours, or acquaintance, have been attacked by the ſmall-pox, either during the time it was in the ſaid family, or within 16 Days after it had ceaſed therein, on the of But as of their neighbours remain uninfected, is conſequently intitled to *half a crown* reward.

Inſpector.

Dated

3. I certify that the family of No. have faithfully obſerved the *Rules of Prevention*; and that none of their neighbours or acquaintance has been ſeized with the ſmall-pox, either during the time it was in this family, or for 16 Days after the laſt ſcab had dropt off; which happened

pened on the of tho'
children liable to the diſtemper live within
doors of the ſaid family.
is conſequently intitled to the full reward of *five ſhillings.*

Inſpector.

Dated.

4. I certify that the family of
No have faithfully obſerved the *Rules of Prevention*; and that none of their neighbours or acquaintance has been ſeized with the ſmall-pox, either during the time it was in this family, or for 16 Days after the laſt ſcab had dropt off; which happened on the of tho' children liable to the diſtemper live within Doors of the ſaid family. is conſequently intitled to the thanks *of the Society, as will accept no pecuniary reward.*

Inſpector *.

Dated

* The *Certificate* is an improved method of tranſacting this buſineſs; and may ſuggeſt a farther improvement. The xith column of the *Regiſter*, p. 122 of the INQUIRY, may give the "*Date and kind of Certificate.*" which will be uſeful information.

No.

No. V.

[GENERAL CERTIFICATE, 4th November, 1778. See the INQUIRY, p. 123.]

No. VI.

PARAGRAPHS from the CHESTER NEWS-PAPERS.

1. WE have had authentic information that Elizabeth Bryly (a poor woman in Sty-lane, Handbridge) received the reward of TEN SHILLINGS, on Thurſday the 9th of this inſt. April, 1778, from *the Society for promoting General Inoculation, at ſtated periods, and preventing the natural Small-Pox in Cheſter*; becauſe ſhe had faithfully and *ſucceſsfully* followed their directions. Twelve weeks ago two of her children were attacked by this dreadful diſtemper, and of ſo malignant a kind that one of them died; yet, excepting a boy who had been in the ſick chamber before the directions were given, not a ſingle child has caught the diſeaſe, tho' two were liable to it even at the next door, and not fewer than 26 in the near neighbourhood. Although this event happened before the Society was eſtabliſhed, yet the poor woman

was

was thought to deſerve the reward, becauſe, by following *their* rules of prevention, ſhe had given a ſeaſonable check to the diſtemper, which had not been in this part of the lane, nor generally epidemical in Handbridge, for three years, ſo that had it ſpread from her children it might probably have ſoon deſtroyed great numbers in this quarter of the town.---We are informed that the future meetings of the Society will be held at the Infirmary every Tueſday morning, immediately after the buſineſs of the Houſe is tranſacted; and that Mr. Owen, of the Infirmary, will receive contributions to the charity from any who are deſirous to keep the town free from the natural Small-Pox, and to ſave the lives of their fellow citizens by inoculation. He is authoriſed to give a *reward* to any perſon who firſt communicates information that a freſh family in Cheſter is infected by the Small Pox.

2. AT a general meeting of the SMALL-POX Society, held the 9th of Nov. 1779, at the Infirmary, it appeared, from the Report of their Inſpector, that ſince Nov. 4, 1778, the diſtemper had been ſtopt, by the regu-

lations

lations of the Society, in 37 different places of Cheſter, that in 32 of theſe it had been ſtopt without infecting a ſecond family, and in three, out of the remaining five places, after infecting a ſecond family only, in the neighbourhood: that from want of early information and other irregularities, it had ſpread more generally in Boughton than any other part of the town; the number at preſent ill of the diſtemper in that quarter being ſeven, in all others eight. It appeared to the Society very practicable to prevent the Small-Pox from ſpreading in Cheſter, if *aided* and *aſſiſted* by their fellow citizens. The chief miſchief has ariſen for want of early intelligence. If the benevolent and humane would give *immediate* information to the Inſpector, Mr. Owens, as ſoon as a freſh family is known to be attacked by the Small-Pox, they would not only ſave much expence to the charity, but the lives of many inhabitants. A Committee was appointed to meet the firſt Tueſday of every month, to extinguiſh the contagion, by diſtributing rewards, and executing other regulations for that purpoſe.

The

THE *thanks* of the Society for obſerving their *Rules of Prevention*, without any pecuniary reward, were given to Dr. Denton, Mr. Harriſon, Mr. Ridgway, Mr. Walker, Mr. Ratcliffe, Mr. Pratchitt, Mr. Palin, Mr. Buſhel, Mr. Whittell, Mr. Bennion, Mr. Backarn, and particularly to Mr. Bramwell for directing ſuch regulations to be faithfully executed as prevented the Small-pox from ſpreading thro' the Workhouſe, tho' ſeveral had been infected there before the diſtemper was diſcovered.

Dec. 7, 1779.

3. AT the monthly meeting of the ſmall-pox Society, on the 7th inſtant, it appeared, from the Inſpector's report, that the number of ſmall-pox patients in this city had this month decreaſed from 15 to 7, of whom three are ſtrangers; and that the contagion had been extinguiſhed, during the laſt month, in four different places of the city. On this occaſion, ſeveral received the rewards of the Society for preventing the diſtemper from ſpreading, who had many next-door neigh-

bours liable to the ſmall-pox, and yet not one of them caught the infection.

No. VII.

To Member of the

SMALL-POX SOCIETY.

THE Small-pox Society has been eſtabliſhed near two years. During this time, the diſtemper has been frequently brought into Cheſter from the neighbouring towns and villages, appearing in different parts of the city, ſo that no perſon, liable to be infected, could have walked with ſafety on our walls or in our rows. The regulations of the Society have prevented the danger of catching the Small-pox, not only in theſe places of public reſort, but have, in numerous inſtances, ſtopt its progreſs among the pooreſt claſs of our inhabitants, who were ſurrounded, even at the next door, by children liable to the diſtemper. The money expended in rewards, beſides the purpoſe of checking the fatal ravages of the natural Small-pox, has alſo afforded a moſt ſeaſonable relief to many diſtreſſed families, whoſe poverty and wretchedneſs

edneſs were greatly aggravated by the viſitation of ſuch a peſtilence. You have the ſatisfaction to reflect, that, under providence, your bounty has been the means of ſaving the lives of many children, who would otherwiſe have periſhed by this deſtructive diſtemper.

INOCULATION, at proper intervals, was from the firſt made a part of the benevolent inſtitution; ſince, as the ſmall-pox continued to prevail unchecked through the reſt of the kingdom, there would obviouſly be little advantage in ſecuring the inhabitants of Cheſter from a diſeaſe while young, which they would inevitably catch as ſoon as they were old enough to have any intercourſe with their neighbours. It is now judged expedient to propoſe general inoculation, in order effectually to preſerve the young generation hitherto ſpared from the natural ſmall-pox. That the attempt can do no harm there is the cleareſt evidence to prove. It appeared from authentic facts * laid before the GENERAL MEETING, that previous to the eſtab-

* See the PROPOSAL, p. 155.

liſhment of the Society, the ſmall-pox prevailed ſo generally in Cheſter, and ſo nearly did all the miſchief it was capable of producing, that if only nine patients were to be inoculated annually by this inſtitution, it would counterbalance all the poſſible injury that could be effected by more extenſively ſpreading the contagion. On the other hand, the advantages to be gained by ſuppreſſing the natural and communicating the inoculated ſmall-pox, are the greateſt that human art can beſtow, in reſpect to the preſervation of life. And as the good to be derived from this charity will be exactly in proportion as it is generally accepted, we earneſtly intreat you to diſperſe by a ſervant the incloſed *Addreſs to the inhabitants of Cheſter*, and to explain to your ignorant and indigent neighbours and dependents the benevolent purpoſe of the Society, and to exert all your influence over them, not to neglect the offered bleſſing. You are authoriſed by the unanimous reſolution of the general meeting, to recommend as many patients as you judge proper. If you ſhould be abſent from Cheſter at the time of general inoculation, we requeſt that you would immediately appoint ſome reſident

citizen

citizen to recommend patients in your name. If any ſhould perſiſt in rejecting the good intended them, warn them, in ſtrong terms, of the danger and criminality of wantonly catching infection from inoculated patients: indeed the moſt ſolicitous care will be taken that *theſe* ſhall not ſpread the diſtemper, unleſs their uninoculated neighbours ſhall be guilty of the moſt willful and blameable negligence.

AFTER mature deliberation, it has been judged neceſſary to give *rewards* to the moſt indigent parents, in order to allow them the means of ſubſiſtence while nurſing their children under inoculation, and to ſecure their ſtrict attention to all medical directions. Many of our fellow citizens earn their daily bread by their daily labour. We truſt that none will be recommended for the *rewards* but ſuch as are proper objects of the charity. The money which has been ſo generouſly and humanely beſtowed, it is hoped will be prudently and judiciouſly expended.

By order of the general meeting,

THOMAS FALCONER, Chairman.

Cheſter, Feb. 11, 1780.

No.

No. VIII.

ADDRESS to the INHABITANTS of CHESTER.

MANY of your fellow-citizens are deeply affected with compaſſion at the dreadful deſtruction made on great numbers of the poor children in this city, by the natural ſmall-pox, while the lives of their own families and relations are preſerved by inoculation. This ſalutary art has been practiſed in England near 60 years with the happieſt ſucceſs; and few, who can afford the expence, now neglect this method of preſerving their offspring. And as it is to be ſuppoſed that a poor man's children are as dear to him as a rich man's there can be little doubt, that, if he had the ſame ability, he would uſe the ſame means to ſave their lives. What we deem the kindeſt office in our power to beſtow on our dear eſt connections, we now offer to all the citizens of Cheſter, who need our aſſiſtance, free and general inoculation, at your *own houſes*, and under your own care. Neglect not this humane propoſal. If you loſe the preſent

preſent opportunity, another will probably never be offered.

You know that all the poor children in Cheſter are expoſed to this infection in early infancy. Your choice can only be, whether to give it a few months ſooner or later, whether to give a mild and ſafe diſeaſe by inoculation, or a moſt loathſome and dangerous illneſs by the natural infection; whether to have a ſick family for a few days or hours only, or for many weeks. You are farther to conſider, that it is not merely the *lives* of your children which have a better chance of being ſaved by inoculation; but that thoſe dreadful conſequences ſo frequently following the natural ſmall-pox, ſuch as blindneſs, lameneſs, and the like, which cauſe the unhappy ſufferers to remain, for life, a burden to their parents or friends, are almoſt entirely unknown in the inoculated ſmall-pox.

SHOULD any of you, however, refuſe the benefit now offered, we warn you to avoid the danger of catching the infection from inoculated patients, which may be done by obſerving the following eaſy directions:

ſuffer

ſuffer none of your family to enter an infectious houſe, nor allow any perſon or thing from an infectious houſe to approach near to thoſe of your family who are liable to the diſtemper.

IT were to be wiſhed, that as many of the independent citizens as could make it convenient, would take this opportunity of inoculating their children, for their own ſake, as well as example to the reſt. Tho' they will run little or no riſk of catching the infection from inoculated patients, yet they are now in great danger from the natural ſmall-pox, which, in ſpite of every effort of the ſociety, is at preſent prevailing in ſeveral parts of the town. This miſchief we believe, was chiefly occaſioned by ſoldiers in the diſtemper, who *avowedly diſobeyed* all rules. They have propagated the contagion in ſo many quarters, that it will be difficult, if not impoſſible, for a ſingle inſpector to *ſee* that our own citizens obſerve the regulations of the ſociety, which many of them have formerly done with ſuch commendable exactneſs. To theſe cauſes it muſt be attributed, that ſeveral perſons of higher rank, of late, have been unfortunately attacked by the natural ſmall-pox, and more melancholy

melancholy accidents of this kind, we have too much reaſon to apprehend. Tho' the natural ſmall-pox, that at preſent prevails in Cheſter, is remarkably malignant and fatal, yet it by no means follows that the inoculated will be ſo. General inoculations have often been moſt ſucceſsfully executed at the very time when the natural diſtemper has been moſt deſtructive.

WE have reflected that ſeveral of our fellow-citizens may be in ſuch a ſituation that they cannot conveniently ſpare time, from the employment on which the ſubſiſtence of their family depends, to nurſe their children during inoculation. The greateſt objects of compaſſion might hence be unable to enjoy the benefit intended by this bounty. To perſons in ſuch circumſtances we offer the following *rewards*, on condition that they exactly obſerve the rules that are judged neceſſary both for the welfare of their own family, and to prevent the diſtemper from being communicated to others.

IF then you have a proper regard for the health and lives of your children, and have a

due ſenſe of your own duty and intereſt, you will not ſuffer yourſelves to be ſwayed by any idle and groundleſs prejudice againſt inoculation; but will, with one mind, thankfully accept the bleſſing now offered by the goodneſs of providence, and the kindneſs—the free and bounteous kindneſs, of your fellow-citizens.

By order of the general meeting,

Cheſter, Feb. 11, 1780.

T. FALCONER, chairman.

REWARDS.

ſhillings.		children in a houſe.
5, 7, 8, 9, 10	for	1, 2, 3, 4, 5, *&c.*

[A catalogue of 149 members of the ſmall-pox ſociety were inſerted, beſides the]

MEDICAL MEMBERS:

Dr. Denton.
Dr. Haygarth.
Dr. Currie.
Mr. Morrall.
Meſſ. Crewe and Harriſon.
Meſſ. Brodhurſt and Williamſon.

Meſſ.

Meſſ. Johnſon and Owens.
Mr. Sandbach.
Mr. Freeman.

No. IX.

REPORT OF THE SMALL-POX SOCIETY, CHESTER.

General Meeting, March 27, 1781.

WE judge it neceſſary to acquaint our fellow-citizens with our proceedings, ſince the General Meeting of Feb. 11th, 1780.

IN deference to the opinion of ſome reſpectable perſons, an attempt was made, laſt Spring, to inoculate our poor people in an hoſpital. A commodious houſe, in a convenient ſituation, was fixed on for the purpoſe. After a week ſpent in inquiries for patients, by all the inoculators, not a ſingle perſon could be found in Cheſter, who would enter an hoſpital for the ſake of inoculation. The ſociety then inoculated eighty-five children, each at their own houſes. The moſt ſolicitous care was taken, for a fortnight before inoculation, to preſerve theſe patients from the natural contagion, every where diſperſed among them, and, after they became infectious, to prevent their communicating it to

others. They all recovered. Indeed not one of the whole number had a dangerous complaint during, or in conſequence of, the diſeaſe, though the natural ſmall-pox, at that very time, was remarkably fatal in the town. It is reaſonable to expect that ſuch ſucceſs will render inoculation generally deſired, at a future period. Inoculation did not, as ſome might apprehend, ſpread the contagion, but appeared to produce a quite contrary effect. For in the diſtricts, where moſt patients were inoculated, there remained the feweſt in the natural ſmall-pox; and, in the diſtricts where the ſmalleſt number were inoculated, the diſtemper was afterwards moſt general. We believe that only two were infected by inoculated patients; one of them was concealed from the inoculator, in the ſame houſe with a patient; the other had free intercourſe with the infectious, being ſuppoſed to have before had the natural ſmall-pox.

IT may be proper to explain why the natural ſmall-pox ſpread ſo generally through the town in February, March and April, 1780. The contagion was manifeſtly propagated by a new-raiſed regiment of ſoldiers, who were under no controul, being without their ſurgeon,

geon, and ſcarcely under the command of their officers, who did not receive commiſſions till their departure from Cheſter. One of theſe ſoldiers, walking about the town, with the ſmall-pox upon him, in the moſt infectious ſtage of the diſtemper, was deſired by our inſpector to take care that he did no miſchief by ſpreading it. His anſwer explained the conduct of them all; "nobody takes care of me, and I will take care of nobody." Many of theſe ſoldiers had the ſmall-pox, and ſpread the diſtemper in every part of the city; the patients were ſo numerous and ſo widely diſperſed, that a ſingle inſpector could not poſſibly ſee that the rules were obſerved. On this conſideration, the regulations were ſuſpended for ſome months. In future, the moſt attentive care of the ſociety will be exerted to guard againſt the return of ſuch a calamity.

THE regulations for preventing the natural ſmall-pox, were again eſtabliſhed on the firſt Tueſday in May. The town was then divided into ſix diſtricts, each under the care of an inſpector. During that month, the diſtemper was in Foreſt ſtreet, St. Olive's lane,

Goſs

Goſs lane, Parſons lane, Crane ſtreet, Britain's entry, Nun's lane, Handbridge, Bridge ſtreet, and Northgate ſtreet. It was in twenty-five families; and in five out of the ſix diſtricts. It appears, from the reports of the cenſors to the committee, that in all theſe places, except one, the contagion was totally extinguiſhed on the 17th of June: That, in this diſtrict, the diſtemper was only checked, through the imperfect execution of the regulations, but not ſtopt, till the 9th of December, and till theſe irregularities (well known to the committee) were corrected: That, during this period, the ſmall-pox appeared in two diſtant parts of the town, but the contagion was ſtopt in both places without infecting a ſecond patient: That, ſince the above-recited perfect extinction of the contagion, it has been brought into Cheſter, twice from Liverpool, and once from Coventry: That the *rules of prevention*, in two inſtances (* E. Williams' Crook lane, and Martha Billingham's, Cow lane) have preſerved from the contagion, *two* perſons, never infected, in the *ſame houſe*, and,

* In this inſtance, the inſpector had miſtaken ſome other eruption for the ſmall-pox; as Williams' child had afterwards this diſtemper.

in

in another inſtance (John Rawdon's, Hand bridge) *three* perſons, never infected, in the *ſame family*, with a patient in the natural ſmall-pox, during the whole diſeaſe. Such numerous examples have occurred to the ſociety of preventing infection being communicated to perſons liable to it, in the cloſely adjoining houſes, that it would be tedious to mention them; and indeed muſt be thought ſuperfluous, after the more difficult and more doubtful point has been aſcertained, that they may be preſerved while dwelling in the ſame houſe, and the ſame family.

AT preſent, there is not a ſingle patient in the natural ſmall-pox, in Cheſter.

FROM theſe *facts*, of which any perſon who entertains a doubt may eaſily be ſatisfied, it appears evident to the ſociety, that their regulations to prevent the progreſs of the ſmall-pox will be ſucceſsful as far as they are executed. They add, with great ſatisfaction, that no citizen has tranſgreſſed the rules in a ſingle inſtance, except through inadvertency, and no ſtranger, except the ſoldiers above-mentioned.

THE

THE ſociety return thanks to Mrs. Smith of Parſon's lane, Mrs. Bennett, of Crane ſtreet, and Mrs. Cook of Goſs lane, for their gratuitous obſervance of the rules of prevention.

THOUGH the contagion is now ſo perfectly extinguiſhed in this city, yet danger every where ſurrounds us. We are credibly informed that the natural ſmall-pox did very lately, and probably does at preſent, rage with deſtructive violence in Liverpool, Mancheſter, Shrewſbury, and many other towns and villages in our neighbourhood, even ſo near as Boughton, where it has lately attacked one child; ſo that we cannot hope to preſerve the inhabitants of Cheſter from this fatal malady without the ſteady attention and conſtant charge of the ſociety.

THE committee expend with ſtrict œconomy the money intruſted to their care. They hope to deſerve the approbation of every ſubſcriber and beneſactor, and of others of their charitable fellow citizens, who only with-hold their bounty till they are convinced that this humane inſtitution will anſwer the ends for which

which it was eſtabliſhed. The tranſactions above faithfully related, it is hoped, will help to produce ſuch conviction. The money already ſubſcribed is conſiderably leſs than will be required. The ſociety, however, have no apprehenſion, that, in Cheſter, there will ever be a deficiency of charitable aid for ſuch a humane purpoſe as ſecuring our fellow citizens from ſo loathſome and ſo fatal a diſeaſe as the natural ſmall-pox.

By order of the general meeting.

THO. FALCONER, Chairman.

No. X.

ADDRESS TO THE INHABITANTS OF CHESTER.

Cheſter, Jan. 29, 1782.

UNFORTUNATELY, the ſmall-pox, and of a very mortal kind, at preſent prevails in ſeveral parts of this city. Two years ago, when this diſtemper raged fatally among us, a general inoculation was propoſed by the ſmall pox ſociety. *All* who accepted this benevolent propoſal, though ſome under one month old, paſſed through the diſeaſe, in the moſt favourable manner: an event ſo recent and ſo well known in this place, ought to produce general conviction of its ſafety.

WE hear, with great ſatisfaction, that there has lately been 416 patients inoculated at Liverpool, of whom only one died.

A FREE inoculation is again offered to ſuch of our fellow-citizens as may require our aid, to ſave the lives of their offſpring from this fatal peſtilence; provided they bring a recommendation from any of the following members of the ſmall-pox ſociety, within the next enſuing ten Days; otherwiſe they muſt be excluded from the benefit now humanely intended for their preſervation.

[Catalogue of members.]

THE committee of the ſmall-pox ſociety think it their duty to acquaint their fellow-citizens, eſpecially the humane benefactors to this charity, that this dreadful diſtemper is now ſpreading in Cheſter; and that this calamity has manifeſtly proceeded from numerous tranſgreſſions of the regulations propoſed by the ſociety. The chief occaſion of this misfortune has been a want of early information after a family became infectious, ſo

that,

that, in many inſtances, the inſpectors had not received intelligence of the diſtemper, till two or three weeks after it had appeared in a family, and not till it was quite over in many other families; in the former caſe, much miſchief was done before the *Rules of Prevention* were delivered to them, and in the latter caſe, they received no *Rules* at all. This want of early intelligence, we are clearly convinced, has, in great meaſure, been occaſioned, by not giving the *Reward for Information*, ſo punctually and ſo promptly as ought to have been done, and by its not being generally known that ſuch reward might be obtained. Both theſe errors, the committee have taken meaſures to correct, and in a manner that they truſt will be effectual.

THOUGH we lament, moſt ſincerely, that theſe irregularities have diſperſed this deſtructive contagion in many parts of the town, yet they ſhew, in the cleareſt light, the great utility of our preventive meaſures. During the experience of near four years, *not a ſingle fact has occurred* to prove that the regulations of the ſociety have been inſufficient to prevent the diſtemper from ſpreading, when per-

fectly executed; nor that any of them are impracticable.

THE ſeveral obſervations here advanced, are founded upon facts which were particularly ſtated at the committee held this day, where moſt of the medical, and many other members were preſent, to their unanimous ſatisfaction.

THE inoculators as well as the inſpectors, will now unite their moſt aſſiduous attention to prevent, as far as poſſible, the infection from ſpreading, before the general inoculation, leſt their inoculated patients might previouſly have received the natural diſtemper, and unmerited blame fall upon this ſalutary art. There muſt be ſome riſk of this kind, at the time of a ſpreading contagion, but we rely on the candour and diſcernment of our fellow citizens to attribute ſuch failure of ſucceſs, if any ſhould happen, to the true cauſe.

THOMAS FALCONER,
chairman.

No. XI.

REPORT of the SMALL-POX SOCIETY at CHESTER.

General Meeting, Sept. 17, 1782.

THIS inſtitution having exiſted four years in March laſt, and there having been two general inoculations, we ſhall review the principal facts that have occurred to our obſervation.

LAST ſpring, 128 poor children were inoculated by the members of the Small-pox ſociety; theſe, added to the 85 inoculated in the ſpring of 1780, make the whole number 213; during the laſt four years, 203 private patients have been inoculated: in all four hundred and ſixteen. Two infants have died after inoculation, tho' there are doubts, in both caſes, whether in conſequence of that operation: there was reaſon to ſuſpect that one of the patients had previouſly received the natural infection, and the death of the other might not improbably be attributed to a diſorder of the bowels. Hence its degree of mortality in Cheſter, ſince the ſociety was eſtabliſhed,

eſtabliſhed, if both the deaths above-mention were occaſioned by inoculation, has been only one in 208. The dreadful fatality of the natural Small pox is ſo well known, that it ſeems impoſſible to account for the reluctance which the common people ſtill have to partake the benefit of this ſalutary art.

WE will next ſtate the difficulty and the ſucceſs of our endeavours to prevent the progreſs of the natural Small-pox. The ſame people who refuſed inoculation, and they are a large proportion of the inhabitants, are fearleſs or rather deſirous that their children ſhould be infected with the natural ſmall-pox. It is with concern we remark, that in one part of the town (Croſs-gun entry, Foreſt-ſtreet) the Inhabitants, diſregarding the inſpector's exhortations, have purpoſely propagated the diſtemper, carrying the poiſon, and even the patients, from one houſe to another, without reſerve. In conſequence of this conduct, it ſpread thro' 15 families, infecting all in this entry liable to it, and proved fatal to ſeveral. In another quarter, the poor people allowed their children to have an unreſerved intercourſe with the in-

fectious.

fectious. This irregularity in part proceeded from their ignorance that ſome money might be obtained by obſerving the rules. The hope of procuring the reward has had ſome influence on their conduct, and the infection is nearly extinguiſhed, though many of their neighbours are liable to receive it. Theſe two inſtances of irregularity, though very unfortunate, yet, when contraſted with the numerous facts where the progreſs of the diſtemper was ſtopt by obſerving the rules, afford the cleareſt proof how uſeful the preventive regulations might become if properly obſerved.

HOWEVER wonderful it may ſeem, we believe, in ſeveral other caſes, that the parents who rejected the propoſal of inoculating their children, purpoſely expoſed them to catch the natural infection. Though ſome of our fellow-citizens are ſo careleſs in diſperſing the deadly poiſon of the Small-pox, yet they would regard with horror any perſon who ſhould purpoſely adminiſter arſenic or any other deadly poiſon to innocent infants.

THEIR

THEIR conduct clearly proceeds from a popular deluſion, which it is our duty to correct and oppoſe. It is manifeſt that many lives may be ſaved by the preventive regulations of the ſociety, and yet the moſt prejudiced eye cannot diſcern or ſuſpect that they can be productive of the leaſt poſſible miſchief. Such unaccountable infatuation will ſurely not always prevail. As, in their ſituation, the Small-pox is clearly unavoidable either by the natural or artificial infection, we may hope that reaſon and the example of their more intelligent neighbours, will, ere long, teach them to prefer inoculation, which is more than 20 times leſs dangerous, and occaſions leſs than a 20th part of the pain and miſery. If theſe hopes be well founded (and they are founded on a very general principle in human nature, parental affection) the chief difficulty with which this ſociety has contended, will proportionably diminiſh.

SOON after the ſociety was eſtabliſhed, the natural diſtemper began to ſpread ſo quickly in Handbridge, thro' the irregularity of the inhabitants

inhabitants in this remote part of the town, and our funds were at that time ſo low, as to cauſe an apprehenſion that the rewards of prevention might become too expenſive; on theſe conſiderations, the regulations were ſuſpended in that quarter for ſome months; during the *ſuſpenſion*, 16 died of the natural Small-pox in this pariſh; and in the ſpring of 1780, the diſtemper was ſpread ſo widely by ſoldiers, as explained in the laſt report, as to occaſion a *general ſuſpenſion* of the regulations for ſome months; during this time, the deaths by the natural diſtemper amounted to 58. Taking the whole period of four years, ending March 30, 1782, the Small-pox has been fatal to 139, or 35 annually. If we deduct the above-mentioned 16 and 58, who died during the interval when the regulations were not executed, the total deaths would be only 55, or 14 annually; whereas the annual average of deaths by this diſtemper for ſix years previous to the eſtabliſhment of this ſociety, was 63. Hence its fatality has been actually reduced to near *one half*; and, if we may deduct the numbers who died during the two periods, when the regulations were ſuſpended, to near one *fifth*.

This degree of ſucceſs will appear wonderful to any one who impartially conſiders how diſadvantageous the prejudices above deſcribed muſt prove to our proceedings, as they ſo generally and ſo conſtantly counteract the endeavours of the ſociety to prevent the contagion from ſpreading: the fatality of this diſtemper may be reduced to near a *twentieth* part, that is, from 63 to 3, if all the inhabitants and their neighbours anxiouſly united their endeavours to avoid the natural, and to obtain the inoculated Small-pox.

The inſpectors were particularly inſtructed to obſerve whether the natural Small pox was received from inoculated patients. On the moſt careful inquiry, one private and one or two public patients appeared to have communicated the natural diſtemper; and, in all theſe inſtances, the perſons infected had unreſerved intercourſe with the infectious, without any wiſh to avoid them.

The thanks of the ſociety for obſerving the rules of prevention *gratis*, were given to Captain Sarſefield, Captain Briſcoe, Mr. Millington, Mr. Jones, Mr. Smith, Mr. Linney,

Mr.

Mr. Johnſon, Mr. Preſbury, Mr. Whittel, and Mr. Cowdroy.

SINCE the laſt report, the Small-pox has been extinguiſhed, where ſeveral in the neighbourhood were liable to infection, in a great many parts of this town.

DURING the year 1781, only eight perſons died of this diſtemper in Cheſter, of whom two were infected *in* Mancheſter, a third *in* Liverpool, and a child of the fourth *in* Coventry. Tho' the contagion has been ſo often extinguiſhed, yet it is again brought ſo frequently among us from the neighbouring towns and villages, that Cheſter has not been perfectly free more than a few weeks, ſince the ſociety was eſtabliſhed. The diſtemper has been, for ſome months, in various parts of the town: After a difficult and expenſive ſtruggle, the contagion is again nearly extinguiſhed. At preſent the Small-pox is only in *four* families in Cheſter. Conſidering what great numbers are liable and willing to catch the infection, this happy ſucceſs muſt be attributed to the attention and vigilance of the inſpectors.

THE medical members have unanimouſly declined to accept the offered gratuity for inoculating the poor patients; deeming the heart-felt ſatisfaction of preſerving the lives of their fellow-citizens a ſufficient recompence for their trouble.

ON mature conſideration, we have thought proper to aboliſh the rewards to the inoculated patients. At the firſt general inoculation, the meaſure appeared neceſſary to overcome inveterate prejudices; but it now ſeems to hold out an improper motive, which would have a pernicious influence. It is regarded by many as a bribe to do what they think wrong. To have the children of our poor neighbours preſerved, as far as in our power, from death and miſery, ſhould be the only, and is ſurely a ſufficient inducement for them to *accept* of *gratis* inoculation.

THE two principal expences of this eſtabliſhment are thus taken away. The chief charges which remain are the ſalaries of the inſpectors, and the rewards to infectious families for obſerving the rules of prevention.

The

The great attention and diligence of the inſpectors amply deſerve the ſalaries which they have obtained: Indeed their ſervices have been thought highly to merit other *honorary* rewards. The money for obſerving the rules is only given to the pooreſt families, and at a ſeaſon too when poverty is moſt diſtreſſing, on the viſitation of a moſt loathſome diſtemper. Independent of every other conſideration, the humane could not find more proper objects for their charitable relief. The fear of incurring greater expence than our funds can ſupply, has induced us to offer too ſmall rewards to infectious families. At preſent a perfect obſervance of the rules intitles the family to five ſhillings only: A greater reward would command more care and attention, and would, of conſequence, be more frequently ſucceſsful.

FOR this humane and beneficent purpoſe, we are ſorry to obſerve, that our fund is likely to become deficient, and are therefore under the neceſſity of again ſoliciting the charitable aid of our fellow citizens and other well-wiſhers to Cheſter. If the deficient ſum could be ſupplied by ſmall *ſubſcriptions* of a

crown,

crown, or *half-a-guinea* or a *guinea* annually, or by proportionable *benefactions* for life, or by ſmall *occaſional donations:* And if all the members of the ſociety would cordially unite their influence to prevent the natural contagion from ſpreading, we have reaſon to hope that our endeavours to check the ravages of this fatal diſtemper might be attended with much greater ſucceſs. On this occaſion, ſuch charitable aid would be particularly ſeaſonable; becauſe, if the regulations be now ſuſpended, and, without freſh contributions, our income may not be ſufficient, as appears from the annexed account, its deſtruction of the poor children would be dreadful. In many of the ſurrounding towns and villages, the Small-pox now generally and fatally prevails. It will be often brought among us, and freſh expence will frequently be incurred to ſtop its progreſs. As the greateſt miſchief has ariſen from a want of early notice, when the diſtemper appeared in a family, we earneſtly intreat the humane, whether a ſubſcriber to the charity or not, particularly all affectionate parents, who wiſh to preſerve their children from this mortal malady, to ſend immediate information to the inſpector

of

of the diſtrict, below named, as ſoon as they hear a freſh family is infected.

IT is with the ſincereſt ſatisfaction we obſerve, that our example has excited a like beneficent ſpirit toward the poor inhabitants of other large towns. In Leeds they had a general inoculation in the ſpring of 1781, and propoſed another in 1782; in Liverpool a general inoculation was ſucceſsfully executed in the autumn of 1781, and another in the ſpring of 1782, and they have reſolved on a general inoculation there *twice every* year. Such has been the ſucceſs that has attended theſe exertions at Cheſter, Leeds, and Liverpool, that the Royal College of Phyſicians at Edinburgh have appointed a committee to inquire into their mode of conducting the gratis inoculation of the poor, in order to diffuſe the benefit of this ſalutary art among all ranks in the metropolis, and probably other large towns of Scotland. And it may be reaſonably expected that the ſame benevolent diſpoſition which has promoted general inoculation in theſe places, will ere long be employed to check the progreſs of the natural diſtemper, an important object

which

which has principally engaged the attention of our ſociety ever ſince its eſtabliſhment.

Of all the children who died in Cheſter under ten years old, during the ſix years which preceded this inſtitution, a *full third part* died of the Small-pox. It is probably fatal to as great a proportion of the young generation in other large towns of Great-Britain. If, in the places above mentioned, their phyſicians, who are ſo highly and ſo juſtly celebrated for knowledge and humanity, would eſtabliſh regulations to prevent the propagation of this deadly peſtilence, our united example and influence might prove of great importance to our country and to mankind.

THOMAS FALCONER,
Chairman.

Receipts, - - 199 2 6
Diſburſements for 4 years, - 170 3 0
Inſpectors, Mr. Warrington, Mr. Meacock, Mr. Connah, Mr. Venables, Mr. Lightfoot, Mr. Jackſon.
General Inſpector, Mr. Owens.
Secretary, Mr. Wilkinſon.

CON-

CONCLUSION OF THE INQUIRY, addreſſed to the *Medical Reader*.

I Submit to your deliberate conſideration, as a queſtion which it is peculiarly your duty to determine, whether it is medically poſſible to prevent the Small-pox. A dark cloud of vulgar prejudices has long obſcured this ſubject. But all the miſchief appears to have originated from the two opinions particularly diſcuſſed in the INQUIRY; namely, 1ſt. "That clothes, &c. "are rendered infectious by variolous "miaſms;" and 2d. "That the at-"moſphere of the place in general is "contaminated, where the Small pox "is epidemical."

WHILE theſe opinions prevail, it muſt be deemed moſt abſurd to propoſe any human means to prevent the diſtemper.

I HAVE attempted to prove that no perſon will be ever attacked by the Small-pox, except after " infection by " *nearly* approaching a Small-pox pa- " tient, or the variolous poiſon in the " ſtate of ſerum pus or ſcab."

IF this propoſition be true, and, if the medical faculty, with the more intelligent part of mankind could be convinced of its truth, the chief difficulty would be vanquiſhed. If it were generally known that the Small-pox is produced by a peculiar poiſon, which might be certainly deſtroyed, and which could never do miſchief, except through careleſſneſs or malevolence, it would ſoon be thought as criminal, being infinitely more deſtructive, for a perſon to convey the variolous poiſon to thoſe who are liable to infection, as to mix arſenic with their food. On this foundation, I venture to ſuſpect that medi-

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cal errors have led mankind into the moſt pernicious *habits*. If this ſuſpicion be well founded, it is the duty of phyſicians to reconſider this important queſtion with due deliberation.

I SHALL ſhortly ſtate the evidence, which the experience of the Small-pox ſociety, during ſix years, has uniformly ſupplied, to refute theſe two opinions. Some explanation and apology may be required, by the medical reader, for the mode in which the PROCEEDINGS of the ſocicty are compoſed.

I WROTE them as a citizen of Cheſter, not as a phyſician; otherwiſe, the numerous facts which they contain, might have been applied, in a much more direct manner, to prove the doctrine maintained in the INQUIRY. In regard to the *truth* of the facts which they briefly ſtate, it ſhould be obſerved, that they are aſcertained with a great

degree of authenticity, by a committee conſiſting of all the medical, and many other intelligent members of the ſociety. The poor people, who claim rewards, come regularly before theſe gentlemen every month. The full reward is not to be obtained, except by thoſe who have preſerved *all* their neighbours, and acquaintance from the infection. Beſides a written certificate from their inſpector, they are examined in preſence of others, who have in ſome inſtances, tranſgreſſed the rules, and whoſe reward is conſequently diminiſhed: theſe would complain of injuſtice, if there were any pretence for complaint. In regard to the other facts related in the INQUIRY, I have generally quoted the authority of medical witneſſes in confirmation of my own teſtimony. Many of their names *(a)* are univerſally known, and highly reſpected by

(a) See the INQUIRY, p. 35, 36, 51, 107, 112, 113, 186, 187, 208, and the addendum, laſt page.

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the medical world; and the judgement and veracity of them all are acknowledged by their numerous acquaintance. Names and dates are always mentioned, ſo that, if any doubt ſhould ariſe, inquiry may ſtill be made, concerning ſuch recent events, whether the narrative be accurately true.

1. DURING the whole period of ſix years, the progreſs of the Small-pox has been carefully watched by the inſpectors, and the cauſe of infection inveſtigated with all poſſible diligence, and attention: but, not a ſingle fact has occurred to excite a ſuſpicion that variolous miaſms, adherring to clothes, had communicated the diſtemper. Yet, during the whole period, except a few weeks, all the medical practitioners occaſionally viſited ſmall-pox patients, and the inſpectors daily entered the infectious chambers: In the ſame clothes, without the leaſt reſerve, they approached

ed children liable to the infection, but, in no inſtance, were known or ſuſpected to have communicated the diſtemper. A body of ſuch evidence muſt remove every rational doubt.

2. The Small-pox ſociety have had proofs ſtill more numerous and poſitive, that the infectious atmoſphere, which ſurrounds the variolous poiſon, is limited within a ſmall circumference. The facts ſtated in the 97th, 104th, 107th and 125th pages of the Inquiry, exhibit the cleareſt and fulleſt evidence on this point; they eſtabliſh it ſo far beyond all controverſy, that I purpoſely omitted, in the future Proceedings of the Society, any other proof, as altogether ſuperfluous. But it may be proper to declare that the whole experience of the ſociety has uniformly confirmed this opinion. During the laſt ſix years, few weeks have elapſed, without ſupplying poſi-

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tive proofs that the infectious influence did not extend to the closely adjoining houses. Yet all medical readers may recollect numerous instances, in that period, when this distemper has prevailed, in other towns and villages, so as to become generally epidemical.

But on a point where the conclusion may lead to such important consequences, I am solicitous to he instructed by the united wisdom, and experience of my medical brethren. If the arguments of the Inquiry be erroneous, the *Queries* annexed to it seem well adapted to detect such errors. To these, I beg leave to solicit the particular attention of the medical reader. If you answer the 1st, 3d or 4th query in the affirmative; or the 2d and 5th query in the negative, I request an exact detail of every circumstance concerning the facts on which such an answer is founded.

THE whole tenour of the PROCEEDINGS of the Society, tho' conſtantly counteracted by the moſt pernicious prejudices, afford deciſive evidence in ſupport of the theory advanced in the INQUIRY, according to the teſt of a true theory ſagaciouſly and judiciouſly propoſed by the great Lord Bacon. "Inter ſigna, nullum magis certum "aut nobile eſt, quam quod ex fructi- "bus. Fructus enim et opera inventa, "pro veritate philoſopharum velut "ſponſores, vel fide juſſores ſunt *(b)*.

THE letter from Dr. Waterhouſe is curious and inſtructive. It is much more ſatisfactory to ſay, that the Small-pox has been exterminated, than that it might be exterminated, by civil regulations. However, I would not propoſe the proceedings of Rhode-Iſland as

(b) Novi Organi Lib. 1. §. 73.

by

an example for imitation. They ſeem to have been ſuggeſted by fear, not by reaſon, and a clear diſcernment of the danger. They have eſtabliſhed many unneceſſary reſtrictions, and difficulties. Among theſe, I would reckon the tremendous coffin, in which the patients were ſhut up alive; their tranſportation to a deſert iſland; boarding up the ſtreet; placing guards to keep paſſengers at a diſtance from the infectious houſe; and many other troubleſome and uſeleſs regulations. It is probable, that theſe unneceſſary difficulties, and the ſuppoſed peculiar advantages of a ſmall iſland ſo near the capital, Newport, may have been the cauſe why their method of exterminating the Small-pox has not been more generally imitated. Dr. Waterhouſe computes the inhabitants of Newport to be about 11,000. The reſt of the iſland is fully peopled. Beſides the principal Port, there are, I believe, two or three ferries, and thoſe

nearly adjoining the ſeveral large towns on the continent. It is the great thoroughfare between the northern and ſouthern Provinces. I have been informed, on good authority, that there are two roads, the whole length of the iſland, one for horſes, hilly and nearer, the other for carriages. Their connections with foreign countries is remarkably extenſive. Combine all theſe circumſtances together, and I doubt whether there be another iſland in the whole world, whoſe intercourſe with their neighbours and with diſtant countries is ſo general, and, conſequently, no iſland is ſo liable to receive the variolous poiſon from every quarter. The inhabitants of Britain are comparatively in retired and remote ſituations as to the danger of receiving foreign infection. Dr. Waterhouſe obſerves, that the Small-pox is more commonly brought from the neighbouring continent, than diſtant countries, that is,

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by the market people, and travellers that come by the ferries, than by ſhips arriving at their principal port. But Britain has no ſuch near communication with her neighbours, by ferries.

HOWEVER, this country is by no means prepared for ſuch a propoſal. To correct the pernicious errors, and habits that have univerſally pervaded the kingdom, no means could poſſibly prove ſo effectual as the eſtabliſhment of Small-pox ſocieties, to ſtop the ravages of this dreadful peſtilence. In large towns, there would be moſt difficulties to contend with; becauſe, in them, the Small-pox is generally preſent; and never feared or avoided. But, even in large towns, the difficulties are ſuch as would rather animate than diſcourage the truly benevolent mind. The diſtemper, in ſuch places, does every poſſible injury *. The attempt is ſo far from being attended with any hazard, that ſome benefit muſt

* See the PROCEEDINGS, p. 155.

reſult from all preventive regulations, even ſhould they fail of being completely ſucceſsful. I entertain ſanguine hopes that medical gentlemen may form aſſociations on diſintereſted benevolent principles. They are the moſt frequent witneſſes of the deplorable ſufferings occaſioned by this loathſome diſtemper. Their thoughts, in the daily exerciſe of their profeſſion, are ſo conſtantly and ſo anxiouſly exerted to ſave life and to relieve miſery, that they enjoy perhaps a higher ſatisfaction than others, from the gratification of theſe humane ſentiments. On theſe conſiderations, a propoſal which would anſwer both theſe benevolent purpoſes in no inconſiderable degree, will probably receive their moſt ſtrenuous ſupport. They can beſt obviate the difficulties, diſcern the advantages, and demonſtrate the practability of ſuch a plan. They may promote ſuch eſtabliſhments with all the zeal that their humanity dictates, without

out incurring the remoteſt ſuſpicion of a ſelf-intereſted motive. The moderate expence of ſuch an inſtitution can no where be an object of difficulty. On the contrary, it may be reaſonably hoped, that the moſt intelligent and humane inhabitants, forming themſelves into a ſociety, on the pureſt principles of beneficence, by transfuſing this ſpirit into the breaſt of each other, and of their acquaintance, would excite, among all ranks, an anxiety and active exertion, to promote its ſucceſs.

STRONGLY impreſſed with an opinion that the moſt important advantages may reſult to our country and to mankind, from a medical combination to check the ravages of this deſtructive peſtilence, I take the liberty of addreſſing the gentlemen of the profeſſion moſt diſtinguiſhed for their knowledge and liberal ſentiments. The prevention of diſeaſes is certainly the moſt beneficial, and ought

ought to be the moſt honourable branch of medical ſcience.

From the degree of ſucceſs with which our regulations to prevent the Small-pox have been executed at Cheſter, tho' generally oppoſed by the moſt untoward prejudices, I have not a doubt, that the natural diſtemper might be in a great meaſure excluded from any diſtrict whoſe inhabitants, to avoid this dreadful peſtilence, would willingly and gladly accept of inoculation. Such inſtitutions, wherever eſtabliſhed, would immediately preſerve the lives of a large proportion of the young generation. But their benefical conſequences would be infinitely more important. By due perſeverance, they would probably correct the medical errors and ſuperſtitious opinions which have ſo long and ſo fatally deluded mankind. On facts publicly aſcertained, to the full conviction of the more intelligent part of ſociety,

ſociety, there might be ſafely and ſucceſsfully founded a general law to promote inoculation, or, what would be incomparably more eaſy, and more grateful to the feelings of humanity, to eſtabliſh regulations that would *exterminate the Small-pox from Great-Britain.* To attain ſo important a bleſſing would require the general, united, and perſevering exertions of our legiſlators and magiſtrates, as well as the medical faculty. It would employ much time and labour, executed with aſſiduous zeal, care and attention. No ſervice could deſerve to be more amply rewarded, if we eſtimate its value by the multitude of lives it would preſerve, and the infinite variety of human miſery it would prevent. To accompliſh a plan ſo beneficial to our country, and to humanity, would be highly honourable to our profeſſion, and unſpeakably grateful to every heart warmed with the generous ardour of patriotiſm and philanthropy.

Errata & addendum.

Page 5. ‘ michief’ for ‘ miſchief.’ p. 10. l. 13. ‘ ſix’ for ‘ ſeven.’ p. 24. l. 4. ‘ varlioous’ for ‘ variolous.’ p. 113. l. 13. ‘ Hncee’ for ‘ hence.’ p. 198. l. 2. ‘ above-mention’ for ‘ above-mentioned.’ p. 36. after the 9th Caſe, add,

On June the 25th, 1784, Maſter —— ——— 13 years of age, went into a chamber, where there was a boy 13 years old recovering, and another ill of the Small-pox. He took notice to me, that he perceived a peculiar ſmell in the room. On the 9th of July his eruptive fever commenced; that is, on the 15th day after he was infected. This caſe deſerves peculiar attention, as it affords a clear and deciſive inſtance that the period between infection and the eruptive fever, was longer in the natural, than it is in the inoculated Small pox. Mr. Nicholls, ſurgeon, of Ruthin, was alſo witneſs of this fact.