

Summary of facts and inferences, respecting the causes ... of plague, and other pestilential diseases ; with proofs of the non-existence of contagion in theses maladies : intended for ... the Select Committee of the House of Commons, for enquiring into the validity of the doctrine of contagion / [Charles Maclean].

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SUMMARY
OF
FACTS AND INFERENCES,
RESPECTING THE CAUSES, PROPER AND ADVENTITIOUS,
OF
PLAGUE,
AND OTHER
PESTILENTIAL DISEASES;
WITH
PROOFS OF THE NON-EXISTENCE OF CONTAGION
IN THESE MALADIES:

INTENDED FOR THE USE OF
THE SELECT COMMITTEE OF THE HOUSE OF COMMONS,
FOR ENQUIRING INTO THE
Validity of the Doctrine of Contagion,
IN THE PLAGUE, &c.
IN FEBRUARY, 1819;
AND PRESENTED TO THEM, BUT NOT HITHERTO PUBLISHED.

By CHARLES MACLEAN, M.D.
LECTURER ON THE DISEASES OF HOT CLIMATES TO THE
HONORABLE EAST INDIA COMPANY.

LONDON:
1820.

SUMMARY OF FACTS AND INFERENCES

RESPECTING THE

CAUSES OF PLAGUE,

&c. &c.



SECTION I.

Importance of the Subject.

CONSIDERING that, upon a knowledge of the cause, depends that of the means of prevention, of every disease; that epidemic diseases are more numerous, and more destructive to mankind, than all other maladies put together; and that the mortality and misery, incidental to these diseases, are multiplied, in an almost incredible ratio, in consequence of the belief in contagion, as their cause; it cannot but be of the highest importance, or rather of indispensable necessity, to determine, whether these additional calamities be inevitable dispensations, to which it is our duty with resignation to submit, or evils, depending upon error and delusion, which it is in our power to remedy.

That they are entirely of this latter description, it is my purpose here to shew.

SECTION II.

Definition and names of Epidemic Diseases.

Epidemic are general diseases, produced by such causes as are capable of simultaneously operating, upon any given portion, or the whole, of a community; and of affecting, in a similar manner, the same persons, repeatedly.

But epidemic diseases may, as when their causes are but partially operating, be occasionally confounded with affections, which are essentially sporadic: and contagious general diseases, as

small-pox when it affects for the first time a community (although even then it never attacks simultaneously, but is always propagated in a certain succession) may be occasionally confounded with those which are essentially epidemic.

In the former case, however, the malady may be easily distinguished, by its possessing all the other properties of an epidemic: in the latter, by its possessing none of these properties, except diffusion.

Epidemic diseases, then, consist of every variety of morbid affection, in every degree of intensity, and on every scale of diffusion, which can be produced by the causes to be mentioned in the next section, from the slightest catarrh, or common cold, occurring in one or a few individuals, to the most severe pestilence, pervading a whole community.

The principal maladies of this class are such as have usually been distinguished by the appellations of plague, yellow-fever, sudor anglicanus, typhus, ship, hospital, and jail-fevers, and dysentery.

In order to obviate cavil, I have in this enumeration omitted scarlet-fever, and scurvy, the epidemic of the sea, as well as many others. But this cannot affect my general conclusions: for, every disease, according to the laws which it obeys, must at last be ranked in the class to which it belongs, whether epidemic, contagious, or sporadic. The list of Hippocrates includes, fevers of every kind, as continual, whether mild or ardent, intermittent, whether quotidian (diurnal and nocturnal), semitertian, perfect tertian, quartan, quintan, and nonan; chronicals, and erratics; dysenteries, diarrhæas; quinseys; heripneumonics; palsies; erisipelas; and even ophthalmies and hæmorrhages. This list I am by no means disposed to curtail.

The higher degrees of epidemics are denominated pestilences.

SECTION III.

Of the Causes of Epidemic Diseases.

Epidemic diseases, according to their definition, can only be produced by such causes as are capable of simultaneously acting upon any given portion, or the whole, of a community; and of affecting, in a similar manner, the same persons repeatedly.

In the former respect, they differ from diseases, which are strictly and essentially sporadic: in the latter, from those general diseases which depend upon a specific contagion.

Diseases then, in respect to their causes, appear to be distinguished by the hand of Nature into epidemic contagions, and sporadic. Upon this distinction depends the difference in respect to the means of their prevention.

The principal causes of epidemic diseases may be resolved into :—

1. Noxious qualities of the atmosphere.
2. Sudden or extreme vicissitudes of temperature.
3. Deficiency of nourishment.
4. Depression of mind ; and
5. The consequences of the belief in contagion, as a cause of epidemic diseases.

Those included under the first four heads, may, for distinction, be denominated proper ; those under the last head, adventitious causes.

SECTION IV.

Proper Causes of Epidemic Diseases.

1. AIR.

Air being of all the agents which act upon the living body, that which exercises the most diffusive influence ; it is, in a pure state, the most efficient in maintaining health, and in an impure state, in producing disease. We are therefore justified by reason, no less than by universal experience, in considering the latter as a principal, or rather the chief cause of epidemic diseases.

It was the opinion of Hippocrates, that almost all diseases depend upon the air. He believed that wisdom was communicated to the brain by the air ; that it prompts the brain to thought. Marsinelli, in commenting upon this text, observes, that the brain is first of all affected by wholesome or unwholesome air. Accordingly, affections of that organ, as delirium, are incidental to epidemic diseases. The exhilarating or depressing effects of a pure or an impure atmosphere, are the subject of the daily experience of every individual. Its qualities are even presumed to have a permanent influence upon the state of the intellectual faculty ; and the vivacity or dulness which distinguish the inhabitants of certain countries, appear to be, in some measure, with reason, attributed to this source.

It is to the general qualities of the atmospheric air, considered in its relation to the living body, or as an exciting power, that these salutary and noxious effects are to be attributed, whether these qualities be determined by the course or velocity of the winds ; the nature of the soil ; the vicinity of marshes, woods, minerals, metals, salts, volcanos ; the breaths of animals ; vegetable exhalation ; animal putrefaction ; the influence of earthquakes, comets, and planets ; or other circumstances, which, although to us unknown, are perfectly in the ordinary course of nature.

Besides the express authority of Hippocrates, (surely to be pre-

ferred to mere medical authority of modern date,) that almost all diseases arise from the air. I believe I may venture to assert, that no writer of any age or country has denied, that the air is a principal cause of epidemic diseases; or that it is alone adequate to produce them. During a plague, which proceeds from a corruption of the air, says Madame Dacier, (*Iliad*. i. p. 8.) the sun has not a pure clear light, but is obscured by the grossness of the atmosphere, and by exhalations which ascend like clouds.

That the general qualities of the atmosphere are alone quite sufficient to produce epidemic diseases, is farther confirmed by the following, amongst other phenomena, which indicate the approach of pestilence. Moles, mice, serpents, conies, foxes, &c., are observed to quit their subterraneous abodes, and to seek the open air; the birds of the air to depart entirely from their usual residence, as happened in the plague, which afflicted Athens during the Peloponnesian war; and fishes suddenly to die.

Calms, as well as the absence of particular winds, and the presence of others, have been observed to be injurious to health.

Dr. Baynard remarks, that, during the height of the plague of London, 1665, there was such a general calm and serenity of weather, as if the wind, and the rain also, had been banished the realm; and for many weeks together he could not discover the least breath of wind, so much as to stir a fan. The fires with great difficulty were made to burn; there fell abundance of mildews; and the very birds would pant for breath, especially the larger sort, and were observed to fly more heavily than at other times. (C. R. i. 73.)

Grand Cairo is situated in a sandy plain, at the foot of a mountain, which, by keeping off the winds, makes the heats very stifling. This, with others which I shall afterwards mention, is, no doubt, one of the causes of the frequency and mortality of plague in that devoted city.

In a similar manner, the refreshing breezes from the Levant, are intercepted by the high rock of Gibraltar, which occasions stifling heats, previous to the commencement of the epidemic season in that garrison. And this, I apprehend, may serve, at least, in part, to account for the fact, that Gibraltar has been visited with the plague four times in the course of ten years, whilst it has occurred at Malta but once in more than a century.

The violence of the winds, as when they are confined in narrow channels, or suddenly turned aside from their course, may readily occasion disease in persons over-heated, or otherwise predisposed.

Much depends also upon the points of the compass from whence they blow. Of the winds in our hemisphere, generally speaking, the wholesome seem to be the Etesian, or those which blow from

the North, and the unwholesome those which blow from the South.

According to Frederick Hoffman, manufacturers of nitre have observed, "that the beds of earth prepared for that acid of the air, which constitutes the very essence of the nitre, are impregnated principally or solely, whilst the winds blow from the points of the compass between the North and East." (Ingr. 64.)

These winds are remarkable for cooling the air.

In Egypt the Etesian winds are said generally to prevail at the period of the overflowing of the Nile, which is also the period of the cessation of the plague in that country. (Ing. 65.)

Hippocrates, and other ancient Physicians, have insisted especially upon the noxious qualities of the winds *which blow from the South*. Celsus, after giving some directions respecting what ought to be avoided during an epidemic, adds: "all these things ought to be attended to in every pestilence; but *particularly* in that which is brought on by *Southerly* winds."

Lancisi states, that Varro being at Corcyra whilst a fleet and an army were there, and all the houses were filled with the sick and the dead, made new windows on the opposite side of the house, and admitted the *North* wind, shut up the pestilential light on the other side, and changed the door, by which, and other attentions of a similar nature, he carried his companions and his family safe through.

Empedocles is said to have delivered his country (Sicily) from barrenness and from pestilence, by closing up, as Plutarch relates, an opening in a mountain, through which the *south* wind used to blow upon the plains.

According to the same principles, the absence of the Etesian winds ought to be noxious, and the Southerly winds salutary. And we find that the Etesian winds not blowing as usual that year, is assigned by Diodorus Siculus, as one of the causes of the great plague of Athens. In Egypt, are the Etesian winds absent, or do Southerly winds prevail, previous to, or during the periods of pestilence?

The qualities of the atmosphere must, no doubt, frequently be determined by the nature of the soil, which we inhabit, or over which the winds blow. Impregnated from salt petre grounds, as in the East Indies, they will occasion convulsive, and spasmodic affections, paralysis, tetanus, fever, cholera morbus, and death.

After a course of Southerly winds, blowing over the burning sands of Africa, a plague very often follows at Tunis, during which the inhabitants withdraw to old Carthage. When epidemics prevail in the towns, on the coast of Africa generally, in Gibraltar, and other parts of the Peninsula, and at Malta, in the same

season, they usually commence, spread, decline, and cease, in all of them, at periods nearly, or entirely similar.

The atmosphere notoriously becomes noxious to health by impregnation with marsh effluvia. Among the ancients it was no uncommon thing to introduce pure water from the hills, to correct the malignity of marshes. We read in Strabo, that the marshes near Alexandria lost all their mischievous influence, when they were overflowed by the Nile. It still continues to be at the precise period, at which the slimy bed of that river becomes exposed, that the plague commences, and when it is again covered, that it ceases generally in Egypt. Through the midst of Grand Cairo, there passes a great canal, which is filled as the waters of the Nile increase, and emptied as they diminish. It is at the latter period that the plague commences, and at the former, that it ceases in that city.

In the Island of Zealand, which is full of stagnant waters, there occurs an epidemic intermittent, almost annually, in the autumn. That the epidemics of Gibraltar, where there are no marshes, should commence, spread, decline, and cease, at precisely similar periods, shews, that these diseases obey similar general laws, and that it is the type only, which is determined by the modification of the cause.

When the Salopians of the Lake were annually visited by a pestilence, M. Hostilius freed them from it by removing them four miles from the place.

Formerly the city of Oxford was unhealthy, the Isis and Charwell being filled with mud, from which after a flood, noxious exhalations ascended. In 1517, at the charge of Richard Fox, Bishop of Winchester, those rivers were cleansed, and more trenches cut for the passage of the water, since which time the town has been more healthy.

Empedocles delivered the Selinantic from a pestilence, by directing two neighboring streams to be turned into the Lazyore, a sluggish stream crossing through their settlement. By this operation, its course was rendered more brisk, the channel was cleansed, and, as Laertius relates, the waters becoming fresh and sweet, the plague ceased.

Peter Salius Diversus, in his tract upon pestilential fevers, has the following observations: "If pestilential fevers proceed from stagnant waters, the first thing to be done, is to introduce a running stream; or else to dry them up altogether, as is practised in my country, where the water stagnated in the public canals round about, and undergoing corruption, excited, *towards the end of summer and during the autumn of every year*, violent pestilential fevers."

In another place he states, that, "no sooner were ditches, in the vicinity of his residence emitting a bad smell, filled up, than the inhabitants were most happily freed from the pestilential fevers, by which they had, for many years, been harrassed *about the close of the summer.*"

Diodorus Siculus ascribes the plague of Athens to the following causes "abundance of rain had fallen in the winter, by reason whereof the earth being over wet in many places, especially in low and hollow grounds, the water lay like standing pools, and those being putrified and corrupted by the heat of the summer, thence produced a mist of gross and stinking vapors, which corrupted the air, as it often happens about filthy marshes; and besides *the want of food much advanced the progress of the disease*; for the year before, the fruits, by too much rain, were crude and unwholesome."

In the harbors especially of woody and uncultivated countries, the health of the crews of ships, will depend very much upon their sleeping on board, or on shore, upon their being exposed to the sea, or to the land wind, and upon their proximity to, or distance from the shore. A few cable lengths may in this respect, make a very material difference. The farther from land, the more security, the nearer, the more danger.

In respect to my present object, it would be superfluous to enlarge upon the manner in which the qualities of the atmospheric air may be effected by earthquakes, minerals, metals, salts, volcanos, comets, or planetary influence. Neither is it material to inquire particularly into the effects of vegetable exhalation, and animal putrefaction, meaning to indicate, rather than to explain the causes which vitiate the atmosphere, so as to occasion epidemic diseases.

There is, however, one cause, which, as it did not operate to so great a degree in ancient, as it has done in modern times, has been considerably overlooked, and is so frequently in action, and of such extensive influence, as to occasion several of our principal and most usual epidemics, seems to deserve more particular consideration. I mean that alteration of the qualities of the air, produced by the breathing of many persons, confined together in a small space, which is always a principal, and often the sole cause of those modifications of Typhus, called Hospital, Ship, and Jail fevers, so common in this country.

The effects of a noxious atmosphere, produced by respiration, operating in various degrees of intensity, are well exemplified by the great diversity of phenomena, which marked the memorable catastrophe of the English factory imprisoned in the black hole of Calcutta, as described in the narrative of Mr. Howell.

Formerly, in the jail of Newgate a fever used to appear annually, but only in hot weather. (Ing. 103.)

But the injurious effects of the air of jails have been manifested in their most destructive, as well as most edifying form, when the apartments over them (it was formerly the custom in this country to have the prisons, or dungeons, immediately under the place of trial) have been opened for the purpose of holding the Assizes. The foul air of the prison underneath, together with the noxious vapors of the cold and damp apartments newly opened, being set in motion, and being driven by currents of the external atmosphere against the auditory, affected them so as to produce fatal maladies; whilst the prisoners, who were habituated to that foul air within, and less exposed to the currents from without by which it was set in motion, escaped unhurt.

This I apprehend will be found to be the proper explanation of the memorable affair of the black assizes at Oxford in 1577, when the judges and the auditory, to the number of three hundred, were seized with a malady, of which they all, or almost all, perished, whilst the prisoners remained uninjured. It is stated that "almost every one present died *within forty hours*."

A similar calamity is stated to have taken place at Oxford in July, 1579. The jurors died presently; shortly after died Sir Robert Bell, Lord Chief Baron, Sir Robert de Olie, Sir William Babington, Mr. Winman, Mr. De Olie, High Sheriff, Mr. Davers, Mr. Harcourt, Mr. Kisle, Mr. Pholeplace, Mr. Greenwood, Mr. Foster, Serjeant Baram, Mr. Stephens, &c. There died at Oxford three hundred persons; sickened there, and died at other places, two hundred and odd from July 6 to August 12, after which not one died of that sickness. (Tell Tale 194.)

In 1581 Mr. Teegion at Lawnston, Mr. Rigby, Mr. Christopher Watson, with eighteen persons more (popish priests), perished at York with the disease of the prison. (Jews and Babel, p. 549.)

At an Old Bailey Sessions in 1750, in the mayoralty of Sir Samuel Pennant, Sir Thomas Abney, Mr. Baron Clark, the Lord Mayor, Mr. Daniel Lambert, half the jury, Mr. Anthony Biggs, Surgeon, and many others, lost their lives.

About the middle of the last century many persons being close shut up in the prison of St. Martin's round house, some died in a few hours.

In my work upon epidemic diseases I have stated instances of ship-fever, or typhus, produced simply by shutting down the hatches, and keeping prisoners confined in a small space without ventilation. On board of Guineamen both fever and scurvy have frequently been occasioned in this manner.

That the alteration produced in the air by the respiration of

many patients crowded together in an hospital, especially if the building be in a low or unwholesome situation, will be followed, when in a sufficient degree, with fever of a similar description, requires neither proof nor illustration.

2. *Sudden or Extreme Vicissitudes of Temperature.*

The second cause of epidemic diseases, which I have enumerated, is sudden or extreme vicissitudes of temperature. It cannot be doubted, that this is a sufficient cause of disease, nor that, when extensively operating, it is capable of occasioning an epidemic. It, however, for the most part, only acts as an auxiliary or collateral cause: the countries in which those vicissitudes are the greatest, and the seasons in which they are the most extreme, will be found, other things being equal to be the most subject to epidemics. In Egypt, the variation of the thermometer from noon to midnight, in epidemic seasons, is stated to be usually very great. At Malta in 1813 it was when the difference between the temperature of noon and midnight was at the highest, that the plague was the most extended, and the mortality the greatest. In individuals it is about midnight, or towards morning, that attacks of disease, as well as death, are believed most frequently to happen. This is the period of the twenty-four hours which constitute the day, at which the diminution of temperature is the greatest, the air which we breathe the least pure, and the exciting powers, generally, both physical and moral, applied in the smallest degree of intensity.

3. *Deficiency of Nourishment.*

It is notorious, not only that years of famine, arising from actual scarcity, are also years of pestilence, but that, in every community, those classes or individuals who have the fewest means of procuring subsistence, are also the most liable to epidemic maladies. And, if a deficiency of nourishment should not be deemed alone an adequate cause of pestilence, there cannot be a doubt that it will often be sufficient to produce the disease, when, from the force of the other causes merely, it would not take place.

One of the causes of the plague of Athens, according to Diodorus Siculus, was a scarcity of food.

In the year 21 before Christ, the plague of Syracuse was preceded, and seems to have been principally occasioned by famine.

In England a famine commenced in 1315, which was so great that horses and dogs were eaten, and continued for three years, ending in a most terrible pestilence.

During the plagues of London in 1665, and of Marseilles in 1720, a scarcity of provisions was occasioned by the mistaken

measures which were resorted to, in consequence of the belief in contagion, with a view to prevent the spreading of the malady; and the scarcity, in its turn, greatly extended both the sickness and mortality.

4. Depression of Mind.

The last of the proper causes of epidemic diseases, and a very powerful one, is terror, or a settled depression of mind. Lancisi, (chapter vii and xviii) places serenity of mind among the requisites in his prophylactic plan. "I do not, however," says he, "recommend cheerfulness as an antidote to pestilential distempers upon theoretical considerations alone, but I do so upon the solid basis of experience, and request my readers to note it accordingly. Rivinus and others have related, that during the prevalence of plague, fear wrought greater mischief than the true contagion itself; on which account he solemnly declares that, during the plague at Leipsic in 1680, *he did not know a single instance of sickness occurring from the plague, which did not originate in terror.* And yet this observer saw numberless cases of the disease in Leipsic. The subject may be illustrated by the experience of my late colleagues John Mana Constance, and Luke Tomasino, during the pestilence which almost depopulated Rome in 1655. Those physicians personally attended the sick in the plague hospital, and frankly owned to me, that their escape from that violent contagion was owing to their firm and cheerful state of mind, enabling them to disregard death, and administer friendly reproof to the fearful. *All those who were timid were carried off by the distemper.*"

These are the statements of persons believing in contagion; and yet it is self-evident that neither can the greatest equanimity prevent, nor the greatest timidity occasion, a disease, which depends upon contagion, although the former may serve to mitigate, and the latter to aggravate its effects. Fearlessness cannot prevent, nor terror occasion small-pox.

On the other hand, under a slight degree of epidemic constitution of the air, and of deficiency of nourishment, terror might occasion disease, when it would not otherwise happen; and, under a higher degree of those causes, equanimity might prevent disease, when it would otherwise take place. It is to this source (equanimity), rather than to his strict temperance, as reported by Aulus Gellius, that we ought probably to attribute the exemption of Socrates from the plague, which in his time afflicted Athens.

Noxious qualities of the air, then, sudden or extreme vicissitudes of temperature, deficiency of nourishment, and depression of mind, constitute, what I consider, the four proper causes of pestilence;

which, in their various combinations, proportions, and degrees, produce every known species of epidemic. The first is undoubtedly the chief, and sometimes at the commencement, the sole cause. But it is, for the most part, at least in the progress of epidemics, united with one or more, or all the other causes; and one or more, or all the other causes, may, in the absence of the noxious qualities of the air, be adequate to produce disease. Upon the variety of their combinations depend the modifications of disease produced.

SECTION V.

Adventitious Causes of Epidemic Diseases.

The consequences of the belief in contagion considered as a cause of epidemic diseases, by adding to the force of the proper causes, greatly multiply, in all severe epidemics, the otherwise inevitable sickness and mortality.

The terror inspired during a pestilence, by the view of surrounding calamity, and by the apprehensions, whatever be its presumed cause, of being affected like others, forms an additional, and perhaps the most powerful cause of mortality. But under the belief in contagion the disease is deemed almost inevitable, and terror is still farther increased: and when that opinion, sanctioned by medical authority, is accredited by governments and municipal bodies, and officially acted upon by the adoption of conformable measures of police, with a view of prevention, the panic is augmented in a dreadful ratio, the public mind is appalled, and destruction becomes incalculable. Under such circumstances the very rumor of a pestilence in any one quarter of the globe spreads universal alarm, and begets universal precaution in every other; and, in the progress of an epidemic, affecting several countries, the inhabitants of the most remote quarters from the scene of its commencement feel its baneful influence long before its approach. A plague, or yellow fever, occurring in Asia, Africa, or America, will occasion the adoption of the most rigid quarantine on the shores of the Baltic. The arrival of a ship or vessel from any country, in which pestilence frequently occurs, is attended with precautions, even when there is no actual disease either in the vessel herself, or in the country from whence she came. And when there happens to be actual disease on board, or at the port which she had left, and an epidemic simultaneously commences at the place of her arrival, (a coincidence which does and must necessarily often happen,) an immediate and universal panic is propagated, wherever the circumstances are known. Thus terror operating before the other cause or causes of pestilence come into

action, will throw communities into a state of general predisposition, if it be not sufficient to produce actual disease.

In places adjacent to countries subject to frequent visitations of pestilence, as Gibraltar and Spain in respect to the coast of Africa, the dread and anxiety of the public are necessarily almost incessant. The police establishments are perpetually on the alert. Travellers are detained and imprisoned. Persons having the misfortune to arrive in a state of disease from a place suffering under an epidemic, in any port at which the malady soon after commences, is immediately considered as the source from which it is propagated, as happened to an unfortunate man of the name of Santos, or Santo, coming from Cadiz or Malaga, and arriving at Gibraltar in August, 1804. In this case, instead of adopting efficient precautions, founded on a knowledge of the proper causes of the malady, to prevent its spreading, the means employed were only calculated to raise the public indignation against the innocent individual, who had the misfortune to have been amongst the first persons seized with the malady; and he was made to suffer, if not persecution, every sort of annoyance. In like manner boats or vessels suspected to have had communication with places supposed to be infected, are put in quarantine. Or, if the fact of their communication be established by proofs, they are burnt. This actually happened not many years ago upon a large scale at Gibraltar. In the Christian ports of the Mediterranean, ships or vessels known to have persons ill of the plague on board, are driven away without knowing where to find shelter. I have elsewhere stated an instance of this, which happened some years ago at Odessa. It is only a few months since a similar case occurred at Malta, as related in the London newspapers of the 15th of January last (1819). Howard, in his work upon Lazarettos, speaks of it as a common practice. He particularly mentions a Ragusian ship, which was driven away both from Ancona and Trieste.—(Lazarettos, p. 11.)

The injurious effects of these proceedings are greatly aggravated, when the prohibition of intercourse, as in this case, is between countries, some of which are mainly dependent upon the others for their ordinary supplies of provisions. In such case many of the miseries of pestilence are suffered by anticipation, or without the disease appearing at all; and when it does occur, its otherwise inevitable calamities are multiplied in a dreadful ratio.

When, under the belief in contagion, epidemics pervade communities on a large scale, terror, distrust, and dismay, become universal. The country is afraid of the town, and the town of the country. Travellers dare not sleep at inns, and inns dare not receive travellers. Confidence between neighbours is at an end.

Even the ties of kindred are severed. The sick, deserted by friends and relations, are left to the care of mercenary attendants, generally of the most hardened description, who, if they do not accelerate their deaths, are too often impatient to profit by their spoils. But even these are sometimes disheartened, and sicken or fly. In Gibraltar in 1804 pestiferous patients were found dead in their beds without any person near them!

The dreadful effects of the belief in contagion are nowhere better exemplified than by the circumstances which attended the plague of Marseilles in 1720. By the 10th of September several parties of galley slaves, with which the magistrates had been supplied to remove bodies and to bury the dead, had successively perished. On that day a reinforcement is received of those galley slaves, "and six, who are butchers by trade, are sent to serve in the slaughter-houses, where, *all the butchers being dead or deserted, no one is left to kill oxen and sheep.* By the 11th there are hardly any physicians or surgeons, who have not run away or perished. *The people are in want of every thing. Provisions are not to be procured. No medicines or drugs are to be had, owing to the flight of the apothecaries, druggists, and grocers. The dying cannot make their wills for want of notaries; they cannot confess for want of priests. Women with child have no assistance in their labor. Misery is at its height. Those whom disease has missed perish by famine or despair. The fountains of charity are dried up.* THE HEAVENS SEEM TO BE OF BRASS, AND THE EARTH OF IRON." (Res. i. 323-4. Journal of the Plague of Marseilles.) It is not, I should apprehend, over-estimating the operation of terror, and all the other consequences of the belief in contagion, to impute to them nine-tenths of the whole calamity which happened on this occasion.

Such are the injurious effects of the dread, occasioned by the mere phenomena of pestilence, aggravated by the belief in contagion individually operating, and farther augmented by the influence of this belief, concentrated and set in motion by authority.

By the measures adopted under this belief for its prevention all the calamities of pestilence are necessarily aggravated. The effects of drawing lines of circumvallation, digging ditches, and placing cordons of troops round what are called infected cities, if the inhabitants were really laboring under a contagious disease, would be to multiply the chances of infection, as well as to increase mortality; for although a noxious atmosphere cannot generate contagion, compulsory residence among the infected would tend to spread the disease, whilst exposure to a deleterious air could not fail to render it more severe, and to increase its mortality; and the air itself being the principal cause of the disease, imprison-

ment in it would be justly chargeable with almost the whole of the calamity. It would be little better than authorised murder upon a large scale.

All these evils are necessarily farther aggravated and augmented by every measure, which, by increasing seclusion, restriction, and confinement, tends to depress the mind, to render the means of subsistence more scanty or precarious, and to diminish the facilities of procuring consolation or assistance; such as the shutting up of houses, the establishment of guards over private dwellings, and the insulation of different streets, or different quarters of a city.

Under such circumstances mortality is farther increased by the difficulty, and frequently even the impossibility of procuring medical aid; for, if professional men were in sufficient number, and sufficiently above apprehension for their personal safety freely to visit the sick, they would not dare to do so in an efficient manner, lest they should be themselves excluded for forty days, probably in a noxious atmosphere, from all intercourse with society, without even the chance, in case of sickness, of any efficient assistance, menial, dietetic, or curative. Of between eighty and ninety plague patients that were shut up in the Lazaretto hospital of Malta in 1813, for want of such assistance, only *two* survived!

The scenes of which this state of things may, nay, must frequently be productive, are revolting, and even disgraceful to humanity. Instances well authenticated have occurred of persons endeavouring to escape, or going abroad in a fit of delirium, or of the few who had survived of a whole community, *supposed to have been infected*, being deliberately shot by the surrounding guards, by virtue of an order from the nearest magistrates. (Howard, p. 22—46.) In this country, by stat. i. Jacob. i. c. 31., it was made felony to go abroad with (supposed) *infectious* sores. Whether this statute has been repealed I do not know.

Thus, by the official operation of the belief in contagion, in an accredited form, persons are kept upon compulsion, exposed to the principal cause of pestilence, noxious air; the force of another principal cause, terror, is increased; and a third, famine, if it did not previously exist, is occasioned. By the formal interruption of the ordinary trade and intercourse, and the operation of the fears of the market people individually, where no scarcity of provisions previously existed, an artificial scarcity is created, which is farther aggravated by the want, on the part of servants and laboring people, thrown out of employment, as happens in all pestilences, of the means of procuring the necessaries of life, however abundant. By these causes it is obvious, from the history of those

pestilences, that the sickness and mortality in London in 1665, and in Marseilles in 1720, were greatly multiplied, or rather principally occasioned. Upon the slightest suspicion of disease, or of communication with the sick, servants and laborers were discharged, as dangerous to the families or individuals who employed them; and thus left destitute of the means of procuring subsistence in health, or comfort or attendance in sickness. Even when it was their lot to recover, they were still shunned as dangerous members of society; and not being able to procure employment or food, they only escaped pestilence to perish by famine. Of all the deaths which took place in London in 1665, by far the greatest number is said to have happened amongst servants and laborers out of employ.

It is upon the poorer classes of society that all the principal causes of pestilence, whether proper or adventitious, more especially operate. They are more exposed to the proper causes, as noxious air, from their habitations; vicissitudes of temperature, from their avocations; terror, from superstition; famine, from poverty; and to the adventitious causes, constituted by the consequences of the belief in contagion, from all these circumstances combined. Accordingly, the fact, that the poorer classes of the community suffer most in all pestilences, even in a very extraordinary proportion, is universally admitted. And this, I trust, will be found a satisfactory explanation of it.

There is still another manner, although upon an inferior scale, in which the belief in contagion in epidemic diseases occasions an additional mortality. Persons finding themselves attacked by a pestilential malady, knowing that, upon their disease being declared, it will be their lot to be abandoned and shunned by all the world, conceal their sickness as long as possible, i. e. until it can no longer be concealed; and when, if efficient medical assistance could be procured, it would be no longer of any avail.

Thus, it is manifest, that to the adventitious causes consisting of all the consequences of the belief in contagion, ought to be attributed by far the greatest proportion, perhaps nine-tenths of all the calamities incidental to pestilential diseases, wherever they occur in their higher forms, under the accredited operation of that belief.

If mankind, as has been computed, (Wallace on the numbers of Mankind, &c. p. 10.) consist of a thousand millions; if the annual mortality upon this number amount, according to the usual calculations, to three in the hundred, on an average of civilised and barbarous nations, or thirty millions; if one half only of that number, or fifteen millions be victims of epidemic diseases; and if of this fifteen millions (supposing the belief in contagion to be

universally entertained, and its consequences to be formally operating in every epidemic) three-fourths, or eleven millions, two hundred and fifty thousand, would be the annual sacrifice to the adventitious causes, besides the misery of the many millions who might survive; the great importance, or rather the indispensable necessity of inquiring into the foundation of a belief, by which so much destruction is annually occasioned, cannot surely stand in need of illustration.

The operation of these causes, in an accredited form, it is true, does not extend to all communities, or to all epidemics. They act variously according to the severity of epidemics, and the belief of communities respectively. But whatever may be presumed to be their average operation, the sum total of their effects cannot but be sufficiently extensive to merit the highest attention, and to excite the warmest and the most universal interest.

If we suppose the maximum of annual destruction, occasioned by the operation of the adventitious causes of pestilence to be eleven millions, and the minimum to be one million, the mortality, from the first establishment of this belief, generally, in an accredited form, will have amounted, upon the lowest calculation, at any rate to several hundred millions!

SECTION VI.

Injurious consequences to Society, in other respects, of the belief in Contagion, in Epidemic Diseases.

1. *In a view of Science.*

The belief in contagion in epidemic diseases, as accredited and acted upon by governments and municipal bodies, has, without reference to the truth or falsehood of the opinion, hitherto operated as a permanent and insurmountable obstacle to a full, free, and efficient investigation concerning epidemic diseases. It has been an insuperable bar to experiment and observation, as well as to the application of known remedies, in some of the most numerous and most fatal maladies which afflict mankind.

But, considered as an error, it is an opprobrium medicorum of no common degree. It has served not simply to perpetuate ignorance, but to produce an accumulation of false knowledge in medicine, and upon the whole, to occasion, in respect to epidemic diseases, a great and important retrogradation; in so much that, after upwards of two thousand years, finding that the farther we advance the more we recede from our object, we are constrained to return to the more simple doctrines of Hippocrates.

2. *In a view of Morals.*

The afflicting scenes incidental to severe pestilences, whatever

be their supposed cause, never fail to occasion a depression of mind, which, besides adding to the mortality, by increasing the force of the other causes of those maladies, effects a great change in the moral state of societies. In some extreme cases, as in the plague of Athens, described by Thucydides, the general misery has produced a complete demoralisation, blunting or obliterating the ordinary feelings of humanity, destroying all sense of propriety and decorum, and even occasioning an almost total suspension of social order. "Neither the fear of Gods, nor the laws of men, restrained them." But in the very nature of things, the consequences of the belief in contagion must be deemed, as it is found in fact, greatly to increase the terror otherwise occasioned by surrounding calamity; since, under such a belief, the disease is regarded as more inevitable, destructive, and irremediable. During the plague of Athens the Peloponnesian besiegers prevented the inhabitants from removing from the cause of the evil; and produced, in a smaller degree, the same calamitous effects, as our modern lines of circumvallation, ditches, and cordons of troops. But the mortality at Athens, under the former species of imprisonment, was not nearly so great, in proportion to the population, as that at Marseilles was in 1720, under the latter. At Marseilles a full half of the population perished; and I am persuaded nine-tenths of them a sacrifice to the consequences of the belief in contagion.

In several of the plagues of Rome, especially that which broke out in the consulate of P. Servilius Priscus and Æbutius Elva; in that of Constantinople in 543, described by Procopius; in that of Florence in 1348, as related by Boccace, in his Decameron; in that of London in 1665; and that of Marseilles in 1720, the misery and demoralisation were extreme. These pestilences were all greatly more fatal, in the ratio of population, than the memorable plague of Athens.

3. *In a view of Political Economy, Commerce, and Navigation, &c.*

This opinion occasions the expenditure of immense sums annually, by all the nations of Christendom, for the maintenance and support of quarantine, lazarettos, and other establishments of plague police; of which certainly not less than one, and probably more than two hundred thousand pounds annually, falls to the share of this country alone, on account of her plague police establishments at home, and at Gibraltar, Malta, and the Ionian Islands. By imposing restraints upon the trade and intercourse of those places, with all the countries subject to frequent returns of epidemic diseases, it necessarily enhances the price of all the com-

modities of these countries, to the general consumer, and injures the public revenue.

I may here observe that, in consequence of the obscurity which this doctrine has thrown upon the real causes of epidemic diseases, expensive expeditions have been rendered unsuccessful, and formidable armaments destroyed. Ignorance of their proper cause has occasioned a total neglect of all efficient means of prevention: and the belief of an imaginary cause, has given rise to measures, with a view to prevention, which have been pernicious or destructive in an extraordinary degree.

It exposes travellers coming from countries subject to epidemic diseases, whether by sea or land, to a considerable detention and serious inconveniences.

It imposes upon all ships coming from these countries, with their crews and lading, a quarantine frequently of forty-four days' duration; thus occasioning a loss of time, in the Levant trade of this country, considerably exceeding the half of an ordinary voyage; expense of wages; tear and wear of ships; loss upon goods and merchandise, by pilferage, damage, waste, and deterioration; and a variety of incidental expenses.

The institution of quarantine, it may also be observed, greatly increases the disadvantages, under which, from position, we otherwise labor in respect to France, in the prosecution of the Mediterranean trade. By the abolition of quarantine in both countries (which would, of course, upon due inquiry and conviction, be followed by its abolition in all others) these disadvantages, on our part, would be greatly diminished. By its abolition in Britain, whilst it continues to be maintained in France, they would be wholly removed, or the scale turned in our favor. Without any unfair views of rivalry, it seems but bare justice to ourselves to inquire whether it be not practicable to effect this object, not only without a single danger, but even with many incalculable benefits; thus removing obstacles which are only adventitious, and leaving the two nations to derive, from their commerce with the Levant, advantages proportionate to their respective industry, talents, and enterprise.

4. *The consequences of this opinion are particularly injurious to the prosperity of the British Colonies in the Mediterranean, and to the progress of general Civilisation in the Levant.*

The arguments which apply generally, have still greater force in respect to places which are adjacent to, or surrounded by countries very frequently, or almost perpetually subject to epidemic diseases, as the British dependences in the Mediterranean, in respect to the Turkish ports in the Levant. Gibraltar, Malta, and the Ionian Islands are, on this account, kept in an almost constant state of

vigilance and alarm ; their commercial intercourse frequently interrupted ; and their usual supplies of provisions cut off.

The uncommon rigor of the plague police establishments in these colonies not only increases the alarm, sickness and mortality in times of actual pestilence, and occasions emigration and the decay of commerce, as happened to Malta in 1813, and repeatedly to Gibraltar of late years ; but, in all seasons, discourage settlers from the surrounding countries, paralyse industry, retard the augmentation of strength, prosperity, and happiness, which could not otherwise fail, under the particular circumstances of these colonies, to be great, rapid, and progressive ; and prevent the increase of the fidelity and attachment of the inhabitants to the parent state, as well as the establishment, upon a stable foundation, of that great and unprecedented emporium of British Commerce in the Mediterranean, for which the Islands which we have acquired in those seas, as well as the station of Gibraltar, are, from their peculiarly favorable position, so pre-eminently calculated.

Every regulation which restrains the intercourse between countries and individuals, it is obvious, must tend to impede the progress of general civilisation.

SECTION VII.

Laws of Epidemic Diseases.

1. They are capable of attacking simultaneously various portions, or the whole of a community, and of affecting the same persons in a similar manner, repeatedly, even in the same epidemic, and the same season. These laws are either self-evident, or admitted by the advocates of contagion. The proofs of the repeated recurrence of plague, yellow fever, &c., in the same persons, are notorious. (Results, chap. vii.) In respect to the prevailing fever of the united kingdom, similar testimony is given to the Select Committee of the House of Commons. The same fever attacked both the father and the daughter *three* times successively. (Report, p. 14.) Of the epidemic called Sudor Anglicanus, it is said, "those that recovered of this pestilential sweating, though they continued well a good while, were sometimes seized with it again, even a *third* time." (City Rem. i. 174.)

It is true that what is called a seasoning fever in the East or West Indies, can never, *as such*, attack the same person a second time ; and that an epidemic of such rare occurrence and limited diffusion as scarlet fever (in the existing sickness it has been to typhus of the common form in the proportion of one to thirty-five or forty) can very seldom recur twice in the same person. Yet, it by no means follows, that these diseases are not of the nature of

epidemics ; that they are incapable of affecting the same persons more than once ; or that they depend upon contagion. No one, I believe, doubts that, in the East or West Indies similar causes applied a second or a third time, in a somewhat higher degree, will, a second or a third time, occasion a similar fever with that which, upon its first attack, is, in these countries, called a seasoning fever, although it will then cease to retain that name. These seasoning fevers are only the yellow fever, or other ordinary epidemic of the country, attacking sporadically persons newly arrived ; and it is principally, or almost solely amongst the population of this description, that when more diffused, and more intensely operating, these diseases prevail. But whether epidemic or sporadic, no one, in these countries, ever dreams of considering them contagious. It having been observed, that persons who have been seasoned to different climates, and have already experienced an attack or attacks of fever in some one or more of them, are not so liable as those who have not been so seasoned, to be seized with the prevailing epidemics of other climates in which they may happen to sojourn ; the extraordinary conclusions have been drawn that they are incapable of being again affected, and that the disease so prevailing is therefore contagious ; thus confounding the *fact* of the same malady not affecting the same person repeatedly, with the *principle* of its incapability of recurrence. The same reasoning applies to scarlet fever. Besides its obeying all the principal laws of epidemics, it may, at any time, be shown by the simple experiment of contact, under unequivocal circumstances, to be incapable of propagating itself from person to person, in the manner of a contagious disease. If it were otherwise, it would be unaccountable that this disease, which is by no means slight, should be always of such limited diffusion.

2. They have usually determinate periods of commencement, increase, abatement, and cessation ; different in different countries, according to their geographical positions respectively. In Great Britain and France, for instance, and other countries, in similar parallels of latitude, the autumn is the usual epidemic season ; in Asia Minor, Egypt, and Syria, the latter end of spring, and the beginning of summer ; and in other latitudes, other periods.

The usual periods, however, according to the causes which are operating, are often either anticipated or postponed. (Results, 1. Ch. viii. p. 228.)

3. They usually travel in a particular direction, in respect to their progress through different parts of the world ; through the same countries, and through the same towns.

At the Island of Scio, the inhabitants have no fear of the plague from Smyrna, although within a few hours' sail ; but when

they hear of its being at Alexandria, which is at a much greater distance, they expect it to a certainty to attack them. (Legh's Journey in Egypt, p. 5.)

According to the natural and ordinary course of epidemics, they appear at an earlier season of the year in Africa, Asia Minor, Egypt, and Syria, than in the towns on the European Coast of the Mediterranean. Hence, in the latter, under the influence of the belief in contagion, they are always thought to be imported, either from the former, or from some other distant country, as South or North America, or the West Indies. But, in Algiers, Alexandria, Smyrna, or Aleppo, even the Christian part of the population, who alone believe in contagion, never suppose it to be imported from Marseilles, Venice, Leghorn, Genoa, or Gibraltar. The reason of this difference is obvious. In the North the epidemics of the season cease a considerable time before they commence in the South; whereas, in the South they scarcely terminate, when the epidemics of the North begin.¹

Those great pestilences, which have, in the same years, pervaded many nations, have commenced in this hemisphere in the South, and proceeded to the North, as the plague which in its progress visited Athens during the Peloponnesian war, and that which afflicted so many parts of the world towards the middle of the 14th century; and analogy allows us with probability to infer, that in the Southern hemisphere they travel in an opposite direction.

The epidemic, which in 1809, 1810, and 1811, affected the inhabitants of the neighbourhood of the Pylney mountains in India, and which carried off a hundred thousand of them, travelled, in some places, from North to South, and in other places from South to North.

They usually commence in particular towns, or districts of the same country, and in particular quarters or streets of the same town. In Egypt the plague rages most frequently in Grand Cairo. In London, Marseilles, Cadiz and Gibraltar, and all other cities or towns, there are particular quarters, or streets, in which epidemics most frequently commence and prevail. (Res. i. p. 262.) (Rep. of the Select Committee on the London fever, 1818.) If epidemics were contagious, a very different progress would take place; for, in whatever part of a town the disease might happen to commence, it would invariably spread most in that of the greatest resort, as the exchange. This would be an inevitable consequence.

4. The manner of commencement, progression, and cessation of epidemic diseases, is very various.

It is the usual course of these maladies, that some one, or a few individuals should be first affected; but the variety in this re-

¹ This is, of course, with reference to this hemisphere only.

spect is great. On the 26th of July, 1720, the Plague of Marseilles was first distinctly announced by the simultaneous seizure of *fifteen* of the poor inhabitants of the Rue de Lescalle. (Res. i. 326.) We are informed that in 1485 the sweating sickness spread *in the same day* (the 21st of September) all over England; and that after a great mortality it stopped *all at once* about the latter end of October. (Goodwin, p. 14, 15.) In 1506 it again disappeared *all at once*. In 1665, the Plague in London suddenly declined and ceased, at the period at which the greatest number of persons were affected: and this is the most common manner of the termination of epidemics.

In the course of their progress they frequently experience considerable fluctuations, ceasing, and recommencing, increasing and abating repeatedly, in the course of the same year or season. These fluctuations were remarkable in the plague of London in 1665. They were also considerable in the epidemic of Gibraltar in 1813. (Res. i. 337.)

They sometimes continue their devastations, with more or less uniformity for a whole year, or for several years consecutively. (Results, ch. xii.)

These variations depend upon the combinations, proportions, and degrees, in which the several circumstances, of which the united influence constitutes the sum total of the cause of epidemic diseases, operate. If an epidemic constitution of the air be steadily, and alone operating, the various periods of pestilence, will be, to a certain degree, regular, or but inconsiderably anticipated, or postponed. But when to atmospheric influence are added vicissitudes of temperature, deficiency of nourishment, and depression of mind, or when these preponderate, considerable deviations from the ordinary periods will take place; and epidemics may, with but little inequality in their progress, continue to exist for years. Under such circumstances the prevailing malady, although diffused, will generally be mild; and the autumnal exacerbations will give the exact measure of atmospheric influence, which enters into the composition of the cause. When disease spreads to such a degree, as to bring the adventitious causes into operation, sickness and mortality increase with accelerated rapidity.

5. Epidemic diseases occur more frequently in some countries than in others. Even in those countries, which are most exempt from them, in a pestilential form, as modern Britain, there is always, or almost always, some increase of disease, during what may be called the regular epidemic season. In others, as modern Spain, they more frequently amount to a declared pestilence. And, in some, as modern Turkey, in many parts of which they occur in their severest forms, they are almost never wholly absent for a twelve-

month. Could the adventitious causes procure access to that country, in their accredited form, it would soon become a desert.

These different degrees of liability depend principally upon the cultivation of the soil, the police of cities, and the manner of living of the inhabitants. In these respects, Turkey is now, what England was formerly; and vice versa.

It is no less illustrative of my argument to observe, that in the countries most subject to the plague, there are spots which are wholly exempt from that malady: for instance, Essouan, in Upper Egypt, "which," says Mr. Legh, (p. 105.), "has the singular advantage of never being visited by the plague; a privilege for which," he very justly remarks, "it is indebted to the mildness of its temperature, and the prevalence of strong Northerly winds." But will any one affirm that the small-pox would not be propagated at Essouan, to every person within the infectious distance, who had not already had the disease, or was not laboring, at the time, under a disease of an equally or more severe degree?

6. Epidemic diseases occur more frequently in sea port, than in inland, towns. From this fact an argument has been raised in favor of contagion, as if it were an imported commodity.

The sites originally chosen for towns on the sea coast, having been determined, if not by accident or caprice, by the demands occasioned by the vicinity of good ports, or harbors frequented by shipping; elevation and salubrity were, for the most part, either disregarded, or found unattainable. To these circumstances then, and not to their being placed upon the sea coast, are to be attributed, under a due comprehension of the proper causes of epidemic diseases, the more frequent occurrence of these maladies in sea port towns. Accordingly inland towns, in other respects similarly situated, are equally liable to them. In Grand Cairo, and Aleppo, the plague appears even more frequently, than in Constantinople, Alexandria, and Smyrna. Have not Rome, Vienna, Paris, Moscow, Leipsic, Bucharest, Cronstadt, Medina Sidonia, Florence, and Madrid, and other inland places, been subject to epidemic diseases, as well as Marseilles, Leghorn, Genoa, Venice, and Trieste?

Epidemic diseases sometimes prevail in inland towns, in villages, or in the country parts, whilst the neighbouring towns on the coast remain free. This happened, as I have elsewhere related, on the authority of Dr. Russel, in respect to the towns of Antioch, Shogre, and Edlib; and in respect to the adjacent sea port towns of Spain, when the inland town of Medina Sidonia was visited by a pestilence in 1801.

The epidemics of sea port towns have, for obvious reasons, the semblance of being propagated in inland parts, more frequently

than those of inland parts, of being propagated in sea-port towns. The inhabitants of the country are often under the necessity of visiting the sea-port towns on business, and are, of course, very readily affected by their noxious air, when an epidemic prevails; and when they sicken they are supposed to have brought home what is called the contagion. But the inhabitants of the sea-port towns, being under no such necessity, in respect to the country parts, will not often visit them by choice, when they are afflicted with an epidemic: and, if they should, they would not be so liable to be affected, the noxious air of the country not being so injurious to them, as that of the towns must necessarily be to the inhabitants of the country. In either case, an epidemic disease cannot be propagated out of the air, which is its principal cause, although all the inhabitants of the place affected should travel abroad with a view to its propagation; whilst, of the strangers, who might resort, as visitors, to such place, a considerable proportion would undoubtedly be seized, if its cause were powerful, with the prevailing malady. The progress of a contagious disease, it is obvious, would be quite different. The great importance which has been attached by the advocates of contagion, to the fact that epidemic diseases prevail most in sea-port towns, appears to have, on these points, demanded a fulness of illustration, which I should otherwise have deemed superfluous.

They sometimes, according to the progressive operation of the proper causes, commence first in the country, and affect afterwards the towns. In the year 21 before Christ the plague of Syracuse began first in the country.

If it were possible, in the precise state in which they now are as to all other circumstances, to remove Aleppo and Grand Cairo to the sea-coast, and Smyrna and Scanderoon to the interior, their relative liability to epidemic diseases would not be materially altered.

But if any of these towns, being near the sea-side, were placed upon an eminence in wholesome air, without marshes or other sources of noxious vapors in the neighbourhood, even although its houses, streets, water, drains, and population should remain the same, and although ships were daily to arrive in its ports, from countries suffering under pestilence, their crews having pestilential sores upon their bodies, and communicating, as happened in the town of Larnica, with the inhabitants, it would be much more exempt from epidemic diseases than at present.

That towns on the sea-coast should be more liable to epidemics, than inland towns, is easily explicable by difference of situation and circumstances, as well as by the nature of the proper causes of those maladies. They are generally, or almost always, low, some-

times with marshes, stagnant waters, or other sources of impure exhalation in their neighbourhood, often with bad water, and bad draining, and generally narrow streets, mean and ill-constructed houses, and, for the most part, in those particular quarters, which are most subject to epidemics, a very poor and miserable population. In most of these respects, if not in all of them, the inland towns, in general, have the advantage, and therefore they are more healthy. In sea-port towns, too, especially such as are large, there is a greater resort of strangers, both from the adjacent country and from the sea; and strangers are, other things being equal, always the most subject to epidemics. All these circumstances are surely sufficient to account for the greater frequency of epidemics in sea-port towns, without the necessity of having recourse to the non-entity contagion.

Procopius, in his account of the plague of Constantinople in 543, which also pervaded many other countries, observes historically, that it "began still at the sea-coast, and thence went into the inland parts." The advocates of contagion have conceived this fact to be very favorable to their hypothesis; and were it allowable to assume contagion, the inferences drawn from it would be plausible: Dr. Friend infers from it that "Procopius himself must have thought that the disease was propagated by contagion, whatever might be the original cause." (His. of Phy. 1. 158.) But besides that the generation of contagion, here hinted at, is altogether a modern hypothesis, this conclusion is entirely at variance with the whole language of Procopius; who declares, in express terms, the disease to be a direct judgment from the hand of God; and adds, that no physician, or other, had it from attending the sick. And farther, the malady killed instantly, or by an apoplectic paroxysm, which contagion never does.

All the arguments in favor of contagion, built upon this fact, must fall at once to the ground, when it is considered that, in sea-port towns, as in other places, epidemics commence and cease with casual anticipations and postponements at determinate periods, depending upon their degree of latitude respectively. If the diseases of these places were contagious, and capable of being imported from other countries, surely they would appear at all seasons at which ships or vessels could arrive, or rather they would never disappear; for it would be very extraordinary, if contagion could only be imported, and must necessarily disappear at particular periods. But, notwithstanding the many arrivals of ships from all parts of the Levant, at all seasons of the year, at Gibraltar, and other ports of the Iberian Peninsula, we find that the plague (the fever of these parts is nothing else than the plague of the Levant in a somewhat mitigated form) never appears

among them much before August, nor continues much after November.

7. Some descriptions of persons are more liable to be affected with epidemic diseases than the community at large.

A. Strangers in a country. This is observed in all epidemics, but particularly in the yellow fever in America and the West Indies, where the mortality is, in a great measure, confined to persons recently arrived from Europe. (Res. 269, &c.)

B. The young, vigorous, and male part of a community. Males are generally affected in a much greater proportion than females; often in the ratio of ten to one, and sometimes even more. "What is very remarkable," says Rapin, "this mortality (that of the sweating sickness) raged chiefly, or rather only, among men, and those young, and of a strong constitution, or of the best age, between thirty and fifty." In Cadiz in 1800, on a mortality of 7,387 the proportion of males to females was as 5,810 to 1,577, or nearly as 4 to 1. (Res. 1. 15.) In the same city in 1804 the proportion was 2,692 to 200, or upwards of 13 to 1. (Seclo Ret. p. 479.) In the plague of Cyprus, in 1760, 10 men died for 1 woman. (Phil. Trans. 1763. No. xii.) In all of the twenty-three towns of Spain, which were afflicted with pestilence in 1804, the mortality among the men, with one exception, exceeded greatly, in many by more than one half, that among the women; and, in regard to the exception, (the town of Ecija) it seems highly probable there must have been a mistake in the return, since, by reversing the numbers, the ordinary proportions of the other towns would be preserved.

It is, then, an inevitable inference that to the causes of pestilence, males are greatly more exposed than females; and that this cannot be contagion, since, if that were the case, the contrary would happen.

C. As an inevitable consequence of their unavoidable greater exposure to every one of the principal causes of pestilence, the poor are invariably more liable to be affected with epidemic diseases than the rich. The proofs are to be found in the very nature of things, as well as in the history of all epidemics. (Res. 1. 262.)

D. For the same reasons that men are more liable to epidemic diseases than women, and the poor than the rich, servants and laborers are more liable to them than their masters and mistresses. (Res. 1. 263.)

E. Persons liable to exposure to sudden or extreme vicissitudes of temperature, as bakers, blacksmiths, cooks, &c., have been observed to be particularly subject to epidemic diseases. (Res. 1. 264.)

F. Catholics in the Levant, especially Greeks, are, during Lent, more subject to the plague than persons of other persuasions. (Res. 1: 267.) This is a necessary consequence of long fasting. It is also to be presumed, that persons of that persuasion have a firmer belief than others, in the doctrine of contagion, which, in its consequences, tends to increase sickness and mortality. Some of the fasts, in the Levant, it may be observed, happen unfortunately to coincide with the usual epidemic season; and thus both inanition and terror concur to augment the force of the ordinary causes of pestilence; but there are also other circumstances connected with the Catholic faith, which are conducive to the same end. Religious processions under a burning sun, crowding of damp or ill ventilated churches, burial services, &c. &c. &c. It is a remarkable fact to our present purpose that, during the plague of Malta in 1813, the Catholic clergy of the Island, who, to their honor be it spoken, never ceased to perform their duty most heroically, lost twenty-six of their number; a much greater proportion than died of any other description of persons in the community. (Res. 11. 23.)

8. The description of persons who are the least liable to epidemic diseases affords farther proof and illustration of the proper causes of these maladies.

A. Aged and infirm persons, women and children. (Res. 1. 270.) We have already seen that the young, vigorous, and middle aged are more subject to epidemic diseases than the old and infirm; and males more than females. Children are peculiarly exempt from these maladies. In Medina Sidonia in 1801 all the inhabitants were affected, except *children at the breast*. (Res. 1. 271.) The reasons of this are obvious. Children are not exposed to noxious winds, or extreme vicissitudes of temperature. They have, especially those at the breast, sufficient nourishment, comparatively speaking, even when general scarcity prevails. They are not sensible of the impending danger; and are, therefore, exempt from fear. Neither can the institutions of plague police affect their minds. Thus they are peculiarly exempt from the operation of all the causes of epidemic diseases, excepting the qualities of the atmosphere, as existing in their apartments; and these alone are rarely sufficient to produce the malady.

B. Physicians, nurses, and other attendants upon the sick, are generally more exempt from epidemics, in proportion, than other persons of the classes to which they respectively belong in society. From the evidence laid before the Select Committee of the House of Commons, on the fever in London in 1818, it appears, that in the Fever Institutions of London, Chester, Manchester and Waterford, from their first establishment, as well as in the seven great Hospitals of London, in which fever patients are mixed

with others, but very few of these persons, and but very rarely, have been affected with typhus, even since the commencement of the prevailing epidemic; i. e. that they have, upon the whole, been affected in a much smaller proportion than the community at large. I am not aware that a single physician attending any of these establishments has, in the course of many years, been attacked. Even in those rare instances, in which a fever has affected any student or nurse, or other frequenter of the hospitals, the evidence given by the advocates of contagion, respecting its cause, has been very indistinct and unsatisfactory; whilst that of Dr. Roberts, one of the physicians, for twenty-four years, to the largest hospital in London (St. Bartholomew's), speaking in his own name and that of his colleagues, as well as the evidence of most of the other physicians examined, has been clear, explicit, and conclusive. (Report, *passim*.) I may observe by-the-by, that instances of students being affected oftener occur, than of nurses, or other frequenters of hospitals; a fact very easily to be accounted for, and throwing additional illustration on the subject. Students are, for the most part, composed of young men from the country, unused to the impure air of hospitals, or even the more slightly sophisticated atmosphere of the town; and, of course, more easily affected than physicians, nurses, and others, who have resided for many years in town, and accustomed, perhaps, for the whole of the time, to the air of an hospital. They are also exposed to an additional cause of disease, in the air of the dissecting rooms, and other theatres of instruction.

If such diseases were contagious, they would affect those various descriptions of persons equally, who were equally exposed to the cause.

It is very much to the purpose here to observe, that only *two* medical men died of the plague at Malta in 1813, whilst of the priesthood there perished *twenty-six*!

"In August and September, (1709,) the plague raged with the greatest violence (at Dantzic), and several eminent men lost their lives. Of the chief magistrates there died *two*, as many judges, and about *one half* of the clergy; of the *physicians* and *apothecaries none*." (City Rem. i. 276.)

"The next winter, 1557, the quarterne agues continued in lyke manner, or more vehemently than they had don the last yere, with a new sickness or pestilence, as some called it, when throughe it dyed so many priestes, that a greate number of parishes in divers places of this realme wer unserved." (Stowe, 186.)

In fact clergymen of every denomination are, in the performance of their duty, in churches and at burials, and in attendance

upon the sick, independent of processions, &c., exposed, more than any other description of persons, to one of the principal causes of epidemic diseases, in its greatest intensity, viz. noxious air.

C. Expurgators of goods in Lazarettos are less liable to be affected with epidemic diseases than the community at large. Dr. Caruana, President of the College of Physicians of Malta, during fifteen years that he attended the Lazaretto, knew no instance of an expurgator of goods being affected. Dr. Grieve, Superintendent of Quarantine, states, that no expurgator of goods, during the plague in 1813 in that island, was attacked with the prevailing malady. (Res. 11. pp. 21, 31, and 45.)

D. Watermen, (Hodges, 277, 8,) oil-sellers, water carriers, tanners, &c. are believed to be less liable to epidemic diseases than the community at large. (Res. 1. 271, 2.)

9. In epidemic diseases relapses are common occurrences. (Res. 1. 422.)

10. The periods of recovery and death are very various. In general, recoveries are slow, from two weeks to two, or even three months. The periods of death are also extremely various. In the plague of Athens, described by Thucydides, death generally took place from the 7th to the 9th day; whereas, in the plague of Constantinople, in 543, described by Procopius, it frequently killed instantly, by an apoplectic fit, as Agathias says, in one day.

The sweating sickness is said, (Dr. Hancock on water, p. 82.) to have killed, without mercy, in twenty-four hours. In 1517 most of those who were seized died within three hours. (Rapin, 1. 737.)

In 1550 many of the persons seized died, or recovered in nine or ten hours. On another occasion, it is related that this disease killed in six hours. In the plague of Malta in 1803 death is said to have sometimes taken place in the course of a few hours. (Res. 1. 26. Proto. Med. Ans. 9.)

SECTION VIII.

Laws of Contagious General Diseases.

1. They are incapable of affecting the same persons more than once. Assertions of the occurrence of small-pox twice in the same persons, being a species of evidence wholly unbefitting, in disquisitions of science, are to be disregarded. If such diseases be capable of affecting the same persons twice, there can be no good reason why they should not be capable of affecting them oftener; and if that were the case, they would never cease, until

communities were extinguished. In such case persons, as often as they recovered, would be liable, as has been ridiculously asserted of epidemic diseases, to be re-infected by their own contagion. Such phenomena are in direct contradiction to the known laws of nature. To believe that a few individuals may be affected twice, or oftener, with a disease, which all the rest of the world are capable of receiving only once, is, in my opinion, as absurd, as to believe that some individuals may live for ever, whilst all mankind besides are doomed to die.

2. In contagious general diseases the periods of fever, of emption, &c. after receiving the infection, and the periods of the malady at which infection commences and ceases to be capable of being communicated to others, as well as those of recovery, and even of death, are, to a certain degree, determinate.

3. They are capable of affecting all persons who have not already had them, and in every kind of air, upon their specific virus being applied, excepting such as are laboring at the time under some malady of severer degree.

4. They are successive, not simultaneous, in their attacks upon individuals.

5. They never kill, in a few hours, as frequently happens in epidemics.

6. In contagious general diseases no relapses can happen. When a patient dies, it must be either from the original malady, or the intervention of a new disease.

SECTION IX.

Proofs of the Impossibility of the Existence of Contagion in Epidemic Diseases.

When a doctrine of great importance is also of such a nature that, if it were true, its validity might be easily established; but no satisfactory evidence of its correctness has, in a long series of ages, been adduced, we should be justified in at once rejecting it, without examination. And such would assuredly be the fate of the doctrine of contagion, in epidemic diseases, were it now, for the first time, to be submitted to the world. But, finding it actually established, and formally acted upon, in every Christian community, it remains (having, after a sufficiently long experience of its operation, ascertained the injurious manner in which it affects the interests of society) to enquire into its validity.

1. I consider it impossible that epidemic diseases should ever depend upon contagion, because, during the several centuries that

the opinion has prevailed, no proof, which ought to satisfy the scientific enquirer, has, in any single instance, been adduced, of the propagation of an epidemic disease, by contact or contiguity, from person to person; and because, where contagion really exists, there can be no difficulty in detecting its presence; or rather it is impossible not to perceive it. It did not require the evidence of inoculation to convince all the world that small-pox depends upon contagion, and never upon any other cause.

2. I can find no evidence, in history, of the doctrine of contagion, in epidemic diseases, having been formally accredited and acted upon, by any public authority, previous to the sixteenth century. Yet there appears no reason to presume that epidemic diseases have changed their nature since the days of Hippocrates.

3. The absurdity of the grounds assigned for the belief in contagion, and for the institution of quarantine and other establishments of plague police, founded upon it, together with the abject superstition of the age in which they originated, are in farther confirmation of the futility of this doctrine. These grounds consisted of a tradition, that, at Verona in 1511, twenty-five Germans were sufficiently infected by one leathern garment or cap; of another tradition, that a feather-bed shook up, after having lain by *seven years*, had produced a plague at Wratislaw; and of a third tradition, that a young man was seized with the plague, from thrusting his hand into an old trunk, in which there was a *cob-web*, which, *in that instant*, made a plague sore! Such are the actual grounds upon which plague police establishments were successively instituted in the different nations of Christendom.

4. The laws of epidemic, and those of contagious general diseases, as stated in Sections VII. and VIII., are wholly incompatible: plague, typhus, &c., obey the laws of epidemics; they cannot, therefore, be contagious.

5. If plague, and other similar diseases were contagious, consequences would follow which do not take place. Being capable of affecting the same persons repeatedly, they would never cease, where no precautions are taken, until communities were extinguished. Turkey would have been long ago a desert.

6. Phænomena now take place, which, if plague and other epidemic diseases were contagious, could not happen. They commence and cease generally at certain determinate periods; affect some countries, and some classes of the community more frequently than others; often undergo extraordinary fluctuations in their progress; and, for the most part, suddenly decline and cease, at the precise moment when the greatest number of persons are affected.

7. As diseases which depend upon a specific contagion, as

small-pox, are never produced by any other cause ; so diseases, which depend upon other causes, are never produced by a specific contagion. Epidemic and contagious diseases can neither co-exist nor be convertible.

8. The history of every epidemic supplies numerous direct and positive proofs of their incapability of propagating themselves by contact or contiguity from person to person. But a disease cannot choose to be contagious or not contagious. The fact of its non-existence, in so many instances, is, in this case, a proof that it cannot exist in any.

Men living with their sick wives, women with their sick husbands, children at the breast of their sick mothers, and mothers suckling their sick children, are often not affected with a prevailing epidemic. (Res. i. 411—420.) During the plague of Malta in 1813 several women lived with their sick husbands, without suffering in their healths ; and children drew milk from their sick mothers, up to the period of death, without taking the plague. (Res. ii. 28.) This is the most usual course, women being more exempt than men, and children more exempt than women, from the operation of the most usual causes of epidemics.

During my residence at the Pest-house of the Seven Towers at Constantinople, three priests, who successively attended, the clerk, the interpreter, and all the servants of the establishment, were in daily contact, or rather in constant intercourse, with the pestilential patients ; and not one of them was affected with the disease.

The interpreter, and some of the servants, had not previously had the malady, and the others had it not, during a residence at the hospital of several years, although they had, before that period, experienced, some of them, repeated attacks of the disorder. Some, who were inmates of the hospital upon charity, and others who were in the house for slight ailments, as ulcerations of the legs, &c., were in the same predicament. (Res. i. 45.)

It may tend farther to elucidate the subject, if I explain the difference between my own situation and that of the persons mentioned, which occasioned my being seized with the plague, whilst they remained unaffected. The period was toward the end of August, the height of the epidemic season in that country. I was a stranger to the climate. From the day of my entrance into the hospital I had not literally sufficient sustenance. I was laboring under considerable anxiety, if not irritation of mind, by the prospect of having my great object, if not wholly defeated, at least considerably retarded, by the intrigues of the persons by whom I was surrounded. Thus several of the principal proper causes of pestilence were at once in operation. And, surely, no farther circumstance could, in reason, be deemed necessary to account for

my malady. If the disease had been contagious, it is quite impossible that I should have been the only one in the house, who was seized with it, out of above twenty; since the other persons mentioned were in constant intercourse with all the sick of the hospital, myself included; and since the disease is capable of affecting the same persons repeatedly.

9. That when persons laboring under epidemics are removed into pure air, the disease is not communicated to those whom they approach, is a fact universally acknowledged. The advocates of contagion endeavour to explain away this fact, in the following manner: "To the effect of contact," say they, "*a certain disposition of the air is necessary*; for we often see *infected* persons arrive from other countries, *yet the disease does not spread*." (Howard.) But this disposition of the air must, according to the contagionists themselves, be deemed to be the real cause, since that must assuredly be the real cause of an effect, without which the effect does not follow. And, *a fortiori*, the state of the air must be deemed to be the cause, when we find the effect to be produced by that alone, without any contact with the sick; for, to the effect of an impure atmosphere, *contact is by no means necessary* to produce an epidemic. Contagion, therefore, does not constitute the cause, nor any part of the cause, of epidemic diseases. A person, quite isolated, may, at any time, give himself an epidemic, by exposure to an artificial impure air: but as he cannot communicate that disease, by contact or contiguity, to any other person, in pure air, it must be deemed to be destitute of the characteristic of the very essence of a contagious malady; *which consists in the faculty of propagating itself equally in every kind of air*. This confusion of ideas could only have arisen from not attaching a definite meaning to the words used.

The following instances are in proof of the above position.

In a plague, which raged at Santa Cruz in the island of Teneriffe, many of the sick were carried to the city of La Laguna, three or four miles distant, where some of them died; the people of La Laguna visited and conversed with them; yet not one of the inhabitants were affected with the disease, excepting such as had been at Santa Cruz. (Res. 1. 349.) The same thing has been invariably observed of the epidemics which have occurred in America and the West Indies. (Res. 1. 348.) In a plague, which affected Medina Sidonia, which is thirty miles inland, none of the neighbouring sea-port towns of Spain, with which it had communication, were affected. (Res. 1. 260.) In April, 1759 a Turkish vessel from Alexandria was wrecked off Cyprus, and a great part of the crew who escaped, happened to have the plague. Two more vessels arrived about the same time, both of which landed passengers and

sailors ill of that disease. The malady prevailed, at the same time, in other quarters of the island; peasants and mule-drivers from those quarters, with pestilential sores upon their bodies, daily frequented the streets and markets, and some of them died in the houses of Larnica. *Yet none of the inhabitants of that town were then seized with the plague; although it suffered severely from that malady the following year, in the months of February and March, from twenty to thirty persons dying daily!* (Res. i. 345.) The explanation is obvious. The disease was not contagious; but produced by the atmosphere.

Upon another occasion persons ill of the plague came from the mountains to the towns of Antioch, Shogre and Edlib, and died in the families where they lodged; yet the distemper did not spread among the inhabitants. (Res. i. 345.)

In 1813, out of above eight thousand persons that encamped upon the neutral ground at the commencement of the epidemic of Gibraltar, no disease appeared; whilst of those, who remained in the garrison, 2847 were attacked, of whom 904 died. (Fellowes, 452, 3.)

The 8th battalion of the 60th regiment, being encamped on the Governor's meadow, were removed into town, and quartered in the cooperage range; where they were immediately attacked by the fever, and both officers and men suffered severely. *Upon being sent back to the encampment the disease immediately ceased.* (Burnet.)

After the removal of Dillon's regiment to the camp in the Governor's meadow, while the men were allowed to enter the town on fatigue duty, the fever still continued to prevail: but from the day of their confinement to the neutral ground they were quite free from it, *although they had equal intercourse and communication with the inhabitants coming from town, in which the disease was, at that time, very destructive.* (Burnet, 437.) These facts contain a double illustration.

On this subject evidence might be almost infinitely multiplied. But there appears to me to be already an abundance, if not a superfluity of proof.

If any weight were, in such a case, due to the authority of numbers, even this, in respect to the epidemics of Gibraltar, would now be found to be in favor of my argument. Upon their votes being collected, more than one half of the medical officers of that garrison were against contagion, in the fever of 1814. (Burnet, p. 439.) It must be obvious that upon my own principles, I cannot consider this as intrinsically a good argument in my favor: but it is at least good in so far as it is a proof of the diminution of that prepossession.

sion, which was wont so universally to prevail, in favor of the opposite side.

10. After all that has been stated, it is scarcely necessary to add, that quarantine is found to be wholly inefficient for its professed object. In Gibraltar, and other towns of the Peninsula, the plague has appeared of late years, even more frequently than before the establishment of quarantine in these places, and more frequently than in other places where there is no quarantine. It prevailed at Gibraltar four times in the course of ten years, from 1804 to 1814, notwithstanding all the vigilance of the plague police; whilst, in Wallachia, and its capital, Bucharest, through which all travellers from Turkey pass in proceeding to Germany, and other parts of the North and West of Europe, and where there is neither quarantine, nor plague police, it has occurred only once in twenty years. On that occasion it observed the same periods of commencement and cessation with the epidemic, which happened at Malta the same year, although at the latter place there was a remarkably strict plague police. In 1813 when, in consequence of learning that the plague raged at Malta, the greatest possible vigilance was exercised by the plague police at Gibraltar, the disease commenced in that garrison precisely at the same period of its attack, run its usual course, and ceased at the usual time! (Res. I. 443.)

But quarantine and other establishments of plague police are not simply inefficient; they are positively mischievous. (Section VI. and VII.)

SECTION X.

Inutility of Quarantine, &c. in England, supposing Contagion to exist in the Plague.

Even supposing contagion to exist in the plague, it would appear that a sufficient quarantine is performed, during an ordinary passage from the Levant to England, in respect to crews and passengers, when the plague does not actually exist among them; and that any detention upon their arrival, beyond what is necessary to ascertain that none of them are affected with that disease, must be superfluous.

And with respect to goods, the inutility of any length of quarantine is still more palpable. Even if it were undoubtedly true that contagion does exist in plague, and that goods, wares, and merchandise, as has been supposed, are capable of retaining, and of communicating the infection, after a period of seven, fourteen, or

twenty-one years, it is a flagrant absurdity to expect that any benefit could be derived from a quarantine of forty days, upon these articles.

*With respect, however, to this presumed capability of merchandise to retain and propagate an infection that does not exist (there is no doubt of the capability of many articles to retain and to propagate the contagion of small-pox); the formation of a scale of different degrees of susceptibility has been nothing more than a mere exercise of the imagination. Thus the classification of goods into articles susceptible in the first degree, susceptible in the second degree, and non-susceptible of infection, is not founded upon any intelligible data, but a series of mere gratuitous assumptions.

I think I have now made good my case. It is quite absurd to allege, that, to discharge the evidence of tradition, testimony, assertion and authority, in matters of science, which can be submitted to the test of experiment, is to discredit the honor or integrity of those persons, who may have suffered themselves to be deceived, deluded or bewildered into a belief in false doctrines. This observation forcibly applies to the belief in the validity of the extraordinary hypothesis of contagion, in epidemic diseases; in favor of which such stupendous masses of this species of evidence have been accumulating for ages. The decision of so momentous a question, it is obvious, ought not, and, in this enlightened age, cannot be allowed to depend upon the numbers or authority of the advocates of either side. Against a species of evidence altogether unbecoming science, I have here adduced even a superabundance of proof, negative, positive, circumstantial, analogical and *ad absurdum*, that plague, or other epidemic diseases, can never depend upon contagion. It has also been shown that the consequences of the contrary opinion have been productive of much injury to society. And the proper causes, as well as the most efficient means of prevention, of these maladies, have been, I trust, rationally explained.

But, if the results of my experiments, researches and reasoning should still be regarded as inconclusive, it will be easy, and cannot but be desirable, to institute such farther enquiry, as may bring the question to a final issue. In that case, should it be thought that my peculiar experience may have qualified me for the task, it would be gratifying to my feelings to be enabled, under such high sanction as the undertaking assuredly merits, to devote my time, and whatever talents I possess, to the completion of so useful an investigation.

SECTION XI.

Prevention of Plague, and other Epidemic Diseases.

Removal, or flight, from the place where pestilence prevails, was recommended, as the only preventive, first by Hippocrates, then by Celsus, and afterwards approved by Galen. This proceeding was recommended expressly with a view to escape from the influence of the noxious air, which they considered as the cause of epidemic diseases; but by no means, with the intention of avoiding communication with the persons, who were affected with them.

In modern times, under the belief in contagion, the practice has been, to avoid the persons affected, and to remain, frequently by compulsion, exposed to the influence of the noxious air, which is almost always one of the causes, often the principal, and sometimes the sole cause of these maladies.

In countries where no compulsory measures of precaution are enforced, as where the dominant population do not believe in contagion, those, who do entertain that belief, have recourse, in times of pestilence, to voluntary confinement.

This is the uniform practice of the Frank inhabitants of the Levant. And as the security which has been supposed to be derived from it, has tended to support the common delusion, respecting the cause of plague, it is proper that I should here endeavour to put this matter on its proper footing.

That persons who shut themselves up in their houses, during the prevalence of an epidemic, in the Levant, are, *cæteris paribus*, less liable to be seized with plague, than those entertaining a similar belief in contagion, who freely expose themselves to all the vicissitudes of the weather, there can be no good reason to doubt, on many accounts. In the first place, the mere idea of security from such an evil confers, to a certain degree, a real exemption. In the second place, persons, who are in a condition to follow these precautions, must be presumed to reside, if not in the most healthy, at least not in the most unhealthy, part of a town, which is the usual seat of an epidemic. They, besides, at these seasons, inhabit the upper stories of their houses, in order to get as far as possible out of the reach of the supposed contagion, and by having their windows well sashed and glazed, as well as generally shut down, in order that no stray particle of the contagion may gain admission, they are pre-

served from the influence of the noxious winds, which usually blow at those periods. Persons, employing these precautions, have always adequate means of procuring subsistence, and the ordinary supply of provisions, under such circumstances, never meets with interruption.

Thus, by having a due supply of the necessities, comforts, and even luxuries of life, tranquillity, and a fancied security from the imaginary cause of the disease, persons shut up are enabled to maintain, in voluntary confinement, the vigor of the animal frame, as well as to mitigate the operation of the real causes of pestilence. And if they must necessarily be subject to considerable anxiety of mind, whilst in this situation, they have, however, the consolation to know, that, different from those who are amenable to the compulsory plague police regulations of Christian states they can put an end to their imprisonment at pleasure.

But this seclusion, in time of pestilence, can only be practised, with any prospect of benefit by the rich, who have a sufficiency of the comforts of life, and their residences in a comparatively salubrious situation. It would be no advantage to the poor, but on the contrary a detriment, to confine themselves, more closely than usual to the impure air of their ordinary habitations. If, to a limited extent, and under certain circumstances, then, this practice should prove to be of some utility, upon similar principles with those by which it happens that women are more exempt than men, and children more exempt than women, from epidemic diseases; the grounds, upon which it is employed, are nevertheless erroneous. And there exist proofs, that, under the delusive opinions entertained respecting the causes of epidemic diseases, it is a mere chance, whether the practice of shutting up be so conducted as to prove beneficial or otherwise. At Malta in 1813 those, who thus secluded themselves, are said to have escaped in a greater proportion; whilst, at Malta, those who observed similar precautions are said to have suffered in a greater proportion than the community at large. The difference must have principally depended upon the situation of their dwellings respectively, in regard to air, &c. The same thing has happened to the inhabitants of convents, and other secluded persons. Instances of greater suffering, and of greater exemption than belonged to the community at large, are related, in regard to these institutions, during the plagues of Marseilles in 1720, and of Naples in 1764. In 1513, during a pestilence, which raged in London, there died in one house in the Minories, twenty-seven professed nuns, besides servants, and others of the house. (Goodwin, p. 18.)

This practice is, therefore, generally speaking, not efficient, or applicable to communities at large: and must be injurious, by de-

taining those persons, who could depart, exposed to the noxious air which is the principal cause of the dreaded malady, as well as by turning the attention from those means of prevention which are appropriate and efficient.

The real causes of epidemic diseases being properly understood, and the public being at liberty, in times of pestilence, to consult their own safety in their own way, there can be no doubt that those who now shut themselves up would remove into another atmosphere; and that such part of a community as cannot go to the expense of a removal, and upon whom pestilences most heavily fall, would be removed by their governments or municipalities.

It being no part of my object to treat of the means of prevention, medically considered, I here limit myself purposely to a view of those measures which depend upon popular belief, municipal regulations, and legislative enactments; and now therefore conclude.

N.B. It will be observed, that, in the foregoing summary, I have, with a view to propitiate enquiry by avoiding matters which might, by admitting of a political interpretation, have created opposition, wholly abstained from discussing one of the chief causes of the fever of the United Kingdom, viz. the absence of the accustomed occupations of the laboring classes of the community. Its introduction was the less necessary, on this occasion, that the *plague of the Levant* was the subject professedly under discussion. But I think it right to observe, that this frequent cause of disease was neither overlooked nor omitted from inadvertency; as well as to announce that it is my intention at an early period to treat fully of this matter, as connected with the prevailing epidemic of Great Britain and Ireland, in order that, as a result of this controversy the questions at issue, may, in respect to all future epidemics, be for ever set at rest.

Bucklersbury, October, 1819.