

How is the cholera propagated? : the question considered, and some facts stated / by an American physician.

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HOW IS
THE
CHOLERA PROPAGATED?

THE QUESTION CONSIDERED,

AND

SOME FACTS STATED.

BY AN AMERICAN PHYSICIAN.

LONDON:

PRINTED FOR JOHN MILLER,
HENRIETTA STREET, COVENT GARDEN.

1831.

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HOW IS THE CHOLERA PROPAGATED?

THE history of most of our epidemic diseases, it must be acknowledged, is but a record of the extent of their ravages, and the horrors which follow in their train, with some of the phenomena which accompany them. We search in vain through the most faithful of such records, ancient and modern, for the laws that govern their coming and going; and even, at the present day, when our researches have been so far extended into physical nature, it is best for us to confess that we still know but little of their origin and mode of propagation.

That it is a subject of the most momentous inquiry, and well deserving the attention of men of observation, the appearance of so fearful a disease as the Asiatic Cholera in England, after having invaded, in its fatal march, so many empires, and called forth so much speculation, sufficiently attests. Whence originated this fearful disease?

and how is it propagated? are problems which medical men are called upon to solve, and in which humanity has the deepest concern. The writer of these observations has never seen the disease as described by those who have watched its progress in Asia, and since it came into Europe; but his observations upon many of the diseases of America, generally believed to be communicable, and attended with a mortality not less than Cholera, induces him to record some of the facts ascertained, in the hope that they may prove useful at the present time, and lead to a stricter scrutiny into the cause and prevention of this fatal malady.

It will not be pretended, that there is any parallel between a disease which has extended itself over so many degrees of latitude, through the snows of winter, and the heats of summer, and one which comes after the vernal equinox, and is invariably checked by the first frost of autumn; yet it may be equally true, that their mode of propagation, when the cause is in activity, is the same.

According to the opinions of the earlier writers on the epidemic Yellow Fever of the West Indies, the disease was looked upon as of African origin, and as being communicable from body to body in an eminent degree. This view of the case, so

afflicting to humanity, prevailed for a long time, and has only given way after the closest examination, and upon the recorded testimony of so many able and ingenious men who have watched the origin and progress of the disease, and have taken a more enlightened view of the subject. At the present time, while nineteen-twentieths of the medical observers on the other side of the Atlantic have abandoned the idea of contagion, or the communicable nature of this disease from one body to another, and have gradually yielded to the testimony of their countrymen, who annually observe its progress on the Atlantic border, or on the banks of the Mississippi; few European philosophers have changed their views with regard to its contagious nature, and everywhere quarantine regulations are instituted to prevent its importation. With all the intercourse which England has had, since this disease was first observed in her possessions beyond seas in three quarters of the globe, (and how mortally her able writers have well described,) the fact of its importation and propagation at home, extended as her commerce has been, is unknown. At the same time, in the South of Europe, and upon the shores of the Mediterranean, where quarantine laws are excessive

in rigour and preserved at the point of the bayonet, the disease has often appeared, and with the same malignancy which sometimes marks its progress in America. How shall we reconcile facts so contradictory to the laws which we know to govern in those diseases which are strictly communicable or contagious? The Small Pox, unknown in America at the period of its discovery, was carried there, and has spread itself over the whole continent at different times, from the hut of the Esquimaux at the icy cape, to the miserable natives of the Terra del Fuego. It is strictly a communicable disease, and the laws which govern its progress are well understood. Can the same be said of the Cholera or Yellow Fever? I apprehend not, at least in the present state of our knowledge; for, although it is certain that each of these diseases is propagated from one place to another, it may well be doubted whether they pass from one body to another, or through the medium of those morbid secretions of the human system which preserve and multiply the sources of infection in contagious diseases. This is the great and interesting subject of inquiry; and I shall proceed to state for consideration, at a time when the country is threatened with so dreadful a scourge as the Asiatic Cholera, some of the obser-

vations I have made upon the propagation of the great and fatal epidemic of America.

There are so many evidences of the causes of fatal fevers originating under certain conditions of the atmosphere, in all parts of our globe, and disseminated through the air, sometimes slowly, and sometimes rapidly, over vast regions,—the disease appearing in the same type at different places, with greater or less mortality,—that the fact may now be considered as well established. The medical history of England abounds with interesting matter upon this subject. That the Plague, Yellow Fever, and perhaps the Asiatic Cholera, thus originate and are disseminated, is very probable; for these diseases, if they were communicable, like Small Pox, and capable of being multiplied like it, through the morbid secretions of the body, would long since have visited the four quarters of our earth with the most awful destruction of the human family. That infectious diseases, in their progress, obey very different laws, is, however, evident from the well recorded testimony we possess, of their manner of appearance and disappearance. They are all the endemics of certain latitudes; but sometimes change their characters, and become epidemic, and very mortal in their course. The Yellow Fever of America, it is

well known, prevails annually, between the months of May and November, in the Antilles, and on the Continent, from the Gulph of Mexico to Cape St. Roque. At Havanna, on the Mississippi, at Vera Cruz, and on the Orinoco, it is the same disease, with the same symptoms ; obeying the same laws ; varying in intensity at different periods, — one year very malignant, and the next comparatively mild. That it is produced from a gaseous emanation, the origin and force of which is regulated in a peculiar manner by temperature, is now well understood. The interesting fact stated by Humboldt, that the *vomito* never appears upon the table lands of Mexico ; and what is strictly in accordance with the observation of every one, that the disease comes with the heat of summer, and vanishes with the first frosts of autumn, are corroborative of what I have stated,—that the cause of this disease is gaseous, and is propagated through the common atmosphere we respire.

It is reasonable to believe, that most of the formidable diseases to which we are subject are received through the respiratory organs ; and there are some facts connected with the propagation in this way, of the formidable fever of which we are speaking, that are very interesting. It has been observed, that persons sleeping in the lower parts of houses,

or in the open air, are more liable to take it than those who occupy the more elevated apartments ; and those who are cautious of exposure to the night air are also less liable to the disease than others. Vessels lading at the wharfs of cities where the atmosphere has been known to be much charged, have taken it with them to distant climes ; and although the captains and crews have not fallen victims to the disease, yet upon the cargoes being discharged in other ports, persons newly exposed have taken the disease ; and, in a climate favouring its propagation, whole towns have occasionally become infected, and great mortality ensued. When, from the heat of climate and condition of the atmosphere, the poison of this disease is generated or introduced, germs are diffused as if from a common centre, and thus the infection radiates, tainting the air in every direction ; but it is found invariably to lessen in intensity, the more it becomes diffused. The first cases, in all epidemics of this description, are usually the most fatal ; and where the infected air has been pent up in narrow and confined streets, the disease has often been observed to spread in a direction corresponding with the currents of air. A knowledge of this fact has led to the immediate removal of the citizens, and the boarding up of

those streets in which the pestilential air is known to exist. A great portion of the population of the city of Baltimore was thus saved in the year 1819, when this disease appeared in that city in a mortal form. Another fact in regard to the mode by which this disease is propagated, is now well known to the commanders of vessels of war. It is, that almost invariably where ships are moored in a direction to catch the land breeze of the Tropics, particularly in the vicinity of towns, the most fatal effects result. A frigate, which was thus exposed at Port au Prince, St. Domingo, in the year 1823, the crew of which, on her arrival, were perfectly healthy, lost one-third of her men; and, upon returning to port, infected many who respired the air of her interior. The succeeding year, another remarkable instance was presented in the case of a sloop-of-war and store ship which came into port from the West Indies. The officers and men, engaged in breaking bulk in both of these vessels, were taken with malignant Yellow Fever, and most of them died. All commanders acknowledge the difficulty with which the change of an impure atmosphere on ship-board is effected, — the resort to wind-sails and other means has not always proved available. Fortunately, the discovery of chlorine

in its combinations with lime or soda furnishes a convenient, and, it is believed, an effective agent through which the miasmata producing fever are decomposed, or rendered harmless. The author formerly communicated to government the result of his observations upon the manner in which the Yellow Fever was propagated, and has since derived great satisfaction from the complete success which has attended modes of prevention then pointed out. It is melancholy to reflect, that a loss of many valuable lives has attended the efforts to suppress piracy in the West Indies, from want of knowledge of a fact so simple as that above stated. At the present time, ships of war of the first class visit these islands during a prevalence of the epidemic fever; but by keeping out of port, (though they hold constant communication with the shore by means of boats,) and by attention to cleanliness and the free use of chloride of soda, they are preserved, during the most sickly seasons, in a perfectly healthy condition. How the exhalations so noxious and fatal to human life are generated, it is best at once to say, we are perfectly ignorant; *causa latet, vis est notissima* is perfectly applicable here; and, without entering into any theory or

speculation upon this interesting subject, my whole aim is to direct the attention of the medical profession, at the present important crisis, to a strict observation of the manner in which the Asiatic Cholera is disseminated; for upon this correct knowledge must depend all preventive means and the safety of the population. It may be a disease communicable from body to body, and obeying, like Small Pox, all the laws of a contagious disease; but it has occurred to the writer, from what he has read upon the subject, that Cholera, like Yellow Fever, has in truth no common attribute of a disease strictly contagious, and that we must look for some other solution of the manner in which its germs, so fatal to life, are produced and sown.

It is evident that no chemical combination exists between our atmosphere and the miasmata of which we have been speaking, but it would appear, that they are received and held in solution, and thus diffused, sometimes very extensively, and, in the instances of Yellow Fever and Plague, would often be much more so, were it not that the infecting miasmata are specifically heavier than the atmospheric air. It has been a question with naturalists to what extent the pollen of plants is active when conveyed by the atmosphere;—that there is a limit

to this activity, in both cases, there can be no doubt; for the more extended the diffusion, as before observed, the less the activity and power of infection. An early removal of the population from the sources of infection, and an immediate interdiction of the healthy from diseased parts of a town, are of the first importance in arresting many of our epidemic diseases; and, should the Asiatic Cholera prove thus communicable from one to another, will be the only efficacious means which can be resorted to, and by which we can arrest its course, or prevent its communication through the foul air of vessels coming from infected ports. The contagious nature of this disease has been rather hastily inferred from the fact of its following, both in Asia and Europe, the great rivers and masses of population; for it accords with observations both of ancient and modern times, that many diseases, such even as are not ranked as contagious, are diffused over Continents in a direction contrary to the currents of air, and with a certainty which defies all human means to avert or arrest, and that these diseases are generally mild when extensively diffused, and become malignant when the cause is concentrated. Now, it is not difficult to conceive that a concentration of the cause of Cholera producing its malig-

nant form, should take place in camps or in the crowded or ill ventilated portions of cities, generally inhabited by the poorer part of the population, and that in this concentrated form it should be carried along the courses of rivers in vessels, or over the highways of nations. What medical man is there who does not know the fatal effects of confining any quantity of diseased persons to narrow and ill-ventilated apartments? Yet, will this be called contagion? Small Pox produces its impression fully wherever taken, and multiplies itself. Not so with jail or hospital fever, which we all know to be infectious only at the source whence it emanates, or through clothes which have not been properly ventilated. That all the gases which poison the sources of life through the lungs, obey particular laws, which are modified by temperature, appears very certain. I might instance the generation of the cause of Yellow Fever at a continued temperature over 80° , and the entire loss of its activity when the thermometer is low enough to occasion frost. It has been observed of the epidemic Influenzas of the United States of North America, that they originate in the Autumn on the borders of the great Lakes, and after passing over the Continent in a direction parallel with the sea, with a

certainly the most extraordinary, disappear in the milder climate of the Gulph of Mexico, or are lost in the boundless forests beyond the Mississippi. The Influenza, in its course, rarely spares any of the population, but is seldom fatal, except in cases of old people. So regular is its march, that its appearance in one town is the certain signal of the next becoming afflicted with it, and sooner or later, according to the distance which separates them. The singular appearance, also, a few years ago, in the Antilles, of a fever with rheumatic symptoms, familiarly called the Dangué, which, after passing through the islands, visited the coast on the Gulph of Mexico, and extended itself from the sea to the mountains, and as far north as the Capes of the Chesapeake, is another instance. The universal diffusion of this disease was so remarkable, that few, or none of the population escaped in those regions through which it extended. It was communicated through the atmosphere, and appeared capable of being propagated only where the climate was regulated by a certain degree of temperature, for no restrictions whatever were imposed upon intercourse of the population from south to north. This disease was believed to be highly contagious, and in the West Indies, where it first appeared, was declared to be

imported, as all bad things are, from Africa.

Not only does temperature influence these causes of fever, but it is equally certain, that their deleterious character may be often changed or modified through the general use of certain articles of fuel, as bituminous coals, &c. A most remarkable evidence of this fact occurred upon the Mississippi in the years 1821—22. Such was the mortality which, during those years, prevailed in the city of New Orleans, and so highly infected was the atmosphere of that city, that the ships and steam-boats which left the wharfs with passengers, often lost many on board before reaching their places of destination. In one case, a steam-boat with passengers ascended the river, and, deserted by all who had the power to escape from her, was not visited until the returning Autumn brought a more salubrious atmosphere, when the bodies of those who had perished on board were found in a putrid state. It is worthy of remark, that during great mortalities, the Robert Fulton, a steam-ship, burning *coals*, continued to make her trips with no loss, from the fever, of those on board. It has been observed, that since the general use of coals in London, there has been a comparative decrease in mortality, and that Plague has been unknown. Can it be that Plague and Yellow Fever, diseases

similar in their characters, and communicable in the same way, but generating no specific virus, depend upon the same cause, and have a common origin? Is the Cholera a dissimilar disease, or does it depend upon a specific contagion for its propagation?

Too much stress has been laid by physicians upon the different forms and symptoms which diseases assume, in different climates, in determining their causes and origin. The records of the art afford abundant proof that, in the same country, at different seasons, various orders of parts are affected from the same common atmospherical cause, exhibiting different symptoms;—thus at one season, the serous membranes, at the next, the mucous. The cause of Yellow Fever generally invades the seat of life, through the sero-membranous structures, while that of Plague attacks the sero-mucous,—the mucous membrane of the gastro-enteric system is the seat of the fatal Cholera. The violence of the attack in these diseases being modified always by the intensity of the cause, and the condition of the body invaded.

It is objected to the atmospherical transmission of the infection of pestilential fevers that we do not see them becoming general, as in the more marked instances which we have noticed of the Influenza and Dangué, and extending to the whole

population. Our atmosphere, like other fluids, is capable of receiving, and without any change of its constituents, of transmitting other bodies ; the extent of transfusion must depend upon the greater or less facility with which the foreign body is taken up, and upon the greater density or rarity of the atmosphere itself. We know also that the presence or absence of both heat and light influences noxious exhalations and their dissemination through the air. We can thus readily account for the cause of the Yellow Fever never extending to the table lands of Mexico ; and we have somewhere read of a *Padrè*, in South America, who saved himself during the prevalence of a formidable malignant fever, by retiring at an early hour every day to his hammock, which was swung in the branches of one of the highest trees of the forest. The force of the causes producing malignant fevers would appear to be generally proportioned to their density and consequent difficulty of diffusion through our atmosphere.—This law is but another evidence of the wisdom which has provided for the preservation of our species ; for, were it otherwise, and did not the air act as a diluent, few would escape. In the American epidemic, the most malignant and fatal cases have occurred from persons going into houses in streets

which were infected, after the pestilence had subsided, and before they had been ventilated. The same remark, it is believed, has been made in other countries after malignant fevers have prevailed.

The difficulty attendant upon the removal of the people from that part of a city which becomes infected, is very great, and no doubt it has not escaped a board so able as that which now watches over the health of London, that it is best done by a very early warning to the inhabitants near the source of infection, and a subsequent exclusion and entire prohibition of the population from that part of the town. The poor are to be provided for, and, as it is much easier to do so in health than in sickness, should the infection reach the metropolis, the sooner they are removed from the streets in which it makes its appearance, the better. Much attention must be paid to clothing. In the Winter of 1815, a disease highly infectious, and unexampled for its mortality, broke out among a body of men who were quartered in a large stone building, and who were confined to it, except when on duty. It commenced in a corner of the house, and spread with rapidity. So prostrated were the powers of life in healthy vigorous young men under its attack, that in many cases, the first

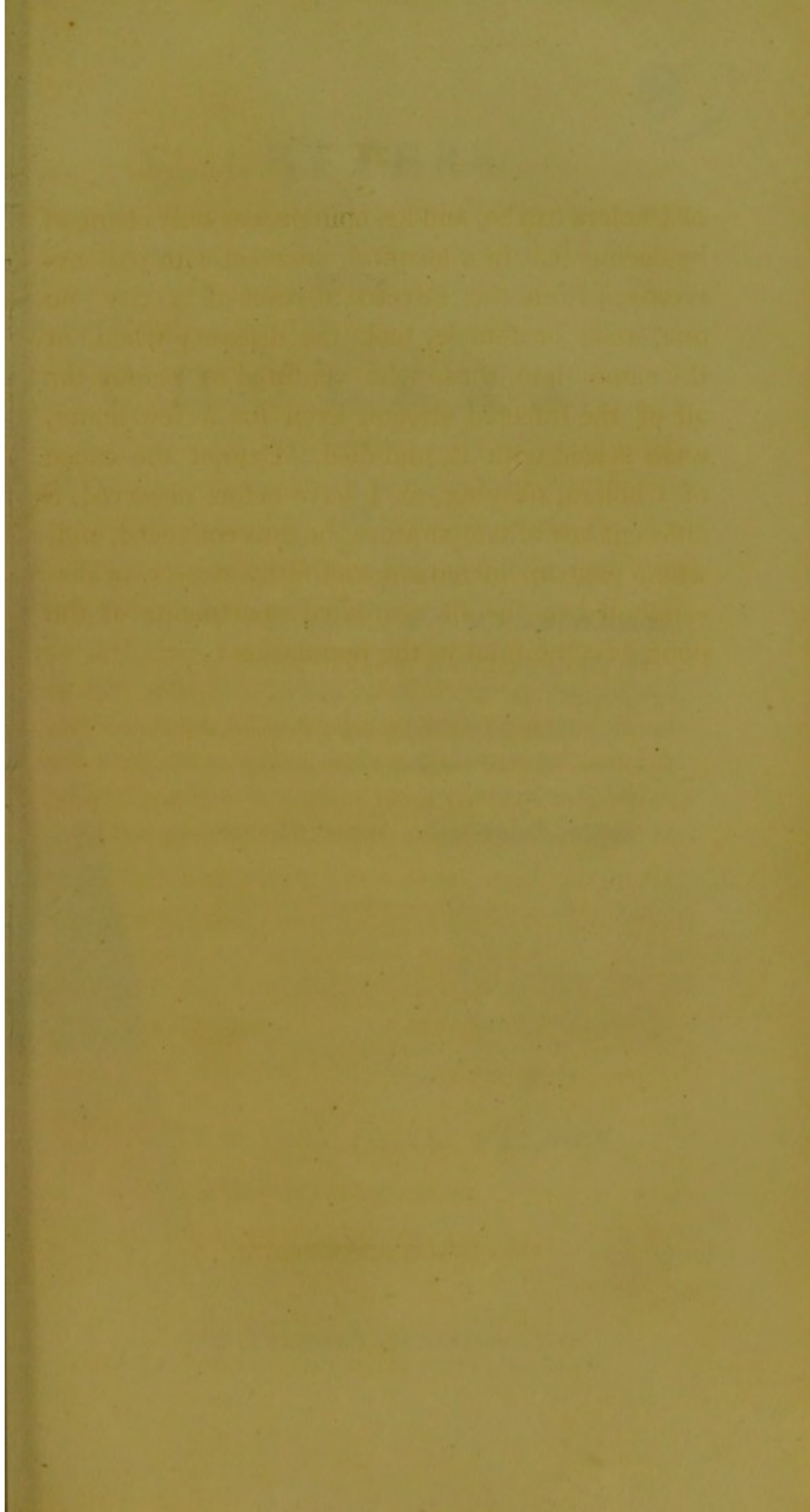
paroxysm was mortal. Two-thirds of those taken died. The disease was completely arrested by changing the clothes, and putting the men into tents, although eighteen inches of snow then covered the ground.

If, indeed, Cholera depends upon a specific virus, and is communicated through contact, then it is not asserting too much to say, that all the cordons of troops in the world, with the most active and vigilant exercise of the power of the different Governments of Europe, will not prevent its extension ; for what disease have we been more interested in preventing the spread of, than the Small Pox, and has it not gone from the hut of the peasant to the palace of the prince, in every quarter of the earth ? But if, on the other hand, the germs of this disease, which, it is probable, can only be changed by a very high or low degree of temperature, are disseminated by means of the foul air of cities, which is carried from place to place by different modes of communication, then its mortality can be lessened, and the population of many nations saved, by the immediate removal, where the disease occurs, of those infected, to a more healthy atmosphere, and the exclusion of the other portions of the population from such infected places, until a thorough ventilation and cleansing,

through means of the chloride of soda or lime, can be fully effected. The fact that the removal of the population, and closing up of the infected streets, has often prevented the spread of Yellow Fever in the transatlantic cities, is worth a thousand theories on the subject.

In the foregoing pages, if a single hint which has been given should lead to a more correct knowledge of the origin and propagation of the fatal malady which now threatens this metropolis, the object of the writer will be fully attained. In conclusion, he would only remark, to those medical gentlemen who may have an opportunity of observing the disease, that it is necessary, for the attainment of truth, that we should lay aside the dogmas of the schools, and dispossess ourselves of all preconceived notions on either side of the question of contagion, or non-contagion, and not too hastily to make up our minds, or give opinions upon this subject. Let us attentively watch and diligently inquire into the causes and mode of propagation of this enemy of the human family in a new shape. The writer was once as firm a believer in the contagious nature of Yellow Fever as any advocate for the contagion

of Cholera can be, and his opinion was only changed by seeing that in a hospital, crowded with patients removed from the infected district of a city, no one, male or female, took the disease; when, at the same time, those who ventured to respire the air of the infected streets, even for a few hours, were seized with it, and died. Cannot the cause of Cholera, obeying, as I have before observed, a different law of temperature, be thus conveyed, and, when pent up in narrow and filthy streets, or disseminated to the ill ventilated apartments of the poor, become fatal to the population?



LETTERS

ON THE

CHOICE

BY

WILLIAM AINSLIE, M.D., F.R.S., M.R.S.E.

"O' Lord, greatest, doth I love his quene's face."—*W. B.*

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