

mination of this question cannot affect the historical truth of the foregoing observations: but the general dread now existing of the appearance of cholera in its worst form—in a form which has proved alarmingly fatal for many months past in many cities of Europe,—gives to a description of this disease as it has at different times appeared in various parts of the world, and in this country, a great degree of interest; and an exposition of its nature cannot fail to impress on the minds of those who peruse it the best methods of avoiding it, or of controlling its ravages.

That the disease has actually appeared in England is no longer a matter of doubt. That it has already carried off many of the aged, the sickly, and the intemperate, at Sunderland, is stated by a physician who is well acquainted with the Indian form of the malady*. Its progress from Sunderland to other towns, although slow, has been certain;—and in one place, Gateshead (a close and dirty neighbourhood connected with Newcastle by a bridge across the river Tyne), it seized upon its victims with a frightful energy †. But whether the progress of this disease be slow or rapid, every man in his senses will do his best to guard against it, and spare no pains to understand what may be expected, and how it may be best overcome if it should attack him.

* Dr. Daun.

† See Postscript, p. 204.

CHAPTER II.

DESCRIPTION OF CHOLERA.

THE disease which is called *Cholera*, or Asiatic Cholera, or *Cholera Morbus*, or *Spasmodic Cholera*, is often spoken of as one which was unknown until about fifteen years ago; but it is evident, from the description of the older writers, both of India and of Europe, that the disease had frequently been seen before. Its appearance is shown to have generally been as sudden, and its attacks to have been as violent as in later times. Persons in full health became all at once seized with convulsions, and died in a few hours; the disease in these respects resembling one which the Indian writers describe, if not indeed the very same disease, and in which the whole case is often comprehended in the words "*Being seized with vomiting and purging, he immediately died.*" In the year 1781, a division of Bengal troops, under the command of Colonel Pearse, was attacked by the disease with as much fury and with results as fatal as if it had encountered the enemy: men who seemed to be in good health became suddenly ill, and dropped down "by dozens," dying almost im-

mediately. At an Indian festival in 1783, above twenty thousand of the people there assembled were destroyed by cholera.

But it was not until the year 1817 that it began to excite general attention, caused great alarm, and became the subject of careful observation. In that year it prevailed in India most extensively, beginning without any known cause, unless some irregularity in the seasons can be looked upon as such, and continuing to spread in every variety of season and weather, in every variety of heat and cold, and rain and drought, attacking Indians and Europeans, and people of all constitutions.

It commenced in Bengal, from which part of India it has hardly ever since been absent; in the next year, 1818, it passed on to the Coromandel Coast, or Presidency of Madras, where, with the exception of two years (1826-27), it has, more or less, ever since prevailed. In the same year (1818) it visited the coast of Malabar, or Bombay Presidency, and spread to the Burmese empire; and it is traced in 1819 to the islands of Penang and Sumatra, to Ceylon and Malacca, and to the Mauritius; and in 1820 to China, and successively throughout large portions of Eastern Asia; to islands in the African Ocean; to Arabia, to Mesopotamia, Syria, and Judea, in 1821; to Persia in 1822. At length it appeared in Russia. It extended to Poland in March, 1831; it appeared in Prussia in May, and also in Austria. In June it reached St. Petersburg: in October

it appeared at Hamburgh, and in the same month its existence in this country was first discovered.

The cholera, as it has always appeared in India, may be thus described. After reading the introduction to the present volume, there will be no difficulty in understanding the whole of the description.

Unlike many diseases, the cholera often begins without what may be called warning symptoms. Sometimes the patient is first affected with nausea, or slight irritation of the bowels, or pains or cramps in the legs; but very often there is no warning at all. Perhaps the patient, on awaking out of his sleep, and having gone to bed in health, is all at once most violently affected with spasmodic pain in the bowels, sickness, and purging; and his pulse is hardly to be felt. A man is well at breakfast and dies before noon. Or a man has been out drinking at night, and is attacked with cholera at day-break. Practitioners, however, who are engaged with the troops in India, well knowing the destruction which the malady brings into an army, have learnt to be so watchful that they say they can often detect the approach of cholera before the patient begins to make any complaint at all. The *look* of a patient tells them what is going to happen. A skilful doctor generally knows a great deal more than he can teach others to know: habits of observation enable him to read disease in the countenance where an un-

taught eye would see little or no departure from the appearance of health.

If the doctor of a regiment in India, at a time when cholera is prevailing, sees any man on the parade with an expression of distress or anxiety in his face, or looking hollow-eyed, or of a dirty earthy colour, such colour not being natural to him, he often sends him off to the hospital at once; for these slight alterations of appearance are the very first signs of the coming of cholera. It is not often, indeed, that a man looks in this way without feeling himself a little out of order. If he is not absolutely sick, he is uncomfortable. His hands and feet are cold, his nails look blue, he complains of heat at the pit of the stomach, and his bowels are commonly disturbed. This disorder of the bowels (*diarrhœa*, or purging) has a particular character, for the bowels are violently moved, as if they were completely emptied at once, and the patient feels very weak.

Fear makes people quicksighted; those who know nothing of medicine, soon learn, if in India, to know the look of a man whose health is going wrong. An officer sees something odd about the appearance or manner of his servant: the man looks ill, and is a little deaf; but on closer examination by a doctor, the poor man is found to be colder than usual, his pulse is very much sunk, his bowels are not right, and he soon becomes dangerously ill.

No active and industrious man likes to complain of being ill without great cause. No good soldier likes to miss parade or duty unless he is very ill. If a man makes frequent complaints, and has little or nothing the matter with him, he loses that character which a good soldier is too proud to give up. This good feeling often makes a worthy fellow suffer all the first symptoms of cholera without saying much about it, and from this cause it unluckily happens that the first symptoms are often neglected. In seasons of sickness, the surgeons of regiments go down the lines every morning, and examine every man attentively. Those who are not soldiers are not so well looked after; but when cholera is prevailing anywhere, every man ought to pay attention to such slight feelings of sickness as he would at other times disregard. The English working-man should now remember this, no less than the Hindoo.

In the confirmed stage of cholera, when there is no longer the least doubt concerning what is the matter, the countenance is still more strongly indicative of the disease. It is altogether altered, so that it is sometimes difficult to know that the sick man is the man whom you knew when in health; and this alteration takes place in a remarkably short time. All the features of the face seem contracted and shrunk; the lips are blue, the eyes seem to be sunk in the head, and there is a ghastly look about the mouth. In this stage the bowels have always been violently moved, and

much weakness is felt: deafness and giddiness are not uncommon; the heat and pain of the stomach are of a burning kind; the patient is very thirsty, although the tongue, which is white, seems moist: the skin is very cold, and a particular coldness of the *tongue* is also observed. There is now, generally, both vomiting and sudden and violent purging, and the discharges are peculiar; not natural, not bilious, not like what has been taken as food, but watery, or like a turbid fluid, or like water in which grain has been boiled, with whitish fragments floating in it, or like the seethings of oatmeal. Thus it is commonly said that the matter discharged is like "rice-water." The purging is a more constant symptom than the vomiting, which sometimes does not take place at all. Nor is there always much pain of the bowels, or tenderness when they are pressed. The stools are often like water. In the worst cases of all, there is neither vomiting nor purging, the stomach and bowels seeming to have lost all power.

In a violent case of cholera, the same symptoms are present, but all of them are more severe. The face, in the first place, is more extremely altered, and also the voice, so that the change in the patient is much more complete. His eyes look completely sunk, and there is a dark circle round them. The lips are blue or bloodless. The cold and livid skin is covered with cold large drops of perspiration, although sometimes there is a feeling of burning heat in it; the hands and feet are

not only excessively cold, but are wrinkled, as if they had been held a long time in water. The tongue and the breath are cold. So insensible is the whole skin, that if blisters are applied they will not rise. But the patient also suffers from dreadful spasms: these begin, like cramp, in the feet or in the hands, and stretch up to the trunk of the body; or the muscles of the fore part of the trunk are violently contracted, which is what is meant when it is said they are affected by *spasms*. Spasms and cramps in the legs are violent contractions of the muscles of the legs, and every one who knows the pain which attends a common "cramp of the calf of the leg," may imagine the sufferings of a patient in cholera, where such pains are continued, and affect many more muscles. In some instances the spasms are so great, that it is necessary to hold the patients down; and they sometimes say they feel as if their arms and legs were breaking.

With such violent disorder of parts so important as the stomach and bowels, it is not surprising to find that the action of the heart and the circulation of the blood are greatly interfered with. The heart and blood-vessels, however, are disturbed or weakened from the very first, as well as the stomach and bowels: but in the greater violence of the attack, there is, with the great coldness of the skin that always follows a weak circulation of blood, such a weakness of the heart that it can hardly be felt to beat, or even seems, when the spasms

come on, to stop. The blood itself is changed, dark-coloured, very thick, and soon coagulates, when drawn, into a dense mass: or it can hardly be forced out of the vein in the smallest quantity. At this stage of the malady the breathing is also sometimes much troubled, slow, and oppressed, and the breath is cold. Still, with this lowness of the pulse, and slowness of breathing, and coldness of breath, and shrunken and chilled skin, the patient feels tormented by heat, throws off the bed-clothes, and begs those about him to give him cold water to drink, and to let him have cool air. Almost all the functions of the body are imperfectly performed. What are called the secretions are very scantily formed: the glands of the mouth form little or no saliva, so that the mouth is dry; the kidneys little or no urine; the liver little or no bile.

It is needless to describe the last miserable stage of the disease, when death is fast approaching; when the spasms both of the limbs and trunk, and of the stomach and bowels, are at an end; when the pulse in the arteries can no longer be felt, and the feeble fluttering of the heart can hardly be perceived; when the greater coldness and dampness of the skin, and the glazed eyes, present the image of death itself. But amidst all these signs of departing life, the patient often continues sensible until life is quite extinguished. The mind is very little or not at all disturbed during the whole course of the malady, but its energy is of course weakened. Its sensibility

in the last stage of this dreadful disease has caused observers to compare a man in this state to "a living corpse." But even after sensibility and every sign of life has seemed to be gone, the power of contraction in the muscles is sometimes suddenly displayed; and the bye-standers are alarmed at the unnatural spectacle of spasmodic motions in what they considered to be a lifeless body; and fears have been sometimes expressed, that people have been buried before they were dead.

All these terrible changes, which commence in the midst of health, and end in death, are generally completed in sixteen hours. Different observers have made different reports, which must always happen when the reports are faithfully made, for there must always be varieties in different circumstances. Sometimes the patient lingers in the state of stupor which is the forerunner of death for a whole day; but not unfrequently death comes on in a much shorter time, even in four hours from the first symptoms of illness, or, at least, from the attack. The old and infirm sink rapidly. The patient is sometimes like a man poisoned: the spasms may be slight, or may not come on at all; the vomiting may be trifling; the bowels may be once violently moved, and the patient all at once brought to death's door. A patient, feeling himself ill, will perhaps walk to speak to the surgeon, but his pulse is found to be already gone, and his heart to have ceased to beat: an attempt is made to bleed him, but only a few drops of

blood can be procured, and the patient dies without more complaint*. In some instances people dropped down when in the market or in shops, and very soon died; even in the short space of a quarter of an hour.

In happier cases, when the patient lives, and overcomes the malady, the first ray of hope arises with a little returning strength of the pulse, and a little return of warmth in the skin. If these are observed, and the spasms also subside, the patient perhaps feels some inclination to natural sleep, and the stools become natural; and the secretions of saliva, of urine, and of bile are renewed, and all the functions of health are gradually restored. But the improvement in these cases is seldom perceived until the patient has been suffering for twenty-four hours or more; and it is also observed, that as the pulse rises it will sometimes become sharp and hard, and the tongue will become furred, and the thirst will continue,—a state which resembles that seen in typhus fever; and during the continuance of which the state of the bowels is far from natural, the motions being dark or black and pitchy, or abounding with unhealthy bile. It also sometimes happens that this state of fever continuing becomes more and more like a typhous fever, and destroys the patient after recovery from cholera had seemed to commence.

The natives of India, who, although not a strong people, are healthy, and very little

* BELL on Cholera Asphyxia.

liable to inflammatory disorders, often recover from attacks of cholera with surprising quickness; so quickly, indeed, that the recovery is compared to recovery from a mere fainting fit, or from a fit of cholic. The people of our country, who live in India, are seldom in very good health before the attack, and are more disposed to inflammation; so that when they are getting better of a severe attack of cholera, they are often attacked with some disease of the brain, of the liver, of the stomach, or of the intestines.

What, then, is the nature of this dreaded disease? Keeping in mind the introductory chapter on the structure and offices of different parts of the body, let us try to understand how the offices or functions of the body are interrupted in cholera. But first, it is necessary to pay some attention to the appearances which are found when the bodies of persons who have died of cholera are examined after death.

The stomach and bowels, being so violently affected during life, must of course be objects of peculiar interest after death. In some cases the whole of the intestines, and also the stomach, are found empty, and the lining membrane of them pale. But in lingering cases, the stomach shows signs of having been inflamed. It generally contains some substances of a greenish, or yellow, or turbid appearance, and sometimes only the undigested food. The intestines are also found to con-

tain, in parts of them which are swelled out into bags or pouches, turbid fluids of various colours—light-coloured, or greenish, or dark; and some parts of the intestines are found contracted or narrowed. No solid matters are found. The lining membrane of the intestines is covered, in a state of health, with mucus, or a soft, oily kind of fluid; this is sometimes found wanting in cholera, and sometimes abundant and changed in its appearance. It is rare to find bile or food in the intestines. Sometimes there are marks of inflammation in different parts of the bowels.

The liver is commonly said to contain more blood than natural; and the gall-bladder is generally full of bile, which, as is almost always the case when its discharge into the intestines has been prevented, is of a dark colour. The gall-ducts, or canals by which bile passes from the liver into the gall-bladder and into the intestines, have often, but not always, been described as closed or filled up.

In all cases of cholera, the urinary bladder is said to be found quite empty and contracted. The lining of this organ, like that of the stomach and intestines, is covered, in health, with mucus, to protect it; this has been found in increased quantity.

The lungs are not always changed from their natural condition, but sometimes they are gorged, and full of blood, and resemble in appearance the liver or the spleen; and sometimes they are contracted, so as to leave a large

part of the chest quite empty, forming a complete vacuum. The blood which the lungs contain is very black.

The heart, and the great vessels which bring the blood to it and carry it away, are found distended with blood; and this distension with dark or black blood is found both on the right side and on the left, in both the auricles and in both the ventricles.

As might be expected from the violence of the disease, and its effects during life on the outward character of the body, those who have died of it often look like those who have died of a long and wasting disorder. The general appearances after death, then, are a shrunken state of the surface, a gorged or very full and distended state of the large internal vessels, and of some of the internal organs; with more or fewer signs of disease in the stomach and bowels, and occasionally with collections of matter in them resembling that which was discharged by vomiting and purging during life. These seem to be but slight alterations to be found after so violent a disease. But the violence of the disease in some measure explains the slight alterations in the form and appearance of parts; for all disease begins with disordered actions or functions, and it is generally by the long continuance of disordered actions that changes are wrought in the appearance and structure of the parts diseased. For the same reason, when the cholera is subdued, the patient in India often gets well at once. Nothing but weakness is left, at least,

unless some disease has been going on before the attack, or unless symptoms of fever come on.

In cholera there is most violent disordered action; so violent, that a man is killed before there is time for many changes to be made which can be seen after death. He dies like a man who has taken a deadly poison, or who has been bitten by a poisonous snake. All his energy seems either at once overcome or rudely impaired. Sometimes, indeed, he dies so soon, that he may be said to be like a man killed by lightning; his nervous power or energy seems all to be struck out of his frame at one blow:—his heart no longer beats, his blood no longer flows, and he sinks at once. But the resemblance to the effects of poison is commonly more striking; all energy, except the irregular energy shown in spasms, is overpowered; and when this irregular energy is gone, life soon departs also.

Those who look into medical books for information must expect to meet a great variety of opinions on this matter. Even the anxiety of medical men to know more than they at present do, and to do more than they at present can, leads to contradictions. Seeing all the functions so soon oppressed, and with such violence, many are not content to think that it all takes place from one cause. Some, attending to the vomiting, think the man dies because of the disorder of his stomach and bowels; some, attending to the discharges, think the disease arises from the want of bile; some, looking only to the dark and altered

state of the blood, and the weakness of the heart, think death arises from a want of the proper changes going on in the lungs, by which (as has been mentioned in the Introduction) the blood in the veins is rendered fit to go into the arteries; others, considering the scanty state of the urine, have even fancied cholera was a disease very much connected with some disorder of the kidneys.

If any one of these changes invariably happened *first*, and the rest followed, we might believe such first change to have a great deal to do with the disease; but all the changes take place at once, or at least are always very speedily effected. The heart is weakened, and the stomach and bowels are disturbed, and the bile and urine are suppressed, and the blood in the veins ceases to be properly changed in the lungs, either all at one time, or so nearly so that we cannot say which is first.

A patient affected with cholera is, in fact, under the influence of a poison, communicated to him from the air, and at once so strongly affecting his brain and nerves, and his heart, that no action in the body can possibly go on well. All the functions of the nerves, and all the functions of the blood-vessels, are impaired together. The blood is no longer good blood; the nervous energy, or influence, is no longer powerful; the proper secretions do not take place into the stomach, and digestion no longer goes on; the blood no longer flows into the smaller vessels; the action of the heart itself is hardly continued. There is no proper

supply of blood for any secretion, or for nourishment; there is no control or proper government of the actions of the body, and the muscles become disorderly, and contract excessively and irregularly,—no longer obeying the will, nor any longer acting in the usual manner on the contents of the bowels without our will being concerned, as they do in health, but acting in spasms, and with disorder, and with extreme pain. The warmth, too, and the sensibility of the body are rapidly extinguished; and the sensations so disordered, that whilst the skin has all the coldness of death, the stomach seems a prey to a consuming fire, or the whole body oppressed with a devouring heat.

Medical men have not yet determined how the poison of cholera is introduced. It is sometimes imagined that the skin affords a passage to it. But seeing that we continually breathe air, and that the air we breathe continually acts on the blood, it seems pretty clear, that if it is a poisoned state of air which produces cholera, the air thus poisoned must affect the blood in the lungs, and by so doing, by impairing its qualities, probably lead to disorder of every part of the body. It may be that the poison of cholera acts at once, and first, on the nervous system. The question, however, is chiefly of consequence to medical men. That the stomach and bowels become violently irritated, is plainly enough seen in the vomiting and diarrhœa; but whether this irritation is the *consequence* of disordered fluids being formed in the bowels, or whether these disordered

fluids, or secretions, are the consequences of previous disorder of the nerves, or blood-vessels, or both, is another question not very easily decided.

Enough, however, is known of the nature of cholera, to teach us how it ought to be treated, or warded off; and that, which will be explained in another chapter, is the chief consideration for the public.

Such, then, is the dreaded Indian cholera; such is the disease which has, more or less, prevailed over the whole of India since the year 1817, and has since spread into our colder northern regions. It began in that year with little or no peculiarity in the state of the air. The changing seasons did not affect it; coldness and heat, dryness and moisture, did not check or increase it. It prevailed when the soil was burnt up with heat; and it continued to prevail when it was deluged with rain. It attacked both the native Indians and the Europeans, and no constitution seemed proof against it.

So long, indeed, and so violently has this disease prevailed, that it is difficult to credit all that is truly said of the destruction of life that it has occasioned. It seems beyond belief, that any one disease should destroy in one year more people than are contained in such a vast city as London, yet, for fourteen years past, the cholera has destroyed twice that number in every year; that is to say, on an average of the years, it has destroyed three millions of people in each year. It has

passed over large portions of the earth like a destroying angel, spreading from one desolated city to another affrighted place, with a certainty and force which nothing could withstand.

It first appeared in countries so different from our own, in every particular, that we could hardly expect its approach to the shores of England; but it has gradually come nearer to us, and, after spreading over almost every part of Asia, and a certain portion of Europe, has crossed the German ocean and landed among ourselves.

CHAPTER III.

CLIMATE AND HABITS OF INDIA.

BUT the reader, unaccustomed to medical details, is perhaps weary of descriptions not always fully understood, however plainly described, without more preparation in anatomy and physiology than he happens to possess.

Let us turn, then, aside from this strictly medical discussion, to consider the vast and peculiar country where the cholera first began to scourge the human race. With the reputed *wealth of the Indies*, no one is quite unacquainted. An inspection of the map will show the large extent of Hindostan, and its situation, with respect to China, to Arabia, and Persia, and to the great continent of Africa. Long before any nation had learnt to sail round that southern Cape or promontory of Africa, called and marked in the map as the Cape of Good Hope, the wealth of India, and its various produce of silk, of spices, and of precious stones, had caused it to be eagerly invaded by conquerors, and visited, over land, by merchants and traders. It was the scene of many of the conquests of Alexander the Great; it was the country from which the Romans often returned victorious, and laden