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THE

PATHOLOGY AND TREATMENT

OF

CHOLERA ASPHYXIA,

BY

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IN IRELAND, ETC.

— si quid novisti rectius istis,
Candidus imperti; si non, his utere mecum.

Hor.

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THE PATHOLOGY AND TREATMENT

OF

CHOLERA ASPHYXIA.

THE formidable disease called Cholera Asphyxia, which has visited almost every region of the earth, within the last few years, has forcibly attracted the anxiety and exertions of the medical profession, towards ascertaining its nature and most appropriate mode of treatment. Although much information relative to the symptoms of the disease has been accumulated, yet the facts which have been sufficiently established, are recorded in the various publications on the subject, in a manner so unconnected and isolated, that they afford little assistance towards discovering the best mode of curing the disease, and consequently the treatment has been often worse than empirical.

Sir William Chrichton says, " it is a most melancholy confession, but one not the less true, that, after cholera has spread its devastations

from Ceylon to Archangel, from Orenburgh to Berlin, we are almost as far from a rational *methodus medendi*, as we were when it first appeared on the banks of the Ganges." This remark is still applicable, for it must be confessed that no rational mode of treatment has heretofore been pointed out. To attain so desirable an object, the physician must study the phenomena which the disease presents, by cautiously reflecting upon the trains in which those phenomena present themselves. Under such circumstances the following sketch is submitted to the consideration of the medical profession, as the result of the information obtained from publications on the subject and deduced from personal observation of the disease.

There cannot be a derangement of the vital powers, from the most trifling to the most severe, that will not exhibit some symptoms which may also be met in this cholera. The symptoms of a disease are a number of phenomena which must be exhibited in a certain series, and without which the disease is not: it is therefore evident from the medical records of this country, that a disease similar to the one under consideration, has not been before observed in Ireland. In three epidemics which have occurred in Dublin since the year 1811 I have had most extensive opportunities for observation during

my attendance on the different hospitals to which I was attached, and I can safely assert that no case of disease similar to the present came under my notice.

The difference of opinion which has occurred among medical practitioners relative to the infectious nature of this disease may be attributed in a great measure to the want of discrimination in the first observers. Genuine Cholera has been known from time immemorial in India, and the term expresses accurately the nature of the disease ; but this term has been extended to an affection, one of the most essential characteristics of which, is a total suppression of biliary secretion. By thus confounding two diseases so different in their natures, under one denomination, the practitioners who know that true Cholera is not infectious, extend that opinion to the affection under consideration. One of the strongest statements in support of the opinion, that Cholera Asphixia is not contagious, may be seen in the medical reports from Danzig. When these reports are examined with attention, it will be found that the symptoms in the first stages differ considerably from the disease at present in this country. As it is stated, there was increased and vitiated biliary discharge, evinced by the vomiting and purging of greenish matter. Dr. Baum says it made its appearance without communi-

cation with any unhealthy place ; and that the disease had been preceded by a remarkable change of weather, the temperature often differing in some hours time, nearly ten degrees R. He mentions also that immense quantities of fish were caught, which were sold at so low a price that the people lived almost entirely upon them during the months of April and May prior to the appearance of the disease. Under such circumstances, it is obvious that the citizens of Danzig might have been afflicted with disease quite independently of any other which happened at the same time to be spreading its ravages through Europe.

By considering the circumstances which have been observed during the whole course of Cholera from its origin in the East Indies, to its arrival in these countries, it may justly be inferred that the disease is propagated by communication between those having the malady, and individuals who, by habits or constitution, are disposed to take the infection. By calculating upon this supposition, I was enabled to prognosticate the time of its arrival several months prior to the appearance of the disease in this city. Certain states of the atmosphere may have a powerful influence in developing the disease in those affected ; and a remarkable instance is related, where a number of passengers were crowding the deck of a ship, when a severe storm arose

from the east, fourteen persons were affected with Cholera on the side exposed to the storm, while not an individual showed symptoms of the disease among those on the opposite side. The cold wind in this case, thus changing the disease in those infected from the latent to some of the active stages. When it is considered however that the disease spread at the same rate through all the varieties of climate from the torrid zone and over the snows of Russia, it cannot be supposed that any state of the atmospheric air alone is capable of communicating it. It may be interesting to examine how far exposure to a damp atmosphere may render individuals liable to take the disease, for it is well known that it traverses along the sea coast, and the course of large rivers, in preference to inland situations. The severity of the disease in the town and castle of Clare, in Ireland, is an example of the power of such a situation in propagating this disease and increasing its malignity. It cannot be inferred that the disease arose spontaneously from the state of this place, for this Cholera spread through the Russian empire when the ground was covered with snow. Since it has made its appearance in Dublin and in Liverpool, a remarkable fact may be observed, which corresponds with the nature of the disease as observed in other countries. When the cold easterly winds prevail, the num-

ber of new cases are increased in Dublin; and a similar result takes place in Liverpool, when the westerly winds prevail; showing the influence of the sea breeze in developing this disease here, as in the eastern countries. Other circumstances have also the power of developing this disease, such as deep mental impression, or sudden alarm; an instance of the latter occurred at Youghal, in the County of Cork, soon after the disease appeared there: a man was standing on the deck of a ship, apparently in perfect health, when a seaman fell from the mast head, and was killed beside him; the man was immediately taken ill, and died in a few hours of Cholera Asphixia.

By examining in this manner, all the various circumstances which have been assigned as the causes of the disease, they will be found reduced to the single one, of a conducting medium of communication with previously infected individuals. It may be asked, how did the disease first arise in the East Indies, and may not the same occur in other places? When, however, the peculiar complication of circumstances is considered, which may have been necessary to the first formation of this morbid miasm, it will be found that the chances of a combination exactly similar in any other place are infinitely small.

In the progress of the disease towards these

countries, it has been ascertained that strict quarantine has effectually resisted its advance : examples of this occurred in Egypt and in Persia. The permanent character which the disease has assumed, renders all quarantine measures ineffectual, which cannot be persevered in as long as the disease exists.

Having taken a general view of the contagious disposition of Cholera Asphyxia, I am enabled from personal observation to state a few facts of a local nature. The disease under consideration first appeared at Ennis in the County of Clare, in Mill-street, a day or two after a party of people with luggage, &c. stopped there on their way from Limerick, where the inhabitants at the time were severely afflicted with cholera. From this street it quickly spread through the town. Out of twelve nurses attached to the cholera hospital, seven were infected during the first three weeks, two of whom died, having obstinately refused to take any medicine ; of three apothecaries, one died, and his wife died also, who lived in the hospital. Of four physicians two got the disease, and one died from the second attack. In these cases the disease appeared to have been propagated by personal communication. Several well authenticated facts prove that in this country the morbid poison may be communicated under some circumstances by substances which have had contact with the

infected. Thus, an officer died at Island-bridge, in this city, whose sheets were taken, after death, by a man and his wife who lay in them for some days, when both these individuals took the disease and died. When Cholera appeared at Athy, an officer's wife, who dreaded the disease, fled to Carlow, where she was shortly after attacked with the disease, and died. She was the first person affected in that town. Her bed-clothes were stolen after her death, and the people who committed the theft died. The disease then spread through the town. The first case observed at Athlone occurred in a pedlar who died, and was buried, with all his goods, among which was a quantity of hair; a girl, the daughter of a man who traded in this commodity, dug up the hair, which she carried home; she took the disease, and died: soon after this several cases appeared in the town. A very important circumstance has been communicated to me by Captain Vignoles, who commands the Police in the County of Clare; he states that since I left Ennis, (to which place Dr. John Ferguson and myself were sent by the Central Board of Health of Ireland, in order to render our assistance to the inhabitants of that town,) the same places from which patients had been transmitted to the cholera hospital still continued to supply the fresh cases; although the inhabitants have been several times in succession

changed without any communication with the preceding occupants. Many instances of this kind came to my knowledge during the epidemic fever which occurred in this city in 1826-7.* It would be unnecessary to multiply instances of this kind, which must be familiar to every practitioner. From these and other facts, I therefore conclude that the contagious nature of the disease is placed beyond a doubt in this country.

In a Treatise on Tetanus and Hydrophobia, published in 1817, I have stated "that the essential symptoms of disease often excite others, which at first appear more conspicuous than themselves, owing to the peculiarity of constitution or circumstances of the patient; yet the physician is obliged to work upon them, and thus deduce the nature of the disease, like the unknown quantity in algebraical calculations." There is not perhaps any disease to which this remark is more directly applicable while investigating the nature, and the course of its symptoms, than that which forms the subject of these pages. The observation of the celebrated French Physician, that as all other diseases end in death, Cholera Asphyxia begins with it, although stat-

* *Vide* Clinical Observations made during this Epidemic, which I read before the Association of the King and Queen's College of Physicians in Ireland, and published in the 5th vol. of their Transactions.

ed as the general result of what he had seen in those affected with the disease, yet upon strict investigation, it will be found applicable to each particular function, during the progress of the disease in every individual. When Cholera Asphyxia is allowed to take its own course without the interference of medical treatment, it will be found that all the symptoms arise, not from excitement, but as the consequences resulting from the absence or suppression of the function, which in a state of health regulated that ~~function~~, the deranged actions of which attract the notice of the physician. Thus the discharge from the alimentary canal, which is so generally observed in the first stages of the disease, is found to consist not only of the usual contents of the stomach and intestines, but also of fluids which had made progress through the general frame. The vessels having been deprived of that vitality which enabled them to urge on their contents, allow their fluids to pass into the alimentary canal, as if by mere percolation. The fluids thus escaping from the general frame, the skin on the external surface becomes corrugated, particularly in the hands and feet. Frequently the entire body appears remarkably diminished in bulk, so as scarcely to be recognised by persons who were acquainted with the individuals when alive. It appears that the cause of the disease tends to suppress vital actions, for the

organ

various secretions cease to be performed, or are performed imperfectly. The first symptoms which indicate that the constitution of the individual yields to the disease, are derangements in the functions of that portion of nerves which I have denominated the ganglionic system; and as the nerves relating to this system are so intimately connected with the heart and arteries as to form almost a nervous tissue round the vessels, the general circulation must be very soon affected. As the disease advances, the impediment to the spinal functions becomes more evident, and the power of motion is diminished. The muscular irritability being thus left uncontrolled, irregular muscular spasm takes place in various parts. The cerebral system* is the last which yields to the destroying influence of this dreadful malady, the patient retaining his intellectual faculties almost to the moment when life ceases.

By thus investigating the nature of the disease, it will be found that these phenomena can only be attributed to the influence of an animal poison, which being communicated to the human

* For a full explanation of the terms ganglionic and cerebral functions, vide a treatise published in 1817, on Tetanus and Hydrophobia, and a paper on Fever which I presented to the Association of the King and Queen's College of Physicians in Ireland, and published in the 3d vol. of their Transactions.

frame continues for a period in a latent state, until it can acquire sufficient force to overcome the vital powers of the constitution. From some observations which I have had an opportunity of making, it appears that the latent period may be extended to six weeks. This poison however seems, like that of fever, capable of having its virulence increased considerably by condensation; thus, when the disease occurs in situations where numbers of individuals are crowded together, and where proper ventilation and other circumstances are not attended to, as in gaols and prison-ships, the disease is apt to spread from individuals exposed to such infection, with the utmost rapidity and fatallity.

The plan of treatment which I have found most successful in relieving those suffering under this Cholera has been founded upon the views of the nature of the disease, which have been already stated. The rapidity with which the disease runs through the various stages towards a fatal termination renders it necessary for the physician not only to treat the stage of the disease immediately presenting itself to his investigation, but at the same time he should, if possible, anticipate the stage which he may expect soon to follow. As far as I have been able to ascertain, the disease appears to have four distinct stages, which require peculiar management. It is of the utmost importance towards a suc-

cessful treatment, for the physician to be aware that different functions of the frame may be in different stages of the disease at the same time; for, although the virulence of the disease may, in some cases, be rapidly fatal, yet careful observation will prove that the poison is progressive in its effects. By keeping this fact in view the physician is enabled to combine his remedies in such a manner as to produce often the most desisive effects, in his attack upon the disease. The first stage is that in which the natural secretions are evacuated, these are generally increased, as if the natural powers of the organs were exerted to throw off an offending matter. The timely administration of a mustard emetic, followed by a warm purgative, such as spirits of turpentine and castor oil, with a few drops of camphorated spirits of wine, has frequently succeeded in relieving the patient entirely from the disease. The choice of emetics demands the most serious consideration. The great debility attendant on the disease prohibits the employment of any emetic medicines which tend by their secondary effects to debilitate. The most intractable cases I have met, were treated in the first instance by emetics of large doses of ipecacuanha. In such cases, when other medicines were afterwards given to the patients, they produced as little effect as if they were poured

into an empty cask. In this stage much medical science is required to discriminate between this disease and that properly called Cholera; I have in general found the state of the pulse the most certain guide. In this period of the common Cholera, the pulse is small and frequent, but in the Cholera Asphyxia it is slower than in health, with the calibre of the artery enlarged, and seems to have a strong tendency to intermission. When, with this circumstance, the patient exhibits strong symptoms of fear, however courageous his natural disposition may be, no doubt can remain on the mind of the physician as to the nature of the disease.

The second stage exhibits symptoms so peculiar to the disease under consideration, that the true nature of the case is at once detected. The evacuations now consist of unassimilated matter; even liquids resembling chyle have been ejected both from the stomach and intestines, and which ultimately become similar to rice water or whey: when bloody serum is passed from the bowels it indicates a constitution previously broken down, and I do not recollect a single case of recovery where such a circumstance has taken place. The dark areola about the eyes gives to the countenance the expression characteristic of this stage. The pulse continues to diminish

in strength, so much that if the physician should press his finger on the artery, its motion would cease to be perceptible, and he might suppose the patient to be pulseless. As the third stage, or that of collapse approaches, spasms and pains in the extremities begin to torment the patient. Under such circumstances the disease may be considered in full force, and the rapid changes towards a fatal termination make time most precious. The first object now to be attempted is to correct or destroy the animal poison supposed to be the exciting cause of the disease. Did this poison exercise its influence at once in a general manner over the frame, it may be difficult to determine to what point the physician should direct his attention. The secretion from the lungs is at least not increased, and the action of the urinary organs is evidently diminished; it is therefore evident that whatever can be done towards correcting the cause of the disease must be attempted in the course of the alimentary canal.

From the accounts which were published respecting the influence that the hydrochloruret of lime evinced in destroying animal effluvia, I was induced to try the efficacy of this substance in neutralizing the animal poison generated in fever, and having found it fully answer my expectations when tried on an extensive scale in the Fever and Dysentary Hospital of Kevin-st.,

during the epidemic of 1826-7,* I have continued to prescribe it in many other diseases with decided advantage. The utility of this valuable medicine appeared to me, therefore, to be clearly indicated as a powerful agent in the treatment of the disease which at present occupies our attention. I therefore directed it in this and the subsequent stage with the view of correcting or controlling the primary cause of the disease, and have generally found from one to three doses of the mild solution of the chloride of lime in water, fully to answer all the purposes intended.† While the physician thus attacks the source from whence the morbid phenomena arise, he should carefully direct his attention towards supporting the vital powers of the constitution. The function which seems to have the most general influence throughout the frame is that of the heart and arteries; life is

* *Vide* Clinical Observations to which I have before referred.

† The solution I direct, is made by putting a small quantity of the chloride of lime into a bottle of water, which being well corked, is to be shaken. When the sediment has subsided the clear liquor is to be poured off and preserved in well corked phials. There is a solution said to be a concentrated solution of chloride of lime, which appears to contain a quantity of free chlorine, and the physician should be aware that this solution, when given to a patient, is liable to cause a most alarming sense of suffocation, which, without timely assistance, might prove fatal.

preserved as long as the action of these organs is continued. It was therefore necessary to consider what means were most efficacious in keeping up the action of the heart and arteries. The known effect of extract of elaterium in exciting the pulse, held out a promise of its utility in the present case. The rapidity with which the disease now runs its course also pointed out the importance of combining any medicines which may be deemed expedient, so that the desired effect may be speedily produced upon the frame. The usual mode of prescribing medicine either in form of pills or diffused through a watery medium is objectionable. The state of the alimentary canal in this stage of the disease, is such that the effect of medicine in either of these forms would be extremely uncertain. Having observed that olive oil, when applied to the tongue, or almost any other part of the frame, quickly communicates its peculiar flavour, it appeared to me that if it were possible to impregnate this fluid with the active qualities of elaterium, a valuable remedy would be obtained, whose quick action might be equal to oppose the rapid progress of the disease towards the fatal termination. I therefore directed some extract of elaterium to be rubbed with olive oil, which being filtered through paper, it was found that the oil had imbibed the active principle of that medicine, and when

applied to the tongue, quickly produced the peculiar effects of elaterium. Having thus far succeeded, I considered it possible to combine, in such a manner, the powers of different medicines adapted to the treatment of this disease: and, for obvious reasons, made choice of columbo and capsicum in addition to the elaterium, as the most appropriate combination of medicine for general service; which, by curbing the rapid progress of the disease, and thus prolonging life, would allow the physician time to treat the various organs which happen to be affected. There were now two powerful agents at my command, for the treatment of this disease, and ample opportunities were soon afforded to put them to the test of experience. Having found these medicines answer the intentions for which they were directed, beyond my most sanguine expectations, I communicated the circumstance to several medical friends, who have assured me that this compound oil has had the desired effect in several hopeless cases. I have no hesitation in attributing much of the success which attended our labours at Ennis, to the operation of this remedy.

A remarkable circumstance is worthy of notice, respecting the action of the solution of hydrochloruret of lime and the compound oil, when given in combination, in this stage of the

disease. When the circumstances of the case would clearly point out the propriety of giving an emetic to the patient, the combination of these medicines has produced that effect, the instant it has reached the stomach. I have been often astonished at the immense quantity of liquid which has thus been thrown off. When the vomiting induced by the medicine has ceased, and while the stomach is still empty, if the same dose be immediately repeated, it then lies easy on the stomach, and produces the general effects which are to be expected from the medicine. By studying the effects of the compound oil on the general economy, it will be found that, by affecting the action of the heart and arteries, it tends to restore the natural secretions through the entire frame.

With respect to the employment of other medicines during this stage of the disease, it must entirely depend upon the state of the patient at the time he comes under the treatment of the physician. Several very valuable remedies have been praised or dispraised according as they happened to produce a beneficial effect by their proper application, or the reverse. Even the local circumstances of the patient appear to modify the disease in such a manner that the medicines directed by experiment, and found beneficial at one time or in one place, will disappoint the expectations of the practitioner.

It would extend these pages far beyond the limits proposed, were I to enter into minute detail of the symptoms which indicate the treatment best adapted for their relief. When the physician reflects upon the nature of the disease, in the manner I have already pointed out, he will be enabled to direct his remedies with almost the certainty of success, when the constitution of the patient has not been broken down by other causes previously to his having become infected with this disease. The great difficulty arises from the necessity of directing the attention not only to the morbid phenomena immediately present; but also to those which may be expected quickly to succeed them, and which require to be treated as if by anticipation.

This stage admits of the greatest variety of treatment, as every organ of the frame is liable to the attack of the disease, which becomes modified according to the number or state of the organs affected. Thus, when the liver has been accustomed to the influence of spirituous potation in excess, but does not evince tenderness on pressure, although the patient may have a copious evacuation from his bowels of the rice water matter every half minute, a full dose of tincture of rhubarb with thirty or forty drops of the compound oil, and a small quantity of camphorated tincture of opium, will quickly suppress these discharges, and cause a natural

evacuation to take place in six or eight hours afterwards. In robust patients, and those accustomed to great bodily exercise, in whom the functions of the liver have been healthy until the attack of the present disease, after the first steps in the treatment have been taken, and that vomiting and purging still continue, a solution of carbonate and muriate of soda will quickly allay these troublesome symptoms, and restore the patient to health. In this stage bleeding from the arm will be found highly advantageous when indicated by a sensation of weight and oppression about the præcordia. When judiciously employed, this remedy seems to facilitate the operation of medicines given internally. I have met many cases in whom the medicines which were given appeared to lie dormant, until the patient was bled, soon after which they produced their peculiar effects in the proper manner. The indiscriminate use of the lancet has, however, induced several practitioners to pronounce that there is no dependance to be placed upon it in this disease. When the spasms are severe in the external muscles great relief is obtained by rubbing the parts affected with a liniment formed of camphorated spirit of wine, spirit of turpentine, and a little oil to which spirit of ammonia is sometimes a useful addition. These facts ought to be sufficient to prove the absurdity of routine practice, such as "saline

treatment," mercurial treatment, or any treatment, adopted without discrimination.

When the spinal system seems to be severely affected, as indicated by the spasms, accompanied with loss of strength in the frame, advantage may be obtained from the employment of the cajeput oil. I am inclined to attribute much of its efficacy in such cases to the impregnation of copper which this oil, when brought to this country, is found to contain, and have had therefore a minute portion of sub-acetate of copper added to some of the compound olive oil, for the purpose of employing it in cases where the cajeput oil may be expected to be useful.

Although the influence of the cerebral system upon the internal organs, which are attacked by the disease, may be suppressed, yet the external senses and intellectual powers remain, for a considerable time, apparently unaffected. There is, however, a feeling of dread in the minds of those afflicted with Cholera Asphixia, which seems almost peculiar to the disease. When this feeling predominates, the cerebral system ceases to oppose the disease, which, under such circumstances, makes a progress amazingly rapid towards a fatal termination. I attended a lady who was afflicted with this Cholera in a very decided manner: on my second visit it appeared that the medicines which were ordered did not sufficiently produce the effect

expected from their operation. Her spirits were so depressed that she shed tears in describing the symptoms of her complaint. I observed that she was a woman of energy, with a fine cultivated mind; and therefore explained to her fully, how important it was for her to exert her natural resolution, and keep up her spirits. She at once showed her determination, dried her eyes, and related a droll anecdote. From this moment the medicines acted with the utmost satisfaction, and her progress towards recovery was rapid. A lady, after attending a friend who died of this disease, became affected with it herself, in a very severe form. She was taken ill at some distance from home, but being aware of the nature of her complaint, she called upon her attorney, regulated her affairs with the utmost composure, and then went into bed. All the remedies directed produced the desired effects, and she was soon restored to health.

When the disease was making rapid and fatal progress at Ennis, in the county of Clare, the shops being shut, and most of the inhabitants having fled, the frequent scenes of the dead and dying spread a mournful gloom over those who remained, each expecting himself to be the next attacked. Captain Vignoles, whose valuable and philanthropic services must be long remembered in Ennis with gratitude, with his usual

energy, thought of interrupting the solemn silence of the town, and employed the children, from four years old and upwards, in repairing the streets. This afforded some appearance of bustle in the town, and the little creatures seemed to take pleasure in the work. I have the happiness to state that not one of them was sent to the hospital during my attendance. These circumstances clearly evince the good effects of cheerful occupation in diminishing the liability of persons to this disease.

The third stage is generally considered the blue stage, or that of collapse. In this all the powers of life seem to be exhausted in the parts affected. The general appearances of the patient have been already described, in every book upon the subject. Although the motions of respiration still continue, yet the function is not performed ; for the membranes interposed between the blood and atmospheric air, becoming dry like parchment, cease to transmit the influence of the atmosphere to the blood, and the patients die without the mucous rattle which is heard in other diseases prior to dissolution. When it was observed that the blood ceased to undergo the necessary changes in the lungs, the inhalation of oxygen gas was recommended to the Prussian Government by Dr. Schllsenger, and by Sir Anthony Carlisle to the British. Dr. Baum tried it in two cases, and states, " that

both terminated very soon fatally; although there had been apparent grounds for a favourable prognosis in these cases." * This is an example of the inutility of attempting to supply, by artificial means, any substance, which by analysis, may be found deficient in the blood during disease, without attending to all the circumstances which are necessary to its proper union with that fluid. The inhalation of this gas with aqueous vapour may tend to obviate the parched state of the membranes: but when it is recollected that the substances which cause the union of oxygen with the blood, perhaps by *disposing affinity*, may also be absent, the physician will perceive how many circumstances it will be necessary to be aware of, so as to afford full prospect of success in the application of any remedy. The occasional failure of all the different *treatments* may be viewed in a similar manner.

The blueness of the extremities in this stage appears to result in consequence of spasm, by which the extreme vessels become paralyzed and incapable of urging forward the blood. The lungs, at this time, having ceased to transmit the atmospheric influence to the blood, this fluid is deprived of the stimulant property by which the extreme vessels may be excited to action. The propriety of external warmth and

* Ext. from Hamett's Medical Reports.

rubbing the parts thus affected, is therefore, plainly indicated. The process of rubbing should be performed as much as possible in the course of the venous circulation, and I have found the turpentine liniment greatly to contribute towards restoring the circulation in the parts.

When the treatment has been commenced by giving to the patient the solution of the chloride of lime, and the compound olive oil, already mentioned, as often as may be deemed expedient, other medicines may become necessary. When vomiting continues, and the patient complains of uneasiness about the precordia, a saline mixture, composed of carbonate of soda and muriate of soda, has been of the greatest utility. Even when vomiting had ceased, and the tongue exhibited a moist fur on its surface, I have met many cases where this medicine seemed to have a decided influence, in preventing that severe fever which so frequently supervenes after this stage. This medicine will be found of great utility in any period of the disease where the patient complains of a sensation of heat in parts which give a feel of death-like coldness to the touch of the attendants. Even cold water, in such cases, will be found to afford considerable relief to the sufferings of the patient. Indeed cold or iced water has appeared so refreshing to the feelings of persons suffering under this disease in every period, that I have always

allowed a wine glass-ful at a time to be taken as often as the patient may wish, during the whole course of the disease, with the most decided advantage. Practitioners should be aware that however beneficial cold or iced water may be when given internally, the most injurious effects arise from external cold or the admission of cold air. I have known many fatal cases result from nurses incautiously opening windows, and thus allowing the patients to be exposed to a stream of cold air.

There is a circumstance liable to occur in this stage of the disease, which, it is very important for the physician to bear in mind. The patient is exhausted by his sufferings, and life, to all appearance, becomes extinct. After lying for a time apparently lifeless, the vital actions are gradually restored, and the patient, to the surprise of his attendants, revives. In the cases of this kind which came under my observation, the revival might be attributed to the slow but steady effects of the compound olive oil, which had been previously given to the patients.

The fourth stage of Cholera Asphixia, consists of a consecutive fever. It appears that when the various organs have been, by proper treatment, relieved from the morbid suppression of their functions caused by the disease, that a re-action then takes place. Were all the organs

of the frame equally affected by Cholera Asphixia, this re-action would only take place in sufficient force to re-establish that balance of activity which constitutes health. This seems to be the case when the physician is enabled to foresee the state of the organs impending after the original disease has been removed. I have pointed out that the effects of the animal poison are progressive in the human frame. The action of some organs may be altogether suppressed, while other organs may have the influence of the ganglionic, spinal, or cerebral nerves, suspended separately. The physician may, therefore, by observation, be enabled to judge, during his treatment of the former stages of the disease, to what organ it may be expedient for him now to direct his attention. I have already observed that the ganglionic system is first and chiefly affected in Cholera Asphixia, it is thus reasonable to suppose that this system would be latest in restoring its healthful influence. It is, therefore, improbable that what is called inflammatory action should take place in any of the organs of the frame. Indeed, I have not met a single instance of the kind among a large number of cases which came under my observation. All the cases of this stage, which I have had to treat, consisted of genuine congestive fever. It is, of course, unnecessary here to enlarge upon the mode of treating such fever.

When congestion takes place in the substance of the nervous centre, situated in the spinal column, the patient complains of a feeling of great general debility. This is accompanied with intermission of the pulse, and the catamenia, when present, is discharged like liquid pitch. These symptoms are attended with great danger, as the patient may expire without a groan, and appear only as if in deep sleep. In such circumstances, I have found the most efficacious treatment to consist in applying leeches to the neck, and the compound olive oil and tincture of myrrh in mixture repeated every hour or half hour until some steadiness is observable in the pulse. Indeed the great debility in every function, after recovery from the third or collapsed stage, demands the most careful attention on the part of the physician. The debility of the cerebral system is so excessive, that mental impression, which under other circumstances would have little effect, is sufficient to destroy the patient. Many cases occurred to my observation, when the patients cured of the disease, have expired without a struggle, merely on account of seeing others die beside them. That such was the fact appeared evident: for when I observed a few such occurrences to take place in hospital practice, I directed that patients thus cured, should be immediately transferred to the convalescent wards. By adopting this arrangement, no fatal

case, among such patients, afterwards occurred.

From what has been observed of the circumstances and nature of Cholera Asphixia, I am convinced that it is amenable to scientific treatment and that there is every probability of its affording another splendid triumph to medical science, in addition to those which have of late years been accomplished.

THE END.