

CONTRIBUTIONS TO THE PATHOLOGY AND TREATMENT OF CHOLERA.

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(Continued from page 321, April Number.)

II. MODIFICATIONS, STAGES, AND SYMPTOMS, CONSIDERED COLLECTIVELY.

SOME writers on Cholera would establish a difference between cases of *endemic* and *epidemic* origin; distinguishing varieties of serous diarrhœa, attended by depression of nervous energy, feebleness of the circulation, and low animal heat, as forms of *pseudo-Cholera*. There is no foundation, however, for this distinction; cases of diarrhœal Cholera, caused by functional blood lesions, may be converted by neglect, or the employment of purgatives, into well-marked attacks of Cholera. In such, as I shall clinically illustrate, languor, lassitude, nausea, and diarrhœa, accompanied by alternating chills and heats, may precede, even for several days, the appearance of purely serous, rice-water-like stools, and the *algide stage*. During the epidemic of 1818, I frequently witnessed cases of this kind, and have good ground for belief, derived from personal observation, that between these and the endemic Cholera attacks, prevalent annually in India just before the commencement of the rainy season, and those which have proved so fearfully fatal to regiments and their followers, while marching through the southern Mahratta country, there is no real difference. The action of the causes producing them may differ in intensity; but the morbid changes effected in the constitution by their agency are the same.

General description of Cholera. The invasion of Cholera is sometimes slow and insidious; sometimes, it is sudden and rapid in its progress, overpowering the vital functions, as if the person affected had been struck down by lightning or apoplexy. The first is the more common mode of attack when the disease proceeds, as would appear, from *endemic* malarious causes, or impure and deficient food; the latter is the more frequent occurrence when it is produced by epidemic atmospheric conditions of great intensity. Premonitory diarrhœal symptoms, the indications of incipient abnormal changes in the blood, usually give warning of the first kind of attack, while little or no purging precedes the vertigo, oppressed respiration, syncope, and interrupted pulse, by which the last is characterized. Some symptoms of depression, or at least of disturbance in the nervous system, usually usher in each form of attack. The patient is sleepless, complains of languor, lassitude, and listlessness, and has indescribable sensations of oppression at the chest. These are succeeded by an expression of anxiety in the countenance, pallor of the cheeks and lips, coldness of the hands and feet, nausea, and burning pain at the pit of the stomach; to which supervene vomiting, purging, and occasional tenesmus. The pulse is found, on examination, to be generally, frequent, small, and irregular: and sometimes very slow. There is extreme constriction at the præcordia; the thirst is intense and painful; the tongue, moist and cold; and there are occasional *clonic* spasms of the muscles of the abdomen and legs. Sometimes the cold-

ness of the cutaneous surface, when the disease is slow in its progress, is followed by partial dry heat of skin, and accompanied by a sharp, rapid, and compressible pulse. With the continuance of the diarrhoea, these symptoms progressively pass into collapse; though the more usual occurrence is to find the disease progressing rapidly to collapse, without any indication of reaction in the circulating system. Where this is the case, the tormina and thirst are exasperated; the vomiting and purging increase; the eyes are deeply sunk in their orbits; the countenance becomes shrivelled and Hippocratic; the skin of the hands and feet corrugated; the forehead is covered by profuse cold sweat; the vomiting, purging, and spasms, cease; the heart is feeble and fluttering in its action; the pulse almost imperceptible; the respiration frequent and oppressed; and the patient gets more and more exhausted, tossing about the bed in a constant state of restlessness; till at length coma, stertorous breathing, and the struggles of death, close the scene.

Modifications of the Disease. All the varieties I have ever seen of this extraordinary malady, may, I think, be comprehended under the *Diarrhæal*, *Pyrexial*, and *Asphyxial* forms.

1. *Diarrhæal Modification.* In this form, the causes producing Cholera appear to have had only partial effect; and to require the contingent conditions of time and circumstances to complete those changes of the blood, which constitute the complete development of the disease. Epidemic and endemic cases of this kind are frequently met with, and will be best illustrated by examples.

CASE I. James Copper, a corporal in the Grand Arsenal, aged 39 years, emaciated and feeble—states (on admission into hospital, March 14th, 1840), that, for the last three or four days, he has had frequent purging with vomiting, which increased last night. Pulse feeble; skin dry; tongue expanded and white; epigastrium tender on pressure, and somewhat full. Four grains of calomel, with aromatic confection, and a grain and a half of opium, were given on his admission in the morning, and followed by four dozen of leeches to the epigastrium, and hot fomentations. The purging continued frequent throughout the day, the stools were like rice-water; and, by the evening, the skin was more damp or cold, the pulse feebler, the eyes sunken, and the voice scarcely audible. Pills of acetate of lead, with minute portions of opium, and brandy and water for drink, and application of heat to the body, were tried without any effect in arresting the progress of the symptoms. At midnight, his pulse was scarcely perceptible; and his respiration had become greatly oppressed. The liquor lyttæ was rubbed into the chest, and produced moderate vesication, but without any decided improvement of symptoms: the disease went on to a fatal termination, which took place on the morning of the 16th. A post-mortem inspection of the body showed that the lungs were collapsed, the cavities of the right side of the heart filled with dark fluid blood, and the *glandulæ solitariae* of the colon prominent and enlarged. There was also some venous congestion of the substance of the brain, as met with in other more rapid Cholera cases.

The intimate connexion which appears to exist, in malarious countries, between the gastro-enteritic, dysenteric, choleroïd, and febrile affections, from which Europeans suffer, is indicated by the same atonic and congestive character that leads us to infer similarity of cause and

community of origin in such cases. Where such analogy of symptoms presents itself to observation, we naturally conclude that a like series of morbid changes takes place in each variety; nor can there be much cause for doubt, that such changes commence in the blood. Common diarrhœa, dysentery, or gastro-enteritis, unconnected with blood-lesions, will not, of course, terminate in Cholera; but where the cessation of endosmotic function in the pulmonic cells, as a consequence of blood disease, takes place gradually, and is accompanied by increased exosmotic action of the mucous intestinal surface, the attack may commence with all the symptoms of common diarrhœa, and terminate, in a day or two, as a case of true Cholera. The following is a good illustration of the successive morbid changes effected in cases of this kind.

CASE II. James Randall, æt. 40, seaman of the Government steamer Cleopatra (admitted into hospital, May 22, 1840)—states, that he was attacked last night with vomiting and purging, accompanied by cramps of the upper and lower extremities, but made no complaint of his ailments till this morning, when he was treated for diarrhœa, on board the receiving-ship Hastings. Countenance sunken; voice and pulse feeble; tongue covered by a white film; skin cold and damp. Acetate of lead pills were given every half-hour, along with half an ounce of brandy in warm water; his extremities were shampooed, and bottles of hot water applied to his feet; the liquor lyttæ was rubbed into the epigastrium, and a blister afterwards applied. 11 A.M. Pulse more developed. Three or four rice-water-like stools have been passed since admission. An enema of acetate of lead and tincture of opium was administered, and ordered to be repeated if the purging continued. 12 A.M. Has had three stools since last report, and is disposed to sleep. 2 P.M. Has been only purged once; the stool passed is like rice-water; pulse of better strength. 4 P.M. Bowels moved twice; stools of a pale grey colour; pulse of moderate strength, and soft; headache complained of. Two pills of ten grains of calomel, with one of ipecacuanha, and one of opium, to be given along with a warm salt water enema.

May 23. The calomel and opium pills were repeated yesterday evening at eight o'clock, soon after which time, the purging of rice-water stools recommenced. Acetate of lead pills were again given during the night, and the purging ceased. The calomel and opium pills to be repeated as yesterday. *Vespere*. Bowels moved several times since morning; stools green and mucous; headache gone. ℞ Hydrargyri cum cretâ et quinquæ sulphatis aa. gr. ii; pulveris ipecac. et opii aa. gr. i. M.; fiat pilula horâ somni sumenda. Utatur balneo calido; injiciatur enema anodynum si perstet diarrhœa, vel adsint tormina intestinorum.

24th. *Mane*. Bowels once moved during the night. Continuentur medicamenta heri prescripta.

25th. A small dose of carbonate of soda with rhubarb, taken this morning, acted more severely on his bowels than might have been expected, and produced much languor, accompanied by a cold clammy moisture on the skin. He was seized towards the afternoon with convulsions, became comatose, and died during the night.

A post-mortem examination, five hours after death, revealed the usual morbid appearances observable in Cholera, viz., turgescence of the membranes of the brain, abnormal distension of the blood-vessels of its

substance, with copious serous effusion into the ventricles. The lungs were emphysematous, and there were the usual marks of congestion visible in the heart and abdominal viscera.

The following is a case of *Spasmodic Cholera*, which had scarcely any of the premonitory symptoms incident to the diarrhoeal modification of this disease; but as the spasms belong properly to a stage of Cholera, they cannot well be considered as the groundwork of distinction in varieties of this disease.

CASE III. March 21st, 1840. Absalom Bradley, aged 36, a private of H.M. 6th regiment, admitted at noon into hospital by Dr. Morehead. Stated he had been taken ill about nine o'clock in the morning, since which time he had vomited several times, and had passed as many as five or six stools, one of which, voided since his admission, has the appearance of rice-water. Skin of nearly natural temperature. A warm bath to be used immediately, and a pill of six grains of calomel, with $1\frac{1}{2}$ grain of opium, given. A mustard cataplasm to be applied to the epigastrium. 2 P.M. One copious rice-water-like stool passed since last report; stomach still irritable. The liquor lyttæ to be well rubbed into the epigastrium, and a large blister afterwards applied. An acetate of lead enema, with tincture of opium, to be used; and pills of acetate of lead and opium to be given every half-hour, along with small quantities of brandy and water. 4 P.M. Three pills taken, two of which were vomited soon after. The acetate of lead enema, with opium, was repeated about an hour ago; since which time two scanty rice-water-like motions have been passed. Pulse and skin more natural, and cramps less troublesome. 5 P.M. One scanty stool since last report; skin covered with warm perspiration; pulse feeble; cramps have ceased. The pills to be continued every half-hour, and small quantities of warm arrowroot, with an ounce of brandy, to be given to the patient every hour, or second hour, according to the strength of the pulse. 9 P.M. Had two scanty rice-water like stools about seven o'clock, since which time there has been no recurrence of purging; pulse good. Arrowroot and brandy omitted. Pills of acetate of lead and opium to be given every third hour.

22nd. Four pills given during the night; several dark grey stools passed; little or no secretion of urine; slightly increased temperature of skin; pulse of good strength. ℞ Sulphatis quinæ, calomelanos aa. gr. vi; opii gr. i; confect. aromaticæ, q. s. ut ft. massa, in pilulas æquales tres dividenda, quarum sumat unum 4tâ quaque horâ. Sumat haustum misturæ camphoræ, ℥i ss., cum acetatis potassæ, et spiritûs ætheris nitrosi aa. ℥i. Sugo, with wine, to be given thrice a-day. *Vespere*. Two scanty grey stools passed since the morning; urine scanty; stomach irritable; tongue coated; skin natural, and pulse good. ℞ Calomelanos, gr. vi; pulveris ipecac., gr. ss; opii gr. i. Fiat pilula horâ somni sumenda, et nocte, nisi dejecerit alvus, repetenda. Sumat olei ricini ℥iv cras mane.

23rd. Two light grey stools in the night; some urine passed; pulse soft and skin moist; tongue still coated. Castor oil not given. Sumat pilulam sulphatis quinæ, calomelanos, et opii, antea præscriptam tertiâ quâque horâ. Habeat haustum misturæ camphoræ, et spiritûs ætheris nitrosi. *Vespere*. Urine passed freely; pulse good, and skin natural. Capiat cras mane olei ricini ℥iv.

24th. *Vespere*. Had a good night; urine free; tongue cleaner; skin natural; several bilious yellow stools have been passed since the oil was

given in the morning. The symptoms from this date continued to amend; and the patient was discharged well on the 1st April.

The diarrhœal modifications of the disease, classed by some as *pseudo-Cholera*, can be only viewed properly as imperfectly developed forms of true Cholera, wherein the abnormal functional changes in the blood are followed, more or less suddenly, by a complete development of the symptoms which characterize the more advanced or collapsed stage of the disease. The time which may elapse from the first manifestation of diarrhœal symptoms to the period of complete development, varies according to the intensity of the Cholera poison, and the quantity and depressing effect of the diarrhœal discharges. Sometimes, flatulency and distension of the stomach and abdomen, accompanied by anxiety at the precordia, chilliness of the whole surface of the body, and by diarrhœa of yellow watery evacuations, or bilious green and serous stools, precede for many days the symptoms of collapse; the surface then becomes livid, and is bedewed by a cold unctuous sweat, attended by white rice-coloured dejections from the bowels. On other occasions, symptoms of pyrexial reaction, burning pain at the epigastrium and navel, cramps of the abdominal muscles, vomiting and purging of thin mucous fluid, and a partially hot skin, may be met with as intermediate between the diarrhœal and the asphyxial or collapsed form. Such cases constitute the febrile or gastric modification of the disease; the treatment of which, though not attended by the same amount of success as attends the earlier diarrhœal forms, is more likely to be followed by recovery than in the slowly collapsed *asphyxial* modification.

Cholera being easy of cure in its earliest stage, or diarrhœal modification, it is of great importance to ascertain, by symptoms, how far such choleroïd cases differ from simple diarrhœa. Fortunately, we possess the means of doing so, by testing, in all doubtful cases, the urine; which Mr. Busk and Dr. Rostan find to be albuminous at the beginning of the attack, and for several days after. *Whenever, therefore, there exists any cause for suspicion that the diarrhœa is choleroïd, and may, if neglected, end in complete development of Cholera, we should examine the urine for albumen both by the nitric acid and heat tests.*

2. *Pyrexial Modification.* In this class of cases, the cause has only in part developed itself, or been followed by temporary cessation of endosmotic function in the pulmonic cells, and partial destruction of the heat-producing process. Incomplete and sometimes successful attempts at reaction are made by the constitution, to restore to health the impeded circulation of the pulmonary capillaries; and here the burning pain at the epigastrium, and the partially hot skin, which are indications of such reaction, evidence the constitutional effort which Nature makes to anticipate, as it were, that more active secondary fever and inflammatory reaction, which, as the fourth and last stage of Cholera, succeed to symptoms of grave collapse. The following case will illustrate modifications of this kind:

CASE IV. July 4, 1840. Stephen Dewer, aged 22, a seaman from one of the ships now in harbour, was attacked this morning by vomiting and purging of watery matter, accompanied by occasional spasms of the abdominal muscles; stools passed since admission have the appearance of rice-water; pulse frequent and feeble. *Sumat pilulam acetatis plumbi et opii omni semi-horâ; injiciatur statim enema acetatis plumbi, gr. x;*

solutæ in decocto oryzæ ꝑvi, cum tincturæ opii ꝑss. ℞. Liqueoris lyttæ, ꝑss; quo perfricetur epigastrium, et postea tegatur emplastro lyttæ amplo. *Vespere.* Five pills have been taken and the enema administered; vomiting and purging have ceased; no return of the abdominal spasms; skin of moderate temperature, and soft; pulse of better strength, and easily compressible. The blister has produced moderate vesication. Continuentur pilulæ secundâ quâque horâ. 9 o'clock, P.M. Is from time to time troubled by severe cramp of his legs; pulse somewhat full and sharp. Mittatur sanguis e brachio. After eight ounces of blood had been abstracted, the pulse became more compressible, and lost its sharpness. Continuentur pilulæ tertiâ quâque horâ.

5th July. No return of cramps since the bleeding; urine passed in moderate quantity; skin and pulse soft. Four pills taken; no return of purging. Sumat haustum effervescentem secundâ quâque horâ. Continuentur pilulæ. Small quantities of sago and wine to be given to the patient at short intervals. *Vespere.* Is quite easy; bowels have not been opened; tongue somewhat coated. ℞ Calomelanos, gr. vi; sulphatis quinae, gr. ii; opii, gr. ss. M. fiat pilula horâ somni cum haustu effervescente sumenda.

6th. Bowels not yet opened. Sumat statim olei ricini ꝑvi, ex haustu aquæ menthæ piperitæ. *Vespere.* Bowels twice moved; stools passed with griping. Repetatur pilula calomelanos et opii. Sumat cras mane olei ricini ꝑiv, et tincturæ opii m. x, ex haustu aquæ menthæ piperitæ.

7th. Bowels have not again been moved; occasional cramp in his toes complained of. Capiat cras mane olei ricini ꝑvi.

8th. Complains of pain at the epigastrium, increased by a deep inspiration; pulse natural. Admoveantur epigastrio hirudines l. Sumat haustum effervescentem ter die.

9th. *Vespere.* Has been much griped throughout the day; pulse and skin soft. ℞ Calomelanos gr. iii; pulveris ipecacuanhæ compositi gr. x. M. fiat pulvis horâ somni sumendus. Sumat cras mane olei ricini ꝑvi.

11th. Bowels gently moved yesterday by the oil. Is complaining of slight rheumatic pain in the muscles of his right leg and left shoulder. Utatur balneo fervente horâ somni. Illinatur parti dolenti linimentum camphoratum mane nocteque.

13th. Rheumatic pain of his limbs lessened; bowels gently moved by a small dose of rhubarb and carbonate of soda, given yesterday. ℞ Pilulæ hydrargyri, gr. i ss; pulveris ipecacuanhæ, gr. i; opii, gr. ss; extracti gentianæ, gr. iij. M. fiat pilula mane nocteque sumenda. Sumat cras mane olei ricini ꝑi, ex haustu aquæ menthæ piperitæ.

15th. Bowels moved several times yesterday; stools watery yellow, and passed with tenesmus; tongue clean; pulse of natural frequency. Omittantur medicamenta.

16th. Complains of pain and tenderness along the ribs of the left side, and in the cardiac region, accompanied by difficult respiration and headache. Admoveantur pectori sinistro hirudines l. ℞ Magnesiæ carbonatis, ꝑi; magnesii sulphatis, ꝑvi; tincturæ gentianæ compositæ, ꝑi ss; vini colchici, ꝑii; aquæ menthæ piperitæ, ꝑii ss. M. fiat haustus statim sumendus.

17th. Complains of tenderness at the upper part of the sternum, and uneasiness in the superior portion of the left chest, where the respiration is puerile, accompanied by obscure vesicular murmur; headache not lessened; pulse of natural frequency; tongue furred and deficient

in moisture; bowels gently moved by the draught. ℞ Pulveris ipecacuanhæ, ℥i; vini ipecacuanhæ, ℥iiss; aquæ fontanæ, ℥i. M. fiat haustus emeticus statim sumendus. *Vespere*. Much muco-bilious matter brought away by the emetic; uneasiness of the left chest relieved; headache continues. ℞ Hydrargyri cum cretâ, gr. iij; pulveris ipecacuanhæ compositi, gr. xii. M. fiat pulvis horâ somni sumendus.

18th. No uneasiness in the left chest; slight rheumatic tenderness of the sternum; bowels not moved during the night. Sumat statim olei ricini ℥i, ex haustu aquæ menthæ piperitæ. *Vespere*. Bowels moved several times; tenderness of the scalp at the vertex; pulse full, but soft. Admoveantur temporibus hirudines xxx.

19th. Tenderness of the scalp not lessened. ℞ Misturæ antimonialis ℥i; vini colchici, m. x; morphiæ muriatis solutionis m. xv. M. fiat haustus bis die sumendus.

20th. Tenderness of the scalp lessened. Repetatur haustus magnesiæ sulphatis et vini colchici 16mo. præscriptus. *Vespere*. Bowels moved three times; headache and tenderness of the scalp as yesterday. Mitatur sanguis e brachio ad uncias xviii. Repetatur haustus misturæ antimonialis et vini colchici 19mo. præscriptus.

21st. Passed a restless night; headache and tenderness of the scalp as yesterday. ℞ Misturæ sulphatis quinæ ℥iij; vini colchici, m. xv. M. fiat haustus ter die sumendus. Sumat horâ somni pilulam calomelanos gr. iij; pulveris ipecacuanhæ, gr. i; et morphiæ muriatis, gr. ss.

22nd. Passed a good night, and slept soundly; no headache. Sumat ter die misturam sulphatis quinæ et vini colchici antea præscriptam. Repetatur pilula calomelanos et muriat. morphiæ, ut antea.

24th. Free from complaint, and permitted to leave the hospital.

The phenomena of Cholera generally, and those which constitute its various modifications, may be considered as manifestations of the pathological conditions of the organs in various stages of the disease; which conditions, however, are developed regularly or irregularly, according to the constitution of individuals, and the particular predisposing and exciting causes of the Cholera. When reaction takes place between the stage of congestion and that of *well-developed Cholera*, as in pyrexial modifications of it, this must be viewed as a pathological condition of inflammation or fever, which, though it may not happen in the usual series of effects, must be treated accordingly. The cases in which Mr. Burrel, surgeon of her Majesty's 65th regiment, employed blood-letting so successfully, during the prevalence of Indian Cholera in the year 1818, appear to have been of this kind; and the following case is a further illustration of like pyrexial modifications.

CASE V. Sept. 3, 1818. William Jones, a young, healthy, European soldier, admitted into the garrison hospital, at Tannah, for a contusion of his foot. Went to sleep yesterday evening, leaving the two windows near his bed open, by which he was exposed to the night air. Awoke, sometime after midnight, with pain at the epigastrium, followed soon after by vomiting, chilliness, and cold skin; to which vertigo and purging succeeded. The head was so vertiginous, that the patient fell down several times on his way to the hospital privy; and there was a cold, clammy perspiration on his body during the whole night. Made no application for medicine till the hour of my morning visit to the hospital; when his pulse was feeble and labouring, his stomach irritable, his

skin very cold, and covered by clammy moisture. A dose of fifteen grains of calomel, and the usual draught of tincture of opium, rectified ether, and spirit of ammonia, were given, but rejected almost immediately by the stomach. The medicines were again given and retained; and the patient being then put into a hot bath, was bled from the arm to the extent of fourteen ounces. 3 P.M. The draught last given was not long retained by the stomach; epigastric tenderness and pain still complained of; pulse labouring. *Sumat statim calomelanos, gr. xv; cum haustu tincturæ opii et ætheris rectificati antea præscripto. Mittatur sanguis e brachio ad uncias xii.* 6 P.M. The pulse rose somewhat at first as the blood flowed from the arm, but soon after sank very low; the calomel and laudanum draught were repeated as before, and the patient put to bed, with plenty of warm covering over him, and bottles of hot water to his feet and legs. Dr. Jukes, surgeon of the garrison, had visited the hospital at 4 P.M., and ordered a blister to be applied to the epigastrium. Symptoms the same as at last report. *℞ Assafœtidæ gummi-resinæ ℥vi; sulphatis magnesiæ, ℥ii; aquæ calidæ, ℥xii; tere intimatim, solve, et cola; adde liquori tincturæ opii et tincturæ castorei aa. ℥iiss.* M. ut fiat enema statim injiciendum. 8 P.M. Is much easier, the violent pain in his stomach and bowels having been greatly relieved by the enema; the injection of which was followed by a warm glow on the skin, and gentle perspiration. The blister has not yet produced vesication.

6th. 10 A.M. The blister has produced free vesication. Respiration more free and equable; pulse frequent and feeble; hands and feet of moderate warmth. *Injiciatur statim enema assafœtidæ antea præscriptum.* 6 P.M. Feels quite easy, and seems in a fair way of recovery. Skin warm and perspirable; one watery clay-coloured stool brought away by the enema.

7th-10th. Nearly well; has had one clay-coloured stool from some calomel and opiate confection, prescribed yesterday evening by Dr. Jukes. Left the hospital quite well on the 10th September.

3. *Asphyxial (or Collapsed) Modification.* In the more severe cases of this kind, there are generally no premonitory symptoms of lassitude and nervous depression, diarrhœa, or sensibly progressive congestion; but the patient is, as it were, struck by lightning, and falls down insensible, after a sudden attack of vertigo; lies with half-closed eyes, but has not altogether lost his consciousness; breathes heavily and sighs often; has an interrupted, thready, or almost imperceptible pulse, accompanied by slow action and irregular rhythm of the heart. The eyes are sunk in their sockets, and surrounded by a dark circle; the conjunctivæ are injected with blood; the lips are livid; and the extremities ice-cold and blue, accompanied by a peculiarly corrugated state of the skin, resembling the hands of a washerwoman. These symptoms may be attended by frequent choleroïd evacuations from the bowels, though sometimes little or no purging precedes such attacks, and in all bears no relative ratio to the severity of the other symptoms. Sometimes this symptom is altogether absent during the prevalence of like epidemic attacks, where the presence of all the other symptoms, just enumerated, leaves no doubt of such being modifications of Cholera. Such was the case already narrated in the history of the disease in 1818.

Symptoms and Stages collectively. The characteristic symptoms of *Cholera algida*, which declare the nature of the disease, are those which

have their origin from morbid changes in the respiratory, circulating, and nervous systems ; by which the voice is weakened, the inspirations rendered shallow and frequent, the respiratory murmur lessened, the action of the heart made slow and irregular, the pulse interrupted and thready, the extremities and lips livid, the exhalation from the skin and intestinal surface increased, the secretion of urine suppressed, and the animal heat diminished to a standard little short of the coldness of death. These symptoms vary in their progress and intensity, according to the original or acquired constitution of individuals ; but generally come on in a certain order or progression, constituting stages of the disease : irregularities in which, or interruptions of their usual course, give rise to the several modifications I have mentioned. It is from this very irregularity, that the disease is sometimes so much more unmanageable than at others ; depending, as it appears, on the greater or less intensity of the atmospheric cause, and the predisposition of individuals affected. On the first breaking out of an *epidemic Cholera*, cases of a severe type generally prevail, which become milder as the disease is disappearing. In ascertaining the value of particular remedies in the treatment, it is necessary to estimate, with precision, these conditions and circumstances ; and it is of no less importance, if we would secure the probable success of such remedies, and consult the safety of particular cases, that we should not be led by a blind empiricism in our practice, but endeavour to ascertain, by an accurate discrimination of the particular modifications and stages of Cholera, what specific remedies may be applicable. A summary of the course and progress of symptoms may be conveniently arranged under FOUR STAGES : 1st, the premonitory stage of depression, or diarrhœa ; 2nd, the stage of congestion, or development ; 3rd, the algide stage, or that of collapse ; and 4th, the well-marked stage of reaction, or consecutive fever, which is not an *essential or invariable part* of the disease, but follows as a *contingent condition of congestion* in some cases, by which the parts affected are restored to activity, and poisonous products in the blood eliminated by the secretory organs maintaining their natural functions, without yielding to a state of inflammation.

First Stage. The symptoms of this stage varied in different individuals. In some, the digestive organs were disturbed, attended by fulness of the stomach, flatulence, slight colic, dryness of the palms of the hand, yawning, and indescribable languor. In others, a sense of fulness in the stomach, accompanied by a painful sense of anxiety at the præcordium, listlessness and depression of spirits, preceded pain in the præcordial region, which was followed by diarrhœa, at first of a dark yellow colour, sometimes of a bilious green. This stage was present in the majority of Indian cases ; but was not always sufficiently well marked, or of long enough duration, to be taken into account by the patients. In some, it lasted two or more days ; but its period may be said to extend from the first disturbance of the digestion, and symptoms of nervous depression, to the appearance of Cholera stools, or spasms.

Second Stage. This was generally one of rigour, or chilliness. The patient's countenance had an expression of great anxiety, and was of a dusky brown hue, or livid cast. The alvine evacuations, which were in the first stage fœculent, now became like rice-water, or serous, mixed with flakes of mucus ; but, in some instances, they were of a leaden, turbid

appearance. Vomiting of watery matter, similar to the dejections in colour, accompanied by epigastric pain, was generally simultaneous with the purging. As the vomiting and purging progressed, and became urgent, the cyanosis of the face, neck, and extremities, increased in proportion; the skin became extremely cold, and bedewed by clammy sweat; the voice hoarse; the pulse small, and rapid; the eyes deeply sunken; accompanied by urgent thirst, deafness, and frequent violent cramps of the legs, thighs, and arms. In the earlier part of this stage, small quantities of urine were sometimes passed; but, during its latter period, the secretion from the kidneys was altogether suppressed. The complete development of these symptoms, or a more vigorous circulating system and higher degree of nervous tone in individuals, giving rise to feeble constitutional efforts of reaction in this stage, might be said to form that modification of Cholera which I have called *pyrexial*.

Third Stage. In this stage, the discharges from the stomach and bowels became less frequent, or almost ceased; the spasms were nearly at an end; the pulse, if it had not ceased, was scarcely perceptible; the whole body was bathed in cold, clammy, perspiration; the skin of the hands and feet was icy cold, and corrugated, as if long steeped in water, though many patients could not bear the bed-clothes, and complained of burning heat of skin; there was much constriction of the thorax, accompanied by breathlessness, jactitation, and anguish; the eyes were half covered by the eye-lids; and the dying man, though still conscious, appeared almost in a state of stupor. Some degree of disorder in the respiratory, circulating, and nervous systems, seemed to precede the symptoms of the *second stage*; but in this more *intense form* of the disease, the oppressed respiration, the embarrassed and struggling heart, the loss of nervous irritability, the cessation of all secretions, and the death-like coldness of every part, indicated that all the powers of life were paralyzed, and that vital action was at its lowest ebb. The apoplectic form of the disease is but a modification of this stage, wherein the cerebral functions are at once suspended, by the amount of congestion in the head; while the impeded functions of respiration, circulation, and calorification, are more recently and suddenly affected; and are attended by less real debility than when they occur more gradually.

Fourth Stage. The symptoms, and complications of reaction, have a near relation to the conditions of the third stage; as much, indeed, as sweating, or inflammatory complication in fever, bears to the cold stage. At the period of reaction, the surface of the body became gradually warmer, the skin, from being livid, resumed its natural colour; and the perspiration returned to its healthy warm state. The vomiting, cramps, and diarrhoea ceased; and there was a stronger and fuller pulse, more equable and natural respiration, and a return of both the urinary and biliary secretions, the evacuations from the bowels being now of better consistence, and green. Sometimes, however, as in the hot stage of fever, inflammatory complications of the stomach and liver took place, during the general increased action of the circulating system, with a not unfrequent constitutional *asthenic* tendency, to sinking of the pulse, coldness of the skin, reappearance of the vomiting, return of the Cholera evacuations, and such final prostration of the powers of life, as to terminate in death, after reaction had promised recovery.

(To be continued.)