

REPORT

OF THE

COMMISSION

APPOINTED BY THE

SANITARY BOARD OF THE CITY COUNCILS,

TO
VISIT CANADA,

FOR THE
INVESTIGATION OF THE EPIDEMIC CHOLERA,

PREVAILING IN

MONTREAL AND QUEBEC.

PHILADELPHIA:

PRINTED BY MIFFLIN & PARRY.

1832.

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Sanitary Board, June 22, 1832.

Resolved, That it is expedient that three physicians of eminence be appointed to proceed forthwith to Montreal or Quebec, or both at their discretion, to ascertain the true character of the disease prevailing there, and to attain such further information in relation thereto as they may deem necessary, and to make their communication as early as practicable to this Board.

The Board appointed Samuel Jackson, M. D., Charles D. Meigs, M. D., and Richard Harlan, M. D."

Extract from the minutes, July 30, 1832.

SAMUEL DAVIS, *Secretary.*

1832

1832

ERRATA

Line 8 line 2 from bottom, for Mr. Mann read Mr. Mayow
21 line 1 at the top for applied read apply
22 line 30 from top for spine read epic
27 line 3 from top for present read present
38 line 9 from top for overpowrd read overpowrd

and Mr. Young the Secretary of the Board of Health, visited Grosse Isle, on the 7th of June, examined the passengers and crew, and reported that no case of Asiatic Cholera was on the island. This fact was announced by the Board of Health to the public on the 8th of June, to quiet the apprehensions of the citizens of Quebec, excited by reports of a vessel having arrived at Grosse Isle with cases of the disease on board. Thus it appears that the crew and passengers of the Carricks, the only vessel on board of which cases of Cholera had appeared, were, on the 8th of June, the day the disease commenced, detained at Grosse Isle under quarantine, having had no communication with Quebec—and at the very moment the proclamation of the Board of Health announced to the public that the Carricks, her crew, and passengers were in quarantine at Grosse Isle, and that they were exempt from Cholera, the disease had then broken out in the city itself.

The disease having made its inroad in the manner described, did not extend slowly from the point of its first onset, but manifested itself in almost every part of the town, proceeding with rapid strides to every quarter. From Friday evening, the 8th of June, to Tuesday morning, at 9 o'clock, 12th of June, little more than three days, 70 deaths had taken place, from every point of the city. By this time, also, the disease had shown itself at Point Levi, on the opposite shore of the St. Lawrence, at Beauport, and Little River.

The first case in Montreal was an emigrant who was landed on the 9th of June from the Voyageur steamer, as has been already mentioned, and died the same night, near the old market house. The next day, the 10th of June, a number of cases appeared in the St. Lawrence suburbs, particularly in Sanguinette street, distant from the old market house about half a mile. Cholera cases immediately sprang up in great numbers in numerous unconnected points. The quarters of the town in which these chiefly occurred were the St. Lawrence suburbs, back of the town, the Quebec suburbs, north of the town, and the St. Louis suburbs, between the two last. But very few cases were developed in the city, and especially in the streets immediately adjacent to the river, or on the river bank, where the emigrants were bivouacked, barely protected from the weather by pieces of scantling, sustaining old blankets, rugs, or similar materials.

It is here to be remarked, that the first spread of the disease, its irruption upon the population of Montreal, was in the positions that have been indicated. The city, or the port, properly speaking, was the last and the least affected.

The rapidity with which the disease advanced in Montreal and the suburbs, is almost unexampled in the annals of pestilence. Its commencement may be dated properly the 10th of June. As late as the 12th, the existence of Asiatic Cholera in the city was denied in the papers, and the rumour treated with disdain. On the 13th the Board of Health announced the prevalence of the disease, and issued their first report. The number of cases for the last twenty-four hours was stated at 94—the deaths 23. On the 15th they re-

ported 1204 cases and 230 deaths as having occurred from the period when the disease first appeared, though it was acknowledged the exact number of cases and results could not be ascertained.

This announcement was like a thunderbolt falling in the midst of a population, unconscious of an impending storm. Dismay seized on every mind. A universal panic pervaded the city, which doubtless contributed to the augmentation of the disease. The bulletin of the Board on the 16th, for the twenty-four hours, rated the cases at 431, and the deaths, "as ascertained," at 82; and for the succeeding twenty-four hours the numbers stood 475 new cases and 102 deaths. Taking into consideration the population of Montreal, estimated at 25,000 souls, this statement exhibits a scene of unparalleled desolation: seldom will be found in the records of the bloodiest strifes, in which contending hosts have engaged, so severe a loss of human life.

While Quebec and Montreal were thus unsparingly ravaged by the pestilence, immunity from the scourge was not enjoyed by the numerous villages that line the shores of the St. Lawrence, nor by the adjacent country. Below Quebec it extended to Kamouraska, a distance of eighty miles from the city; it existed at Riviere Ouelle, at Bertha, at Point Levi, and Beauport. Between the two cities it prevailed at Lotliniere, Berthier, Point au Trembles, and Long Point. These are places where we learnt of its existence, though probably many others were equally subjected to its influence. Above Montreal it pursued the course of the St. Lawrence, skirted the shores of Ontario, and had reached Buffalo. We witnessed it at La Prairie, and obtained information of its prevalence at Lachine, Caughnawaga, an Indian settlement, visited by Dr. Harlan, Chateaugay, St. Regis, Cornwall, Prescott, Ogdensburgh, Brockville, Kingston, and York. The great tributaries of the St. Lawrence were the routes of its desolating march. It ascended the Richelieu, entering from the south-west the outlet of Lake Champlain, attacking Chambly, some distance above its junction with the St. Lawrence, and St. Johns. It made a manifestation at Plattsburgh, on Lake Champlain, where seven cases were developed, but soon terminated; and scattered cases appeared at Burlington and Montpelier, Vermont, Whitehall, Fort Miller, and Mechanicsville, New York, but which were individuals, who, arriving from the infected region, had brought with them the original cause of the disease, and with whom it ceased, not having been communicated to others.

The Grand or Ottawa river, falling into the St. Lawrence from the north-west, above Montreal, opened for it an avenue by which it reached Cornwall, Greenwich, and By-town, one hundred miles above its mouth.

The prevalence of the disease in the open country has been by many considered doubtful. Its character in this respect has generally been neglected in the accounts of the disease published in Europe and Asia. The historian of Cholera has been principally the practitioner confined to the limits of the city, or the army surgeon attached to his regiment, and his observations have been restricted

The following statement shows the number of emigrants that arrived at Montreal.

	<i>Cabin.</i>	<i>Steerage.</i>
June 7, arrived in Steamer John Bull -	32	1150
On board two vessels in tow		375
In Steamer British America	9	630
Chambly -	23	530
Lady of the Lake		240
Arrivals on the 7th of June - - -	64	2925
June 8, arrived in Steamer John Molson	18	882
Hercules -	25	740
Lady Aylmer		230
	107	4777
June 9 to 12, arrived in Steamer Voyageur	37	550
St. Lawrence	22	644
Lady of the Lake	7	218
Chambly	15	794
British America	23	114
Total from June 7 to June 12 - - -	211	7097

The emigrants arriving in large bodies, hasten on to the places of their destination. Some penetrate into the states by the route of La Prairie, St. Johns, and Lake Champlain, entering Vermont and New York chiefly by Whitehall and the northern canal. Others ascend the Ottawa, to locate themselves in the settlement forming on its banks; while still greater numbers pursue the course of the St. Lawrence to the lakes, and spread themselves over the adjacent country.

II. *The Character of the Population, and its relation to the Epidemic Influence.*

The population of Quebec and Montreal is of a mixed character, and possessed of different manners and modes of life. At the period of the epidemic it was composed of emigrants, principally Irish, newly landed; of emigrants who had been residents from one to five years; of Canadians of French origin; and of English and Scotch.

The newly arrived emigrants at Quebec, during the prevalence of the disease, were estimated at 5,000. At Montreal the estimate rated them at 3,000. The permanent population of Quebec is stated to be 27,000; and that of Montreal 25,000. The larger proportion consists of Canadian French.

Quebec and Montreal are mere touching points for the great flood of emigration. No adequate provision is made to furnish proper accommodation to the host, that, for the summer months, issuing from the ocean, swarm on the quays, wharves, and streets of

those cities. They are crowded in narrow lanes, in ill-ventilated apartments, and many with scarcely a shelter from the weather. By Dr. Robinson, of Montreal, we were informed, it was not unusual for six and even ten families to occupy a tenement formerly inhabited by one. In a house containing only two rooms, during the last year, fifty persons were found, twenty-seven of whom were sick with typhus fever. So destitute are numbers of these people, and so little capable of procuring the commonest lodgings, that large wooden sheds have been erected to afford them a temporary shelter. At Montreal, the Board of Health, when the disease commenced its ravages, took possession of these sheds, and converted them into hospitals. Large numbers of the emigrants were consequently forced to bivouack on the open grounds along the river banks, exposed to every vicissitude of the weather, against which they were unable to procure sufficient protection.

In addition to these untoward circumstances, the crowded state of the vessels in which the emigrants arrive, the length of the passages, averaging from fifty to sixty days, the indigestible and irritating food and bad water to which they have been previously unaccustomed, together with the influences of a new climate, constitute a combination of causes highly predisposing them to the attacks and ravages of disease.

In former years, when the tide of emigration was directed to the ports of the middle states, the circumstances above mentioned, it was then observed, invariably gave origin to numerous cases of gastro-enteric fevers, with typhoid symptoms, amongst the Irish and German passengers, at the period or shortly after their arrival. The wards of the Alms House Infirmary were, at that time, often crowded with patients of this character. Whole families were brought in labouring under this form of disease, and on some occasions it was necessary to detain the vessels, and send the passengers into the Lazaretto Hospital, from the number of sick on board.

Subsequently the course of this living flood took the direction of Nova Scotia and New Brunswick, where the same disease afflicted the emigrants, and occasioned amongst them, at times, a most lamentable mortality. Within the last few years it has again changed its direction, and now rolls with annual augmentation up the mighty stream of the St. Lawrence, peopling rapidly the wilds of Canada, or thickening the settlements of the western districts of our country. The same attendant circumstances are productive of the same effects, and great numbers at Quebec and Montreal are struck down with fevers of typhoid type, under which many perish. The following statement obtained at Montreal will demonstrate the correctness of this remark.

The admission of *fever* patients into the Montreal General Hospital, from November 1st, 1829, to April, 1830, was 152, and this had been the average for several years. The admissions from November 1st, 1830, to April 1st, 1831, were 232; and the admissions from November 1st, 1831, to April 1st, 1832, were 565.

The typhus fever which prevailed the last summer among the emigrants, we were informed by Dr. Robinson, was extended to other classes, and had continued its prevalence on to this spring.

The emigrants newly arrived, it is thus seen, have their systems strongly predisposed to attacks of disease, and from being thus an appropriate material, would first feel the effects and become the earliest victims of a pestilential or epidemic influence when prevailing.

The French Canadian has undergone no change, in language, habits, religion, or modes of life, since the conquest of the country by the English. He retains all the peculiarities of his origin, and manifests in every respect the character, temperament, and feature of the nation whence he sprung. The only alteration attendant on that event, has been in the rulers, and, in some respects, mode of government.

The general diet of the lower Canadians is vegetables, with soups and bread; they live with little attention to comfort or cleanliness, and are rather intemperate. The liquor in most common use is West India rum.

The English preserve the usual customs of their country, and use a good substantial nutriment, with the attention to the comforts of life for which their nation is distinguished.

The epidemic, on its first appearance, assailed the emigrant and French Canadian population almost at the same moment. At Quebec, the emigrants landed from the *Voyageur*, under the circumstances already detailed, and which were decided exciting causes of the disease, were the first attacked, but on the same and the next day, the French Canadians were equally its victims. At Quebec, from the great number of emigrants crowded together in the small tenements and narrow confined streets and lanes of the lower town, a larger proportion of them, it is said, were attacked and perished, than of the residents and natives.

In Montreal this observation did not hold good. The emigrants suffered less than other classes of the population. The following is an extract taken from the *Montreal Gazette*, of date June 14th. "Another fact which cannot fail to strike every one with surprise is, that but a very small proportion of the cases is amongst newly arrived emigrants, or those connected with them, or with shipping, but the disease seems to have fallen with the greatest severity on the natives of, or those who have been long residents in the country." On the 16th of June, in the same paper, is the following remark: "The prejudice that has arisen against the newly-arrived emigrants is most unfounded, for seven-eighths of the cases have appeared among those who have been a long time resident here." This statement corresponds with the information derived from Dr. Robinson.

The English class of the population of Montreal escaped the disease until the 16th of June, at midday, when the first cases were manifested among them. They suffered in proportion less than the others.

At La Prairie, the individuals who first experienced the pestilential influence, were the carters of the town, who, like the rest of the lower Canadians, are habitual consumers of ardent spirits.

The first individual living in St. Johns, attacked with the disease, was a native Canadian, of the name of Tetron. "He had not been without the limits of the town for perhaps years, and had had no intercourse whatever with emigrants, farther than seeing them pass the streets."* His habits were intemperate. He died after an illness of 15 hours. He was attacked on the 14th June; on the 15th, his daughter suffered a slight attack; on the 18th the widow was taken down, and though she recovered from the first symptoms, subsequently succumbed under those of a typhoid type. Three other members of this family experienced the disease, but in a mitigated form.

A case had previously occurred on the 11th of June, in an Irish woman, an emigrant, in the vicinity of St. John's. She had left Montreal that morning in good health, was seized on the road, 7 miles distant from St. Johns, with violent spasms of the extremities and abdomen, and died the next day, soon after she had been visited by Dr. Buckley, with all the decided characteristics of Asiatic Cholera. This woman had landed 8 days previously at Quebec; the vessel in which she arrived, her husband declared, had not been visited by any sickness, nor had she seen any sick persons at Montreal, where the disease had appeared on the 10th.

In the house in which this woman died, three other cases subsequently took place, one of which proved fatal.

The number of cases at St. Johns amounted to between 50 and 60. Of this number 13 were emigrants; the deaths were 13, of which 4 were emigrants; since our departure there have been several deaths more.

A canal is under construction at Chambly, a village 11 miles below St. Johns on the same river. A body of emigrants is engaged in this work, amounting, including women and children, to 600. While the disease extensively prevailed amongst the French Canadians, the Irish labourers almost entirely escaped, and only four died.

The information collected by Dr. Harlan at Caughnawaga is interesting on this point. This village, an ancient settlement of the Indians of the same name, a band of the Iroquois, is situated on the right bank of the St. Lawrence, 11 miles west of Montreal. It is located on an elevated plane of secondary limestone, covered with gravel and clay, and contains 1000 Christian Indians, under the fatherly and spiritual direction of Mr. Mann, a Catholic priest, highly respected for his devotion, love of truth, and eminent Christian virtues. During the fatal pestilence which laid waste this remnant of the aborigines, he exercised towards these children, the offices of father, friend, physician, nurse, and spiritual comforter and guide.

* Communication made by Dr. Buckley, of St. Johns.

The houses of the village are comfortable stone or frame dwellings. The men are occupied in the cultivation of corn and are addicted to intemperance; the women are engaged in making moccasins, and do not abuse the use of spirituous liquors. A free intercourse exists with Montreal. No emigrants visit this village, their route to Upper Canada being through the La Chine canal, on the opposite bank of the river.

The first case of the disease appeared on the 18th of June. This patient was not known to have been at Montreal; he was intemperate, and had drank freely of spirits with one of the tribe just returned from Quebec. This last individual at the time had a diarrhœa, and was attacked subsequently to the first case with the disease in a very malignant form, and died in five hours. The males constituted the largest proportion of cases, and the greatest number of deaths occurred among them, owing probably to their intemperance.

From the 18th to the 29th of June, 123 cases had taken place, and 59 had fallen victims to the disease. The greatest mortality was on the second day after the disease broke out, the 20th, when 14 died. The whole number of cases up to July 10th, was 137, and the deaths 70, as stated in the Montreal Gazette. Amongst the cases in the village were three pregnant women; premature labour took place in each; two at 7 months, and the other at 8½ months. One recovered, the other two died; one child was born dead, the others living, but soon deceased.

From the preceding facts, it would then appear: 1st, that the disease was not in its commencement confined to the newly arrived emigrants, but attacked on the same day, both the emigrants and the native French Canadians; 2nd, that, with the exception of Quebec, the newly arrived emigrants were less subject to the disease than the native French Canadians and permanent residents of the country, amongst whom the greatest proportion of cases and deaths occurred; and 3d, that the English suffered the least in proportion.

The coincidence between these facts and those observed in Europe cannot fail to strike the attention.

The malignant epidemic Cholera, appeared to find but few subjects in England and Scotland, where the number of cases, compared to the population, was remarkably small. It dealt more severely with the Irish, who were attacked in greater numbers, but with a slight mortality: while it pressed on the population of France, and particularly the metropolis of the country, with an iron hand.

III. *Local Circumstances at Montreal, that favoured the spreading of the disease, and aggravated its mortality.*

The extraordinary manner in which the Cholera first made its irruption upon this continent; its sudden burst upon the cities of Quebec and Montreal, as though pestilence had rained down on them from an impending cloud, with the fearful mortality that ac-

accompanied its onset, have spread a sentiment of alarm and dread throughout the country. A similar visitation is apprehended in every city and village; every where is preparation making to meet the destroyer, and to disarm it of its malign character, as far as human means can avail. It is an inquiry of no little interest, therefore, to determine, whether peculiar and local circumstances did not exist, to which may be ascribed in some measure, the production of this unusual malignancy.

Our observations on this point will be confined to Montreal, of which we had the opportunity of personal inspection and examination.

1st. The topography of Montreal will exhibit one circumstance which has in most instances been connected with inveterate malignancy in the present epidemic wherever it has prevailed.

Montreal is situate on an elevated sloping plain, on the right bank of the St. Lawrence. This plain descends from a considerable elevation, called the mountain of Montreal, about a mile distant from the town. The river bank at the northern suburbs of Quebec, is from 30 to 40 feet above the river; at the southern suburb of St. Ann, it is from 14 to 16 feet. A small stream, called Prudhomme river, coming from the south west, falls into the St. Lawrence at the southern extremity of the town, separating it from the St. Ann suburb. The waters drained from the mountain are collected and form two streams, running in deep ravines and intersecting the plan of the city. The first, commencing below the northern or Quebec suburb, collecting the drainage to the north of the river, runs in a south west course forming the south western boundary of the city, being the dividing line between it and the populous suburb of St. Lawrence. When it reaches the St. Antoine suburb, it bends in a southerly direction, and falls into the river Prudhomme. The second arises from the western declivity of the mountain by two heads which unite back of the St. Lawrence suburb, which it intersects, and falls into the creek already described near St. Lambert street. So entirely does the ravine and the stream that flows along it, pass through the centre of the town and suburbs, that of thirteen wards into which they have been divided, it forms a boundary to eleven. This stream is subject to freshets in the spring, frequently overflowing its banks. To prevent this inconvenience, a tunnel was cut at the northern extremity of Quebec suburbs uniting the ravine with the St. Lawrence, in this manner draining off the superfluous water. The consequence has been to reduce the water in the ravine so much, that it flows in a sluggish stream, dark, lutulent, and offensive. Between this ravine and the river, to the south east, the ground rises to 40, 50, and 60 feet, and attains in the St. Lawrence suburb to the west side, the same elevation. During the winter, the garbage and other refuse matters are thrown into the ravine described, in the expectation that the spring freshets will carry it off. The rise of the waters did not take place this spring, and the stream was said to be unusually offensive.

Along the banks of this ravine, and in the streets and lanes that

cross it, the disease raged with the greatest intensity. Of one hundred cases, ninety, it was stated to us by Dr. Robinson, occurred in this locality. The disease still continues to linger in Montreal, and nine out of ten cases are in the immediate vicinity of this ravine.

In addition to this circumstance, well calculated to favour the progress of the disease, the streets are very narrow, the houses low, and from the want of an effective police, the town was filled with nuisances of various kinds, the removal of which was not effected until after the epidemic had commenced its ravages.

2. Apprehensions had been entertained of a visit from the epidemic, and the government had begun preparations by the formation of Boards of Health. But at the period when the disease made its invasion, the Board of Health had not commenced its operations, no sanitary regulations had been adopted, no measures for the cleansing of the city, the removal of nuisances, the accommodation of the emigrants, and other methods of mitigating the malignity of the epidemic, had been enforced. During the first days of the disease, the Board was engaged in its own organization, and every thing with regard to the sanitary police was in confusion and neglect. From some unaccountable prejudice, or other motive, the seminary, a large, airy, and commodious building in the town, which had been offered for a hospital, was, as we were informed, refused, and the emigrant sheds, one of which had not even flooring, which were mere shelters from the weather, without the least arrangement for comfort, and most inconveniently situated, were taken possession of and converted into hospitals. These were at first without beds or bedding; the sick were laid on straw spread on the floor, without blankets or other covering. Even to the period of our arrival more than half the patients were without beds, and the extent of their covering a single blanket. Under these circumstances a proper system of medical treatment was impossible; it was a useless attempt, and instead of hospitals they could in reality be regarded as mere charnel houses, where the destitute and houseless might die beneath a roof instead of the canopy of heaven. In the St. Ann's shed, the day of our arrival, 117 patients had been admitted, of whom 101 had died, and during our stay 9 to 10 more deaths ensued.

3. From the sudden and unlooked for invasion of the disease, without previous warning of its approach, the rapidity of its progress and extension, the appalling communication by the Board of Health on the 15th of June, the second bulletin issued, that 1204 cases and 175 deaths had taken place in so short a space of time, the ill success of medical treatment destroying confidence in the resources of science and art, all these circumstances combined operated on the public mind in a most unfavourable manner. A universal panic ensued; depression, apprehension, fear and dismay, acting on the systems of hundreds already labouring under the universal predisposition which is observed to influence a community during the prevalence of the epidemic, developed the disease in innumerable instances, in which, without these exciting causes, it would have remained latent.

In all epidemic diseases, moral causes are observed to exercise a most decided influence; in none probably with so great force as in the present. The commotion induced by panic and terror acts precisely in the same line of depression which is the tendency of the disease in its most dangerous stage; and when it exists in its mild form, or there is merely a strong predisposition to an attack, the sentiment of fear and alarm suddenly felt, inevitably brings on the attack in its worst form, that of extreme prostrated collapse. It is all important, therefore, for every individual to discipline the mind so as to look on the disease with self-possession and resolution, and it is a high and important duty in professional gentlemen and the public authorities, to avoid all exaggerations, to manifest no signs of alarm, but to make preparations for the threatening storm with every mark of coolness and determination, and assurances of perfect confidence in the great measures of prevention, when they are observed with exactness and rigidly adhered to.

4. The moral condition of society possesses often a most decided bearing on the character of diseases, and this is especially evidenced in epidemics. Periods of great excitement have frequently an injurious tendency, both as predisposing to and exciting attacks of disease. In Canada party strife had proceeded this spring to great lengths, the passions had been roused, antipathies, and hatreds, and personal animosities were in the height of bitterness. These feelings had not subsided when the epidemic burst upon the city. Not only did the excitements of these passions prove individually unfavourable, but they exercised an unhappy influence, by paralyzing public measures for sanitary objects. The most beneficial suggestions and liberal offers coming from the one party, were regarded with a jealous eye, as originating in a sinister intention, and were rejected by the other. Instead of unanimity for the public welfare, there reigned division, distraction, and distrust.

The lower Canadian population live in a manner well suited to the extensive prevalence of an epidemic possessing the characters of that under which they so severely suffered. They consume largely of ardent spirits, pay but little attention to cleanliness and comfort, make use of a food crude in nature, and live in dwellings mostly of a single story, with confined rooms, and consequently sleep on the *ground floor*. This last circumstance, it is well known, in all epidemics, is one of the most certain means of inviting attacks of disease.

With the above circumstances must also be mentioned the bad quality of the water. The substratum of the soil is a soft secondary lime-stone, mixed with clay, which is dissolved in the water. Springs are deficient, while the well water is seldom clear and is bad tasted. The water of the rivers is chiefly consumed by the inhabitants of the country, which is the cause of their congregating on their banks. Above Montreal the Ottawa enters the St. Lawrence, forming at the junction of these vast floods the island of Montreal. The rivers, though united, do not flow in a blended stream. The St. Lawrence, with its pure pellucid waters, issuing from the great lakes, passes on the southern shore, while the tur-

bid Ottawa, confined to the northern bank, runs beneath the walls of Montreal. This water, charged with impurities, is that used by the inhabitants. Combined with the frequent vicissitudes of temperature, the oppressive heat of the midday, and the coolness of the mornings and evenings, it is probably the cause of the frequent affections of the stomach and bowels, and of the cholera morbus, which are endemic diseases of this city, and tended to the aggravation of the prevailing epidemic.

To the foregoing local causes must be added the large body of emigrants, who, from being deprived of the sheds in former years appropriated to their use, were left in an exposed, destitute, and forlorn condition. That so many should have escaped under these circumstances, is rather matter of surprise, than that they should have afforded so many victims to the disease. It is not to be doubted, that had proper accommodation been afforded to these people, had they and the lower population in the localities where the disease was most rife, been encamped on the beautiful highland in the rear of the town for a few weeks, the ravage of the pestilence would have been restrained, its victims diminished in numbers, and its virulence earlier abated.

IV. *Influence of Locality, Habits of Life, and Disciplinary Regulations.*

In treating of the local causes existing in Montreal to influence disadvantageously the character of the disease, the fact was there stated, that two-thirds of the cases were located along the banks, or in the streets immediately adjacent to the ravine and rivulet which almost bisects the city. The disease in Quebec commenced and was chiefly prevalent for a few days in "the cul-de-sac, a low, confined, ill-ventilated part of the city, crowded with emigrants of the lowest description, with sailors, and other persons of irregular habits." It was this portion of the town that furnished a constant succession of cases.

The island of St. Helens, opposite the lower suburbs of Montreal, displays the influence of locality in a striking manner. The troops were stationed in barracks situated in the Quebec suburb. The disease appeared among them immediately after it broke out in Montreal; they were a few days after transferred to the island, and in three days from their removal not another case took place. The number of cases in the garrison was 94—85 men, 7 women, 2 children—of which 36 died; 34 men, 2 children. The same circumstance was observed in another detachment stationed at the La Prairie barracks. The troops became affected and a number died. They were removed to the island, and the disease immediately ceased.

This island is formed of limestone rock, overlaid with a dry, marly soil—it is shaded with lofty trees, and covered with a fine sward. A small portion is devoted to cultivation. The shore is dry and pebbly—no damp or marshy exhalations contaminate the purity of its atmosphere.

Although the troops were encamped on the island, a guard of twenty-five men was detailed daily, to be stationed at different posts in the town during the day and night, yet none were attacked with the disease. This exemption is to be attributed to the constant surveillance exercised by the medical officers over the health of the men and the impossibility of irregularities. The soldier while on duty, cannot indulge in any excess, and on the island it was not in his power to gratify his vicious propensities.

In this instance it is impossible not to be struck in the most forcible manner, how completely this terrible affection is to be controuled and baffled by attention to the salubrity of a residence and strict disciplinary regulation.

The influence of locality is exemplified in other instances. At Trois Rivieres, midway between Quebec and Montreal, which is a sandy soil and elevated position, and at which the emigrants land in great numbers, the disease has been very light—it is denied that it has occurred except amongst a few emigrant passengers landed from the steamers. At Berthic, higher up the river, which is out of the route of the emigrants, where they do not land, but which lies low, in a damp, wet soil, the disease has prevailed with great violence among the Canadian residents and natives.

Sorel, which is also situated on a dry sandy soil, at the mouth of the Richelieu, has escaped the disease, while it has raged with great violence at Chambly, a few miles above, on the same river, and has appeared at Isle au Pas in the river immediately opposite the town.

Many other villages also escaped a visitation, or the disease manifested itself in the slighter form of disordered stomach and bowels, easily managed, and giving rise to but few cases of its more malignant type.

In these instances particular circumstances mitigate the energy of the productive cause, or tend to modify the character and reigning type of the disease. These circumstances properly seized on and duly appreciated, are of the highest consequence; for, though it may not be within the limited power of our very finite capacities to ascertain the natural causes in the action of which pestilential diseases originate, nor in the power of human agency to destroy those causes, yet, by determining the laws of their production, and all their attending phenomena, we may controul their energy, restrict the extent of their prevalence, and abate very largely their mortality.

Habits of life have acquired so much of notoriety from their influence as predisposing and exciting causes of diseases generally, but as more especially marked in the prevailing epidemic in these respects, that it would be supererogation to enlarge on this subject. Still it would not be proper to pass in silence the concurrent testimony furnished to this most important fact, by the experience of Montreal and Quebec. This point, in fact, cannot be too strongly enforced, or too emphatically dwelt on, for it is the circumstance of all others, that most places the disease within the controul of nearly every individual. Few attacks of this affection in its ma-

lignant and unmanageable form take place, that are not to be attributed to the habits of life, or to some act of negligence or imprudence on the part of the patient.

Under this head, the habit of life, maintaining an unrivalled supremacy in its pernicious tendency, is intemperance in the use of ardent spirits. It is true that persons who are perfectly temperate in this particular are the subjects of the disease, and even become its victims; but these are rare instances when compared to the numbers of the intemperate who perish from its ravages. In Montreal we were informed that no one addicted to habitual intemperance recovered. The organs that most suffer from the impressions of the morbid cause generating the disease, are placed, by the habits of intemperance, in the very line of the disease. They have already passed the first steps; the opposition raised by a sound constitution to the progress of destruction has already been beaten down—no obstacle is present to impede its onward course—it is a blow, a rush, and the miserable wretch is sunk into the prostrated collapse, a rescue from which is almost a miracle, and is too rarely witnessed.

Intemperance in other respects, whether of a moral or physical nature, though less destructive than the habits of constant intemperance in ardent liquors, are of injurious consequences. They all possess the general effect of disturbing the equilibrium in the force of the various organs composing the animal economy, and in this manner destroy its powers of resisting morbid impressions, and often call into active existence the latent influence exerted by the epidemic poison on the economy, and which would otherwise have passed away.

It has been a very general observation, that the prevalent epidemic has spread its destructive ravages among the lower orders of society, touching with a light and sparing hand those happier individuals blessed with easy circumstances. This general observation, though it has its exceptions, explicable always by some marked peculiarities in the cases, was verified at Quebec and Montreal. The greater number of individuals attacked, and especially of those who perished, were of the lowest class of the emigrants, and resident or native population. The most numerous exceptions to the rule occurred during the panic which pervaded the population of both cities for a time. In Montreal, from the existence of so many co-adjutant causes aggravating the disease, more of the better orders of society perished than in Quebec. In this latter city, of 362 subscribers to the exchange coffee-house, and who are all persons enjoying comfortable and good circumstances, only one died, and particular circumstances tended to give in that a fatal result.

This greater prevalence of the disease in the lower classes of a population, arises entirely from their habits of life. It is in those classes that gross intemperance abounds, which, united to aliment of inferior quality, small, close, ill-ventilated, crowded, and uncleanly dwellings, form a combination of all the circumstances inviting the attacks of the disease and aggravating its character. In

addition to these, in the lower classes, almost without exception, the symptoms of the first stage are misunderstood and neglected, and they are placed under medical treatment only when the disease has assumed its most formidable aspect. It is from these causes, as more frequently existing in the inferior classes, that the poor suffer in greater numbers; but intemperance, imprudence, negligence and inattention to cleanliness in any situation, among the rich or the poor, the high or the low, are equally predisposing to and excitative of the attacks of the disease. Another prolific cause subjecting the poorer classes in greater numbers to this terrible malady in its worst shape, is the constant necessity of labour for their subsistence. The exhaustion of fatigue especially induced by labour in the midday sun, is amongst the most common sources of the malady. In Montreal, we were informed by Dr. Robinson, "that masons, sawyers, and others exposed in their occupations to the open air suffered greatly. Men fell down with their hods on their shoulders." These facts indicate the propriety, during the prevalence of the epidemic influence, of suspending labour during the hours of greatest heat.

The immense advantage, the almost absolute conservative power affording nearly complete immunity from the disease, derived from disciplinary regulation, was demonstrated by the exemption from the epidemic procured for the garrison of Quebec. The troops were stationed in fine lofty barracks in the upper town, and so far possessed the advantages of a salubrious situation. But detachments were daily posted in different positions both of the upper and lower town as guards—and thus were exposed along with the citizens to the common causes of the disease. No soldier, however, was permitted, when not on guard, to leave the barracks, unless accompanied by a non-commissioned officer, responsible for his conduct. Every precaution was taken to preserve the most perfect cleanliness, and to prevent excesses, or exposure to the imprudences of which soldiers are so commonly guilty. Every morning, the garrison, men, women, and children, were mustered and underwent an inspection and examination by the medical officers, so as to detect the first germs of complaint. Not a case of Cholera occurred in the barracks until Monday, July 2d, twenty-four days after the commencement of the epidemic. A sapper and miner of feeble constitution, who lodged in the citadel, was then attacked, and is the only case known to have occurred.

Combining together in a general result the foregoing observations, we obtain the following summary of facts:—

1st. The epidemic appeared almost simultaneously at Quebec and Montreal, and in a few days occupied with but few exceptions the whole line of the St. Lawrence, from below Quebec to Prescott and Ogdensburgh on the river—and York and Kingston on Lake Ontario.

2d. A large body of emigrants had arrived at Quebec and Montreal previous to the breaking out of the disease, but who continued in health.

3d. That the circumstances in which these emigrants were

placed, were precisely those that give in the highest degree the predisposition to the disease, and are the most active of its exciting causes.

4th. That no emigrants had landed at Quebec or Montreal previous to the commencement of the disease, who had arrived in vessels on board of which cases of Cholera had occurred during the passage.

5th. That the average duration of the voyages was from fifty to eighty days; while the period of incubation of the disease, or the time from exposure to its cause and the development of the symptoms, so far as ascertained by the history of the disease from its commencement to the present epoch, is from six to fourteen days.

6th. That the Carricks, the only vessel on board of which cases of Cholera had taken place before her arrival at Quebec, was, on the 8th of June, the day when the disease commenced its ravages in that city, actually in quarantine with her crew on board, and her passengers all perfectly exempt from disease, in the shed on Grosse Isle, thirty miles below the town.

7th. That the disease attacked on the same day, the emigrants and French Canadians, and singled out victims at points distant from each other, and who had no previous communication.

8th. That in Montreal, the English residents did not begin to suffer from the disease, until the 17th of June, a week from the time it first appeared.

9th. That in Montreal the Canadian population suffered more than the emigrant population, especially when is taken into consideration, the unfavourable circumstances in which these latter were placed.

10. That the native Indian population appeared to be strongly predisposed to the disease, which afflicted them with a dreadful mortality.

11. That numerous causes existing in Quebec and more particularly Montreal, concurred to occasion the rapid extension and propagation of the disease in those cities, and impressed on it the virulent aspect and malignant character it there manifested.

12. That those circumstances do not exist in the city of Philadelphia, and with some degree of confidence, we may anticipate a mild visitation, and comparative exemption from its prevalence in the epidemic form; or should it appear, that it will be confined to the close lanes, alleys, and narrow streets, with crowded tenements, where ventilation and cleanliness cannot be procured.

13. That a system of municipal regulations calculated for the preservation of the health of the community, and a sanitary police perseveringly adhered to and rigidly enforced, are capable of guarding, to a great extent, against pestilential influences, and warding from the people the attacks of the epidemic, in the form when alone it is malignant and unmanageable.

14. That individuals, by an adherence to a strict personal morality, by temperance in all the appetites, and moderation in all the passions; by cleanliness, and the exercise of a common pru-

dence, may preserve themselves amidst the pestilence, perfectly exempted from a malignant attack, which is alone to be apprehended. The disease is thus placed in a great measure under individual controul.

15. That instruction in this important, and we believe universal fact, should be carried home to every individual of the community. This may be accomplished by a few simple rules and precepts, concisely and clearly expressed, published and largely distributed, placarded on the corners of the streets, alleys, and lanes; affixed to places of public resort; placed in a conspicuous position in all the taverns and boarding houses of the city; taught in the public and private schools as a portion of the exercises; and above all, enlarged upon and enforced by the moral instructors and spiritual guides of the people, with all the eloquence and talent that adorn, and the holy reverence that surround the sacred desk.

Part 2d. Medical Account of the Disease.

GENERAL REMARKS.

I. So much has been written and published within the last two years on malignant Cholera, under various designations, that it might be thought prudent and excusable, should we omit entirely to enter on any medical notice of the disease. The press has literally groaned beneath the weight of publication. Notwithstanding these numerous efforts, and this amount of labour, it must be confessed, that a corresponding progress in arriving at positive knowledge of the character, nature, and method of treating the disease, has not been accomplished. The evidence of this is presented in the discrepancies of opinion and the discordancies of views that are earnestly maintained; the conflicting theories, the opposing numberless systems of treatment, all equally conjectural, uncertain, vacillating, vague, and unsatisfactory in results, that are daily promulgated and warmly advocated. Truth is simple, striking, and convincing. When once discovered, then rally around it unprejudiced inquirers, the candid in sentiment, the true lovers of knowledge, and a unanimity of opinion soon begins to prevail; for facts presented in their just light are seen alike and acknowledged by all. Diversities of opinion on the same subject are generally proofs of obscurity and ignorance, and numerous remedies for the same evil is conclusive evidence of the little utility of any. In this unsettled state of the question, we may be permitted, without hazarding the charge of presumption, to offer the results of our observation on this formidable epidemic.

Before proceeding to speak of the disease, a few general observations on epidemic diseases will tend to illustrate some of its characters.

A. Epidemic Influence or Constitution.

The influence or remote cause giving rise to epidemic diseases, is unknown. All that has been written on the subject is mere con-

jecture, and deserving no serious attention. It is probable certain information on this subject is not attainable, from the imperfection of our means of research, and the finite power of our senses. Though we may not penetrate the nature of final causes, yet we can seize on the phenomena they develop, we can determine by cautious observation the modes in which these are produced; we are enabled to appreciate their true character, and to unfold the laws by which they are governed. This is the only knowledge man can boast of as positive: it is that which he can alone render available for useful purposes in his present mode of existence.

Epidemic diseases are to be studied on these principles. In a philosophical view they compose great problems, the solution of which will furnish the basis of sanitary municipal regulations for the community, and fortify the moral discipline of society. In this light they are to be regarded as important lessons to be studied as yielding wholesome instruction, and not in the light of vengeful acts to be deprecated, as inflictions for offences with which they are unconnected.

Some general principles in relation to epidemics may be considered as well settled.

1. They are partial, as pervading a city, district of country, or an entire continent; or universal, as sweeping over in succession a zone of the earth.

2. The grand line of march of universal epidemics, is from the eastward to the westward, though they exhibit at the same time an irregular and sometimes a diverging course.

3. They are confined to zones comprehending a certain number of degrees of latitude. The influenza of last winter did not reach as far north as Montreal, and it does not prevail at the same period in both hemispheres. The dengue which travelled as an epidemic the circuit of the globe a few years past, was limited to the southern latitudes of the northern hemisphere. As yet the most southern point of the present epidemic has been the Mauritius.

4. The duration of the epidemic influence or constitution varies, being prolonged from a few months to several years. The influenza seldom continues longer than three or four months in any one place; it travels rapidly, and generally completes the circuit of the globe in about twelve months. The eruptive diseases when epidemic, as small-pox, scarlet fever, and measles, are slower in their movements. Small-pox and measles generally prevail from one to three years; scarlet fever from three to five years, and they occupy from ten to twelve years in their circumterrestrial course. The present epidemic has occupied fifteen years in its progress from Bengal to the continent of America.

An epidemic constitution that gave rise to yellow fever, high bilious remittent, and intermittent fevers, commenced about 1790 in the United States, and continued to 1805. During this period, every summer cases of yellow fever occurred, and it was at times epidemic. This constitution disappeared until 1819, when it again returned, acquired its acme in 1825, and has since declined.

While the epidemic influence endures, the disease it generates

continues to recur at different intervals, until the epidemic constitution is exhausted. It is not improbable, from all appearances, that malignant Cholera may for a time present this character.

5. The epidemic influence is not confined to the human race. All organized beings suffer from its operation. The epidemics of animals, or epizootics, have become an interesting subject of inquiry, and throw much light on epidemic diseases generally. The blights which affect plants very extensively, are epidemics amongst vegetables. The whole of the forest vegetation was remarkably backward in Canada and exhibited an extreme languor, while an immense number of the trees had perished. It was generally supposed they had been killed by the winter cold. Yet this seems rather doubtful of the hardy forest trees.

6. The epidemic influence or constitution is especial for each particular epidemic. No one epidemic can be taken as a standard by which the others are to be compared, examined, and judged of, but each must be investigated in reference to its own phenomena. The epidemic influence or constitution appears to act on certain organs, and affect certain functions of the economy, disordering or disturbing their natural or physiological phenomena, and altering their natural mode of being, and thus producing an especial predisposition to a certain form or class of diseases, in preference to any other.

7. The epidemic influence or constitution is essential to the prevalence of any disease in the epidemic form; even of diseases notably contagious. Small-pox, measles, and scarlet fever, are contagious diseases, and at the same time are epidemic or sporadic, according as the epidemic influence may be existing or absent. Before the introduction of the practice of inoculation for small-pox, it prevailed epidemically at intervals of twelve or more years. After inoculation became general, individuals affected with small-pox always existed in society, but the disease did not assume the epidemic character, except at certain epochs. There was something wanted, which was the epidemic influence, imparting the predisposition. Since the abandonment of the practice of inoculation and the substitution of vaccination, small-pox now presents its original character. It disappears for a series of years, or manifests itself only in the sporadic shape. This circumstance from being misunderstood, led to a belief for a time, that vaccination had actually exterminated small-pox. But this pleasing delusion was dissipated by its recurrence, accompanied by its modified congener varioloid, in the epidemic form, when its specified period arrived. This has now become the settled habit of the disease. The same observations are applicable to all the eruptive contagious epidemic febrile diseases.

They are equally true with respect to other febrile epidemics. During the influence that imparts the predisposition to yellow, bilious, and intermittent fevers, putrid effluvia, marsh exhalations, moral commotions of the intelligence, indiscretions in habits of life, and numerous other causes, which, at other periods would be innocuous or cause a slight degree of disorder in some function or organ, now become exciting causes, developing those greater ma-

ladies. The same facts applied to other epidemic affections, and particularly to the present reigning disease, which is excited into action by the same causes that before produced former epidemic diseases.

8. Epidemic influences or constitutions recur periodically at different intervals. Influenza recurs at intervals of six or seven years; small-pox, measles, and scarlet fever, reappear at periods of from twelve to fifteen years. The various forms of epidemic gastro-enterites, yellow, remittent, bilious intermittent fevers, and the same diseases with typhoid characters, have manifested periods of from fifteen to seventeen years. These periods are stated not as positively accurate, but as approximations to the truth. More time than is at our disposal, and a reference to numerous works would be requisite to establish the exact intervals and periods of each epidemic. The preceding views are the result of the recollections of general reading and observation, and may be liable to some inexactness, though the principle will be found correct.

II. *The Prevailing Epidemic.*

The present reigning epidemic having ravaged Asia, and overrun the great portion of the European continent in its desolating march, has reached our shores and threatens to carry its devastations into every portion of our country.

The generic name of Cholera first given to it in Bengal, has been universally adopted, though a variety of special appellations has been bestowed on it. The term has most probably been unhappy. The disease is certainly very distinct from common cholera morbus, though it presents some features analogous to that affection. It bears, however, analogies quite as strong to other diseases. The name too has led most probably to treatment very generally based upon the usual remedial proceedings adapted to common cholera, but the propriety of which may be well questioned.

Many discordant opinions have been advanced, each of which has been more or less earnestly advocated, respecting the proper character and true nature of this formidable and very peculiar disease. They may be approached probably more nearly by an analytical examination of its distinguishing features.

Malignant Cholera, the name that at present may be adopted as the least objectionable, exhibits very distinctly different stadia or periods, each possessing its peculiarities, constituting perfectly distinct, and in some of them dissimilar states, requiring different modes of proceeding in the treatment.

Four or even five periods may be distinguished, and will be best understood by treating of them separately.

A. *The period of Predisposition originating in the Epidemic Influence or Constitution.*

Every epidemic, it has been seen in our general observations, depends on the agency of some unknown cause, disposing at the

same period, numbers of individuals on whom other causes perturbative of the operations of their economy shall exercise their influence, to be seized with a particular array of symptoms or attacks of a disease, in preference to any other set of symptoms or disease. This remote cause is often widely diffusive, acting at once over a wide space. It gradually advances in intensity, reaches its climax, and then as slowly disappears.

In the present epidemic this character is strikingly displayed. Wherever the disease has prevailed it was preceded by a disordered condition of the gastric and intestinal functions, with slightly augmented nervous irritability. And during its continuance, those who escaped the explosion of the disease, all suffered in varying degrees from affections of this nature.

In Montreal as early as the months of April and May, this epidemic influence was manifested; numerous cases of stomach and intestinal diseases attracted the attention of the medical practitioners. Cholera Morbus, though out of season, occasionally occurred, and one fatal case with the symptoms of the disease that subsequently appeared, took place in the Quebec suburb, under the care of Dr. Nelson, on the 28th of May.

Dr. Robinson keeps a meteorological table, in which remarks are made on the prevailing diseases of the north. He exhibited to us the following entry on the 1st day of May last.

At St. John's the same facts were noticed. Dr. Buckley lost in April, a patient named Steen from an attack of Cholera Morbus, which exhibited the same characters as the epidemic that afterwards ensued.

In Philadelphia, every one the least observant, has been conscious of an unusual and peculiar condition of his economy, during the last three or four weeks, chiefly displayed in the disordered state of the stomach and bowels. It is probably no exaggeration to assert that two thirds of our population have experienced feelings of this kind. This derangement of the functions of those viscera, is not confined to our district of country. Letters from medical gentlemen in various sections of the country, as far south as North Carolina, announce the existence of the same phenomena. Of the fact of a general epidemic predisposition, there can exist no manner of doubt. It remains then to inquire 1st, the symptoms of this state, and 2d, the condition of organs in which it consists.

1st. *Symptoms of the Epidemic Constitution.*

They are chiefly disturbance in the healthful feeling of the stomach and bowels, and the regular exercise of their offices. Digestion is impaired; food that formerly caused no disorder of these viscera, produce a sense of tumefaction and distention of the stomach and abdomen, or bring on attacks of colics or diarrhœa. A sentiment of heat in the belly is not unusual, and slight dysenteric symptoms are present. The tongue in most persons is furred, and not unfrequently pasty. Thirst is generally more urgent than usual.

This array of symptoms so generally experienced, is clearly indicative that the epidemic cause or influence affects primarily and principally the mucous tissue of the alimentary canal. It would appear to be its starting point.

2d. The condition or mode of being of this tissue as indicated by the symptoms, is that of an extensive irritation, occupying not a single zone of this extended surface, but its whole extent. The phenomena manifested in this period of the disease have the closest analogy to the phenomena resulting from small doses of an irritating or drastic cathartic, not sufficient to ensure a free and copious evacuation, but tormenting the bowels with their irritating impression, disturbing their offices, and worrying with irregular operations.

The treatment adapted to this period and to these symptoms, is chiefly dietary. While the symptoms are strongly marked, solid food should be omitted. Mutton or chicken broth; rice or barley water; rice or hominy for a few days should constitute the food. Black tea made by boiling so as to form a strong decoction, possessing slight astringent and tonic properties, diluted with cream or milk, forms the best breakfast and supper. Bread should be stale. At the same time, quiet and rest should be observed. The patient should keep to the house, or remain in bed, and maintain the body in a comfortable temperature, erring as to heat rather than cold.

For medicine a few drops of spirits of camphor, or spirits of camphor with laudanum or black drops (notwithstanding the formal prohibition of this combination) are useful. If there be diarrhoea or pain, the opiate is essential. Calomel or blue pill, with opium and ipecac. in this are also serviceable. The external irritation of the skin by salt or by foot baths, pitch plaisters, spine plaisters, daily frictions of the body are exceedingly serviceable, and these constitute excellent prophylatic means.

Purgative medicine must be avoided entirely in the delicate, feeble, and nervous, and in the robust, strongly constituted and phlegmatic, be used with great discretion and caution. The saline purgatives are particularly obnoxious to this complaint. Many fatal attacks have been developed by them. The bowels are intolerant of purgation.

The symptoms of this state are easily controuled, and hence arise the numerous remedies extolled as specifics in Cholera. The cures have been in cases of this slight nature, apparently augmented, by timidity of character in some, and the nervous temperament of others, exaggerating symptoms, without increasing their danger.

The most certain, the most efficient remedies are diet, rest, repose and warmth.

In a great majority of a population, the epidemic influence proceeds no further in the production of disease, especially in the temperate, and those of good constitution and sound organs. To the explosion of the disease in its aggravated character, an exciting cause is necessary, and this cause may be any circumstance making

a strong, powerful and sudden impression on the economy, no matter what may be its nature. Hence it is that all situations where unwholesome and offensive effluvia, exhalations, miasmata, are generated—where malaria exists—errors of diet, passions, strong doses of medicine, and a thousand other circumstances are observed to bring on sudden attacks of the disease.

B. The Forming Stage or Commencing Symptoms of the Disease.

This stage or period varies in duration from a few hours to one or two days. It is most generally induced by some of the exciting causes enumerated, especially errors in diet, vicissitudes of the weather, exposure to wet and cold, and fear.

This stage is to be considered, 1st, as to the organs affected; 2d, the condition of the organs; 3d, the treatment.

1st. The stomach and bowels still take precedence, as is evinced by the symptoms, in the most decided manner. The stomach is nauseated and vomiting is urgent. The discharge from the stomach is at first very frequently the food which had last been taken. Often the meals of the last twenty-four hours are rejected, having remained undigested. The general character of the fluid evacuated is a clear thin fluid, resembling rice water—it is sometimes bilious or greenish.

Diarrhœa is a very constant, though not universal attendant. The discharge at times resembles thick gruel, or is very similar to that yielded by the stomach—often as clear nearly as spring water, but having a sediment of a mucous or albuminous character settling after standing. Violent tormina often exist, sometimes tenesmus, with spasms of the stomach and intestines, with so much torture to the suffering patient as to cause him to scream with the agony he endures. The discharges both upwards and downwards in this period are mostly of two kinds and usually mixed together. The one a very thin, clear, serous fluid, the other albuminous matter, either in flocculi, or the form of a white, thick, and creamy fluid.

In this stage disorder of nervous function is manifested. Cramps affect the extremities, most commonly commencing in the feet and attacking the muscles of the legs, then the thighs—the upper extremities suffer, and in very desperate cases the whole body is seized with spasm.

Neuralgic pains or morbid sensibility is also very common. In some instances they prevail in a most excruciating manner, without the slightest contraction of the muscles; at other times both affections exist together.

The glandular secretory apparatus has its functions deteriorated. Bile is not secreted, the urine is deficient, the tears are dried up. No mental emotion calls forth this natural witness of the internal grief of the soul.

The circulation in this stage is under the influence of the morbid

condition. The general circulation or that of supply is enfeebled—the pulse becoming small, frequent, and feeble. The organic or capillary circulation presents opposite states. The surface of the body loses its temperature, the extremities begin to cool and to diminish in bulk, showing the moveable element, the organic fluid of their tissues, is forsaking them. The head in the same manner has a diminished temperature. The features begin to shrink, the eyes look hollow. The colour of the whole exterior is of a duller hue, the nails and lips are livid, the eyes are surrounded with a darkish zone, the fingers, hands, and feet exhibit a lividity that is unnatural. The pulmonary or respiratory organs in this stage exhibit signs of disorder. The breathing is anxious, laboured, oppressed, in some exceedingly distressing.

In this state then the organs affected are the stomach and bowels, the glandular organs, the nervous organs of muscular contractility and sensibility, the organs of the general circulation, the capillary vessels of the external surface, and the respiratory organs.

2d. The condition of the organs is to be determined from the symptoms and a knowledge of their functions. The symptoms are the outward sign or manifestation of the disturbance in the natural function or condition of the organ. They are the language of the suffering organ. The natural function or condition must first be known before the meaning of the symptom can be understood.

The symptoms emanating from the stomach and bowels are those of a most wide spread and most active irritation of the gastro-intestinal mucous tissue. It is not a single compartment of this extensive surface, greater than that of the whole exterior, that is affected, but every point is involved at the same moment. Hence the simultaneous discharge upwards and downwards. Neither is it one element of this complicated tissue which is the subject of this morbid impression and suffers in its mode of being. The capillaries are highly injected, as shown in post mortem examinations, when death ensues in a few hours, and previous to copious discharges, that relieve the congested organ. The exhalents pour forth a copious watery or serous perspiration. The mucous follicles and cryptæ, and the glands of Peyer and Brunner invariably enlarged, and in protracted cases mostly ulcerated, are irritated, inflamed, and furnish the vitiated mucoid secretion, constituting the whitish, creamy, and albuminous matter discharged from the bowels and found in them so constantly after death. The nervous expansion or tissue forming an element of this membrane experiences a violent irritation, provoking the contractions of the muscular tunic. Hence the spasms, tormina and griping pains so frequently torturing the patient with agonizing sufferings.

The condition of the nervous organs, giving rise to the cramps, spasms, and neuralgic pains, it is not easy to determine. These symptoms have their origin in the columns of the spinal marrow, but the precise pathological state of this structure is very obscure. Dissections do not demonstrate any remarkable alterations of structure, nor is the coloration so generally affected, or injection of vessel frequent, as to lead to a supposition of any very intense ac-

tion having existed. Besides, the cramps and spasms in most cases are a symptom so easily controlled, that they cannot be considered a very important feature of the pathological state. A tourniquet, a tight ligature, cups to the spine, or even to the abdomen, frictions, are often sufficient permanently to dissipate and almost always to relieve them. The suffering of the patient is then abated, but no material improvement is effected in his condition. The neuralgic pains often yield to frictions or cups on the spine, or to a few drops of laudanum, without, however, the patient being placed in a less hazardous position.

From the symptoms it is evident there is disorder of the nervous functions of sensibility and muscular motility. But we find these functions to manifest disorder under two opposite conditions—an inflammatory excitement of the nervous organs; and the reverse—or a state of exhaustion, especially induced by excessive losses of blood, or by copious evacuations. From either of these causes will proceed neuralgic pains, spasms, and even convulsions. The cerebral organs remain unaffected, or at least exhibit no disorder or commotion. They are enfeebled, and every exertion of the mind is an effort frequently painful to the patient. There is want of energy in the actions of this structure.

The glandular apparatus appears to suffer from deficiency in its circulating fluid, and a want of excitement. In this respect it is in unison with the skin.

The condition of the heart, the impelling force of the general circulation, is that of gradually increasing debilitation. The general circulation, or the system of supply to the capillary or organic circulation, is becoming exhausted, being deprived of a large amount of the quantity of blood it contains and circulates. From these states the pulse loses in its force and fulness, while it possesses augmented frequency; and the blood is not propelled in sufficient quantity into the organs unaffected by the diseased condition to sustain and develop their forces of life.

The capillary circulation, in which in health, antagonizing forces preserve an equilibrium, exhibits the commencement of the complete overthrow it subsequently manifests. The extremities, especially the lower extremities, lose their natural temperature; beneath the nails, the colour is seen purple, livid or blue. This change in the coloration extends gradually along the limbs, and is seen to circle the mouth and the eyes. Now commences the shrivelling of the fingers, hands, toes, and feet. The skin loses its elasticity, and remains in whatever position it may be drawn. These changes are the evidence of three positive conditions: 1st, the moveable element of the organism, the sanguineous fluid, exists in the exterior surface, in much less proportion than is natural; it has abandoned the periphery of the body: 2nd, the red globules remain stagnant in large quantity in the tissues, their movements have ceased, and hence they acquire, as they always do when quiescent and not exposed to the action of the atmospheric air or oxygen, the dark hue of venous blood: 3d, the watery, serous, saline, and albuminous elements of the blood have escaped from the

internal and external surfaces, so as to change materially the character or constitution of the sanguine vital fluid. The red globules can move only from the pressure of the watery element, the vehicle which gives them mobility. The loss of this tends to the general stasis of the circulation that is to be observed in every portion of the structure. The internal capillaries exhibit a condition the reverse of the preceding. The blood that has abandoned the exterior is precipitated into the tissues of the interior, is accumulated and detained in them, forming an extensive congestion with hemastasis or stagnation of the blood. An examination of the interior surfaces open to inspection, demonstrates this state to exist. By turning down the lower lip, exposing its inner surface, the vessels, capillaries, and the whole tissue are seen injected with blood in the most beautiful manner. In the advanced period, or collapse, it has the appearance of a fine size injected preparation, and when pressed on with force by the finger, the blood is not *displaced*—the stasis is complete.

The respiratory organs in this stage, do not present aberrations strikingly indicative of their pathological condition. The huskiness or thickness of the voice, resembling that caused by a slight cold, and the anhelation with a sense of oppression in the chest, arise from a commencing alteration in the laryngeal, tracheal, and bronchial mucous membrane, and probably a disorder in the functions of the pneumogastric and thoracic ganglia. The natural secretion of mucus, lubricating, and softening the membrane, and fitting it for its various offices, is arrested. Its circulation is becoming embarrassed and congested, of which the aspect of the labial surface and gums is an indication and evidence. From this state of the mucous membrane, the voice is affected somewhat as it is from an analogous condition in irritation of this tissue from cold. The function of respiration, attached to the bronchial mucous membrane, is necessarily affected by the stasis or remora which occurs in its circulation and its power of transmitting the blood. Hence the feeling of sense of suffocation, of the want of air, a feeling always called into existence whenever the mass of the blood, from any cause whatever, does not undergo the changes essential to its constitution, by an exposure to the air in the lungs. The difficulty experienced in the circulation of this membrane, resists and prevents the passage of the blood from the heart, and that fluid accumulates in the pulmonic ventricle and auricle, and the venous system generally. This is the correct explanation of the anhelation and oppressed breathing, the anxiety and sense of suffocation experienced by the patient; it is from this cause also that proceeds the præcordial anguish so often endured by the sufferer from this disease, and the accumulation of blood found after death in the right or pulmonic cavities of the heart and general venous system.

That the above symptoms depend on the causes assigned, and are not connected with a congestion of blood in the lungs is evident. 1st, The chest when percussed is resonant; 2d, examined with the stethoscope, the respiration is clear, distinct, and uninterrupted; 3d, after death when the chest is opened, the lungs collapse, or if

they do not, they are emphysematous, and are remarkably devoid of blood; 4th, the bronchial and tracheal mucous membrane is red, turgid, and congested; 5th, when reaction ensues after the collapse, a suffocating bronchitis occasionally succeeds and destroys the patient in a few hours.

The general pathology of this stage of the disease, as deduced from the combination of the especial pathology of the different organs, may be stated as the following: 1st, an active irritation overpowering the whole extent, and involving every constituent of the alimentary mucous tissue, giving it a predominance over the vital energies of every other organ of the economy, and directing on it, by a movement of concentration, the mass of the organic or capillary circulating fluid; 2d, profuse and exhausting evacuations of the serous, watery, and albuminous constituents of the blood escaping from the internal, and leaking from the external dermoid membrane at every pore; 3d, debilitation or enfeeblement of the action of the heart, and exhaustion of the general circulation; 4th, irregularity and disorder of the nervous excitation of muscular contraction and of sensibility; 5th, suspension of the glandular secretions; 6th, a commencing stasis or stagnation of the organic circulation, and the consequent presence of the lethal fluid—black or unoxxygenated blood, in all the vital organs—the beginning of asphyxia; the gradual accumulation of the circulating fluid, and its arrest in the venous system and pulmonic heart.

3d. The indications of a method of treatment founded on the pathology of this state, are apparent. They consist 1st, in diminishing the irritative excitement of the alimentary mucous tissue; 2d, in causing revulsion in the movement of the circulating fluid by the irradiation of irritation from the internal gastro-intestinal tissue to the heart, lungs, brain, and skin, or its general diffusion throughout the economy, exciting by this means into activity the diminished energy of the capillary or organic circulation, and sustaining the failing balance in the powers of the organs; 3d, in allaying the increased irritability of the gastro-intestinal mucous membrane, and restoring the nervous excitement to its natural state; 4th, in exciting the suspended glandular secretions, and imparting to them a healthful character. These different indications may be fulfilled by a variety of means and numerous remedies. Hence it is, that so many methods of treatment and different remedies have been extolled as surperlative in the treatment of malignant Cholera, and alone to be relied on according as some one has been exclusively pursued. The best general method can be determined only by a very laboured and judicious comparison under the same circumstances of different systems of treatment. But this task has not been accomplished. Besides, no one method can be adapted to every individual, regardless of constitution, habits of life, temperament, moral disposition and previous health of the patient. These circumstances modify the individual, making one person different from another. The strong, robust, healthfully constituted, are to be managed differently from the feeble, the frail and sickly; the intemperate are distinct beings from the

temperate. The sanguine, lymphatic or nervous temperaments demand modifications in treatment. The calm, collected, and courageous, present symptoms of a different character from the timid, agitated and fearful, and very opposite courses are to be pursued with respect to these individuals. It is the physician of knowledge, tact, and judgment, that makes these discriminations, and regulates his proceedings in conformity to them.

When the symptoms of this stage are severe, the cramps and spasms violent, with urgent vomiting and dejections, if the patient be of sober habits, sanguine, robust, and plethoric, the most prompt, decided, and certain remedy is the abstraction of blood from the general circulation. Ten, fifteen, or twenty-five ounces may be drawn according to circumstances. This remedy allays immediately the excitive irritation of the digestive intestinal apparatus, and operates a revulsion from the interior surfaces where congestion is forming. It may be followed up with great advantage by local depletion, effected by cups or leeches applied to the abdomen, or in some cases to the anus.

In those of the nervous temperament, the habitually intemperate, the feeble and delicate, local depletion by cups or leeches from the epigastrium, the præcordia, or anus, is to be preferred to general depletion.

In the lighter forms of this stage of the disease, sanguine depletion is not necessary, but, whenever the symptoms are of aggravated character, threatening to advance into the collapse, according to the circumstances of the case, one or the other mode of depletion is imperative. It places the patient, most generally in safety, and prepares his economy for the more prompt and efficacious operation of other remedies.

Subsequent to depletion the remedial means accomplishing the other indications are to be immediately brought into requisition. Stimulant pediluvia are of great utility; the feet to be wrapped up after the bath in warm flannel; either frictions, with decoctions of Cayenne, or some stimulant liniment or ointment; dry frictions; lotions or epithems of spirits of camphor, or plaisters of spice to the abdomen; sinapisms to the abdomen, to the extremities, and to the chest, are means all acting on one principle, and some one or more of them should be employed.

While the diffusion of excitement is attempted by the external means enumerated, the same object is to be attained by various internal remedies. The alcoholic solution of camphor, camphor water; calomel and opium; blue mass opium and ipecacuanha; sulphuric ether; ammonia; warm brine; spirits of lavender compound; and many other similar medicines, have been, and are constantly employed, and all with more or less success, as they happen to be administered in the cases adapted to their exhibition. Whenever the condition of the patient admits of the employment of diffusible excitant agents, and diffusion of excitement and reaction can readily be accomplished, this order of remedies is admissible and often advantageous. The cases in which these means are most serviceable are those of a light character, in which the nervous tempera-

ment prevails and nervous symptoms are most predominant, and in which timidity and fear have given aggravation to the symptoms by their depressing influence.

In the cases where sanguine irritation is the more leading feature, they are not safe remedies unless preceded by some depletion.

In cases of the last character, especially occurring in the sanguine temperament and robust individuals, with highly irritable stomachs, who suffer intense thirst, with tenderness and heat of the epigastrium, ice held in the mouth, iced water given in small quantities, the effervescing draught, iced gum water, are to be preferred in the first periods of the attack to the internal excitants. At the same time external stimulation by the means above indicated, is to be actively employed.

This stage of the disease, taken at its commencement, is, in nearly every instance, arrested without difficulty by the means indicated. There are few diseases more manageable and more entirely within the control of medicine and medical skill. No one can neglect the symptoms of this period, and fall into the state of collapse, without being chargeable of suicidal folly—however light the symptoms may be, medical advice must be sought for, and every precaution taken. This is more especially true with the feeble, the sickly, the aged, and intemperate. They are often prostrated by the first onset of the disease, as felled by a giant's blow; they hurry from stage to stage, and in the course of a few hours sink into the arms of death.

C. *Cold Stage, or State of Collapse.*

This stage of the disease is the consummation of the preceding. All the tendencies of the organs which then existed are now completed. The conservative powers of the constitution are destroyed, are nullified. The balance in the forces of the organs preserving the harmony, and composing the unity of the economy, is overthrown; the connexion of the organs is dis severed, and reaction, or the diffusion of excitement throughout the tissues and viscera, by which they lend a mutual assistance to each other, is rarely to be accomplished; anarchy and misrule ride triumphant, and the superb fabric lies prostrate in ruin.

The period when this stage occurs varies exceedingly. In individuals who are enfeebled by any cause, and whose organs are incapable of opposing a resistance to the morbid impressions and actions established, it comes on with fearful rapidity. This occurrence most frequently is observed in those who are sufferers from chronic inflammations of the digestive and alimentary organs; in the intemperate, who are usually in this state; the very aged, and those exhausted by labour, fatigue, and an innutritious diet.

In some rare instances it is not preceded by the two first periods; no premonitory symptoms, no forming stage of the disease, announces the threatened danger, but from the first moment of attack the cold stage or collapse commences, and rapidly hurries the patient in a few hours into eternity.

This stage may be divided into two periods—the incipient, and the confirmed, or state of asphyxia.

The *incipient cold stage* is the extreme aggravation of all the symptoms, and the pathological conditions of the organs, described as appertaining to the forming stage. The evacuations upwards and downwards are generally frequent and copious, consisting of a thin sero-albuminous fluid, either clear or of various colours. The epigastrium, in most instances, is exceedingly sensitive to the touch; burning heat, feeling of distension, and often violent spasmodic pains are felt in the abdomen. The thirst is intense, the tongue is cold, moist, and mostly pallid—the temperature of the breath diminished—the voice reduced to a whisper and is guttural; the external surface is cold, generally bathed in a colliquative cold sweat, yet the patient complains of a distressing sensation of heat, and warmth is excessively annoying; the skin of the fingers, hands, and feet, is shrivelled, and its elasticity impaired. The extremities of the fingers and even hands are discoloured, having a livid or blueish tinge. The capillary circulation is feeble, the blood pressed from the skin and inner labial surface returning with slowness. The pulse is feeble, vanishing from the touch—generally frequent. A disposition to fainting is common. The respiration is oppressed, the sense of suffocation distressing, with often great precordial anguish. The face is pallid, the eyes surrounded with a livid areola and are sunken; the features pinched and shrivelled—all the phenomena of extreme old age are induced in a few hours—the spasmodic cramps and neuralgic pains, sometimes one, sometimes the other, and frequently both, are generally present, and often subject the patient to extreme anguish. They are less frequent and more easily controlled in the phlegmatic or lymphatic than the nervous temperament.

The incipient collapse, in individuals of robust constitution, who have enjoyed good health, and led temperate lives, in whom the attack has not been induced by some most gross act of imprudence, is very frequently arrested, and reaction is established. But, in the feeble, the intemperate, the aged, the broken down valetudinarian, those exhausted by fatigue and watching, it resists all remedial means, and hastens with unrestrained rapidity into the second period, confirmed collapse or state of asphyxia.

In the *confirmed collapse* all hope has fled—so few are the escapes from this condition, it may be regarded as the dying state. The symptoms of the antecedent period have reached their climax. The evacuations are less constant in this period; at times they continue profuse, but often cease or are easily checked. The torment of thirst is unabated—cold drink is ardently desired and vehemently demanded—tongue and breath cold, the voice almost extinct. The surface cold as marble, is bedewed with a clear, thin fluid strained through every pore. A sense of oppressive heat still prevails, and the application of warmth is earnestly resisted; it causes restlessness, and frequently violent efforts to escape from it, exhausting and injuring the patient. The sensibility of the skin in this as in the preceding period, is often morbidly acute—sinapisms

and other irritating remedies cannot be borne; they cause, sometimes in a few minutes, intolerable pain—vesication is easily induced, frictions with decoction of cantharides will often remove the whole cuticle—spontaneous vesication of the face has occurred in this city.

The livid and bluish tinge of the extremities now pervades the whole body, passing frequently into a sooty hue. The same colour is seen around the eyes, and in the internal surface of the mouth and lips. The eyes are sunken deep in their sockets with a ghastly expression, or are rolled upwards in their orbits—at this period the adnata are often injected. The mind is enfeebled, questions harass and worry the patient; the efforts at conversation are exhausting—he becomes listless, indifferent, careless to his fate, and even invites death as a relief to his misery.

The pulse is either scarcely perceptible, a mere thread at the wrist, or it has vanished, not being felt even at the axilla, and barely to be detected in the carotids. The capillary circulation is now nearly terminated—no impression can be made on it by pressure on the labial surface where it can be brought into view, or the hands.

The spasms of the muscles, in this as the other periods, are not a constant phenomenon—in many instances they are not present, while in others they continue to torture the patient to the last moment of existence; and after death, it is not uncommon, to see the fingers, toes, and at times the limbs move, for a considerable period, from the contraction of the muscles.

Shortly before dissolution, the body which has impressed the touch with a sense of coldness, generally becomes warmer, and a general glow appears to be returning to the surface. This phenomenon often leads the observer into a belief that reaction is about to be established—it is a delusion—it is the precursor to death, and after dissolution the temperature of the corpse continues to augment for some time, and is found several hours subsequently warmer than during life.

The pathology or the condition of the organs of the cold stage, does not differ from that of the preceding stages except in degree. It is analogous to the cold stage of all febrile diseases and diseases of irritation. It bears a strong resemblance to the Pernicious Algid Intermittent, the Cold Plague, as it is termed in the southern states. The difference between the cold stage of this and other diseases, arises from the extensive surface, the seat of the primitive affection, and the excessive evacuation, both which disable the economy and prostrate its forces of life to such a degree, as to prevent effectually reaction from occurring—and death necessarily ensues, as it does in the cold stage of pernicious intermittent, or any disease when reaction or diffusion—irradiation into the whole economy cannot be accomplished.

Treatment. The indications of treatment in this, are the same as in the preceding stages, but with much less prospect of a successful issue. They are to allay the irritation of the alimentary apparatus, create and diffuse excitement, and to arrest the profuse

discharges from the external and internal surfaces. It is in the first period of this stage, or incipient collapse, that any well founded expectation of attaining these objects can be indulged.

General bloodletting, which in the forming stage proves the most prompt and efficient of remedial means, becomes in this stage an uncertain remedy, exceedingly equivocal in its effects. It is decidedly mischievous in the intemperate, the feeble, the nervous. Abstracting blood from the general circulation, the exhaustion of which is one of the strong features of this stage, its direct operation is to debilitate and enfeeble the actions of every organ, the healthy as well as the diseased—diffusion or reaction is then rendered still more difficult, if not impracticable.

Local depletion by leeches to the epigastrium and lower belly, to the anus, and, by cups to the abdomen and precordium, may be used in the incipient period with good effect.

From the coldness of the general surface, application of warmth would appear to be decidedly indicated—yet experience in this city has not shown it to be materially beneficial—it should be regulated to the feelings of the patient. Extreme warmth is generally prejudicial; it occasions great distress to the patient and forces him often to violent exertions to escape from its application—it favours also the excessive drainage from the skin. Heated bran or oats in bags, is the most preferable mode of applying warmth.

The excitement of the skin is a measure of importance. Various modes of effecting this are employed. Dry frictions are preferred by some—others employ stimulant embrocations, liniments or ointments. Sinapisms are commonly resorted to. Frictions with tincture or terebinthinate decoction of cantharides are recommended, but they denude the surface, by removing the cuticle, and are objectionable. This effect has been produced by frictions with spirits of camphor.—Spirits of camphor, heated and applied to the abdomen and to the limbs, which subsequently are covered with flannels imbued in the same liquid, has been employed. In the incipient collapse, when there are violent pains in the belly, warm poultices and epithems of hops, &c., and stomach warmers have proved highly serviceable.

The internal remedies are exceedingly various. They generally consist in excitants more or less diffusible. Some prefer the very diffusible as spirits of camphor—sulphuric æther—Hoffman's andoyne—tincture of opium—essence of menth.—warm toddy—others rely on calomel alone, or with opium, or blue pill and opium: ammonia and carbon of ammonia, camphor, and cayenne pepper are resorted to. Water as hot as it can be swallowed, has been extolled. It is useful when there are violent spasms of the stomach. Amongst other remedies of this character are warm brine, and the saline solution of Dr. Stevens—consisting of super carbonate soda $\frac{1}{2}$ dr. muriate of soda, 1 scr. chlorate potass gr. vii. dissolved in half a tumbler of water and given every hour. Frictions, dry heat, sinapisms, and injections of hot brine are employed at the same time.

While excitants of various kinds are administered by some, others

employ sedative internal means—such as ice in small quantities, or held in the mouth; iced gum water; the effervescing draught alone, or with laudanum and camphor, carbonated water, and acetate of lead.

From the number and diversity of these means, for all of which some success is claimed, it is evident, that no one course of proceeding can be adopted, to the exclusion of all others. Individual differences, arising out of habits of life, constitution, temperament, and other circumstances, must have weighty influence in directing the course of the practitioner. The stimulant and excitant plan, is adapted to the intemperate, the feeble and the very nervous. The sedative to the sanguine, robust, and healthily constituted. In many the two may be conjoined, or the sedative, proper at the commencement, must soon be abandoned for the excitant.

When the discharges are very copious they should be arrested if possible, for the loss of the aqueous portion of the blood, so changes its constitution and qualities, as to become a new source of difficulty and danger. It confirms the arrest of the capillary or organic circulation, as the red globules cannot move when deprived of their vehicle. Mild astringent decoctions are used for this purpose. The acetate of lead, in injections in the dose of one scruple, with or without laudanum, according as pain has existed or been absent, has been effectual for this object. The hot brine and saline solution, given by the mouth and as injections, appear to act in this manner, and also to prove mildly stimulant from their absorption.

Injections in to the veins of warm water, or saline solutions, have been proposed, and would appear to be the most direct means of meeting this last indication. Experience has, however, shown, that although they do act in this mode, and relieve temporarily, yet no permanent advantage has been derived from them.

D. *Stage of Reaction or Febrile Period.*

When the patient escapes from the cold stage or collapse, a reaction succeeds, that exposes him to new dangers and creates new difficulties to the practitioner.

The reaction does not always present the same phenomena. It varies, 1st, in being confined to a single organ; 2d, in being extended to the whole economy.

In the first class of cases, the brain becomes most generally involved, or in some instances the lungs.

The reaction of the brain is, at times, rapid and intense, the symptoms of apoplexy suddenly supervening and destroying the patient. At other times it is slower and less vehement. The head becomes warm, and is of more elevated temperature than the rest of the body; the cheeks and lips acquire a better hue, the mind wanders with a light delirium, the conjunctiva are injected with blood. The affection of the brain increases, pain is suffered, often acute, causing the patient to cry out; phrenitic delirium supervenes, which is soon succeeded by stupor, profound coma, and death.

The reaction in other cases, occupies the lungs; the respiration is hurried and embarrassed; the pulse rises, becomes full—the skin warm; when the chest is examined with the stethoscope, mucous, and submucous rattles are heard, the patient seeks an erect position, and soon perishes, suffocated by effusion into the bronchial tubes, or with pulmonary engorgement.

In the second class of cases the reaction is diffused; it is not manifested in a single organ, and assumes the type of the ordinary typhoid fevers, too familiar to most practitioners to require any particular description.

When the signs of the first class of cases appear, or reaction of the brain or lungs, local depletion should be immediately resorted to, by leeches, applied behind the ears, or along the jugulars; cold applications should be made to the head, and these succeeded by blisters to the scalp. When the symptoms are pulmonic, cups, or leeches to the chest, followed by blisters, are demanded. In some instances, when the pulse will admit of it, general depletion is to be resorted to.

The treatment of the second class of reaction is the same as that pursued in common typhoid fevers—having great caution in the employment of all excitant remedies.

The foregoing general statement of the disease, as manifested in the different organs of the economy, and the remedies employed, is not intended as directions to the general reader for the management of the disease—none but professional men are capable of undertaking this task. The varieties in the cases are so numerous, the disease is modified by so many circumstances, that practical knowledge and skill can alone enable any one to form the necessary discrimination. This portion is addressed entirely to the professional reader, and is derived from the personal observations of the commission on the disease in Canada, New York, and this City.

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The following report, containing a general summary of the observations of the Commission on the characters of the disease, was submitted to the Sanitary Board, the day after the return of the Commission, and was then made public through the Journals.

THE Medical Commission appointed by the Sanitary Committee to visit Canada, for the purpose of making investigations concerning the epidemic disease prevailing there, in anticipation of a more detailed report, which will be laid before the Committee in a few days, present the following general conclusions as the result of their observations, which they flatter themselves will tend to allay the public anxiety.

1st. The disease so lately an epidemic in Montreal and Quebec, and which now prevails in the city of New York, and is extending throughout the country, is malignant Cholera, the same that has ravaged Asia, and spread its devastations over Europe, under the name of Asiatic and Spasmodic Cholera.

2d. That they have not been able to ascertain any positive unequivocal fact to justify a belief that it is a disease communicated by those affected with it, or is one of importation.

3d. That during the prevalence of the epidemic constitution or influence, a general predisposition exists in the whole community, from which very few individuals are exempt, productive of a liability to the disease.

4th. That this predisposition is manifested by embarrassed and difficult digestion, sense of heat, fulness, uneasiness or pain in the abdomen, irregularity of bowels, a furred and pasty tongue, a sense of general debility, with frequency of cramps or contractions in the muscles of the extremities, especially at night.

5th. That this state of predisposition will not give rise to an attack of the disease, without the application of an exciting cause.

6th. That the exciting causes of the disease are moral excitements, especially from the passions of fear and anger; intemperance in the use of fermented and spirituous liquors, or in eating, overloading the stomach; acid drinks, or large draughts of cold water; the use of crude indigestible food, whether animal or vegetable, particularly the latter; excessive exertion or fatigue in the heat of the day; exposure to the night air, sitting in currents of air, and particularly sleeping with too light a covering, and with the windows raised, except the rooms are very small and confined. Most of the attacks occur in the night, from 11 or 12 o'clock, to 3 or 4 in the morning.

7th. That prudence in living during the epidemic period, which continues from six weeks to three months, the wearing of flannel, particularly on the body, keeping the feet warm and dry, the avoidance of improper food and drinks, tranquillity of mind and body, are almost certain guarantees against the assaults of the disease, and disarm the pestilence of its malignity.

8th. That the disease, when abandoned to its course, passes through different stages, in all of which it is easily controlled, except one—the cold stage, or period of collapse, and which is in almost every instance preceded by the symptoms of the forming stage, when the disease is arrested with facility.

9th. That the symptoms of this forming stage should be generally promulgated, and persons instructed of the necessity of an immediate attention to them. It is ignorance in this respect, amongst the labouring and lower classes of society, leading to indifference and inattention, together with their habits of life, that plunge so many belonging to those conditions, in the desperate situation so frequently met with, when medical aid and human skill are utterly unavailing. Those symptoms are, a sudden looseness of the bowels, the discharge becoming thin, watery and colourless or whitish, with little odour—vertigo or dizziness—nausea, oppres-

sion, pain and cramps of the stomach, with retching and vomiting of a fluid generally resembling dirty rice water, attended or soon followed by cramps of the extremities, particularly of the legs and thighs.

10th. When the foregoing symptoms appear, application for remedial assistance must be made immediately. The delay of an hour may usher in the cold stage, or period of exanimated prostration and collapse, from which it is almost impossible to resuscitate the expiring energies of the economy.

11th. That every preparation should be made by the public authorities, in anticipation of the appearance of the disease, providing the means of treatment for those who cannot command them, so that aid may be promptly administered to all the moment of attack. These means are—a number of small hospitals, or houses of reception; in various parts of the city; stations where nurses, physicians, and students, with suitable medicines, and apparatus, can be procured in the night without delay; the evacuation of certain localities, where the occurrence of numerous cases indicates a pestiferous influence, and the furnishing to the poor, as far as practicable, wholesome and nourishing food.

By the adoption and observance of the foregoing means of precaution and prevention, in addition to the sanative measures already in operation, the Commission are convinced that the prevalence of the disease will be greatly circumscribed, its mortality diminished, and the public guarded against panic and alarm, the great sources of danger—and, under the blessing of Divine Providence, the pestilence will be shorn of its terrors, and mitigated in its destructive fury.

SAMUEL JACKSON,
CHAS. D. MEIGS,
RICHARD HARLAN.

July 8th, 1832.

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July 24, 1832.