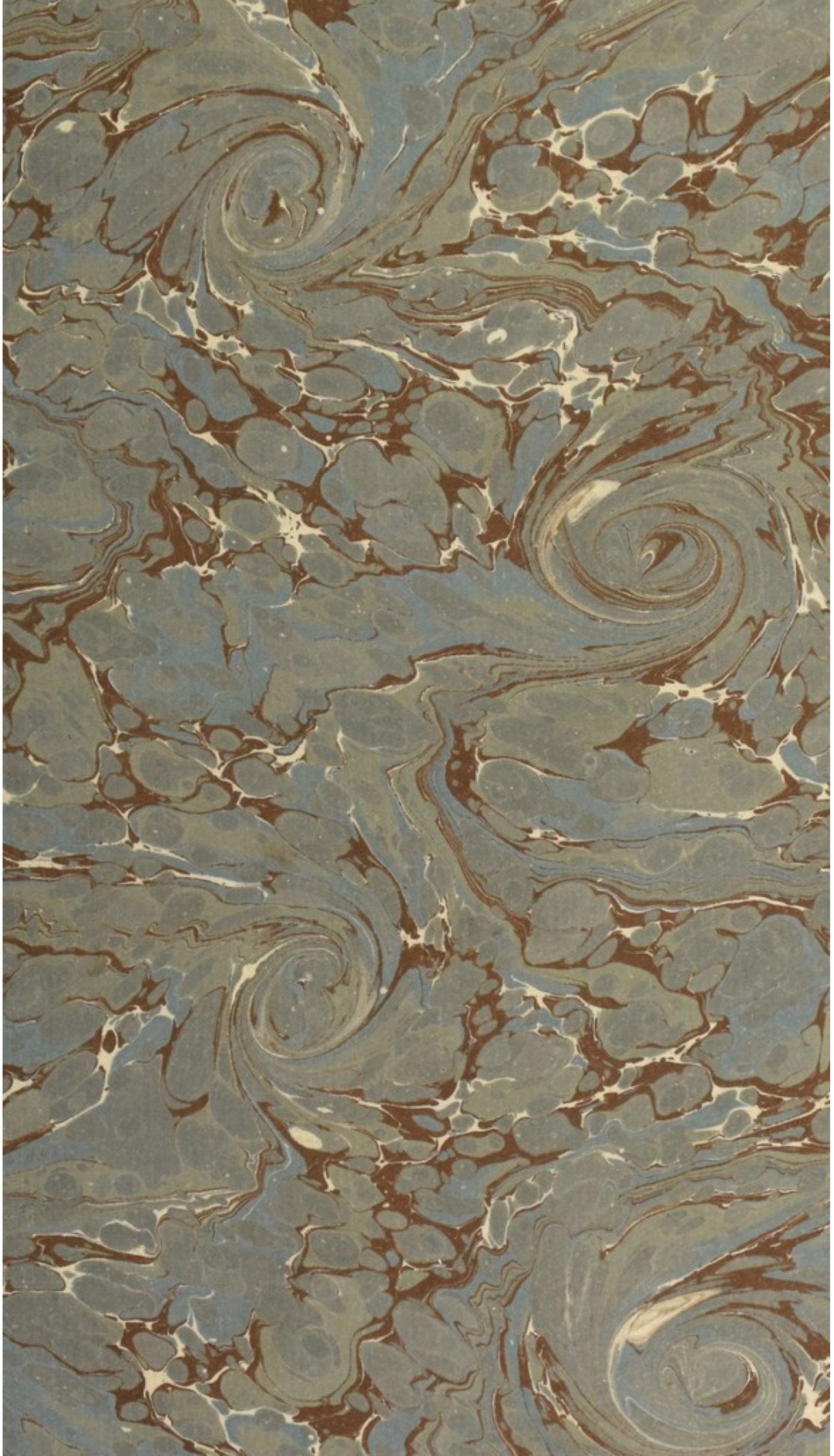
A report, &c.; on cholera morbus / By Darwin Chawner.



A

REPORT, &c.

ON

CHOLERA MORBUS,

BY

DARWIN CHAWNER, M.D.

NEWARK:

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TO THE MEMBERS OF THE

BOARD OF HEALTH,

IN NEWARK,

THIS REPORT, READ AT THEIR MEETING,

AND

PUBLISHED BY THEIR UNANIMOUS REQUEST,

IS INSCRIBED,

WITH EVERY FEELING OF OBLIGATION,

BY THEIR VERY OBEDIENT SERVANT,

THE AUTHOR.

Newark, January 21, 1832.

In giving a larger publicity to a report, hastily written, of my observations on Cholera, while I acknowledge the kindness displayed by those individuals who heard it read, and who, in the handsomest manner, requested its publication, I feel the more sensible of its deficiencies. To each of my readers, general and professional, I would address the observation, in the same spirit in which I feel its force:—

Si quid novisti rectius, candidus imperti:
Si non, his utere mecum.

REPORT, &c.

IN offering to the Board of Health the result of my recent visit to Newcastle and Gateshead, I beg at the outset to avow my determination to confine myself entirely to those facts which came under my own notice; or which were communicated to me from unquestionable authorities residing on the spot. Instead of advocating one or other of the hypotheses which have been set forth relative to the nature of the disease, my principal object was, from *personal* observation, to detect the erroneous and false information which, I feared, was generally disseminated by the public press; as well as to inform myself of that rational way of treatment, which being the result of experience, is the only safeguard against the dangers of Empiricism. And I was the more inclined to adopt this resolution,

from observing the conflicting opinions which pervade the Medical profession, both as regard the nature of the disease, and the period of its first appearance in England.

In my own private opinion I may advocate a particular view of the nature of the disease, but I am anxious that this paper, which I have the honour to lay before you, should simply contain the result of personal investigation; leaving it to every Medical man to form his own opinion, and only claiming for myself that privilege of judging, which I am most willing to concede to others. I trust my communication will be received with that indulgence, for which the haste in which it has been arranged, furnishes my apology; but, I confess, I felt anxious not to defer laying it before this Board, at the earliest opportunity.

Although my visit to the District of the Disease was very short, yet when I inform you of the opportunities of observation which I enjoyed; and when I say, that during the time I was at Newcastle, I was permitted to accompany different Physicians, who usually visited their private patients every

three or four hours, it will be seen that I had ample opportunities of becoming acquainted with the peculiarities of the disease. *Four* Cholera Hospitals were open to me; the private patients of the several Medical men, (particularly selected to superintend the Cholera cases in their respective parishes) were at all times accessible to me, and I was invited to offer any suggestions that might strike me; an offer, of which, in some instances, I availed myself.

Whilst I was at Newcastle and Gateshead, I saw considerably more than *One Hundred* patients; the result, of course, marked by various success. These cases presented the varied symptoms incidental to the disease occurring in all the different combinations, which they assume in each particular stage; and I hesitate not to express my firm opinion (though in declaring it, I am subjecting myself to the *remarks* of those who consider personal investigation useless) that PERSONAL INVESTIGATION, and it alone, has afforded satisfaction to my own mind: for I am free to confess that many of the opinions which I had formed, from reading and report, were not borne out by my experience on the spot.

When first I arrived at Newcastle I expressed regret that I had deferred my visit until the *Epidemic* had, in some degree, subsided, and that I did not see the disease at its height. This regret, however, was immediately removed by the very sensible and judicious observation of a Medical friend: "that when first the disease appeared, an "unusual excitement pervaded the profession; "but that now, while the fatal cases were "happily of rarer occurrence, they were still "TOO frequent: and in place of the crude "suggestions, and necessarily empirical treat-"ment, resorted to on its invasion, the most "violent cases were now treated in that syste-"matic and practical manner, which, if it too "often failed in *curing*, yet was generally "more successful; and, at least, possessed the "advantage of being dictated by reason, and "regulated by experience."

The cases which came under my own notice justified the propriety of my friend's observation, and their treatment reflected the highest credit upon the Medical skill displayed by those members of the faculty, who were particularly called upon to treat the disease. From the official reports, while I am

happy to find a great mitigation of the disease, I see additional reason to congratulate myself upon the time I selected to visit Newcastle.

I hope that some advantage will accrue from my visit to Newcastle, should the disease, in its progress, reach this neighbourhood, my experience would enable me, I trust, more successfully to combat it; (or which is most ardently to be desired) should we be exempt from its attack, some unfounded apprehensions may have been allayed. I venture to make this observation, suggested, in the first instance, by the kindness of personal friends, who have expressed themselves to me in these terms, and I trust my report, when generally known, may produce the same effect upon all who read it.

The propriety of the term CHOLERA, as applied to the disease, it is not my province to question. With the derivation of the word, all my Medical hearers are familiar. To enter into a vindication of the term, would be to involve myself in hypothesis, which would be foreign to the ultimate object of this report.

Cholera Morbus, like diseases in general, has its STAGES, VARIETIES, and DEGREES, and according to these circumstances, must the *treatment* be regulated. In the majority of cases which came under my notice at Newcastle and Gateshead, THREE stages of the disease might be distinctly marked: (and I again repeat, that my observations are intended to apply solely to that *form* of the disease which came more immediately within the range of my own inspection). The three stages are as follows:—1st, The PREMONITORY STAGE; 2dly, The stage of COLLAPSE, or BLUE STATE; and 3dly, The CONSECUTIVE STAGE.

I adopt these terms, as they appear to me to be quite appropriate, and also as being in very general use amongst the Medical men of the district. The stages vary in *degree* and in *duration*.

(1). The first stage will sometimes be prolonged for a week, or even for a longer period. In many instances it continues only for a few hours, when the Blue State or Collapse supervenes: and too constantly, the attack is so rapid and violent, that even

the stage is with difficulty distinguished. The *Premonitory* class of symptoms consist of a disordered state of the stomach and bowels, in many instances so slight as not to have attracted attention until strictly enquired into; but when particularly questioned it will be found that the patient has experienced slight affections in his bowels for a few days, of which he took no notice, having suffered no pain; his appetite remained good, and he continued his usual employment, until these slight symptoms became so urgent, as to compel him to have recourse to medical assistance. This stage commonly begins in the night or early in the morning. At this time the patient suffers from pain in the stomach and bowels, accompanied with diarrhœa, his spirits are much depressed, and his evacuations are sometimes dark and offensive: they become watery and mingled with unhealthy fæces: they shortly assume the appearance of RICE GRUEL. In some instances I have seen this peculiarity at the commencement, attended with occasional vomitings of the same kind of matter. Cramp accompanies these symptoms, and becomes gradually more violent and frequent. The cramp and vomiting curiously commence and recur together. The pulse in

the patients I saw, in this stage, was not unusually *quick*, but unusually *feeble;* though in some cases, I am informed, it has been observed to be *full* and *hard*, with symptoms of increased action, approaching to fever. The skin is cool and moist; the features are relaxed; the tongue is sometimes loaded at the root, with a red tip; and at other times altogether red; or presenting a natural appearance. The disease, with judicious treatment, and occasionally without *any* medical treatment, has been known to cease at this stage, and not to run into the second. Examples of the degree of Cholera I have just described, were those ranked by Dr. Daun, when the disease first appeared in Sunderland, under the head of DIARRHŒA: he afterwards altered this plan, and reported all cases under the term CHOLERA: for he observed that precisely the same symptoms would, if *increased* beyond a certain point, rapidly progress till this most dreadful malady arrived at its height. On enquiry, I found that those persons most experienced in the disease, were unable to distinguish, at this stage, whether the case would terminate here, or run through its most fatal form: this depending upon the strength of the *secret morbific* cause, and the

power of resistance in the constitution of the patient. However dissimilar the forms of the disease may appear, no generic difference has been observed between them. This want of distinction was commonly admitted in India, and even the cases marked by bilious vomiting and purging, instead of the *rice gruel form* of evacuations were still ranked among the milder forms of Cholera. It is worthy of observation, that such deviations became more frequent as the epidemic declined.

The *Premonitory* symptoms having been noticed, I have now to speak of the second stage, viz. that of COLLAPSE or, as it is expressively termed by some, the BLUE STATE.

This stage more particularly characterizes the *malady*. Under its violence, in a few hours, the most vigorous frame will be prostrated, in spite of every human effort; for the gripe of the disease seems to have fastened upon each vital power.

The first patient I saw was in this stage, and I did not hesitate to declare it was, to ME, a new disease. In fact, no malady is more fatal in result, or more dreadful in aspect.

The Cramp, in most instances, though *not* invariably, becomes more violent and frequent; vertigo often ensues; the surface of the body cold; the pulse is scarcely perceptible; the countenance blue, anxious and peculiarly resembling old age; this symptom is so remarkable, even in the early period of this stage, that when once seen it cannot be easily forgotten; the vomiting incessant; the secretion of urine entirely suppressed; and all the vital functions wane. These symptoms are succeeded by a sinking eye, surrounded by a dark *areola;* a nose pale and compressed; lips livid; tongue cold; and the breath issuing forth from the mouth like a chilling current of air. The pulse is entirely lost; the voice changes into a shrill whisper, and appeared to me to be formed only in the throat. This peculiarity is such as to have acquired the term *Vox Cholerica.* The hands, previously cold, become withered, and the nails livid.—The mind of the patient is strongly impressed with an apprehension of death; in many cases there is a continued moaning, interrupted only by hiccough; a sensation of oppression on the heart is felt; the weight of the bed clothes becomes oppressive; a change of position is constantly required, though instant danger

attends the slightest exertion. The cry of the patient is, "I am burning to death, give me cold water." The body meanwhile is extremely cold. The scene now is about to terminate; the eye becomes still more shrunk, glassy and half closed; the eyelids often loaded with a mucous discharge; the features more haggard and covered with a cold sweat: indeed the patient from whose case I drew this description, more resembled a mummy, than a living being. One remarkable feature attends this malady, viz. the retaining the intellectual faculties almost to the last extremity.

In India it was observed, that those cases in which the symptoms of retching, spasms, &c. had been more than usually violent, and which by a common observer might be considered hopeless, became tractable: and in the most fatal cases the same symptoms were slight and quickly ceased, nay, even were not observed.

Should the strength of the constitution and the natural powers retain sufficient energy to enable it to throw off this stage of collapse: or should medical skill have been successfully employed, the patient has

still to encounter the dangers of the *third* or *consecutive* stage: for it has been observed, and the remark is most just, that every *recovered* patient is TWICE saved. A very different class of symptoms is exhibited in this stage of re-action to those which have been presented in either of the preceding.

The vital powers having recovered from the pressure of the collapse, in turn require moderating. The first symptoms of re-action may be thus described. Nature gradually reviving, begins to develope a degree of animal heat. The features and hands become less blue, the pulse returning at intervals, ultimately is found quick and hard, the vomiting and purging having for some time gradually ceased—the excretions *(which it is most important to observe)* become changed in their appearance, often assuming a greenish or dark cast favourable in prognosis:—the secretion of urine, before so totally suppressed, is restored; the face becomes flushed; the tunics of the eye much suffused; the tongue dry, red, and cracked; there is generally pain on pressure in the region of the stomach; headache is complained of; a state of coma supervenes with restlessness; impatience of distur-

bance is exhibited; when roused the patient will answer questions; in fact, this stage fully established, resembles a degree and variety of typhus fever, sometimes terminating fatally; at others in a rapid convalescence, and the same remedies commonly used in *that* disease have been very successfully administered in this stage of Cholera.

I may here be permitted to observe, that although great variety may mark the *symptoms* of this disease in other countries; the disease still maintains its identity. Other signs of the disease, unfrequent and anomalous, might have been detailed: these I have *intentionally* avoided. Aware that my paper claims only to be a *report*, and does not profess to be a *treatise*, I have only mentioned those symptoms which will, I trust, enable any person to recognize the disease. I am conscious, however, that both in description and in detail, I have omitted much which might beneficially have been remarked.

I have now finished my description of *Cholera Morbus:* it remains for me to speak of the *treatment*—would that I could say the *cure* of the disease.

Every remedy that ingenuity can suggest appears to have been tried, but we are still looking for a *specific*. I am sorry to declare it to be my firm opinion that the research is hopeless.

By *specifics* must be understood such remedies as infallibly produce given salutary effects, under every circumstance of the disease to which they are applied :—acting by some unknown or occult power, as bark, mercury, sulphur, &c. on the disorders for which they are respectively prescribed—these and such like are the boasted remedies of empirics.

In general, however, as the knowledge of sound science has increased, these vaunted specifics have disappeared, and systematic treatment is regularly adopted according to the indications of the disease.

It is to be lamented as producing no beneficial result, that some members of the profession, far removed from the disease, continually busy themselves with not only suggesting to the public, through the medium of the press, supposed specifics, but also trouble those who are obliged to encounter the

disorder, with their fancied remedies. Nothing, indeed, appears to me in *theory*, and I have observed it in *practice*, more calculated to retard a patient investigation into the systematic treatment of Cholera, than the mania for specifics.

Indeed universal experience of disease, while it has proved the non-existence of specifics, might have suggested the hopelessness of any such being discovered for Cholera.

I may here advert to what have been termed *Cholera doses :* the exhibition of which, we know, to be common in India, (with Asiatic Cholera I have nothing to do) for during the prevalence of the Epidemic, few people were without them: the consequence of which was their frequent malappropriation, for whatever symptoms of disease presented themselves the Cholera dose was invariably resorted to.— This practice prevailed to a degree in Sunderland: for I was informed by a Physician, deputed from a Board of Health to investigate the disorder, that great difficulty was experienced in distinguishing between the appearances of original disease and the effects of the administration of Cholera doses; patients

being constantly found under the *full* influence of the narcotic powers of opium. And the same physician gave it as his decided opinion—the propriety of which must be admitted—that these effects of opium frequently accelerated the fatal termination of a case, which under other treatment might happily have recovered. In a subsequent page a few directions are given relative to the most advantageous plan of treating incipient symptoms. When I state that the following catalogues of remedies, with many others, have been applied, and the most opposite under the same circumstances, having their advocates, it will be admitted that no specific can be selected from among them. Bleeding, the exhibition of Cayenne pepper, phosphorus, turpentine, ammonia, emetics, calomel, opium, hot-baths, brandy, the inhalation of oxygen; the exhibition of injections, whether of infusion of tobacco, or simply of warm-water, the application of mustard plasters, blisters, boiling water, and even the actual cautery, have been in frequent use.

I proceed to state the remedies usually resorted to in each stage: and although I shall detail one or two cases, yet I prefer

rather giving the RESULT of what I saw, in the form of DEDUCTIONS, than swelling out my report by a multiplication of examples. I shall mention some remedies separately, and afterwards shall lay down a summary plan of treatment for each stage. Bleeding has been used in every stage. In the first stage when the pulse is found full, and the strength of the patient is deemed capable of bearing the loss of blood, this remedy has been so strongly recommended, as even, by some, to be thought a specific.

I shall give the details of a case as far as circumstances permitted me to remark them. D. W. aged 50, a stout and powerful man, a spirit drinker, was seized on the 29th of Dec. last with purging, which continued all night. No vomiting; violent cramps in his limbs; pulse hard and small; bled from a large orifice to about 30 ounces; blood coagulated firmly, shewing the usual appearances; a little faint after the bleeding; voice restored, though before whispering; vomiting followed the bleeding; free from pain; tongue white and moist; an emetic of common salt was administered, after which calomel in doses of 10 grains were repeated six times at intervals.

Dec. 31st, no cramps; feculent stools; pulse feeble and morbidly slow; hand shrivelled; blue fingers; no urine; tongue dry; calomel and opium continued in moderate doses until January 4th, when the typhoid state supervened, with frequent bilious stools; urine became copious; but the patient died comatose on the 9th. Though the details in this case are very imperfect, yet they prove that bleeding is no specific, though tried to a full extent, and under favourable circumstances.

Another case in which I recommended the use of the lancet, may be not inappropriately introduced. J. C. aged 30, was attacked about 4 o'clock on the morning of January 9th with bowel complaint. He was a very stout man. He was visited at 9; took a dose of 15 grains of calomel and 2 of opium; and warm water injections were repeated hourly; at 2 *o'clock*, P.M. he was found with purging and vomiting of the rice-gruel matter; eye sunk, surrounded with blue areola; cold tongue and breath; blue lips and whispering voice; intellect quite clear; hands cold, and fingers slightly livid; pulse scarcely perceptible; cramps slight; the left arm was tied up to be bled, the veins looked very full and dark; a

large opening was made and about 3 ounces of blood were immediately obtained, after which not a single drop could be made to flow, though every means were tried; the blood presented a very thick appearance, resembling thin treacle. Exposure to the air produced a very slight change in the colour; no serum separated; the coagulation was imperfect; the symptoms remained the same after the loss of blood. Five grains of calomel and *one* of opium, were ordered to be given every hour, till visited again; with injections of warm water. *Twelve o'clock*, P. M. no pulse; vomiting, purging, and cramps remain; still the countenance rather improved. A mustard plaster applied to the pit of the stomach for 20 minutes, at the end of which time it was removed, owing to the desire of the patient; the pulse had returned; four other plasters were applied in succession to different parts of the lower extremities. *Tuesday*, 4, A. M. left the patient much better, pulse steady, and the animal heat considerably returned. To continue the calomel and opium in half the quantities with the use of the warm water injections. *Three*, P. M. Evacuations green; pulse still more improved; vomiting ceased. It was the opinion of all the medical men, who saw this

case in its earliest stage, that it was hopeless. On Tuesday night, he had lost the symptoms peculiar to the blue state, and was considered in a fair way of recovery. In this case no stimulants were administered, even in the blue stage, though a very slight loss of blood had taken place.

Bleeding, under some modifications of Cholera, may be highly useful; but I had few further opportunities of judging of its effects than these two cases afforded me.

The use of stimulants (as phosphorous, turpentine, Cayenne pepper, &c.) has been prescribed to the greatest extent in the stage of collapse; and although attended with little, if any, benefit, their use appears strongly indicated.

The result of two cases, both in the blue stage, placed in opposition to each other, forcibly proves the inefficiency of these remedies.

In the one case, six ounces of undiluted spirit of turpentine were administered in two hours without any perceptible effects; the

actual cautery was applied down the whole length of the spine, and the patient shortly died. The other patient was bled in this stage; took no stimulants, and yet ultimately recovered.

The following case was treated on a somewhat stimulating plan, in a Cholera hospital; and I subjoin the details furnished by the surgeon of the Institution:—

M. A. *admitted January 8th*, 1832, *aged* 20. This patient came from Corbridge, (a small town 16 miles west of Gateshead), where no Cholera had yet appeared, he was perfectly well when he reached Gateshead on the 6th; he went to a lodging house situated in Pipe-well-gate, a low, dirty, narrow street, in which the very outcasts of society reside, and in which upwards of thirty persons had died of Cholera since the 25th of December. None had been attacked with the disease in the house in which the patient went to reside, nor had he, to his own knowledge, ever been where the disease had existed. *Seventh*, 8 *o'clock*, A.M. His bowels were regular, but at that hour he was attacked with violent purging, which continued all day; during the night of

the 7th, he was attacked with severe pain in the stomach and bowels, and immediately after vomiting; stools watery. *Eighth*, 1 *o'clock*, A.M. Cramps in legs and thighs; I was called to him about 9 o'clock, and found him in a state of collapse; no pulse; slight lividity of fingers, and underneath the eyes; cold tongue; cold nose; cold breath; cold surface. Although, from the first moment I saw him, I considered it a hopeless case, I immediately had him conveyed to the hospital. Patient much depressed; a conviction of approaching death; still no pulse. Took 15 grains of calomel and two and a half of opium. Had an injection of three pounds of warm water, with a drachm and a half of laudanum.—*Twenty minutes to* 1 *o'clock*, P.M. No pulse; (used dry cupping for 1 hour on first entering the hospital.) Took a draught with 10 grains of the carbonate of ammonia, and 30 drops of spirits of camphor. *One o'clock*, P.M. Had an injection with an ounce of rectified spirits of wine in a pint of gruel. *Five minutes past* 1 *o'clock*. Took a draught with 10 grains of the carbonate of ammonia, and 30 drops of spirits of camphor. *Ten minutes past one o'clock*, P.M. No pulse in right arm, but perceptible in left; surface warmer; pain in sides diminished.—

Eighteen minutes past 1 *o'clock.* Expressed himself as feeling easy, but "burning hot;" voice sinking. *Twenty minutes past* 1 *o'clock,* P.M. Took a draught with 10 grains of the carbonate of ammonia, and 30 drops of spirits of camphor. *Twenty-two minutes past one o'clock,* P.M. Pulse the same in both arms; tongue warmer. Had an injection with an ounce of rectified spirits of wine in a pint of gruel; dejected immediately. *Fifteen minutes before* 2 *o'clock,* P.M. Still easy; pulse 100, small in left arm, scarcely perceptible in right; tongue still warm. *Two o'clock.* Pulse 100 in both arms. *Fifteen minutes past* 2. Pain in stomach; pulse again lost in right arm; tongue cold. Took an ounce of brandy in warm water; had the injection repeated, and 5 grains of calomel. *Twenty minutes past* 3 *o'clock,* P.M. No pulse; tongue cold; surface a little warmer. The injection to be repeated with two drachms of laudanum every hour. *Four o'clock,* P.M. No pulse; surface cold; cramps returned in feet. The stimulants repeated. *Half-past four o'clock,* P.M. Pulse again perceptible in right arm. *Five o'clock,* P.M. Had an injection with an ounce of rectified spirits of wine in a pint of gruel: dejected immediately. *Half-past* 5. No pulse; great thirst; surface cold;

tongue cold; countenance sunk; has not had a secretion of urine since taken unwell. *Six o'clock*, P.M. Patient is restless; complains of sickness; pain at the pit of the stomach. *Ten minutes to* 7, P.M. No pulse; evidently sinking; annoyed if spoken to; lividity extending; surface cold and damp; tongue cold and dry; great thirst. *Eight o'clock*, P.M. No pulse; surface cold and dry. *Nine o'clock*, P.M. Death.

The inhalation of oxygen has been recommended, with the most sanguine expectations; and its failure caused great disappointment to its advocates.

Every person is acquainted with the peculiar change effected in the appearance of the blood by the inspiration of atmospheric air into the lungs. It was consequently hoped that the blue stage would be removed, and animal heat restored by applying oxygen in a concentrated form.

This expectation was founded on false reasoning; for when we reflect that the inhalation of pure oxygen can only be endured for a *short time*, and that its supply is required to be

permanent and diluted; the defect evidently lies in the system, not in the default of oxygen, but in the inability of the patient to appropriate to himself that supply which nature affords.

The same kind of reasoning is applicable to the use of hot baths of *all kinds*. They are intended to re-establish animal heat—but are found inefficient permanently to accomplish this, unable as they are to restore the healthy action of those vital functions necessary to the formation of this heat. I found their use at Newcastle and Gateshead almost entirely laid aside; and Dr. Barry and others, have declared them to be *worse* than useless.

It was generally observed that vomiting (during the first stage) though very constant was very generally insufficient to evacuate the contents of the stomach. It was therefore suggested to administer mild emetics, not only to remove the load that might be oppressing the stomach but to rouse the sinking power of the system.

The kind of emetics commonly used were either composed of flour of mustard or

common salt. Both were tried in the first stage constantly, and with the greatest advantage. The effect of the emetic was most frequently to tranquillize the stomach for two or three hours, and to induce, in place of nervous irritability, a comparatively healthy excitation. During this time (perhaps the most important period for the administering remedies) calomel properly apportioned with opium must be given. Considerable caution is requisite here, for if the emetic be too powerful, exhaustion will reduce the patient, and thus irreparable mischief ensues. A teaspoonful of flour of mustard, or a tablespoonful of common salt in warm-water is the usual dose, to be repeated every ten minutes, until the desired effect is produced. The effect of emetics is, *to clear the way for the favourable exhibition of the most valuable combination of remedies* (systematically used) in this disease, viz. calomel and opium. An effective dose, of these remedies combined, should be administered as soon after the emetic has operated, as the state of the stomach will allow; and smaller doses should be hourly repeated, particularly taking care that the patient does not suffer from the *narcotic* effects of opium, for although opium is most valuable

as a remedy, yet when too largely administered the effects are highly injurious. These remedies should be then continued till some effect is evident; and unless some different action, after their use, is evinced, the case generally terminates unfavourably. In conjunction with these remedies, the continual application of injections affords the greatest relief. So much so, that the hourly administration of warm-water, with a dram or more of laudanum was scarcely ever omitted.

The *injection* of the infusion of tobacco has been used, and its efficacy has been mentioned in the public prints. From what I saw and learnt, although, in *one* solitary instance after its application the patient *escaped,* yet experience too soon evinced its dangerous, nay, directly fatal effects. Of the external class of remedies, mustard plasters are the best form of counter-irritation, and it appeared to me, when applied in SUCCESSION, decidedly beneficial; blisters and boiling water have been applied with apparent benefit. The actual cautery has been once or twice resorted to in this country, but all who witnessed its application, regretted that it had

been tried, whatever may have been the report, from the continent.

The most beneficial mode of treatment appears to me to be as follows :—The disease in its first stage, should be encountered by a mild emetic, succeeded as before directed, by proper doses of calomel and opium. Combined applications of external warmth, to the extremities by means of bags containing heated sand, with warm-water injections afford great relief. Should the second stage supervene, the doses of calomel and opium must be continued; which, in fact, are the only remedies that have been tried with any thing like systematic success, for violent stimulants, &c. have generally failed; in truth, no one can say what has more particularly succeeded in this stage. The third stage in its re-action, is so similar to some other diseases, particularly to those of the typhoid kind, and with which all medical men are so familiar, that I can only say it will be best met by such remedies as have been found advantageous in this type of disorders.

I may be permitted to observe that almost every thing depends upon the early and

proper application of remedies in the *first stage*. In the second, or blue stage, when all the vital organs seem paralysed, no certain effect can be anticipated from the exhibition of ANY medicine. The difficulty to medical men, is to refrain from attempting TOO MUCH. That natural desire, which at *all* times prompts us, to afford every relief which medicine can suggest, in the extreme state of cholera, dictates the application of those powerful remedies which the distressing appearance of the patient seems to demand; but which experience has proved to be, if not decidedly injurious, at least useless.

The report, as it was read by me to the Board of Health, is now finished and with the exception of a few verbal alterations, and the addition of one or two *cases*, which I considered perfectly useless to detail to unprofessional auditors, but which become greatly important in the way of confirmation, when submitted to the medical as well as general reader. In

this report it will be seen that I studiously avoided, as much as possible, the introduction of all matters of opinion; my own view of Cholera I give in an appendix.

APPENDIX.

At the request of several Medical friends, I publish this Appendix, containing my views of Cholera Morbus. My *pathological* opinions appeared to them clearly borne out by received *physiological* facts.

Interesting as it is to view the assemblage of symptoms peculiar to Cholera, yet to trace the order of their succession is equally curious. My attention has been a good deal invited to the subject; and I have been induced to follow it in many of its ramifications. I profess now only to give a compressed outline of what I may subsequently fill up. A variety of opinions have been formed as to the primary and immediate seat of the disease. The one most constantly entertained is that the nervous system, in some of its relations, is the first to suffer:—that its energies are not only depressed, but its influences are become abnormal. Appearances certainly authorize the opinion that the nervous system is directly affected; I think such opinion too general in its bearings to be efficiently brought within the rules of practice. If, however, we can point out what part of the nervous system is more immediately the seat of the invasion of the disease, we shall be enabled to reconcile, and adapt our curative measures more effectually to our inductive opinions. It must be evident from a review of the symptoms, that the organs principally and most directly affected are the stomach, lungs, and heart. Each of these viscera has to discharge peculiar and vital functions; at first view apparently unconnected, but, upon a closer inspection, they are found so essentially dependant on each other, as to be directly united by the *pneumogastric nerve*. No part of the body has been

more ably submitted to investigation than this nerve. Anatomists have pointed out its remarkable structure and distribution, which alone prognosticate some important results; and the experiments of physiologists have gone far to point out their nature. The *par vagum*, or *pneumogastric* nerve, as termed by the French, from its destination, derives its origin from the lateral parts of the *medulla oblongata*, passes through the *foramen lacerum*, is continued through the neck and chest into the abdomen, associating, as is well known, the larynx, the lungs, the heart, the stomach, and the upper part of the alimentary canal. Near the pharynx this nerve is seen to become enlarged, softer, and redder, so as to present the appearance of a ganglion. In its course it is joined by several others, particularly the great sympathetic nerve, and consequently is indirectly connected with parts of the utmost importance. Its final distribution we have seen to be to the stomach and upper part of the alimentary canal: its importance here has been ably investigated by Dr. Wilson Philip, Mr. Brodie, and others. (1) The object of a series of experiments which they instituted, was to shew that the secretion of the gastric juice was dependant upon nervous influence. Dr. Philip found that upon the division of the pneumogastric nerve, after it had emerged from the chest, digestion was suspended; and imagining this operation to be accomplished by the action of the gastric juice, he concluded that the secretion was necessarily dependant upon nervous influence. This conclusion, apparently educed with such simplicity and clearness, met with opposition from physiologists of great authority. (2) M. Breschet and Mr. Edwards performed similar experiments in Paris, and obtained modified results. They attributed the diminished effects of the action of the stomach, after the division of the nerve, to the paralysis induced upon its *muscular fibres;* in consequence of which the different parts of the alimentary mass were not duly submitted to the action of the gastric secretion. (3) These experiments were repeated in London by Mr. Cutler, under the inspection of Dr. Philip and Mr. Brodie, and it was found that when a portion of

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(1) See the Quarterly Journal, v. vii. (2) See Archives Generales de Medicine for August, 1823. (3) Medical Chirurgical Review, v. p. 589.

nerve was actually removed, or the divided ends folded back, the process of digestion was suspended in the manner described by (4) Dr. Philip. The simple division of the nerve, and even the retraction of the divided ends, for the space of *one-fourth* of an inch, were not sufficient to prevent the transmission of nervous influence; therefore the precautions above-mentioned were adopted, and the original proposition of Dr. Philips was consequently established, *that the functional* properties of the stomach depend upon the influence of the pneumogastric nerve.

Experiment also proves that the peculiar functional properties of the *respiratory organs* depend upon the influence of the same nerve. Mr. Brodie shews that animal, or vital heat, is produced by the nervous influence communicated to the lungs, and not by the chemical process as laid down by Dr. Crawford. (5) Brande states that the chemical doctrine of animal heat, is completely subverted by the researches of Mr. Brodie. (6) Dr. Young also observes, "that animal heat depends jointly on circula-"tion and nervous energy, but probably little on respiration." (7) Dr. Thompson also expresses his opinion, that Mr. Brodie's experiments have entirely destroyed the foundation of Dr. Crawford's theory. It has repeatedly been ascertained, that on division of the pneumogastric nerve, before it gives off its pulmonary branches, the animal dies shortly of suffocation. This alone shews the immediate necessity of nervous energy. To prove that the chemical theory of *animal heat* was insufficient to account for the phœnomenon; (8) Mr. Brodie, after the removal of all nervous power, artificially inflated the lungs. By this means the usual changes of the blood, from the *venons* to the *arterial* appearance, was produced; the oxygen of the atmosphere was united with the carbon of the blood; and carbonic acid disengaged. All that was necessary, according to the chemical theory for the production of vital heat, was thus effected; respiration, contraction of the heart, and the passage of the blood

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(4) Philosophical Transactions for 1822, *p.* 22. (5) Manuel, *v.* iii. *p.* 226. (6) Medical Liter. *p.* 108. (7) Chem. Syst. *v.* iv. *p.* 632. (8) Philosophical Transactions for 1811, *p.* 37; also for 1812, *p.* 378.

through the lungs were maintained; but upon inquiry it was found that the generation of animal heat was destroyed. These two combined experiments prove, to demonstration, the influence of the nerves on the functions of the lungs. The production of animal heat, is not the only function attributable to the organs of respiration. The following are some of the uses of respiration enumerated by Sœmmering;(9) to assist in sanguification; to purify the blood; to render it fit for secretion; to preserve the contractibility of the muscles; to form the voice and speech, &c.

The failure of the action of the heart, forms the next link in the chain. In cholera, it is ascertained, that the blood in its passage through the lungs does not undergo the necessary change from *venous* to *arterial*, and is returned unregenerated to the heart. The vessels of nutrition, or, as they are termed, the coronnary vessels, become charged with undecarbonized blood, and, consequently, the heart's power of contraction fails.(10) It must be recollected that the heart also receives branches from the pneumogastric nerve; and though direct experiment does not prove the fact, we cannot imagine that it should escape the morbid influence, of which this nerve is most certainly the medium; for though the circulation may be said to be independant of the nerves, we have sufficient facts to prove that it is occasionally under their influence.

The peculiarity of the voice is the last circumstance to which I shall advert. The larynx, it is well known, is supplied with various nerves, but a material branch is sent off from the *pneumogastric*, viz. the *recurrent*. Dr. Haighton gave it as his opinion, that "the "recurrent branch of the pneumogastric was essentially necessary to "the formation of voice." This opinion was afterwards fully verified by Dr. Hastings(11), who observed, in his experiments, that little or no dispnœa was produced by the division of the recurrents alone—though the voice was much altered—but that suffocation was immediately produced by the division of the other laryngeal nerves.

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(9) Corp. Hum. Fab. *p.* 6. (10) Bichat sur la vie. (11) Philip's Enquiry, *p.* 121, note.

APPENDIX.

In this physiological sketch, a series of vital functions in the course of the pneumogastric nerve, and depending upon it for their peculiarities, has been, it is imagined, satisfactorily traced. It is seen, that the stomach, the lungs, the heart, and the larynx, are closely connected by this nerve. We shall now attempt to trace, with similar perspicuity, a chain of diseased movements taking the same course. It cannot fail to be observed that the organs above mentioned are primarily affected in Cholera, and that the pneumogastric is immediately distributed, and almost confined to them.

The experiments I have quoted are from high authority, and I trust I have neither misrepresented them or their projectors. The symptoms observed on an attack of this disease, are, in the first instance, confined to the stomach and bowels, and their functions appear to be augmented as well as depraved. The bowels purge considerable quantities of the rice-gruel-like evacuations, and copious vomiting, of the same kind of matter, is very constant. The fact is remarkable, that although the vomiting may have continued for many hours, and the quantity ejected may be considerable, still the stomach when examined, after death, is generally found much distended with food, taken prior to the commencement of the attack; proving how remarkably the function of digestion had ceased(12). When this state of stomach and bowels has continued, for an indefinite period, and its duration is uncertain, the symptoms of the stage of collapse supervene, and the disease seems to extend itself to the organs of voice, respiration, and circulation. The peculiar voice, the *first* signs of diminished action of the heart, and the blue appearance of the countenance, commence almost simultaneously; and can only be attributed to a continuation of the same morbid influence.

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(12) This fact clearly points out the propriety of the exhibition of emetics, recommended in the report, as tending to suspend the irritable vomiting, by evacuating from the stomach an oppressive load. It may also supersede the diseased action in the stomach, and establish one of a more healthy tendency.

The peculiarity of voice has been remarked, as the first symptom, denoting the transition from the *premonitory* to the *second* stage. When these affections of the organs, primarily attacked, have arrived at a certain point, all the aggravated symptoms, of the viscera indirectly disordered, may be observed gradually to be exhibited. Appearances shew more palpably that the blood ceases to undergo its natural changes, particularly in colour; the animal heat falls many degrees; the secretions are almost universally suspended, and the contractibility of the muscles is nearly destroyed. Above I have given some experiments of Mr. Brodie; and enumerated a few of the uses of respiration from Sœmmering; these reviewed, in conjunction with the symptoms of the blue stage will, I think, lessen the difficulties hitherto experienced in accounting for the phœnomena of the disease. One of the principal uses of respiration is to "*purify the blood;*" that is, to render it fit for the performance of the functions of the vital organs of the body; for it is well known, that without a due supply of arterialized blood, the organs fail to act. The blood drawn from the arm during the first stage of the disease, in a case which I saw, exibited the *usual* appearances; in another case, where blood was taken about *eight* hours after the first symptoms had appeared, and only *four* from the commencement of the blue stage, neither changed its pitchy appearance from exposure to air, nor coagulated. These instances shew, that the loss of power to effect such healthy changes in the blood, is only experienced as the disease advances to those organs, whose office it is to produce them. In the first stage of this disease, while the blood undergoes its natural changes in colour, &c. we observe the stomach and bowels unusually active, and other secretions fully performed; but as the second stage begins and increases, the stomach and bowels not only gradually lose augmented action, but become torpid; even calomel which had been administered some hours before death, has been frequently found lying entirely *unchanged* on the coats of the stomach. The secretion from the kidneys is totally suppressed during this stage; but, what is well worthy of observation, the secretion of bile continues to be produced, for the gall bladder is constantly found distended after death. This may be accounted for by the fact, that the secretion of bile is naturally pro-

duced from *venous* blood, while that of urine, now totally suppressed, is produced from *arterial* blood. The liver, it would seem, has acquired an hereditary to all diseases of oriental origin; but in the disease in question, it is clearly less in fault than some other organs.

The contractibility of the muscular system appears to suffer equally with the secretory organs. The cramps, before violent, become much relieved, or altogether cease; and the action of the heart, from secondary influence, is now so much reduced, that its pulsations can scarcely be felt; and when perceived, do not exceed *ten* or *fifteen* in a minute. This enfeebled circulation and suppressed state of secretions, sufficiently account for all the congestion which takes place in this awful disease. The lungs, from the congestive condition in which they are found, have been compared to "*bruised pieces of flesh.*(13)" The mechanical part of respiration is still performed without any difficulty.(14) By some it is even supposed, from stethoscopic observations instituted for that purpose, that a larger volume of air, than usual, is received into the lungs at each inspiration; the deficit is not therefore, as has been before observed, the *want* of oxygen, but the incapability of appropriating, to its proper purpose, the supply which has been inhaled. Physiologists, and Cuvier amongst the rest, have expressed their opinion, that the conversion of chyle into fibrine, is a vital action performed by the lungs; we certainly find that it enters the vessels just before their blood is sent to the lungs, and that the blood returns fitted for all the purposes of life. If therefore, we find that the fibrine in this disease loses its healthy properties, to what cause can we attribute it, but to the disordered state of the functions of the organ intended to confer those properties?

It is a curious circumstance that while all the organic functions of the body are seen failing, from a want of properly undecarbonized blood, the intellectual faculties should remain, but little, if at all

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(13) Orton on Cholera Spasmodica. (14) The respiratory muscles, so denominated by Sir Charles Bell, continue uninfluenced.

impaired, to the last moments of life. This observation struck me very forcibly in those instances of disease which I saw terminate fatally. Post mortem examinations have thrown but little light on the nature of this dreadful disorder; they have only exposed to view the mischiefs of congestion, and these are to be considered the results of diseased action. The great mystery to be solved, in order that the nature of Spasmodic Cholera may be advantageously understood, is in the first movements of the disease. These are attributed by some to a morbid impression made on the nervous system, affecting the sanguiferous; and the group of symptoms we see in the disease are supposed to be the result of this impaired state of the circulation. To point out *the part* of the nervous system, more directly injured by the morbid influence, and to explain its consequences, has been my attempt; how far I have succeeded, the public will judge.

It appears to me abundantly proved, that in the second stage of cholera, the blood ceases to undergo its natural changes, and that venous blood is distributed to all parts of the system. From this cause the secretions cease to be formed, and the organs are no longer susceptible to the action of our remedies. And till we can either prevent, or correct this state of the blood, from a knowledge of its cause, our treatment of Cholera must remain uncertain.

Official directions having been issued recommending preventive measures; to them I beg to refer my readers, as carrying with them greater weight than any thing I can venture to offer.

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