OBSERVATIONS

ON THE

HISTORY AND TREATMENT OF

CHOLERA ASPHYXIA,

AS IT HAS APPEARED AT

HADDINGTON,

SHEWING THAT IT IS NOT NECESSARILY INFECTIOUS;

AND INCLUDING

AN ACCOUNT OF THE USE OF GALVANISM IN THE STAGE OF COLLAPSE.

WITH AN APPENDIX OF CASES.

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INTRODUCTION.

It is not intended in the following pages to enter into any detailed account of the Cholera Asphyxia. Lengthened treatises, comprising all that is yet known in regard to it, are already before the public and the profession. The sole object of the Authors is to state the conclusions to which they have been led in regard to its Mode of Propagation, and the Treatment most useful in its different stages. They are most willing to admit that, in some of the cases (as will be seen by a reference to the appendix), there may have been errors in practice; but they suspect that these are almost unavoidable in contending for the first time, with a disease so new and formidable in its features, so rapid in its progress, and regarding which no fixed and determinate principles of medical treatment have as yet been adopted.

They conceive it to be the duty of the Members of the Profession generally, wherever the epidemic makes its appearance, carefully to investigate the circumstances connected with its origin and after progress, tracing as far as may be the probable remote cause of each individual case, noting the effects of the different remedies employed, and exhibiting the results of any varieties of practice they may have found it necessary to institute. It is in this way, they apprehend,—by a diligent collection and collation of facts,—that much may ultimately be done towards the elucidation generally of this very remarkable disease, and in particular towards its more successful treatment.

The origin and subsequent progress of the epidemic at Haddington, where the disease first occurred in Scotland, were rather favourable for an investigation of this nature,—the circumstances and habits of the individuals affected being intimately known, and the number of cases at any one time never so overwhelming as to preclude or suspend inquiries of the nature in question.

In coming to the conclusion that Cholera Asphyxia is propagated by an epidemic influence, a position so much at variance with the opinions of many of their professional brethren who have seen the disease only in this country, they do not mean to assert that it is necessarily and absolutely diffused alone by this influence; but, speaking from the sphere of their own observation, they do conclude, that it has extended only or chiefly as an epidemic in Haddington; many of the cases, especially in the surrounding country, having no other possible origin; and, in a considerable number of examples, the disease having manifested itself under the most malignant type, *in an isolated form*, in the bosom of large families, and without any subsequent extension. In very few of the cases could the idea of an infectious origin be at all entertained; and, even in these, there was always the possibility that another influence might have been efficient. The conclusion, in fact, is almost irresistible, that if Cholera Asphyxia be infectious, its grade of infection must be a very low one; and that, consequently, it would be fully as unwise and impolitic to embarrass the commercial relations and intercourse of

the country, under a mistaken apprehension that it is *virulently* infectious, as it would be to do so during the prevalence of fever, small-pox, or measles *.

* By the term Infection is here meant, " that unknown quality in a disease whereby it is capable of being communicated from man to man, *without the presence of its original source*," vide G. H. Bell, on Cholera Asphyxia, p. 80. Keeping this in view; to establish the infectious character of *any disease*, it is not enough to say that *every* member of a family (in which it can be proved to have originated without the influence of this cause), has been the subject of its attack,—its epidemic or rather endemic character being as strongly supported by this position.

The terms Infection and Contagion have been used in the following pages, as of synonymous import.

CHOLERA ASPHYXIA.

HISTORY AND MODE OF PROPAGATION.

The town of Haddington is situated on a plain about a quarter of a mile square, bounded on the south and east by the river Tyne, having its course eastward.

The elevation of the town above the level of the sea is somewhat under 100 feet, and the whole surrounding country, except on the river-side, rises from it as a centre. The streets in the town are wide and airy, but there are numerous sections by lanes, which are ill ventilated and filthy.

The suburb of Nungate, irregularly built, also abundantly filthy, ill ventilated, and inhabited principally by the poorer classes, is on the east side of the river, (about 100 yards wide here,) and the line of communication is by means of a bridge, the water being pent up by a mill-dam running across from that part of the town in which the disease first appeared, to the Nungate side.

It is worthy of remark, that the refuse of three tan-works, the town slaughter-houses, and two common

sewers, intersecting the town, is discharged into the river at or near this place.

The Cholera made its first appearance in Haddington on the 17th December 1831; and, after a few straggling cases, between which, with one exception, there was no communication traceable, it became general; confining itself, however, more particularly to the eastern districts of the town, and to the suburb of Nungate.

The first patient was a confirmed drunkard, and had been exceeding in the use of ardent spirits more particularly for the two days preceding his attack. His residence was in a steep narrow lane, leading down to the river, in the vicinity of the slaughter-houses, and forming one of the avenues to a tan-yard and bone-mill, where there was a large depot of bones, &c. gathered from the surrounding country, and not imported from Hamburgh, as was reported at the time. If filth, dissipation, and the combined influence of many causes acknowledged to have a direct effect in depressing the vis vitæ, can, without the agency of contagion in its true sense, produce Cholera Asphyxia, we think it will be allowed that they had full scope for exercising their power in this case; and, as there was not the most distant probability of the man having come in contact with any one labouring under the disease, or from the infected districts, we may certainly be justified in concluding, that the first case in Haddington was sporadic. The assertion that the disease was "brought from Newcastle," is too vague to have deserved notice, were it not that, through the public press at the time, it was asserted, with much confidence, that three shoemakers

were the unhappy medium of conveying this malady. If this were the case, the men must consider themselves more than fortunate in having escaped the addresses of their unsparing fellow traveller. The truth is, the three persons alluded to, named Frazer, Gow, and Walker, left Newcastle, on the 9th or 10th of December, travelling on foot, resting eight nights on the road, at different stages, and arriving in Haddington after the first case had been ill for twenty hours. They never saw the man, they had never seen a case in Newcastle, have never been attacked themselves, nor have they communicated the disease to any of their families or neighbours.

Considering the first case here as arising from other causes than the influence of contagion, it becomes a question of much interest to decide how it spread; and, as the succeeding cases, for some days, were in the same part of the town, contagion starts to the mind as the probable means of diffusion. But though, in this town and neighbourhood, we have seen little or nothing to *lead* an inquiry into the laws regulating the course of this malady, yet we feel satisfied that the contagious influence never predominated; admitting however that, in the present state of our knowledge, it were premature to assert that the disease may not prove contagious to a greater or less degree, according to the favourable or unfavourable circumstances in which it may be found in other places.

We are aware that, in entering on this subject, we tread on delicate ground, and may be found in our experience to differ with some of our professional brethren,

yet we would be wanting in our duty to the public, were we to omit a statement of our convictions on the subject.

As already remarked, the first case appeared on the 17th December; the second (on the 25th) a girl, æt. ten or twelve, of a delicate constitution, who lived in the neighbourhood of the first. She had no communication with him, or the inmates of the house in which he resided, but had been exposed for some time in a thin dress, on the evening before her attack, which proved fatal in a few hours. The house in which she lived communicated with the entry to the tanyard, was damp, ill ventilated, and inhabited by her father, mother, and numerous family, all of whom were more or less exposed to the influence of contagion, had it existed; yet not one of them had the disease until the 3d of February, when the eldest daughter, æt. 18, (who, from her occupation as a straw-hat plaiter, was necessarily much from home in another part of the town), was attacked, and fell a victim to it. The family were thus again exposed to the risk of infection; but, up to this date, remain well, although no separation of the healthy from the sick was practicable from the limited extent of their dwelling, and no means of prevention have been used except whitewashing the house and washing the bed-clothes.

The third and fourth cases were women living in the same tenement, but in different apartments. Their house is situated in one of the dirtiest closes in the town (leading also to the river), about 150 yards from the residence of the last case. They both fell victims to the disease, without communicating it to any of the numerous visitors

led by curiosity to see them during their illness, and after death. The husband and niece of one of the women removed to the family of a brother-in-law, who was much engaged with them in attending their relation, and in cleaning the house, &c. after her death. Four or five days after being thus exposed to the influence of all the causes producing the disease in his wife and her neighbour, the husband was attacked in the house of his brother-in-law; and, on the same day, the niece and brother-in-law, who also were exposed to the same causes in the poisoned locality. The husband perished in six hours and a half; the niece and brother-in-law recovered; the girl, after a dangerous illness of three weeks. Here, let it be remarked, that none of the brother-in-law's family, in which they were ill, or the families in the tenement in which they lived, have been attacked, although nothing whatever has been done towards fumigating or whitewashing the house *. Owing to the long illness of the girl, it was not practicable to remove her for that purpose, and, since, it has been overlooked †.

Isabella Macleish, mother of case first in Appendix, died in a house in the Nungate, on the opposite side of the river from the close in which the third and fourth cases died. She was a most dissolute character, and had no communication with any of the previous cases. Three other women of similar habits, living in the same tene-

* For three days after the husband's death all his bed-clothes remained in a heap at the side of the bed, *to which the niece was removed immediately after her uncle's death;* and in the same room (ten feet square) a family of eight or ten individuals resided.

† A case occurred in the tenement on the 17th February.

ment, were subsequently attacked and died. Macleish's two children, and a child of one of the other women, had also symptoms of the disease; but none of the other inhabitants of the tenement have been attacked. One of these is an old man, with cancer in the throat, and a debilitated constitution, living in the story immediately above the rooms of Macleish and the others.

George Patterson and his daughter, also residing in the Nungate, though at some distance from these cases, took the disease on the same day: he died of it, the girl recovered; but none of the family (though they all slept in the same room) have been attacked.

Mrs Robertson, also in the Nungate, on the outskirts of the suburb, died of cholera, and, though she was surrounded by a numerous family, none of them have taken the disease. Many similar instances could be adduced among the lower classes. Let us now, however, view the course of the disease among the more respectable inhabitants of the town.

After a remission of the disease for nearly eight days (which took place upon the return of soft weather), we had a renewal of it (with great violence during two or three days) following a gale of wind from the north and east, with rain and snow. In this attack the better classes were its principal victims. In their families, the disease has been confined entirely to those first attacked, they being predisposed to it in almost every instance, and contagion here is altogether out of the question.

One of the first of these cases was that of Mr S. who had been subject to disorders of the stomach and bowels

for some years. He died in the midst of a numerous family. Mr A. also fell a victim to the disease, surrounded by his family. Mr M. was attended by his mother, sister, and servant. Mrs A. and Miss C. also died of cholera, and in none of their families have there been any farther spreading of the malady. So much for "contagion" in this town. Its influence has not been more perceptible in the country, as far as we have had access to it.

The case at Beanston Mill was truly a sporadic case, the subject of the attack being a poor woman who had neither been in Haddington, nor had any communication with any person from that place since harvest. She died of the disease after reaction had commenced. During her illness, she was well attended by several of her neighbours, besides receiving casual visits from many more. Not one of them has taken the disease except her mother; this case being in its results a farther proof of the limited influence of contagion, although at first sight it appears like a confirmation of its virulence. The woman, after a residence in the house of her daughter for about forty hours, returned home to the village of Athelstoneford, about ten miles off, and was attacked with cholera on the second day after her return. She had visited the poisoned spot and received the disease (when attending a patient?) she did not communicate it to any one in Athelstoneford, which she probably would have done had it been contagious. There was another case in the village at the same time, between which and the old woman there was no communication. None of the attendants of either have been since attacked.

The case at Knowes, six miles east of Haddington, was similarly a sporadic case. It is rather remarkable that both these cases are on the banks of the Tyne, and the general situation of both resemble that of Haddington. The poor woman who was the subject of the attack lost her life, but none of her neighbours, or her attendants, have been seized.

There was one case at the village of Whittinghame, in which the disease did not spread, and two cases at Bees' Knowes (about two miles distant from the latter), which had no intercourse with each other, although the other inhabitants of the hamlet had free communication with both, with impunity. At Ruchlaw Mill, also in that neighbourhood, there was a fatal case, which was not interred for three days after death. During his illness, and until he was interred, some of his family and friends sat up night after night in the house, and have not been attacked.

A young man, named Hardy, who had been working for a week in Tranent during the prevalence of the disease, to its greatest extent in that place, came to his home at the village of Gladsmuir, and took the disease, but did not communicate it to his family, who are known to be highly predisposed.

A woman, who was afterwards the subject of our first galvanic experiment, left Tranent while labouring under an attack of diarrhœa, travelled on foot to the village of Samuelstone, became collapsed there, and was removed in a cart to Haddington. None of the people who saw her, and assisted in removing her, have taken the disease.

Two of the servants of a gentleman's family, about seven miles east of this, took the disease, having had no previous communication with any of the infected persons or districts; they both recovered, and the disease has not spread in the family nor neighbourhood. There was also one case at the village of Whitekirk, in which the disease has not spread.

The disease has not attacked the village of Linton, five miles east of this, although the inhabitants are in daily communication with all the above places. It prevails at West Barns, four miles farther east. It has not attacked Belhaven nor Dunbar, both within two miles of West Barns.

Are we not justified in concluding, if the course of this disease had been determined here by its contagious influence, that the hamlets of Beanston Mill and Knowes would have been pervaded by it; that the villages of Whittinghame, Athelstoneford, Whitekirk, and Gladsmuir would have had it radiated from the central point of the residences of the first cases; that the village of Linton would have been attacked long ago, and before West Barns; and that Belhaven and Dunbar would have also had to regret their vicinity to the infected spots? The thoroughfare being as great to the eastward as to the westward, should not these towns have suffered in the same way as Tranent and Musselburgh? Are we not privileged to ask, after the above instances, If the disease could have been restrained in its course, the intercourse being uninterrupted, were it to any extent contagious; or, in other words, if its spreading did not depend upon some

more accidental circumstances hitherto concealed from our knowledge?

To conclude; it were to be desired that medical men would come to the investigation of this subject free from prejudice or party feeling, so that much of the talent at present thrown away in unavailing assertion, might be turned to account by a united and strenuous research after the truth.

The disease, though it be admitted to have travelled down the river (as has been alleged), has not as yet ascended its course, nor has any of the inhabitants of high grounds around the infected localities been its subjects.

It is remarkable, that, in its progress, very few instances of the disease have occurred in persons perfectly healthy; they, to a certain extent, appearing to enjoy something like immunity, from the severer symptoms at least; the aged poor and laborious, the dissipated, with those subject to disease in the digestive organs, and whose minds were weakly constituted, being among its earliest victims, and almost invariably experiencing the severest attacks.

In the whole of the cases there was some degree of precursory indisposition, and this varied in intensity from a general *malaise* to the more regularly marked premonitory symptoms, continuing from a few hours to four or five days. The onset of the severer chain of symptoms generally took place during the night, or early in the morning; and, in one or two instances, the first indication of its attack was disturbed slumber and restlessness after going to bed.

When the patients were seen during the premonitory stage, the management of the disease seemed to be easy; and we are not aware of any case so seen that run on, in spite of treatment, to collapse. A few cases went so far, that some of the symptoms observed in collapse, particularly cramps and coldness of the extremities, were present, but these were followed very soon by fever lasting for a longer or shorter time. In one case, the febrile type was completely formed, and the patient lost her life after seventeen days' illness. In such cases, the morbid irritability of the stomach remained long, with foul tongue and impaired appetite, or symptoms of inflammation of the mucous membranes of the intestinal canal. In two cases, after the administration of purgatives, the disease took the appearance of dysentery, with slight bloody and mucous stools, and, in one case, a severe attack of peritonitis supervened.

In one of the bad cases, after reaction had gone on for some time, there was a cutaneous eruption resembling urticaria, which receded, and was immediately followed by symptoms of congestion in the abdominal viscera, ending in death; and, in another, the patient laboured under an attack of itch, with venereal blotches, but these did not in any perceptible degree modify the disease.

The general course of treatment was that recommended by writers on this disease; but the total want of success attending it, soon led to many modifications in practice.

The mortality up to this date has been one in two of all the cases reported, or, in other words, almost all the cases which were seen for the first time during the collapse

stage died; very few indeed rallied from this state, and those who did, with a few exceptions, sunk under the congestive symptoms which supervened during reaction. The brain seemed chiefly to suffer from this cause, though, in some of the cases, the functions of the abdominal and thoracic viscera were more particularly deranged.

The modifications produced in this disease by atmospheric changes open a wide field of inquiry, and we are sorry that our limited opportunity does not enable us to say much on this head. The accession of the disease here was during a hard frost, with northerly and westerly winds; and, on the other hand, mild weather, with south and west winds, prevailed upon the first remission;—increasing tenfold with severe weather and north-east winds, and now again decreasing with south and south-west and frosty nights.

The diet of the poorer classes in this town and neighbourhood consists principally of vegetable matter, and the use of ardent spirits is more or less general in the same class. Nearly all the medical attendants here were more or less affected with a peculiar uneasy feeling in the abdomen, sometimes amounting to tolerably sharp pain, and these feelings seemed to be increased, after an attendance upon the patients for any length of time in their own dirty and ill ventilated dwellings.

The disease among the poor has decreased both with regard to the number of cases, and the severity of the symptoms, since the establishment of a soup-kitchen, and clothing depot. We mention this as a fact, without, of course, pledging ourselves to account for it.

In a great many of the cases, the attack supervened very shortly after excess in the use of ardent spirits, and in one or two melancholy instances, the patients were only roused to consciousness from the stupor of intoxication, by the distressing urgency of the symptoms of collapse. All such cases perished, without being in any way relieved by the means used. May this fact serve as a warning to the intemperate! In justice to the practitioners here, it ought to be stated, that no cases were reported designedly, but such as had pathognomonic symptoms of Cholera. Five or six not decided cases were reported, being found under circumstances which increased the probability of their having the disease.

ABSTRACT OF CHOLERA CASES.

PARISH OF HADDINGTON, 23*d February*.

		Men.	Women.	Boys.	Girls.
Deaths, -	54	22	30	0	2
Recoveries,	70	28	35	1	6
Remaining,	1	0	1	0	0
	—	—	—	—	—

Total cases, 125; being 50 men, 66 women, 1 boy, 8 girls.

The proportion of children attacked seems remarkably small, and may be considered as another proof, that this disease is not one of great contagious power. There were only three of the cases domestic servants (all mild), another curious fact leading to the same conclusion.

OF THE PREMONITORY SYMPTOMS AND THEIR TREATMENT.

The premonitory symptom of all others most commonly observed as the forerunner of Cholera in this district, was Diarrhœa, varying in its duration from a few hours, to several days, or even weeks, before the more violent onset of the disease. In some instances it has been preceded, and attended throughout, by griping pains in the stomach and bowels, occasional feelings of sickness, languor and debility. More commonly, however, it occurred as simple diarrhœa without pain, and with so little inconvenience to the individual affected, that many have continued their usual avocations, up to the commencement of the more decided form of the disease. The character of the evacuations in those cases has not generally varied from that observed in common bowel complaint, or as the result of the operation of purgative medicine. As the period of the second stage, however, approached, the evacuations became more watery, and ultimately assumed the appearance of rice-water or thin gruel.

Connected occasionally with this state of diarrhœa, there was some degree of headach, giddiness, and tinnitus aurium, and in one or two instances partial deafness has been observed.

In a few cases, a pyrexial state has ushered in the more decided symptoms, indicated by languor and listlessnes s, weight in the head, heat of skin, and frequency o

pulse (the strength of the latter being generally *under* what might have been supposed its natural amount) some degree of sickness, and occasionally vomiting. Præcordial uneasiness has not existed to any considerable degree as a premonitory symptom, but has seldom been wanting in a more advanced stage of the disease. It has always been prominent and distressing, when the attack was violent and sudden in young subjects of considerable natural vigour. Cases 4th, 5th, and 6th.

In one instance only, so far as is known, were crampish twitches in the fingers, the first indication of an impending attack; and these were experienced at intervals, without any other symptom for some hours previous to its commencement.

In regard to the premonitory symptoms generally, it may be observed, that their intensity and combinations with each other in different cases were most various, and their duration most uncertain. When diarrhœa had existed for a considerable time, unconnected with any other premonitory symptom, the subsequent progress of the disease, if not arrested, has been generally very rapid, and the result fatal; while in those cases ushered in by pyrexial symptoms, or a state of indefinable *malaise*, the attack has been of a milder and more manageable character, probably from the patient being compelled to surrender himself to proper treatment at an earlier period.

The Treatment most successful in combating the premonitory symptoms, is very simple, and has been found very efficient. Diarrhœa with or without griping pain in

the bowels, often yielded to a dose of castor-oil, or one or two mild doses of rhubarb, magnesia, and ginger, with rest and warmth, and a duly regulated diet. In some cases, an opiate preceded the exhibition of the aperient, and with decided advantage. When the diarrhœa was attended with frequency of pulse, heat of skin, and even a certain amount of collapse in the features, shewing the livid areola about the eyes, a small bleeding has been often practised; and as an effect, the patient generally says he "feels lighter," though not previously sensible of any particular depression. One grain of opium, with three or four of calomel, repeated in a few hours, according to circumstances, was next administered, and followed up, after a proper interval, with castor-oil, or divided doses of the compound extract of colocynth with rhubarb.

The purgatives required repetition for several days, till the alvine evacuations, thinner and darker than natural (sometimes pitchy), regained their usual appearance. The diet was of course mild and moderate in quantity, and the patient kept constantly in bed.

It is worthy of remark, that in the majority of these cases, the blood presented the true Cholera appearance, so far as relates to darkness of colour, and a slight increase in consistency. In some of them the change to a brighter colour, towards the conclusion of the operation, was very distinctly observed.

SECOND STAGE OE CHOLERA.

When the premonitory symptoms did not yield to medical treatment (an unusual circumstance), or, as often happened, the patient was not seen until a more advanced period of the disease, a remarkable and alarming change was observed in the intensity of the symptoms, and the general appearance of the patient.

The attacks of diarrhœa had become more frequent, with painful feeling of bearing down; the matters thus forcibly evacuated having in many instances a close resemblance to rice-water, or whey through which a small proportion of curdy matter was diffused, in others to water slightly muddy. Vomiting of fluid, similar to the dejections, was then a pretty constant and distressing symptom, with painful oppression and sense of heat about the præcordia, extending to the spine; the thirst insatiable; the tongue white and moist; the respiration (occasionally natural) quick or oppressed; the breath often cold; the secretions suspended.

To the attacks of vomiting, cramps generally supervened, at first in the fingers and toes, but soon extending throughout the more muscular parts of the extremities; and ultimately, though chiefly in the more vigorous and robust subjects, affecting the trunk itself.

Conjoined with these symptoms, we observed the alarming prostration and sinking (so characteristic of the disease, and so indelibly inscribed on the recollection of those who have once witnessed it); the feebleness and

suspension of the pulse; the suspirious voice; the coldness of the skin; the shrinking of the features; the hollow sunken appearance of the eye; the shrivelling and blueness of the extremities; the deathlike aspect of the sufferers.

These symptoms existed of course in different degrees of intensity in different cases, and in varied combinations with each other. When the patient died in the stage of collapse, it was common for the vomiting, purging, and cramps, to cease for some hours before the fatal event took place; and in several of the most malignant and rapidly mortal cases, these symptoms were never urgent.

The great majority of cases which proved fatal did so in this stage; no combinations of remedial agents, in the worst examples, arresting for a moment the downward progress of the disease.

The Course of Treatment pursued in the second stage of Cholera, had for its chief object the revival and restoration of the depressed and languishing energies of the system — the establishment in fact of a state of reaction. For this purpose a variety of probable means were always in operation at the same time; and in no disease perhaps is this so essential as in the second stage of Cholera: life already appears at a low ebb, and the disease seems hastening with appalling stride to a fatal termination.

It is not intended here to enter into any detail regarding the treatment in the second stage of Cholera,—knowledge on this subject, so far as it exists, is widely dif-

fused. All that is now meant, is a brief statement of the effects of the more important remedies, as they were observed in the epidemic which lately prevailed in this town and neighbourhood.

Particular allusion is not necessary to the application of dry heat in various forms, or to the employment of frictions with hot linen or stimulating embrocations. All are agreed on the absolute necessity of such measures, under one form or another. In regard to frictions, when assiduously maintained under the bed-clothes, they have been found most decidedly useful, both in promoting reaction and in relieving cramps.

These means once put in force, the remedy generally employed in the first cases was bleeding. Much was expected from it, as it had been found so eminently serviceable in Indian practice. In this we were most decidedly disappointed. In cases where the pulse could not be felt at the wrist, or even where it was feeble, blood could never be obtained in a full stream, or in any sufficient quantity, except in two or three instances; and in none of these could it be said that the individuals were benefited by the operation.—*Vide* Case 12th. In the larger proportion of cases in the state of collapse ℥iii or ℥iv of blood were all that could be procured, after a tedious kneading of the arm and covering it with warm cloths; and in no case with any appreciable benefit. In the case of Smith (case 16th), a small quantity of blood was obtained, after the operation of the mustard-emetic,—but the collapse continued and increased after this period, although the patient ultimately did well.

At the commencement of the second stage, when the discharges from the stomach and bowels are decidedly characteristic, but the vomiting not urgent,—when the collapse in the features is considerable,—*but the pulse retains its firmness under pressure*,—bleeding may be practised with advantage, *but the operator must keep his finger on the pulse, and judge from the effect on it, and not from any feeling or indication on the part of the patient, how far it is safe to proceed in the abstraction of blood.*

In none of the cases of collapse in which bleeding was practised, did the blood become of a brighter colour during the operation, except in that of Cheape. The quantity abstracted in every case has been moderate, the tendency to syncope and the actual existence of that state being very readily induced. In this respect the present epidemic differs very remarkably from the Indian Cholera, in which Mr Bell says, "it is extremely difficult to produce syncope by bleeding *."

Mustard has been very fairly and fully tried in a great proportion of the cases,—but rarely, except in a few of the milder variety, with any appreciable benefit.

Its effect as an emetic could generally be counted upon, and not unfrequently under its immediate operation a feeble and fluttering pulse became more distinct; but the improvement, except perhaps in case 8th, was never permanent; and in some of the cases it is unquestionable, that, during the vomiting produced by it, an indistinct and feeble pulse became altogether imperceptible. Upon the

* Bell's Treatise on Cholera, p. 161, *foot-note.*

whole, we are inclined to believe, that the mustard-emetic is, like bleeding, *most adapted to the very commencement of the second stage*, or for the removal of the premonitory symptoms.

As an external application in Cholera, mustard is invaluable, from the quickness and energy of its action—useful alike in exciting reaction, and in subduing its effects. Where bleeding has not been practised, or is contra-indicated, a large sinapism over the epigastrium has been found most serviceable, in relieving the præcordial uneasiness and oppression.

The internal remedies generally found most useful in the stage of collapse, were small doses of opium with calomel, repeated frequently according to circumstances, or from gtt. xxv to gtt. xxxv of laudanum in a little warm brandy and water, when the stomach will retain it,—the brandy and water repeated at short intervals, without laudanum, or with a smaller proportion, if judged necessary.

It became very soon evident, that the large doses of opium and calomel, so serviceable under different circumstances, were not adapted to the particular form of the epidemic prevalent with us. Indeed, it appeared highly probable, that in some instances they increased, if they did not originate, symptoms of cerebral congestion: half grain doses, or, as a first dose, one grain of opium in combination with three or four of calomel, repeated at intervals, were found to answer better.

While these remedies were administered by the mouth, large and warm enemata, consisting of water with Tinct. Opii ʒi or ʒiss, or a weak solution of salt, were, in many

cases, thrown up into the bowels, and retained there by pressure for a considerable time. They were frequently repeated, and appeared to do good.

The hot-air bath has been used in a considerable number of the cases which proved fatal. No evident benefit ever appeared to result from its application.

The utter inefficiency of all the means used in the more desperate cases, for rallying the system out of the state of collapse, having been too often proved, we were led to inquire whether the agency of Galvanism, often proposed, but never, so far as we knew at the time, experimentally tried, might not possibly be serviceable in rousing the depressed energies of the system, and establishing a state of reaction. Several cases of a malignant type, in which the collapse was perfect, occurring soon afterwards, were individually subjected to its influence. In all but one some sensible effect was produced. The cases are detailed at length in the Appendix.

The results might have been more satisfactory than they were in cases 21 and 22, if a battery had been used instead of a single trough of *sixty* plates; and if the trough itself had been in a state of more perfect order. But, so far as the results go, it appears reasonable to conclude, that, with a more perfect and powerful apparatus, and more vigorously constituted subjects than those operated upon, a greater and more permanent benefit might be obtained.

If, under the combination of all the means employed, we are so fortunate as to excite a state of reaction, marked

most unequivocally by a restoration of the pulse and animal heat, it must be our care sedulously to promote the more perfect development of this state, and, at the same time, to guard attentively against the occurrence of cerebral or other visceral derangement. The plan which has been pursued here, has consisted in diminishing the quantities of stimulants administered, and withdrawing the use of opium entirely, supplying the patient instead with weak beef-tea and other mild nourishment, at short intervals. Purgatives and purgative enemata we have now found most essential.

The weak points in the system being of course most liable to suffer during the state of reaction, must be most particularly watched. In the cases here, the tendency has been most decidedly towards cerebral congestion, or perhaps a subacute form of inflammation. In relieving this state, a large sinapism over the scalp has been found more efficient than a blister: cold applications to the head and pretty active purging, were at the same time had recourse to. In regard to the use of purgatives, it appeared, that, employed cautiously, they could not be used too soon after the commencement of reaction,—the risk of visceral derangement being simultaneous with the occurrence of this state.

General bleeding has been occasionally practised in this stage, with the twofold view of seconding the efforts of the system in the development of the pulse and relieving local symptoms, but the effects have not been such as to warrant any recommendation of the practice.

Leeches have been seldom prescribed, as there was great difficulty in getting them to fix or draw blood.

APPENDIX.

CASE I.

9th January 1832.—Isabella M'Leish, æt. 6. Admitted to the hospital at 10 A. M. Complains of headach and sickness. Face and hands pale; feet cold; pulse imperceptible at the wrist. Attacked yesterday about 7 A. M. with vomiting and purging; the appearance of the stools reported watery; without pain of abdomen; continuing during the night: passed a little urine to-day. Bottles of hot water were applied to the feet, and a small quantity of hot weak brandy and water administered.—Hot salt-bags to the spine. Pulv. Sinapeos ℥ ij. Aq. calidæ ℥ iss. M. stat. sum. After the operation of the emetic, the following—℞. Spt. Lavandulæ Comp. gttæ xij. Tinct. Opii, gttæ xx.; Brandy ℥ ss.; Aq. Menthæ ℥ ss. M. Coch. mag. omni ¼ horæ. 11 A. M. Pulse 100, very feeble. Emetic operating freely. 11½ A. M. Passed one whey-coloured stool; Ht. stat. Submur. Hydrarg. gr. iii.; Pulv. Jalapæ gr. viii. M. 2 P. M. Pulse 102; surface warm; has not vomited nor passed urine since last report; one watery stool. Took a little beef-tea; immediately rejected. Reptr. brandy and water. 6 P. M. Has slept a good deal; some retching after brandy and water. Complains of much pain of abdomen; no stool. Inject. stm Enema purgans ℥ iv. ½ past 7 P. M. Has vomited all the ingesta; no effect from enema. P. 100, weak; skin below natural temperature. Ht. calomel gr. iv.; Pulv. opii, gr. ss. stm. sum.

Note.—Cases 1, 2, 3, 8, 9, 10, 11, 13, 18, 19, 20, 21, 22, 23, were extracted from the Hospital Case-Book, kept under the management of the Medical Board here.

10 P. M. Has slept for the last hour. Pulse 90, and firm; skin natural heat; no stool. To have warm tea or gruel every hour. 10*th January*. Has slept well all night; two bilious greenish stools; pulse 100, full; tongue clean; headach. ℞ Pulv. jalapæ gr. v.; Pulv. rhei gr. v.: Magnes. ustæ gr. viii. statm sumend.; producing more natural evacuations, which were kept up by laxatives, decreasing the tendency to fever, until 13th January, when she was discharged well.

REMARK.—In this little patient the disease seems to have been more tardy in assuming its deadly type, than in most of the similar cases; and perhaps it is altogether the mildest case we had, shewing the pathognomonic symptom of watery purging. We may also observe, that the presence of urinary secretion seems to be somewhat fallacious in this disease, until decided symptoms of collapse supervene, when its secretion invariably ceases.

CASE II.

29*th December* 1831.—Robert Brown, æt. 31, cabinet-maker, residing in Hardgate Street, of a spare habit, and occasionally addicted to the use of ardent spirits, in which he had exceeded the day previous; was attacked at 3 P. M., with spasms of the feet and legs, succeeded by vomiting and purging of watery fluid, tinged with bile. Seen at 8 A. M., when a draught containing laudanum and æther was administered. 10 A. M. Paleness of features, without collapse; the eyes appear sunk, but expression lively; general soreness of abdomen, not increased upon pressure; much thirst; breathing oppressed; tongue white; pulse 126, feeble, but very distinct at the wrist; vomiting and purging of bilious fluid still continue; skin colder than natural. Habt. stm. Ol. ricini, ℥ i.; Ol. terebinth. ℥ ss. M. 1 P. M. Vomited oil; vomiting continues. Ht Calomel gr. xv.

Pulv .opii gr. ij. in pil. ij. s. s., which was vomited, and repeated in two hours, being again vomited. 8 P. M. Oppression of chest relieved. Pulse 138, skin moist. Habt. haust. cum Tinct. opii, Æth. sulph. āā gttæ xl. *30th January, noon.* Feels relieved. Two bilious stools, more feculent; pulse 120. Ht. ol. ricini ℥ i. et sumat pil. calomel. cum colocynth. et ext. hyosciami ij. omni bihora. 7 P. M. Pulse 68; several feculent evacuations; thirst nearly gone; no vomiting. The purgatives were repeated with gradual improvement, and in two days he resumed his work.

REMARK.—In consultation, it was considered that bleeding this patient would have been hazardous, and from what we have since seen in the use of that remedy, it is likely that, had the patient been bled, collapse would have been induced. The free use of opium seemed to have no effect in allaying the irritability of the stomach, which, in all probability, a blister or leeches would have done.

CASE III.

29th January 1832.—Thomas Watson, æt. 25, tailor, spare habit. Was seized yesterday afternoon, about 3, with griping and diarrhœa, which troubled him during the night; took his breakfast as usual this morning, but soon afterwards became sick, and vomited; being relieved, he went to church in the forenoon, from which he was obliged to return by a renewal of his symptoms. When seen in the hospital, the pulse was imperceptible at the wrist, and he suffered from severe cramps and extreme prostration of strength, though the appearance of general collapse was not defined. He had a mustard emetic, and a sinapism to the abdomen. Injictr. enema sol. mur. sodæ calidæ. ¼ to 3 P. M. Enema brought off a quantity of scybalous feces. Pulse 162. Ht. Sulph. quinin. gr. iii., Calomel. gr. x. M.

Rept^r Enema purgans. 30*th*, 2 A. M. Passed two dark-green watery stools; feels much relieved; has slept a little now and then; pulse 120. Rept^r. calomel gr. x. cum pulv. ext. colocynth. gr. viij., t. opii gtt^æ xxx. 11 A. M. Has passed rather a restless night; free alvine evacuations of a dark colour and offensive odour; pulse 89, tongue foul, skin rather hot. Complains of much thirst, and a sharp pain over the liver on pressure. Some vomiting during the night. Admovt^r Hirudines xii. hypochond. dextro. 31*st January*, 7 A. M. Leeches bled well; pain relieved; has been much disturbed by other patients; feels weak; pulse natural, but feeble. Four or five very dark offensive stools. H^t Ol. ricini ℥ i. To have beef-tea. Continued to improve under the use of laxatives and sulph. quininæ, with a little wine, and was discharged cured on the 7th January.

REMARK.—It is somewhat curious, after the continued diarrhœa, that scybalous feces should have been expelled; but it will be seen afterwards, that the purging in Cholera does not always evacuate the intestinal contents. *Vid.* Case XX.

CASE IV.

29*th January* 1832.—Mr W— W—, æt. 18, a healthy and muscular young gentleman, was in his usual health at 5 P. M. Was called to see him at 6 P. M. He had just returned from walking; affected with sickness, and a crampish feeling in one hand; in a few minutes succeeded by a sudden attack of diarrhœa (egesta resembling muddy water), coldness, and rigor, paleness of countenance, palpitation, severe cramps in every limb, occasionally extending to the trunk; pulse 120, firm, but rather unequal. Being put to bed, and surrounded with warm applications, with friction, to relieve the cramp. ℥ xvi. of blood were abstracted, with immediate relief of the præcordial

uneasiness and cramps. The blood was decidedly darker than natural, but regained its natural hue as it flowed. Ht. T. opii gttæ xxx., cum æth. sulph. gttæ xxx. 9 P. M. Warm diluents have been taken freely; temperature of surface natural, cramps less severe and frequent; no return of diarrhœa; pulse 100, full and equal. Feeling of oppression about the præcordia has increased during the last hour. Ht. stm Calomel. gr. xv. Admov. emp. vesicat. epigastrio. To be kept warm during the night. *January* 30. ½ past 8 P. M. Passed upon the whole a comfortable night. Cramps gone; pulse 96; has had two stools, reported of a brownish colour. Ht. stm Ol. ricini ℥i. *February* 1. The oil produced its full effect, with complete relief, and he now only complains of weakness.

CASE V.

February 1.—Mrs —, æt. 25, in the better ranks, was seized suddenly during the night with an attack of diarrhœa; the evacuations like muddy water. Seen about half an hour after the attack. Complains of anxiety and oppression about the præcordia, and feeling of coldness, although the heat of surface is natural; nervous tremors; pulse 140, tumultuous, but of good strength; some degree of headach; no vomiting. Is five or six months pregnant. Immediately bled to ℥x., which she bore well. The blood, dark at first, distinctly changed colour towards the conclusion of the operation, which was followed by much relief of the præcordial uneasiness; pulse fell to 120, and became decidedly more equable; nervous tremor much subsided. Ht. statim T. opii xxxv., in a little warm spirits and water. Heat to be applied to the extremities, and a hot dry fomentation to the stomach; a little warm negus to be given occasionally. In four or five hours afterwards, most of the uneasy symptoms were relieved, she having had some sleep. Two or three days after this, her recovery was retard-

ed by febrile paroxysms, which gave way under the use of laxatives, diaphoretics, and anodynes.

CASE VI.

9th February 1832.—Landales, æt. 19, a tailor, residing at the Abbey, about one mile east of Haddington, a stout and apparently healthy young man, had occasionally, during the afternoon of this day, felt a little griping pain in the bowels, but so slight as not to have recurred to his mind until after the accession of the more severe symptoms. He had returned from an evening walk about 9 o'clock, and when in the act of stooping, was suddenly seized with severe pain, described as spasmodic, about the præcordia; coldness of the surface, and sickness; violent pulsation in the head, with a feeling as if the "head were thrown from his body;" indistinct vision. The pediluvium was administered by his family; severe cramps in the limbs immediately came on, and he was put to bed, when they became still more general. He was seen within half an hour from the occurrence of these distressing symptoms. Countenance apparently natural; skin warm; cramps severe in the lower extremities; no vomiting or purging; pulse most irregular, some of the beats being full, and others scarcely perceptible; so far as it could be counted, it varied between 120 and 130. A vein was immediately opened, and not above ℥ iv. of blood were abstracted, when the pulse ceased entirely at the wrist, but without the occurrence of syncope; his face, however, became paler. A little warm liquid was given, and frictions to the limbs ordered. Reaction took place in half an hour; the pulse became full and equal, 120; the cramps and præcordial oppression were much relieved, and the skin became moist and warm. 10*th February*, 1 A. M. Continues easy; no stool. ½ past 9 A. M. Slept a little during the night, and feels easier to-day; pulse 120, full; tongue whitish; has had two

whey-coloured stools, mixed with whitish curdy matter; slight crampish feeling in his limbs. H℞ Calomel. gr. v., to be followed by infusion of senna in a few hours. Mild diet. 9 P. M. No change. Medicines have had no effect. 11*th*. 9 A. M. A tolerable night, and makes no complaint. Pulse 112, full; some degree of thirst; no stool; has taken breakfast. H℞ Pil. colocynth. cum calomel et ext. hyosciami ij., to be repeated in two or three hours. 12*th*. Much sickness from medicine, which operated well; dejections more natural in their appearance. 13*th*. Has passed a good night; no complaint but weakness; pulse 80; tongue cleaner; appetite improved; evacuations natural. Cured.

REMARKS.—Cases 4th, 5th, and 6th, are good examples of the efficiency of timely bloodletting, in arresting the symptoms of threatened collapse, which, judging from the sudden and violent onset of the disease, would have, in all probability, been perfected in a very short period. The premonitory indications could scarcely be said to have any existence; the system appearing as at once overwhelmed by a poison. The relief obtained by bleeding was immediate, particularly of the præcordial uneasiness and cramps.

CASE VII.

31*st December* 1831.—John Dunbar, æt. 40 or 42, residing in Tyne Close, Haddington, by trade a shoemaker, of generally regular habits; had been frequently in the Goull Close, in the house inhabited by the woman Sandy, and had assisted in cleaning the house, &c. the day before he was taken ill, during which engagement he had taken two glasses of spirits: attended the funeral of Samuel Pearson (this day), who had died an inmate of his house at 10 A. M.; had been complaining of nausea and looseness of the bowels during the forenoon; had gone to bed early in the evening. 10 P. M. Was awa-

kened by Mr Meikle in consequence of the above information; complained of sickness, general soreness of abdomen, increased on pressure, headach, much thirst; tongue white; pulse 120, rapid and small. He was immediately bled to ℥ xxv. and had a dose of calomel gr. x., opium gr. i. In about an hour and a half after he was bled, the pulse increased in strength and fulness. Still pain of abdomen, with excessive thirst.—Repet. calomel. cum opio; to be followed in an hour by Ol. ricini ℥ i. 1*st Jan.*—9 A.M. Medicines produced copious dejections of a black liquid matter of a peculiar disagreeable odour. The calomel, &c. were repeated, with improvement in the appearance of the evacuations. Ptyalism was produced, and he got well in three days.

REMARK.—Except in Case IV, this case is the most favourable account of bleeding we have seen.

CASE VIII.

31*st Jan.* 1832.—Alex. Grundy, æt. 18; a carter; hitherto healthy, of a muscular frame. Was seen about 2 P.M., when he complained of much sickness, and tenderness of epigastrium. Had just returned on horseback from the country: had vomited, and passed two watery stools. Calomel. gr. x, opii gr. i. were administered. Refuses to be removed to the Hospital. 6 P.M. was brought to Hospital, and had a mustard emetic, sinapism to the abdomen, saline enema, and frictions, with ammoniated oil of turpentine, when the cramps were urgent. Complains of much thirst; collapse perfect; pulse gone at the wrist; much vomiting. Four stools after the enema. —Ht. stm. haust. tinct. opii gttæ xxx.; Brandy ℥ss.; the brandy to be repeated every half hour. Repetr. enemata calida omni hora. Continue the frictions. 31*st*, 7 A.M. Cramps very severe during the night, but were relieved by ligatures. Owing to a misapprehension on the part of the nurse, the mus-

tard emetic has been repeated four times, at intervals of 1½ hours, producing full vomiting each time; no vomiting since the last emetic operated. Pulse distinct at the wrist, but cannot be counted.—Ht. statim calomel. gr. xij. Repet. enemata and brandy and hot water. 2 P.M. Vomited calomel. Pulse less distinct. Feels better; countenance improved. Breath warm; skin colder than natural.—Repet. calomel, until retained. 1*st Feb.* Noon. Feels comfortable: has had some sleep. One bilious stool this morning. Vomiting of a dark fluid, apparently tinged with blood. Pulse 108.—Emp. vesicat. nuchæ. Omit brandy; to have spiced wine and beef-tea instead. Continue enemata. Ht. pil. colocynth. et calomel. ij. every two hours. Midnight. Leeches have been ordered to the head, and bled well. Pulse stronger. Hiccup, and pain of epigastrium.—Emp. vesicat. epigastrio. 2*d Feb.* Pulse 108. Has passed a good night: no pain; general appearance much improved. Passed urine four times. Stools natural, with admixture of small black clots, resembling coagulated blood. No vomiting; hiccup gone.—Ht. ol. ricini ℥ i. Continue, &c. Remove blister. ½ 3 P.M. Has vomited oil.—Ht st^{m}. pulv. extr. colocynth. gr. iii.; calomel. gr. v.; extr. hyoscyami gr. x. in pil. iii. 3*d Feb.* Has had a very restless night, with much confusion of intellect. Frequent stools, with urine. Shave the head, and apply a blister over it. 8 P.M. No change.—Habt. pil. colocynth. et calomel. ij. every two hours. 4*th Feb.* Oppression of the head, with delirium increased. Has slept almost without intermission. Pulse gone at wrist. Blister imperfectly risen. Complains of pain of head and abdomen. Apply hot fomentations to the belly; sinapisms to the legs. Reapply leeches, to be followed by cold applications.—Ht. enema purgans. 10 P.M. No alteration took place from the treatment. Pupils contracted, without blindness. Convulsions; death.

REMARKS.—This is almost the only case in which the mustard emetic seemed to produce its effect as a useful stimulant in collapse; but we would not advise the adoption of this practice

always, because the irritation and injury done to the coats of the stomach must have been very considerable, as indicated by the bloody discharges; and, even when used to a more limited extent, its good effects are not such as to give it a high character as a stimulant medicine. It does not seem to have any claim of superiority over the other emetics, as it is probably the act of vomiting, and not the stimulating effects of the mustard, that we must look to for advantage. It may be doubted when the use of emetics is indicated, whether the selection of mustard is judicious, as there seems to be occasionally a tendency to gastro-enterites in the subsequent stage of reaction.

CASE IX.

5th Jan. 1832.—Charlotte Burnside, æt. 43, after a debauch yesterday, was attacked at 8 P.M. with sickness, oppression of the stomach, vomiting, and purging, with cramps of the limbs and abdomen, which continued all night. When seen, the pulse was imperceptible at the wrist, and the collapse perfect, the discoloration of the integuments, and pinched appearance of the features being particularly remarkable. Half-past 10 A.M. brought to Hospital. Features shrunk and livid; hands and feet corrugated, and cold; pulse gone; pain of abdomen severe; thirst and craving for cold water continued and excessive; tongue white and loaded; purging continues. Sinapisms to the abdomen and feet were immediately ordered, and she took some hot brandy and water.—℞. pulv. sinapeos ʒ i.; aq. calidæ ℥ iss. M. Every hour. Half-past 11 A.M. To have nitrous acid and water for drink. She died at half-past 12. One hour afterwards, there were convulsive action observed in pectoral muscles and those of the lower jaw.

REMARKS.—This was a hopeless case from the commence-

ment, and gives a good idea of the worst description of our cases. The small doses of mustard were given with a view to try how far its stimulant effects would be serviceable, independent of vomiting. This case, certainly, was not a fair trial of it in this way; but in others where it was administered, both by the mouth and in enemata, its effects were not visible, farther than by its producing bloody stools, certainly no inducement to repeat the experiment.

CASE X.

6th Jan. 1832.—Alison Sanderson, æt. 29, of irregular and dissipated habits. Was seized at 7 this morning with cramps in the legs and thighs; pains in the abdomen; soon succeeded by vomiting, and purging of whey-coloured fluid. Extremities cold; countenance anxious and livid; tongue moist, and loaded; pulse very feeble, 90; discharge of urine involuntary. Bled to ℥ v.; blood very dark. Brought to the Hospital at 1 P. M. No pulsation at the wrist; voice weak and suspirious. —Ht. statim emeticum sinapeos; artificial warmth. Emetic operated immediately and freely. Admov. sinapism. abdomini. Capt. statim calomel. gr. v; pulv. opii gr. i. which was vomited, and repeated. A quarter before 2 P. M. hot air-bath applied for forty minutes, during which period the spasms of the extremities became more frequent. Heat of skin increased. Has vomited a little.—Injic. enema stimulans, (tinct. opii ʒ i.; mist. fœtidæ ℥ iij.; pulv. sinapeos ℈ ij.) 3 P. M. No appearance of re-action.—Capt. statim calomel. gr. v; opii gr. ss.; brandy ℥ i. with hot water, to be taken afterwards. Hot salt-bags to the abdomen. 6 P. M. Pulse still imperceptible. Says she feels less pain in the stomach and bowels; could not bear the hot salt-bags. 7 P. M. Coldness of surface, diffusing itself generally, accompanied with extreme jactitation and restlessness. Injic. statim alcohol. ℥ i.: pulv. sinapeos ʒ ss.; tinct.

opii ʒ i.; aq. calidæ ℥ ij. M. Ht. tinct. lavand. c. ʒ ss.; brandy ℥ ss.; pulv. sinapeos ℈ i. M. pro haust. Re-apply hot air-bath. 8 P.M. Repet. haust. cum pulv. sinapeos ℈ i. Half-past 8. Rep. statm. camphor. gr. vi.; spt. lavand. c. gttæ xxx.; brandy ℥ ss. M. The legs to be rubbed with spirit of turpentine. 9 P.M. Has taken about ℥ iv. of beef-tea. After retaining all the medicines, and showing some appearance of rallying, for a short time, the bad symptoms increased rapidly, and she died without a struggle at a quarter past 11 P.M.

REMARKS.—The loss of irritability of the stomach shown towards the end, is invariably one of the worst symptoms. The mustard did not seem to produce any appreciable effect. This patient had been subject to attacks of vomiting for three or four days, and had taken purgatives. The discoloration of the integuments was remarkable.

CASE XI.

9th Jan.—Half-past 1 A.M. Christian Wilson, æt. 56, an insane woman, who was continually wandering up and down between the town and Nungate. Was seen at half-past 11 P.M. of the 8th. Complained of cramps of the legs, arms, and hands, the fingers now extended, now retracted, spasmodically; eyes sunk; countenance pale; pulse imperceptible at the wrist. Purging and vomiting, but no urinary evacuation since yesterday at 2 P.M., when these symptoms supervened, upon a state of general *mal aise*, with slight sickness, which had existed all the previous day (7th); thirst urgent. An attempt was made to bleed her, by opening both basilic veins and the left jugular, but not above ℥ ij. could be obtained from them all, notwithstanding persevering efforts were made for an hour. The mustard emetic was administered, and retained for half an hour;

and stimulating draughts, with tinct. opii gttæ xij, in each, were given every quarter of an hour. She was removed to the Hospital at 2 A. M., and was treated with stimulants, small doses of mustard, at short intervals, calomel, and nitrous acid, but expired at half-past 6 A. M.

REMARK.—Though authors have recommended bleeding in almost every possible case of Cholera, it will be seen by this case, that, in a state of complete collapse, it is impracticable. The veins seemed full, and emptied themselves under the pressure of the finger, carried along them; but after that, not one drop could be got. The mustard, in small doses, aided by other stimulants, had a fair trial, without effect. The craving for cold water in this case was expressed to the last moment of life, by the most distressing screams for "water!" "water!"

CASE XII.

11*th Jan.* 1832.—Mrs Robertson, æt. 50; Nungate. Had attended her sister on the previous evening for three hours, and appeared in a state of great alarm and agitation, on account of the supposed risk she ran by coming in contact with the disease. Pursued her usual avocations in perfect health until 6 P. M., when she was affected with feelings of sickness and oppression at stomach, as if from flatulence; soon succeeded by purging and vomiting of watery fluid. Seen at half-past 9 A. M.; in bed. No complaint, but from diarrhœa and vomiting. Pulse 100, small, but distinct; heat of surface natural; slight clammy perspiration. Eyes sunk, and surrounded by a livid areola; other features natural. Tongue whitish; some degree of thirst. A vein was immediately opened, and ℥ x. of blood taken in a full stream (dark and thickish, without change in its appearance), when syncope was induced. On recovering from this state, and vomiting a little, the pulse was restored at the wrist.

Before she was seen, a neighbour had recommended the salt emetic, which operated freely. Ht. stat. Tinct. opii, camph. ʒ iij.; Magnes. ustæ ʒ ss. Injic. enema fœtida cum tinct. opii pauxillo. 11 P.M. Got a hurried message, in consequence of a sudden increase of all the symptoms, attended by general cramp. Temperature of the trunk and lower extremities natural, but the arms cold, being exposed by jactitation. Pulse imperceptible at the wrist; features shrunk; countenance more anxious. Had vomited medicines, and passed the enema. Hot spirits and water to be administered every hour.—Ht. calomel. gr. iv; pulv. opii gr. i.; to be repeated every hour for two hours, and followed by a laxative dose in three or four hours. Sinapism to the epigastrium. Heat to be maintained artificially. 12*th Jan.* 3 A.M. Irritability of stomach and bowels have ceased since the first dose; feels more comfortable; still no pulse at wrist; in other respects the same. Continue stimulants. To have a laxative at 5 A.M. 7 A.M. Has been quiet since last visit; to appearance asleep now and then; features collapsed; voice suspirious; heat of surface not diminished; stools passed involuntarily.—Died at half-past 9 A.M.

REMARK.—We only observe that this is one of several cases in which the bad symptoms have supervened rapidly (in cases not unpromising at first) after the abstraction of blood, producing syncope.

CASE XIII.

James Cheape, æt. 56, stout make, but pale complexion; has complained of pain in the bowels, with diarrhœa, for three weeks past, which has become worse during the last three days. It is ascertained from his wife that he has been subject to this complaint for twenty years, the attacks coming on

monthly, and lasting for three or four days at a time. About ten years ago had an attack of trismus, when otherwise in his usual health, the attack coming on suddenly, without any previous warning or injury. For some time previous to this affection he suffered much from headach, and subsequently he has been seldom free of it; the pain referred to the sinciput. 10*th January* 1832. During the last two days he has taken anodynes, which partially checked the diarrhœa until this afternoon, when his evacuations became watery, and he was attacked with vomiting and cramps in the extremities. 6 P. M. Half an hour after these symptoms he was visited, in bed. Countenance pale and anxious. Skin covered with perspiration; lower extremities colder than natural; complained of severe pain along the course of the spine. Abdomen tender upon pressure. Pulse 100, feeble but distinct. Tongue white, and breath cold. Was immediately bled to ℥ xvi., freely at first, but the stream fell off, though the colour improved, and the whole quantity was only obtained by shampooing and covering the arm with hot cloths; during the bleeding, which was tedious, the jactitation became excessive, and he passed several watery stools in bed involuntarily. A mustard emetic was administered, and operated freely; and a draught, with brandy and T. Opii gttæ xv., which was retained, and shortly afterwards repeated with T. Opii gttæ x. A sinapism was applied to the abdomen. The region of the spine was rubbed with ammoniated oil of turpentine. Hot salt-bags applied to the feet and legs; the patient at this time being sensible and collected. About half-past 8, when engaged in preparing a stimulating enema, his wife came to say he was dying. He was lying insensible, with his head thrown forward on the left shoulder. Eyes wide open; pupils dilated and insensible. Grinding of the teeth, hiccup. Pulse *regular* and strong in the carotid artery, becoming gradually weaker, and he died in about five minutes.

REMARK.—Syncope took place (under the bleeding), at-

tended by the convulsed state frequently witnessed under similar circumstances. At this time the pulse ceased at the wrist; jactitation became excessive, and the pain along the spine was much increased. Could this man's death have been caused by apoplexy, or was the nervous energy extinguished by the syncope? As there was no post-mortem inspection we cannot decide; but to hazard a conjecture, it appears probable that he died more immediately from apoplexy, sensibility being extinct, and his pupils dilated and immoveable; and this is rendered more likely, from the knowledge of his having had a "weak head" previously. We think, from the regularity of the pulsation in the carotid, that spasm in the heart could not have been the cause.

CASE XIV.

31*st December*.—Samuel Pearson, æt. 42, shoemaker, spare habit, reported sober, though there is reason to believe that he has been liberal in the use of ardent spirits for some days preceding his attack. (Is the husband of, and lived in the house with, the woman Sandy who died some days ago). Was seized about 3 A. M. with vomiting and purging. Appearance of dejections could not be ascertained. 5 A. M. was visited. Complained of pain and spasms of abdomen. Countenance shrunk, and of a livid paleness. Eyes sunk in the head, half closed, turned upwards, and surrounded with a discoloured areola. Breathing much oppressed. Severe cramps of the extremities. Hands cool, and smeared with cold sweat. Tongue white; thirst urgent, to allay which he had taken frequent large draughts of cold water, vomiting them as soon as taken. Pulse imperceptible at the wrist. Was immediately bled to ℥ vi., all that could be got from two openings in the veins at the bend of the arm; blood dark coloured, but coagulated. A draught with T. opii et Æth. sulphuric. ā ā gttæ xl.

was given, and sinapisms with oil of turpentine applied to the abdomen and feet; frictions with Ol. terebinth. to the legs, and a wine glass of hot brandy and water ordered to be given every half hour. Half-past 7 A. M. Pulse not to be felt at the wrist, and but indistinct in the humeral artery. No vomiting, but retching. Coldness of surface increasing; cramps continue severe. Cloths dipped in boiling water, and smeared with oil of turpentine, were now applied to the abdomen, without causing much pain. Contin$^{r.}$ medicamenta. 9 A. M. Getting worse. Has had no stool nor vomiting; surface of body bedewed with cold sweat. H. st$^{m.}$ Calomel. ℊ i.; T. opii g^{ttæ} xl. Twenty minutes to 10 A. M. Attendants report that he could not swallow medicines at half-past 9, and died without a struggle about ten minutes ago.

REMARK.—In this case, for about an hour and a half after death there was considerable muscular irritability exhibited. The left arm was displaced from the side and laid across the thorax, and there were twitchings of the face, lips, neck, and fibres of the deltoid and pectoral muscles on the right side; causing much alarm to his attendants, and originating a report that the patient was entombed alive. Could the bleeding in this case hasten the event?

CASE XV.

31*st December* 1831.—Margaret Thomson, æt. 15, of a slender form, but healthy, resided with the last case and his wife. Complained of sickness at 5 A. M., and took two colocynth and calomel pills, after which she became so much better that she got out of bed, and took care of one of the younger children until about 1 P. M., when she vomited a quantity of watery fluid tinged with liquorice she had eaten. Complained of tenderness over the abdomen on pressure. Pulse 100. Skin

warm. Pain in the sole of the left foot. Half-past 2 P. M. Vomiting continues at intervals. Pain of abdomen. Cramp in the legs; feet cold. Pulse 90. Ft. v. s. ℥ viij. was all that could be got, syncope having been induced by the abstraction of it. Terebinthinate frictions were ordered to the legs. Ht. T. opii gttæ xx. in a little hot brandy and water. Shortly after this she was seen by Messrs Meikle, Drs Morries and Stevenson. The mustard emetic was administered, which produced full vomiting, but did not seem to excite reaction. Ht. Pil. Calomel. gr. v. et Opii gr. ss. and repeat every two hours. Ten minutes past 8 P. M. Very restless; has vomited every thing taken since last visit. One scanty mucous stool. To have water acidulated with nitrous acid as strongly as she can bear. Apply sinapisms to the abdomen and feet, to be followed by a blister to the epigastrium. 10 P. M. Excessive jactitation; vomiting continues; pulse 100. Injicr stat. enema purgans. Ht. Ol. Ricini ℥ i. and in three hours Ht. Calomel. gr. x. T. Opii gttæ xxx.; small quantities of brandy and essence of ginger to be allowed through the night. *1st January*, 9 A. M. Seen by Mr Meikle and Dr Stevenson. 11 A. M. Pulse 120; vomiting continues. Eyes bloodshot; feels well; heat of skin more natural.—Reptr. enema purgans. Ht. Pil. calomel. et colocynth. ij. every two hours. Continue gruel, acidulated with nitrous acid, for drink. Half-past 2 P. M. Pulse 120, weak and compressible; heat of surface natural; still some vomiting; drowsiness; complains of thirst; two bilious stools.—Ht. Ol. ricini ℥ i. 4 P. M. No change.—Reptr. enema purgans. 7 P. M. Vomited oil; three stools, bilious and feculent. Pulse 115. No pain but from blister. To have some spiced soup. Continue brandy, &c.—Ht. Ol. ricini ℥ i. *2d January*, 10 A. M. Pulse 110, very weak, and not easily counted at the wrist. Has passed a very restless night. Countenance improved. Four stools. Slept for about an hour, and passed a little turbid urine.—Reptr. Pil. u. s. cum Ext. colocynth. gr. v. Inj. enema purgans cum pulv. aloes

ʒ ss. She continued to improve slowly under the use of purgatives and a blister to the head until 10th January, when there came on something like erysipelatous swelling of the face, and the seat of the sinapisms on the abdomen and feet ulcerated and discharged purulent matter. Pulse 105, sharp. She then took columbo and rhubarb with cool acidulated diluents, under which she completely recovered, and now continues well.

Remark.—This recovery cannot be ascribed to the agency of any one remedy; certainly there was no perceptible advantage traceable directly either to the bleeding or mustard emetic. As far as we recollect, it is the only instance here of the ulceration of the parts blistered during collapse taking place so long after convalescence, though we believe this to have been noticed more frequently elsewhere, especially in India.

CASE XVI.

9th February 1832.—Mrs Smith, middle aged, residing at the hamlet of Abbey, about one and a half miles eastward of this. Is a ploughman's wife; healthy and corpulent, and nursing. During the whole of yesterday had been complaining of diarrhœa, the evacuations towards evening becoming more frequent, and resembling whey, with whitish flocculi suspended in it; attended with sickness, oppression at the stomach, and cramps in all the extremities, sometimes extending to the trunk. Half-past 10 p. m. Visited. Countenance of a natural expression. Skin warm. Tongue whitish. Pulse at the wrist barely perceptible, not to be counted. Has had no vomiting; complains principally of cramps. A mustard emetic was now given, which operated very soon but not fully; however, the pulse improved so much from the exertion that a vein was opened, and about ℥ vi. of dark blood abstracted in a fair stream, the pulse at first improving, but the bleeding was stopped as the pulse fell off;

some degree of sickness and paleness was brought on, but she expressed herself upon the whole "lightened" by the bleeding. T. opii gttæ x. were given in a little warm weak spirits and water, which was ordered to be repeated every half hour without the T. opii. An assafœtida enema was thrown up, and assiduous frictions with hot linen ordered. 1 A. M. No improvement; the cramps not so severe, and the diarrhœa less frequent. The pulse still to be counted. Collapse not increasing; heat of surface steady; sinapism causing much uneasiness. The mustard emetic was administered, but not being vomited ℥ ii. of ipecachuan was administered in divided doses, and occasioned full vomiting three times during the night; the frictions and spirits and water were continued. Half-past 7 A. M. 10*th February*.—Reported to have slept occasionally for a few minutes since 2 A. M. Features not more collapsed. Pulse imperceptible at the left wrist, but still to be felt at the right. Enema passed off unchanged; heat of surface decreasing; no cramp; makes no complaint but of "lowness."—Ht. calomel gr. x.; Pulv. opii gr. ss. to be repeated in three hours; to have a little hot tea and ginger at intervals; continue frictions. Half-past 3. Considerable improvement has taken place. Pulse 120, distinct in both wrists. Face flushed a little; slight headach. Whey-like dejections continue. The head to be shaved and covered with a sinapism.—Ht. Ol. ricini ℥ i. Ol. terebinth. ℥ ss.; continue spiced diluents. Half-past 9 P. M. Reaction continues. Sinapism remained on for an hour. Oil has not operated. Some præcordial uneasiness and cough. Pulse 120, distinct.—Rept. Ol. ricini, &c. Reapply sinapism, and repeat its application if the pain recurs. 11*th February*, 9 A. M. Purgative produced three bilious darkish green stools. Has slept much during the night. Heat of skin natural; feels more comfortable. Secretions of milk and urine which had been suppressed are now restored.—Ht. Pil. colocynth. et calomel. cum extr. hyosciami ij. every two hours until the bowels are freely moved. She continued to improve

under the use of purgatives until the 13th February, when she was cured.

Remarks.—In this case the chief benefit seemed to proceed from calomel and opium, aided by repeated doses of warm and weak stimulants, and assiduous frictions.

CASE XVII.

3d February 1832.—Elizabeth Hay, æt. 18, Hardgate Street. Lost a sister from Cholera on the 25th December. Has been subject to general malaise, with impaired appetite, for two days. Seized this forenoon with diarrhœa (the character of the dejections not attended to), unaccompanied with pain or sickness until 3 P. M., when, after making some exertion out of bed, she fainted, and was seized with vomiting. 6 P. M. Visited; she was tossing about in bed in a peculiar manner, as it were, leaping from side to side. Vomiting continues, with frequent purging of limpid fluid, containing flocculent matter; no pain of abdomen on pressure; slight cramps in the calves of the legs. Countenance pale; eyes sunk and lively, surrounding integuments discoloured; features rotund; tongue white, and loaded; pulse imperceptible at the wrist, and very feeble at the elbow; respiration unimpeded; heat natural. Has passed no urine since she fainted.—Ht. statim pulv. ipecac. ℈ j. Sulph. zinci gr. x.; and after the operation of the emetic a draught with T. opii camphoratæ ʒ i.; small quantities of hot toddy; frictions to the spine and legs, with stimulating mercurial liniment. 7 P. M. Vomited meds immediately; features more collapsed. Apply sinapisms to the epigastrium and legs; to have mustard emetic; continue friction, ½ past 11 P. M. Has been seen since last report. Hot toddy continued. Pulse more distinct, 150; slight pain of epigastrium on pressure. *4th*, Vomiting continues; has perspired much; thirst less; pulse 150,

stronger. 2 P. M. No pain; skin hot; bilious stools; no urine. Injic. enema purgans; diminish hot toddy. 4 P. M. Vomited once; passed enema tinged with bile; has slept none; still very restless; no urine; pulse 120, strong; heaviness and suffusion of the eyes, which are bloodshot.—Ft. v. s.; ℥vij. of blood were taken in a good stream, dark, but became more florid as it flowed; pulse a little weaker after bleeding; feels as if relieved of a weight, and inclined to sleep. Shave the head and apply a blister over it; repeat enema purgans.—Ht. stm. calomel. grx. 7 P. M. In the same state; pulse 144. The blood exhibited a very peculiar appearance, being covered with a firm semipellucid gelatinous coat, having much the appearance of the fracture of camphor. This was more remarkable in the first cup drawn; it was not perfectly coagulated, and there was a deficiency of serum. *5th*, Has had frequent bilious stools during the night; complains of general soreness over all the body; vomiting at intervals; some sleep since morning; not so restless; pulse 120, feeble; has passed a little urine.—Ht. Calomel. gr. i. every half hour. 4 P. M. Blisters removed, and re-applied after rubbing the head with stimulating liniment, without vesication; no headach; very restless; pulse 130, feeble; frequent stools of a dark-brown colour; no vomiting; no pain.—Ht. Pil. aloes cum colocynth. ij. 9 P. M. Has become rapidly worse; pulse imperceptible; excessive jactitation; frequent purging. Died about midnight.

Remarks.—Bleeding was considered rather a hazardous practice in this case, but as the affection of the head was decidedly increasing, the blisters, though aided by frictions with oil of origanum, turpentine, aq. ammoniæ, and pulv. cantharidis, not producing vesication, and, from previous experience, knowing that leeches were not to be depended upon, it was adopted as a dernier resort; and though the increase of the symptoms might possibly be attributed to it, it is likely that they were caused more by its inefficiency than any direct

effect it had in weakening the patient, who was certainly much relieved by it in the first instance. The fluid passed by stool was more limpid than in other cases here; being so perfectly transparent as to have been mistaken by her mother for urine.

CASE XVIII.

21*st January*, noon.—William Russel, æt. 46, a vagrant. Has been for some time palsied on one side. Went to bed quite well last night, having taken his supper heartily, and abstained from ardent spirits. Was awakened by a call to stool about midnight, which was frequently repeated during the night, attended with vomiting and great debility. Collapse perfect, with much restlessness.—Ht. emet. sinapeos. Apply sinapism to the abdomen, and hot air-bath immediately. Mustard acted freely without producing any perceptible excitement. Hot-frame could not be borne more than ten minutes. The lamp to be removed, and reapplied every five minutes as long as he can bear it each time.—Ht. calomel. gr. xij. Tinc. opii gtt. xl., which was rejected immediately. 2 P. M. Ht. stm. opii gr. iss.; calomel. gr. x. Several large enemata of hot-water and salt to be thrown up at intervals of an hour. 3 P. M. Blueness of the skin very intense; has retained the calomel; sinapism caused excruciating pain.—Ht. ol. terebinth. ℥ ss.; pulv. piperis nigri gr. x. et repet. omni semihora. 5 P. M. Has had three doses of oil, &c., and retained them, as well as the enemata, except a small portion of the last. No cramps; coldness of surface increasing; slight moisture of skin.—Cont. med. Stimulant frictions to the spine. ½ past 7 P. M. Died, after severe struggling, and making several attempts to spring out of bed.

CASE XIX.

20th January ½ past 1 P. M.—Samuel Pollock, æt. 45, mendicant. Had slight diarrhœa, without pain or sickness, yesterday, which became worse about 4 P. M., and vomiting came on in about three hours afterwards, with cramps in the lower extremities. Had medical assistance before admission. Complains of severe pain of epigastrium; slight cramps of the legs; restlessness; much thirst. Tongue white; feet cold; heat of skin natural; pulse not to be felt at the wrist; features shrunk; eyes sunk, expression lively; cramps becoming more severe.—Ht. stat. brandy ℥ ss. in hot-water. Mustard emetic. Frictions to the legs, with ol. terebinth. Hot salt-bags to feet. Apply hot air-bath, and let the ward be filled with nitrous acid fumes. Full vomiting excited by mustard. Pain of epigastrium relieved. Slight moisture of the hands and arms. Ht. pil. calomel. gr. v., to be washed down with tinc. opii gtt. xv., sp. lavan. comp. gtt. xx., brandy ℥ ss. The hot air produced smarting of the surface so severe as to oblige its removal in ten minutes; to be reapplied at intervals as he can bear it. Heat and moisture of surface increased; feet still cold. To have brandy and hot water acidulated with nitrous acid for drink. 20 minutes to 2 P. M. Hot air-bath has been continued, the lamp being removed for a few minutes now and then when he complained of the smarting. Heat of surface much increased; feet warm; says he is a "deal easier" than he was, and disposed to sleep. Pulse still imperceptible at the wrist. 3 P. M. Calomel pill repeated; no change. 4 P. M. Reported to have been asleep now and then, but awakened by spasms. Hot air has been continued; whole surface and feet warm; countenance slightly flushed; no pulse at wrist. Calomel pill has been repeated.—Ht. stm. ol. ricini ℥ i., ol. terebinth. ℥ ss.; continue acidulated brandy and water. A blister had been applied to the epigastrium, and, having shifted, was ordered to be reapplied. Injic. enema purgans fœtid. cum tinc.

aloes ℥ ss. 6 P. M. As he was asleep, the enema has only now been thrown up. 20 minutes to 7 A. M. Injection passed off alone. Pain in the back. Pulse to be felt at the wrist, but cannot be counted. Let a large enema of warm water and salt, with tinc. opii gtt. lx. tinc. aloes ℥ i., be thrown up immediately. 9 P. M. Has retained the enema; features more sunk; pulse still perceptible.—Ht. stat. haust. cum æth. sulph. ℥ i. camphoræ gr. v. The spine to be rubbed with mustard mixed with concentrated acetic acid.—Midnight. Has had three or four stools with feculent admixture; slight redness and elevation of the skin from frictions; countenance rather more indicative of collapse; no vomiting; has retained all his medicines. Jactitation slight; cramps of the legs; pulse still perceptible. Continue brandy and water with pulv. sinapeos ʒ i. every hour. 21*st January*. Retained all his medicines; had slight retching. About 2 A. M. was seized suddenly with very severe cramps in all the extremities; not allayed by stimulating frictions or hot salt-bags. Jactitation became excessive; pain across the loins; and general collapse increased rapidly, until 20 minutes to 5, when he died.

Remarks.—In this and the preceding case, one very remarkable feature was, the almost total insensibility of the stomach, while the other powers of the system were not so completely destroyed as in many cases in which the stomach was very irritable. It was in considering this state that we thought of galvanism as an agent likely to be useful in the treatment of the second stage of Cholera. In the last case, the mustard, in small doses, was fairly tried; and, except slight retching, no stimulating effect whatever was observable. The hot air-bath was continued for four hours and a half, supporting a temperature of nearly 90°, without, however, appearing to excite reaction; the temperature of the body falling upon its removal, as if it had been inanimate.

CASE XX.

25*th January* 1832.—Elizabeth Cochrane, æt. 26; of a slender frame. By her own account, came to Tranent on Wednesday last, and lost her daughter there from Cholera. On Monday, 22d January, the landlady of the house in which she resided, having also died of the disease, she became alarmed, and left Tranent on the 24th, for the village of Samuelston, three miles south-west of this, having herself laboured under an attack of diarrhœa for two or three days. This increased during her journey, and, after arriving at Samuelston, and having some hours' rest in a barn amongst some straw, she was attacked with cramps and vomiting. She was seen in this state at 6 A. M. being then completely collapsed, without pulse at the wrist; and, in consequence of the impossibility of procuring even a lodging for her, she was conveyed in a cart (imperfectly protected from the cold) to the hospital, where she arrived at 9 A. M. The pulse was then very faint in the humeral artery; collapse perfect. Expression of the eye lively; voice almost inarticulate; severe cramps.—To have mustard emetic. Apply sinapism to the abdomen, and the hot air-bath. Emetic produced vomiting.—Ht. tinc. opii gttæ. xxx.; Spt. lavand. comp. ℥ ij.; Cretæ pptæ ʒ ij.; aq. calidæ qs. Ft. haust. Complains of pain in the back and sides.—Ht. calomel. gr. vi. 11 A. M. Has had two large hot enemata; voice sonorous.—Ht. pulv. ipecac. ʒ i. in hot water, which produced vomiting. No improvement having taken place, at 1 P. M. a galvanic trough, of sixty pairs of plates, four inches square, was applied. The negative wire round the chest, and the positive attached to a wire round the neck. After five or six minutes (the patient complaining of the wires burning her) the pulse became perceptible at the wrist, but could not be counted; the positive wire was now removed to the right hand, and the pulse immediately rose to 120, and improved in strength for several mi-

nutes; the countenance improved, and the lips became plump. The negative wire touching the neck produced convulsive action of the muscles of the throat, and severe pain. Applied to the left foot, the pain in the back and side were so severe as to cause the patient to cry out violently, but no muscular contraction was visible. 2 P. M. The galvanic influence has been continued, removed, however when the pain could not be borne; pulse 126, stronger. Has taken calomel. ℊ i. half an hour ago; slight sickness produced.—Ht. statim camphoræ gr. x. in ol. terebinth ℥ ss. soluta. The oil was vomited immediately. Heat of surface improving; complains of cramps in the legs. To have brandy and water for drink. 4 P. M. The influence of the trough having been suspended after the absence of an hour, during which the connexions with the wires had, nevertheless, been continued; some fresh liquor was introduced into the trough, and the pulse, which had fallen off, became almost immediately perceptible at the wrist; without muscular contraction the stomach became more irritable, and she complained of pain in the back and sides. Has had cramps frequently since last report. Thirst urgent; voice continues strong and sonorous; retching, with some vomiting. Hands cold, but heat of skin natural. Frictions of the legs with oil of turpentine have been steadily persevered in.—Ht. Pil. opii gr. i. ¼ to 5. P. M. Has had two large hot water enemata, with pulv sinapeos ʒ i. and the opium pill has been repeated. The pulse is not so strong, but of the same frequency, and still distinct; the collapse of the features and blueness of the hands on the increase. Retching has ceased, and the restlessness, which had increased, has diminished.—Ht. statim camphoræ gr. xv. magnes. ʒ i., forma emulsionis. 6 P. M. Has vomited the medicines. Pulse again improved in strength, in other respects the same. —Rept. camphor. gr. v. et enemata calida u. s., continue the frictions. ½ past 7 P. M. Has vomited, and had partial cramps of the legs. Thirst continues urgent; pulse imperceptible. Has had two enemata.—Ht. statim sulph. quininæ

gr. ij., camphor. gr. v., magnes. ʒ i. forma emulsionis; if vomited, to be repeated in a few minutes with opii gr. ss.; if retained, to be repeated in an hour, without opium. The trough was again supplied with fresh liquor, and, on the arrangements being completed, the pulse very soon became distinct at the wrist; its strength increased when the hand formed part of the circle. ½ past 8 P. M. The collapse is increasing as the trough becomes exhausted, and the pulse is now more feeble. The hands cold and discoloured. The mustard emetic was repeated after she vomited the medicines last given; and the pulse, which had improved under the galvanic influence, was thought to be increased in strength during the vomiting excited by the mustard. Voice still sonorous.—Ht. aq. ammoniæ gttæ. xx. spt. lavand. c. ʒ i. in a little hot brandy and water every half hour. 26th January, 1 A. M. Lies in a very low state; no pulse; irritability of stomach continues. Has slept a few minutes, and expresses an inclination to do so. To have hot brandy and water every half hour. Heat of surface to be maintained artificially. 9. A. M. Has slept frequently during the night, but was occasionally awakened with starting. No cramp; thirst less urgent since 6 A. M. Retained the last enema in part until 6 A. M. Is much improved in appearance. Heat of surface nearly natural; pulse 108, good strength. Has asked for food; no stool; some retching. Eyes heavy; pupils slightly contracted.—Injic. st. enema purgans mag. Ht. calomel. gr. v. ex. colocynth. gr. viij. pro dose. The head to be shaved and blistered. 11 A. M. Pulse 66; improved in strength and fulness; seems disposed to sleep —To have a tea-spoonful of wine in hot infusion of ginger every now and then. Ht. pil. colocynth. calomel. et ext. hyosciami gr. ij. 1 P. M. Has passed the injection containing feculent matter of a blackish-brown colour, mixed with undigested portions of potatoes (a quantity of which she vomited also while under the galvanic treatment) and mucous flakes. Has slept at intervals. Pulse 108, of good strength.—Rept. enema purg. et pil. colocynth. &c.; continue wine et infus. of ginger.

¼ to 6 P. M. Continues to improve; has had three dark brown stools, consisting apparently of flocculent matter with the natural feces; has passed some urine. Complains much of blister. Pulse 108, rather more feeble; heat of surface continues. Has had frequent retching; tongue brownish; sleeps a little at intervals; some appetite.—To have ℥ ij. beef-tea, with bread or biscuit, every hour. 9 P. M. Continues to improve.—Ht. ol. ricini ʒ i. 2 A. M. 27th January. Oil operated three times; evacuations more natural. Pulse 95, and improved in strength. — Continue beef-tea and gruel during the night. 9 A. M Has had three darkish-coloured stools since last report; pulse 92, more feeble. Has not taken much beef-tea; has vomited a little. Feels comfortable.—Injict. enema purgans, Ht. pil. colocynth. &c. d. n. s. ij. To have sol. Sup. tart. potass. for drink. 7 P. M. Complains of pain over the stomach. Tongue dry, but clean; vomiting increasing.—Applicentur hirudines xij. epigastrio; Ht. ol. ricini ℥ i. h. s. To have white wine and beef-tea during the night. 28th January, noon. Tendency to coma. Eyes blood-shot; has slept a great deal; pulse wiry; copious stools; no vomiting since leeching. —Injict. enema purgans; emp. vesicat. capiti; discontinue the wine. 29th, 9 A. M. Has passed a good night. One natural stool; countenance natural; feels quite well. To have a little rice to dinner; continue wine and beef-tea. 30th, noon. Passed a tolerable night; three natural stools; complains of "stounding" in the head; eyes suffused; tongue shining red; pulse 78, sharp and wiry.—Applicentur hirudines xij capiti, after which cold applications; intermit beef-tea and rice. To have gruel. As the leeches did not appear healthy, ℥ iij. of blood were abstracted from the arm; pulse 80, sensibly softened during the bleeding; "stounding" of the head relieved. Still apply the leeches. 3 P. M. leeches would not enter.—Ht. ol. ricini ℥ i.; emp. vesicat. nuchæ. 9 P. M. Revived pulse improved; tongue still red. Several natural stools; copious secretion of urine and tears; much uneasiness from blister.

Continued much in the same way until 3d February, 11 A. M.

Cadaverous odour * in the ward. Has had a convulsive attack during the night, which lasted twenty minutes. Stools and urine in bed. Is again convulsed; face bloated, great difficulty in breathing, and hiccup; eyes staring, bloodshot, and fixed, pupil dilated and insensible; pulse very feeble; complained of no pain.

These attacks became very frequent during the day and night, with delirium in the intervals; and she died, in spite of treatment, on the 4th February, 10 A. M.

There was no post-mortem examination, as the patient was interred early in the morning.

CASE XXI.

26th January.—A Female, æt. 32, of dissipated and irregular habits; in previous good health. Was seized this afternoon, about 1 P. M., with sickness, soon succeeded by vomiting and purging, and cramp in all the extremities. Was first seen at ½ past 6 P. M. and removed to the hospital; collapse perfect, with blueness of features, and no pulse at the wrist; cramps frequent, and approaching the trunk; character of evacuations resembling whey; mustard emetic given, and brought up a large quantity of whey-coloured fluid. 7 P. M. The same galvanic trough was applied, the positive wire round the chest, and negative round the left ankle; after twenty minutes, the positive wire having been applied to the left wrist, the pulse became perceptible in both wrists, and, after a few minutes more, could be counted in the right wrist 96, at intervals becoming more indistinct.—To have a large injection of hot water and mustard. 8 P. M. Irritability of stomach increased, with great restlessness; contraction of the muscles, with considerable pain, produced by the galvanic action.—Ht. camphoræ gr. xv., tinct. opii gttæ. xxv., magnes. ʒ ss. forma emulsionis.

* Having an exact analogy to that proceeding from *dried* anatomical preparations: it decidedly marked the case as fatal; and was sometimes perceived early in the stage of collapse.

Apply sinapism to the abdomen. 11 P. M. No pulse to be felt; complains of much pain at stomach.—Ht. brandy ℥ i. eth. sulph. ʒ i. tinct. opii gttæ. lx. M. Midnight. Heat of surface much improved; pulse 100, very weak; galvanism applied without any manifest change. 27th January 1 A. M. Refuses to allow the galvanic wires to be applied any more. Pulse scarcely perceptible; and heat of surface diminished. Stimulants, with calomel and blisters, were used without effect; and she died at 2 P. M. having had several watery evacuations, tinged with blood, after the mustard enemata, which were frequently repeated.

CASE XXII.

January 27.—John Mather, æt. 44; of a very powerful frame, was seized this morning with diarrhœa; did not prevent him getting up to work as a blacksmith, until 8 A. M., when cramps and vomiting supervened. Was visited at 10 A. M., and had tinct. opii, æth. sulph. aa. gttæ xl.; Ol. menthæ gttæ. xv.; was then brought to the hospital; collapse considerable; has very severe cramps in the extremities, affecting the trunk, and extending to the scrobiculus cordis; pulse perceptible, but very unequal; was immediately bled to ℥ xi. Blood abstracted in a good stream at first, but fell off towards the conclusion; of a very dark colour; pulse seemed to improve during the operation, now (¼ to 11 A. M.) 104, feeble. Ordered mustard emetic, to be followed by large enemata of hot water and mustard. Frictions with ol. terebinth. to relieve the cramps. Noon. Upon connecting the galvanic trough (the negative wire to the wrist, and the positive round the trunk, meeting at the scrobiculus cordis), the pulse, which was barely perceptible, immediately became much more distinct, and after 10 minutes, the irritability of the stomach increased, producing vomiting. The severity of the cramps seemed also to be much increased, considerable muscular action being excited when the galvanic

circle was completed. Pulse 120, improved in strength. One yellowish watery stool. Sinapism to the abdomen, Ht. brandy ℥i. pulv. zingiberis. gr. x. M. 1 P. M, the trough was removed to apply to another patient now brought in, and after its continuance for half an hour, not appearing to produce excitement, it was reapplied to this patient, who had become much worse during the interval; the pulse had become imperceptible at both wrists. After 3 minutes connection with the galvanic apparatus, the pulse was restored; cramps were much increased, and the pain caused by the wires was much more severe; Ht. calomel. gr. x.; brandy ℥ss. in hot water.—After half an hour's continuance of the application of the apparatus, the pain became intolerable, attended with a most appalling attack of spasm, in which the muscles of the trunk and throat seemed more particularly to participate; the jaws were half open and rigid, and the pupils dilated; the eyes glancing rapidly, with a dreadful feeling of suffocation, causing the patient to spring up; reapply the trough, which was removed during the spasm. Sinapism to the spine; contr. enemata calida. 7 P. M. The severity of the spasms produced frequent interruptions to the application of the galvanic apparatus, which became gradually exhausted, the pulse falling off in proportion, until 4 P. M., when he became suddenly and rapidly worse, and he died between 5 and 6 P. M.

REMARKS.

Although the results of these experiments cannot be assumed as conclusive evidence of the truth of the principle sought to be established, yet, as the improvement in the symptoms in these cases was clearly traceable to the agency of galvanism, it may, with some confidence, be inferred, that this power is capable either of exciting the latent and suspended nervous energy, or, as in the experiments of Dr Wilson Philip, of supplying its place; in either instance enabling the heart and stomach to perform their functions much longer than they could otherwise have done under similar circumstances, and thereby affording

a more reasonable prospect of the general system, through them, being ultimately influenced by the remedies administered internally.

It is not easy as yet to estimate correctly the degree of influence which the galvanic fluid might have had in producing reaction in the case of Cochrane, independently of the agency of the other means used; but, keeping in view the very disadvantageous circumstances of that case, it will probably be admitted, that without the galvanic agency, we should have had another example to record, of the uncertainty and inefficiency of our practice in the second stage of Cholera.

The effect on the pulse at the wrist was evidently unconnected with the *local* application of the agent, as the result was exactly similar in the radial artery, when the galvanic circle was completed by one wire surrounding the trunk at the scrobiculus cordis, and the other attached to the ankle.

As an auxiliary to the agency of galvanism, would it be advisable, when the circulation is excited in the stage of collapse by this remedy, to take blood from the arm?

Since the above went to press, another individual has been subjected to the influence of galvanism.

A woman, ætat. 65 or 70, very poor, and reported of intemperate habits, was attacked with Cholera on Thursday afternoon the 1st of March. At 9 o'clock in the evening, she was in a state of collapse, without pulse, &c. During the night, small quantities of stimulants were administered at intervals, warm enemata thrown up, and attention given to the use of external means. No benefit resulted from their use. She was brought to the Hospital on the forenoon of the 2d. The collapse was then most perfect, having existed for at least sixteen hours and a half. The vomiting and cramps had ceased; the pulse quite imperceptible; the voice inaudible, except in a whisper; the extremities blue, cold, and shrivelled. The galvanic arrangements being completed, one wire was connected

with the trunk at the scrobiculus cordis, the other attached to the left ankle. After a few minutes, a very feeble pulsation was perceived in the radial artery; but as it was not permanent, the wire was removed from the ankle, and applied round the lower part of the neck. The effect was immediate and powerful: the pulse became very distinct at the wrist, 96; the eye and countenance generally much improved, the voice strong; and bitter complaints were made of the severity of the suffering occasioned by the wires. The patient occasionally raised herself in bed, but the effect of any such exertion was to render the pulse more indistinct, or to suspend it altogether. The galvanisation was kept up for five or six hours (other remedies being also employed), during the whole of which time the pulse continued steady. As the energy of the trough was exhausted, the pulse became feeble, a deeper collapse recurred, and in four hours more she expired.

In this very desperate case, the efficiency of the galvanic influence in restoring the pulse, and improving the general appearance, is most marked. That it was not ultimately successful in rallying the patient, was probably owing to the state of collapse having existed so long previous to its application; to the advanced age, poverty, and intemperate habits of the individual, and to the imperfection and limited power of the apparatus.

It appears certain, that, under all the circumstances, no other remedy with which we are at present acquainted, could have produced the effect on the circulation observed in this case. A more powerful galvanic agency might possibly have excited the stomach to the due performance of its functions, and rendered the stimulants administered internally more efficient.

FINIS.

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