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NEW SERIES.

FRATERNITY BETWEEN METROPOLITAN AND PROVINCIAL PRACTITIONERS.

TWENTY-ONE years ago, when the PROVINCIAL MEDICAL AND SURGICAL ASSOCIATION was founded, there prevailed in the provinces strong feelings of distrust and jealousy of metropolitan physicians and surgeons. In fact, it was in no small degree owing to the arrogance of the London magnates, and to the depreciatory attitude which they assumed towards their provincial brethren, that so many rallied round our Association in its earlier years. The Provincial Association was, in fact, established and originally supported with the view of vindicating, before the world, the highly advanced state of the profession in the provinces, of maintaining its privileges, and securing its progress. These objects have been, all must admit, accomplished in no small degree. The advance of the new institution has been ever onward, in spite of many difficulties and discouragements which have beset its career; and with this prosperity, old jealousies, in place of being fostered, have gradually declined, and may now be truly said to have neither an existence nor an apology. The practitioners of town and country perceiving that by railways, journals, and improved education, their geographical and intellectual distinctions have been swept away, have seen that their true policy is to retire from even the appearance of antagonism, and to unite for mutual counsel and support, in one great fraternal association, in which the rights of all members shall be equal. These were the sentiments expressed by every one present at the dinner of the conjoined committees on Thursday last, and they are, we venture to aver, the sentiments of the five hundred gentlemen who have joined the Association during this year, of hundreds about to join our ranks in January, and also of a vast majority of the original members who, from the causes already stated, were once united to each other by very different bonds from those which now exist—by the necessity for protection, and by the jealousy of those who are now firm friends and active allies.

A great ethical movement is at present going on within our body, which cannot fail, ultimately, to cement together still more firmly than ever all the loyal and honest members of the medical profession. The two fundamental principles upon which the Medico-Ethical Committee of the Association and the Gratuitous Advice Committee of the Metropolitan Branch proceed, are cooperation with each other, and the careful collection and digestion of the opinions and facts supplied by all who are willing to contribute them. In subsequent numbers, we propose to direct attention to the proceedings and aims of the two committees. In the meantime, on their behalf and at their request, we earnestly invite all who have information to give, to forward it freely and early to the respective secretaries. The old jealousies between town and country must be buried in oblivion, since fraternity between metropolitan and provincial practitioners is not only morally right, but is, likewise, the best professional policy. Without this fraternity, the power and influence of the profession can never be increased.

ORIGINAL COMMUNICATIONS.

NOTES ON THE PATHOLOGY AND TREATMENT OF CHOLERA.*

By JOHN ROSE CORMACK, M.D.

The following notes are not offered as a complete paper on cholera; and they are simply intended to present, in a condensed form, the leading pathological and therapeutical opinions adopted by the author, after a careful study of the disease in books, and at the bedside. The views which are unfolded are the same as those which I espoused anonymously in the *London Journal of Medicine* for 1849, and in a speech delivered at the Westminster Medical Society, on October 6th of the same year.

To give some degree of method to the remarks, they are arranged under the following heads:—

- I. MANNER OF STUDYING CHOLERA.
- II. DIAGNOSIS OF CHOLERA.
- III. OBSERVATIONS MADE BY THE AUTHOR DURING PART OF THE EPIDEMIC OF 1848-49.
- IV. PATHOLOGY OF CHOLERA, INCLUDING ITS MORBID ANATOMY.
- V. TREATMENT OF CHOLERA.

I. MANNER OF STUDYING THE DISEASE.

The majority of authors who have treated of cholera, have drawn their descriptions too exclusively from the more appalling forms of the disease, and have too generally spoken of the diarrhoea concurrently abounding, especially at the beginning and at the decline of an outbreak of severe cholera, as if it were a malady different in kind, as well as in degree. To this obvious but common error must, in a great degree, be ascribed the unsatisfactory nature of the literature of cholera, and the perplexing contrariety of opinion which prevails among practitioners as to the pathology of the disease, and its appropriate treatment. The phenomena of aggravated cases, and the appearances found in the bodies of those who died, have unfortunately formed the chief materials out of which theories have been constructed; and the natural history of the disease, the true key to the mystery, has been nearly neglected; or, in other words, adequate attention has not been bestowed upon the natural course of those cases which, from being essentially mild in degree, or in some other way favourably circumstanced, terminate in recovery without much, or without any, medical interference. In all diseases, very much is to be learned by the minute study of simple and uncomplicated cases, which have not been disturbed in their career by any treatment; and assuredly no advance can be made in rational medicine by those who take their notions of what a disease is only from books, or only from their own observation of patients with whom active measures have been adopted. Therapeutical experiments must be jealously corrected by the observation of simple cases, which have been mainly confided to nature; and recoveries must not be promiscuously set down as cures. There are unfortunately some among us very prone to commit this error; while others, by pursuing no plan of treatment upon clear principles, or with the necessary firmness, or with the slight modifications which may be required from day to day, become sceptical of the therapeutical resources of medical science, and yet never suspect that their scepticism is mainly

* The substance of this paper was read before the Medical Society of London on the 5th current.

the fruit of their incapacity to furnish for themselves legitimate data. Cherishing, however, as I do, a strong faith in the efficacy of many of the curative means employed in practice, I equally hold that one of the best ways of learning the skilful use of these means, is patiently to watch and study the phenomena of spontaneous recoveries. It is a species of investigation which is replete with benefits to all concerned. By pursuing it, the practitioner procures and secures for himself a stock of knowledge which neither the theorist of the closet, nor the empiric of the day, can ever wrench from him nor deteriorate; and which will impart to his practice an amount of well founded self-confidence and of success, which could in no other way be obtained.

Numerous illustrations of the truth of these remarks readily suggest themselves; and probably no one has any objection to offer to them, except that they are very prosy and common place. Nevertheless, if we turn to the current medical literature, we find that they are practically disregarded by some of our most ready writers. They are too plain and homely to win the favour of those ambitious men who yearn after brilliant theories, and seek to captivate the world by special systems and new formularies. But while the evils which flow from the want of adequate attention being paid to the natural history of disease are conspicuous, the advantages of this study are equally striking in the improved treatment of many diseases; among which may be mentioned some of the most formidable disorders, such as pneumonia, tuberculosis, syphilis, and fever.

Thousands of cases of scarlet fever recover almost spontaneously, while others are obviously saved by the skilful use of remedies; but, on the other hand, not a few are tremendously rapid in their fatal career, and proclaim to the eye of experience, almost from the moment of seizure, that a sentence of death has gone forth, and that the hours of the victim are few and may be numbered. Now, although epidemics of scarlet fever differ much from one another in severity and in other respects, yet we often meet with the mildest and the most terrible cases occurring simultaneously or consecutively even in the same house. We are taught by the frequency of such occurrences that both classes of cases, though strikingly different in many of their phenomena, are the results of one morbid poison; and that the diversity of effects proceeds not from a diversity of poison, but from a difference in the quantity imbibed, and in the condition of the recipient. It is equally reasonable to regard tractable cholera and intractable cholera as pathologically the same; and therefore of course to include in the same category all the cases which are intermediate between these two extremes. If this rule were adopted, the mortuary statistics of cholera, as published in the newspapers, would be more truthful, and less appalling.

If we hope to learn from nature, we must interrogate her fairly. If we wish to discover the essential character of any epidemic—be it of measles, of scarlatina, of cholera, or of any other disease—we must not only follow the rules which have been above stated, but we must also proceed a step farther. We must observe and study the condition of the whole population during a given period, and within a given district: we must, in particular, trace out and record the characters by which the maladies of all the sick persons are characterised; and we must not begin by adopting an ideal standard of what are the essential features of the disease to be investigated, and then limit our observations to such instances as fall within this ideal boundary. Is it not by adopting foregone conclusions as to the very essence of the questions to be solved, that even good observers have accumulated materials too faulty to be safely used in the construction of opinions? But, however painstaking and conscientious a single observer may be, he cannot singly collect all the materials for a complete history of an epidemic; and this is a fact too commonly forgotten. Isolated observers can do little for epidemiology, compared with what might be accomplished by district societies of medical observation, in which the members adopted by mutual consent

an uniform plan of treatment and of reporting. If such societies were now to be extensively formed and carefully organised, a mass of trustworthy data would be obtained; and there is no other method by which many disputed questions relating to cholera, and epidemics generally, can ever be settled.

Painfully impressed with the imperfections of the following observations, I have ventured to introduce them by these prefatory remarks. My little contribution of facts may be useful apart from all theory; and, while I freely state the opinions which I have formed, I avow with equal frankness my conviction that, notwithstanding all that has been written regarding cholera, sufficient data do not yet exist to entitle any one to feel quite confident that his opinions are built upon an unassailable foundation.

After briefly reciting a chapter from my own experience, I propose to state briefly the opinions which I have been led to adopt, and which I have based upon that experience, in conjunction with a tolerably extensive course of reading upon the subject of cholera.

II. DIAGNOSIS OF CHOLERA.

The diagnosis between English cholera and Asiatic cholera has engaged the attention of many writers; but I agree with Dr. Knox in thinking that it is "useless and impracticable" to discriminate between them. That judicious author well remarks:—"No means of discrimination are generally known, or we should not hear one practitioner saying that he could see no difference in the diseases except in the number of the cases; and another, that he should be of opinion that he had been treating a case of Asiatic cholera, had that disease been present in the country." [Knox, Alex., M.D., *On Cholera*, Dublin, 1849.] Slight cases of cholera, like slight cases of all diseases, are the least easily recognised, and when cases of cholera occur sporadically, they are doubtless very often mistaken as to their nature, even when they are to a certain extent correctly treated. On the other hand, severe cases generally present certain symptoms in combination, which leave little difficulty in determining their character. The symptoms to which I refer, are vomiting, serous purging, cramps, prostration, coldness, collapse, and suppression of urine. I have, however, seen every one of these symptoms concurrently present in the same patient upon three different occasions, the disease being decidedly not cholera, and probably being fungus of the stomach, similar in character to the uterine disease known by the name of cauliflower excrescence. The gentleman to whom I refer, is subject to severe attacks of pain in the stomach. Some days ago, after much agony, at last alleviated by the external use of belladonna, he vomited several quarts of fluid greatly resembling dirty water, after which he nearly fainted, became extremely prostrate, and then suffered great pain from cramps in the legs. By the application of warmth externally and of turpentine fomentations to the extremities, the alarming coldness of the body was removed within an hour: and he then passed twelve hours without any fresh symptoms to excite alarm. He then, however, became faint, cold, and nearly blind. In these circumstances I was summoned. I had left him an hour previously tolerably well; I now found him collected but deadly cold; the countenance was haggard, and he complained of almost total loss of vision, painful cramps, and utter prostration. After some hours of anxious treatment, in which the external application of warmth and stimulants, along with the internal use of sulphuric acid, were the predominating features, his almost suspended animation returned. He collapse now described was not ushered in by vomiting or purging; but some hours after reaction had been established, he discharged from the stomach by vomiting several quarts of a fluid, resembling cream in consistence and tar in colour. This was undoubtedly blood which had been poured into the stomach immediately antecedent to the time of his rapidly becoming affected with the symptoms simulating the cold stage of cholera.

In this instance (without a previous knowledge of the

history of the case) its character might, and, indeed, must have been mistaken. This case strongly impressed me with the truth of the opinion which is generally, though not universally held, that the collapse and spasm of cholera are not usually, if ever, the direct effects of a morbid poison, but simply the consequences of the serous hæmorrhage resulting from the action of a morbid poison.

A few days before the occurrence above described, my friend Mr. B. W. Richardson had under his care a man who suffered in a very similar way, though the case was not one so liable to be misunderstood. The following notes were given to me by Mr. Richardson.

S., aged 65, was seized, while out of doors, on the 27th of October, 1853, with pain in the stomach, followed by the vomiting of a large quantity of dark coloured blood mixed with clots. He went home and kept quiet; but on the following morning immediately after breakfast, the vomiting having returned with increased violence, he came to Mr. Richardson. He was very cold and faint, his pupils were dilated, his face was pinched, and his voice was weak. There was likewise at intervals involuntary jerking of the limbs. He was ordered to go and keep himself warm in bed, and to take every six hours ten minims of aromatic sulphuric acid in an ounce of the decoction of cinchona. He continued under this treatment for three days, without any return of the symptoms; and he is now perfectly restored.

The collapse of cholera may be closely imitated by the secondary consequence of the serous purging, induced by claterium and other drugs in inordinate doses.

I have seen scarlet fever patients become collapsed, and die rapidly from sudden and profuse serous purging. Death in typhoid fever likewise occasionally happens in the same way, and I am not sure that in such cases the diagnosis can be made, except from determining the presence or absence of the eruption. In enteritis there is often a series of symptoms similar to those of cholera.

From the preceding remarks, it is very evident that other causes than the cholera poison may induce collapse and spasms, similar to those which characterise the cold stage of cholera. The differential diagnosis has, in fact, repeatedly been a matter of difficulty, both with the medical jurist and with the practical physician. The way to avoid error is to investigate thoroughly every circumstance, and to bear in mind that different causes may, and often do, produce similar symptoms.

III. OBSERVATIONS MADE BY THE AUTHOR DURING PART OF THE EPIDEMIC OF 1848-49.

Before proceeding to speak of cases of disease, it may be well to give a short account of the localities within which they occurred.

The field of observation embraced the suburban parish of Putney, part of which is close to the Surrey bank of the Thames, and contains some insalubrious localities, although, speaking generally, it is a remarkably healthy district. Towards the close of 1848, I was one of a committee of parishioners to whom was intrusted the domiciliary visitation of the whole parish. The following is a verbatim copy of the report given in to the Local Board of Health by the sub-committee which visited that part of the parish described as "the Lower Richmond Road, commencing at Windsor Place, taking in Putney Lower Common, right and left, to the extremity of the parish, where it joins the parish of Barnes". Some parts of Putney Lower Common are close to and almost level with the river Thames.

REPORT, etc. "We have visited every house in this district, and have to report that we find the whole in a very healthy state. But, although we have pleasure to state so much generally, we feel bound to express our surprise that that part of our district on the Common, to the right of the Lower Richmond Road, should be so, for we find the cottages there, or most of them, overcrowded with inmates; some with little or no furniture in them, and from five to seven persons being in two rooms. Dirty, badly clothed, shoeless, and miserably poor boys and girls sleep together of greater age than is

prudent. There are many children running about the Common. In many cases the mothers and fathers were out at work, and the children left in the care of the eldest girl, perhaps about ten years old, without education. No clergyman visits the neighbourhood, nor any members of the Putney Visiting Society. The premises are in a bad state of repair, and the poor persons are much exposed. There is one open privy assigned to ten houses, of which all the tenants complain. A general sink is in the centre of these houses, which occasionally gets stopped up, and then the water lies on the surface, opposite, and near to the doors of the houses.

"These ten form a kind of square. To these, and fourteen other houses, in all twenty-four, there is a good well; but it is open and exposed, and is dangerous among children; and in this small locality we think there are more children than in any other place of its size within our recollection.

"In this place some privies are good, and others bad. The same remark applies to the drains. Some tenants have no drainage, and the wash water is thrown from the houses upon the common. The whole of this property is so situate as to be capable of drainage at little expense. As the parish holds houses here, we recommend this to be done, and that the owners of the adjoining property be required to join in the expense of making an improvement generally, so as to make the spot more conducive to health than it now is. There is a dung-heap here, which must be removed; for, independently of the quantity of dung, the heap tends to stop the soil of a privy from taking its proper drainage course: this drain or ditch requires cleansing.

"There are a few swine in the neighbourhood, but we find no accumulation of dung, nor any annoyance arising from pigs, except in the case of a Mr. P., after mentioned, whose privy and pigsty are in too confined a spot, and too close to several small tenements, to be wholesome.

"The above remarks apply specifically to the spot before named: and as the other parts of our district are not particularly observed upon, it must be understood that we have not anything to report regarding them.

"The owners of the above property are the Parish, Mr. F., Mr. S., and Mr. W.; and the objectionable parts (in connexion with the number of inmates more particularly) are these.

"PARISH PROPERTY. Tenant G., seven persons in two rooms, seven feet high. Privy in bad condition: no drain.

"Tenant J. S., seven persons, five children, none at school. Eldest son twenty; girls ten to seven. Girls sleep with mother and father. Two chairs and one table. Boys sleep on floor. Room dilapidated. Privy bad. Children healthy: good drain.

"Tenant J. R., wife and three children. Boy nearly fifteen. Girls ten and thirteen. Girls and boy sleep together. Privy wants emptying. The house is otherwise very clean.

"Tenant W., wife and five children: two rooms: place in good order: but the tenant should acknowledge a tenancy. It appears the land belongs to the Parish, but the tenant built the house, etc., by permission.

"Tenant T. E. Very clean and good.

"Tenant Mrs. M. She and her son live together in one room. She is eighty-three, and he forty-four. Drains right, but privy wants emptying, and she cannot afford to do it. [N.B. This tenement is not with the others, but is situate to the left of the Lower Richmond Road, opposite Iangshaw Lodge, and is merely spoken of here to keep the Parish property under one head.]

"MR. F.'S PROPERTY. It consists of ten houses in a kind of square: in the centre are two sinks, and at the end in a corner one open privy.

"Tenant M., wife and four children. Three rooms.

"Tenant L., wife and five children. Three rooms.

"Tenant R., wife and six children under eleven. Three rooms.

"Tenant H., wife and two young children.

"Tenant W., wife and five children. Eldest son sixteen. Eldest girl fourteen. All sleep in one room, but in two beds. The man out of work, and a most miserable family.

"Tenant S., wife and ten children; but six only at home, from eleven to seven years. Two rooms and three beds, all sleep up stairs. Caroline, eleven years, sleeps alone: five boys together: and husband and wife together.

"Tenant W. and wife. Three rooms. Roof bad, and wet comes in. Woman in delicate health.

"Tenant Mrs. C., and four inmates: three adults and two infants.

"Tenant W. S., wife and five children. Eldest boy at home is eighteen, and eldest girl thirteen: only two rooms. Mother and father, and a little boy of three years sleep together in one bed, and in another bed in the same room the other three boys and girl sleep.

"Tenant C., seven inmates. They use the general privy. No drain; no sink; they throw the waste water before the door on the common.

"MR. S.'S PROPERTY. Tenant P., wife and two children. Plenty of room and underlets. The privy is badly constructed, as also the pigsty. There is one pig in it. The sty is covered in, but too close to three or four tenements; and all the inmates complain.

"This person's dung-heap is away from the premises, but close to Mr. S.'s other property, near L.'s, after mentioned, the soil of whose privy is stopped by it. It should be removed, and the drain or ditch dug out, then there would be a fall, and all would go off clear. This person (P.) is a night-man, and has been known to deposit night-soil here, and some few months ago was made to remove it. Such acts as these should be narrowly watched.

"Tenant B., wife and child. These have all requisite conveniences, with a privy for this and the next named house; but premises are too close and offensive to this and the other tenants close by.

"Tenant T. and son. The preceding remarks apply here. The houses join.

"Tenant L., and wife only. No sink: no sewer: wash water thrown on common. There is a privy conveniently placed at the end of the garden with a fall; but P.'s dung-heap before named, prevents the soil from being carried off. This house does not adjoin the foregoing houses.

"MR. W.'S PROPERTY. Tenant K., wife and child. Tenant R., wife and two children. Tenant D., wife and a little boy.

"The above occupy three tenements in a line with L.'s. They are in want of a drain to connect it with a ditch behind at the end of garden which is well situated. Their privies are at the end of the garden, well away from the houses, overhanging the ditch, which requires digging out; and then, when P.'s dung-heap is removed, the soil would go away in all probability. All complained of P.'s dung-heap, which makes their privies less comfortable.

"There are other houses in this locality not belonging to the foregoing owners. They need not be remarked upon, except

"Tenant J. R., wife and four children. Three rooms. Privy requires attention. They complain of it because their overflow is caused by P.'s privy being badly constructed and out of order. They back each other.

"Tenant B., wife and five children. The privy is in too confined a place, requiring more air. It leads out of B.'s workshop. He is a carpenter. It smells, and must be bad for him who is necessarily confined in it for hours together.

"G., a gardener. He should remove his dung and decayed vegetable matter to another part of his premises, and he has much space. His heap is offensive and unwholesome to Mrs. T. and Mrs. C., behind whose premises it is.

"Wm. S. Privy and drain connected with it were bad. He is clearing them out. There is another drain farther off which should be connected with the preceding. The tenant justly complains of it.

"Mr. H. and Mrs. W. Mr. C. owner or mortgagee. These houses run in a line with Mr. S.'s. There requires a drain to be made here. The houses must be very unwholesome. There is a considerable quantity of water under the sitting rooms, and we learn it remains. It wants to be let off. There is a drain close by, with which it can be easily connected. It would seem as if these rooms were built over a

ditch or fall of water from adjoining grounds. It may be a spring.

"Tenant G. Owner M. In two rooms on the ground floor, he, his wife, and five children live. All sleep in one room. They seem miserably poor. The husband and wife were out at work. He is a gardener with M. It seems a damp place in the winter, but is very open, and we saw no nuisance, but extreme poverty." [Then follow the signatures.]

The village of Putney was, at the period referred to, and still is, extremely ill drained. Nevertheless, from the comfortable circumstances in which most of the inhabitants are placed, and the general absence of excessive crowding, it is a healthy place; and the description which has just been given of the Lower Common is not applicable to the village, nor to the parish generally. I must state, however, that in 1849, there were some houses even in the best parts of Putney which formed notable exceptions; among which I must include my own residence, the drainage of which had never, up to that period, been performed, except by a series of cesspools. In my house, two cases of cholera occurred; and although both recovered, one got well after all hope had been abandoned. Putney Heath and the adjoining neighbourhood are famous for free and bracing air; and, lying far above the range of the river vapours, ought to present circumstances the most favourable for health. At the period, however, to which I refer, ancient unemptied cesspools were in close contiguity with the mansions of the affluent; and in some instances these dangerous depots of filth still remain, saturating the surrounding soil with their exudations.

The suburban village of Fulham, on the Middlesex bank of the river, and only separated from Putney by a bridge, is even worse drained than Putney; and, at the northern extremity of the village, on most days of the year, the air is charged with a heavy stink. I have heard it said that there is nothing unwholesome in this smell; but I cannot help thinking that the causes which generate it likewise give rise to unwholesome emanations. Around the episcopal palace there is a moat or great tidal ditch, which, in its circuit, comes up pretty close to the houses in the western side of the High Street, and to the cottages in the road leading to the Fulham fields. This moat has existed for about six hundred years; and, unless the commissioners of sewers attack it as a dangerous nuisance, it is likely to remain for six hundred years longer; for there is no one sufficiently interested in filling it up. In fact, it is by occasionally discharging its contents through the Fulham sewers, that the imperfect drainage of the village is accomplished.

The subsoil of Putney Lower Common and of Fulham is a stiff clay; but a great part of the village of Putney and of Putney Heath is situated on gravel, through which a large fall of rain rapidly disappears.

All the patients referred to in the following notes were in comfortable circumstances; and, though some of them were in a humble rank of life, they had the full benefit of efficient domestic attendance. From this circumstance, combined with the early period of the disease at which I was sent for, the cases afforded great facilities for studying its natural history, and for successfully applying remedies.

Having now sufficiently glanced at the characteristics of the locality about to be referred to, it becomes necessary to describe the cases of disease which were under treatment during the period specified. We cannot place truthfully on record the constitution of an epidemic, by simply detailing characteristic cases; it is necessary to bring into some degree of prominence every description of disease which has come under notice during the period to which our history refers. By doing this carefully and faithfully, and by such means only, can we correctly communicate to others the facts which we have observed, and upon which our generalisations are founded. Our descriptions, it is true, may in the estimation of some be redundant and overloaded; yet, in epidemiological inquiries, it is safer to be prolix than meagre; in the one case, the reader is able to judge for himself; but in the

other, he is either unfairly entrapped into conclusions, or is prevented from fully testing their soundness by the light of his own reason.

These considerations induce me to mention, categorically, three groups of cases which particularly arrested my attention during the epidemic of 1848-49, all of which distinctly partook more or less of the prevailing epidemic influence.

The following is a summary description of the three groups of cases now referred to:—

FIRST GROUP. *Quotidian fever, or febricula, with diarrhoea*, which was not at first serous; hepatic, splenic, and gastro-enteric symptoms being in some cases prominent and in others absent. Cases of this group may be called *epidemic diarrhoea*.

SECOND GROUP. Similar to the first group excepting that the purging was always serous and the type was either remittent or irregularly intermittent. The secretion of urine was scanty or absent. Cases of this group may be called *cholera*.

THIRD GROUP. The severer cases of the second group passed by insensible gradations into the third; the distinction between the aggravated cases of the one and the milder cases of the other being purely arbitrary and one of degree. The cold stage was sudden and protracted, and passed into collapse. This we term *cholera*.

In the above division, discharge from the bowels is made the basis of classification; or, at least, one of its essential features. This, however, without explanation, might mislead; and I therefore subjoin a more detailed method of grouping, which enables me to embrace every case of acute disease which came under my care within the period embraced, excepting a case of menorrhagia. Of neuralgia, in a variety of forms, I had numerous cases; but the predominating forms were ague and neuralgia of the feet. Of the latter, I saw three cases in September 1849; and I have had only one since that period. I felt it quite impossible to resist the conclusion, that every case of disease then prevailing manifested more or less the characters of periodicity, associated with neuralgic or choleraic symptoms. At the commencement and close of the cholera epidemic, neuralgia was common; but when the epidemic was at its height, cholera and cholera seemed to swallow up all other forms of disease.

To present clearly my meaning then, I would say that during the height of the epidemic, the choleraic type was impressed on all diseases, or that there was nothing to be seen except choleraic disease; whereas, at the advent and subsidence of the epidemic, the neuralgic type was distinctly visible, and became gradually displaced by serous diarrhoea, and at last by algid cholera.

During the late epidemic, I recorded the following well-marked

GROUPS OF CASES:—

1. Quotidian fever and quotidian neuralgia; and diarrhoea a subordinate symptom.
2. Quotidian, tertian, and irregular neuralgia—no diarrhoea.
3. Quotidian fever, with gastro-enteric and hepatic symptoms—diarrhoea?
4. Dysentery.
5. Remittent and intermittent serous diarrhoea (choleraic): cramps, and prostration.
6. Cholera in the first degree.
7. Cholera in the second degree; the algid stage being complete.

I feel quite satisfied in my own mind that there is nothing fanciful or overstrained in this grouping of cases; though I willingly admit that in several instances it was only by dint of minute investigation that I could obtain evidence of the occurrence of intermissions and remissions at regular periods. If a few cases be well observed, the truth of my statements may often be corroborated in the future: but of course by those who have hundreds and thousands of cases to deal with, no correct data can be

established regarding the affinities and course of such a pestilence as cholera.

I subjoin some choleraic cases which were observed with great care, and reported many times daily at the time of their occurrence.

CASE 1. Mrs. P., aged 30, residing at Holcroft, Fulham. On the night between August 31st and September 1st, 1849, she was seized with diarrhoea and cramps in the legs, for which she took repeated doses of a mixture which I had prescribed for general use in the family in which she resided, to be used in such emergencies. She felt so much better on the 1st, that she did not think it necessary to have medical advice. On the 2nd, she continued to improve, and considered herself nearly quite well when she went to bed. On both of these days, she had sudden cold fits. About six o'clock in the morning of the 3rd, the characteristic symptoms of cholera set in with great impetuosity and suddenness. She remained in bed some time, unable to make known her condition. I was called to see her at 8 A.M., and found her vomiting and purging incessantly, and pulseless. She had a senile, haggard expression of countenance. The legs were quite cold, as were likewise the arms, face, and abdomen: the thorax was the only part of the body approaching to the natural temperature. The lips and tongue were also cold; and the lips were livid, as was likewise the countenance generally. The intellect was quite clear; she answered questions with great precision, though she articulated with some difficulty, and spoke in a feeble and sepulchral tone of voice. She had cramps in the calves of the legs, but in no other part of the body. There was an uneasy feeling at the præcordia, with a good deal of pain in the lower part of the bowels. She complained of excessive thirst. During the two hours which elapsed before I saw her, the quantity of fluid discharged by vomiting and stool was quite enormous. The discharge per anum had no feculent odour, and entirely consisted of a fluid resembling the washings of raw meat. There were a very few shreds resembling flocculi of mucus seen floating in it. What she vomited was paler in colour, and was quite homogeneous: it a good deal resembled slightly dirty water. She stated that she had not passed any urine for twenty-four hours, but might have passed some with the stools. A grain of solid opium was administered in the form of pill; sinapisms were applied to the calves of the legs; and the lower two-thirds of the body were enveloped in a blanket, wrung out of very hot water. She was cautiously kept in the horizontal position; and dry heat was applied to the upper part of the body, to avoid the fatigue which would have been inseparable from removing her chemise. Two ounces of brandy were at the same time administered. In ten minutes from the commencement of this treatment, the pulse returned, and gradually increased. She was ordered to take a teaspoonful of the following mixture every hour:

R. Tincturæ catechu ʒij.
 " opii ʒij.
 " cardamomi co. ʒj.
 Mist. camphoræ chlorof. ʒss.*
 " acaciæ ad ʒij. M.

At a quarter to eleven, Dr. James Bird saw her with me; and the following was her condition at that time. Considerable præcordial tenderness, extending to the umbilicus, and along the course of the colon. Respirations 40 in a minute; pulse 100, feeble, and labouring; considerable tenderness at the nape of the neck, accompanied with oppressed respiration and severe headache. The warmth of the body was maintained with great difficulty, by means of sinapisms and bottles of hot water. The mixture was continued; and a liniment of turpentine and pyroligneous spirit was ordered to be applied to the epigastrium and abdomen, until free redness was produced: also to the nape of

* The following is the formula for preparing the camphor-chloroform mixture, according to Messrs. T. and H. Smith of Edinburgh.

R. Chloroform ʒi.
 Camphoræ ʒij. M.

The camphor is perfectly dissolved; but, in consequence of the volatility of the chloroform, it is advisable to add another drachm of this fluid.

the neck, and along the spine. She was allowed to drink plentifully of soda-water, to each bottle of which two teaspoonfuls of gin were at first added, but afterwards omitted, as the heat of surface increased.

2 P.M. There had been some slight return of the vomiting, and four stools of the same character as in the morning. There was less abdominal tenderness, and tolerable heat of surface.

3 P.M. There was more warmth in the skin: and the body was bathed in a profuse perspiration. During my visit, there was some vomiting, and a copious discharge from the bowels, similar to that previously described. The interval between the doses of the camphor-chloroform mixture was increased to two and a half hours.

8 P.M. The condition (now and at half-past five) was very similar to that at three o'clock: there had been several stools, and some vomiting. The last motion contained more flocculi than had hitherto been observed; in other respects, it possessed the same characters. The abdominal pain, which was somewhat relieved by the liniment, having returned, it was re-applied. She took the two following pills immediately:

R Quinæ disulph. gr. vj.
Calomelanos gr. iij.
Opii gr. ss. Ft. pilul. ij.

Half of the following injection was administered directly, and the rest was ordered to be repeated in two hours, if required:

R Plumbi acetatis ʒi.
Tinctur. opii ʒiiss.
Decoct. oryzae ʒviii. M.

4th, 9 A.M. She passed a tolerable night. The other half of the enema was not administered, as there had been no stool. There had been no urine passed. She had been in a profuse perspiration since last report; and, indeed, since between 2 and 3 P.M. yesterday. She had occasional sudden and very transient attacks of nausea, and these were generally accompanied with a temporary augmentation of the perspiration, which was then seen to stream down her face in greater abundance. The tongue was clammy and furred, except at the point, where it is dry and red. The pulse was 100, and the respirations 30 in a minute. She had finished the camphor-chloroform mixture prescribed at the first visit. There was great prostration, which had been relieved by each dose of this mixture.

2 P.M. About 11 A.M. she became much flushed, and complained of intense headache, with pain in the muscles of the back of the neck, and some flying pains of the limbs. The state of perspiration continued unabated. Pulse 130; breathing a good deal oppressed. At half-past one P.M., she passed between one and two ounces of very high coloured urine.

R Quinæ disulph. gr. iii.
Calomelanos gr. vj. M. pil. ij.

One immediately; the other in two hours, if the bowels have not been moved.

6 P.M. She had taken both the pills; but had had no stool. She had, however, passed fully a pint and a half of urine, which, though dark in colour, was not so much so as that mentioned in the last report. On examination, it was found to be acid, of sp. gr. 1022.5: it lost much of its dark colour on the application of heat, and became momentarily clearer; when there were seen, as the heat was continued, milk coloured filaments in abundance. The addition of nitric acid did not seem to produce any change; but, on boiling it with liquor potassæ, there seemed to be an aggregation of the filamentous or flocculent particles into larger bodies, with a clearer appearance of the urine.

According to the report of the nurse and of the patient herself, a marked improvement speedily followed the discharge of urine. She felt much better, and drank a tumbler of cold beef-tea, being her first application for that beverage during the day. She had drunk a large quantity of soda water. Her thirst was now much abated. It is necessary to note, that during yesterday and the night, and this forenoon, she drank many quarts of water and soda water. At

present, the perspiration continued; and was reported to be more abundant than during the height of the febrile paroxysm some hours ago. There was still a good deal of headache; pulse 90, respirations 26 or 28; but the pulse and respiration varied considerably from slight causes, as when she moved in bed, or attempted to raise herself on her pillow.

10 P.M. There was decided improvement in all respects, though she became very faint when her chemise was being shifted. At about 9 P.M., she had a scanty black, fluid, and somewhat faculent motion. There had been no more urine passed. On sitting up in bed to take a little arrowroot with wine, she was seized with faintness, and had some vomiting.

R Opii gr. ʒ.
Camphoræ gr. ss.
Quinæ disulph. gr. iss.
Calomelanos gr. ii.
Extr. anthemidis q.s. ut fiant pil. ii.

To be taken immediately.

R Liquor. quinæ amorph. ʒxv.
Ferri sulphat. gr. ʒ.
Aquæ ʒiiss.

To be taken in the morning.

5th. She passed a good night: the medicine was taken as directed, and she had a few spoonfuls of thin arrowroot with wine at intervals during the day. In the morning early, she was described to have awoke pretty cool and comfortable; but between six and seven she became flushed, and had a good deal of headache up to noon. When I saw her at eleven, the pulse was above 100, and the breathing laboured; she was also restless and uncomfortable, but this state did not long continue. She had a black, tarlike, copious stool in the afternoon; after which there was some temporary exhaustion, speedily relieved by a little wine. The quantity of urine passed was excessive; it had now a pale straw colour. Pulse, at eight in the evening, 54; perspiration continued. A good deal of lachrymation was present.

R Calomelanos gr. vj.
Quinæ disulphat. gr. xii.
Pulv. opii gr. iii.
Camphoræ gr. iv.
Ext. anthem. q.s. ut fiant pil. vi.

One of these was taken at 4 P.M., and another at 8 P.M.

6th. At 9 P.M., the four remaining pills had been taken. Towards the afternoon, the perspiration began to moderate, but it never ceased, and still continued excessive. Pulse 78, irregular, small, and compressible. Respirations 32. No stool to-day; but an abundance of urine. She seemed extremely depressed, both in body and mind; and her necessary movements in bed caused much muscular pain. To have a tablespoonful of wine in negus every hour.

7th, 9 A.M. Seven ounces of wine were taken during the night, which was the quantity I had said was not to be exceeded. I found that the last dose had been given two hours before my visit; and that, from the longer interval, she had become cold on the surface, and alarmingly depressed. During the regular continuance of the wine, her condition was represented as more favourable. I directed her to have a tablespoonful of wine every second hour; and on the alternate hours, some veal broth or arrowroot, occasionally substituting the one for the other.

To take one of the following draughts every three hours.

R Spir. æth. sulph. co. ʒss.
Mist. camph. chlor. ʒii.
Tinet. cardam. comp. ʒss.
Mist. acaciæ ad ʒi. M.

Mitte tales iij.

Pulse 70, irregular and feeble; respirations 40, catching, and occasionally sighing.

3 P.M. Two of the draughts had been taken, and the wine, arrowroot, and veal broth, given as directed. She was much better; pulse 80, regular, and firmer than in the morning; and surface warm, and bedewed with a gentle perspiration. ʒii. of castor oil to be taken immediately.

Half-past nine P.M. There had been great improvement

since the afternoon, especially since the bowels were moved about two hours ago. The stool was of the consistence of thickish mortar, but not formed; it was of an inky blackness, with some patches of dark green. There had been much less urine passed to day than yesterday, and comparatively little sweating. To take a draught in the morning, similar to those prescribed above; and a pill of citrate of iron and quinine.

The subsequent history of this case it is not necessary to detail. Recovery was gradual. The use of alcoholic stimulants was freely resorted to, and seemed essential to prevent sinking. During convalescence she took—and apparently with great advantage—the citrate of iron and quinine.

CASE II. C. U., aged 2 months, residing in Putney Lower Common, was taken ill on the morning of the 18th August, 1849. She was violently sick, and refused the breast, or food of any kind; and before I saw her at noon, had had a great number of stools. The first towels which had been used, contained some matter like very soft clay-coloured mortar; but the towels in which the latter evacuations had been passed, though soaked therewith, were hardly discoloured in any way. When I was in the house, she passed a large quantity of inodorous, almost colourless fluid from the anus. A mixture of chalk, catechu, and opium was prescribed, and a little brandy in beef-tea was directed to be given *pro re nata*. In the evening, the child was somewhat better. On the following day, she was again worse; but the discharge was again moderated, and for some hours arrested, by means of small doses of acetate of lead and Dover's powder. On the 20th, she seemed improving. On the 21st, about 9 A.M., she had a rapid succession of copious fluid motions, from which time, up to death at 7 A.M. on the 23rd, being a period of forty-six hours, she had no discharge either from the bowels or bladder; and remained in a state of absolute collapse, with the eyes open, and sunken, and the countenance haggard. The alteration in the countenance was described to me as having taken place quite suddenly. By means of the diligent use of hot fomentations, the temperature was maintained at the natural standard throughout the whole of this time; and small doses of beef-tea and brandy were administered every half hour, so long as the power of swallowing remained. Shortly before death, the movements of the hands, arms, and legs, were very active; and this continued long after the surface had become quite blue. I was not present when the infant died; and those who were in attendance could not exactly say the moment at which life ceased; for after they had concluded that death had taken place, notable movements of the arms were observed.

EXAMINATION OF THE BODY, 9 hours after death. *External Appearance.* The countenance was haggard, the eyelids open, and the eyes sunken. The fingers were blue; and there were extensive marks of ecchymosis on the posterior aspect of the trunk, but in no other part of the body. In some degree, the extremely collapsed appearance had disappeared since death; and the fingers were certainly not so blue as during life. There was a total absence of cadaveric rigidity in any part of the body.

Head. The vessels of the pia mater were considerably congested; but not more than is usual in deaths from very many diseases. The brain was of soft consistence. There was no effusion under the arachnoid, or into the ventricles.

Chest. On opening the chest, there was a considerable layer of fat in the integuments. The lungs did not collapse; the left overlapped the heart. They presented a perfectly white appearance. The anterior lobes were oedematous, not in any degree emphysematous; they were bloodless. The middle portion was pallid and oedematous, but not entirely destitute of blood. The posterior lobes were likewise oedematous, and, in their more dependent portions, were almost black from the contained blood: but this coloration seemed to depend more on the character than on the quantity of blood. The posterior aspect of the lung, in contact with the parietes of the chest, was deeply furrowed

by the impressions of the ribs. It may be said of the lungs, therefore, that their prevailing character was oedema; and that, although there was an unequal distribution of blood in them, there was nothing which could be truly called sanguineous congestion.

The auricles and ventricles of the heart contained a very small quantity of black, thickish, but not coagulated blood. There was no fluid in the pericardium, nor any fibrinous clots in the heart.

Abdomen. Here, as over the chest, there was a considerable layer of subcutaneous fat. On displaying the viscera, they were observed to be in their natural position. The stomach and intestines were moderately distended with air, but entirely destitute of solid or fluid contents. A large brown patch was observed on the ascending colon, just above the cæcum. Some portions were reserved for microscopic observation. The spleen seemed to be quite natural, and certainly was not enlarged or congested. The liver was rather more pallid than is usual; its inferior surface had a tarry look. The gall-bladder had a similar appearance, and contained a moderate quantity of tarry somewhat inspissated bile. The kidneys were anæmic. The bladder was contracted, and contained no urine.

The general deficiency of blood throughout all the organs was striking.

CASE III. — Churchill, a labourer, aged about 50, resided in the north-west corner house of Saddler's Buildings, Lower Common. I was summoned at 9 A.M., on the 27th July, a close, sultry morning with an ardent sun, to see this man. His wife, who came for me, said that he had been poorly for two days with aguish feelings and undue purging; that he had taken some mixture from a druggist (prescribed for diarrhoea), which had done him some good, she thought, and that morning he had gone to try to labour in a neighbouring market garden, but was obliged to come home. She described him as cold, rigid, and convulsed, and so ill that she did not expect me to arrive to see him in life. I found him with a blue cadaveric countenance; pulseless at the wrists; his heart beat irregularly; and the surface (excepting the chest), was quite cold. He could articulate distinctly, but his voice was weak, and his words were slowly uttered. I had him carried from his chair, stiff and doubled up as he was, and laid in bed. From the severity of the cramps, it was impossible to get him out of his sitting position; the legs and abdominal muscles were rigid, and occasionally violently affected with spasmodic movements. At the moment of my arrival, there was no evacuation going on; but it was stated to me that for an hour previously a fluid resembling dirty water had poured from the bowels. He had likewise had vomiting of a similar fluid. The patient seemed moribund. I had with me pills of camphor and Cayenne pepper; but his efforts at swallowing were not successful, though they were determined and intelligent. A little time was lost in getting some camphor-chloroform solution, which was administered in large doses every ten minutes; but, before he began to take this medicine, hot bags of salt were placed around him, and a large sinapism to the spine. In the course of an hour and a half, during which this treatment was unremittingly continued under my personal superintendence, the pulse became apparent at the wrist, and the body became warmer. The cramps likewise abated; and the blueness of the skin diminished. I then left him in charge of Dr. Henry, who continued the treatment with some modifications. At 2 o'clock, I found him going on favourably, and at 4, P.M., in my presence, he swallowed a cup of cold beef tea. At 7 o'clock, he was very hot, and complained of acute pains in his limbs and of headache; he seemed drowsy, which was not surprising, as he must have taken, within twelve hours, more than a scruple of camphor. All medicine was now suspended; but the warmth was ordered to be kept up, and the friction continued at intervals. If thirsty, he was to have draughts of water acidulated with sulphuric acid, and some cold beef tea at specified periods.

I did not see him for eleven hours. He had passed

the night uncomfortably; but there had been no return of the coldness, collapse, or purging. No one could have supposed that it was the same man, so entirely had the features changed for the better. There was a great moisture on the skin; and the kidneys, which had on the previous day secreted no urine at all, were now rather active. He complained of an uneasy and distended condition of the bowels, for which I prescribed a full dose of castor oil with some laudanum and carminatives. Towards evening, he had a stool without much feculent odour; and, about an hour afterwards, he had simultaneously slight rigors, with a discharge of serum from the bowels. He then had a draught of camphor, chloroform, and creasote.

Next morning, the report was favourable; and he was certainly better. I then prescribed, to be taken three times daily, disulphate of quinine with sulphuric acid; each dose containing four grains of the disulphate, and fifteen drops of the acid. This treatment was continued for two days: when he was able to walk out. After that time, he continued to take the medicine for several days.

CASE IV. Mrs. C., wife of the preceding, had a severe attack of serous purging, with subsequent coldness of the surface on the 25th of July. I saw her two hours after the first liquid stool. She never had another serous evacuation from the time that she took the first dose of a mixture of creasote and mucilage. Each dose contained three drops of creasote, and she took three doses in as many hours. Next morning she was very weak, and the tongue was furred. She took a dose of calomel and rhubarb, and for several days afterwards, though apparently perfectly recovered except as regarded her strength, she took citrate of iron and quinine.

CASE V. Loveday, a labourer. The symptoms and the treatment very similar to those of Mrs. C. For sixteen hours he passed no urine. I mention the case because it also occurred on the Lower Common, and in a house close to that occupied by Churchhill and his wife, and on the same day in which Mrs. C. was seized.

At the same time I was attending upon the Lower Common (along with the above cases) four cases of diarrhœa in one family, two cases of severe neuralgia, and a case of fever (Thornton), with the remittent type so obscurely marked as perhaps to bring it under the designation of continued fever. There was no purging or collapse in these cases. An infant in an adjoining house was also at the same time under my care, with the usual symptoms of infantile remittent fever. Other cases of disease were under treatment in this locality by other medical men at the same time; but some weeks afterwards, upon diligent inquiry, I found that there was no sickness. The susceptible population had probably been exhausted by the outbreak, which occurred about the 27th and 28th of July.

CASE VI. J. R. B. C., my son, aged 13 months, was seized on the morning of the 10th September, 1849, with serous purging. This was restrained by chalk and Dover's powders, but not until extreme exhaustion had occurred. The temperature of the body was maintained by the application of external warmth. A stimulating liniment was rubbed in over the spine, and I administered thirty drops of brandy at very short intervals, according to the demands of the languishing circulation. The pulse and the respirations were very slow; but towards evening they both increased; and the external warmth and the brandy were less called for. About four in the morning of the 11th, he became blue and cold, and the inodorous watery fluid poured from his bowels. An enema of acetate of lead was at once administered. Warmth was diligently applied to the surface, and brandy was again freely administered. By these means, complete collapse was probably prevented. He did not, however, rally so well as on the previous day; and although the body was kept warm by artificial means, the blueness of the skin never disappeared, and the tongue and breath were cold. During this day, very small doses of the citrate of iron and quinine were given every hour.

He drank several pints of cold beef-tea, to the doses of which were occasionally added brandy. Between 5 and 9 p.m., he had a more life-like appearance; but the tongue, which had hitherto been cold and moist, became hot and dry. He perspired slightly from nine to about five or six in the morning, and seemed altogether better than he had done since the first attack. Suddenly, however, the former symptoms recurred—the blueness, the cold surface, and the serous purging. The quantity evacuated was not nearly so large as on either of the previous attacks, which was perhaps attributable to the acetate of lead enema having been administered without a moment's delay, on the first gush from the bowels. He had evidently, however, by this sudden relapse, lost more ground than he had previously gained; and while his mother and I personally continued to keep up artificial heat, and to administer the citrate of iron and quinine, the brandy, and the beef-tea, we had no hope of life being prolonged many hours. We now resolved, that if he showed the slightest disposition to rally, we should be ready at once to start with him for Brighton, to give the chance of benefit from a change to sea-side air. He hardly improved; but still we determined to go; as by remaining, death seemed inevitable on the next recurrence of the previous symptoms.

He was carefully wrapped up in flannel, wadding, etc., and hot water vessels were applied around him; but when about to be carried down stairs, a sudden gush from the bowels, and his shrunken death-like aspect, made me hesitate as to removing him, as it seemed, merely that he might die from home. However, the acetate of lead enema was repeated, and brandy was freely given. Though the tongue was cold, and the body cramped, he swallowed easily, and I might almost say greedily, whatever was put into his mouth. He decidedly improved in warmth and in appearance as we went along; and when we reached Brighton, there could be no question as to his being better than when we left Putney about three hours previously. There was no more serous purging. From the time of his leaving Putney, he had no medicine of any kind for twenty-four hours. The treatment consisted more in watching than in acting. During the night he became very hot, and continued so during the greater part of the next day. He passed no water from the previous evening till the afternoon of the day following his arrival in Brighton; and how long previously the kidneys had ceased to act, I cannot say. He seemed every hour to improve, and in a week was out of danger; though for more than twelve months afterwards he had a puffy skin and an anæmic aspect. When at Brighton, he continued to take the citrate of iron daily, and had occasionally some doses of hydrargyrum cum creta.

In addition to the cases detailed, I had, subsequently to the illness of my child, four cases in Fulham, and nine in Putney, in which there were more or less of the algidæ stage with cramps, as the sequence of serous purging. The treatment adopted in all of them was external warmth, and creasote internally. In some, acetate of lead enemata were used; and the majority had either ammonia, camphor, or brandy, as a stimulant. All had iron and quinine during convalescence. I never felt any temptation to use calomel or other medicines empirically. Each successive case tended more or less to convince me of the paramount importance of arresting the serous discharge from the bowels, and of diligently maintaining warmth.

In one case (Oatts, Gardener's Lane), at the suggestion of Dr. J. Bird, who saw the case, quinine was freely given from the first in consequence of the distinctly marked ague type being present. I was convinced that the quinine did much good.

IV. PATHOLOGY OF CHOLERA, INCLUDING ITS MORBID ANATOMY.

The history of the cholera epidemics of 1832 and 1848-9 points out a clear course to sanitary reformers, and also most assuredly holds the torch of truth to the physician, pointing out to him the true pathology of cholera, and, by the light of that pathology, guiding him to the principles on which

he is to apply the abundance and variety of his therapeutic resources.

The first subject which suggests itself for investigation is the relation which cholera bears to other diseases, which, while they require a general epidemic influence to cause them to be severely felt upon a community, have likewise a necessity for the assistance of endemic or local causes, before this can take place. We have also to consider whether cholera be a new disease.

Marsh miasmata, and the putrid exhalations from decaying animal and vegetable matter, are really the chief causes of intermittent, remittent, and yellow fever; although, most probably, these diseases, or rather, we should say, these modifications of the same disease, may, in their more intense forms, and under certain peculiar circumstances, be communicated by personal contact, and thus show themselves beyond the territorial range of the miasmata. They do not each, however, originate in distinct specific poisons; nor do they originate in morbid animal poisons, like scarlatina and typhus—diseases which are, in the strictest sense of the term, contagious. The true state of the case seems to be this; that miasmatic fevers cannot be propagated to any extent where there are no miasmata prevailing; but that a partial eruption of cases may occur, depending on contagion. The effect produced by a change of wind points out strikingly how fevers are rapidly carried from one place to another. Dr. Dundas, quoting Lancisi, informs us that thirty people being out boating on the Tiber, the wind suddenly veered round to the south; the consequence of which was that twenty-nine out of the thirty were seized with fever. The miasmatic diseases already named, however, while they essentially differ from typhus and scarlatina, do not differ pathologically from each other; the apparent distinctions between their phenomena depending upon accidental causes, such as climate, temperature, and what, for want of any other term, we must, with Sydenham, call the epidemic constitution of the atmosphere.

A very cursory glance at the statistics of malarious fevers in the West Indies will convince any one how much the type of the fever is influenced by the condition of the atmosphere, especially as regards temperature, winds, and electricity. A hurricane has been known to convert the most malignant type of yellow fever into a manageable intermittent. This fact is of itself sufficient to establish the pathological identity of intermittents and remittents, which have been so often described as essentially differing from each other.

The previous sanitary condition of individuals is also a remarkable element in determining the type and gravity of the fever. The degree of exposure to the miasmata, the sudden or gradual nature of that exposure, are circumstances which give a character to groups of cases. Persons going from a healthy district to one where ague is prevailing as an epidemic, are generally seized, not with the *intermittent*, which is affecting the natives and long residents, but with *remittent* fever; *i. e.*, with the same disease in a more aggravated form. When a yellow fever epidemic breaks out, the acclimated and non-acclimated, regarded as two classes, are attacked with diseases of very different degrees of malignity; and, in both, the periodicity of the fever is strikingly modified. For example, it often happens that, when the acclimated are attacked with a common intermittent fever, the non-acclimated are swept away by a more pernicious form of the disease, by remittent fever, or by that more intense form called yellow fever. Europeans, on their arrival in the West Indies, are very commonly seized with bilious remittent or yellow fever, which, from this circumstance, are in their cases properly called "seasoning fevers", or the fevers of new-comers; and, indeed, they may be truly called the fevers of new-comers, for new-comers are seized by them even when there is no prevailing epidemic. Here we have an illustration of endemic causes being sufficient to originate, in one class of individuals, a certain definite train of morbid phenomena, which require, in another class of persons, the operation of epidemic as well as of endemic causes. The pestilential miasmata are,

therefore, we must suppose, floating constantly in the atmosphere of these places, or in the water used by the inhabitants, but not in sufficient abundance, concentration, or virulence, to affect those who have become habituated to their influence, though abundantly potent to give rise to fever in persons suddenly, or for the first time, exposed to them.

It does not seem necessary to prove that cholera is a malarious disease. True though it be, that the pestilence has travelled to our shores from the far East, and that we must therefore recognise, as essential to its propagation, a specific poison or a specific constitution of the atmosphere, yet it is equally true that it has only been able to do its deadly work on a large scale on the banks of rivers, or amid the inhabitants of districts ill drained, or the air and water of which have been notoriously contaminated by open privies, cesspools, or other putrescent nuisances of like character. In a word, the recent vital statistics of the Registrar-General unequivocally corroborate what Macculloch averred in 1828, from the comparison of various data, that cholera is a disorder produced by malaria.*

The apparent exceptions to the malarious character of cholera are not stronger than those which have been brought forward to disprove the malarious origin of ague. For example, in the Alentejo, a province of Portugal, south of the Tagus, 500 feet above the level of the sea, and entirely devoid of marshes, intermittent fever is endemic, and hardly any one escapes. The whole country is covered with Gum Cistus, in rank vegetation; and the surface abounds in rocky debris, wonderfully retentive of moisture. These circumstances abundantly explain the prevalence of miasmatic fevers. With regard to these diseases, it must also be remembered that they may be disseminated to a small extent by personal communication; and still more by corrupt water, as is abundantly proved by facts such as those which Dr. Snow has collected.

It has been the ignorant or interested boast of the bone-crushers of Lambeth, that the emanations from their stores of putridity are harmless, because those living on the premises have been more exempt from the epidemic than others at a little distance. If this be a fact, it is one which admits of a ready explanation. Those resident on the premises are acclimated; whereas those living at some distance have the seeds of pestilence sent to them only fitfully, according as the wind may blow. There can be little doubt that the ravages which cholera has made in Milbank Prison are mainly dependent upon the putrid bone-yards on the opposite side of the river. The prisoners are probably, in the majority of cases, feeble, dissipated characters; they are also suddenly brought into the malarious atmosphere; and these two circumstances, when taken in connexion with the mental depression which we must suppose to exist more or less in every prisoner, point out how it is that they may suffer from the pestilential emanations referred to, while those residing in the midst of them are less frequently or less severely affected. The same remarks will hold good with reference to the horrible graveyards of the metropolis, which have been recently shut up; and to the filthy bilgewater in the holds of vessels, which accounts for the outbreak of cholera in ships at sea. In the autumn of 1843, the modification effected upon the fever prevailing in Edinburgh, by previous residence, was well seen. Tramps, vagrants, and Irish reapers, upon arriving in Edinburgh, were in general seized with the disease in a much more virulent form than those of the same class, and of precisely the same habits, and inhabiting the same localities, who had been resident for some time before their seizure.

Duflet states, in his work on "Yellow Fever", that persons habitually exposed to putrid emanations, as tanners, tallow-chandlers, and soap-boilers, are less liable to that disease than agricultural labourers, who work under an ardent sun, or smiths, bakers, etc., and others, who are subjected to great heat within doors. There would, therefore,

* Macculloch, John, M.D., On Remittent and Intermittent Diseases. London: 1828.

seem to be something preservative in being habituated to the operation of the same poisons which dangerously or fatally affect those suddenly brought into contact with them. Every one can, within his own experience, recal cases in which malignant fevers have suddenly broken out in houses where the sewerage or cesspools have been allowed to contaminate the water-cisterns, or the air of the apartments.

Illustrations might be indefinitely multiplied, to show how much accidental circumstances may modify the type of disease; and, having premised thus much, we become better prepared to appreciate the doctrine of Dr. Billing, Dr. James Bird, Dr. Charles Bell, and others, that cholera is pathologically of the same family as intermittent fever; that it is, in fact, a pernicious ague, as was long ago believed by Alibert, Comparetti, Sydenham, and Morton.

The doctrine which is most in consonance with my reading and observation, is very concisely stated by Dr. Billing in the following sentences. "Under the denomination of ague, I include remittent as well as what are called intermittent fevers. Ague is essentially fever: it forms, however, a connecting link between fevers and neuroses, as a considerable degree of nervous sensibility exists in it. Ague is, besides, closely allied to Asiatic cholera and influenza, which are also essentially febrile diseases, as I demonstrated in 1832, when we had daily opportunities of seeing the epidemic." (Billing's *First Principles of Med.*, p. 236.)

Various methods may be suggested, by which each may examine for himself the question as to the resemblance between, or rather identity of, cholera and ague. For example, we may examine the records of various epidemics of intermittent and remittent fever, wherein we shall find abundance of cases which might truly be designated cholera. I have now before me the work of Alibert, entitled *Traité des Fièvres Pernicieuses Intermittentes*, originally published fifty years ago. This author hesitates as to whether *cholera-morbus* ought to be considered as a distinct disease, or as a variety of pernicious intermittent fever.* He quotes the following illustrative case from Torti:

"A man, aged 64 years, was attacked by simple tertian fever, accompanied by bilious vomiting, and dejections of the same character. These symptoms had, on several previous occasions, complicated diseases by which the patient had been affected, which induced Torti to administer the remedies reported to have been previously beneficial in similar circumstances. But after the fourth or fifth paroxysm, the phenomena indicated a frightful intensity in the disease; the vomiting was violent and copious, and the stools followed each other almost without an interval; and each time he vomited or was purged, there was extreme anxiety. The symptoms which succeeded were, a general coldness, a feeble pulse, sighing respiration, hiccup, sunken eyes, lying in the supine position, and an almost total inability to perform any muscular movement. In this alarming state of matters, it was probable that deglutition would be very difficult, or that if the patient did swallow anything, it would be immediately rejected. The danger was imminent; the sacrament was administered to the patient; when, although everything seemed to announce speedy death, Torti resolved to give cinchona in large and often repeated doses. The symptoms did not diminish; and, although there were no fresh paroxysms, the condition of the patient remained very critical. The pulse gradually became restored; but the heat was with extreme difficulty re-established. The cinchona was continued for several days in large doses; by the use of wine, which the patient could hardly retain during the first few days, his almost extinguished life was supported. In a few days, he was convalescent, having been (so to speak) recalled from death to life."

Alibert says that the predominating symptom which constitutes the disease (*fièvre pernicieuse intermittente hépatique ou atrabileuse*), is a copious and frequent flux from the bowels, resembling the washings of raw meat (semblance

à la lavure de chair); and which was described by the ancients under the name of hepatic flux. "It first shows itself," says he, "without any symptoms of apparent danger; but it speedily induces extreme prostration of the vital forces. The pulse becomes small and feeble; the voice is sharp, and sometimes aphonia comes on. There is a remarkable chilling of the body and of the extremities. The patient has such a tendency to fainting, that it occurs whenever he attempts to get out of bed. The intellectual functions are, nevertheless, unchanged." (p. 15.)

Comparetti, in his work entitled *Risconti Medici delle Febbre Larvate Periodice Perniciose*, published at Padua in 1795, speaks of a species of double tertian fever, which he designates *collerica sincopale*, in such a way as to show very clearly the correctness of the views which it is at present attempted to illustrate. The diminution of animal heat, and the weakness of the pulse, characterise the cold stage of the fever, rendering it truly a stage of collapse.* The remedies which he recommends are laudanum and cinchona. He refers to three cases of intermittent fever described by Morton, which had the mask of cholera, and which had alarming symptoms of delirium, violent spasms, and purging. It appears that Raimond-Restaurant treated choleraic intermittent fever by cinchona in 1680. Scanty or suppressed urine forms a leading symptom in the histories of cases of choleraic intermittent fever, described by the authors whose names have been already mentioned.

Dr. Webster, in 1832, satisfactorily showed that cholera with a well marked intermittent type was, in the time of Sydenham and of Morton [1669-1693], a great scourge of London. It was called *cholera morbus* by these physicians, and, in the Bills of Mortality, "gripings in the guts", and "plague in the guts." In 1669, when the population of London was only 600,000, the deaths from this disease were 4,385.

Enough has now been said to show that cholera is not a new disease, that periodicity has been long ago recognised as an essential character, and likewise that its treatment by antiperiodic remedies is of equal antiquity.

It may, however, be interesting, as corroborating the doctrine that cholera is a form of intermittent fever, to refer to the following extract from the New Statistical Account of Scotland, regarding the medical statistics of Kelso, a town in the county of Roxburgh, during the cholera epidemic of 1832. It is well known that an improved agriculture has extirpated ague from many districts, where it used at one time to prevail. Its total disappearance from the county of Haddington, where it was formerly endemic, must be ascribed to an amelioration of the atmosphere, the result of the drainage of the land, which has there been carried out on a scale of great extent and magnificence. The same cause has produced a similar effect in Kelso, and many other places. The following table is compiled from the records of the Kelso Dispensary.

In 1832, it is said that the increase in the number of agues was apparently occasioned by the opening of some drains in a piece of marshy ground. It was in this year that cholera visited Kelso with such fatality; and, for two months, the dispensary was used as a cholera hospital; during which time, no records of the other cases were kept, so that the cases of intermittent fever for that year must have been more numerous than they appear in the books.†

* "La febbre per l'ordine degli accessi, per la qualità, e relazione di alcuni sintomi, per la remissione de' più gravi in certe ore, per la qualità dell'urina, pel difetto del calore, per la debolezza del polso, e pel cambiamento di tali caratteri nell'uso del febrifugo dichiarassi periodica del genere delle doppie terzane, e della specie perniciosa collerica-sincopale."—Comparetti, part II, p. 414.

† The table quoted in the text possesses considerable interest in several points of view. It appears that the years 1780, 1781, and 1782, were very severe upon the lower orders, in consequence of the inclemency of the weather, and the scarcity of food. In addition to the heavy list of fever and ague cases, there occurred, during that period, twenty-one of scurvy. In 1781-82, there was an unusual number of cases of dropsy, depending, there can be little doubt, upon the great prevalence of intermittent fever during the preceding years. Asthma is often a sequel of intermittent fever; and by reference to the table, we see this well illustrated. Probably, the asthma, which follows intermittent and remittent fevers, and likewise cholera, is the result of the peripheral portions of the lungs never recovering from the capillary congestion characteristic of the primary diseases.

* "Si l'on a égard au cholera-morbus, considéré comme indépendant de la fièvre pernicieuse intermittente, aucune affection peut-être n'a été décrite avec des couleurs plus vraies, plus énergiques, dans les épidémies d'Hippocrate."—Alibert, 4ème édition. Paris, 1809, p. 14.

DISEASES.—FIRST SERIES.

Years.	No. of Patients.	Fever.	Ague.	Asthma.	Rheum.	S. Fox.	Dropsy.
1777-8	302	13	17	10	15	2	10
1778-9	306	26	33	13	16	17	2
1779-80	400	109	71	17	22	37	2
1780-1	675	147	159	19	32	4	5
1781-2	510	65	103	24	21	4	11

SECOND SERIES.

1831-2	772	66	0	4	40	0	9
1832-3	561	26	0	1	18	1	7
1833-4	729	39	1	3	42	2	8
1834-5	678	65	0	3	30	51	5
1835-6	593	63	1	2	38	0	0

The effect of malaria is to render the blood dark coloured, and to cause a breaking up of its globules, and consequently the imperfect elimination or a complete suppression of the normal secretions. Majendie has produced artificially, in dogs, these effects by injecting a small quantity of putrid water into a vein. In reference to the appearances found on dissection, he says: "Among the pathological phenomena presented by animals into whose veins putrid water has been injected, we have principally remarked among the intestines that which is commonly called acute inflammation, or in other words, an exhalation of a matter of the colour of the water in which meat has been washed, as pathologists have so happily described it. This matter, adherent to the mucous coat of the intestine, and solidified in the form of jelly, is, in reality, a portion of the fibrin of the blood, which has transuded and become coagulated in a peculiar manner in the cavity of the digestive canal. Here is the way in which we prove this position. We have detached and washed with care this intestinal secretion, we have removed the colouring matter from it, and it has precipitated very minute particles of fibrin. I intentionally make use of the word particle, for it is in some respects different from a globule; the latter being to a certain extent organised, and affecting a determinate form, and because globules constantly present a great analogy the one with the other, whereas, on the contrary, what I term particles, are merely a heap of extremely delicate parcels, differing in form and volume, and to which one cannot attach any idea of regular or symmetrical configuration."* These masses, since they do not possess the cellular structure of coagulated fibrin, or of accidental tissues, cannot be regarded as the results of inflammation; and it is probable that, were the analogous masses found in the intestines in cholera and yellow fever to be similarly examined, they would present the same physical characters.

The condition of the blood and of the internal organs in persons who have died of cholera has been made the subject of laborious investigation by Garrod, Gairdner, Raikem, Levy, and other pathologists. It is to be regretted, however, that, in many of these observations, sufficient attention has not been paid to the stage of the disease in which the patients have died, and especially to the amount of serous draining which has taken place; for it is evident that on this must in a great measure depend the state in which we shall find the residual blood.

In his valuable paper on the "Blood in Cholera", published in the *London Journal of Medicine* for May 1849, Dr. A. B. Garrod draws the following conclusions from his own investigations, and from those of Drs. O'Shaughnessy, Thomson, and Clanny, and MM. Lecanu, Rose, and Wittstock:—

"1. In cholera, the physical characters of the blood are altered, and its tendency is to become thicker, tar-like, and less coagulable.

"2. The proportion of water is much diminished.

"3. The specific gravity of the serum is very high, which is due to the increase of the solid portion of the serum, and especially of the albumen; and the fluid also tends to become less alkaline in its reaction.

"4. The saline constituents of the blood are not only not decreased in amount, but sometimes exist even in increased proportion; and the diminution of its alkaline reaction is not due to the loss of salts, but to the impeded excretion of organic acids which are constantly being formed in the system.

"5. Urea usually exists in increased quantities in cholera blood, but the amount differs considerably in the different stages of the disease, being but small in quantity in the intense stage of collapse, increasing during reaction, and in excess when consecutive febrile symptoms occur."

Dr. W. T. Gairdner, in his "Memoir on the Pathological Anatomy of Cholera", published in the *Monthly Journal* in 1849, says: "The remarkable viscosity so often noticed was chiefly observed in cases fatal during the collapse or early reaction; and was certainly owing to the removal of the fluid matter by the intestines." These remarks of Dr. Gairdner I believe to be very correct. It is to the excessive evacuation of the fluid part of the blood that we must refer the spissitude of that portion which remains in the vessels: and it is from the examination of patients dying in the stage of collapse, or of early or feeble reaction, that the description of the blood in cholera has mainly been taken. Of the blood in the earlier stages, less is known; but Dr. James Bird, after stating that he was rarely able to obtain blood from the veins of patients in the collapse, says that, "in the earlier periods, the blood flowed more freely from the veins of the arm, though it trickled down in a small feeble stream"—evidently showing that, although alteration had commenced, it had not become so far inspissated as is commonly described.

Dr. Zarlengo of Naples, says that cholera is a disease in which the blood is unfit to support life. He remarks—"Hæc crasi corrupta fit ut sanguinis serosa pars e cruore disjungatur ac ad tubum gastricum congregatur; ex quo evenit, ut materia serosa continuo vomatur aut per alvum ejiciatur, dummodo membrane serosæ atque vesica urinaria, liquore omnino carens, exarescit." (Quoted by Knox, *op. cit.* p. 50.)

The remarks which I have made with regard to the importance of noting the stage of the disease apply with great force to the pathological conditions of the internal organs. Let me take an example from among other diseases. A patient may die in the early stage of scarlatina, and may have had anasarca and albuminuria, but we may find the kidneys only congested; whereas, if we examine these organs in one who has died after suffering from dropsy and albuminuria for weeks or months, we shall probably find degeneration. The observations of Drs. Gairdner and Raikem were made on patients who had died in the stage of collapse; and they, as well as those of MM. Levy and Tholozan and others, point to a general deficiency of blood in the system; many organs presenting the appearance of bloodlessness in a marked degree. It is true, that "congestion" and "sanguineous infiltration" have been mentioned by MM. Levy and Tholozan, as being found in the algid stage; but these phenomena are by no means to be confounded with the congestion or subacute inflammation arising during reaction. They are, I think, chiefly mechanical effects of the thickening of the blood; and in this way also are to be explained the "subpleural ecchymoses", "hyperæmated vascular ramifications in the gall-bladder", "hyperæmated villousities" in the stomach (Raikem), and the ecchymoses, arborisations, etc., described by Levy and Tholozan as present in the intestinal canal. These observers mention the congestion of the kidneys, and effusions in the lungs; but they also describe the blood procured from these "congested" organs, by section and pressure, as being thick.

I have not considered it necessary to enter minutely into the appearances presented by the various organs in cases of death from cholera, believing that more information is to be gained from a careful consideration of the alterations produced in the blood. It is simply absurd to fix on any part, and to say that, because we there find "congestion" or "inflammation", cholera has its seat there.

* Majendie, *Leçons sur les Phénomènes Physiques de la Vie*, tome iv p. 226. Paris, 1838.

If indeed any of the appearances of hyperæmia found in cholera patients are referrible to the same causes as the eruptions of measles or scarlatina, or to the bronchial or renal congestions in these diseases, they are not, in the present state of our knowledge, to be distinguished from those—probably the most numerous class—which obviously arise from the cause to which I have already so often referred—the inspissation of the blood, and the consequent impediment to its passage through the capillaries.

The adoption of the following conclusions seems to be justified by the facts and analogies now brought under review:

1. Cholera is a fever, intimately related to those fevers which depend on malaria.
2. The intermittent or remittent type can be generally recognised in the milder, and also not unfrequently (though less distinctly) in the severer cases.
3. The stage of collapse ought to be considered as an aggravated cold stage of the paroxysm of a pernicious fever, which may spontaneously terminate in death or reaction.
4. The least dense portion of the blood has an excessive tendency to exude through the capillaries of the stomach and bowels, and pass from the body by vomit and stool.
5. The inspissated residual blood being unable to pass through the small pulmonary vessels, causes congestion of the lungs; and as speedy consequences of this condition, paralysis of the right side of the heart from over-distension, asphyxia, and other subordinate derangements of the vital actions.
6. Death may take place from
 - a. Asphyxia.
 - b. Necræmia, with loss of the least dense portion of the blood by stool and vomit.
 - c. Necræmia without such loss of the least dense portion of blood as can be discovered during life—the exudation remaining within the stomach and intestines.
 - d. Toxæmia from absence or deficiency of sanguineous depuration.
 - e. Inflammation of lungs or other organs supervening in convalescence.
 - f. Debility.
 - g. Gastro-enteritis.
 - h. Two or more of the above causes combined.
7. The anatomical lesions found on dissection vary with the causes of, and circumstances attending, death.

V. TREATMENT OF CHOLERA.

The advocacy, by many, of a uniform and empirical system of treatment of cholera, has greatly tended to obstruct the progress of rational inquiry. Several plans, and particular remedies have been found useful; and practitioners, impressed by the published account of this success, have too often contented themselves with empirically repeating the instructions of others, without carefully analysing the facts and seeking for a rational explanation of the *modus operandi* of the therapeutical agents which they employ. The stage of the disease has not been sufficiently noted in relation to the therapeutic means employed; and recoveries have been too largely designated cures. With one, capsicum has been the specific; with another, camphor; with another, sulphuric acid; with another, acetate of lead; with another, quinine; and so on might the list be indefinitely extended. Now, that all of these and other medicines are *par excellence* cholera remedies, I perfectly believe; and it seems to me that a more successful treatment is to be discovered by a judicious application of the means which we possess, than by searching for some new specific.

It seems to be of primary importance to bear in mind that we have a poison-disease to deal with, resembling, if not indeed identical with a pernicious ague: that it has a course to run, which may be modified and curtailed, but which, even when let alone, shews a disposition to terminate in recovery. We have, therefore, in the first stage, in which chills and

other premonitory symptoms of discomfort may be present, to adopt measures which may be regarded as prophylactic rather than curative. It is in this stage that the pernitrate, or some other preparation of iron, and the disulphate of quinine, are of signal benefit. Here, however, we must not follow a blind empiricism. We must, if the digestive system is at fault, combine with the use of these special medicines a judicious alterative system; and, should there be any tendency to copious watery evacuations,—the serum of the blood,—we must be prompt in our administration of those remedies which are generally termed hæmostatics; among which may be particularly mentioned quinine, sulphuric acid, nitrous acid, acetate of lead, creasote, and nitrate of silver. If the case should proceed a little farther, in spite of our endeavours to arrest its progress, or should the case, from its inherent intensity, or from neglect, not present itself for medical treatment till the secondary effects of the loss of serum have become apparent, we may probably find it useless to think of the quinine, and be obliged to treat the cramps and collapse which threaten speedy dissolution. The necessity for diffusible stimulants is now apparent: and, of them all, as a general rule, camphor will be found the most useful. It can be conveniently administered in large doses by dissolving it in chloroform; and the solution combines so well with creasote, that it will often be found prudent to confine our administration of medicine to frequent doses of a mixture of camphor, chloroform, and creasote. The chloroform is useful as affording facilities in dispensing; and it cannot, in the small quantities administered, do any harm. The camphor acts quickly as a diffusible stimulant; and the creasote has a powerful effect in restraining the serous discharge. Indeed, I am inclined to think that its beneficial effects are not much, if at all inferior in this respect to those of sulphuric and nitrous acids. External warmth, and the use of stimulating embrocations, are very beneficial in conjunction with the internal use of camphor. The suppression of urine is not a symptom which is to be relieved by the administration of diuretics; it is a necessary consequence of the congestive paroxysm of the disease, and its removal is likely to follow the cessation of that paroxysm.

Enormous doses of opium, of calomel, and of other powerful drugs have been given to cholera patients; and there can be no doubt that such substances, when introduced into the system when in a state of collapse, are not likely to produce any very suddenly appalling effects. And indeed, in a vast number of cases, they seem to lie as quietly in the stomach of the cold cholera patient, and to produce as little effect, as if they were deposited in a glass bottle. Should the patient, however, emerge from the state of collapse, he runs as great a risk from the poisonous doses of these medicines which have been placed in his interior, as he has just escaped from the pestilence. Large quantities may certainly pass off by the bowels, unacted upon; but it cannot be questioned that in a very great number of cases which have been treated in the way mentioned, patients have had their convalescence abruptly arrested by fatal narcotism or exhausting salivation. The use of opium and calomel, in ordinary doses, is often necessary: but the inordinate doses of these medicines formerly, and perhaps still, employed by some, cannot be too much condemned.

The importance of arresting the serous discharge, and of maintaining the warmth of the body by the application of heat externally, cannot be over-estimated. In fact, the judicious carrying out of these intentions constitutes the essence of the treatment of cholera. Other therapeutic measures may be regarded as liable to considerable variety, according to circumstances, and as valuable and auxiliary, rather than as always indispensable. The prompt arrest of the serous discharge, by creasote, sulphuric acid, nitrate of silver, or other remedy, has undoubtedly saved innumerable lives; and from amid the chaos of contradiction, depreciation, and laudation, in which the merits of special modes of treating cholera are involved, the diligent application of warmth to the surface can be extricated as a measure of established value.

Mr. Barwell, in a little work just published, says: "It is

a grand essential to keep up the temperature of the patient, since the tendency to become cold is certainly a great characteristic of this disease. Hot bottles should be placed to the feet, and inside of the thighs; and India-rubber bags filled with hot water to the loins and abdomen. The bed-clothes must be ample, and should be so arranged, by means of an extra blanket wrapped round the shoulders, or passing round the chest and under the arms, that he does not bare that part to the cold in his restless jactitations, nor in rising on the elbow to vomit, as he may perhaps frequently be obliged to do." These recommendations of Mr. Barwell are sound and practical. They are, moreover, firmly based upon facts which came under his observation in St. Thomas's Hospital. In the following passage, he states very clearly, and, I think, very correctly, the relative value of internal stimulants and external warmth in cholera; and he also refers to the hospital experience already referred to, upon which his opinions are founded.

"Stimulants," says Mr. Barwell, "such as brandy, ammonia, or wine, though decidedly useful in their place, have not such effect in restoring circulation, and exciting the system to greater action, as in collapse from other disease; indeed, considering the difference of its cause in this and in other maladies, it is not to be expected that they would be as beneficial; for prostration usually occurs in consequence of nervous shock, and consequent loss of nervous power; therefore stimuli which act upon that system are naturally, in those cases, such as would benefit. But in this disease there is comparatively little loss of nervous power; in fact, with so great disturbance of the circulation, the retention of nervous power is marvellous. Our remedies ought not, therefore, to be directed through that system, but we should, if possible, find some means of acting on and recalling the circulation, without exciting the nervous centres; and the best mode of doing this is by external heat. This principle of combating the deadly cold collapse was not found or recognised at St. Thomas's until after several cases had been treated at the hospital, and the general inefficacy of medicines or of stimulants proved. Though a certain number under the treatment then adopted recovered, still the whole result was unsatisfactory: thus, of twenty-eight cases of perfect collapse, before external heat was used, seven only recovered—a very small proportion; but, after this was employed, sixty-one patients were treated by some mode in which this formed an essential part; and of these, twenty-seven recovered, or not very far from half the whole number." (p. 97.)

Did space permit, I could adduce much evidence of the same description, in addition to that which has now been quoted. In fact, I could show that the success which many have ascribed to favourite pharmaceutical nostrums, ought, with much greater probability, if not with absolute certainty, to be ascribed to the external warmth employed along with the drugs.

Having now glanced at the general principles upon which medicines ought to be employed in the treatment of cholera, I would now remark, that I have not enumerated every drug which may be usefully employed, and have selected those with the operation of which I am personally most familiar. This much, however, may be added; that they are good types of the respective classes of remedies to which they belong.

The formulæ to be adopted must of course be varied in accordance with the circumstances of each case; and it is by a ready power of modifying these formulæ, that the skill of the practitioner is displayed. The formulæ cannot be too simple. No therapeutic advantages flow from the multiplicity of ingredients; and by administering remedies for the purposes of clinical study, as well as of cure, it is obviously necessary not to give more than one medicine, or one class of medicines, at the same time.

The following medicines possess in a high degree the power of arresting the serous diarrhoea, which generally precedes collapse by a good many hours, and which is the immediate cause of that collapse as well as of the cramps:

Creasote;
Turpentine;
Sulphuric acid;
Nitrous acid and nitro-sulphuric acid;
Nitrate of silver;
Quinine;
Gallic acid;
Alum; and
Acetate of lead.

1. *Creasote*. Some patients refuse to take creasote, from a dislike to its odour; but if one or two doses of two or three drops can be taken every hour or two hours, in mucilage, I prefer it to any other means of cure in serous purging. It hardly ever fails.

2. *Turpentine* may be used in place of creasote, in doses of ten minims. I have in several cases of diarrhoea found it quite successful.

3. *Sulphuric Acid*. The use of this acid in diarrhoea is by no means new. The late Dr. Anthony Todd Thomson, in his *Dispensatory* (Edit. 1837, p. 762), wrote as follows: "When combined with mucilages, it has been beneficially given in passive diarrhoea, operating on the relaxed nervous coat of the intestine as an astringent. The usual dose is from ten to thirty minims, but this dose may be very often repeated." In later years, its use has been revived; and several writers in the various medical periodicals have spoken in high terms of its efficacy. Among these I may mention Mr. W. I. Cox of Kensal Town, who has also employed it in cholera; (*Lancet*, for August, September, and October 1849, etc.); Mr. W. Griffith of Eaton Square, (*Ibid.*, Oct. 4th, 1851); Dr. G. B. Payne; Dr. Miller of Stoke Newington; Mr. Edgar Sheppard of Enfield (*Provincial Medical and Surgical Journal* for September 15th, 1852, and *ASSOCIATION JOURNAL* for March 18th, 1853); and several other practitioners. To Mr. W. I. Cox is due, as far as I am aware, the merit of having first employed sulphuric acid in the treatment of cholera. In a tabular view of the result of treatment of ninety cases, given by him in the *Lancet* for January 26th, 1850, five are mentioned as having been treated with sulphuric acid, generally in combination with Dr. Ayre's method. Four of the cases so treated recovered; but we can scarcely draw a conclusion from so small a number.

Dr. Fuller, of St. George's Hospital, in a paper lately published in the *Medical Times and Gazette*, speaks in high terms of the efficacy of sulphuric acid in arresting diarrhoea. In bilious diarrhoea, and in certain chronic diarrhoeas, he says it is of little or no avail; but in epidemic diarrhoea, in "acute autumnal diarrhoea", and in more decided choleraic diarrhoea, he has known no single instance of its failure. He gives it in doses of half a drachm mixed with water every twenty minutes or oftener; and the effects produced are described as remarkable; heat returns to the extremities; the nausea and vomiting cease; the purging is stayed; the cramps subside; perspirations generally break out; the tongue becomes moist and slightly coated; the intestinal evacuations become healthy; and the pulse regains its normal steadiness.

In epidemic cholera, Dr. Fuller has had no experience in the use of this remedy. He would give it in doses of ℥xl or ʒj, five or six times in an hour, simply mixed with water; and he is opposed to the employment at the same time of brandy or any strong flavoured stimulant or carminative. Calomel, if it is thought necessary, may be given at the same time with, or after the acid. Mustard, bran, or other warm poultices or fomentations, may be applied; they usually afford relief. From the prompt action of sulphuric acid in arresting diarrhoea, Dr. Fuller expresses great hopes as to its superiority in cholera over other medicines which require a longer time for their action.

4. *Nitrous Acid and Nitro-Sulphuric Acid*. Mr. W. J. Anderson, in the *ASSOCIATION JOURNAL* of Nov. 4, 1853, recommends a combination of nitrous acid and sulphuric acid. He says: "Can a remedy be found which will readily yield up its oxygen, and supply that element to the impure blood; and at the same time, by its astringent properties,

tend to check the enormous exudation which takes place from the mucous surface of the intestinal canal? In our present state of knowledge, some of the mineral acids appear to be the best adapted to this purpose; and, for certain reasons about to be explained, a combination of nitric with sulphuric acid seems to me to be preferable to any other. The acid should be administered in tolerably full doses, and repeated at intervals varying according to the nature and urgency of the case. For an adult, we may give *acidi sulphurici diluti f. 3ij*, *acidi nitrici diluti f. 3j* in a six ounce mixture, an ounce being the dose for an adult.

Mr. Hope, of Chatham, in the *Edin. Med. and Surg. Journal* of July 1826, recommended nitrous acid in cholera. He spoke strongly of the efficacy of the following mixture:

R *Acidi nitrosi 3j*.
Mistura camphoræ 3viij.

Misce, et adde tincturæ opii ʒij.

Of this one-fourth is to be taken every three or four hours. Mr. Whiteman, of Putney, informs me that he finds nitrous acid so prompt and so satisfactory a remedy in epidemic diarrhœa, that he trusts to it in preference to every other medicine. He often combines with it a little laudanum, but, in the majority of cases, he uses the acid alone. I have not used nitrous acid in diarrhœa or cholera; but I have no doubt as to its value in arresting the discharges.

5. *Nitrate of Silver* I have not given in cholera and diarrhœa, except in the form of enema. It is valuable in this form. My experience is too limited to enable me to compare the efficiency of enemata of nitrate of silver with enemata of acetate of lead, and of alum.

Dr. Lever and Dr. Aitken are the principal English writers who advocate the use of nitrate of silver in cholera and diarrhœa. On the continent, the authorities by whom it is recommended are Hirsch, Canstatt, Boudin, Bouchardat, and Trousseau. Dr. Charles Lever, in 1832, extolled the nitrate of silver as a remedy in cholera. In a forlorn case, he administered thirty grains dissolved in three ounces of distilled water, which the patient swallowed at once. She lay quiet for six minutes, when she vomited a small quantity of whitish turbid fluid. She had no return of the vomiting, fell asleep, and recovered. [*Johnson's Medico-Chirurgical Review*, Oct. 1834, p. 444.] I give ten grains in half a pint of water as an enema. Hirsch prescribed it in the form of mixture; and I am sure that it is a safe medicine in this form, as I have given it internally in other diseases, dissolved in abundance of water. The danger lies in giving the medicine in too concentrated a form.

6. *Quinine*. Of the power of quinine to check epidemic diarrhœa, and to thus arrest cholera in what may be regarded as its first stage, I feel well assured, from an extensive use of the remedy. It is true that I have generally combined it with sulphuric acid, or with iron, and sometimes with both; so that my facts are not available for the purpose of accurately determining the value of the quinine given alone. Dr. James Bird and others have, however, from ampler data, arrived at the same conclusion. Dr. Mandl, in the *Gazette Médicale* of October 29th, p. 682, speaking of the importance of checking the diarrhœa which he has generally found in the initiatory stage of cholera, says, "the most powerful means of arresting epidemic diarrhœa is by administering disulphate of quinine in doses of ten centigrammes (a grain and a half) every two hours." He says that he has seen cases of cholera, in which opium and injections had failed to arrest the discharge from the bowels, cured by quinine in twenty-four hours. Dr. Charles Bell, who has written so ably in favour of the doctrine that cholera is a fever of a remittent or intermittent type, naturally advises quinine. He says: "If asked what I should do in a case of cholera, I should answer, that that depended very much on the stage in which I found my patient; but, in all cases and in all stages, I should certainly give a largely diluted solution of some salts of iron and quinine, with a view to counteract the morbid inactivity of capillary congestion, and repeat it as often as the patient would drink of it, till warmth was restored." The practice is, there can be

little doubt, correct; but it is equally probable that it is a method well calculated to stop the diarrhœa, which Dr. Bell strangely considers salutary. He makes this dangerous announcement:—"Diarrhœa is a natural mode of relief to congestion, and thereby tends to the prolongation of life." The hæmorrhage from the stomach thrown up as black vomit in yellow fever, is nature's mode of relieving congestion; but it is not a salutary hæmorrhage. Within certain limits, a serous or a sero-sanguineous discharge may be harmless, or even useful; but in as much as it is physically impossible for the blood to circulate when it has been deprived of its serum, so is it imperative upon the practitioner to restrain the serous evacuations of cholera.

7 and 8. *Gallic Acid and Alum*. I have often used these remedies in the diarrhœa of phthisis, and occasionally in epidemic cholera. They are less to be relied on as means for arresting serous diarrhœa than creasote and the mineral acids. They are not superior, and hardly equal, to logwood and catechu, as mere astringents; but I know that some authors regard them as especially the astringents to be used in cholera and serous diarrhœa.

9. *Acetate of Lead* may be used internally alone, or in combination with opium. It is generally a prompt astringent when used in the form of enema.

I have not space to enter upon a consideration of all of several reasonable methods of treatment which have attracted the attention of the profession, and deserve to be spoken of with respect. I can only notice one of them at present.

The sulphur plan, as advocated by Mr. Grove of Wandsworth, has evidence in its favour, though I do not think that the theoretical ground—the fungus theory of cholera—upon which it is advocated, is tenable. Mr. Grove uses the following formula:—

R *Sulphuris precipitati 3j*.
Sodæ bicarbonatis 3j.
Sp. lavandulæ compositi 3vj.
Aquæ q. s. ut fiat mistura 3iij.

A teaspoonful of this is taken every half hour or every quarter of an hour. Mr. Grove informs me that the effect of the medicine is to restore warmth, and promptly to check the serous discharges.

I believe Mr. Blacklock was the first author who recommended sulphur as a remedy for cholera. Although I have no personal experience of its virtues, I may quote, in connexion with this subject, the following passage from a letter dated September 22, 1849, which I received from a non-medical friend residing in Edinburgh:—

"I saw a man to-day from the south mairs, who told me that his wife and he, as well as many of the people of his remote landward parish, had been very unwell; and, from the symptoms which he mentioned, it was clear that they had suffered from cholera, and had been saved from it. They had no medical man near them, and got no medical attendance; yet there were no deaths. As soon as they found cramps come over them, they took a teaspoonful of powdered brimstone, or sometimes the flowers of sulphur, mixed with a little whiskey, to which was added water, if the sick could not otherwise swallow the dose. The man described the cure as certain and very rapid. Try this on the London folks; it may serve the afflicted, and do you much good."

Mitchell says that, "the sulphureous localities of the sickly island of St. Lucia are its only salubrious places. Cities, too, which abound in sulphur products.....enjoy an immunity from ague, for which they are everywhere noted. Immediately around the sulphur works, and factories for making gunpowder and sulphuric acid, the vegetation and the ague disappear together". To this we may add, that, in 1849, during the bombardment of Rome, that city suffered much less than usual from malarious fevers,—a fact which induced Mr. Walker to recommend cannonading, and the discharge of fireworks, as measures likely to ward off, or prevent the spread of, cholera. The rushing of columns of air, caused by the production of a vacuum, is, however, the more probable explanation of the benefits (if any) which

resulted from the cannonade. Mr. Blacklock (Madras, 1848) says: "I hope yet to see the day when sulphur, in small quantities, will be regularly issued to every soldier in the field, in India, say forty grains per day, while actually marching, and twenty grains per day, during halts, as a sure way of warding off this terrible disease; and I have a firm belief that sulphur, so employed, will be as effectual in banishing cholera from our armies, as lime-juice has been in eradicating scurvy from our fleets."

Mr. Grove quotes the following curious passage from the *London Practice of Physic*—a work published in 1692:—"In the year 1670, about the autumnal equinox, a world of people here were seized with a most dangerous flux (though without blood), and joined with a cruel vomiting, which presently caused great faintings and a total decay of strength. For the cure of this disease, no evacuation did good; nay, bleeding, vomiting, and purging did hurt: only cordials, and those of the hottest nature, to wit, such as abounded with *spirit and sulphur*, did good." (p. 22.) From this, it would appear that the whiskey and sulphur treatment of the south muirs of Scotland is an old tradition.

Manec administered sulphur in all possible forms, in his treatment of Cholera in the Salpêtrière in 1849.

Sulphur is a stimulant of the capillary circulation, and so is camphor—one of our best remedies against collapse. Perhaps the combination of the sulphur with hydrogen is the cause of the augmented heat in the surface of those who take the former in repeated doses. The characteristically offensive smell of sulphuretted hydrogen gas is sufficient proof that this chemical action does take place. The therapeutic action of sulphur is, however, yet open to investigation.

The treatment of cholera cannot be reduced to any routine formulary, but ought to be adapted to the particular condition of each patient in each stage of the disease.

The principal indications of treatment may be thus summed up:

1. The "rice-water" vomit and purging require to be energetically subdued by quinine, sulphuric and other acids, creasote, nitrate of silver, and such like remedies.
2. In actual and threatened collapse, external warmth, stimulant embrocations, and those internal stimulants which act on the capillaries, are of signal benefit.
3. In reaction, and during convalescence, local inflammations and congestions require to be guarded against or subdued; and rational means must be adopted to restore the secretions of the liver, kidneys, and skin, but particularly of the two former.
4. Lastly, though not of less importance, the character of the fever should be modified, and a repetition of the paroxysm guarded against, by change of air, or by the administration of quinine, which, in the majority of cases, from the existence of anæmia, ought to be conjoined with iron.

Putney, London, November 5, 1853.

REPORT OF THE READING PATHOLOGICAL SOCIETY.

By W. W. MOXHAY, Esq.

[Read June 28th, 1853.]

The annual retrospective address of the Reading Pathological Society contains many cases of interest; and will serve to shew how great an amount of information may be derived from attendance on such meetings. The cases are arranged under the heads of the various systems diseased.

DISEASES OF THE NERVOUS SYSTEM.

SOFTENING OF THE SPINAL CORD: DEATH. By T. L. WALFORD, Esq. (June 30th, 1852). Mr. Walford mentioned the case of Edward Gore, aged 51, who got wet on the 9th October 1852, and lay asleep for some time in an outhouse in his wet clothes. On the 11th, on rising to go to work,

he found great difficulty in moving his legs. On the 12th, his arms also became weak, and he became restless, constantly requesting to be lifted out of bed, etc. On the 20th, articulation became difficult and indistinct; his breathing also became difficult and gasping; his voice dwindled to a whisper; and he expired on the 21st.

Examination of the Body. The spinal marrow was found softened in parts, in some being quite diffident, and there was much fluid in the theca vertebralis. This case seemed very similar to that of the late Mr. Dunn. He was exposed to cold; numbness and loss of power in the feet began soon after, with the addition of pain along the sciatic nerves, and in the sacrum. The paralysis gradually crept upwards, and ultimately killed him by suffocation, from the intercostal and phrenic nerves being implicated. A *post mortem* examination would doubtless have revealed a similar state of things to that found in Mr. Walford's case.

TETANOID DISEASE. By F. A. BULLEY, Esq. (Nov. 24th, 1852.) George Chilvers, aged 19, applied at Mr. Bulley's house on the evening of April 26th, with painful tonic contraction of the forefinger and thumb of the left hand, the result of a wound which he had received four days previously. He was told by a fellow-servant that he might have locked-jaw; and soon afterwards, in gaping, his mouth became fixed in the open position, and he could not shut it again for five minutes. Tobacco steeped in brandy was applied, and the muscles relaxed. Soon afterwards, the boy took hold of a broom, and the hand became so firmly clenched on the handle, that he could not let it go for some time. He seemed to have been much frightened by something a druggist practising in the town said to him, and applied in consequence at Mr. Bulley's surgery. Mr. Bulley found a slight cut between the thumb and forefinger nearly cicatrised. The countenance expressed alarm; the pulse was quick, but feeble; and the skin pale and cold. The chief complaint, on the patient's part, was that the jaw, finger, and thumb, were very stiff. Mr. Bulley was about to pass a few mild shocks of electro-galvanism from the brachial plexus downwards, and had just adjusted the poles of a battery for that purpose, when the boy swooned. On his recovery from this state, muscular twitchings took place in the body and limbs, and the whole became convulsed, the trunk being violently bent backwards as in opisthotomos, so that three men were required to hold him. Some froth oozed from his mouth. The convulsions recurred frequently, and the boy seemed partially insensible in the intervals. He spoke little, and with difficulty. The skin remained cold and bathed in cold perspiration, and the pulse very feeble. The muscular disturbance began to diminish in about four hours, when, a conversation being held in the patient's hearing about procuring a shutter, and the necessity of conveying him on it to the hospital, it ceased altogether, and he was removed in a state of fatigue to that institution. He subsequently complained of some pain up the arm, and the finger and thumb remained contracted into the palm of the hand for some days. He had, however, no further convulsions, and was soon discharged well.

DISEASE RESEMBLING HYDROPHOBIA. By F. A. BULLEY, Esq. (Nov. 24th, 1852.) Mr. Bulley was called on the 2nd September, 1851, at 8 P.M., to James Woodlands, aged 28, a man of intensely melancholy countenance. He found him laid on some bedding in a yard in Friar Street, with several people holding him, whilst his body and limbs were affected with violent contortions. These had been going on for some time, and recurred every five or ten minutes. In the intervals, he was moody, frequently sighed, and was obstinately silent. The jaws were firmly closed, except when a teaspoon or cup containing fluid was brought near him. He in this case made attempts to bite at the article, and his countenance became expressive of great horror; he would utter a low groan, his features relaxed from their malignant expression, muscular contractions ensued, beginning in the face and extending over the whole body, which, at length, was thrown into convulsions, so violent