Thoughts on cholera / by Edwin Hearne.

THOUGHTS ON CHOLERA.

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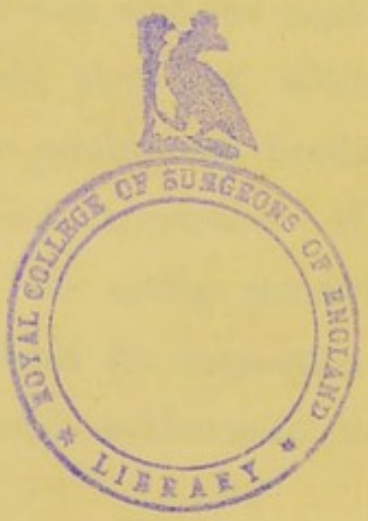

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PREFACE.

CHOLERA having again made its appearance in this country, I cannot but feel that those who have already had the opportunity of witnessing the disease, and testing any given mode of treatment, would be consulting too much their own ease and neglecting the general good, should they not, without delay, make known to their professional brethren the results of their individual experience. With such impressions, I should be acting somewhat inconsistently did I not submit for inspection an outline of my own views, with evidence of their practical application.

I am aware that some points in connexion with this interesting subject, such as the history, post-mortem appearances, &c., have been but slightly

touched upon, or altogether omitted in the following pages; but so fully have they been described by others that, had I made the attempt, I could only have repeated what has been already made known. Imperfect as, I fear, this endeavour at elucidating a somewhat obscure subject may appear, I am not without hope that it will prove to some extent a guide to the successful treatment of this much dreaded malady.

The arrangement of the subject may be regarded as peculiar, but it is consequent upon the description being given in the order in which the disease presented itself to my observation during the epidemic of 1849.

I have first grouped and described its various stages and modifications, then specified individually my fatal cases, which will show that I had opportunities of becoming familiar with the disease in its worst and most rapidly fatal forms, and that it was as deadly here as elsewhere if neglected, or inefficiently treated. Two hundred and thirty-nine died of cholera in Southampton within three months, and thirty-four of diarrhœa.

I have next discussed the question as to what we know concerning the real nature of this disease, and expressed opinions relative to its contagious or non-contagious character, on which points I have derived great assistance from the facts published by Dr. James Mackintosh; as also, from the article on Cholera, in the Library of Medicine, by Dr. G. Budd. I have then endeavoured to interpret the importance of individual symptoms in relation to the necessary remedial measures; and to explain the principles on which treatment is to be based. Lastly, I have attempted to show to what an extent plans of treatment, apparently different, agree.

In conclusion, I may remark that we understand the nature of a given disease, only in proportion as we correctly interpret the phenomena dependent thereon. This being accomplished, there is a foundation on which may be erected a rational and successful plan of treatment; but until that be attained, all must be unsound, confused, and ineffectual.

In the general correctness of the views to be

hereafter advanced, I have every confidence, and feel well satisfied in leaving it for time and experience to confirm or contradict their reality and practicability.

Southampton,
September, 1853.

THOUGHTS ON CHOLERA.

The following observations on the subject of cholera are founded on the experience derived from the treatment of some 570 cases, during the months of July, August, and September, 1849. I include in this number about 200 cases of severe diarrhœa, which I could only regard, in the late epidemic, as the incipient stage of Asiatic cholera—a view supported, I believe, by most other observers. That it was much more than the diarrhœa of ordinary seasons was indicated by the fact, that the remedies which arrest common diarrhœa had little or no influence in checking this; as, also, by its invariably (if inefficiently treated) having glided insidiously into true cholera, and that, too frequently, in the course of a very few hours. This premonitory stage, as it could only be rightly regarded, was usually preceded by chilliness, a feeling of general lassitude, and a sense of weight and oppression at the chest;

dizziness of sight, ringing in the ears, and giddiness were frequently complained of; there was an indescribable feeling of emptiness referred to the region of the stomach, together with a peculiar sinking sensation in the abdomen; in some instances accompanied, at intervals, by severe colicky pains, and even violent cramps in the belly and extremities were not uncommon. The diarrhœa was almost always preceded and attended by much flatulency; the tongue being whitish and clammy, and the pulse quick and irritable.

The relaxation did not commence with evacuations uniformly liquid, or semi-fluid, but with a peculiar admixture of much divided, dark, lumpy fæces, and a fluid resembling soapy water; after a time, assuming a barmy aspect, then becoming more watery and lighter in colour, and by degrees putting on the peculiarly characteristic "rice-water" appearance.

This stage would sometimes extend over an interval of several days, or even weeks, but more generally ran its course in as many hours.

Vomiting was by no means an unfrequent attendant on this premonitory stage, yet it was as often altogether absent.

The next group of cases, numbering about 223, embraced such as had passed on to the stage of

incipient collapse: this was characterized by a rapid failure of strength, vomiting, purging, (rice-water or serous,) sweating, (cold and clammy), cramps, affecting chiefly the extremities, a burning sensation at the epigastrium, much flatulency, with a feeling of rolling and turning about in the abdomen, great thirst, diminished secretion of urine, respiration somewhat quickened and short, voice husky, breath cool; tongue cool, flabby, sodden, and whitish; heart-sounds feeble, but in other respects natural; pulse greatly accelerated and of a somewhat thready character. There were not wanting those marks which would most forcibly strike the casual observer—the coldness, the bluish tinge, and incipient shrinking of the surface, the peculiarly anxious expression of countenance, and the sunken eyes beginning to be surrounded by the broad, livid circle, so characteristic of the ulterior stage.

The third group, of about 130 cases, included such as had passed beyond the commencing collapse already described, some, even to the stage of extreme collapse. The majority of these may be said to have been in the following condition—viz., vomiting was generally present, also purging (serous), sweating and cramps, but usually of a less violent character than in the last-described stage; in a

few, the vomiting, purging, and cramps, had abated if not entirely disappeared; the sweating, still cold and clammy, was even more profuse; the burning sensation at the epigastrium much complained of; thirst excessive; urine very scanty and high coloured, or altogether suppressed; this suppression continuing from twelve to sixty or seventy hours, and being not unfrequently followed by retention, which lasted from one to six or seven days; the breathing hurried and short; the articulation unaffected, but the voice small and shrill, or even reduced to a whisper; the breath cool, sometimes cold; tongue cold and sodden; the heart's action feeble and rapid; pulse thready; the surface of the body, especially of the face and extremities, bluish, cold, in some cases almost amounting to an icy coldness, and shrivelled; the expression of countenance had now assumed a terrible aspect, anxious, contracted, and more decidedly livid; the nose sharpened; cheeks drawn inward; eyes sunken, and surrounded by broad livid circles. Consciousness was usually preserved unimpaired to the last, and although there was an indication of the greatest anxiety during the first and second stages, in that of extreme collapse there was evidenced the most perfect indifference as to what might be the result.

A fourth class of cases, about ten in number,

was met with, in which there was no vomiting or purging, but cramps, great prostration, and the other symptoms, as already enumerated, were present; in some cases highly developed, in others not so far advanced.

In a fifth class of cases, numbering about the same as the last, the patients were seized suddenly, and fell down insensible, as if shot. Such attacks were mostly observed when the disease was raging at its height. Three of these had neither vomiting nor purging; three, vomiting, but no purging; whilst in three or four, both vomiting and rice-water evacuations were present. The other symptoms appeared in various degrees, as in the stages already described. As these patients rallied from the state of insensibility, they became at intervals much cramped, and frequently violently delirious; but recovery took place, as a general rule, in the course of a few days.

The following may be taken as illustrations of this last class of cases, viz. :—A female, aged 50, and to all appearance in her usual health, which was tolerably good, was seized as above described whilst standing and talking with a friend; there was complete insensibility, neither vomiting nor purging, but sweating, suppression of urine, a quick, almost imperceptible pulse; short, hurried

breathing; tongue, breath, and surface cool; marked lividity of lips and skin; features contracted; eyes sunken, each surrounded by a broad livid circle, and the voice small and shrill. Such was her condition for about thirty hours, after which time she slowly recovered, and was pronounced convalescent at the end of a week, but remained much debilitated for upwards of a month.

This patient's son, aged 17, was seized in the same manner, and lay insensible for six hours; he then rapidly recovered, and was walking about, although very feeble, the next day.

The husband suffered from a severe attack of vomiting and purging (rice-water), cramps, and other attendant symptoms; he became greatly prostrated, but eventually did well.

These patients resided in a house situated at the junction of four streets, having in the central space, within a few yards of their door, an open, untrapped grating, communicating with the sewer, from which emanated the most fœtid gases, such as could not do otherwise than completely pollute the atmosphere of the immediate neighbourhood.

A few cases were met with, which may be well regarded as a modification of the last-described class; these were characterized by severe head symptoms, such as more or less pain referred to

that region; great giddiness, dimness of sight, noise in the ears, dilated sluggish pupils, but no loss of consciousness; vomiting, great general prostration, and pain in the back and limbs, were usual attendants; the tongue covered with a whitish fur, and the secretions generally deranged, but usually no violent action of the bowels. One such case was attended by partial paralysis, but this proved temporary in character. I may here state that I have altogether excluded from my description a large number of cases of mild diarrhœa, for which I was called upon to prescribe.

Having giving an outline of the phenomena presented by the different stages, and spoken of the exceptional forms, as far as my opportunities of observation extended, I will next particularize such fatal cases as occurred in my own practice, and will then hazard a few thoughts on the nature, causes, and treatment of this much dreaded disease.

1.—R. L. H., aged 7 months, died July 23rd, 1849, at half-past one P.M. I saw this little patient at 10 A.M. of the same day for the first time. Vomiting and rice-water purging were then going on; the surface of the body was shrivelled, of a leaden hue, and fast becoming cold; nose pinched, cheeks fallen in, eyes sunken and surrounded by the

broad livid circles; respiration short and hurried; the voice, or rather cry, scarcely audible; the pulse wanting at the wrist. This little sufferer had been under the care of a chemist since the 20th. Purgatives were said to have been administered at first.

2.—J. K., aged 49, died July 24th. This patient was not seen until he had been seriously ill upwards of thirty hours. He was then in extreme collapse; tongue and breath were icy cold, and his other symptoms similar to those of Case 1. The vomiting and purging greatly abated, but he died in about eleven hours from the time I first saw him.

3.—A. T., aged 46, died July 27th, at the expiration of fifty-six hours from the commencement of the attack. Here, again, no medical man was summoned until forty-eight hours had been allowed to elapse. The symptoms of extreme collapse were already developed, and it was evident to all present that death was rapidly approaching. During the progress of this case there was comparatively little pain, and remedies from a chemist were trusted to during the early stages.

4.—E. B., aged 68, died August 2nd, after an illness of eighteen hours. I was called in about five hours before the fatal result. She was attended by

my assistant, other engagements having prevented my seeing her. She was found greatly collapsed, and rapidly sunk. This poor patient had also trusted to nostrums, until treatment became all but hopeless.

5.—J. M., aged 33, died August 2nd, twenty hours after the commencement of cholera symptoms. He was seen by me only an hour before the fatal result. He had been suffering from phthisis for about a year, so that death was merely a little accelerated by the attack of cholera.

6.—A. O., aged 29, died August 6th. My assistant first saw her about six hours before death. She was then in extreme collapse, but had not been considered seriously ill for more than about six hours, although she had been taking nostrums for diarrhœa for nearly a month.

7.—S. M., aged 63, died August 18th. This patient suffered from painless rice-water evacuations, with the usual concomitants, for twenty-four hours before relief was sought; after which she went on for five days, the disease being at times apparently arrested, but as frequently returning,—her attendants, either from stupidity or carelessness, having relaxed in their efforts as soon as an improvement had been effected. Had the treatment been rigidly

enforced, even after the sacrifice of the first twenty-four hours, it is my impression that this patient would have been saved. She had within a few months recovered from a severe attack of typhoid fever, which for many weeks rendered her existence highly precarious.

8.—S. H., aged 61, died August 13th. She was not seen until the disease had induced almost hopeless collapse, after which she lingered for about four hours. She was reported to have been ill altogether but nine hours, yet it appeared, on making further inquiries, that she had not enjoyed her usual health for two or three weeks. The friends of this patient had heard that much benefit sometimes resulted from bleeding, and expressed themselves very strongly in favour of its being tried. The whole surface of the body, in this instance, presented a much darker leaden hue than I had before observed, and the superficial veins were greatly distended. I therefore felt that I should be justified in complying with the request. Veins were opened in both arms, but only a few ounces of dark grumous blood could be obtained. The patient expired within half-an-hour after the operation had been completed.

9. W. H., aged 2½, died August 14th. This little patient was seized with vomiting, purging,

and the other usual symptoms, at two A.M. There had not been the slightest complaint before that time. Medical aid was not sought until half-past eight A.M. Medicines were immediately sent, but the little fellow was incapable of swallowing, and died at half-past nine A.M. The appearance of neglect in this case, in allowing so many hours to elapse before medical aid was obtained, possibly depended on the condition of the poor mother, who was at the time almost in a dying state from phthisis, and therefore engrossed the utmost anxiety and attention.

10.—J. A., aged 46, died August 16th. She had been suffering from pain and diarrhœa not less than thirty hours when first seen, but had not been considered seriously ill more than about six hours. She was then in extreme collapse; vomiting and purging (serous) still going on; tongue flaccid, sodden, and cold; breath cold; surface of body rapidly cooling and very livid; pulse scarcely perceptible. She died within five hours. The husband and the son were in the stage of incipient collapse, the former much prostrated. Both did well.

11.—T. S., aged 49, died August 20th. He had been suffering from diarrhœa at intervals for ten days, but died within twenty-four hours from the commencement of the rice-water evacuations. He

was apparently of weak intellect, and his habits, I was informed, had been very irregular. Very little was done for him, since he could not be induced to submit to treatment. Dr. Ayre's plan was attempted.

12.—O. C., aged 26, died August 22nd. In this case, the fatal result did not occur until the sixth day, but there was from the commencement of the attack great mental prostration, in consequence of the epidemic having carried off his wife and several of his children. He was first treated by opium, camphor, and capsicum, combined with stimulants; but the symptoms not yielding quickly, and his restless, excitable condition rendering it impossible to keep him well covered, so as to produce and keep up the necessary action from the skin, Dr. Ayre's plan was substituted, which, in the course of twenty-four hours, arrested the rice-water evacuations, vomiting, &c. The heat of the extremities to some extent returned, and the pulse from being scarcely perceptible became stronger. During the third day the evacuations again became frequent, but they had now assumed a grass-green colour. The calomel was omitted, and beef-tea, stimulants, &c., were administered; yet, in spite of every effort, the vital powers gradually declined.

M. S., mother-in-law of the last patient, resided in the same house, and was restored from the stage of incipient collapse by the use of opium, with acetate of lead, administered in the manner to be described under the head of treatment.

13.—M. B., aged 66, died September 3rd. This patient was naturally weak, and had suffered from diarrhœa, more or less, for about six days. Some medicines supplied by a chemist had been taken with apparent benefit. Rice-water evacuations, with vomiting, then came on, but without much pain; there were also occasional crampy feelings. At my first visit she apologized for troubling me, in consequence of thinking but little of her ailments, and believing medical aid to be scarcely required. Other patients I have heard express themselves in a similar manner, but such self-deception must have cost very many their lives, as it did this poor lady. The vomiting and purging were arrested in the course of a short time, and a free perspiration, with the necessary warmth of surface, induced by the use of the acetate of lead with opium, in conjunction with the other means to be hereafter described. A modified plan of treatment was then prescribed, but her friends thought she was sufficiently recovered to render

this unnecessary ; it was therefore only partially enforced, in consequence of which, I found at my next visit that there had been two or three rice-water evacuations, but these had not even excited alarm ; yet such was the prostration in this feeble constitution, that I could only give an unfavourable prognosis. She expired within thirty-six hours from my first visit. Such is the insidious nature of the disease in some subjects.

As the preceding were the only fatal cases out of at least 400 severe attacks, it will be gleaned that the disease is not, when efficiently treated, of so intractable a character as the non-medical public generally suppose. In all but two or three of these thirteen, the patients were virtually lost before any plan of treatment worthy of confidence was resorted to. These hopeless cases being excluded, the mortality would be less than 1 in 100.

Before hazarding thoughts on the nature or essence of a specific disease, such as that of cholera, or, in other words, before attempting to define in what it essentially consists, I may indicate more clearly the starting point, by asking, what is understood by the term vital principle, or life? It is only known by scrutinizing its manifestations. Disease, which may be regarded as the commence-

ment of the antithesis to vitality, is known by the same method.

We can hardly expect to grasp and verbally define the nature of that which is opposed to vitality, until we have done so with regard to vitality itself. We are as ignorant as to the active cause of the combination of certain elements, and the manifestation of certain phenomena, apparently dependent thereon, indicative of life, as we are of the active cause of that which destroys these phenomena, by disorganizing and resolving the combination upon which corporal life depends.

The nature of cholera is therefore understood only in proportion as its manifestations are carefully studied. The same remark may be applied to a host of other diseases, more particularly to the different forms of fever, in which we are as much at a loss to define in what the malady essentially consists as we are in relation to the nature of cholera. Let a case of fever be taken as an example; we find, by chemical examination, certain changes in the relative constituents of the blood, and sometimes dissection will demonstrate structural alterations. It has been asserted by one class of observers, that the former was the cause of the disease; and, by another, that the disease was altogether due

to the latter. A third class will assert (and I think correctly) that there is no positive evidence to show that we can recognise anything more than effects in either, but that there is the strongest presumptive evidence that the active cause is a miasma, or something which we have not as yet any means of demonstrating. Whilst in both fever and cholera we have been unable (and possibly shall ever remain so) to demonstrate, beyond dispute, their exact pathological condition, we have been able, by a diligent observation of their history, supposed exciting, and proved predisposing causes, their symptoms, and the results of treatment, to arrive at a conclusion, relative to that condition, tolerably satisfactory.

The history of cholera leads to the opinion that its active or immediate cause is the imbibition of some septic agent from the surrounding medium, capable of greatly prostrating the vital powers and entailing lesions to be presently enlarged upon. That it is a power capable of almost unlimited diffusion has been indicated by the raging of the disease, almost at the same time, over considerable portions of Europe, Asia, and America.

Observation has also proved, that this disease-producing agent is all but powerless in the absence of certain co-operating or predisposing causes,

such as darkness,* filth, cold, damp, moist and low situations, animal and vegetable matters in a state of decomposition, and whatever besides produces atmospheric impurity; bad ventilation, defective drainage, excessive population, food deficient in quantity or bad in quality; scanty clothing, mental emotions, and such other influences as tend to depress the vital powers. But, if experience has taught us that cholera, fevers, &c., only appear where such causes are rife, why seek further, in order to explain certain manifestations, after something intangible—something which has as yet eluded both the inquiry of the physicist and chemist, and which the mind can only grasp indefinitely? For this reason; that the influences termed co-operating, constantly exist in given localities, and, unfortunately, to a very aggravated extent; but happily the omissions and commissions which sanction their presence are not frequently chastised by a scourge like to that we too well remember, yet by lesser ones (large, however, in the aggregate) they are much more frequently followed than the non-medical public have

* The absence of light necessitates the exclusion of the vivifying influence of the sun, and is generally accompanied by circumstances giving rise to defective ventilation. The importance of this cause as a source of disease, it is hardly possible to over estimate.

any idea of: therefore have we to seek for a specific agent to explain their occasional appearance, and I believe that I have given as rational an explanation of the amount of our knowledge on this question as the subject will admit of. I would wish it to be understood, that I apply these observations to epidemics generally, especially to the different forms of fever, typhus, scarlatina, measles, influenza, plague, &c.

In answer to the question—Is cholera infectious, or contagious? there is room for considerable latitude of opinion. The following are my reasons for believing in the negative: viz.,

1. It has not been disseminated as such diseases usually are, under circumstances of free intercourse. The disease has been almost invariably confined to towns, and generally to particular parts of them; cases appearing in open, well-drained, healthy localities, being exceptional, and usually modified in character.

2. I have yet to learn that the medical men and attendants on the sick have been attacked in undue proportion; although many of the former, exhausted mentally as well as bodily, from giving their nights and days to preserve the lives of their patients, must have rendered themselves more than ordinarily

susceptible to disease. Again, others spent hours, daily, in examining the bodies of those who died of cholera, with their hands, occasionally punctured and scratched, imbrued in the secretions peculiar to the disease, and did so with perfect impunity. As the medical men and nurses were exposed in a degree incomparably greater than those who rarely or never approached the sick, they could not fail, if contagion existed, to suffer in a corresponding proportion. The nurses, without doubt, suffered to a greater extent than the medical men, and that in consequence of their having been exposed for a length of time to all the influences (such as existed in a concentrated degree, in given localities) which produced the disease in others.

3. The most rigid quarantine has been found powerless in arresting the progress of the disease. It would be altogether superfluous to give examples, since the instances where the strictest quarantine has been enforced for fourteen, or twenty-one days, or even longer, without producing the desired effect, are very numerous; whilst the rapidity with which individuals become affected after arriving at a locality where cholera exists, militates strongly against the opinion that the disease admits of a long period of incubation. In India, regiments have marched in perfect health from a healthy to an

infected district, and numbers have been attacked with cholera within forty-eight hours of their arrival.

4. The disease has sometimes appeared suddenly, and as suddenly disappeared, which is not usually the case with infectious diseases. It made its appearance in London in the year 1834, and disappeared within a period of six weeks; and in 1837, after proving fatal to twelve individuals in the Seaman's Hospital, "Dreadnought," and showing itself in the Marylebone Infirmary, situated in a part of the metropolis the most remote from, and maintaining the least intercourse with Greenwich (where the Dreadnought is stationed), and not appearing in any other part, it left in the same mysterious manner in which it came; the whole duration of the epidemic only occupying nineteen days;—and as no measures of seclusion were taken with respect to these patients, this circumstance is scarcely explicable on the hypothesis that the disease is communicable by contagion.

With such views as regards the nature of the disease—viz., that it is dependent on exterior causation, on something imbibed from without, having a destructive influence on the human organism, as indicated by the great and rapid prostration of the vital powers, and other peculiar

characteristics of this frightful disease which have been already enumerated,—I will next examine how such manifestations are to be explained.

1. The depression of the vital powers is great and rapid, in proportion to the quantity of poison imbibed, and the feebleness of the body acted upon.

2. The vomiting, purging, and sweating can only be regarded as so many spontaneous efforts of the vital powers to eliminate the morbid material from the body: this action may be carried too far, other elements essential to life being removed at the same time.

The vomiting, purging, and sweating, are not in proportion to the violence of the influence producing the disease, but they are rather an indication of the amount of reaction or resisting force;—for just as the impression is great, beyond what the vital powers can tolerate, so are the symptoms denoting resistance less strongly marked.

The action of the skin as a secernent in ridding the system of noxious agents, thereby aiding in the removal of diseases generally, when taken in connexion with its great extent of surface, and consequently the powerful influence it may be made to exert, can scarcely be estimated too highly.

3. The cramps appear to depend upon some

occult action of the disease-producing agent on the nervous system, yet their manifestation seemed to be not in proportion to the quantity of poison imbibed. In several of the fatal cases I witnessed, cramps had scarcely been an annoyance: so little pain had these patients experienced, that they were unwilling to believe they were labouring under any serious disease. As a general rule, where the cramps were most violent, sometimes almost amounting to convulsions, in others assuming a tetanoid character, patients made the quickest recoveries.

The cramps were observed to bear something like an inverse ratio to the lesions of the circulatory and respiratory systems, but bore an intimate relation to the vomiting and purging. They were possibly in some measure dependent on excito-motory action, the abnormal evacuations producing an excess of irritation, which ceased to be manifested with the decline of the vital powers; in other words, susceptibility to the irritant ebbing as vitality diminished. There was certainly no invariable rule as to the severity of the cramps; they were occasionally very violent, and continued almost to the last, even in rapidly fatal cases; but in by far the greater proportion of those that

came under my observation, there was a cessation of the cramps for some time before death.

4. The great thirst would seem to be dependent on the large glandular surfaces abstracting the watery parts of the blood so rapidly, that the comparatively small secreting organs on which the mouth depends for its moisture are actually deprived of the necessary supply; but even this symptom appears to be made subservient to a resisting or curative influence, since it necessitates the taking of fresh fluid into the system, which serves the purpose of rapidly supplying the place of that got rid of in carrying away the offending agent.

5. The suppression of urine was observed to prevail just in proportion to the violence of the attacks; apparently dependent, in part, on the drainage of watery fluid to which the body had been subjected, but principally on the diminished vitality not sufficing for the carrying on of the natural secreting functions. This lesion evidently bore a very close relation to that of the respiratory and circulatory organs, but none to the vomiting, purging, and cramps; or rather, was in the inverse ratio.

6. The rest of the symptoms enumerated may be

grouped together as those of pure prostration, the result of the depressing influence of the morbific agent. The circulatory, and more especially the respiratory organs, soon manifesting a great impairment of function, the disease proves quickly fatal, or otherwise, in proportion to the lesion of these organs. The chemical changes in the lungs being partially arrested, the diminished temperature of body, lividity of surface, lessened respiratory murmur, changed voice, and gradual failure of circulation, must soon follow.

In what manner the poison acts to prevent the passing of the blood into the pulmonary capillaries, for the purpose of undergoing the changes effected by the atmosphere, seems difficult to solve. Post-mortem examinations indicate the fact, but as yet we have been unable to show any mechanical or chemical cause which would account for it: until that can be done, we must fall back on what seems to be in keeping with the rest of our knowledge on this part of our subject—namely, that it depends on the septic agent destroying that part of the function of the lungs, which we can only explain on the assumption of a vital principle; and in the same mode must we explain its action on all other organs. Patients when near their end have the power of expanding their chest, but the effect desired is not

produced. Artificial respiration has been tried, and with the same result.

It must be borne in mind that even with our advanced physiological knowledge, we can only partially explain the *modus operandi* of the animal organism. We can understand full well the physical and chemical influences in natural respiration, but there is something further, call it what we may, about which we know little.

The foregoing is an outline of what I consider a rational interpretation of the symptoms of a fully developed case of cholera, and will apply to every shade of the disease, whether capable of proving fatal in half a dozen hours, or requiring as many days; its intensity being influenced, not only by the quantity of the poison imbibed, but also by the amount of resisting power.

The powers of resistance are feeble in the aged, the badly fed, and the badly clad,—in those residing in over-crowded, damp, filthy localities, more especially if overworked, or subject to other mental or bodily depressing influences. Among such has the disease found its victims, whilst those in the opposite condition have, for the most part, escaped, or offered so great a resistance that only the slightest manifestation of the malady could be developed.

The character of the diet as a predisposing cause, or its opposite, must not be lost sight of.

It appeared to me that those fared the best who lived generously, taking only such foods as have constringent qualities, and carefully avoiding whatever has been known at any time to disagree. Unripe or stale fruit, uncooked vegetables, watery potatoes, or anything which has been found to produce diarrhœa, or even a tendency to it, by setting up an irritation of the alimentary mucous membrane, greatly lessened the resisting power.

In some to whom I was called, the attack appeared to have been accelerated and aggravated by partaking heartily of cold fruit pies at an unseasonable hour, as on going to bed; in others, a dose of castor oil, or some other mild aperient, such as the parties had been in the habit of taking occasionally when feeling somewhat indisposed, was soon followed by hypercatharsis, attended by the most violent cramps, the other symptoms of well-marked cholera gradually supervening. One of the parties alluded to died about thirty-six hours after taking his usual pills; but being under the full impression that he was suffering from the effects of the aperient, he only sought for medical assistance about four hours before his death. Other individuals in the same house suffered severely, after having par-

taken of currant pie, but applied earlier for medical aid, and did well.

Having passed in review the different stages of the disease,—its various forms—particularized my own fatal cases—speculated on what we know of its nature—specified symptoms—endeavoured to interpret their individual importance, and glanced at predisposing causes, it now remains to indicate the principles of treatment, and to examine how far the results of practice have corroborated or opposed the conclusions at which I have arrived.

The principles on which curative measures are to be based (if in accordance with the foregoing views) must take cognizance of two groups of symptoms.

1. Those of reaction, or increase of vital activity, by which nature makes an effort herself to cure the disorder, and sometimes with success, but never in this disease without much attendant peril.

2. Those of pure prostration, or diminished vital action, which indicate that the resisting powers are unequal to their task, and that the powers of life are giving way.

The vomiting, purging, and sweating must be regarded as the principal symptoms of the first group; the thirst being important as an accessory.

The second group must rank as their chief the changed action of the respiratory and circulatory organs; the other phenomena being dependent thereon.

The "primâ facie" indications would therefore be, to aid the first and to oppose the second; but before doing so, let us inquire how far nature works safely in this emergency.

It appears to me that the reactionary effort, whenever a large dose of the poison has been imbibed, (provided it has not been in a quantity sufficient to prostrate at once the vital powers, and thereby partially prevent the usual manifestations,) is of so violent a character, that it not only eliminates from the body the disease-producing agent, but at the same time carries off other elements essential to life; and in so doing, it produces another morbid condition, equally fatal with that which it had possibly overcome. That this reactionary effort is sometimes successful seems pretty certain from the fact that patients who have refused to submit to treatment, have been known to get over very severe attacks—indeed, to recover from such conditions as always render recovery very improbable; but whilst nature, unaided, has been successful in some few instances in bringing about this favourable termination, it is well known, and

generally acknowledged, that in the absence of treatment, the disease, with few exceptions, has terminated fatally.

That the latter result is to a great extent due to the excessive reactionary effort, appears to me beyond a doubt, from the knowledge that a modification of this effort has almost invariably, so far as my experience has gone, obviated it, the other group of symptoms dependent on a diminution of vital action being at the same time opposed by stimulants, both local and general.

In other diseases than cholera, such as fevers, &c., the symptoms must in the same manner be divided into two groups;—those dependent on increased action, and those on a diminution of the vital powers. The physician has to distinguish the one from the other, in order that he may be enabled to modify the former, and judiciously oppose the latter. How often, in the common continued fever of this country, do we notice the most beneficial effects as the result of a mild spontaneous diarrhœa, whilst, on the contrary, an interference with such an effort not unfrequently produces the most lamentable consequences. In cholera, the excess of reactionary effort is chiefly observed in the violent action of the gastro-intestinal mucous membrane; this of itself is sufficiently depressant, but when

made an addition to the prostrating effects of the morbid material it had been set up to get rid of, nature, in the majority of cases, is overcome, and succumbs. To obviate this catastrophe, our object must be to arrest, without loss of time, this kindly intentioned, but really destructive effort. Yet this cannot be done with impunity, without aiding nature to effect what she has to accomplish through the medium of some safer channel; for which purpose, the cutaneous surface, from its great extent, seems to be the most appropriate, inasmuch as it may be almost regarded, on account of its continuity with the gastro-intestinal mucous membrane and from its similarity in structure and in function to it, (both normally eliminating effete matters,) as simply an external continuation of this membrane. Further; sweating has always been noticed as an early accompaniment, and as its use seems so clearly indicated, whilst at the same time it may be pushed to almost any extent for a given period with perfect safety, the reason for stimulating to the utmost this portion of the reactionary effort, and using the most active measures for suppressing that which is attended by so much peril, is sufficiently obvious.

That it is important to carry out concomitantly the several indications, has been too often verified. The treatment necessary to arrest the profuse

serous discharges has been vigorously employed over and over again, but too frequently, if alone relied on, with disappointment, so that its condemnation has resulted; nature either refusing to answer to the attempt at hindering what it was imperative should be accomplished, until a diversion of the current had been effected; or, if she allow her efforts to be suppressed, unless she has almost performed her work, the morbific agent continues to act, until the destruction of vitality is complete.

It now remains to point out how the proposed indications are to be fulfilled.

Presuming that the stage of collapse is near at hand, or that it has already set in, the patient should be immediately placed in the horizontal position, and not allowed to rise on any consideration; heaps of clothing, as much as can be borne, should be called into requisition, and the body surrounded with from ten to twenty bottles (quarts) of boiling water, each wrapped in a cloth. There being much vomiting and abdominal cramp, a mustard poultice, made by mixing with hot water equal parts of flour and mustard, should be applied from the top of the chest to the bottom of the belly, and kept in contact with the skin as long as it can possibly be borne—say from one to two hours. This acts as a powerful general stimulant,

as well as a local derivative, and most certainly materially assists in producing the profuse discharge from the whole cutaneous surface which is so desirable. Having by such means attempted to aid that part of nature's effort of which we can approve, we must at the same time put into force those measures necessary to arrest that which can only prove destructive; to effect which, it has been demonstrated again and again, that the ordinary doses of given medicines are (as a general rule) utterly powerless; and that, to meet a disease the violence of which can destroy life in a few hours, it is absolutely necessary to administer the most potent remedies, in previously unheard-of doses; such as would prove destructive to life in a state of health, possibly in even less time than would the disease which they almost certainly cure.

Opium in large doses, as a stimulant and astringent, in combination with acetate of lead, was the remedy on which I placed the greatest reliance. I have been in the habit of administering, of opium, one grain, of acetate of lead, three grains, in the form of a pill, every quarter of an hour, if the serous (rice-water) discharges were profuse; and unless there was an evident improvement after a few doses, double the quantity at the same intervals. Although I have found it

necessary to continue this treatment for several consecutive hours, in no instance did I witness anything like narcotism as the result, the influence of the medicine being apparently exhausted in overcoming nature's excessive effort to rid herself of the disease-producing agent. I conceive that the opium acted as a powerful stimulant, thus supporting the vital powers, as it evidently does when administered to alleviate the shock which severe accidents, or protracted operations, always occasion.

What supports and renovates like opium a system prostrate as a consequence of over-stimulation? And what enormous quantities of this agent are not only borne with impunity, but absolutely required under such circumstances! The very fact that opium, in extraordinary doses, produced none of the phenomena of an over-dose of the drug, is strong presumptive evidence that it was the remedy the system required; and when taken in conjunction with its other manifest influences—viz., that of its aiding in arresting the profuse discharge from the gastro-intestinal mucous membrane, in relieving the violent cramps, and, at the same time, in supporting the vital powers by its action as a stimulant,—it seems to amount to what may be almost denominated positive evidence.

The acetate of lead appeared to act, not only as a powerful astringent in conjunction with the opium, but to assist in diminishing two prominent manifestations—viz., morbid irritability and sensibility. Opium, without the acetate of lead, acted much less genially. I tried the effect of the same doses of opium in combination with capsicum and camphor, but certainly with less satisfactory results, except in cases where the vital prostration greatly predominated over the serous discharges. Some writers have apprehended subacute gastritis from the use of the acetate of lead: I did not witness such an effect in a single case.

The irritability of stomach being much in the ascendant, hydrocyanic acid in combination with opium usually proved serviceable; both relieving the irritability of stomach, and apparently inducing a subsidence of spasm.

I was in the habit of using the following combination—viz., of Battley's solution of opium, ʒij.; of dilute hydrocyanic acid, (Sch.) ♏ xxiv.; of compound tincture of cardamoms, ℥ss.; of syrup of orange-peel, ʒvi. One drachm to be taken every half-hour, hour, or two hours, according to the urgency of the symptoms.

Chloric ether, in ʒss. doses, with the same quantity of compound tincture of valerian, or the

chloric ether alone, frequently administered, was of the greatest service as a stimulant.

The inhalation of chloroform, in violent cramps, especially when they assumed the tetanoid character, proved most valuable.

If the vomiting continued in spite of the measures already indicated, I succeeded in relieving it in almost every instance by the application of a blister from the middle of the sternum to midway between the umbilicus and pubes; or, for an adult, twelve inches by eight inches.

As a general rule, provided the foregoing plan of treatment was vigorously carried out—not only directed, but actually enforced—by frequent personal attention, patients, even when fast going on to extreme collapse, could be quickly pronounced comparatively safe; the serous purging, vomiting, and cramps were soon arrested, the whole surface, in the course of a very short time, exchanging its semi-livid, dusky, shrivelled appearance for something like the hue of a boiled lobster, and pouring out its perspiration at a rate difficult to be conceived. I usually persisted in keeping the skin acting thus freely for from twelve to twenty-four hours after every symptom of cholera had disappeared, and gave an occasional dose of acetate of lead and opium, according to circumstances. The

chloric ether and compound tincture of valerian, or cardamoms, every two, three, or four hours, were continued until the excessive prostration had to a great extent given way.

So effectually was the system cleansed by this sweating process, that the troublesome and dangerous secondary fever, generally alluded to by writers on this disease, was altogether avoided; so that the only things to be attended to in the after treatment were the restoration of the natural secretions by the aid of vegetable bitters, &c., and the use of such other measures as tended to give general tone.

In a few instances, much nervous irritability and general prostration continued for many weeks, but these effects were eventually got over. This after-annoyance prevailed to no great extent, but in every case in which it occurred, the primary attack had been comparatively mild, so that derivation by the skin had been only partially carried out.

Seeing that secondary fever is altogether prevented by this perspiratory action, it has been suggested that the ordinary fevers may depend on the imbibition of a similar poison, and that the variety of manifestation is only dependent on the amount of concentration, and the quantity received. This view has been strongly maintained

with regard to the fevers of our own country; inasmuch as whenever a given type prevails epidemically, we see indefinite modifications, from simple continued fever to the worst forms of typhus, possibly dependent upon the imbibition of a common agent, but modified by the presence or absence of co-operating influences.

The necessity of continuing the sweating process for hours after the urgent symptoms had given way, was more than once demonstrated among my own patients, in consequence of the patients or their friends indiscreetly removing a portion of the clothing too soon; the exhalation from the skin having been no sooner checked or arrested, than the vomiting, serous purging, and cramps began again to make their appearance, but, as a general rule, were quickly got under by returning to, and rigidly enforcing, the same measures.

Case 7, page 15, having been apparently brought to a satisfactory condition, retrograded from this cause, and having to contend with a previously debilitated constitution, all efforts were afterwards fruitless.

Retention of urine showed itself in about a dozen cases, lasting from one to six or seven days. It apparently depended on spasm affecting the neck of the bladder, as on introducing a catheter the

urine was voided with force, showing an absence of paralysis of the muscular structure of the viscus. Not more than from ten to twenty ounces of highly-coloured urine were usually secreted in the twenty-four hours.

In a much larger proportion of cases, there was suppression of urine, which lasted from twenty-four to sixty or seventy hours. I did not find it necessary to resort to cupping over the region of the kidneys, or to any local treatment, since I considered this symptom to be the consequence of the fluids being eliminated in excess through other channels, and possibly, carrying off with them the solids which the kidneys usually excrete. Excessive vital prostration had doubtless its influence in inducing a total suppression of urine, as also in interfering with the normal functions of other excretory organs.

The more prominent manifestations having been overcome by the plan of treatment already indicated, there remained but little for art to effect; the secretions, at first vitiated and scanty, were usually readily restored to their natural condition by the aid of some vegetable bitter, with extract of dandelion, and sesquicarbonate of soda.

The irritability of the gastro-intestinal mucous

membrane generally continued for some days after the subsidence of active symptoms; and to such an extent, that in many constitutions, even after an apparently perfect recovery, the most dangerous symptoms were again readily set up by the taking of anything possessing irritant properties, such as aperients, &c.; I therefore studiously avoided the administration of everything having a tendency to produce such effects. When interference was necessary, in almost every instance I found that injections of warm water, or gruel and castor-oil, fulfilled every indication. The bowels were allowed to remain undisturbed during three or four days after the subsidence of the attack; then, provided there was no spontaneous action, enemas were resorted to.

As a proof that patients may do well without calomel, for the space of six weeks, during the time that the epidemic was at its height, and committing its greatest ravages at this place, my calomel bottle remained untouched.

Instances would be adduced, could they be made subservient to any useful end, where the treatment based on the principles already indicated proved successful in rescuing patients, who were apparently in as hopeless a condition as others who died, even in

the same houses, and under precisely the same circumstances, with the exception of the difference of treatment.

The cases of diarrhœa yielded, as a general rule, to the chalk mixture, with aromatic confection and tincture of opium, ♏ xx. to ʒss., as often as the bowels were relaxed. If too much of the poison had been imbibed to render this treatment effectual, the derivative plan, by sweating, &c., was resorted to. Having recourse to the latter plan speedily would often prevent a severe attack.

The small doses of opium, such as readily check the diarrhœa of ordinary seasons, I found not only useless, but worse; inasmuch as the poor patient would be persuading himself that he was doing all in his power to ward off the disease, whilst it was hourly gaining a firmer hold, until, in too many instances, it had secured its victim before measures sufficiently active were sought for to arrest it. Several such cases fell under my observation, and to many others I was called when they were bordering on this hopeless condition.

It is impossible to calculate the number of lives that must have been sacrificed by such proceedings, which were not a little fostered by the non-medical press allowing their publications to be made the medium of circulating formulæ for every description

of nostrum, no matter how ridiculous, (some one or other of them being relied on because backed by such and such a name—too frequently, unauthorized,) by which much precious time was lost, and the medical attendant only called in when perhaps too late.

Let it not be supposed that cholera, more than any other disease, can be treated with any large amount of success after it has passed beyond a certain stage; and since it differs from most other diseases of modern times in running on to this scarcely curable stage much more rapidly, let that be a reason for giving up tampering with nostrums, and such other puny measures as have been too frequently trusted to in vain; more especially since, according to my experience of all serious diseases, there are none more amenable to treatment, nor cured with greater certainty, than cholera, provided the necessary remedies be early resorted to, and the patient's constitution be even moderately good.

The aliments I found necessary to be administered, during the violence of the attack, consisted of nutritious fluids, such as animal broths, sago, arrowroot, and the like; these were required to be given frequently, but only by tea-spoonfuls or table-spoonfuls, in consequence of the usually great irritability of stomach rendering it intolerant of

even the mildest fluids when taken in larger quantities. In some cases where the irritability of stomach was excessive, the avoidance of even the smallest quantity of fluid for some two or three hours appeared to assist in overcoming that condition. The taking of tea was very generally followed by an increase of pain. Brandy-and-water, soda-water, or toast-water, were allowed in the above-named quantities as often as desired. As the attack subsided, stimulants were withdrawn, and the farinaceous aliments, with good animal broths, continued, until the patient had sufficiently recovered to enable him to take with benefit stronger nourishment.

Calomel.—So much of a conflicting character has been written relative to the influence of this drug on cholera, that it becomes rather a difficult matter to judge of its real merits. The success which attended the plan of treatment I had been carrying out, prevented my testing other systems, which had not a larger amount of success to recommend them. As far as I could judge from the report of others, I did not learn that the advocates of the calomel system could boast of this; I therefore came to the conclusion that calomel was unnecessary, if not prejudicial, prior to the stage of extreme collapse; but if only called in at this ad-

vanced stage of the disease, I should rather trust to calomel, as recommended by Dr. Ayre, than to any other remedy, since I had the satisfaction of seeing it produce the most wonderful changes, and save lives that would otherwise, in all probability, have been lost; still, it appeared to me that calomel acted less satisfactorily than my own plan of treatment, if resorted to at an earlier stage. One poor sufferer, a fine, robust young man, after he had apparently been brought through the worst stage of the disease, the vomiting, rice-water evacuations, &c., having subsided, and some amount of reaction having taken place, was attacked by bilious purging, under which he sunk. In some other cases I remarked the same tendency after the calomel treatment.

As I have before observed, my own experience bearing on the comparative merits of this remedy has been too limited to render any opinion of mine, unless supported by others, of much value, yet in so far as it goes, it is certainly opposed to the administration of this agent in the early stages; inasmuch as the plan of treatment previously described proved far more efficient, when taken in connexion with the rapidly fatal character of the disease if untreated, than my most sanguine expectations could have predicted; and this was

realized equally by those gentlemen, Messrs. T. P. Wright, T. S. Cooper, of Canterbury, and A. Cridland, who kindly gave me their assistance during the emergency; whilst those patients that came under my inspection, who had, during the early stages, and previously to my seeing them, commenced Dr. Ayre's plan of treatment, which was usually persisted in, recovered much more slowly, and remained weak for a greater length of time; suffering more or less, constitutionally, from the effects of the mercury.

During the prevalence of such epidemics as it has fallen to my lot to witness, it has invariably happened, as we, *à priori*, might have expected, that all other forms of disease have been greatly modified, or as it were swallowed up by the prevailing type; this was especially marked during the prevalence of cholera.

Several cases of small-pox came under my notice during the cholera visitation; and so completely was the disease masked at its commencement by the great vital prostration, rice-water evacuations, &c., that I immediately resorted to the opium and stimulant plan of treatment, and, happily, with the best effects.

In some cases petechiæ were observed to precede the characteristic eruption of small-pox; in others,

the vesicles were scarcely developed when they became filled with a fluid resembling in colour the hue of an over-ripe raspberry, the intermediate skin being deeply dyed with the same tint. This appearance was mostly observed in patches, about as large as the two hands, on the inside of the thighs and on the belly; but not more than one or two patches occurred on the same subject.

These patients, from the great amount of prostration, together with the irritable condition of the alimentary tube, were treated at first by opium and stimulants, and after a time by mineral acids. All did well.

The class of cases alluded to at the commencement of this paper, characterized by the predominance of head symptoms, or rather symptoms having reference principally to derangement of the whole nervous system, accompanied, or not, by gastro-intestinal irritation, only required the vigorous application of the principles already described; the diversion to the cutaneous surface being the agency on which the greatest reliance could be placed, the other adjuvants being called into requisition according to circumstances. The stimulus of a large blister to the nape of the neck appeared a valuable auxiliary in such cases. Some of these attacks bore apparently a close affinity to

an ordinary fit of apoplexy, but very different in reality, as was shown by recovery taking place under a plan of treatment not likely to benefit in apoplexy from effusion.

Another class of cases simulated common continued fever, with strongly marked head symptoms, indicated by great nervous irritability, insomnia, slight mental aberration, congested eyes, intolerance of light, ringing in the ears, flushed, suffused expression of countenance, irritable condition of gastro-intestinal mucous membrane, as marked by sickness and a tendency to diarrhœa; tongue, either glazed and fissured or covered with a moist yellowish fur; skin, sometimes dry and harsh, but frequently perspiring; urine, high coloured, containing in some instances a large excess of lithates, yet tolerably free. Headache was a common accompaniment, and pain referred to the region of the abdomen, with general aching of the back and extremities. These attacks were attended by much prostration, which rapidly increased under the influence of salines. Such cases, for the most part, readily improved under the use of opium, sesquicarbonate of ammonia, and wine, with such fluid nourishment as could be administered.

These apparently different forms of disease yielded to almost the same remedies. Recovery

from various forms of disease, under a plan of treatment which recognises the same principles, must go far to prove that the same morbific agent may have an influence in bringing about very different manifestations in different subjects, doubtlessly modified by the quantity of the poison received, as well as by its state of concentration; also, by the peculiarities pertaining to the constitution of the recipient, and the absence or presence of certain co-operating influences.

As we often see that similar manifestations are the result of apparently opposite influences, so may we find that different manifestations are frequently the result of the same cause.

If the reasons I have given be considered sufficiently strong to render the correctness of this opinion even highly probable, I think that scarcely too much stress can be laid upon it, since diseases can be treated successfully only when we rightly judge as to their causes.

A few words on the apparent discrepancy amongst medical men, relative to the treatment of cholera, may not be out of place. I may first remark, that medical men did much to shake the confidence of the public as to their knowledge of the nature and treatment of cholera, by the wholesale condemnations which they levelled at one another, in conse-

quence of the various modes adopted by different minds for the purpose of producing the same effect. The extent of difference not being understood by the public, nor indeed by all medical men, gave the non-medical writers the opportunity of speaking of the profession somewhat sneeringly, as may be seen by some of the articles in the periodicals of the time. It appears to me that these strictures were applicable to the limited knowledge, and consequently dogmatic assertions of the few; and not at all to those who, from their knowledge of disease in general, were capable, from the commencement of the epidemic, of forming as definite an idea relative to the nature of the disease, as presumptive evidence, in the absence of anything like that which is absolute or positive, would admit of.

That the opinion formed cannot have much of error mixed up with it, is sufficiently evident from the fact, that the results of treatment based upon principles founded thereon proved eminently satisfactory.

The treatment among the thinking men of the profession and their followers differed rather in minors than essentials—in degree than in principle: the object of all being to eliminate from the system the disease-producing agent; that being done, to

correct the vitiated condition of the secernents, a very common sequent; and, lastly, to restore strength. The carrying out of the first indication was that which chiefly gave rise to an apparent difference of opinion.

One class attempted to carry off the morbid material by producing an excess of action from the glandular appendages of the alimentary tube; to effect this object, calomel was considered all potent by some. Tartar emetic, with small doses of sulphate of magnesia, was much preferred by others.

Another class, having the same end in view,—that of eliminating the disease-producing agent from the system,—for reasons which have been already given, chose the cutaneous surface, with its myriads of minute glands, as the channel through which it could be most safely effected.

The action of other remedies, such as phosphorus, sulphur, &c., may be explained on the same principles. If these views be correct, it will be readily seen that the discrepancies in the treatment of cholera are rather apparent than real; at any rate, that treatment, in appearance different, is founded upon the same principles, so that our notions as to the nature of the disease are much more in unison than the non-medical public

appeared to be aware of: hence, the vast amount of nonsense, in stultification of themselves, they have been guilty of publishing.

Although founded on the same principles, I am of opinion that the different forms of treatment are not equally to be depended upon. I will again repeat, that the poison may be eliminated as rapidly, and much more safely, through the medium of the cutaneous surface, than by that of the gastro-intestinal.

In a disease of a less active character, provided the treatment be founded on correct principles, it would matter less to which form certain minds may give the preference; but in cholera, which has been too frequently marked by such rapidly fatal results, it is of importance that our cherished pets should undergo the test of a rigid examination; and since we differ only in the mode of treatment, that that be adopted which an enlarged experience shall prove to have been the most successful.

THE END.

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