served that there was among the numerous sailors in that great port a regular accession of cholera every Monday and Tuesday, owing to the men going ashore and getting drunk on the preceding Sunday. In London also, several medical men informed me they had noticed the same thing; excess either in drinking or eating, particularly if improper food was used, such as pork, cabbage, &c., being followed by attacks, which thus became more frequent on Sunday night and Monday.

Noxious Effects of bad Food.—There is no doubt that many attacks of cholera were also indirectly induced by defective nourishment, and by the use of improper food among the more destitute part of the population: thus I saw one poor family in Lambeth, where the husband had died three weeks previously, and the son was at the time in collapse; they were in great misery, and the only food they could procure were muscles, under the circumstances a most objectionable article of food: these are matters, however, which, though most painful, do not belong to a sanitary report. But it is proper to state that urgent representations were made in different parts of the metropolis, both by the local authorities and medical officers, respecting the open sale of articles of food, especially fish, altogether unfit for human consumption; it was stated, further, that the existing state of the law did not secure the suppression of this practice, which, in poor neighbourhoods, was felt to be a great evil. Several marked examples were brought under my notice, where violent attacks of cholera were distinctly traceable to the use of putrid fish, bad pickled pork, decayed cheese, &c. It would therefore appear desirable, in the event of any return of the epidemic, that more facility should be afforded for preventing the sale of such deleterious articles.

Were this a medical, in place of a sanitary Report, various other predisposing causes would have to be considered—as errors in diet, and especially as regards the imprudent use of vegetables and fruit; bodily and mental exhaustion, and especially night-watching; fear; grief; the improper use of aperient medicine,* &c. &c.

In weighing the influence of the predisposing causes noticed in this section, it must be borne in mind that during the epidemic, when at all active, great multitudes of persons are in a state in which the slightest possible cause will turn the balance. Many instances were related to me where a sudden fright brought on an attack. In one case a young woman was seized immediately after receiving a letter announcing the death from cholera of a near relative; in another, from seeing a cholera patient carried along the streets. There is no doubt that many attacks were thus brought on by grief, attending a relative suffering from the epidemic, night-watching, &c., which were often attributed to direct infection. In fact, the most trifling circumstance, bodily or mental, was often sufficient to give a fatal force to the efficient cause of the disease.†

* One very painful case of this kind was related to me: a lady gave to her four young children some aperient she was in the habit of administering; this was at night. Early the next morning the children were seized with violent purging and vomiting, and ultimately they all died.

† Some interesting examples, illustrative of the operation of predisposing causes, will be found in a valuable paper on the Health of London during the Epidemic, by Dr. Webster, F.R.S. (London Journal of Medicine.)

SECTION VI.

On the Primary Seat of Cholera, and on the Existence of a Premonitory Stage; Notice on Diet and on the Treatment of Premonitory Diarrhœa.

Although it forms no part of this Report to enter into the pathology of cholera, yet some notice of the nature of the epidemic and its leading features is indispensable, both for the due appreciation of the measures adopted by the General Board, and also for properly estimating the influence of the poisonous atmosphere generated by the neglect of sanitary principles.

Primary Seat of the Disease.—One of the most fundamental questions of the whole inquiry concerns the primary seat of the disease—a question which has been answered (principally) in three ways:—

I. It has been affirmed that one or other part of the nervous system is the true seat of the disease.

II. By another and more numerous class of observers it is said the alimentary canal, and especially the small intestine, is the part primarily affected.

III. The last and more prevalent doctrine is that according to which cholera is a disease of the blood.

I. The first of these opinions has had many advocates, especially among the Russian physicians. The arguments adduced at St. Petersburg in support of this hypothesis are principally as follows:—1. Disturbances of the nervous system, such as intermittent fevers, neuralgia, dragging pains in the limbs, were common both before and during the epidemic: all diseases bore a nervous character, whilst inflammatory diseases were rare. 2. The premonitory symptoms were not essential, and merely indicated deranged innervation: in many cases the disease broke out so suddenly, and destroyed the vital powers, especially of the spinal cord, so rapidly, that no other seat of the evil could be assumed. 3. Recovery was so rapid, in many cases, that it was impossible there could be any serious lesion of the intestinal canal. 4. When there were consecutive diseases, they were always affections of the nervous system —sopor, delirium, mania, and a fever resembling but not identical with typhus. 5. A cure was never obtained through the customary modes of controlling irritation of the intestinal canal. 6. The electrical equilibrium was destroyed, so that from all bodies, even when isolated, electricity passed off, and thus sudden lesion of the nervous system was produced.*

These views have been received with little favour either in England or on the Continent; and it is certain that, whilst some of the arguments stated would carry no weight with physiologists, others, and especially that relating to the alleged incapability of controlling the alimentary canal, have been distinctly disproved by the extensive experience acquired in this country during the late epidemic. The rôle assigned to the spinal cord is certainly erroneous, as all the phenomena con-

* See British and Foreign Medico-Chirurgical Review, Jan. 1849, p. 14.

nected with that centre are secondary, and are even occasionally entirely absent; and the same remark applies with much greater force to the brain, which retains its powers in a most remarkable manner, even when black blood must be circulating through it, and when the patient is pulseless.* As to the influence of the sympathetic nerve, so little is known of its normal functions, that every theory respecting its agency in cholera must be purely speculative.

II. It is not surprising that the intestinal canal should, by many observers, be regarded as the part primarily affected in cholera; the vascular injection of the mucous membrane, the enlarged state of its glands, the enormous discharges, and the important changes in the epithelium—all these are such striking phenomena as would naturally lead to such a conclusion. But, as so often happens in analogous instances, these obvious features of the disease would seem after all to be but secondary, depending on certain antecedent and essential changes which they mask and conceal. When the remarkable desquamation of the epithelium, discovered and so accurately described by Dr. Boehm of Berlin, was first announced, it appeared to be so entirely abnormal that that excellent observer, with many others, regarded it as being the essential morbid phenomenon. In the progress of knowledge, however, the nature of the discharges and the changes in the structure of the intestine have lost much of the importance naturally attributed to them when first observed, since it has been proved that the separation of the epithelial covering of the intestinal villi is a healthy process, occurring at each act of digestion.† Again, with respect to the glands

* Some of the phenomena witnessed in cholera are difficult of explanation, according to the received opinions in physiology: thus, as stated above, patients perfectly blue and pulseless often have their mental faculties not disturbed; and under the same conditions persons have walked a considerable distance. I saw lately a case of complete cyanosis from malformation about the heart, and yet the patient was distinguished by superior intelligence. All this shows that too much importance has been assigned to what is called pure arterial blood; but which, in fact, contains all kinds of impurities, and even normally a considerable portion of carbonic acid.

† This important fact was first observed by Professor Goodsir; but as some doubt has been thrown on this point, I may mention that the fact of the desquamation occurring in healthy animals has been repeatedly corroborated by Mr. Quekett. Mr. Rainey, who, at my request, was so kind as to make some examinations, also found that the villi were denuded in the dog, but this happened towards the end of the digestive process, and when it must be presumed the epithelial cells had performed their office of absorbing the chyle. It is not intended, by these observations, to deny the great importance of the enormous discharge of the epithelium occurring in cholera. My observations lead me to dissent from the conclusion of Dr. Parkes, that this detachment of the epithelium is altogether a post-mortem phenomenon. I have often seen the whole length of the small intestine crammed with the choleraic mass, and consisting to a great degree of epithelium—an amount totally incompatible with mere detachment after death. The principal reason adduced by Dr. Parkes, in support of his opinion, is, that the epithelial cells cannot be detected in the stools; but when specimens are selected from different parts of the small intestine, evidence is acquired that the detached epethelium, as it passes downwards, undergoes, as it certainly does under normal conditions, a gradual disintegration, and so disappears. Thus in the duodenum and upper part of the jejunum, the epithelial particles are found in a most perfect condition, the outline and points of the prisms being intact; but in proceeding downwards there is an evident change, the cells becoming less perfect, truncated, and broken up; and at the same time, molecular matter in large quantity is found, apparently the result, in part at least, of the disintegrating process. It is important to notice that these changes are not dependent on the time that has elapsed since death, but are connected with the relative parts of the intestine. Moreover, epithelial particles, which have escaped

of the mucous membrane, it is true they are, and especially in the cold stage, much enlarged, but they rapidly return to their original size; and as regards one of the most common appearances—the ruptured and honeycombed condition of Peyer's glands—this is in some, though not in all instances, a post-mortem alteration, as Virchow has produced the same change artificially by soaking a healthy intestine in water.*

III. As regards the doctrine which teaches us that cholera is a blood disease, it may be remarked that it is advocated by many of the most distinguished pathologists in Europe who have examined the subject; and further, that it is in strict keeping with modern physiology.† If, as is generally admitted, cholera depends on some aërial agent, it is certain that such would, of necessity, first operate on the human body, through the way of respiration, and on the blood. The incessant introduction of atmospheric air into the lungs, and the well-ascertained fact, explained in the preceding section, that the blood, as it moves through those organs, has in itself no power of selection, but absorbs even the most deadly poisons, provided they are presented in the gaseous form; the analogy afforded by the production of intermittent and remittent fever from the respiration of a malarious atmosphere; and by continued fever being caused, either directly, or indirectly in the way of predisposition, by the inhalation of certain effluvia mingled with the air;—these are so many circumstances which tend powerfully to corroborate the view here advocated, and to demonstrate the supreme

destruction, are often found in the stools. The following remarks of Drs. Reinhardt and Leubuscher, on this point, entirely correspond with my own observations:—"We have frequently seen unchanged cylindrical epithelium (in the sediment of the cholera stools), sometimes single cells, sometimes several connected together in large arched-form portions, as they naturally cover the villi; at other times, tessellate epithelium from the neighbourhood of the anus; and also a detritus, in which can only be perceived fragments of cells." "The quantity of epithelium found in the stools does not correspond with the amount of that detached in the intestine: it must therefore be assumed that a large portion undergoes disintegration in the intestine." "In the large intestine the quantity of unaltered epithelium is less than in the small, owing to its detention and the destructive changes consequent thereon."—(Beobachtungen über die epidemische Cholera in Berlin, 1849, pp. 5, 74.) In some examinations of the intestines of persons who have died of typhus, I have found a large amount of desquamated epithelium, and, as in cholera, more abundant and more perfect in the upper than in the lower part of the small intestine: the villi were of course more or less denuded.

The extraordinary rapidity with which some patients recover is another indication that in such cases no very serious organic changes can have occurred. I have seen, for instance, a man standing at the door on Wednesday, who on Monday was in perfect collapse.

Many interesting and important changes do of course take place, and especially toward the close of the stage of collapse, and in that of febrile reaction, in various organs, of which the exudation of a finely granulated or amorphous substance, as seen in the intestine, uterus, &c., the interesting changes in the kidney, and occasional diphtheritic deposit, as in the œsophagus and vagina, may serve as examples. But the very number of the organs affected is one of the strongest arguments for cholera being a general and not a local affection; whilst the nature of the changes—the congestion, the extravasation of blood so commonly happening, and the equally frequent exudation—are so many unmistakable indications that the disturbance is seated, not in the nervous system, which is essentially connected with motion and sensation, but with the nutritive apparatus, and, as contended, with the blood.

* See 'Medicinische Reform,' No. 10, p. 64; and Reinhardt and Leubuscher, *l.c.*, p. 77.

† Among the German pathologists who advocate this view may be mentioned the names of Romberg, Virchow, and Reinhardt.

importance, in regard to the healthy condition of the body, of the quality of the inspired air. The most satisfactory proof would, however, be derived from cases of pure cholera sicca; by which term is meant to be indicated, cases in which there are no discharges from the mucous surface of the stomach or bowels, either evacuated or retained; in which there is no morbid change of the alimentary canal; in fact, where the blood, and the blood only, is affected. But it is doubtful, although there is nothing in the pathology of cholera incompatible with such an occurrence, whether such instances have ever been actually observed; for it is well known that in some cases denominated cholera sicca, and where during life there had been neither purging nor vomiting, it has been found after death that the intestines were filled with the choleraic matter.* One of the most accurate observers among those who have seen the disease in India, where this kind of attack is more frequent than in Europe, Dr. Parkes, in allusion to such cases, says, "there is always some effusion of the thick white substance into the intestines, but often little of the watery part of the blood."†

The view here advocated is, then, that which attributes cholera to a poisoning of the blood, and which regards the profuse discharges as an effort of the *vis medicatrix naturæ*, the various morbid changes in the intestines and other organs being strictly of a secondary character. To those who do not well consider the forcible efforts so often made to remove even a local source of irritation, as daily seen in surgical practice, and the large amount of liquids required to carry out of the system excretory matter, this may perhaps appear an unlikely explanation; but if, as is the conviction of so many pathologists, the whole mass of the circulating fluid be poisoned in cholera, an effort at depuration,

* Dr. Watson mentions such a case ('Lectures on the Principles and Practice of Physic,' vol. ii. p. 487); and Dr. Leubuscher gives a similar one ('Medicinische Reform,' No. 18, p. 124). In a return from Grove Hall Lunatic Asylum, Bow, it is stated that, in some of the cases, death took place without any purging or loss of animal heat. In these and similar cases it is probable that, owing to the rapid and profuse effusion into the bowels, the muscular coat becomes paralysed from over-distension, as the right cavities of the heart are known to be from the blood which accumulates in asphyxia. It is probable that, if it were possible to watch the progress of collapse in all cases, it would in many be found that the discharges are retained for a few hours in the intestines. Dr. Friedländer, a very intelligent physician at Hamburg, mentioned to me the following instructive facts. He is physician to a large pauper establishment for old men and women, among whom six cases of cholera occurred, in all of which it was observed that the abdomen became rather full and prominent, with a doughy feel when handled; this fulness was further remarked to be confined to the lower part, the region of the stomach being rather sunk: contemporaneously with this change, the skin, owing to the drain on the fluids of the body, began to lose its elasticity, so that there was a tendency to *pitting*, when the tip of the finger was pressed; this condition was followed in two, four, or six hours by profuse purging, which, as usual, preceded the vomiting. The very first case I saw in England in 1848 was precisely of this kind, some hours having elapsed after the occurrence of perfect collapse before the bowels were profusely evacuated: on questioning the patient as to whether he had perceived any fulness of the abdomen before the purging, the man replied, "Oh yes, it was as tight as a drum." It is evident that in some such cases the patients might die before the discharged substances passed per anum. Two cases occurred under the care of Mr. Guazzeroni at Kensington, in which all the symptoms were most marked (cramps, blueness, &c.), where there was neither purging nor vomiting of any kind: these, which would appear to have been cases of true cholera sicca, both recovered.

† 'Researches into the Pathology and Treatment of the Asiatic or Algide Cholera,' p. 114.

commensurate with the extent of the morbid change, would obviously be demanded.

In considering this theory, the character of the blood in cholera, and the nature of the discharges poured into the stomach and intestines, become points of much interest. Animal chemistry is not sufficiently advanced to reveal what is the essential change induced in the blood; but independently of this, it is essential to recollect that almost every analysis yet made relates to blood taken from patients after severe purging and vomiting had occurred; usually when collapse had supervened, and sometimes even after death; when, consequently, the quality of the circulating fluid had been secondarily and powerfully affected; and when therefore most of the changes detected depended, not on the specific cause of cholera, but on the flux from the alimentary canal, and on the arrested renal and other secretions. That this is the right view to take of the analyses hitherto made, is shown by the fact, that most, if not all, the morbid changes of the blood described in the epidemic of 1832, as in that of 1848-49, precisely correspond to the losses in the fluid owing to the profuse discharges and the arrested secretions; thus the blood of cholera patients is thicker, tarlike, and less coagulable; it contains less water and more solid matter than is normal, owing to the loss of water and the consequent accumulation of the red corpuscles and albumen; the fibrin appears to be diminished, or perhaps altered in quality; and urea is in excess; as regards the salts conflicting results have been obtained. It is much to be regretted that the attention of chemists has not been directed to the condition of the blood in the very outset of the attack; that is, on the first occurrence of the premonitory symptoms. It would also be most desirable to examine blood taken from persons generally during the presence of the epidemic. It is indeed stated by Canstatt, that it was observed at Munich and other places, in the former epidemic, that the blood during the time of the cholera, and even shortly before its appearance, was sometimes observed to be of dark colour and thick consistence as in cholera, though removed from persons not suffering under the disease.* Dr. Ainsley also states, that the blood exhibits morbid appearances when drawn from patients at an early period of an actual attack of cholera.†

The evacuations, it is well known, consist of a fluid portion and of a solid part, which, by rest, separates as a sediment. Without entering into the extensive inquiry relating to the microscopical characters of these discharges, it may be observed that the liquid part is derived from the serum

* Die Specielle Pathologie und Therapie. Band II. p. 416.

† The following conclusions, which are considered by Dr. Garrod as established by the researches made in 1832 and 1849, will show the present state of knowledge as regards the blood in cholera. (For details see the valuable paper of Dr. Garrod in the London Journal of Medicine, No. 5, p. 409.)

1. That in cholera the physical characters of the blood are altered, the tendency being to become thicker, tarlike, and less coagulable.
2. That the proportion of water is much diminished.
3. That the specific gravity of the serum is very high, owing especially to the increased albumen; this fluid is also less alkaline in its reaction.
4. That the salts are not only not decreased in amount, but are augmented.
5. That urea exists in increased quantities, varying according to the stage; being small in quantity in intense collapse, increased during reaction, and in excess when consecutive fever occurs.

of the blood, and contains, though by no means in the same proportion as in the serum itself, albumen, extractive matter, and salts; fibrin also appears to be discharged; and, more frequently than is generally supposed, even the red particles, which I have detected in cholera-stools that to the naked eye appeared to be perfectly colourless. There is no just ground for believing that any portion of the fluids, so profusely discharged per anum, are derived from the water swallowed so eagerly in these cases. From these observations, it is then obvious that, with the exception of the epithelium and a portion of water, which is, of course, mixed with the matters vomited, the enormous evacuations are derived directly from the blood, a fact which constitutes one of the most essential points in the pathology of cholera.*

* In order to indicate more exactly the results of chemical examination, in reference to the blood, the following analyses are appended:—

Analysis of the Liquid Portion of Cholera Stools, showing the relations to the period of the disease. (Dr. Parkes on the Intestinal Discharges in Cholera, London Journal of Medicine, No. 2, p. 134.)

PERIOD.	Specific Gravity.	Albumen in 1000 parts.	Extractive in 1000.	Soluble Salts.	Total Solids.
Diarrhœal	1012·9	0·466	3·846	9·04	13·9
Ditto	..	0·29	6·82	5·99	13·1
Early Algide	1009·	2·4	1·27	10·98	14·65
Developed ditto severe	1009·5	1·18	0·55	9·14	10·87
Ditto ditto	..	2·186		7·52	9·706
Ditto ditto moderate	1008·3	0·27	2·23	8·33	10·83
Ditto ditto	1005·8	3·2		5·827	9·027
Commencement of reaction	1014·0	20·84		6·34	27·187
Ditto ditto	1008·91	1·48	6·055	9·085	16·62
Relapse	1017·83	0·855	17·35		18·21
Ditto	..	..	4·589	3·881	8·47

Analysis of Stools in four cases of Cholera. (Becquerel, 'Archives Gén. de Méd.,' t. xxi. p. 192.)

	Specific Gravity.	Water.	Solid parts in 1000 parts of liquid.	Albumen.	Chloride of Sodium.	Matter in Suspension on Filter.
1. Cholera of 5 hours. Alkaline	1007·20	988·60	8·64	Imponderable.	3·7	2·76
2. Blue stage, do.	1007·40	979·57	13·29	Ditto.	..	7·14
3. Of 18 hours, do.	1009·70	781·87	14·54	3·22	5·24	3·59
4. Of 18 hours, do.	1011·04	928·83	15·12	4·51	7·81	2·05

M. Becquerel also detected albumen in four out of six analyses of the matter vomited which offers the greatest analogy with that passed by stool, except that it is either neutral or more frequently acid. This distinguished chemist regards the morbid liquid vomited "as consisting of the serum of the blood diluted in a variable quantity of water, in the midst of which floats coagulated albumen, of which the fragments are united by mucus, in which is found a large proportion of chloride of sodium." M. Becquerel appears to have detected much more albumen than observers in this country. In some analyses of cholera-stools made by Dr. Leeson and Mr. Taylor, at St. Thomas's Hospital, only a very minute trace of albumen could be discovered. Dr. Parkes says, "The albumen and salts do not seem to bear a very constant proportion to each other; but salts scarcely ever appear to be thrown out without carrying with them a portion of albumen, however small—the greatest amount of albumen is very trifling." "There is no doubt that it is incorrect to speak of cholera-fluid as the serum of the blood; the fluid is derived from the serum, but it is not composed of all its ingredients." Drs. Reinhardt and Leubuscher's researches as to the liquid portion of the stools, show that in many cases it contains albumen, in others not. They confirm the fact, first ascertained by Guterbock, as to the presence of chloride of sodium, which they think, though the point requires more careful examination, exists in an inverse ratio to the albumen. (L. c. p. 5.) As regards the sediment of cholera evacuations, the subject is too extensive for consideration in this Report.

* Dr. Parkes has particularly illustrated this point ('Researches,' &c., p. 116 *et alibi*).

Among these considerations, which are merely thrown out as indications, the occasion being unsuited to a full discussion of this important subject, I will only add, what is familiar to all who are acquainted with cholera, that the most severe and rapidly fatal cases are those in which the discharges are small in quantity, and where the blood is apparently not freed from the poison it has imbibed; whilst those attacks where the evacuations are more profuse have, on the whole, a better chance of recovery.* Temporary relief is often, too, afforded by the evacuations, especially by vomiting, though this may, in part at least, depend on the removal of distension.

Existence of a Premonitory Stage.—The valuable Reports, both of the Metropolitan Sanitary Commission and of the General Board of Health, distinctly prove the general existence of a premonitory stage in cholera, consisting of diarrhœa. But, notwithstanding the establishment of this fact, the vast importance of the subject, in relation to preventive treatment, demands that the results obtained in the metropolis during the late epidemic should be recorded; and this is the more necessary, seeing there is still some difference of opinion among medical practitioners, on several points connected both with the extent and the signification of the diarrhœa accompanying an outbreak of cholera.

It has often been said that persons, and particularly in India and other places where the efficient cause operates with intense force, are occasionally struck down as by a cannon-ball; many such cases were reported during the late attack in London, persons having sometimes fallen down in the street in collapse, or having been suddenly seized at their work, or whilst at home, and especially in the early morning; and in these instances it was often stated there were no premonitory symptoms, the individuals being, as it was affirmed, in perfect health up to the very time of the attack. The result of extended inquiries and observation induces me to doubt, if any case whatever of collapse occurs without a premonitory stage. But in advancing this opinion it is not meant to be asserted that diarrhœa is the invariable precursor: there are many other though less obvious signs of the coming attack. For example, it was the result of a cautious investigation instituted at the General Hospital at Hamburg into the history of between 300 and 400 cases of developed cholera, that the attack was in many cases preceded by depression of spirits, loss of appetite, uneasiness about the bowels, and an inclination to go to stool, but without effect; dizziness,

noises in the ears, and other disturbance of the sensorium; oppression at the præcordia, the person often waking up with the feeling of want of breath; nightmare and frightful dreams were often experienced: one premonitory sign was an uneasiness in the legs, with slight twitchings or spasms, which, for the most part, closely preceded the profuse evacuations, and evidently indicated the approaching cramps; it was so common at Hamburg, that the people called it "stretching of the legs." This peculiar twitching was often observed in London during the late and previous epidemic, especially in those districts where the disease was severe. The medical officers of St. George's, Southwark, informed me they had noticed it; and some of these gentlemen had, indeed, themselves suffered from the affection. Mr. Chandler, one of the medical officers of Rotherhithe, and who had the direction of the measures instituted by the guardians, says, "a very common premonitory sign consisted of twitchings of the legs." It is an interesting fact, pathologically, that these slight cramps, which, like the other symptoms, were not, of course, always followed by collapse, being, indeed, most amenable to treatment, often occurred without being preceded or accompanied by diarrhœa—a circumstance which tends to show that the violent cramps and spasms accompanying the profuse discharges in collapse do not depend on these, but rather on the morbid quality of the blood deranging the force of the spinal cord.

General existence of Premonitory Diarrhœa.—The phenomena just enumerated are some of the indications of the disturbed state of the system prior to the full development of cholera, to which, during the prevalence of the epidemic, attention should be paid, both by the patient and the medical practitioner, as warnings of the mischief which may follow unless warded off by prompt treatment. But the general precursor is, as it is well known, diarrhœa, often accompanied with vomiting and other symptoms, such as spasms, sinking, and coldness of the surface.

Difficulty of detecting it.—The actual extent to which this affection exists has not, however, hitherto been very satisfactorily determined either in this country or on the continent, and yet this is a cardinal point in the inquiry. There are, as a little consideration will suffice to show, several obstacles which often render it difficult to ascertain the existence of this diarrhœa when it has been actually present. Among the first of these are the extraordinary apathy of the poor, and the difficulty, so often encountered when questions are put, of arriving at the truth. Many most remarkable instances of both these difficulties occurred in the metropolis. One of the surgeons of a large parish informed me that he was called to a child labouring under a fatal attack of cholera; that in consequence he visited the house several times, and on each occasion inquired of all the inmates if any one was suffering from bowel complaint, and was answered in the negative; soon after the father was seized, and became collapsed; and then it turned out that this person, who was present when the surgeon made his visits, had been suffering for some time with diarrhœa, which he had totally neglected. Very frequently, and especially among the poorest and most destitute classes, the only person who could give information was the patient himself, who, from the intense suffering and profound prostration, often of course was in a state in which no

satisfactory replies could be obtained. Little reliance in such cases can be placed on the statement of friends, as the following case will show. In a country town near London, where the disease had been most severe, I visited a case of cholera, and on inquiry of the medical officer if there had been any premonitory diarrhœa, a decided negative was given. I then asked the daughter, a grown-up young woman, if her mother, who had become collapsed in the early morning, had had any looseness of the bowels on the preceding day, when a second negative was given. Not feeling satisfied, I questioned the patient herself, when she answered, "Oh! yes, Sir, I was purged all yesterday." The fact is, that unless the medical attendant makes a more searching inquiry than it is usually possible for a parochial surgeon, overwhelmed as he is with incessant labour, to undertake, the exact preceding circumstances, especially if it be a question of only slight disturbance of the bowels, to which the poor pay no attention, and usually regard as a salutary operation, cannot be ascertained.

The same kind of difficulty was observed in other countries. Thus, at Paris, M. Guérin says that, in the last epidemic, one of his colleagues, who was too young to have seen the cholera of 1832, but who was a careful observer, affirmed that in several cases there had been no premonitory symptoms. Not crediting this, M. Guérin went to the people, and convinced his colleague that in these supposed sudden attacks cholerine had pre-existed during several days, and in one case for six weeks. The editor of the Gazette Médicale also points out the difficulty of ascertaining the existence of the premonitory diarrhœa; and he adduces the case of a man, said to have had a "foudroyant" attack, where there had been diarrhœa for two or three days.

Dr. Macloughlin's Inquiry.—Dr. Macloughlin, one of the inspectors who superintended the house visitation in several populous districts, paid special attention to the question how far premonitory diarrhœa prevailed; and the results are embodied in the following extracts from his Report:—

"In 1832, when the disease raged so severely in Paris, I attended the hospitals daily, and took my duty in the district in which I resided, to attend on cholera cases. My attention was very soon called to the fact that in every case where the patient or his friends could give any account of the state of health previous to an attack of cramps, vomiting, &c., there had been for several days previously a diarrhœa more or less urgent."

"When I was placed in charge of the house-to-house visitors in the districts of Poplar, Stepney, and Greenwich, and temporarily of six other unions, I invariably met the medical officers, and also invariably inquired of each of those gentlemen whether he had had any case of cholera without a premonitory diarrhœa. I found that in all the cases diarrhœa had uniformly preceded the attack. It is true that several cases were reported to me as cases of cholera without any premonitory symptoms; and although these were reported by gentlemen of superior medical knowledge, and whose zeal in the discharge of their duties could not be questioned, yet, on more minute examination in their presence, it was invariably found that they had either been misinformed by the patients or their friends, or that they had not attentively enough inquired into the previous history of the cases."

"Consequently, I am justified in concluding that I have not found in 3902 cases of cholera which occurred in the above nine unions one case of cholera without premonitory diarrhœa."

The large number of developed cases comprised in this inquiry,

namely 3902, of which 1658, or 42 per cent., were fatal, and the care with which it was conducted, give great value to Dr. Macloughlin's conclusions. It is proper to add that these cases, with the exception of a very small number, occurred before the house visitation was established.

Experience of other Countries.—The experience of other countries unequivocally proves that attacks of cholera are, for the most part, preceded by diarrhœa. Thus Dr. Müller, in his account of the epidemic of 1848 at St. Petersburg, says,

"Premonitory signs, usually continuing for several days, and invariably connected with disturbances of the digestive organs, scarcely ever fail." *

The following passage is extracted from the 'Lancet:'—

"It has been noticed by the Russian physicians, that a sudden attack of the disease is but apparently so; and that the precursory symptoms are invariably a painful or painless diarrhœa, with from one to six daily evacuations, which have all the ordinary fæcal characters; whilst the dejections in the subsequent stage, or that of collapsus, resemble, as is well known, a decoction of rice. The necessity of controlling the disease in this stage was felt by the physicians of Moscow, and diarrhœa dispensaries and immediate assistance in the patients' own dwellings were regularly organized."†

Dr. Neville, an assistant physician of the General Hospital at Hamburg, after stating his opinion that in every case there were premonitory symptoms of some kind or other, as noticed in a preceding page, adds, "the most frequent and marked was diarrhœa." It was, however, noticed in this city, as elsewhere, that the premonitory symptoms, whatever they might be, were, at the outset of the epidemic, rapidly followed by the actual attack, death ensuing in a few hours. At this epoch cases unquestionably occurred without antecedent diarrhœa: but in about four weeks it was observed that the premonitory signs, and especially the diarrhœa, were more marked and continued for a longer time; so that, about the middle of the epidemic, I was informed by Dr. Buch that almost all the cases were preceded by diarrhœa.

At Berlin the experience was similar. In a communication with which I was favoured by Dr. Romberg, Professor of Clinical Medicine, it is stated that "diarrhœa for the most part precedes the actual attack of cholera, and this, too, in the commencement, progress, and termination of the epidemic." This distinguished pathologist further remarks that "he has not seen such cases of sudden seizure as those described in India, without premonitory signs." Dr. Simon, an accurate observer and assistant physician to one of the cholera hospitals, stated to me, as the result of express inquiry, that, on the first outbreak of cholera in that city, about half the persons seized had preceding diarrhœa, in the others it was absent: the attacks were most rapid, and almost always fatal. "In about three weeks the disease changed; it was then preceded by diarrhœa, sometimes of several days' duration." In the admirable treatise of Drs. Reinhardt and Leubuscher it is remarked that "diarrhœa was, in the greatest number of cases, the first abnormal phenomenon, which later issued in cholera, the patients suffering twelve hours, one, two, eight, and even fourteen, days before other phenomena arose." *

* 'Einige Bemerkungen über die Asiatische Cholera,' p. 46.
† Lancet, vol. ii. 1848, p. 464.

In a very interesting discussion which took place at the Academy of Medicine at Paris, relative to the instructions to be issued to the people on the occurrence of cholera, M. Guérin, whose opinions were unanimously adopted, spoke as follows:—"Cholera is almost always, if not always, preceded by a period of incubation, consisting for the most part of a diarrhœa *sui generis*, commonly denominated 'cholerine;' more rarely there is a disturbance of innervation. Now according to the admission of all practitioners, it is extremely easy to arrest the disease at this period; it is therefore of importance to inculcate this double truth in the public mind; this is indeed a precept which appears to me to have the same bearing as that of the cauterisation of a wound after the bite of a rabid animal." The reporter of the commission appointed to draw up the instructions for the public, M. Martin Solon, agreed in these views, and altered the instructions accordingly.†

The results of these various inquiries distinctly show that, as a rule, cholera is preceded by diarrhœa; that the cases in which this is absent are strictly exceptional, the number of these exceptions invariably diminishing in proportion to the care and accuracy of the investigation; that the greatest number of these exceptions occur on the first outbreak of the epidemic in a new district; and that, consequently, there is in the vast majority of attacks a period varying from a few hours to several days, or it may be weeks, during the whole continuance of which the aid of medicine, as the experience of all European countries has shown, is as pre-eminently successful, as it becomes powerless in presence of complete collapse, when, it may be said, in the language of Professor Romberg, who speaks after having directed the treatment of a thousand patients, "it is most fortunate if a man escape death; if he is saved, it is by the *vis medicatrix naturæ*, not by curative means." ‡

Amount and Character of the Diarrhœa prevailing during Cholera.—It is well known, even in some degree to non-professional persons, that when a severe outbreak of cholera occurs in any particular city, town, or village, it is invariably accompanied by a large amount of diarrhœa. Now, it is a most important question clearly to determine the relations of this diarrhœa to the destructive disease with which it is concomitant: is it an integral part of the epidemic, or a mere coincidence as to time and place? As regards popular opinion among the educated classes, there is no diversity of belief; the two affections —diarrhœa and cholera—being considered as but different stages of the same common disease, varying, indeed, and most widely, in degree, but being essential in kind. There is not, however, the same uniformity among medical men; for although, so far as my experience extends, those whose information is the most extended and practical admit no real distinction, there is a limited number who contend that true cholera is a disease distinct from the commencement, and not to be confounded with the prevailing affections of the alimentary canal;

* *L. c.* p. 3.
† Gazette Médicale, 1849, Séance Mars 19me.
‡ The opinions of some of the medical officers will be found in the section on the house visitation.

so that these last cannot run on into collapse, though they may predispose to an actual attack. It is obvious that those who hold these opposite opinions would regard with very different eyes the value of any preventive measures, directed, like those, subsequently to be described, of the Board of Health, to the early discovery and prompt treatment of diarrhœal cases occurring in a cholera district; since it is a very different thing to consider an attack of purging and vomiting as merely predisposing, like a multitude of other circumstances, to cholera, or as a part and parcel of the disease, and which may prove to be the actual commencement of the most severe form of the affection.

The general history of cholera as well as more special investigation equally seem to show that the more commonly received is the true conclusion. Simultaneously with the outbreak of cholera in a city, if severe, it is found that almost the whole population suffer from a disturbed state of the bowels, the predominant tendency being to relaxation. Dr. Crawford, in his account of the destructive epidemic at St. Petersburg, says, it was observed that those persons whose bowels were habitually constipated became spontaneously free; whilst those whose bowels were usually free experienced a tendency to relaxation. In Hamburg a vast number of persons were affected with diarrhœa; others suffered from an uneasy sensation and rumbling of the bowels; whilst in others constipation occurred. Dr. Simon states, with regard to Berlin, that, before and during the cholera, diarrhœa was very common, almost every person in that city having been thus affected.

In the metropolis, wherever the epidemic was severe, there was an enormous amount of bowel complaints, consisting essentially of diarrhœa, with which vomiting was very commonly combined. The surgeries of the medical officers in all such localities were besieged with applicants; the various dispensaries gave assistance to multitudes of patients; and a vast number applied, in all the poorer districts, to the druggists' shops; and, besides all these, many neglected to seek assistance, trusting either to various remedies of their own, or allowing the affection to take its course.

There is, then, no exception to the rule, that, whenever cholera breaks out with any force as an epidemic, it is preceded by and accompanied with a vast amount of diarrhœa. In several instances it was indeed asserted by the local authorities in this country, that although, as the mortality tables showed, cholera was actively prevailing, the diarrhœal attacks were few in number; but without a single exception, when a searching inquiry was instituted, the fallacy of such assertions became apparent. It was the same in small villages and country towns, in all of which, when invaded by cholera, so far as my experience extends, it invariably happened that bowel complaints were general. In the section relating to the system of house visitation, many illustrative details on this point will be found.

The constant relation thus observed between the appearance of cholera and diarrhœa cannot, it is certain, be a mere coincidence; and this being so, it is not only the most obvious, but likewise, as it would seem, the most philosophical explanation, to refer the two affections to the same cause, operating with varying degrees of intensity. This view is strongly supported, or rather, it may be affirmed, substantiated,

by a careful investigation of the following characteristics by which these attacks of choleraic diarrhœa were distinguished from ordinary diarrhœa:—

1. The nature of the evacuations, which were for the most part thinner than usual, often light coloured, and evidently approaching to the characteristic rice-water discharges into which they often ran.
2. The sudden nature of the attack and the profuseness of the discharges. This was often observed as regarded the vomiting which so frequently occurred with the purging, and which was compared by many observers to the flow from a fountain.
3. The frequent absence of pain, a circumstance which led to a large sacrifice of life; the victims, lulled into a fatal security by the absence of suffering, taking no measures to arrest the evacuations, though these often continued for days.
4. The great prostration, the tendency to coldness, and the very frequent occurrence of cramps.
5. The time of the attack, being in several remarkable instances where large numbers of persons were simultaneously seized, like that of cholera, the early morning, from two till six.
6. The occasional occurrence of consecutive fever, similar to that following cholera: towards the close of the epidemic the diarrhœa very generally passed into low fever.

These peculiarities were so striking as to leave no doubt on the minds of those who witnessed these attacks on a large scale, that they were dependent on the choleraic poison; indeed, I can scarcely recall a single instance among the numerous medical officers whom I had occasion to consult on this point, where a different opinion was expressed.

Cholera commencing in Bilious Diarrhœa.—But, as among other practitioners it was occasionally asserted that the attack of true cholera was peculiar from the first as to the nature of the evacuations, it appeared to me desirable to make an extended inquiry; the result of which proved that, in a considerable number of attacks, ending in perfect collapse, and where the evacuations were examined by the medical attendants, there was in the beginning bilious purging, which, by degrees, became more and more serous, and at length of the perfect rice-water character. Several cases of this kind were related to me, and among others by the medical officers of Lambeth, particularly by Mr. Dawson and Mr. Mitchell. Dr. Waller Lewis, one of the inspectors, was so kind as to procure a considerable body of evidence of the same nature; from which the following details are taken:—

Dr. Burrows, who, with Dr. Hue and Dr. Roupell, had charge of the cholera cases that were admitted into St. Bartholomew's Hospital, says,—

> "From what I could learn from many patients whom I interrogated, and from what I saw in a few at the commencement, I believe there is a period, of uncertain duration, when the stools are feculent, before they assume their peculiar rice-water appearance."

Dr. Frederick Farre has given the particulars of several cases, in

which dark feculent motions preceded the rice-water stools. Mr. Wood, the apothecary of St. Bartholomew's Hospital, states,—

"I find it recorded in several instances that the evacuations contained feculent matter even after admission into our wards. In a very great number of other cases, where the evacuations were represented to have been dark and offensive, diarrhœa had existed for a period varying from two or three to ten days. Some of those cases which terminated fatally most rapidly commenced by a copious liquid and feculent evacuation."

Dr. Lewis, who carefully investigated this point, says, in speaking of the premonitory symptoms, that the disease was generally ushered in by great depression of the nervous and muscular powers, loss of appetite, and slight nausea, without actual sickness.

"In a few hours diarrhœa of the ordinary feculent character presented itself, accompanied with a greater inclination to vomit; and a cold perspiration over the whole surface of the skin. The diarrhœa soon increased in frequency, the stools being still feculent, but less so than at first; and vomiting came on. The peculiarity of the diarrhœa consisted in its utter painlessness and in the patient almost always imagining that the bowels would not be troubled any more for a long time. After these symptoms had continued a very variable length of time, from three or four hours to as many weeks, the character of the discharges entirely changed in their nature. This change usually took place gradually, but sometimes suddenly; from being of the ordinary feculent appearance, the ejecta became of a pale white, sometimes almost colourless, so well known by the simile of rice-water."

The experience of Berlin corresponds with those statements. Drs. Reinhardt and Leubuscher give the following account of the evacuations:—

"The first stools, so far as we could observe them in the few cases which are available for such examination in an hospital, were in the beginning thin, liquid, and feculent, mixed with the remains of food, and coloured by decomposed brownish or yellowish bile, and generally with numerous mucous flocculi. In a few cases this condition of the stools continued during the whole of the cholera attack; but the most usual course was this, that the remains of the food disappeared; that the stools at length consisted only of a thin, watery fluid, with mucous flocculi suspended therein, sometimes still mixed with green bile, which in some cholera cases remained during the whole attack. In the greatest number of cases, however, the stools were quite colourless, and without the least admixture of bile: these are the so-called rice-water stools."

"We regard the diarrhœa which arises under the influence of the general noxiousness (schädlichkeit) operating at the time of epidemic cholera as the one, and asphyxia as the other point of a progressive series of phenomena, with a number of intermediate stages." *

The great accuracy with which the investigation was made by these authors, who had constant recourse to the microscope, gives to their conclusions great weight.

All these facts distinctly show that, with some exceptional cases, where the discharges are from the first of a peculiar character, cholera usually commences with bilious purging. So intimately, in fact, are diarrhœa and cholera blended together, that it is often difficult to say when one has ceased and the other has begun: thus the diarrhœa may

* *L. c.*, pp. 4, 22.

go on, the discharges becoming more thin, watery, and light-coloured, and even rice-water, without collapse, and where by prompt treatment the disease may still be arrested, as happened in so many hundred cases during the house visitation in the late epidemic.

Notice on Diet, and on the Treatment of the Premonitory Diarrhœa.—On the first occurrence of cholera in this country, the General Board issued an official notification (dated October 5th, 1848), in which plain directions were given both for guarding the people from the use of improper food, and for the treatment, in the unavoidable absence of medical assistance, of the premonitory diarrhœa. As it is possible there may be a return of the epidemic, it is desirable to state what has been the experience of the last eighteen months upon these two important points.

On the influence of Diet.—The following extract from the official notification contains the recommendations of the General Board on the subject of diet:—

"Whenever Asiatic cholera is epidemic, there is invariably found among great numbers of the inhabitants an extraordinary tendency to irritation of the bowels; and this fact suggests, that every article of food which is known to favour a relaxed state of the bowels should, as far as possible, be avoided—such as every variety of green vegetables, whether cooked or not, as cucumber, or salad. It will be important also to abstain from fruit of all kinds, though ripe and even cooked, and whether dried or preserved. The most wholesome articles of vegetable diet are—well-baked, but not new bread, rice, oatmeal, and good potatoes. Pickles should be avoided. Articles of food and drink which, in ordinary seasons, are generally wholesome, and agree well with the individual constitution, may, under this unusual condition, prove highly dangerous. The diet should be solid rather than fluid; and those who have the means of choosing should live principally on animal food, as affording the most concentrated and invigorating diet; avoiding salted and smoked meats, pork, salted and shell fish, cider, perry, ginger beer, lemonade, acid liquors of all descriptions, and ardent spirits. Great moderation, both in food and drink, is absolutely essential to safety, DURING THE WHOLE DURATION OF THE EPIDEMIC PERIOD. One single act of indiscretion has, in many instances, been followed by a speedy and fatal attack. The intervals between the meals should not be long; cholera being uniformly found to prevail with extraordinary intensity among the classes that observe the protracted fasts common in the Eastern and some European countries."

After having made extensive inquiries in Germany and in this country, I feel justified in stating that the soundness of these directions has been fully established. One great argument in their favour is, that the authorities of other European countries, on the approach of the epidemic, have from experience found it necessary to warn the people to abstain from such articles as those above enumerated, even when, as in the case of cabbages and other green vegetables, they formed a main part of the ordinary food of the working classes. It has been stated in the previous section, that many attacks of diarrhœa and cholera were brought on by excesses committed on Saturday night and Sunday; in all parts of the metropolis cases of this kind relating both to eating and drinking were reported to me by medical men. But besides this, instances were very common where the seizure resulted merely from partaking of a hearty meal of substances liable at such a time to disturb the alimen-

tary canal, such as veal, pork, eels, &c. It is particularly necessary to point out that during the epidemic influence even substances which in ordinary times are harmless may produce the most serious consequences; thus, in one instance, the children of a physician, having been allowed to partake of cherries, were all seized with alarming diarrhœa, which fortunately yielded to treatment.

It is also especially important to warn persons who have had an attack of diarrhœa of the necessity of a rigid attention to diet for some time subsequently; many persons in the state of convalescence fell victims to errors of this kind. On examining the returns of the medical visitors and inspectors such cases as these occur:—

"This case had been under treatment two or three days for simple diarrhœa, and was convalescent, when the patient indulged in eating plum-pudding for supper, and was seized in the night with rice-water purging and vomiting, and was soon in a state of collapse: she died in about 20 hours."

Many of the cases which, after treatment, passed into cholera, were, like the present one, owing to indiscretion in diet, exposure, &c.

Notice on the Treatment of the Premonitory Diarrhœa.—In glancing at the treatment of the premonitory diarrhœa, it may be noticed that the one guiding fact to be borne in mind is, that the determining cause of the choleraic discharges operates from within the body and not from without; this being the broad distinction between the diarrhœa of cholera and that common form of the affection which depends on irritants acting on the exterior surface, speaking physiologically, of the bowel. Whatever theory may be formed as to the nature of cholera, all the best authorities agree in this view of the subject; there is then nothing to be expelled from the intestinal canal by purgatives; the object is to stop a morbid flux from the blood-vessels, and whatever will best effect this, the one great end, will constitute the most efficient treatment.

It is not intended by these remarks to affirm that cases of diarrhœa did not occur during the presence of cholera, which depended on the presence of unwholesome ingesta or of morbid secretions, where mild aperients were required; but these formed the exceptions, and demanded the greatest caution both as to diagnosis and treatment. I have known the most alarming and even fatal results produced by the administration of the mildest purgatives; and it is certain much mischief was produced by the notion, so common among non-professional persons, that all cases of looseness of the bowels are caused by some noxious matter which demands expulsion. Mr. *George T. Jones*, who treated, as a medical visitor, 1000 cases of diarrhœa, says—

"When a poor man is attacked with a flux of any kind, and especially diarrhœa, he invariably thinks that there is some peccant humour in his body which requires to be discharged, and forthwith sets about to expedite the removal of the offending matter. Hence a reason why during my visitorship I have met with so many cases of diarrhœa, aggravated by taking doses of Epsom salts, jalap, and other drugs."

This common and dangerous error was dispelled by the house-visitation, so that, when this was established, but unfortunately only at the end of the epidemic,

"the people were better informed on this point, and were not so eager to take purgatives."

The directions issued by the General Board for the treatment of the premonitory diarrhœa were as follows:—

"Medical authorities are agreed that the remedies proper for the premonitory symptom are the same as those found efficacious in common diarrhœa; that the most simple remedies will suffice, if given on the first manifestation of this symptom; and that the following, which are within the reach and management of every one, may be regarded as among the most useful, namely, twenty grains of opiate confection, mixed with two table spoonfuls of peppermint-water, or with a little weak brandy and water, and repeated every three or four hours, or oftener, if the attack is severe, until the looseness of the bowels is stopped; or an ounce of the compound chalk mixture, with ten or fifteen grains of the aromatic confection, and from five to ten drops of laudanum, repeated in the same manner. From half a drachm to a drachm of tincture of catechu may be added to this last, if the attack is severe.

"Half these quantities should be given to young persons under fifteen, and still smaller doses to infants.

"It is recommended to repeat these remedies night and morning for some days after the looseness of the bowels has been stopped. But, in all cases, it is desirable, whenever practicable, that even in this earliest stage of the disorder recourse should be had to medical advice on the spot."

Experience of the Medical Visitors.—The gentlemen who acted as medical visitors in London were, almost without an exception, legally qualified practitioners; many of them were experienced physicians and surgeons. The results of their experience, considering the large number of patients whom they treated, have therefore great value; and, in order to place these on record, a series of questions were circulated, one of which was to this effect—"What remedies did you find most efficacious in stopping the premonitory diarrhœa?" I have carefully examined the returns of 40 of the visitors, who, in the aggregate, had attended 22,729 cases of diarrhœa, besides cases of rice-water purging. Of this number, 34 used, in the case of adults, some form of opium, variously combined with preparations of chalk, ammonia, sulphuric æther, astringents, and aromatics; two administered opiates when other remedies failed; and four did not use opium at all. Several of the visitors speak in the strongest terms of the success following the use of opiates; thus Mr. A. B. Allen, who attended 947 cases, says he found pulvis cretæ cum opio almost always succeeded.* In the severer forms of diarrhœa calomel and opium were extensively and effectually used; in such cases several of the visitors also found a combination of the acetate of lead and opium most successful; creosote, usually combined with laudanum, is named as having had great control over the vomiting. In the case of children, opiates were not so generally given as to adults; pulvis cretæ compositus, either alone or in combination with hydrargyrum cum cretâ, or confectio aromatica, was extensively used; but opium, in small doses, was also often given, and with the best results. I made extensive inquiries, and only heard of one or two cases where narcotism was

* Dr. M'William, F.R.S., who is the medical attendant of the Custom-house officers, provided the men with a preparation of chalk, kino, gum arabic, cinnamon, and opium to be taken on the occurrence of diarrhœa; and by this judicious precaution the men were inspired with confidence, the disease was kept in check, and collapse was prevented. Dr. M'William remarked, what I have mentioned as one of the features of choleraic diarrhœa, that the men under his charge were often attacked during the night.

supposed to have been induced in children. There were various modifications of treatment; but it would be inconsistent with the objects of this, which is a Sanitary Report, to enter into their consideration. I may, however, observe that the treatment of the premonitory diarrhœa by opium and stimulants was very extensively practised in Germany; and a combination of laudanum, peppermint, valerian, and ipecacuanha, forming what were called "Thielmann's Drops," after the physician of that name at St. Petersburgh, obtained great repute.*

In choleraic diarrhœa, especially, there are four subordinate points of great importance: 1, the observance of the horizontal position, a precaution difficult to insure with labouring people, and yet of great consequence in cases of any severity; 2, the avoidance of all exposure to cold and chills, and the careful maintenance of the heat of the external surface, which is so often lowered in these attacks; 3, a rigid attention to diet, and that for some time after the diarrhœa has ceased; 4, the prevention, as far as possible, of fear, a passion which, during the epidemic, has often operated most perniciously.

I cannot better conclude this section than by quoting the observations of one of the most distinguished physicians in this country, illustrative of the whole subject of premonitory diarrhœa; remarking previously, that the experience of the late epidemic has shown how slow is the progress of knowledge, since it is obvious that, if the sound principles laid down years ago in the following extract had been universally acted on, the lives of thousands of victims who are now in the grave might have been spared. In allusion to the attack of cholera in 1832, Dr. Watson says,—

"The epidemic cholera made its attack in two different modes. In one it seized upon the patient suddenly, and without warning. This was comparatively rare. Much more commonly the specific symptoms were preceded, for some little time, even for some days perhaps, by diarrhœa. And this I take to be the most important practical fact that was ascertained during its prevalence among us. When the disease was once fairly formed, medicine had very little power over it, but in the preliminary stage of diarrhœa it was easily manageable. Unfortunately, people are inclined (especially those classes of the community among whom the cholera most raged) to regard a loose state of the bowels as salutary, and to make no complaint of it, and to do nothing for it; or, in other cases, they conceive it to proceed from some peccant matter within which requires to be carried off, and they take purgative medicines to get rid of it. Both of these are serious and often fatal mistakes. Mere neglect of the diarrhœa frequently permitted it to run into well-marked and uncontrollable cholera; and the employment of purgatives hastened or insured that catastrophe. The proper plan of proceeding, I am convinced, was to arrest the diarrhœa as soon as possible after its commencement by astringent aromatics and opiates. You may object, perhaps, that the cases that were cured in this way were not cases of cholera at all, and never would have been, but simply ordinary diarrhœa. It is impossible to prove the contrary, no doubt; but the presumption is strong that the diarrhœa would, in many, and perhaps most instances, have run on, if not checked, into the more perilous form of the disease. In many places, when taught by experience, the authorities established diarrhœa dispensaries, to which those attacked by looseness of the bowels were warned and invited to apply, that the looseness might forthwith be corrected; in many such places the cholera, which before had been cutting the inhabitants off by scores and hundreds, began instantly to decline in frequency. I venture to advise you, supposing the disease should reappear, or whenever in the autumn a suspicion arises that this form of cholera is present in the community, not to try, in cases of diarrhœa, to carry off the presumed offending matters, but to quiet the irritation and to stop the flux as soon as you can."

* Dr. Graves describes a peculiar affection of the mucous membrane of the rectum, in which there are "white stools;" depending, not as was formerly thought on the presence of chyle, but on "the absence of bile and on the secretion of white viscid mucus from the intestines." It is interesting to learn that this affection, which is confined as to its product to the secretion from the small intestine in cholera, obstinately resists astringents, &c., but yields to nux vomica combined with hyoscyamus and opium. The examination of the discharges and of the mucous membrane would probably disclose a desquamation of the epithelium. (Clinical Lectures, vol. ii. p. 216.)

SECTION VII.

On the Neglect of Premonitory Diarrhœa by the Poor.

To those who are unacquainted with the actual facts of the case, the extent to which the poor during the epidemic neglected the premonitory diarrhœa must appear almost incredible. It has been shown in a preceding section that, notwithstanding the various measures adopted by the authorities to advertise the poor of the necessity of early application, patients were, as a rule, first seen by the medical officers when in collapse. This unhappy result was dependent on several distinct causes, which, in consideration of the great importance of the subject, may be here stated.

I. The most generally operative of these causes was unquestionably ignorance of the connexion existing between looseness of the bowels and cholera; this prevailed far and wide, as is indicated in the reports of the visitors. The apparently slight nature of the attack, and especially *the absence of pain*, lulled thousands into a fatal apathy and security. Mr. *Liddle*, whose evidence is particularly of importance, since, in addition to the experience he obtained as one of the medical inspectors, he possesses that acquired as one of the medical officers of Whitechapel Union, observes—

"It is a well-known fact that the poor would not of themselves make early application for medical advice during the premonitory stage of cholera. In some instances, so slightly did they consider the warning given them by the looseness of bowels, that this was denied when the visitors called; and only when collapse supervened did they acknowledge that diarrhœa had existed, saying 'they thought it was of no moment, as they did not feel ill.'"

Dr. *Gavin* says—

"Previous to the house-visitation, few poor persons were found who were aware that diarrhœa was a premonitory symptom of cholera; if asked if any person were ill, the almost invariable answer was 'No, but my husband or child has got a very bad bowel complaint.' One reason for this apathy consists in the belief of the poor that everything of the kind 'will work itself off;' this belief probably arising from the frequency of diarrhœa among them."