happy, and assures us he is progressing favourably, and feels most comfortable; he has no great appetite for solids, but he takes his tea, milk, pudding, etc., thankfully, and with apparent relish: still, we shall remark, he is inclined to sleep, which we probably attribute to the exhaustion caused by the frightful collapse symptoms (cramps, retching, etc.); and now and then there is very slight hiccup. The latter symptom has most frequently awakened me to the true state of matters, and has enabled me somewhat confidently, and long before any danger could otherwise have been anticipated, to form my prognosis. Sooner or later, unmistakable febrile or typhoid symptoms make their appearance: then we have the ordinary difficulties of diagnosis and prognosis in typhus to deal with. It is in the earlier periods that the prognosis is often exceedingly difficult. A just recognition of the more insidious and apparently less dangerous modes in which this stage begins I believe to be of great importance to the practitioner, inasmuch as, by affecting his treatment, the ultimate result of the disease is to a great extent controlled. For instance, after a very mild attack of cholera, marked by considerable serous purging, but by very slight vomiting, and by the absence of cramps, where the condition familiarly known as collapse could scarcely be said to have existed, and without any distinct reaction stage, the patient appears in all respects (with the exception, let us say, of drowsiness or of occasional hiccup) to be convalescing. It is judged quite unnecessary to administer remedies of any kind, and alcoholic stimulants in particular are contra-indicated by the ruddy face and full pulse. The typhoid condition soon shows itself in unmistakable characters, and now stimulants are given with all speed and in large quantity; but it is too late: the vital powers are already too far exhausted, and the patient dies. I question how far the non-exhibition of stimulants during reaction and the earlier stages of the consecutive fever has contributed to the fatal issue in many cases of cholera during this and former epidemics.

[To be continued.]

Crichton Royal Institution, Dumfries, August 1854.

ON THE FUNCTIONAL DISORDER OF THE ALIMENTARY CANAL NOW PREVAILING.

By B. G. BABINGTON, M.D.

I BEG to direct the attention of the profession to a functional disorder of the alimentary canal, which, if not new in its characters, at least occurs under new circumstances, and at the present moment affects so many of the inhabitants of this metropolis as to lay some claim to being considered epidemic. Within the last fortnight, I have seen numerous cases; and I have reason to believe, from inquiries among my medical friends, that hundreds are at this time the subjects of the complaint in question. I allude to pain of a peculiar character, referred to the stomach in particular, and thence passing through to the back; sometimes extending under the false ribs on both sides; sometimes to the loins, especially over the kidneys; and sometimes to the lower bowels. It is more or less acute, being by some described as pricking or stabbing, while by others it is represented as uneasiness and general distress, necessitating a frequent change of posture. It has not affected the pulse, nor exhibited any inflammatory symptoms, in the cases which have come under my observation; but I have heard from other medical men that they have in several instances been obliged, in addition to other antiphlogistic means, to have recourse to topical bleeding by leeches. It is neither attended by vomiting and nausea, nor necessarily by relaxation of the bowels; but it seems in every instance to have been accompanied by, and perhaps in no inconsiderable degree to be dependent on, the generation of flatus. This is not constant, but in some cases occurs two or three hours after taking food; while in others it takes place only late in the evening, and during the

night. The complaint is marked by much debility and depression of spirits.

The cause of this very unusual deviation from health, as existing with so much uniformity in such numerous instances, does not appear evident. At first I was disposed to attribute it to the unusual degree of caution which the generality of persons have of late observed with respect to diet and beverage; many confining themselves up to the present time to bread and butter, fresh butcher's meat, and potatoes, as solid food; and to wine or brandy with water, as a beverage. It seemed not unlikely that the sudden discontinuance of fruits, raw or cooked, as well as of green vegetables and acids, might induce an alteration in the functions of the stomach and bowels—an approach to the scorbutic diathesis favourable to the generation of flatus, and consequently to that state of distension of the stomach and bowels which I have described; but I have since found the complaint to exist in persons who have made no change whatever in their mode of living, and I am therefore constrained to acknowledge some other cause for its prevalence. Is it not possible that this may be found in some modification or dilution of that unknown something which, in certain predisposed persons, gives rise to cholera, and, in others, to what is called choleraic diarrhoea? I am prompted to ask this question from a consideration that there are other agents, poisonous or medicinal, which produce effects somewhat analogous to the *ignotum quid*, which causes cholera, according to the quantity administered. When, for example, but a small dose of calomel is taken, it will cause only nausea, flatulence, and tormina of the bowels; a larger dose will induce purging, and perhaps vomiting; while one still larger acts as a sedative, and might, if enormous, cause even fatal collapse. The same proportionate effects have been frequently observed with other purgatives, as well as with the irritant poisons.

With respect to the treatment of this epidemic, although I have hardly as yet gained sufficient experience to speak with full confidence, yet I believe the following mode will generally be found adequate to effect its cure. If the bowels have been costive, I prescribe some such warm aperient as the following:—

R Tincturæ rhei comp. ʒss.
Tincturæ cardamomi comp. ʒj.
Infusi sennæ comp. ʒviij. M.

Fiat haustus primo mane sumendus.

But whether this be needed or not, I have known much benefit derived from the following carminative mixture:—

R Spiritus ammoniæ aromatici ʒiij.
Tincturæ lavandulæ comp. ʒiij.
Tincturæ hyoscyami ʒj.
Confectionis aromaticæ ʒij.
Aquæ cinnamomi ad ʒvj. M.

Sumat cochl. ij ampla ter in die stomacho jejuno.

In addition to these means, I have only found it necessary to recommend a light nutritious diet, with a due admixture of well-boiled vegetables and cooked fruits; sherry and water, or brandy and water, being used as a beverage, in preference to malt liquor.

It will afford me much satisfaction if these imperfect remarks on this very prevalent, and, under the circumstances, novel form of indisposition, should attract the attention of my medical brethren, and lead to a more elaborate investigation of its nature and cause.

George Street, Hanover Square, Sept. 29th, 1854.

IMPURE WATER AS A CAUSE OF DISEASE.

By ALFRED CARPENTER, Esq.,

SOME observations made by Dr. Snow, upon the influence of water in the production of disease, bring to recollection facts observed by myself, and bear out what I have for some time maintained, that water is most frequently the vehicle by which the poison of continued fever and cholera

finds entrance into the human body. I some time since prepared a small pamphlet upon the subject, but refrained from placing it before the profession, from my inability to do more than prophecy as to the condition of Croydon in the event of a cholera epidemic. That fearful disease has now in a great measure passed over; and, true to my anticipations, this town has escaped a repetition of the severe visitation of 1849. The few cases which have occurred prove the theory I was prepared to advance. Under these circumstances, I shall not be out of place in condensing what I have written, and corroborating Dr. Snow's observations.

In the year 1849, Croydon suffered very severely from the cholera; probably not fewer than three hundred cases occurred in a population much less numerous than at present. At that time, the town had no regular drainage, and the water supply was derived from shallow wells and filthy ponds; the wells being merely drain shafts for the porous gravel upon which the town is built, and each generally in close proximity to a cesspool. Early in 1852 this system was altered, a proper water supply being derived from a well dug some sixty feet into the chalk. From this well a powerful steam-engine pumps up pure water for the whole town, upon the constant supply system. At the same time that the water-works came into operation, the pipe-drains were laid down, and the cesspools destroyed. The water at first was not quite clear, sometimes muddy, sometimes red from iron rust, which was evidently due to the new pipes and the constant disturbances caused by making new connexions: this was, however, sufficient to excite suspicion and distrust in the minds of the inhabitants. Although these appearances declined, the prejudice did not; and when the wet summer and autumn of 1852 began to produce their fruits in the overflow of the Bourne water and its interference with the operations of the Board of Health, this prejudice reached its height. At this time the wells were full of water—water impregnated with a very large amount of animal matter; for, in many instances, the cesspool fluid had been spread about upon the ground, and dug into the soil. Thus the water was charged with animal matter of the most odious description, and, on account of the warmth of the season, in a partial state of change. What condition could be more favourable to produce a state of disease? An outcry was raised against the water supply of the Board of Health; most outrageous tales were circulated, and, as a result, great numbers of people flew to those very wells that contained so large an amount of foul animal matter in a state of solution. Even the deep wells were not free from suspicion; for the chalk was quite full of water, and the sides of the wells, where they passed through the gravel, were unprotected against surface drainage, and therefore contaminated as well as the shallow wells. From observations since made upon isolated cases, I am satisfied that these causes had much to do with the spread of disease in the town in the autumn of 1852, and led to so much dissatisfaction with the Board of Health. They had promised health: what could then be more discouraging than to find, as the works progressed towards completion, that general disease was rearing its head? It was predicted, that as long as the pipe-sewers remained, so would the fever: such, however, is not the case. The pipe-sewers remain, but not the illness; the town having been in an exceedingly satisfactory state since the spring of last year. I am not intending to assert that the epidemic was entirely owing to the impure water received into the body, for some of the severest cases occurred in houses whose occupants continued to use the town water; but in these cases there was something else superadded; the sewers were unventilated; the Bourne water found entrance, and closed them up by flooding the outlet; all sewerage that passed into the pipes displaced an equal quantity of air, which found exit in the houses of the inhabitants. This complication gave rise to a fever of a typhoid type, differing in degree from the generality of cases, which occurred indiscriminately in houses connected as well as unconnected with the Board of Works: these, I

believe, were entirely due to a foul supply of water, assisted by the undoubted epidemic tendency of the season. It may be asked, What evidence can be offered in favour of this view? The evidence is in a great measure circumstantial, but it is convincing. It was found, as the epidemic subsided, that the disease did not disappear from certain houses. Over and over again, cases of diarrhoea and fever occurred in the same houses, sometimes in the same individual; but, as the prejudice against the reservoir water subsided, these became fewer in number. In the autumn of last year, a great number of these cases came under my notice, so different from the usual autumnal diarrhoea, that one felt sure there were local causes at work keeping up the irritation, and in some cases tending to continued fever; yet I could not find a cause to my mind sufficient to account for it. Two or three persons persisted in believing that the water supplied by the Board of Health was the exclusive cause. I determined, if possible, to prove this by actual statistics; and I inquired into the source of the water supply in every case of diarrhoea I was called upon to treat. As nine-tenths of the population were drinking the Board of Health water, I expected to find the cases of diarrhoea distributed in that per centage, if the water had nothing to do with it. Great was my surprise, then, to find that, out of thirty-two cases which came under treatment during the next six weeks, twenty-five were drinking well-water entirely (some not drinking the town water because they considered it unwholesome); five drank water from both sources; and the other two could not decidedly say that they had not drunk well-water. Not in any one instance was the water derived from the water-works supply entirely. Many of these persons would not believe that their water was bad: I was not able to detect anything wrong in it; it tasted good, and looked clear. In one house in particular, where diarrhoea had existed for months, the water seemed very good; but, on pumping away a few bucketfuls, and then examining it, I found it turbid with flakes of animal matter, and now and then a dead worm came into the glass. Having discovered what I believed to be the cause of the diarrhoea, a change in the water supply was insisted on; and, from that week, diarrhoea disappeared from among the inmates.

It is generally believed that, if water is boiled, it must be wholesome; and I was frequently met with the answer to my queries, that the water was not used unless it was boiled. If we remember that the injurious agent is soluble animal and vegetable matter, the fallacy of this opinion is evident: dead worm tea may be very clear and bright, but it is not less injurious to bodily health; and in more than one instance worms were found in the teakettle. I met with several striking instances of the effect of heat in developing the noxious effluvia contained in perfectly clear water, and the first instance that occurred surprised me much. The water, when pumped into a glass, looked quite clear, was without smell and taste, and, on superficial examination, was pronounced excellent; yet, when boiled in a perfectly clean saucepan, it became offensive to the smell, and had a nasty mawkish taste, at times overcoming the taste and smell of the teapot. Attention being thus directed to boiled water, I discovered several similar instances in a short time. I had not the opportunity of making distinct analyses of these waters; but, on testing qualitatively for organic matter, it was shown in large quantity, even in the clearest water.

The most striking instance of impure water causing disease, was shown by an incident which occurred in the large school belonging to the Society of Friends in Park Lane. The school is kept scrupulously clean, and free from nuisances of every kind; ventilation, drainage, and everything connected with sanitary arrangements, seemed excellent. Yet the school suffered very much from the epidemic of 1852: upwards of 40 cases occurred in about 160 inmates who resided in the house. Eventually, the school was dismissed. On its reassembling in the spring of 1853, the health of the children continued pretty good; occasional cases of slight illness occurred, but not more

than the average would be among so many. In the beginning of March, 1854, diarrhoea appeared, slight at first, but in a few days rapidly increasing. The patients all complained alike, of severe pain in the bowels, heat of head, pain over the eyes, slightly furred tongue, with morbidly clean tip, and very prominent papillae, with frequent serous discharges from the bowels. In the course of three days, upwards of fifty cases came under our notice; whilst many others complained of lassitude, loss of appetite, and general uneasiness. It was at once evident that some causes were at work peculiar to the locality of the school itself, as at that time the town of Croydon was unusually healthy: we had, in fact, except in the school, scarcely a case of diarrhoea under treatment. My partner, Mr. Westall, and myself, instituted inquiries to elicit the cause; the diet appeared unexceptionable, the drainage and ventilation of the rooms were in perfect order, and the gas was not more impure than usual. The water was examined, and appeared very good; but it was with some surprise we found the supply was derived from a well, and not from the mains of the waterworks. It was stated that on one or two occasions the tea had tasted unpleasant; and, curiously enough, the cause was supposed to be from the Board of Health water having been used instead of the well-water. Such, however, was evidently not the case; for the waterworks being on the constant pressure system, it is impossible for the water to get contaminated in the mains. We at once requested that the supply might be changed, and the water from the mains only used for dietetic purposes; for we were morally convinced that the cause was some general one, affecting all parties—the cases having occurred equally among boys and girls, teachers and servants—no class, no room, being exempt or affected more than the others. On the day that the water supply was changed, we had sixteen fresh cases; on the following day two only; and eighteen hours after the change had been effected, not a single fresh case of diarrhoea came under our notice. In the course of a few days most of those under treatment had recovered, with the exception of three, which ran on into mild continued fever.

It would be impossible to have a more striking instance of the effect of impure water than this. No person can for a moment doubt that here we have cause and effect; the water neither to the eye nor taste gave any signs of impurity; but nitrate of silver detected a large amount of animal matter in solution. It might be urged that it was merely a coincidence in the water supply being changed at the moment when the epidemic exhausted itself; but we have further proof to the contrary. The rise of the epidemic led to a minute examination of the sewers; they were flushed, and it was believed that they were in good working order; but on a second and more accurate inspection, one of the drains passing from a wing of the building and some of the outhouses was found to be blocked up with sand. This stoppage must have existed for some time, and extensive leakage had taken place into the ground around the impervious sewer, which unfortunately ran in close proximity to the well, only a pervious gravelly soil intervening. This was not discovered until after the subsidence of the disease; but what evidence could be more conclusive or more convincing against the use of water contaminated by sewerage of any description, whether derived from the Thames at Vauxhall, or a well in close proximity to a cesspool? Had there been at that time a choleraic tendency in the country, we should have had to deplore an event similar to the Tooting tragedy; the outbreak at Albion Place, Wandsworth; or, still more recently, that in the neighbourhood of Golden Square. It makes one tremble to think of the precipice upon which we stood, and earnestly urges upon all the necessity that exists for a pure water supply, free from all risk of contamination from any cause whatever, so as to prevent the possibility of the occurrence of such catastrophes for the future.

Having considered what has occurred in this large establishment, one turns to the evidence afforded by smaller

households. If attention had not been drawn to the subject by such incidents, and had two or three members of a small house only been affected, the cause would not have been so evident. It has frequently happened that diarrhoea has continued until the patient has fallen a victim to continued fever, or, as it were, become acclimatised, or used to, the water consumed. I know at this moment several houses so situated, where the inmates will persist in drinking well-water, and where every visitor and fresh servant is attacked with diarrhoea soon after taking up his quarters in any of them.

Since the outbreak of cholera in London, I have looked with some anxiety for its effects upon these very houses. It has been most striking, that as far as the observations of my partner and myself have gone, no approach to choleraic diarrhoea has occurred in any houses connected with the public sewers, where the inmates use the water from the mains of the waterworks. Whilst those who will continue to use well-water, and have not made their connexions with the town sewers, have suffered from choleraic diarrhoea to a considerable extent. I have only met with two cases of cholera in the town itself, and in both were the houses unconnected, and well-water was used.

It must be a great source of gratification to the inhabitants of Croydon, after all that has been said, to find that the money expended upon their works has not been thrown away, and that they are now reaping the benefits of those improvements for which they paid so dearly in 1852.

I have presumed to publish the foregoing observations, in hopes that they may stir up others to trace out the origin of disease—be it fever or cholera: for I cannot lose sight of the fact, that it is far more honourable to prevent disease than to cure it. I have many similar cases upon a smaller scale, but I will not on this occasion offer any further remarks on the subject.

Croydon, September 25th, 1854.

CLINICAL MEMORANDA.

By C. M. DURRANT, M.D., Physician to the East Suffolk and Ipswich Hospital.

PROFUSE SWEATING, AS A SYMPTOM OF CONGESTED LIVER.

It has several times occurred to me to be consulted in cases in which this symptom has been predominant, but the nature of which has been overlooked, inasmuch as tonics and mineral acids have been administered, and have signally failed in affording relief.

The history, if carefully investigated, is simply that of congestion of the liver. The detail of two cases, which have comparatively lately fallen under my notice, will serve to illustrate the leading features.

CASE I. A gentleman, accustomed to field sports, had previously enjoyed good health. On my visiting him, I found him in bed, depressed in spirits, bathed in perspiration, emaciated, and with the certain foreboding that he was labouring under some organic affection of the heart or lungs, and which an injudicious communication from a medical friend had not served to alleviate. The perspirations had been and were most profuse both by day and night, and was the symptom that most annoyed him. His tongue was coated, and he complained of weight and uneasiness in the right hypochondrium. The pulse was 110; the heart's action was irritable, but otherwise normal; the lungs were healthy. On examining the evacuations—a proceeding which, in these cases, ought never to be omitted, as the report of both patient and nurse is, with scarcely an exception, fallacious—they were found to be in the highest degree unhealthy, being dark, bilious, and very fetid. The urine was scanty and very high coloured, but without deposit. Under the impression that the perspirations resulted from debility, the patient had been ordered quinine with full doses of sulphuric acid, and a somewhat stimulating diet. Under a broth and farinaceous diet, and the