ORIGINAL COMMUNICATIONS.

CHLORIC ÆTHER: ITS PROPERTIES AND USES,

ESPECIALLY IN CHOLERAIC AND OTHER FORMS OF DIARRHŒA, AND IN CHOLERA.

By GEORGE B. MEAD, Esq.

DIARRHŒA and cholera have undoubtedly of late very much increased in prevalence in this country. The latter, once only an occasional visitor to our shores, now appears to have become domesticated among us; and in future we may look forward to the deaths from this disorder forming a not inconsiderable item in the returns of the Registrar-General.

Undoubtedly epidemic diarrhœas are much more frequent now than formerly; and they often assume a form which sets at defiance all the established modes of treatment. Whenever diarrhœa prevails as an epidemic, though the flux in the majority of cases is readily checked by the ordinary modes of treatment, and though where spasmodic pain is combined, it generally is relieved by opium and other anodynes, yet a certain number of cases occur, which, though not marked by any other peculiarity save persistence of the pain and flux, obstinately resist all ordinary treatment; and if the patients, previously to the attack, have been in a debilitated condition, they are placed in imminent danger.

During the years 1846, 7, and 8, the typhus fever prevailed to a considerable extent in several of the most populous districts of the Bradford (Yorkshire) Union. The poorer classes were more especially sufferers. Work was scarce, wages were low, and food was dear. It was found in almost every case that the stomach and intestinal canal became in the first instance disordered by the use of improper and insufficient food, producing diarrhœa; these conjointly reduced the strength of the patient, who then fell a ready prey to the action of the poison generated in crowded ill-ventilated dwellings, surrounded by filth of every description. The provision for drainage in the localities infested by the fever was little or nothing. Of those who were attacked while in this debilitated condition, many were lost; while those who had previously been in good health generally recovered. Noticing this fact, we devoted some time to warning the poor of the danger of neglecting the diarrhœa, and directing them to apply earlier for remedies. They did so, and the mortality became greatly reduced.

This diarrhœa was combined in many cases with vomiting and spasmodic pain of a very distressing character. We had very little difficulty in treating those cases in which pain was absent, but we found a certain proportion in which the diarrhœa obstinately continued despite the use of a multitude of remedies; and the pains, though temporarily relieved by the use of opium, returned directly the narcotism passed off; the opium suspended, but did not remove, the spasms. At length we adopted the following formula:—

℞ *Ætheris chlorici* ʒij,
Species pro conf. arom. ʒss,
Misturæ cretæ compositæ ad ʒvj. M.

Fiat mistura.

The fourth part was directed to be taken directly by an adult, and repeated every half hour, or at still longer intervals, according to the severity of the attack, and its effect upon the patient. Occasionally, opium, either in the solid form or the tincture, added to the mixture, was given; but this was seldom necessary, and I think every case would have recovered without its use. The effect of the ether in every case was marvellous. The spasms and pains were relieved, as if by a charm; the diarrhœa ceased; warmth returned to the extremities; the pulse, before perhaps flagging, increased in force and volume; one bottle never failed to relieve, or two to cure even the worst cases in which all other plans had failed. The relapses were infre-

quent, and were generally checked at once by a single dose. After the introduction of the chloric ether, we had no further trouble with diarrhœa. The medical man in whose practice this occurred is since dead; otherwise I am sure he would have felt great pleasure in confirming this statement. Often has he expressed to me his high opinion of the efficacy of the ether in cases of diarrhœa combined with spasmodic pain. After this, at the time the cholera last visited this country, I was residing with Dr. Morris, of Spalding. It reached Boston. Great alarm existed in Spalding, and the public were fully aware of the importance of checking the premonitory diarrhœa which began to prevail, and was exceedingly troublesome in many cases to check. Recollecting the ether, I ventured to suggest its use. My friend acquiesced. It was tried, and in not one case failed. As at Bradford, hundreds of cases in which alarming cramps existed were cured like magic; none ran on into Asiatic cholera, though many appeared to be on the verge of it, or, at any rate, were equal to those of English cholera of the severest character. So prevalent was the diarrhœa, that the surgery was thronged from morning to night by applicants for medicine; the policemen in the streets, sailors in the vessels on the river, and travellers upon the rail, were equally affected: the cause was evidently ubiquitous, whatever it might be.

At last, one morning early, I was summoned in haste to a patient, an old woman, residing in one of the most unhealthy localities in Spalding. I found her presenting unmistakable signs of labouring under Asiatic cholera in an advanced stage; she was blue, almost pulseless, and the cramps were of a most violent character. I had seen English cholera in its worst and most fatal forms, but never aught like this. I have a vivid recollection of the scene, and remember well I stood as it were aghast at the sight of her agonies. Having directed her attendants how to act, I instantly returned home, and sent a mixture, increasing the dose of ether, but with very little hope of success. I ordered it to be given at very short intervals, and, in the course of an hour or two, saw her again, in company with my friend. We were delighted and surprised to find her greatly improved. We continued the remedies, and by the evening she was out of danger. Symptoms of relapse appeared several times during the next day or two, but were at once checked by the use of the remedy. The patient, though advanced in years and greatly debilitated, having led a somewhat irregular life, completely recovered, and died about a year afterwards, of a totally different complaint. The remedy obtained quite a notoriety in that locality; to such an extent was it used, that we were told by an extensive wholesale druggist he had sold more to us than to all the rest of his connexion put together.

A gentleman travelling by the Great Northern Railway was attacked by severe diarrhœa. He got out at Spalding, and consulted Dr. Morris, who prescribed this remedy; it at once relieved him. In conversation, he mentioned to him how valuable he had found it in the treatment of diarrhœa. On his return home, the gentleman told his usual medical man of the circumstance; and he, in consequence, was induced to try it, with great success.

In 1850 and 1851, I was again residing in Yorkshire, and there saw much diarrhœa. I used the ether extensively, and never found any case in which it was properly administered where it failed; indeed, I recollect some equally striking cases with those I have enumerated, in which it might indeed be said to have acted like a charm. I could refer to many of my medical friends who have used it upon my recommendation, and whose experience, after numerous trials, has strongly corroborated my own. Though I have used it in at least fifteen hundred cases myself, and indeed I think not improbably three thousand cases, I have never yet found it fail when used in accordance with the rules I shall lay down for its administration.

A few observations upon the chemical composition of this drug, the various processes for its preparation, and tests for its purity, may not be uninteresting, it being not

unfrequently omitted from works on *Materia Medica* altogether; in those in which it is included, the account is for the most part somewhat meagre. A preparation, consisting of a solution of hydrochloric ether in rectified spirit, was introduced into the *Edinburgh Pharmacopoeia* of 1735, under the name of *spiritus salsæ dulcis*. It does not appear to have been much used. In 1804, Gehler published a dissertation on the subject.* It was soon omitted from the *Edinburgh Pharmacopoeia*, and at the present time is not recognised by either of the British Colleges, though it retains a place in one or two foreign pharmacopœias.

As its name denotes, it is a member of that interesting class, the compound ethers. For reasons the discussion of which would occupy too much space, and answer no useful purpose, I prefer adopting the theory to which Professor Daniell† has lent his sanction, and regard the hydrocarbon as being composed of four equivalents of carbon and five of hydrogen. Adopting for this hypothetical radicle the name of ethyle, regarding ether as an oxide of ethyle, and alcohol as an hydrated oxide of the same radicle, the following, then, would be the formulas:—

This radicle was for a long time regarded as purely imaginary, but it is said to have been isolated by Mr. E. Frankland,‡ who obtained it by the action at high temperatures of zinc upon iodide of ethyle. He describes it as a colourless and inflammable gas, of specific gravity 2.0039, incompressible at zero, but as being converted, under a pressure of 2.25 atmospheres at 37.5°, into a colourless, transparent, and mobile liquid. Ethyle is not acted on by fuming sulphuric acid, scarcely by nitric and chromic acid. In darkness, chlorine does not unite with ethyle, but, in diffused daylight, they unite, contract in volume, and give rise to a colourless liquid.

The explanation of the composition of the compound ethers given by Professor Fownes§ will render the further application of this theory sufficiently clear. He compares them with the ordinary salts, replacing the metal by the radicle ethyle, which substance may then be supposed to form haloid salts. By combining directly with chlorine, iodine, bromine, etc., etc., with oxygen acids thus continuing the series, we have—

The chloride of ethyle is directed|| to be prepared by adding one part of muriatic acid to three of rectified spirit; digesting for some days (at least seven), and then distilling in a water bath. The product is an alcoholic solution of the chloride of ethyle. It may also be formed by the action of vitriol on alcohol and dry common salt, heat being applied, and in various other methods; but I think the former will be found preferable by the amateur. In conducting the process, care should be taken not to push it too far. The theory of the process is as follows:—One equivalent of $HCl = 37$ acts upon one equivalent of alcohol, $C^4H^5O + HO = 46$; we then obtain one equivalent of chloride of ethyle, $C^4H^5Cl = 65$, and two of water, $2HO = 18$.

The product of the distillation is a light, colourless, and very volatile fluid, of penetrating odour, very similar to that of chloroform, and of sweetish taste. The presence of free chlorine will be at once detected by nitrate of silver and the acid reaction; if pure, it does not affect litmus paper; it is resolved into chloride of potassium and alcohol by caustic potass; by the action of chlorine upon it, the following compounds are formed:—¶

Alcoholic solutions of these, it is not improbable, may, at some future time, be found of great value in medicine. On reference to the table above, it will be seen that the change is effected at once by two atoms of chlorine, one of which seizes an atom of hydrogen, forming with it hydrochloric acid, the second entering the remaining compound.

My communication has unconsciously extended to such a length, that I feel it necessary to close it for a time. I will shortly return to the subject.

Bury St. Edmund's, Suffolk, August 17th, 1854.

TREATMENT OF HOOPING-COUGH.

By JAMES GEORGE DAVEY, M.D.

In the review of Dr. GIBB's excellent monograph on Hooping-Cough, in the *ASSOCIATION MEDICAL JOURNAL* for August, I have read the following remarks, in which I entirely concur:—"The doctrine of the toxæmic origin of this" [i.e., hooping-cough] "and other diseases is almost, if not solely, founded on analogy—on the resemblance of the symptoms of toxæmic diseases to those produced by the injection of visible and palpable poisons." That "renewed endeavours" are required "to place it" [the doctrine] "on some firmer footing", I, like yourself, feel confident.

Humoral pathology is doubtless becoming a fashion in this day. It is convenient to locate the origin of disease, of abstruse and abnormal action, in the blood; it saves trouble, and excuses further investigation. However, my object in writing is to state that the nitric acid mixtures advised by Dr. Gibb in his book may be taken with "impunity", if not with advantage. The reviewer of Dr. Gibb's book says:—"We feel confident that the acid could not be taken with impunity in so concentrated a form" as that recommended; and "there must be typographical errors in these formulæ". Feeling anxious to adhere strictly to the advice of Dr. Gibb, and give the nitric acid every fair chance, I sent the book to my druggists, with instructions that the mixture, the formula for which is given at the top of page 342, should be made up to the letter, and with the closest accuracy as to details. I confess to have had, at the same time, some doubts concerning the proportions of the several ingredients composing the vehicle for the acid.

It will be seen, on referring to the three prescriptions at page 342, that the first one at the top of the page is neither a six ounce nor an eight ounce mixture, but gives a total of six ounces and three drachms; that the second amounts in quantity to five ounces and two drachms; whilst the third prescription is for an eight ounce mixture. Professing to contain an increased dose of the nitric acid, it contains, in point of fact, a smaller quantity; the compounded vehicle for the same being over six ounces, instead of respectively four ounces and a half and three ounces and three drachms. (See prescriptions Nos. 1 and 2.) Would it not be well for Dr. Gibb to favour the profession with an explanation of the above facts. That there are "typographical errors" at page 342 of the book is, to my mind, tolerably clear, although the "formulæ" may be employed with all "impunity".

I have had, since April last to even this present time, a sad and painful experience of hooping-cough in my own family, so many as six of my children having suffered from this distressing malady. I no sooner saw Dr. Gibb's work advertised than I obtained it, with the hope of realising in members of my own family the "successful treatment by a new remedy"; but I am sorry to add that, after a persistence in the use of the nitric acid for some ten or twelve days, and precisely as recommended by Dr. Gibb,

* *Journal. Chemical Society*, vol. ii, p. 286.

† Daniell's Introduction to Chemical Philosophy, page 647. London: 1843.

‡ Thompson's System of Chemistry of Organic Bodies, vol. ii, p. 610. Seventh edition. London: 1851.

§ Fownes' Chemistry, p. 398. London: 1851.

¶ Pereira, p. 287. London: 1842.

¶ Graham's Chemistry, p. 718. London: 1842.