On the use of vegetable and mineral acids, in the treatment, preventive and remedial, of cholera, and other epidemic disorders of the bowels / by J.H. Tucker.

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EPIDEMIC DISORDERS OF THE BOWELS.

BY J. H. TUCKER,

SURGEON, ETC.

HONORARY SECRETARY OF THE EPIDEMIOLOGICAL SOCIETY.

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ON THE USE

OF

VEGETABLE AND MINERAL ACIDS,

&c. &c.

Mr. President and Gentlemen,

It has been justly remarked, that "There is no kind of knowledge which confers more honour upon the Medical Art, than that by which we are enabled to *prevent* the occurrence of disease."

This expression is quoted, as it bears upon the intentions of the Epidemiological Society, as will be seen by the following extract from the printed statement of the objects of the Society, published some time since, and distributed among its members.

"It may be stated, then, that the Society purpose to institute a rigid examination into the causes and conditions which influence the origin, propagation, mitigation, prevention, and treatment of epidemic diseases, to collect

and promulgate, with relation to these subjects, such facts as appear to be established on sound and sufficient evidence."

The Cholera Committee of the Epidemiological Society have, since the publication of the statement alluded to, issued a set of queries, and in those queries have, as far as cholera is concerned, dwelt upon all the important points stated in the paragraph quoted.

As an introduction to the cholera queries, the Medical Profession are thus addressed:

"The following queries are intended for circulation among the members of the Medical Profession, in this and other countries, having been carefully arranged with a view to elicit from all quarters varied and copious information."

"It is not expected that every individual to whom they are addressed will be able to furnish an answer to all points touched on; but it is hoped that all medical men who have attended cases of cholera will willingly supply such data as they possess. By this means, a vast body of facts and opinions will be collected, which, when analyzed and digested, will, it is confidently believed, result in the acquisition of much positive and definite knowledge on the subject of this obscure disease."

Being desirous of adding my mite to the good cause, I read carefully the five series, almost to the end of the fifth, when the following question arrested my attention:

"Do you know any cases showing the value of *prophylactic* measures, medicinal, dietetic, &c.? State the particulars of your experience."

Feeling assured that a length of time must elapse ere sufficient replies could be received to the whole of the

questions asked by the Cholera Committee, so as to enable that body to draw up a report thereon, and judging the one asked in reference to prophylactic measures to be of great importance, especially as it is generally feared that cholera will again visit the metropolis and other localities at no very distant period, I have resolved to commit to paper a few gleanings, together with the results of my own experience, suggesting a simple means of *preventing*, to a certain extent, the attack of cholera in those individuals who may be exposed to its influence, whatever that influence may be.

In 1849, Mr. Thomas Hunt, a member of the Epidemiological Society, drew my attention to some articles which had appeared in the 'Provincial Medical and Surgical Journal,' on the exemption of some cider districts in Herefordshire from Asiatic cholera; and being desirous of ascertaining whether the same exemption existed in Somersetshire, I wrote to some medical friends on the subject, and received replies from two gentlemen, which replies, with some observations of my own, were published in the 'Lancet' for August 3, 1850.* My correspondents were Mr. James Millard, of Churchill, and Mr. Richard Sharpe, of Wedmore, Somersetshire, surgeons. Mr. Millard wrote thus: "I have been surgeon for eight years to District No. 5, in the Axbridge Union, consisting of the parishes of Churchill and Windscomb, and during that period there has not been a single case of cholera. Cider is chiefly drank, which in my opinion is a more wholesome beverage than malt liquor: as beer, if drank

* 'On the Immunity of some Cider Districts in Somersetshire from Asiatic Cholera.'

too new, or too old, is almost sure to produce bad reaction of bile. The air in this locality is particularly healthy, and the dwellings of the poor not overcrowded. Its population is about 3000."

Mr. Sharpe wrote: "I beg to state, in answer to your inquiries respecting the late visitation of cholera, that I believe in the parish of Wedmore, comprising a population of about 4000, there have not been more than three cases of true Asiatic cholera, and very few cases of diarrhœa. Why such was the case, I cannot give an opinion; for in some of the districts the inhabitants are both badly fed and clothed. The principal beverage is acid cider, of which they drink an immoderate quantity. The habitations of the poor are of the most wretched description. I am led to believe, from what little I can glean, there were only a few cases of the disease in 1832."

My observations on these communications, as published in the 'Lancet,' are as follow:

"Churchill is located on high ground, the air is salubrious, and the habitations of the poor not overcrowded; it is distant eight miles from Wedmore, and about fourteen from Bristol and Bedminster, where cholera raged to a fearful extent.

"To what cause is Churchill indebted for its exemption from cholera? Has cider, as a *prophylactic*, any claim?

"Wedmore lies in a valley, on a level with the Cheddar Moors, where, in days gone by, ague and typhus were frequent: there, according to Mr. Sharpe's account, three cases of true Asiatic cholera came under observation, and a few cases of diarrhœa. The position of the poor, their habitations, and the locality, were such as to encourage

the spread of the disease, yet only three cases were known out of a population of 4000.* Can the merit here be awarded to the cider?"

The little I have at present stated with respect to the exemption of two cider districts from cholera, will not be proof sufficient, I am aware, in favour of the prophylactic power of cider; but I trust, ere my paper be concluded, as I shall have to bring further authority to my aid when treating on the mineral acids, that many, besides myself, will consider that the subject is one worthy of more extensive inquiry.

In the 'Lancet' for October 8, 1853, will be found a letter from Dr. Mitchell, of Winsford, Dulverton, on "Rough sour Cider in Cholera," he states thus:

"In cases of choleraic diarrhœa, sour rough cider, as a common beverage, abstaining from all other food for a day or two, except biscuit or toasted bread, will restrain the discharge in a short time."

It has been remarked, that in some parts of France, and in Normandy, more particularly where cider is the common beverage, cholera is seldom known to exist. I have heard that Switzerland is free from its visitation.

Besides cider, there are other vegetable acids which may prove of service, much in the same way as cider is supposed to act: lemon juice, orange juice, wines made from the grape, and even the gooseberry, when they may have become somewhat sour.

But in the absence of these, and as London and other

* From the Report on Cholera in England, 1848-49, by the Registrar-General. '*Notes on Cholera.*' "AXBRIDGE, *Wedmore.* Pop., 6884. Chol. 3; Diarr. 4. A labourer, his wife, and child, at Wedmore, Sept. 16, of cholera."

populous places could not be supplied with a sufficient quantity of *pure* cider for consumption, I beg to direct attention to vinegar.

Vinegar, there is no doubt, exerts more power, whatever its mode of action may be, when once in the stomach, than many persons are disposed to award to it; and I am inclined to think, if it were more generally used as a condiment, good effects would result therefrom; especially if all could obtain a pure article.

The late Dr. Jonathan Pereira, in his 'Elements of Materia Medica,' writes of vinegar thus:

"HISTORY.—Vinegar must have been known from the most remote period of antiquity. It is mentioned by Moses (Numbers vi., 3) 1490 years before Christ.

"Hippocrates *(De natura muliebri)* employed white vinegar medicinally.

"Both Plutarch and Livy tell us that Hannibal, in his passage over the Alps, softened the rocks by fire and vinegar."

"PURITY."—(Under this head Dr. Pereira states:) "The foreign matters likely to be present in acetic acid are, excess of water, sulphuric, hydrochloric or nitric acid, copper, lead, tin, or other metallic matter.

"Acrid substances, such as capsicums, grains of paradise, &c., are sometimes added to vinegar to increase its pungency."

The high estimation in which vinegar was held by the ancient Romans, the following will serve to prove:

"Scipio Africanus is said to have gained a great battle with a few SKINS of vinegar.

"The fact was, his troops had expended the stock of vinegar which was served out with the rations daily,

and refused to march until the General had obtained a supply.

"The vinegar was kept in earthen bottles fastened to the belt, as may be seen on the columns of Antoninus and Theodosius at Rome.

"It is supposed that the vinegar was used to prevent the deleterious effects of the brackish and stagnant water."

Cæsar, in his 'Commentaries,' mentions the supply of vinegar to the troops.

Would it not be far more rational to infer, that Hannibal and his followers, when crossing the Alps, made the same use of vinegar as did Scipio Africanus and his, than to give credence to the fable told, namely: "That Hannibal, in his passage over the Alps, softened the rocks with fire and *vinegar?*"

Whether vinegar was used in those times medicinally is a matter of speculation.

Sir John Pringle, in the preface to his work, published in 1775, entitled 'Observations on the Diseases of the Army,' writes thus on the subject:

"But except in a few instances, there remains no account of the diseases incident to the armies of the Greeks and Romans. It may seem strange that Vegetius should have a chapter containing the directions how to preserve the health of soldiers, and yet not name any disorder to which they were peculiarly subject."

Sir Gilbert Blane, speaking of water, in his work, 'Observations on the Diseases of Seamen,' as regards its impurity, and the means by which its ill effects may be averted, first having spoken of the value of quick-lime, adds: "There are other substances which have been

found useful in correcting bad water: alum, and cream of tartar, as antiseptic bodies, have been employed for this purpose. *Vinegar*, and the vegetable acid juices, and fruits, such as tamarinds, may be used occasionally to take off the putrid, offensive taste which may have arisen in case the use of quick-lime has been neglected."

I shall have further occasion to speak of the value of vinegar, as I proceed.

It is well known that, at the former visitations of cholera to this country, many persons who were attacked with the disease, and some who died from its effects, had, on the day previous to the attack, partaken of indigestible or unwholesome food, either for their dinners or suppers; and I am enabled, from my own experience, to give two cases of this nature.

In 1832, I was summoned, very early in the morning, to visit a young man, a blind-maker, then residing in Wells Street, Oxford Street. When seen by me, he was fast approaching the stage of collapse. About four hours before my arrival, and during that period, he had been violently sick, and much purged. The late Dr. McLeod attended the case with me; and during the day, from five in the morning, until three in the afternoon, when our patient died, one of us was constantly present. Before the arrival of Dr. McLeod in the first instance, I learned that our patient had eaten at his supper, after much exercise during the day, cold boiled pork, cold peas-pudding, and potatoes, and that he had drunk at his meal nearly a pot of somewhat stale porter. His death occasioned much surprise. Many had seen him on the previous day in his usual good health and spirits; and a friend, who shook hands with him at his door, which he

entered for the last time, stated, that he had not complained for some hours before of any indisposition.

On the 5th of August, 1852, at about five o'clock in the morning, I was requested to hasten to the residence of a gentleman who it was feared had the cholera. I found him suffering with all the characteristic symptoms of that disease. On the night of the attack he had eaten for his supper cold boiled beef, cold boiled carrots, and potatoes, and that, too, I was informed, in rather an immoderate quantity: he drank porter at his supper. He was much accustomed to eat such suppers. He often suffered from indigestion.

I am of opinion that the sufferings of this person might have been spared if he had, at his unreasonable meals, taken with his food a fair proportion of vinegar and pepper, or mustard: I am told he scarcely ever partook of either.

Sir John Pringle, in the work I have before quoted, when treating on the prevention of diseases arising from improper diet, states:

"As the heats of summer tend to produce diseases in autumn, by disposing the humours to corruption, it were to be wished that during the hot season the diet were so ordered, that this tendency might in some measure be corrected. It may deserve our notice, that the Romans considered *vinegar* as one of the most necessary provisions of an army. Now whether this was only used by way of seasoning their victuals, or mixed with water and drank whilst they were hot and feverish, it must have a good effect in correcting the too great putrescency of the blood during summer.

"Vinegar whey, already known in the hospitals, is a cooling medicine in inflammatory fevers, and was liked by

the patients. But the surest way of making soldiers take *vinegar*, or any other acid by way of preservative, is by mixing it with such a proportion of spirits as may be thought a proper quantity for each man; and especially when troops are sent into Zealand, or the more marshy parts of Brabant or Flanders, during the sickly seasons in those countries."

In a work entitled 'Notes and Recollections of a Professional Life,' by the late William Fergusson, M.D., I find the following treating of diet and rations:

"To drink water, even though thirst calls, is never to be allowed without losing caste. The great Creator has given it for our solace, to digest our food, and assuage our most pressing call; but do not taste it without an alcoholic addition: it will degrade your manhood, and class you amongst the lower animals, who know no better. This really seems to be the impression amongst the Britons everywhere. How differently thought and reasoned the ancient Romans, whose drink in the field, during all their campaigns, was *vinegar* and water! And we must not laugh at the recollection; for on that very drink their warriors conquered the world!"

Mr. Sharpe, in his communication with respect to the part exemption of a cider district from cholera, stated that, in 1849, three cases of true Asiatic cholera only were observed out of a population of about 4000; but he did not speak of the mode of living, beyond remarking that the poor were badly fed.

The same village in which Mr. Sharpe resides, is that of my birth; and up to the age of twenty-two I am enabled to speak as to the diet of many of the inhabitants at that period; and I am informed the same may be

observed now. The daily labourers—indeed, many besides—often eat for their suppers cold cooked vegetables, potatoes, carrots, cabbage, with bacon and other meat; also radishes, cucumber, and onions: they are fond of vinegar and pepper, and their beverage is acid cider, of which they take a fair allowance.

A correspondent writes thus: "Labouring men generally drink per day from five to six pints, when not in the hay or harvest fields; but when mowing, reaping, &c., they are not limited—say from eight to ten pints per day."

When cholera was present, I suppose the habits of the labourers were much the same as I have described.

What I have stated with respect to the mode of living of those who reside in some cider districts, will, I trust, in a degree support me in what I said with respect to my patient, who had eaten a cold vegetable and meat supper; namely, that *vinegar* taken with his meal might have prevented his severe attack.

Men often live to a good old age in and near my native village. I knew a gentleman who was ninety when he died. I have often seen him eat for his supper cold boiled vegetables of all kinds, and finish his meal with toasted cheese. His beverage was, and always had been, cider. I am told he never had a day's illness from childhood, so as to confine him to his bed, except within one week of his death: he died of constipation.

A gentleman now residing there, whose age must be about eighty, is, I am informed, in excellent health: he is seldom otherwise. When I was a boy, he was a man. I have often drank with him at his house very acid cider—a quality he much appreciated.

From very good authority, I am enabled to state that a physician (who is not now living in London) was attacked, in 1833, with cholera, whilst at the Haymarket Theatre, and was taken to a lodging close by. He refused medical aid, and persisted in eating constantly the sourest apples that could be procured, and drank cold water until he recovered. There can be no doubt but that this physician availed himself of the juice of the apple only, and that he cast aside the pulp after mastication and suction had been performed.

It is the juice of the apple, the orange, and lemon that is medicinal, not the pulp of either, which certainly ought, in cholera times in particular, to be discarded.

When the juices of apples have been expressed to make cider, the residue, called the cheese, is used as fuel. Pigs are seldom permitted to eat thereof. I am informed if these animals, by any chance, get into an orchard where apples are lying on the ground, and devour them greedily, that their bellies swell, and death often ensues.

This should teach parents to be cautious, and not suffer children to swallow too much of the pulp, either of the apple or orange; for in some there may not be found a sufficient quantity of the acid juice to counteract the ill effects of the swallowed pulp. It would be more wise to give cooked apples to children.

As a proof that abstinence from vegetable acid juices, and acid and sub-acid fruits, in times of cholera is injudicious, I will relate what occurred to myself.

From boyhood I had always a great partiality for vegetable acid juices of all descriptions, and the juice of unripe fruits of the acid kind, as well as the ripe, and had

often indulged in them to the period when cholera made its appearance in 1832.

At that time I abstained from all: the vinegar cruet was banished from the table; the fruiterers' shops were passed with many a longing look. I often mixed soda with water, and drank it; also with malt liquor; and ate large quantities of salt. I was attacked with cholera in 1833, and my medical attendants pronounced me to be in great danger; but thanks to Him to whom thanks should be given in the first place, next, to the kind and skilful attention of my medical friends, and the good nursing of an anxious partner, I am here this evening to address those friends whom otherwise I should not have known.

Wiser grown in 1849, I resolved to follow an opposite course to that which I had taken in 1832 and 1833; and then, instead of diminishing or abstaining from the quantity of acids I was in the habit of taking, I increased them. During the whole period that cholera was present in London my health was good: I had no relaxation of the bowels, but was often obliged to resort to aperients.

Before quitting the subject of vegetable acids, I will read a few gleanings from acknowledged good authors on their value.

Sir Gilbert Blane, M.D., in his 'Observations on the Diseases of Seamen,' published in 1803, treating of causes and prevention of disease, and, under the head Aliment Section, "of solid food," after complaining of the food the sailors at that time were obliged to subsist upon, and stating, besides scurvy, other skin diseases to which they were liable, remarks: "The only improvement in the sea-victualling, that I know of, from that time until of late, has been the use of raisins for puddings, and the occasional

use of *vinegar*, which is an article extremely salutary, and was looked upon as the great preservative of health in the Roman armies"

Speaking of wines for the navy, dried fruits, seeds, and vegetables preserved for their use, he continues: "But of all the articles, either of medicine or diet (for the cure of scurvy), lemons and oranges are of much the greatest efficacy. They are real specifics for that disease, if anything deserves the name.

"The great utility of these vegetable juices cannot be sufficiently impressed on the minds of those who direct the navy."

In another part of his work, Sir Gilbert Blane remarks: "Vegetables, in the form of salads, are more powerful than when prepared by fire; and I know for certain, that the rob of lemons and oranges is not to be compared to the ripe fruit."

"Raw potatoes have been used with advantage in the fleet, particularly by Mr. Smith, of the Triton, who made the scorbutic men eat them, sliced, with *vinegar*, with great benefit."

I find that the Jews, in days of old, for some purpose, made use of vinegar with their meals.

In the 2nd chapter of Ruth, and at the 14th verse, we read:—

"And Boaz said unto her, At meal time, come thou hither and eat of the bread, and dip thy morsel in the *vinegar*. And she sat beside the reapers, and he reached her parched *corn*, and she did eat, and was sufficed."

I have been favoured with the following note on this subject. The note is by Dr. Kitto:—

"The refreshing qualities of *vinegar* are well known,

which is probably the reason why it was provided on this occasion for the reapers, heated with their sultry labours; for we do not learn that vinegar was thus ordinarily used, any more than it is now, in the East.

"Probably the vinegar was used mingled with a little olive-oil, if we may take an illustration from the fare which was supplied to Joseph Pitts and his companions when slaves of the Algerines.

"The food we had to sustain nature was answerable to the rest of their kindness; and this, indeed, generally, was only a little *vinegar* (about five or six spoonfuls), half-a-spoonful of oil, and a few olives, with a small quantity of black biscuit, and a pint of water a day.

"Here we have bread and *vinegar*, with a little oil, supplied for daily provision."

Perhaps it will be found, upon further inquiry, that the members of the Jewish persuasion of the present day, are somewhat indebted to the use of vinegar and lemon juice, as well as to oil, for their reported exemption from attacks of cholera. I possess a statement of the use made of both with articles of diet, which serves to throw a light upon the subject. The merit hitherto, as far as I know, has been given to olive oil, abstinence from spirituous liquors, as well as to the precautions taken with respect to animal food before being cooked, and to the observance paid to the cleanliness of all cooking utensils.

Of the refreshing qualities of cider I can bear ample testimony, having often partaken of it in the hay and corn-fields, when heated by the rays of the sun, and fatigued by exertion.

The labourers whose drink is cider in the harvest-field, can undergo a greater amount of exertion than can those

whose beverage is malt liquor: the former return from their daily labours full of joyousness, whistling and singing on their homeward way, whilst the latter are often gloomy, and are anxious to seek repose.

I will now speak of the mineral acids.

It is well known to most present, I have no doubt, that sulphuric acid has of late been much spoken of in the medical journals as having proved highly beneficial in diarrhœa and choleraic diarrhœa. Some who have written on the subject have even recommended it in the more advanced stage of cholera.

The testimony of those who have communicated on the treatment of these diseases by sulphuric acid, has induced many who have read the articles published in the medical journals, to test its efficacy; and I believe some have good reason to speak in favour of the remedy.

In the 'Lancet' for August 2, 1851, will be found a letter from Mr. Herapath, of Bristol, the well-known analytical chemist. The letter is headed: 'The Austrian Remedy for Cholera.'

At the commencement, Mr. Herapath states how he gained possession of a bottle of the cholera medicine; he next gives the printed account of its efficacy in the hands of the Austrian Government, as successfully tried on prisoners and patients at public establishments, including the police, and thus remarks: "This was apparently so decisive of its great value, that I determined to analyse it, and publish its components, for the good of the world at large.

"I find" (writes Mr. Herapath) "in the fluid ounce:

	GRAINS.
"Sulphuric acid (density 1·845)	19
"Nitric acid (density 1·500)	12
"Sugar	24
"Water	406·5
"Fluid ounce (specific gravity 1·055)..	416·5

"The sugar, as found, was that of the grape; but most probably was cane sugar, altered by the action of the acids."

The mode of administration follows; and Mr. Herapath thus concludes his letter:

"This horrible complaint has hitherto baffled all practitioners, and eluded every mode of treatment that I have seen practised; but this remedy comes with so good a character, and is so unlike those I have hitherto heard of, that I think it well worth a trial; nor can I refrain from mentioning, that it has been remarked that Asiatic cholera does not prevail in cider counties, where the general beverage has some resemblance to this medicine, though weaker in degree."

On perusing Mr. Herapath's remarks with respect to cider and cider counties, I began to think more seriously of the probability of cider proving a prophylactic against cholera.

With respect to the mineral acids, the components of the Austrian remedy, I resolved to give them a trial the first time a case, either of Asiatic cholera or one resembling it, should present itself to my notice. Twelve months passed away without my having had an opportunity of carrying out my resolution. I have already stated, that on the 5th of August, 1852, I was requested to

attend a patient, and that I found him labouring under all the symptoms of Asiatic cholera. The case I am now about to narrate is the same. Although the messenger who came for me stated that it was feared the patient had the cholera, that he had been much purged, and was very sick at the stomach, and that I was to take something with me, I went only prepared to treat the case with calomel and opium, and the compound chalk mixture. The moment I saw my patient, however, I regretted I had not taken the acids. Every medical man who has treated cholera is well acquainted with the symptoms of the disease; and not one was absent in this case.

Having ascertained that the stomach and bowels had been freely emptied of their solid contents (a description of which was sufficient to convince me of the fact), and having noticed the nature of the fluid that was passing in copious quantities from the bowels—the rice-water dejections—I determined to hasten home, and return with a mixture composed of the two acids, the sulphuric and nitric. The first dose was rejected, the second and subsequent were retained; as was also a drink made with the acids well diluted with water, to which some sugar was added. After the second dose of the mixture, the sickness, which was frequent before, abated, the purging became less frequent, the cramps were less severe. There was no further action on the bowels after the third dose. The fourth was administered before I left to procure more. At the end of five hours from the time the first dose was given, the pulse at the wrist could be distinctly felt, the extremities were becoming warm, and the countenance bore a more healthy hue. Beef-tea had been taken at intervals; and the calves of the legs, the region

of the stomach and abdomen, had been well rubbed with stimulating liniment.

As soon as the purging moderated, bottles of hot water were applied to the legs and feet, and the patient was well covered with blankets. Frequent visits were made by me during the day; and at the last, I felt satisfied there would be no relapse. During the night, he slept soundly: complaining of thirst, he wished me to send him an effervescing mixture, being tired of the sour medicine: his request was complied with. On the following day he took a rhubarb and soda draught, which acted gently. During that day and the next he was supplied with the compound infusion of orange-peel; and thus the treatment ended.

Had this patient died under my care, I should have certified that his death was occasioned by Asiatic cholera. I attribute (as far as medicine is concerned) his recovery to the use of sulphuric and nitric acid, four drachms of each of which, in their diluted forms, were administered as medicine and drink during sixteen hours from the period of their first administration.

Having, after this occurrence, read from time to time, in the medical journals, the reported successful mode of treatment of diarrhœa and choleraic diarrhœa by sulphuric acid alone, I gave it trials in many cases of severe diarrhœa, and am prepared to speak of its merits. I have given it in many instances, and to persons of various ages, from seventy, to children under one year old, and must state that I have found the remedy most efficacious.

To several of my medical acquaintances, as opportunities served, I made known the success which had attended the administration of sulphuric acid in cases of

diarrhœa, as proved by myself. Some were induced to prescribe it; and from time to time I heard very favourable reports thereon. A few were so sceptical, that they could not be prevailed upon, as far as I know, to give sulphuric acid a trial.

One gentleman had given it to several of his patients with marked success; but in one case it quite failed, and the complaint yielded to the compound chalk mixture, catechu, and tincture of opium. Another found the acid acted best with small doses of the acetate of morphia, or tincture of opium.

In the 'Lancet' for October 22, 1853, a letter of mine was published, 'On the Treatment of Diarrhœa and Cholera by Acids.' Soon after the publication, I received the following from Mr. Sharpe, of Wedmore:

"It was with pleasure I read your remarks in the 'Lancet' of October 22nd, on the Treatment of Diarrhœa and Cholera by Acids. I shall certainly give the sulphuric acid a trial on the first opportunity; although I have seldom failed with very small doses of calomel in diarrhœa. I believe there are but few cases in this locality; and I have not seen since 1850, one case with the characteristic symptoms of cholera.

"I think the cider must act as a *preventive*."

In one of the medical periodicals, I read that a correspondent (writing on the treatment of diarrhœa by acids) preferred the combination of sulphuric and nitric acids; and I must confess I am inclined to agree with the author.

In the autumn of last year, I gave sulphuric and nitric acid to a woman who had suffered from diarrhœa for nearly a week before I saw her: she was much exhausted

from the attack. She had passed but little water for several days, which occasioned some annoyance. At my visit on the evening of the following day, she expressed herself much better, and said: "I have passed a great deal of water."

Whether sulphuric and nitric acids, or sulphuric acid alone, alum, tannin, acetate or diacetate of lead, or mineral and vegetable astringents of any kind, will prove of service in cholera, when choleraic diarrhœa has run its course, when the blood has been robbed of almost all of its serous portion, when, indeed, collapse has fairly set in, I will not presume to say. Further proofs, I believe, will be required before the merit can be awarded to any one of the remedies in particular hitherto tried, for saving life under such circumstances.

But that sulphuric acid alone, or in conjunction with the nitric, will prove of service in the premonitory stage of cholera, I have no doubt; and I have reason to think the time will come when they will be considered *prophylactics*.

The mode of action of the vegetable and mineral acids, in relation to the subjects I have treated upon, would form, in my opinion, an interesting paper for this or any other society.

To those gentlemen who may wish to refer to recent works on the action of acids, I beg to direct attention to Mr. F. W. Headland's work, 'On the Action of Medicines.'

On the astringent properties of sulphuric acid, Mr. Headland thus remarks:

"Of the mineral acids, sulphuric acid is the most astringent."

Again: "It is found that sulphuric acid is of great use as an astringent in diarrhœa."

At page 103, treating again on the astringent properties of sulphuric acid, Mr. Headland remarks:

"It is applicable in cases of hæmorrhage, when this takes place from a mucous membrane; for it probably passes off in small quantities from all the mucous surfaces. It is very useful in diarrhœa. Being a special astringent to the intestinal mucous surface, it may possibly be useful even in malignant cholera, especially if given in the *early* stage of that disorder."

At page 409 of the same work will be found:

"Although the mineral differ from the vegetable acids in their ultimate action, and are altogether more powerful than they, yet, in their proximate effect, they are similar. They are all soluble in water; and, when given as medicines, should be so diluted, that they can exert no corrosive action on the mucous coat of the stomach and intestines."

This should be borne in mind by those who may have tried, yet relinquished the use of sulphuric acid, because it has sometimes occasioned pain in the stomach and bowels of patients to whom it has been administered.

The same observance should be paid to some kinds of vinegar, which are found sometimes too acid, and require to be diluted with water for the table. I have some in my possession which admits of an equal portion of water.

Even lemon-juice should be diluted with water.

Independent of the articles on the treatment of choleraic diarrhœa and cholera by sulphuric acid, which have appeared of late in the medical journals, there will be found some in those for 1848 and '49. I am told sulphuric acid was used in 1832 for the same purpose.

Dr. Milroy, in a work published in 1847, entitled: 'The Cholera not to be Arrested by Quarantine,' recommends as a drink for cholera patients, "water acidulated with sulphuric or some other mineral acid."

In the 'Lancet' for August 11, 1849, Mr. W. J. Cox, a member of the Epidemiological Society, published his views with respect to the use of sulphuric acid in cholera.

At the ordinary meeting of this Society held January 5th, 1853, Mr. Cox read a paper, entitled: 'On a Rational Mode of Treatment of Cholera.' Mr. Cox in that paper advocated the employment of sulphuric acid and calomel.

Had I been engaged in writing a work on the subject, instead of a limited paper, I might have endeavoured to have done ample justice to all those gentlemen who, for the information of their professional brethren, and the good of the public, have published the results of their experience as regards the use of vegetable and mineral acids in the treatment of epidemic disorders of the bowels.

I cannot quit this portion of my paper without quoting from the medical journals, that, "At the annual meeting of the Western Medical Society, held on the 5th of May, 1854, Dr. James Arthur Wilson, the President," in his address to the members, after speaking upon some other topics, remarked: "The efficacy of dilute sulphuric acid in diarrhœa, after the strong statements of Dr. Fuller,* of St. George's Hospital, at the meeting of the society in October last, would no doubt be tested in the closely threatened epidemic of the ensuing season. He then took occasion to intreat his auditors to regard cholera in

* See 'Medical Times and Gazette,' for Jan., 1852,—for Oct., 1853,—and for Aug. 12, 1854. Dr. H. W. Fuller's Letters, &c.

its *true light*, as a disease of the entire system—as a true fever; and urged that each case should be treated according to circumstances, and upon its own merits—not *empirically*, with sulphuric acid, or any other single remedy, of whatever reputation."

The treatment of dysentery by vegetable and mineral acids, but vegetable in particular, will conclude my paper. I have been advised to bring before the meeting the views of one who has written on the subject; and for this purpose a work has been placed in my hands, entitled: 'Notes and Recollections of a Professional Life,' by the late William Fergusson, M.D., Inspector-General of Military Hospitals. I have before quoted from it.

The author writes:

"Dysentery is truly an army disease. In some services, the soldiery, when in the field, may escape fever, but never dysentery, if they lie upon the ground; for it depends on atmospherical vicissitudes, and the chill of the morning after the heat of the preceding day, will always cause it to spread; heat, however, is uniformly the remote cause.

"With or without contagion, it is, however, a formidable disease; and, if allowed to run its course unrestrained, leads to results the most calamitous. Luckily, there are few better under the control of remedial means, timeously applied; for unlike fever, it is easily brought under the control of medicine. The antiphlogistic treatment has the happiest effect at the beginning of the disease; and mercury, in its alterative power, is all but specific, provided it can be applied before lesion of structure and alteration of form has been effected in the great intestines. At present there is no disease the symptoms of which are

so obvious that they cannot be misunderstood, even by the most ignorant, as dysentery; none for which the remedies and treatment, with one important omission, have been so well defined in army practice.

"There is still, however, much folly and prejudice in the ordinary management of the complaint. It is purely inflammatory in the beginning; yet, because the acid and subacid fruits sometimes occasion griping when in health, these and vegetables of every kind are strictly prohibited. They are, however, amongst the best remedies.

"Nearly a hundred years ago, Sir John Pringle, one of the best physicians our army ever possessed, proclaimed that ripe grapes were a cure for dysentery. The Portuguese and Spanish physicians, when I was in the Peninsula, went farther, and to ripe subacid fruits of every kind, added lemon-juice, with the best effects. Our own faculty, in different parts of the world, have highly lauded the mineral acids, more especially the nitric; and in an epidemic dysentery which not long ago afflicted Ireland, after one of our hot summers, cream of tartar in large doses was found to be nearly as beneficial as mercury. In short, the acids in every shape, but more especially in that of ripe fruits, will be found excellent remedies by all who can overcome their prejudices so far as to give them a trial.

"But the subject of acids and acid fruits, in the treatment of dysentery, requires yet further illustration; and I think I cannot do this better than by quoting from myself part of a paper that was read before the Medical Society of Windsor, and afterwards published in the October number of the 'Edinburgh Medical and Surgical Journal,' for the year 1837.

"Some writers among ourselves, even as long ago as

the times of Pringle, in the war of 1776, have ventured to recommend ripe grapes in dysentery (a practice of which I have, in my own person, experienced the benefit); but they have been uniformly beaten down by the universal cry against apples in Devonshire, oranges in Portugal, limes in the West Indies, and fruits everywhere. The strawberry, the gooseberry, and even the more justly to be suspected cherry, however immoderately used, have been an exception to this outcry among ourselves, escaping blameless, because these, the earliest of our summer fruits, have, in fact, passed away, as will presently be seen, before the season of dysentery comes on.

"The Spanish physicians, however, have adopted the juice of lemons into the list of their remedies, and I can speak to its safety—I may say its efficacy.

"The late Dr. Cabul, a most promising young physician on the staff of our army in the Peninsula, on his returning from Spain into Portugal, in the year 1811, was so much struck with what he had seen in the former country, that, when severely attacked by dysentery at Coimbra (then one of our principal hospital stations), and attended by myself, he rejected all remedies but lemons and oranges. He speedily recovered, and I afterwards saw him follow the same practice in the hospitals and among his private patients with as much apparent success as attended any of the new modes of practice then in vogue. In Trinidad, too, when a dysentery of uncommon malignity appeared there, Dr. Lynch O'Connor found the lime-juice, administered by mouth and by *lavement*, was the only remedy that could be relied upon. Of this he sent a report to me, and I gave it to be published in the above-mentioned periodical.

"Dysentery has prevailed, in a considerable degree, amongst ourselves during the last two autumnal seasons, and, as usual, the autumnal fruits have been blamed as the cause; but if ever there was a disease arising out of atmospherical vicissitudes alone, dysentery is that one; and a man can no more be seized with true dysentery, from anything he can possibly eat or drink, than he can be taken with pneumonia, ague, or catarrh.

"In some of the northern provinces of Sweden, where I happened to sojourn during one of the hottest summers ever experienced, the dry ground was literally covered with wild strawberries, and the marshes afterwards filled with the whortle and cranberries; yet I never heard of dysentery; though so great was the short-livéd heat, that the thermometer was ascertained to have risen as high as 90 deg. Fahrenheit in the shade on two successive days; and so immoderate the desire of the inhabitants for acid fruits to counteract the effect of their scorbutic winter diet, when no vegetable could be found, that they sought for and devoured with avidity even the berries of the mountain ash,* as well as every other production of that kind."

"I am far from attempting to deny that the abuse of even the wholesome fruits will occasion diarrhœa, and that bowels, weakened by previous disease, may become more liable than they otherwise would be to fall under the influence of any epidemic that is peculiar to them. But diarrhœa is not dysentery: if we can induce diarrhœa (that is, bilious and fœculent evacuations, through the effect of our purgative or mercurial remedies), we have, in

* "Sorbic and *pure* malic acids are identical." See Dr. Hooper's Medical Dictionary.

fact, cured the disease, or at least gained a most important step towards its cure.

"I believe, therefore, that the free, but not immoderate, use of fruits, by assisting to keep the bowels soluble, is at all times a preservative against dysentery; and that when the disease is present, the same use is not only harmless, but, as in the case of the dysentery in Trinidad, may furnish a most important remedy towards the cure; for, if we examine the dismal records of this scourge to our fleets and armies, we shall find that its worst ravages have been seen amongst the famished garrisons of besieged towns, or in ships remote from land, while navigating the tropical seas, or in barren encampments, where fruits could not be found.

"Famine, and not fruit, was the predisposing cause of the dreadful dysentery that several years ago devastated the Irish poor in Dublin; for, in their starving state, fruit, even if it had abounded, was a luxury they could not procure."

Since my paper was approved by the Council of the Epidemiological Society, I have made several notes with respect to some of the vegetable acids named, both as regards their efficacy when pure, and the ill effects produced by adulteration. It is not my intention to read them to the present meeting: it is my wish, however, to preserve them for the consideration of the Cholera Committee, to be dealt with as that Committee may deem wise.

In justice, however, to the productions of nature, the apple and the grape in particular, I must say a few words.

Some of the cider retailed in London is far more pleasing to the palate than such as is ordinarily drank in

cider counties; and I am told the reason is, that the latter undergoes the process of fermentation, whilst the former does not.

Few persons would like the flavour of the fermented cider, such as is consumed by the inhabitants in cider counties. A sample was sent to me a short time since from a village in Somersetshire, and it was pronounced by those who tasted it to be no better than vinegar and water.

The flavour of cider varies: some is called "rough, brisk, full-mouthed cider;" another kind, "thin and washy;" but all, I have no doubt, possess the same properties to which Mr. Herapath drew attention.

As regards vinegar, I almost question, from what I have heard, whether I should feel inclined to recommend it medicinally again, unless I could assure my patients where it might be obtained free from pernicious ingredients.

I have two very important notes taken from the words of persons who have suffered from partaking of one kind of vinegar, but have been highly benefited by another. The vinegar used by the ancient Romans was doubtless a *pure* article; and I wish it were as possible to produce a specimen of it this evening for inspection, as it is (through the kindness of a gentleman who is present) to exhibit one of the earthen bottles which might, at some remote period of history, have contained that unadulterated article.

The naked eye may detect the unsoundness of the apple, the grape, the lemon, and other vegetable productions; but we must be indebted to the aid of chemistry, and the assistance of the all-powerful microscope, to enable us to judge of the purity of many of the manufactured

articles of consumption, as they pass from hand to hand, before they enter into the stomach of man, either for good or for evil.

Mr. President and Gentlemen,—If I have failed in my endeavours to do justice to the cause I have undertaken, I shall nevertheless retire to rest with the impression that a gate is open through which those may pass more competent than myself to cultivate the ground, and to produce better fruit—such fruit as will tend, I trust, to confer an "honour upon the medical art," and prove of benefit to all mankind, many of whom, I am persuaded, are anxiously looking to the medical profession, individually and collectively, to the collateral branches of medical science, as well as to sanitary bodies, for protection against the dreadful scourges which have too often left desolate the hearths of many a *once happy* family, both in the mansions of the rich, and in the habitations of the poor.

THE END.

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