REMARKS ON THE TREATMENT OF ENTERIC FEVER.*

By JOHN S. BRISTOWE, M.D., F.R.C.P.,
Senior Physician to St. Thomas's Hospital.

IN undertaking to open a discussion on the extremely interesting and important subject of the treatment of enteric fever, I did not undertake to treat it exhaustively, or to bring before you any novelties of view or practice. But the object which I set before myself was to discuss (as far as possible by the light of my personal experience) mainly those questions of treatment which are debatable, or on other grounds worthy of special consideration, in order the more directly to provoke controversy, and to elicit the opinions and experience of those of you who have opinions or experience to give.

The heads under which it was suggested that I should introduce the subject to your consideration, and which I saw no reason to add to, to subtract from, or to modify, are, as is stated in the notice summoning this meeting, four in number: viz., 1. Diet; 2. Medicine; 3. Alcohol; 4. Baths. These I proceed to consider *seriatim*.

1. *Diet*.—It was formerly the custom to "starve fevers". During the last thirty or forty years, however, and in no small degree owing to the teachings of the late Dr. Graves, the practice of "feeding fevers" has been very generally adopted; and few, I should think, can doubt the wisdom of the change; for not only are fevers characterised by rapid degradation of tissue, with progressive emaciation and enfeeblement of system, but experience has demonstrated that fever-patients are capable in no inconsiderable degree of assimilating nourishment, and that the specific symptoms of their diseases are seldom, if ever, aggravated by its judicious administration. These remarks are especially true of enteric fever, which is a disease of long duration, and one in which emaciation and asthenia not only are rapidly developed and apt to become extreme, but are exceptionally slow to be recovered from. But it is a fever which, probably more than any other specific fever, demands care and judgment in its dietetic management; for its incidence is mainly on the alimentary canal, and dietetic errors are likely, therefore, to be attended with immediate injurious results. I need scarcely remind you, that Peyer's patches and the solitary glands in the lower part of the small intestine are always affected in enteric fever, and the solitary glands in the large intestine in about one-third of the total number of cases; that ulceration of the diseased patches commence, for the most part from the seventh to the tenth day of the fever; that cicatrisation usually begins some time during the fourth week, but may be delayed indefinitely and indefinitely prolonged; and that the specific consequences of the intestinal lesion, against which we have especially to take precautions, are uncontrollable diarrhoea, intestinal hæmorrhage, and perforation of the ileum. Under these circumstances, it is clear that the food to be administered should be easy of digestion and assimilation, and that its residue should be unirritating to the diseased bowel along which it has to pass. Dr. Murchison observes that it "may consist of such articles as the following: milk, eggs, beef-tea, veal- or chicken-broth, to which may be added vermicelli or arrowroot, meat-essences, meat-jellies, custard, bread-and-milk, sago, and tea or coffee diluted freely with milk". But this, it seems to me, is to be regarded rather as an enumeration of the articles of diet from which we may select under special circumstances, and in exceptional cases, and to which we may resort indifferently during convalescence, than as a list of foods to be administered indiscriminately during the febrile stages of the disease. Indeed, Dr. Murchison admits, what most of us know by experience, that beef-tea and other animal broths and essences not unfrequently promote diarrhoea in enteric fever; and the suppression of the salivary, and probably of the pancreatic, secretion which attends the disease interferes importantly with the digestion and assimilation of starchy matters, which thus, as Dr. Cayley especially maintains, become irritants to the alimentary canal. These facts serve to control our liberty of action in no inconsiderable degree, and reduce us to the

necessity of feeding patients almost exclusively on milk and eggs. Indeed, I suppose that few physicians at the present day give anything besides milk to enteric fever patients so long as the temperature remains febrile. That is the practice which Dr. Murchison himself advocates; it is the practice recommended by Dr. Cayley; it is the practice which has prevailed at St. Thomas's Hospital for many years past; and one which, with few exceptions, I have carried out as long as I can recollect, both in private practice and at the hospital. Very few patients are unable to take milk; and in almost all instances in which patients protest that it disagrees with them in health, they yet take to it kindly here. Even when the stomach is irritable, as it often is early in the disease, and as it may continue during the greater part of its course, it will still generally retain milk given in small quantities and, if necessary, cooled with ice or diluted with soda-water or lime-water. It should be given, in quantities determined by the circumstances of the case, every one, two, or three hours; and thus from one to three or four pints may be readily administered even in severe cases during the twenty-four hours. The feeding of patients during convalescence is a matter of considerable nicety. The presence of a clean tongue and a good appetite, and the need of restoring health and strength to the enfeebled and emaciated frame, tempt one strongly to allow the patient to give full play to his lust for food. But when it is recollected that, during early convalescence, relapses are not unfrequent; that the characteristic ulcers of the disease are not generally healed until convalescence is far advanced; and that unhealthy processes, leading to diarrhoea, hæmorrhage, and perforation, may be readily re-excited in them by anything which irritates the alimentary canal, as well as by anything which causes constitutional disturbance; the need of extreme caution becomes apparent. It is the usual custom at our hospital not to give anything beyond milk until the temperature has ceased for a full week to present a febrile rise; and then to commence with bread and milk, eggs, or rice-pudding; only subsequently adding fish, and fowl, and butchers' meat to the dietary. Of course, many cases occur in which it is thought right not to adhere rigorously to this rule; but it is curious, as most of our sisters know by experience, that the premature addition of solid matter to the diet, is constantly followed by exacerbation or temporary renewal of fever.

2. *Medicine*.—Enteric fever is one of the many diseases for which as yet no specific is known, and for which I am inclined to think no specific will ever be discovered. It was maintained, even a few years ago, that an emetic, given early in its course, would frequently arrest its progress, and my late colleague Dr. Brinton was a believer in this reputed effect of emetics. It has also been held that the diarrhoea is salutary and eliminative, and that, by promoting or encouraging it, the disease may be shortened or rendered less severe. These views were based on an imperfect appreciation of the nature of the disease; on the belief either that the intestinal affection is primary, and to be got rid of, like lice externally, or intestinal worms within, by local remedies; or that the intestinal mucous membrane is an organ by means of which the specific poison of the disease is endeavouring to escape. But even though the contagium of enteric fever be received into the stomach, it has long passed thence into the system before the symptoms of the disease arise; and obviously at this time, whatever opportunity for the successful use of emetics might theoretically have been present at the beginning, has long passed away. And to look on the diarrhoea which is due to the enteric lesions as eliminative, is to look upon these lesions as centres of elimination, and is equivalent to regarding the eruptions of the eruptive fevers, which are mere foci for the growth of poison, as organs developed for the discharge of poison pre-existing in the blood—a view which is manifestly absurd when applied to the pustules of small-pox, or the tubercles of syphilis. But, if we cannot cure enteric fever, or eliminate its specific poison from the system, we can at any rate treat, and in most cases relieve, some of its most distressing symptoms or complications. —*Diarrhoea* is one of the most characteristic, and often one of the most troublesome and dangerous, symptoms of the disease. It is often absent, however, for days together; and occasionally is replaced by constipation during the whole course of the disease. Many physicians, and some even of our most distinguished contemporaries, would encourage by laxatives the diarrhoea, if not carried to excess; and would endeavour to excite it in cases attended with constipation. The practice is based on the opinion already referred to, that the poison tends to escape by the bowels, and on that that the retention of poisonous and putrefactive matters in the bowel is a source of danger. From the former of these views, I have already expressed my reasons for dissenting. As to the latter, I can only say that the motions are not, I believe, specially offensive, or, except in a specific sense, poisonous; and that the bowels, after all, naturally contain ordure. But, on the other hand, persistent diarrhoea tends materially to weaken the patient; the commotion which attends if it is a source of direct danger to the diseased bowels; and, further, diarrhoea, once brought on artificially, is very often difficult to be

* Read in opening a discussion at a meeting of the South London District of the Metropolitan Counties Branch.

restrained. I have no doubt myself that, although two, or even three, evacuations in the day may not call for measures of restraint, diarrhoea, if it should exceed this amount, as a rule, ought to be checked. Of all medicines, opium, in its various preparations, is the most valuable for this purpose. It may be given by the mouth in frequent small doses, or by the rectum in the form of a small enema or suppository. The dose and frequency of administration must, of course, depend on the amount of diarrhoea present, and on the age and condition of the patient. Other remedies, which may be employed either alone or in aid, are the vegetable astringents, especially kino, catechu, and tannic acid, sulphuric acid, and lead. It is important to bear in mind that the danger of diarrhoea depends not only on the actual profuse discharge of faecal matter, but on the peristaltic movements which accompany it, and which tend to cause rupture of thin-based ulcers. Now, this peristaltic movement may be present in the ileum, even when constipation prevails: for the large intestine, from being healthy or torpid, may fail to propel onwards the matters which are being constantly poured into it from the small intestine; that is, diarrhoea, so to speak, may be taking place, from the small intestine into the large, at a time when actual constipation exists. It is clear, therefore, that opium may be demanded to restrain the painful or violent movements of the bowels, even when the bowels are constipated.—*Constipation*, nevertheless, has, at times, to be dealt with. Is it right that constipation, when present, should be allowed to continue until nature brings relief, or should it be obviated by medicinal treatment? I do not think that constipation of a few days' duration is at all likely to be injurious; and, indeed, I have seen it continue for a considerable length of time without causing any ill-effects. It is not, however, desirable in itself that the bowels should be locked up; and, moreover, constipation, long continued, is apt to induce diarrhoea. Whether we should do anything, however, and what we should do, depends largely upon the condition of the patient and on the stage of his disease. There can be no doubt that, during the first week or ten days—that is, before ulceration has commenced—laxatives, such as castor-oil and rhubarb, may be given with impunity, and often with benefit. But, after ulceration has begun, and thence onwards until convalescence is far advanced, even the mildest opening medicines must be looked on with suspicion; and, although I would not venture to maintain that under no circumstances should castor-oil or rhubarb be given during this period, I am sure that, on the whole, it is better and far safer to relieve the overloaded bowels by mild enemata. In support of this statement, I may remind you that constipation is almost always due, not to sluggishness of the small intestine but to sluggishness of the large intestine in which the faeces accumulate and harden.—*Hæmorrhage* from the bowels may occur early in the disease, and is then small in quantity and of no importance. When, however, it takes place from the ulcerated surfaces, and after the second week, it is a matter for serious alarm. It is true that the patient usually recovers, even though it be copious, and that very often it does not recur. But in some cases the blood escapes with sudden impetuosity, and the patient dies rapidly in a state of collapse; and in some the hæmorrhage is so frequently repeated that the patient, who may seem doing well for a time, finally sinks. I am inclined to think, with Sir W. Gull, that this bleeding is practically beyond our control; and that the patients in whom our remedies seem to be efficacious are those in whom the hæmorrhage would not have recurred, even if no treatment had been adopted. It is not by applying weak astringent solutions to external bleeding wounds that hæmorrhage therefrom is restrained; and few, I should think, would have any faith in the possibility of arresting such hæmorrhage by the internal administration of astringents. Nevertheless, feeling it to be my duty to do everything in a dangerous crisis which might tend, however little, to benefit my patient. I should certainly, under such circumstances, give him ice-cold fluid to drink, apply cold compresses to the abdomen, and administer either lead, or tannic acid, or digitalis, or ergot, or turpentine, or perchloride of iron.—*Perforation of the bowel and consequent peritonitis* are almost invariably fatal; the only treatment, in addition to local applications to the abdomen, consists in bringing the patient speedily, and in keeping him, under the influence of opium.—*High temperature* (a subject to which I shall presently recur) is, no doubt, in itself, an element of danger; and, for this reason, its reduction seems desirable. Various medicines have been employed with this object; the most important and efficacious of which are quinine and salicylic acid. In order that quinine shall reduce temperature, it requires to be given in large doses—thirty or forty grains at once, or in instalments at short intervals. Thus administered, it reduces the temperature by three or four degrees in the course of a few hours, and the temperature may remain low for a dozen hours or more. Salicylate of soda may be given in doses of twenty or thirty grains every four hours, and also causes marked reduction of temperature. But in both cases the reduction is of temporary duration only, and the drug requires to be

continued. I have not employed either of these remedies largely in the treatment of enteric fever; and I must confess that my own experience of their use has not impressed me favourably. Of the treatment of other complications, I do not propose to speak; and it only remains for me to add, under the head of treatment, that, during convalescence, tonics, and especially the vegetable bitters, are of great value.

3. *Alcohol*.—It is impossible to discuss the subject of the treatment of fevers without referring to the question of the use of alcohol in relation to them. In the early part of this century, when blood-letting was the fashion of the day, stimulants were seldom employed in the treatment of febrile disorders. Of late years, however, alcohol has not only been regarded by most physicians as an essential element in the treatment of fevers, but by many has been esteemed our sheet-anchor, and has been administered sometimes in appalling quantities. Thereason, however, for giving it thus was not simply to obtain its stimulating effect, but the belief that it was an article of food, and that it was assimilated by the patient at a time when other kinds of food could not be taken or were inadmissible. I see no reason to doubt that alcohol is a food; at any rate, it contains the same elements as starch and sugar, which are undoubted foods; and the experiments of Thudichum and Dupré show that, when once taken into the system, it is in some way used up in the system, and escapes in very minute proportion through the emunctories. But we have, doubtless, many foods that are more valuable as foods than alcohol; and in milk, at any rate, we have one which is generally well suited for invalids. It is rarely necessary, therefore, to have recourse to alcohol as food; and its use in fevers depends mainly on its primary or stimulating—its medicinal—influence. I have never used alcohol indiscriminately in any kind of fever cases; and, indeed, ever since I have had the care of patients in St. Thomas's Hospital, I have been very sparing in my use of it. In the year 1863, when typhus was prevalent in London, I carried out an experiment, which I have never published, and which Dr. Murchison carried out independently, and on a larger scale, a few years later at the Fever Hospital, with similar results to those which I also had obtained. I treated, without selecting them, half my typhus patients with alcohol from the beginning to the end, half my typhus patients without alcohol also from the beginning to the end, and found no appreciable difference in the results. From that time, I have never regarded alcohol as an essential item in the treatment of either typhus or enteric fever; and I have seldom given it, unless special circumstances in the case indicated to my mind the need of stimulation. Many typhoid cases, and even severe cases, have recovered under my care without having tasted a drop of alcohol. Many no doubt have had it; but the circumstances under which I have given it have been: the presence of extreme debility, indicated by a feeble heart and rapid pulse; the supervention of typhoid symptoms; the occurrence of pulmonary complications; and the debility of prolonged convalescence. My friend Dr. Ord, in an interesting paper on Enteric Fever, in the eighth volume of the *St. Thomas's Hospital Reports*, based upon sixty cases (of which twenty-four were my own) received into the Hospital from the end of July 1877 to the end of March 1878, observes that "twenty-four patients received no stimulants at all; six only a small quantity during convalescence; eight not any till after the tenth day of admission; twenty-two received them within the first ten days of stay in the hospital, or while the fever was in activity; but very few indeed received them till after the end of the first week of illness." "The quantity of stimulants varied from a glass of wine or a glass of beer up to sixteen ounces of wine daily in one case, and eight ounces of brandy in another." Of these cases, eight were fatal, the mortality being at the rate of 13.33 per cent. The remarks above made, while they tend, on the one hand, to show that alcohol is less valuable than many persons suppose in the treatment of fever, tend, on the other hand, to demonstrate that alcohol is not injurious in fevers. Indeed, I never recollect to have seen a case in which, even under physicians who have used it largely, alcohol has clearly acted injuriously. My main reason for withholding it has not been the fear of doing mischief, but simply because I have not thought it necessary; and, not finding it necessary, I have allowed economical considerations to weigh with me. I am satisfied that there are many occasions in enteric fever when alcoholic stimulants are of the greatest value; and that whoever then neglects to have recourse to them imperils his patient's life.

4. *Baths*.—It is admitted that, in all fevers attended with high temperature, the high temperature, though merely a consequence of the active disintegration that is going on in the system, is itself injurious by promoting disintegration and in other ways. There are theoretical grounds, therefore, in favour of reducing temperature in enteric fever. With this object, the patient may be kept in a cool and well-ventilated room, may be covered only lightly with bedclothes, and may have his food given to him cool or cold; and there is no doubt that these measures, which are generally adopted, are judicious; but they are quite in-

sufficient of themselves to cause any obvious refrigeration of the body. I have already referred to the employment of quinine and salicylate of soda, and to the powerful influence they severally possess, when duly administered, in reducing temperature. The most powerful agent, however, in this respect, is the cold bath. I need not here go into the history of its introduction. It is sufficient to state that for some years past it has been very largely employed abroad, especially in Germany, in the treatment of enteric fever; and that lately it has been extensively adopted among us by some of those physicians who are connected with fever-hospitals. I have already referred to the admirable Croonian Lectures on Typhoid Fever by Dr. Cayley. In the last of them he discusses, with equal learning, knowledge, and skill, the use of the cold bath in this disease. He quotes statistics from foreign writers, which go to show that the mortality from enteric fever has been reduced by one-half among those who have been treated systematically by cold bathing; and he shows that, in his own hands, this mode of treatment has appeared to be almost equally successful. He argues forcibly that, by keeping the temperature systematically depressed from an early period of the disease, the intestinal lesions, and other morbid processes which are going on in the body concurrently with them, and which collectively bring on asthenia, impede recovery, and hasten death, are kept under; and that dangerous complications are hence less likely to ensue. He admits, however, that relapses appear to follow this kind of treatment in much larger proportion than they follow other plans of treatment; and he concludes a powerful argument by urging that the treatment by cold bathing should, at any rate, receive a fair trial. I am sure that any opinion or advice of Dr. Cayley's will be received with respect by all who know him, and by all who read what he writes; and I should be sorry if a course of treatment which has his sanction be not fully tried in this country by those who have the opportunity of trying it. I confess for myself, however, that I am very much in the same frame of mind as he acknowledges himself to have been in a little while ago; and that I am not yet fully satisfied of the great advantages of cold bathing. I am not absolutely convinced by his arguments, that the lesions attending enteric fever are kept in abeyance by reducing temperature. I know that, under the influence of the bath, delirium disappears, and the patient's condition seems to improve for a time; but I recollect how exactly the same kind of thing used to occur in cholera patients in whom injection of fluid was made into the veins; and how that practice, once much vaunted, has practically been abandoned. And I must acknowledge that, without being able to explain them away, the statistics, honest though they doubtless are, do not satisfy me. The result, in fact, seems too good to be true. If the mortality of a disease be diminished one-half by a particular kind of treatment, the benefit resulting from that treatment ought to be apparent to the most casual observer; it ought, like the effect of salicylate of soda on rheumatism, or of quinine on ague, to be utterly beyond dispute. And yet Dr. Cayley speaks with great caution of his own results. The results which I have witnessed in my own practice have not—at any rate, in my opinion—been favourable. I admit that I have not resorted to the systematic use of the cold bath at all extensively, and that during the last year or two I have scarcely employed it at all; but, two or three years ago, those of my hospital patients whose temperatures ran high were submitted to this plan of treatment. Some of the patients did well, and I was inclined to attribute the improvement which followed the baths to the baths; but two cases occurred in rapid succession in which I thought, perhaps erroneously, that the baths were instrumental in causing death.

The first case was that of a young man who had the disease severely, and a very high temperature; the baths were systematically employed, with the usual immediate effects; but suddenly, after they had been continued for some days, he passed into a state of collapse, with rapid breathing and great dusky of face, and I assumed, notwithstanding that there was no abdominal pain, that perforation of the bowel had taken place. He lived for two or three days more, and at the *post mortem* examination I found that, though there was extensive bowel-disease, there was neither perforation nor peritonitis, but the lungs were in a condition in which I never recollected to have seen them before in enteric fever. They were small, collapsed, almost devoid of air, and of a deep slate colour. There was no pneumonia or oedema. I attributed his collapse and his death to the condition of his lungs, and I could not avoid attributing the condition of his lungs to the use of the baths. The other case was also that of a young man; and although he was very ill and had a high temperature, I demurred, after my recent experience, to treat him with baths. Nevertheless, I left it to the resident assistant-physician to employ them, if, in my absence, circumstances arose to make him think it desirable. The boy died, and at the *post mortem* examination his lungs were found in precisely the same condition as those in the previous case. Believing that the patient had not had baths, I observed

half jokingly to the resident assistant, who was present, that if only baths had been employed I should certainly have attributed his death to them. His answer was that they had been employed.

There are two ways of cooling patients by baths: the one is by means of what is sometimes termed the graduated bath, the other by means of the cold bath. In the former case, the patient is immersed in water, the temperature of which varies from 90 to 100 degrees, and is reduced gradually while he is in the bath to 65 or 70 degrees; in the latter case, he is at once plunged into a bath, the temperature of which from the beginning is made to stand at 65 or 70 degrees. In either case, the patient should remain immersed for a time varying between ten minutes and half an hour, or until he feels cold and shivers, and his temperature has been reduced by two or three degrees. It is important to recollect that the temperature continues to fall for some little time after removal from the bath. The bathing should be repeated whenever the temperature has again risen, and in many cases needs to be repeated as often as every three hours. The graduated bath is that which alone we have employed at St. Thomas's; but it is much more troublesome of application than the other, and it takes a longer time to reduce the bodily temperature. It is a less severe remedy, however, and may be preferably employed, as Dr. Cayley suggests, for old people, and patients who are extremely prostrate, and for those who have organic disease of the heart or lungs. The cold bath is preferred, as a general rule, by foreign physicians and by Dr. Cayley. Those who employ the baths habitually, commence its use in any case of enteric fever, as soon as the temperature in the mouth or rectum has attained an elevation of 102.2 degrees, and then carry on the treatment systematically as long as febrile temperature is maintained.

In conclusion, gentlemen, let me state briefly the treatment to which I should like to be subjected if ever, unfortunately, I should become affected with enteric fever. I should like to be placed in a cool, well-ventilated room, and covered lightly with bedclothes; to have a skilful and attentive nurse to look after me; to be fed solely with cold milk, unless vomiting should demand the addition to the milk of medicine calculated to allay vomiting. If diarrhoea became troublesome, or ever there was much pain or tenderness in the cæcal rings and in the bowels, I should like to be treated, not with laxatives, but with opium, given either by the mouth or by the rectum. If constipation were present, I should, excepting in the first week, like to have enemata only employed for its relief. In the event of intestinal hæmorrhage coming on, I should like to have ice to suck or ice-cold fluids to drink, cold compresses to the belly, and cold injections into the bowels; and, though I am sceptical as to their efficacy, I should still choose to have astringents, and more especially lead, given to me at short intervals. If perforation should take place, let me have large and repeated doses of opium. Stimulants I should prefer to be without early in the disease; later, however, and during convalescence, I should like to have them in moderation. As to the cold baths, I would rather not have them; but I would, nevertheless, leave it to my physician to exercise his discretion in the matter. I would leave it also for him to decide, according to circumstances, whether alcohol should be administered to me in large quantities. I would prefer not to be treated at a temperance hospital.

ON THE ACTION OF PANCREATINE UPON FAT, AND THE PROPER FORM IN WHICH TO USE IT.

By HORACE DOBELL, M.D.,

Consulting Physician, late Senior Physician, to the Royal Hospital for Diseases of the Chest.

I HAVE watched with much satisfaction the reinforcement, under the flag of Dr. W. Roberts, of the interest in the medical use of pancreatic preparations, first excited by my papers in 1864-6; and, hoping that nothing but good could come of Dr. Roberts's campaign, I have hitherto carefully abstained from intermeddling.

After carefully restudying Dr. Roberts's contributions, however, I find myself, at last, constrained to come forward to prevent more harm from being done by one part of his statements, than would be compensated for by all the good that could accrue from the rest. He has done excellent service by bringing prominently forward his experiments, confirmatory of the wonderful effects of the pancreatic secretion in digesting starch and albuminoids, and especially in formulating his results in the very useful recipe for "peptonised (pancreatized) milk-gruel", which seems somehow or other to have fascinated the professional mind more strongly than the forms for pancreatized suet and milk; pancreatized milk, egg, and arrowroot; pancreatized milk-cocoa; and pancreatized nutritive enemata, published by me from time to time (1870, 1872, 1875, 1878, 1880).