

want of amalgamation. It will be no easy matter to produce one consolidated whole for India and Burma from so many isolated elements, but let us be thankful the elements are here to work with, and though eventually it will most likely have to be a recognition for each province that will constitute a legal claim to practise or to hold appointments, still there is everything to be gained and nothing to be lost by combined action in the early stages, and approximation of each to others as nearly as nationality and contrasting traits permit, and by this means make it as easy as possible to accomplish transfers from and to whatever parts of India may be desired.

We are working towards registration of nurses, *i.e.*, a Government recognition of the status of a trained nurse—to get registration we must have a uniform standard of training, to get a uniform standard of training we must know what each other is doing, and what every one considers a necessary and suitable training; this can very easily be accomplished in the manner suggested through the medium of these columns.

In the list of members published in last month's Journal there are doubtless a considerable number of mistakes owing partly to members not having sent in their new address where a change has taken place (in addition to printers' errors for which we are sorry) if all who find that this is so, will send in corrected address or other statement, these corrections shall be published when received; a directory that is faulty and not up-to-date is not very serviceable.

ENTERIC FEVER

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IN considering the subject of enteric fever, I shall depart somewhat from the description of the disease as it is usually given in the medical text books, and adopt an explanation of its pathology which has been furnished by some recent laboratory work on the subject, and which has also the merit of simplifying very considerably our conception of the nature of the infection. As previously, I shall not give a detailed description of the symptoms of the disease, but shall confine myself to general principles only.

Enteric fever is due to invasion of the body by the bacillus typhosus—to that, and to that alone. An attack *may* be caused by inhaling the air laden with the organisms, but in the vast majority of cases, the

germ is swallowed, that is to say, some article of food or drink becomes contaminated with bacilli—always, be it noted, derived from a previous patient suffering from enteric fever—and is unwittingly consumed by the patient.

Epidemics of enteric are usually due to a polluted water supply, that is to say, the excreta from a previous case of the disease find their way into a well, or even, as in the Caterham outbreak, into a reservoir, and very many of the consumers of the water contract the disease. Or the infection may be indirect, as when articles of food are washed with polluted water, and it is in this way that oysters and cockles or mussels give rise to enteric. What then happens is that the shellfish, though they are quite innocuous when they are taken from the deep sea, are laid down to fatten in beds where they become contaminated. Now these beds are very frequently situated at the mouths of rivers, or on the sea-shore where there is a tract of shallow water through which the tide ebbs and flows, and it often happens that they are not very far from the mouths of large drain pipes, and in practice, the oysters fatten on the sewage thus discharged. For some reason or other, they seem to prefer typhoid bacilli, and these germs grow inside the shellfish, and thus give the disease to any one who eats them. In the same way watercress is often grown on sewage, and is then apt to infect the consumer of it.

Another way in which food becomes contaminated is by flies, which carry particles of infected matter from the waste matters on which they feed to the food over which they so freely crawl, and recent research has shown that flies play a very important part in the dissemination of enteric and kindred diseases in this manner. The lesson is obvious; though we cannot avoid polluted water, unless we never drink any that has not been recently boiled, or filtered through a germ-proof filter, it is not essential to our existence that we should consume shellfish, and we can always keep food covered up with covers of wire gauze.

But it is well-known that nurses are very prone to contract enteric fever, and there are now many instances where young and useful lives have been sacrificed in this way; so it is perhaps well that we should investigate this part of the subject rather more closely. Now, while it cannot be denied that it is possible for a nurse to contract the disease by inhaling the breath of her patient, infection by this route must be very rare, and there can be no doubt that a more usual way is for the bacilli to get on to the hands of the nurse and thence to her food. We must take it that whenever a nurse is in constant attendance on a patient suffering from enteric, very many germs must reach her hands,

however careful she may be, unless rubber gloves are worn—as, in my view, they should be—not only when soiled linen or utensils are being handled, but also whenever the patient's mouth is being cleansed, or any dressing done.

How many times, I wonder, does a nurse go straight from a ward where there is a typhoid patient to the dining-room, after an ordinary washing of the hands, and forthwith begin to eat bread with her fingers while she is waiting for more solid fare? Or again, it may be her “afternoon off” and she changes hurriedly into out-door garb, and puts on a pair of gloves, which are not removed until she reaches the seductive tea shop (the visit to which may be necessitated by the fact that her dinner has been so badly cooked that she has eaten as little of it as possible), when she again manipulates the appetising confectionery with her fingers. As a matter of fact, I once took cultures from the gloves of a nurse in an enteric ward, who was really one of the most careful and conscientious people I have ever met, and grew a very fine selection of typhoid bacilli from them. No nurse who is in attendance on even one typhoid patient ought ever to touch her food with her fingers. Eating bread and butter with a knife and fork may be unconventional, but it is better than contracting an attack of enteric fever.

We now come to the results of swallowing these germs, and here I am going to deviate a little from the text books. We know now that the bacilli gets straight into the circulating blood, and we can find them there in almost every case during the first week or ten days; thence they are discharged through the kidneys, and in the vast majority of patients, the urine from the middle of the second week onwards for a variable period contains the bacillus typhosus. They are also found in the spleen and in certain portions of lymphatic tissue in the intestine which are known as Peyer's patches. In the latter situation they cause death of the tissue, and ultimately the dead portion is cast off leaving an ulcer.

So we have in enteric fever two facts to keep before our minds: one is that the bacilli with which the circulating blood is swarming are producing poisons, or toxins as they are called, and that the patient is therefore suffering from a general disease, which goes on whatever we may do to the intestine, and another is that the presence of weak spots in the bowel itself is a source of danger. Formerly we did not know that the organisms got into the blood from the first, and so we concentrated our attention somewhat too closely on the ulcerated intestine.

The incubation period of enteric fever is usually 12 or 14 days, and though we have as yet no definite evidence on this point, the probability

is that during this time the bacilli are growing in the blood to a certain extent; most people feel ill during this incubation period.

The onset of the disease proper is not well marked as a rule, but the patient has a headache, which continues steadily—though the pain is not, as a rule, very acute—instead of passing off as most headaches do, he also becomes more and more tired, and feels heavy, stupid and ill.

As a rule the patient now thinks that he has a bilious attack, and takes an aperient, which gives him abdominal pain and diarrhoea, or rather, instead of his bowels being opened once or twice only, they continue to act for a few days. In severe attacks there is sometimes diarrhoea apart from any aperient, but as a rule the onset of enteric fever is not marked either by abdominal pain or undue looseness of the bowels when no purgative has been administered or taken; this, as will be seen later, is rather an important point.

At the onset, the temperature is raised, and it advances by two degrees at night and falls by one degree in the morning until a pyrexia of 103 or 104 degrees is reached, when it remains with but slight variations for a fortnight or so; the temperature then begins to drop to the normal, or nearly so, in the mornings; the evening readings being gradually lower until the normal line is reached altogether, at about the end of the third week; both shorter and longer periods are, however, quite common.

With the headache and the pyrexia there is prostration, which may be extreme, so that the patient lies almost unconscious of his surroundings, and there is almost always some delirium at nights. He becomes steadily thinner.

Now these are simply the signs of toxæmia, and in many cases there is nothing, or very little, to show where the manufactory of the toxin is; before the discovery of the bacilli in the blood we assumed that they were formed in the intestinal ulcers, but against this is the fact that if we examine the body of a person who has died of enteric, we find very many more bacilli at the beginning of the intestine than lower down, where the ulcers are; also the degree of poisoning observed at the bedside does not correspond to the amount of ulceration found post mortem.

But in many cases the ulceration does give rise to signs and symptoms, and of these, the most important is distension of the abdomen, which, when it is well marked, is known as meteorism; sometimes abdominal pain and diarrhoea are due to ulceration, but, as will be seen later, this is not the most common cause of either. Sometimes the ulcers are deeper than usual, and one of them may penetrate the

submucous layer of the intestine and open up a blood vessel, so that we get hæmorrhage from the bowel, or it may go deeper still and make a hole right through all the coats, so that the contents of the intestine escape into the abdominal cavity ; this is known as perforation : the signs of both these complications will be described in a future article.

To sum up, enteric fever is a general infection of the blood with the *B. Typhosus*, which also irritates the intestine, so that ulceration results. Keeping this before our minds, we will next consider how the disease may best be treated, and then discuss the signs which should indicate to the nurse that all is not well with the patient.

Before we come to the treatment of enteric fever, it is well to notice that there are several rather different types of attacks of the disease, or rather that different people re-act in different ways to the same infection.

For instance, in children, the disease is more often than not of a mild type, and the little patients do not feel much, if any, pain, though a moderate amount of abdominal distension is fairly common. In robust athletic adults, the signs of toxæmia are usually very well marked ; there is violent delirium, and a high temperature, and the danger lies in the failing of either the heart or lungs from poisoning of the heart muscle, which, if the right side of the heart is attacked, means failure of the pulmonary side of the circulation and death from accumulation of fluid in the bases of the lungs.

In elderly spare men, or prematurely aged women, the toxins seem to prefer the nervous system, and we get constant low muttering delirium and intense prostration, though the temperature is usually not high ; the pulse, too, is weak and thready, in contrast to the full bounding artery of the previous type. It is not uncommon in patients of the nervous type for the temperature to persist for several weeks with an entire absence of appetite, though the tongue may be clean and moist.

In patients of any age, we may get a predominance of the abdominal symptoms, though, as will be seen later, these are often produced by a faulty dietary. There is then diarrhœa, with abdominal distension, and a danger of the occurrence of hæmorrhage or perforation.

Turning now to the treatment of the disease, the first point to recognise is that we cannot get at the organism itself, and that there is, therefore, no direct treatment possible ; obviously we cannot put into the blood any antiseptic in sufficient strength or quantity to kill the organisms or restrain their growth without performing the same kind of offices for the patient's white blood cells, which are the very things

that we want to encourage. Neither would it be of much use to disinfect the intestine with the idea of killing the typhoid germs in the ulcers, for, as we have seen, these are of secondary importance. We sometimes, it is true, use antiseptics to stop fermentation in the intestine, but we cannot arrest the disease itself in this way.

We are then left with two essentials : to strengthen the resisting powers of the patient (or, in other words, his white blood cells) and to see that we allow nothing to interfere with the natural tendency to recovery. Also, we may have to treat certain symptoms as they arise.

Now in any battle it is imperative that the soldiers in the fighting line shall be well nourished, and the white blood cells are no exception to the rule; so we get to the first axiom in the treatment of enteric fever, which is to give such food as can be easily digested, and in sufficient quantity to maintain the resistance of the patient at as high a level as possible.

But it will be obvious that we cannot feed the patient in the same way as one who has no ulcers in his intestine, and it consequently became the custom to allow a very wide margin of safety in this respect, and to confine the patient to milk alone for the whole period of his illness, so that we should not run the risk of irritating the ulcers with the indigestible residue which an ordinary diet is apt to contain. Unfortunately, however, very few patients can digest milk, and milk only, for anything like the whole time of their illness, and when we feed patients in this way, we get signs of this inability in diarrhoea from irritation of the intestine by undigested, and possibly fermented, milk curds, and in the passage of these same curds, in the stools. For a reason which I have never been able to understand the excreta under these conditions came to be described as the typical typhoid stools; that they are not so is shown by the fact that they do not occur in enteric patients who are not taking milk at all, and they may be present in cases of other diseases (scarlet fever for instance) when milk has inadvertently been given to excess.

In practice, therefore, we give such food as the patient can digest, avoiding errors in quantity by keeping him very slightly hungry. Now this is where the nurse comes in; signs of indigestion must be carefully watched for, and it will be convenient if I describe firstly the diet of a typical case, and then the signs which indicate that the food is beginning to disagree.

We must feed the patient, and not his temperature chart, and we do not take the height of his temperature into account in prescribing the dietary, inasmuch as the pyrexia acts (when it does interfere with digestion) by causing other signs which can quite easily be observed.

During the first few days of the attack we limit the diet to milk unless the patient dislikes it, but after the first five or seven days, providing that the patient is slightly hungry, and that there is no diarrhoea or abdominal distension, and that the tongue is moist (though coated), we may give him something else from the following list:—Bread and milk, boiled custard, beaten-up eggs, jelly, blanc mange, sponge cake and tea, coffee, or cocoa thickened with concentrated proteid, such as Plasmon or Sanatogen. Later on, if these agree—and, again, irrespective of the temperature chart—we can in many cases add pounded fish or pounded chicken. Meat extracts and beef tea are best avoided at any stage on account of their tendency to cause diarrhoea. I do not mean to imply that any one of the above foods is necessarily suitable to every patient, and the dieting of each individual is a matter for the careful consideration of the physician, but the nurse can help very materially, not only by noticing signs of dyspepsia as soon as they appear, but by presenting each meal to the patient in as palatable a form as possible, for the digestion of any food depends very largely on what the patient thinks of it before he attempts to swallow it.

Many patients have a clean tongue and are hungry throughout the attack, and one very great help is the careful toilette of the mouth, a dry and dirty tongue being more often a consequence of oral sepsis than of enteric fever, and it is essential that the entire mouth and all the teeth shall be carefully swabbed out with the prescribed mouth wash many times a day. Then the nurse must examine every stool for particles of undigested food; if diarrhoea supervenes it is often best to stop all food for twenty-four hours, giving plenty of water or very thin barley water meantime, and at the conclusion of this period to begin with something that he has not had before. Albumen and barley water is often useful in this respect, and may be given until the diarrhoea ceases and the tongue begins to clean, and the patient, like *Oliver Twist*, "asks for more."

Whatever diet be chosen, there can be no doubt that it is an advantage for the patient to drink very freely of water, as much as five or six pints being given in the twenty-four hours; this washes out the toxins from the body through the kidneys.

With this object also in view it used to be the custom to give daily cold baths to almost every patient, but I personally use them only in patients of the robust type where the pulse is full and bounding, and there is much delirium, as I consider them to be dangerous in cases of the nervous or abdominal types. The frequency with which they can be safely employed varies also very much with the outside temperature. In summer and in hot climates they are much more useful than in winter.

The duty of the nurse may be summed up in noticing—and reporting at once—the occurrence of loss of appetite, dryness of the tongue, diarrhoea, flatulence, distension of the abdomen, any of which is a note of warning that the dietary is beginning to disagree.

She should also remember that the typhoid toxins have a special effect on the heart, and therefore see that the patient does absolutely nothing for himself—everything must be done for him, so that the heart may have no extra work to do.

Coming now to the treatment of special symptoms, we often find that sleeplessness is troublesome, and, provided that the pulse is good, a cool bath in the evening is usually the most useful measure we can prescribe; but if this is inadmissible, and the pulse is weak, a little alcohol in hot water is often beneficial. Failing this, we have recourse to such drugs as sulphonal, trional, paraldehyde, and so on.

Diarrhoea is best treated by dieting in the way I have described, but if it persists, we may have to use drugs, and I have often found Izal, given internally in the form of an emulsion, useful. For a reason, which I will presently describe, we avoid opium if possible; but we sometimes have to give it, though the occasions on which this necessity arises decrease with the experience of the physician. Salol is sometimes useful.

For abdominal distension there is nothing equal to the old-fashioned enema containing turpentine, but I have known the application of an ice bag, or even very hot fomentations to the abdomen, succeed when everything else had failed. If opium has been given previously, it should be stopped.

In the next paper we will consider the complications of enteric fever.

FEW HOURS IN HOSPITAL

OVER many things we may glory in our advantages out here, compared to the “jog-trot life” of a sister at Home.

It is said that the great preventative for insanity is to relieve the monotony of life—then let all who feel that the jog-trot life at Home weighs on them, burst their bonds and join us out here. Assuredly the monotony will be broken. How? Well! if you can,—compare this to the even life of our homeland sister.

3-30 a.m.—“Hoot!” a dog under the bed—the visitor moves away a yard or two, and contentedly gnaws a bone which some sympathetic patient gave the day before;—we fall asleep dreaming of bone instruments and the dog has his own way.