The Methods of Infection in Enteric Fever.

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The study of the ways in which enteric fever may be conveyed is of some importance to nurses, not only because a knowledge of the natural history of the disease adds interest to the treatment of any given case, but also because instances are, unfortunately, not uncommon where nurses have become infected in the course of their work, and have even succumbed to the results of this infection.

The latter danger is by no means imaginary or infrequent. There must be few physicians with any extensive experience of enteric fever who cannot recall instances in which the continual watchfulness and painstaking labour which is so essential for the adequate nursing of a case of that disease—and which is so ungrudgingly given—has been followed by the death or disablement of the worker herself.

It will be convenient—though this is hardly a scientific distinction—to divide the methods of infection into those which are most common amongst the general public, and those which more peculiarly affect nurses and attendants on the patient in question.

Enteric fever is a toxæmia, that is to say, the result of the circulation in the blood of the products, or toxins, resulting from the growth and multiplication of the bacillus typhosus, which is present in numbers in the spleen, abdominal lymphatic glands, and intestine, and in some cases in the circulating blood itself. It is necessary, therefore, that the bacillus shall, in the first instance, be conveyed to these situations.

Then we know that the bacillus is always derived from a previous case of enteric fever. We do not nowadays believe that any decomposing matter may breed typhoid germs of its own accord.

This conveyance may be either direct, as when one person catches enteric fever from close contact with another suffering from the disease, or indirect, when the patient deposits the bacilli on some material from which they subsequently gain entrance to the body of the person contracting the disease. Both methods occur in practice.

Whatever the source of infection, it is usually necessary that the organisms shall be swallowed by the infected person. The chief exception to this rule will be mentioned later.

This is but another way of saying that the infection of enteric fever is conveyed by means of food and drink. What substances of ordinary consumption are then likely to be infected, and how do they become so?

By far the commonest article to be infected is water, and as a matter of fact many foods only become contaminated by contact with water. How then does this become polluted?

Undoubtedly the commonest method is by contamination of a water supply with excreta from a patient suffering from enteric fever. In one well-known epidemic this pollution took place through a workman, who was suffering from an unrecognised attack of typhoid fever, voiding his excreta in the reservoir supplying the district. In other instances the excreta have similarly gained access to a leaky well, the water of which was used for drinking purposes. It has been shown from reports on the origin of various epidemics in the past that very slight contamination may be sufficient to give rise to an extensive epidemic. Infection in this way, however, is responsible more for outbursts of enteric fever in definite places than for the variety of the disease that is almost always with us.

Then, food may be contaminated with infected water. Instances are on record of water containing bacilli being employed to wash out milk cans, with the result that the milk itself was wrongly suspected, and of pailfuls of polluted water being thrown over such articles as fish and vegetables in the summer to give an appearance of freshness to the purchaser, or the cups in which ice cream is (or used to be) dispensed in the streets have been washed with contaminated water or wiped with dirty cloths.

The infection may, however, be less direct than this. It was shown some time ago that oysters, cockles, mussels, and other shellfish which are usually eaten raw, had given rise to attacks of enteric fever in the consumers, and it was not at first clear how this had come to pass. Typhoid bacilli were in the first place found in the oysters themselves, and it was subsequently shown that these were not present in those oysters that were taken straight from the deep sea, but only in those that had been laid down in the estuaries of rivers to "fatten." In this process they were constantly washed by water contaminated by the outfalls of the various sewers and drains from those towns on the banks of the river that discharged their sewage into it. Watercress, which is also dangerous in this connection, similarly becomes contaminated by being grown in beds fed with sewage.

Another way in which the bacilli are con-

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