

and accidents occurred. Now-a-days its value in tuberculosis of various kinds is undoubted. This revival in its favour dates chiefly from our extended knowledge of opsonins and the opsonic index, and tuberculin has again taken its place as a valuable diagnostic and curative agent in tuberculosis. It is now known that formerly tuberculin was given in doses which were positively dangerous and the opsonic index has shown that tuberculin is a very poisonous substance and must be used with extreme caution. The tuberculin used now is prepared by macerating tubercle bacilli and adding distilled water to the mass. The mixture is then centrifuged and the upper layer so obtained is decanted off. The residue is again dried and treated as before and this process is repeated till no deposit remains. The fluids obtained from the various washings are added together and constitute new Tuberculin. In treating a case of tuberculosis, the initial dose must be very small and its effect judged by an estimation of the opsonic index or by variation in the clinical symptoms. It is then gradually increased. Koch's old Tuberculin is used in the diagnosis of tuberculosis and is of great value in this connection.

This closes now a very short account of the more common vaccines. Vaccine therapy is still in its early infancy but there is a promising future before it. Its proper application entails in the medical man a special knowledge of bacteriology and, as years go on, it will come to hold a most important place in general practice. Like everything else, it has its limitations but it has come to stay and will prove to be one of the most formidable weapons in fighting disease in the future.

ENTERIC FEVER.

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WE now come to the complications of enteric fever. These are rather numerous and embrace affections of almost every part of the body, but the majority are in the nature of clinical curiosities, and only three need be considered as of practical importance. The interesting feature of all of them is that the diagnosis has to be made by the nurse, as they all occur rather suddenly. Moreover, for any treatment to be of avail, prompt measures must be taken, so I will consider each in detail. They are three in number—namely, heart failure, hæmorrhage from the bowel and perforation of the intestine.

* Continued from p. 94.

Heart failure may, of course, be gradual, in which case it will be detected by the physician and dealt with accordingly, but in enteric fever we also get a variety of cardiac distress which is almost dramatic in its onset and in its results. It is due to sudden and extreme dilatation or stretching of the right side of the heart. Its onset cannot be foretold, and it may occur in those whose illness has not been very severe, though it is certainly uncommon in children.

The exact pathology of the occurrence is not very clear; it may be due to poisoning of the heart muscle, or to a sudden block in the transmission of nervous impulses to the heart, but whatever the cause the symptoms are the same.

Sometimes the patient feels the attack coming on, and cries out that he is dying, or feels as if he were falling through the floor, or he is dizzy and cannot see. More often, however, he does not give us any warning, and the first sign then is a sudden pallor of the face, and the patient falls down in bed if he was previously sitting up. When we feel for the radial pulse we generally find it imperceptible, though there may be a faint flicker in the carotids. If now we examine the chest we cannot feel the cardiac impulse at all, and on percussion we find that the left edge of the left ventricle, instead of being situated in, or just outside, the nipple line, is three fingers breadths outside it.

In very many instances the attack is immediately fatal, but the patient's life can often be saved by promptness on the part of those present at the time. The treatment consists first of all in completely inverting the patient. He must be seized by the legs by the nurse (who should jump on the bed for the purpose) and turned as completely as possible upside down. If another person, such as a ward maid or a convalescent patient, is available, he or she should continue to hold the patient suspended by the legs while the nurse places a hot wet sponge or towel on the bare chest over the cardiac area, and keep up these applications until the patient recovers consciousness. Later on, a hypodermic injection of strychnine is often useful, though neither this nor any other form of drug treatment is of any avail as a measure of first aid. Valuable time is often lost either by attempts to pour brandy into the mouth (whence incidentally, it often trickles down the larynx), or by giving hypodermic injections when the patient has practically no circulation at all. It may be as well to mention that the same variety of heart failure is apt to occur in diphtheria and in influenza, and should then be treated in the same way.

The next complication that we have to consider is hæmorrhage from the bowel, and of this there are two varieties. In the first the blood oozes from the surface of one or more ulcers and is not necessar-

ily of grave significance, while in the other the hæmorrhage is due to an ulcer having eaten its way into a deep blood vessel, and this is always a serious matter. In the former case we simply find blood in the stools without any symptoms or signs in the patient, but in the latter we get danger signals, which are followed by the appearance of a considerable quantity of blood per rectum.

The first of these signals is sudden collapse, with acute pain and pallor of the face. The patient breaks out into a cold perspiration and practically faints; the abdomen is temporarily rigid, and the knees are usually drawn up. From a few minutes to half-an-hour afterwards the bed is found to be full of blood.

Now it will be noticed that all these signs, with the exception of the passage of the blood per anum, are identical with those which are given in the text books as being due to perforation, and in practice, until we find the blood, we cannot always be sure which of the two has occurred. But the point that I wish to make very emphatic—for its realisation by the nurse has saved many lives—is that perforation is not always sudden in onset, or accompanied by collapse. It will be convenient to take now the symptoms of perforation, and to consider the treatment of both later on.

What happens in perforation is that an ulcer goes still deeper than the layer where the blood vessels are, and a hole is formed right through the bowel itself, so that the contents of the intestine find their way into the general peritoneal cavity. Now if the hole is a large one the symptoms are usually sudden, and there is intense collapse, but what much more often happens in practice is that a minute perforation is first made and the peritoneum around becomes inflamed; lymph is thrown out, or a neighbouring coil of intestine or a piece of omentum may adhere temporarily to the aperture so that the intestinal contents leak out gradually. In enteric fever nature's attempt to block up the hole is seldom successful, and in the natural course of events peritonitis always results sooner or later, so that we do not rely on nature and wait for the formation of an abscess, as we often do, for instance, in appendicitis. Whether we can save the patient, therefore, depends on whether we can get into the abdomen before general peritonitis is well advanced or not, and this again depends not so much on whether the surgeon can diagnose peritonitis, but on whether the nurse gives him the chance of doing it sufficiently early.

So we come back to the bedside. What are, or may be, the signs of perforation, and what are those of the subsequent peritonitis?

The signs of perforation are three—abdominal pain, which may or may not be severe, a quickening of the pulse, and a change in the as-

pect of the patient. The practical point is this—that the nurse must summon the surgeon at once, not only for pain accompanied with collapse, but for any pain which is followed by quickening of the pulse, especially if the patient looks worse. Additional signs, pointing to perforation, are loss of the liver, dulness and rigidity of the abdomen, but these are matters which each surgeon will prefer to elicit for himself and place his own interpretation on.

When peritonitis supervenes the pain often abates, and the patient usually feels better. We then get distension of the abdomen, vomiting and great rigidity, and at last free fluid can be detected in the abdominal cavity by palpation.

In practice the nurse should regard any abdominal pain which is not followed by the passage of blood per anum with great suspicion.

If blood appears, and the diagnosis of hæmorrhage is thus made clear, we give opium freely until the patient is fully under its influence. Nothing else is of any avail, but if we suspect perforation we do not give opium, as it would mask the signs of perforation, and we alleviate the pain by local applications either hot or cold. Directly perforation is diagnosed the abdomen should be opened and the hole sewn up, for by this means only can we save our patient from certain death.

I remember well how, on one afternoon, I was lecturing in the wards on enteric fever and was demonstrating some spots and an enlarged spleen to the class. While this was in progress the patient in the next bed gave a little groan and said that he had some colic, but he felt better almost immediately. We came back to him about ten minutes later and found that his pulse rate had gone up by about twenty beats per minute. He had no collapse whatever, and the pain was little more than uneasiness. Half-an-hour later the liver dulness was markedly diminished, and I opened his abdomen as soon as he could be got ready, which, if I remember rightly, was in about half-an-hour's time. I found a perforation, and within an inch of the hole two more ulcers, which were on the point of perforating also, so that I had to resect a portion of his intestine and join the divided ends. That case certainly emphasised the importance of taking abdominal pain, however slight, in the course of enteric fever seriously.

To think well of all, to be cheerful with all, to patiently learn to find the good in all—such unselfish thoughts are the very portals of Heaven, and to dwell day by day in thoughts of peace toward every creature will bring abounding peace to their possessor.—*James Allen*.