fully watched. They are usually best administered in the form of pure spirit.

The more prominent symptoms which mark the course of typhoid fever frequently call for special treatment. Thus, when the fever continues long, with little break in its course, the employment of remedies to control its action (antipyretics) may often be resorted to with benefit. Such drugs as quinine, salicin, salicylic acid, and salicylate of soda, kairin, antipyrin, antifebrin, &c. (in ten to thirty grain doses of one or other), may frequently break in upon the con­tinuity of the fever, and by markedly lowering the temperature relieve for a time the bo<ly from a source of waste, and aid in tranquillizing the excited nervous system. The times for their administration are either one or two hours before the usual maximum temperature or during the period of remission. These remedies may, however, fail, or by inducing sickness or great prostration and depression of the circulation require to be discontinued. For a similar purpose the cold bath is recommended by many high authorities and is regularly employed in Germany. The method recommended by Liebermeister is this: “When the temperature rises above 104° Fahr., the patient should be placed in a bath of about 94o, which is gradually cooled down by the addition of cold water to 68o Fahr., and remain immersed for twenty or thirty minutes, the limbs being all the while gently rubbed. He should then be put back into bed.” Another method is that of Dr Brand of Stettin: “When the patient’s temperature attains 102° Fahr., he should be placed in a tepid bath of 70o and allowed to remain till a sense of coldness or shivering is produced, which usually occurs in from five to twenty minutes.” By such means no doubt the temperature can often be reduced 2o or 3o Fahr., but it is very apt to rise again and the bath must then be repeated. It is claimed by the advocates of this method of treatment that it has been suc­cessful in diminishing greatly the mortality of typhoid fever, but they hold at the same time that its success in large measure depends upon its employment from an early stage in the disease. British physicians are much divided upon the point, many high authorities agreeing in its marked utility, while others no less eminent regard it as fraught with danger from the frequent movement of the patient from bed, the shock to the system, and the risk of hæmor- rhage, pneumonia, or other complications, and as a plan of treat­ment difficult of being carried out in ordinary practice. Although employed in some fever hospitals and with apparent success, it has not yet commended itself for general adoption. Other methods of applying cold, while probably less effectual than the bath, are much more available, as, for example, the tepid or cold pack, the frequent sponging of portions of the body with cold water, or the applica­tion of icebags to the head. The present writer has resorted to these methods in many cases of typhoid fever, with the effect of markedly lowering a high temperature. When diarrhoea is ex­cessive it may be restrained by such remedies as chalk, bismuth, Dover’s powder, &c. Haemorrhage is dealt with by preparations of ergot, or by acetate of lead, gallic acid, or other styptics. In the event of perforation of the bowel opium is the only means avail­able to lessen the distress attending that fatal occurrence.

In the convalescent stage, and even after apparently complete recovery, the utmost care should be observed by the patient as to diet, all hard and indigestible substances being dangerous from their tendency to irritate or reopen unhealed ulcers, and bring on a relapse of the fever or cause a sudden perforation. Lastly, the general health demands careful attention for a length of time, in view of the remoter risks of chest and other diseases already alluded to.

Relapsing Fever.

This is a continued fever occasionally appearing as an epidemic in communities suffering from scarcity or famine. It is characterized mainly by its sudden invasion, with violent febrile symptoms, which continue for about a week and end in a crisis, but are followed, after another week, by a return of the fever.

This disease has received many other names, the best known of which are famine fever, short fever, synocha, bilious relapsing fever, recurrent typhus, and spirillum fever. As in the case of typhoid, relapsing fever was long believed to be simply a form of typhus. The distinction between them appears to have been first clearly established in 1826, in connexion with an epidemic in Ireland. Out­breaks of relapsing fever have occurred in all parts of the world at times and in places where famine has arisen ; but the disease has been most closely observed and studied in epidemics in Great Britain and Ireland, Germany, Poland, Russia, America, and India. It has frequently been found to prevail along with an epidemic of typhus fever.

Relapsing fever is highly contagious, and appears, like typhus, to be readily communicated by the exhalations from the body. With respect to the nature of the contagion, certain important and inter­esting observations have been made. In 1873 Obermeier discovered in the blood of persons suffering from relapsing fever minute organisms in the form of spiral filaments of the genus *Spirochæte* (see vol. xxi. p. 399, fig. 1, n), measuring in length 1/500 to 1/1500 inch and in breadth 1/40000 to 1/50000 inch, and possessed of rotatory

or twisting movements. This organism has received the name of *Spirillum obermeieri.* It appears to be present in abundance dur­ing the height of the febrile symptoms, and is not seen during the interval until the relapse is impending, when it is again present as before. This observation has been confirmed by numerous investi­gators, and it has been found that inoculation with the blood containing these *Spirilla* produced the symptoms of relapsing fever in both men and animals. Comparatively little is as yet known of the life-history of these organisms, and the question whether they are to be regarded as the prime source of the disease or as mere accompaniments affords ground for difference of opinion (see Path­ology, vol. xviii. p. 403) ; nevertheless their discovery and the con­ditions of their presence already mentioned are noteworthy facts in reference not only to the pathology of this fever but also to the general doctrine of infectiveness in disease-processes. The most con­stantly recognized factor in the origin and spread of relapsing fever is destitution ; but this cannot be regarded as more than a predis­posing cause favouring the reception and propagation of the morbific agent, since in many lands widespread and destructive famines have prevailed without any outbreak of this fever. Instances, too, have been recorded where epidemics were distinctly associated with over­crowding rather than with privation. Relapsing fever is most commonly met with in the young. One attack does not appear to protect from others, but rather, according to some authorities, en­genders liability.

The extreme contagiousness of relapsing fever has occasionally been shown by its spreading widely when introduced into a district, even among those who had not become predisposed by destitution or other depressing conditions. The contagion, like that of typhus, appears to be most active in the immediate vicinity of the patient and to be greatly lessened by the access of fresh air. It is capable of being conveyed by clothing. The incubation of the disease is about one week. The symptoms of the fever then show themselves with great abruptness and violence by a rigor, accompanied with pains in the limbs and severe headache. The febrile phenomena are very marked, and the temperature quickly rises to a high point

(105°-107o Fahr.), at which it continues with little variation, while the pulse is rapid (100-140), full, and strong. There is intense thirst, a dry brown tongue, bilious vomiting, tenderness over the liver and spleen, and occasionally jaundice. Sometimes a peculiar bronzy appearance of the skin is noticed, but there is no character­istic rash as in typhus. There is much prostration of strength. After the continuance of these symptoms for a period of from five to seven days, the temperature suddenly falls to the normal point or below it, the pulse becomes correspondingly slow, and a profuse perspiration occurs, while the severe headache disappears and the appetite returns. Except for a sense of weakness, the patient feels well and may even return to work, but in some cases there remains a condition of great debility, accompanied with rheumatic pains in the limbs. This state of freedom from fever continues for about a week, when there occurs a well-marked relapse with scarcely less abruptness and severity than in the first attack, and the whole symptoms are of the same character, but they do not, as a rale, continue so long, and they terminate in a crisis in three or four days, after which convalescence proceeds satisfactorily. Second, third, and even fourth relapses, however, may occur in exceptional cases.

The mortality in relapsing fever is comparatively small, about 5 per cent. being the average death-rate in epidemics (Murchison). The fatal cases occur mostly from the complications common to continued fevers. The treatment is essentially the same as that for typhus fever (see above). (J. O. A.)