

laparotomy may be discussed. If perforation has occurred in the second or third week, it would be useless under the circumstances to attempt to stitch a slit in the intestine; if, on the other hand, it occurs during convalescence, it is only right to give the patient a chance, and the operation should be performed.

Progressive *heart-failure* is one of the most frequent and perhaps one of the most serious of the conditions which the physician has to combat. As in other specific affections, this is in part due to the prolonged action of the fever and in part is a toxic effect. Alcohol is here our mainstay and can be given freely. Strychnine is most useful and may be given hypodermically in full doses. Whether digitalis is indicated in the failing heart of fevers is not yet settled. Personally, I am by no means convinced that it does good. Hypodermic injections of ether may be resorted to, and are sometimes helpful in tiding the patient over a critical period.

The *nervous symptoms* of typhoid fever are best treated by hydrotherapy. One special advantage of this plan is that the restlessness is allayed, the delirium quieted, and sedatives are rarely needed. In the cases which set in early with severe headache, meningeal symptoms and high fever, the cold bath, or in private practice the cold-pack, should be employed. An ice-cap may be placed on the head, and if necessary morphia administered hypodermically. The practice, in such cases, of applying blisters to the nape of the neck and to the extremities is, to paraphrase Huxham's words, an *unwholesome severity*, which should long ago have been discarded by the profession. For the nocturnal restlessness, so distressing in some cases, Dover's powder should be given. As a rule, if a hypnotic is indicated, it is best to give opium in some form. Pulmonary complications should, if severe, receive appropriate treatment.

In protracted cases very special care should be taken to guard against *bed-sores*. Absolute cleanliness and careful drying of the parts after an evacuation should be enjoined. The patient should be turned from side to side and propped with pillows, and the back can then be sponged with spirits. On the first appearance of a sore, the water or air bed should be used.

(f) *The Management of Convalescence*.—With the fall of the temperature to normal in the evening, and the disappearance of the other symptoms, the patient enters upon a stage which is often more difficult to manage than the attack itself. Convalescents from typhoid fever frequently cause greater anxiety than patients in the attack. The question of food has to be met at once, as the patient develops a ravenous appetite and clamors for a fuller diet. My custom has been not to allow solid food until the temperature has been normal for ten days. This is, I think, a safe rule, leaning perhaps to the side of extreme caution; but after all with eggs, milk toast, milk puddings, and jellies, the patient can take a fairly varied diet. Many leading practitioners allow solid food to a patient so soon as he desires it. Peabody gives it on the disappearance of

the fever; the late Austin Flint was also in favor of giving solid food early; and Naunyn, at the Strasburg Medical Clinic, told me that this was his practice. I had an early lesson in this matter which I have never forgotten. A young lad in the Montreal General Hospital, in whose case I was much interested, passed through a tolerably sharp attack of typhoid fever. Two weeks after the evening temperature had been normal, and only a day or two before his intended discharge, he ate several mutton chops, and within twenty-four hours was in a state of collapse from perforation. A small transverse rent was found at the bottom of an ulcer which was in process of healing. It is not easy to say why solid food, particularly meats, should disagree, but in so many instances an indiscretion in diet is followed by slight fever, the so-called *febris carnis*, that it is in the best interests of the patient to restrict the diet for some time after the fever has fallen. An indiscretion in diet may indeed precipitate a relapse. The patient may be allowed to sit up for a short time about the end of the first week of convalescence, and the period may be prolonged with a gradual return of strength. He should move about slowly, and when the weather is favorable should be in the open air as much as possible. The patient should be guarded at this period against all unnecessary excitement. Emotional disturbance not infrequently is the cause of a recrudescence of the fever. Constipation is not uncommon in convalescence and is best treated by enemata. A protracted diarrhoea, which is usually due to ulceration in the colon, may retard recovery. In such cases the diet should be restricted to milk, and the patient should be confined to bed; large doses of bismuth and astringent injections will prove useful.

The recrudescence of the fever does not require special treatment. The treatment of the relapse is essentially that of the original attack.

Among the dangers of convalescence may be mentioned tuberculosis, which is said by Murchison to be more common after this than after any other fever. There are facts in the literature favoring this view, but it is a rare sequence in this country.

II. TYPHUS FEVER.

Definition.—An acute infectious disease characterised by sudden onset, a maculated rash, marked nervous symptoms, and a termination, usually by crisis, about the end of the second week.

Etiology.—The disease has long been known under the names of hospital fever, spotted fever, jail fever, camp fever, and ship fever. In Germany it is known as *exanthematic typhus*, in contradistinction to *abdominal typhus*.

Typhus is now a rare disease. Sporadic cases occur from time to time in the large centres of population, but epidemics are infrequent. In this

country during the past ten years there have been very few outbreaks. In New York in 1881-'82 seven hundred and thirty-five cases were admitted into the Riverside Hospital; in Philadelphia a small epidemic occurred in 1883 at the Philadelphia Hospital.

The special elements in the etiology of typhus are overcrowding and poverty. As Hirsch tersely puts it, "Die Geschichte des Typhus ist die des menschlichen Elends." Overcrowding, lack of cleanliness, intemperance and bad food are predisposing causes. The disease still lurks in the worst quarters of London and Glasgow, and is seen occasionally in New York and Philadelphia. It is more common in Great Britain and Ireland than in other parts of Europe. Murchison held that the disease might originate spontaneously under favorable conditions. This opinion is suggested by the occurrence of local outbreaks under circumstances which render it difficult to explain its importation, but the analogy of other infectious diseases is directly against it. In 1877 there occurred a local outbreak of typhus at the House of Refuge, in Montreal, in which city the disease had not existed for many years. The overcrowding was so great in the basement-rooms of the refuge that at night there were not more than eighty-eight cubic feet of space to each person. Eleven persons were affected. It was not possible to trace the source of infection.

Typhus is one of the most highly contagious of febrile affections. In epidemics nurses and doctors in attendance upon the sick are almost invariably attacked. There is no disease which has so many victims in the profession. In the extensive epidemic in the early and middle part of this century many hundred physicians died in the discharge of their duty. Casual attendance upon cases in limited epidemics does not appear to be very risky, but when cases are aggregated together in wards the poison appears concentrated and the danger of infection is much enhanced. Bedding and clothes retain the poison for a long time.

The microbe of typhus fever has not yet been determined. Hlava found in twenty of thirty-three bodies, and twice during life, a streptobacillus, the relation of which to the disease has not yet been determined.

Morbid Anatomy.—The anatomical changes are those which result from intense fever. The blood is dark and fluid, the muscles are of a deep red color and often show a granular degeneration, particularly in the heart; the liver is enlarged and soft and may have a dull clay-like lustre; the kidneys are swollen; there is moderate enlargement of the spleen, and a general hyperplasia of the lymph-follicles. Peyer's glands are not ulcerated. Bronchial catarrh is usually, and hypostatic congestion of the lungs often, present. The skin shows the petechial rash.

Symptoms.—**Incubation.**—This is placed at about twelve days, but it may be less. There may be ill-defined feelings of discomfort. As a rule, however, the *invasion* is abrupt and marked by chills or a single rigor, followed by fever. The chills may recur during the first few days, and there is headache with pains in the back and legs. There is early pro-

stration, and the patient is glad to take to his bed at once. The temperature is high at first, and may attain its maximum on the second or third day. The pulse is full, rapid, and not so frequently dicrotic as in typhoid. The tongue is furred and white, and there is an early tendency to dryness. The face is flushed, the eyes are congested, the expression is dull and stupid. Vomiting may be a distressing symptom. In severe cases mental symptoms are present from the outset, either a mild febrile delirium or an excited, active, almost maniacal condition. Bronchial catarrh is common.

Stage of Eruption.—From the third to the fifth day the eruption appears—first upon the abdomen and upper part of the chest, and then upon the extremities and face; developing so rapidly that in two or three days it is all out. There are two elements in the eruption: a subcuticular mottling, "a fine, irregular, dusky red mottling, as if below the surface of the skin some little distance, and seen through a semi-opaque medium" (Buchanan); and distinct papular rose-spots which change to petechiæ. In some instances the petechial rash comes out with the rose-spots. Collie describes the rash as consisting of three parts—rose-colored spots which disappear on pressure, dark-red spots which are modified by pressure, and petechiæ upon which pressure produces no effect. In children the rash at first may present a striking resemblance to measles, and give as a whole a curiously mottled appearance to the skin. The term mulberry rash is sometimes applied to it. In mild cases the eruption is slight, but even then is largely petechial in character. As the rash is largely hæmorrhagic, it is permanent and does not disappear after death. Usually the skin is dry, so that sudaminal vesicles are not common. It is stated by some authors that a distinctive odor is present. During the second week the general symptoms are usually much aggravated. The prostration becomes more marked, the delirium more intense, and the fever rises. The patient lies on his back with a dull expressionless face, flushed cheeks, injected conjunctivæ, and contracted pupils. The pulse increases in frequency and is feebler, the face is dusky, and the condition becomes more serious. Retention of urine is common. Coma-vigil is frequent, a condition in which the patient lies with open eyes, but quite unconscious. Subtultus tendinum and picking at the bedclothes are frequently seen. The tongue is dry, brown, and cracked, and there are sordes on the teeth. Respiration is accelerated, the heart's action becomes more and more enfeebled, and death takes place from exhaustion. In favorable cases, about the end of the second week occurs the crisis, in which, often after a deep sleep, the patient awakes feeling much better and with a clear mind. The temperature falls, and although the prostration may be extreme, convalescence is rapid and relapse very rare. This abrupt termination by crisis is in striking contrast to the mode of termination in typhoid fever.

Fever.—The temperature rises steadily during the first four or five

days, and the morning remissions are not marked. The maximum temperature is usually reached by the fifth day, when the temperature may reach 105°, 106°, or 107°. In mild cases it seldom rises above 103°. After reaching its maximum the temperature generally continues with slight morning remissions until the twelfth or fourteenth day, when the crisis occurs, during which the temperature may fall below normal within twelve or twenty-four hours. Preceding a fatal termination, there is usually a rapid rise in the fever to 108° or even 109°.

The heart may early show signs of weakness. The first sound becomes feeble and almost inaudible, and a systolic murmur at the apex is not infrequent. Hypostatic congestion of the lungs occurs in all severe cases.

The brain symptoms are usually more pronounced than in typhoid, and the delirium is more constant.

The urine in typhus shows the usual febrile increase of urea and uric acid. The chlorides diminish or disappear. Albumen is present in a large proportion of the cases, but nephritis seldom occurs.

Variations in the course of the disease are naturally common. There are malignant cases which rapidly prove fatal within two or three days; the so-called *typhus siderans*. On the other hand, during epidemics there are extremely mild cases in which the fever is slight, the delirium absent, and convalescence is established by the tenth day.

Complications and Sequelæ.—Broncho-pneumonia is perhaps the most common complication. It may pass on to gangrene. In certain epidemics gangrene of the toes, the hands, or the nose, and in children noma or cancrum oris, have occurred. Meningitis is rare. Paralyses, which are probably due to the post-febrile neuritis, are not very uncommon. Septic processes, such as parotitis and abscesses in the subcutaneous tissues and in the joints, are occasionally met. Nephritis is rare. Hæmatemesis may occur.

Prognosis.—The mortality ranges in different epidemics from 12 to 20 per cent. It is very slight in the young. Children, who are quite as frequently attacked as adults, rarely die. After middle age the mortality is high, in some epidemics 50 per cent. Death usually occurs toward the close of the second week and is due to the toxæmia. In the third week it is more commonly due to pneumonia.

Diagnosis.—During an epidemic there is rarely any doubt, for the disease presents distinctive general characters. Isolated cases may be very difficult to distinguish from typhoid fever. While in typical instances the eruption in the two affections is very different, yet taken alone it may be deceptive, since in typhoid fever a roseolous rash may be abundant and there is occasionally a subcuticular mottling and even petechiæ. The difference in the onset, particularly in the temperature, is marked; but cases in which it is important to make an accurate diagnosis are not usually seen until the fourth or fifth day. The suddenness of the onset, the greater frequency of the chill, and the early prostration are the distinctive

features in typhus. The brain symptoms too are earlier. It is easy to put down on paper elaborate differential distinctions, which are practically useless at the bedside, particularly when the disease is not prevailing as an epidemic. In sporadic cases the diagnosis is sometimes extremely difficult. I have seen Murchison himself in doubt, and more than once I have known a diagnosis to be deferred until the *sectio cadaveris*. Severe cerebro-spinal fever may closely simulate typhus at the outset, but the diagnosis is usually clear within a few days. Malignant variola also has certain features in common with severe typhus, but the greater extent of the hæmorrhages and the bleeding from the mucous membranes make the diagnosis clear within a short time. The rash at first resembles that of measles, but in this disease the eruption is brighter red in color, often crescentic or irregular in arrangement, and appears first in the face.

The frequency with which other diseases are mistaken for typhus is shown by the fact that during and following the epidemic of 1881 in New York one hundred and eight cases were wrongly diagnosed—one eighth of the entire number—and sent to the Riverside Hospital (F. W. Chapin).

Treatment.—Practically the general management of the disease is like that of typhoid fever. Hydrotherapy should be thoroughly and systematically employed. Judging from the good results which we have obtained by this method in typhoid cases with nervous symptoms much may be expected from it. Certain authorities have spoken against it, but it should be given a more extended trial. Medicinal antipyretics are less suitable than in typhoid, as the tendency to heart-weakness is often more pronounced. As a rule the patients require from the outset a supporting treatment; water should be freely given, and alcohol in suitable doses according to the condition of the pulse.

The bowels may be kept open by mild aperients. The so-called specific medication, by sulphocarbolates, the sulphides, carbolic acid, etc., is not commended by those who have had the largest experience. The special nervous symptoms and the pulmonary symptoms should be dealt with as in typhoid fever. In epidemics, when the conditions of the climate are suitable, the cases are best treated in tents in the open air.

III. RELAPSING FEVER (*Febris recurrens*).

Definition.—A specific infectious disease caused by the spirochæte (spirillum) of Obermeier, characterised by definite febrile paroxysms which usually last six days and are followed by a remission of about the same length of time, then by a second paroxysm, which may be repeated three or even four times, whence the name relapsing fever.

Etiology.—This disease, which has also the names "famine fever" and "seven-day fever," has been known since the early part of the