

value has not been shown. Eucalyptus is a most useful antiperiodic, but it is adapted rather to the treatment of malarial cachexia, and to prevent relapses. Iodine possesses a high degree of utility in the treatment of malarial intermittents, and may be used in substitution for quinine, or to remove some of the secondary lesions. Lugol's solution is a convenient form in which to administer it. The combination of iodine and carbolic acid is highly efficient (℞ Acid. carbol. ʒj, tinct. iodi comp. ʒiij. M. Sig. Four drops every four hours in sufficient water). This combination may be depended on exclusively in some cases. For the removal of the various morbid alterations caused by malaria, the combination of iodide of ammonium and arsenic is most effective (to a solution of iodide of ammonium, giving five grains to the dose, add three drops of Fowler's solution). The practitioner will find this most useful in cases of chronic malarial poisoning with frequent intermittents. For the treatment of enlarged spleen there is, besides the exhibition of quinine, no remedy more efficacious than the ointment of the red iodide of mercury, which is rubbed in daily over the splenic region in the sunshine, until soreness of the skin compels a suspension. For the gastro-intestinal catarrh, the duodenal catarrh, and the catarrhal jaundice, which occur so frequently in malarious regions, with or without any febrile movement, the most serviceable remedies are two, the phosphate or benzoate of soda, three times a day, and a morning and evening dose of ten grains of quinine.

In the treatment of remittent fever the same general plan is to be pursued as in the management of intermittents. It is not necessary to await the remission, but the antiperiodic may be given at once, yet it is certainly true that the remedy in corresponding dose is much more efficient if given during the sweating. The author's first experience in the administration of large doses of quinine was gained under that able physician and medical officer, the late surgeon John M. Cuyler, M. D., of the Army Medical Staff, then stationed (1857) at Fort Leavenworth, Kansas. The author, a recent graduate in medicine, and just then admitted to the army, was very fortunate in being able to witness the practice of so experienced and able a physician. The large hospital of the post contained a number of the severe remittent fevers of that locality. They were broken up into intermittents and sent out of the hospital in a week, usually by the routine prescription of thirty grains of quinine the first morning, twenty the second, fifteen the third, and ten the fourth—single doses, and all taken at once. As remittent fever is due to a more intense and concentrated poison, no delay in the efficient use of quinine is proper; otherwise, it may lapse into the typhoid state, and be confounded with typhoid fever. The intermittent remainder requires the same management as an ordinary intermittent. Should there be,

as is usual, great irritability of the stomach, quinine solution can be given by the rectum, and the usual remedies applied for the relief of the nausea and vomiting. If the rectum is also irritable and rejects the remedy, it must then be given hypodermatically. Whenever it is practicable to do so, the antiperiodic should be administered during the remission in the sweating stage. The almost numberless masked intermittents and remittents require the same management as an ordinary case of intermittent, except that they are more difficult to arrest and require maximum doses of quinine.

## DISORDERS OF NUTRITION.

### SCROFULA.

**Definition.**—By *scrofula* is meant a constitutional dyscrasia, hereditary or acquired, characterized by changes inflammatory and hyperplastic, occurring for the most part in the lymphatic system, the skin, mucous membranes, connective tissue, osseous structures, and viscera. Scrofula is also known as *struma*, the *strumous diathesis*, *tuberculosis*, the *tuberculous diathesis*, etc.

**Causes.**—Heredity is the most influential factor in its pathogenesis, but it is the predisposition and not the disease itself which is inherited. Those cases are said to be *innate* in which, owing to conditions present in the parents, not themselves strumous, a scrofulous constitution is transmitted to their offspring. Such conditions are old age, blood-relations, cachexia of syphilis, etc., which existing in the parents, the offspring may possess the strumous constitution. Acquired scrofula is the product of various evil hygienic influences, as crowding, bad air, poor food, insufficient clothing, overwork, especially in youth, and in dark, damp, and crowded apartments. Recent observations, especially those of Cohnheim, which indicate the essentially infective nature of tubercle—a product of scrofula—show the great danger of inducing tuberculosis in children by the consumption of milk from tuberculous cows. It is probable that many cases of acquired scrofula, especially in cities, are derived from this source. If a scrofulous predisposition exist in a latent state, it may be roused into activity by various causes. Certain diseases, as measles, whooping-cough, typhoid fever, etc., will have this effect. Scrofula manifests itself usually about the time of the first dentition, and increases from the third to the seventh year. It is rare for the manifestations to appear only after pu-



berly. Glandular affections do not often occur before the second year. Scrofula prevails under all conditions of soil, climate, and elevation, but it occurs most frequently in those countries where crowding, bad air, and the other hygienic evils of dense populations are most abundant.

**Pathological Anatomy.**—The anatomical changes occur in the lymphatics, the skin, the mucous membranes, the bones and the viscera. As regards the lymphatics, the cervical, bronchial, mesenteric, inguinal, and others are affected by two processes—one, and the simplest, consisting of hyperplasia of the gland-elements; the other, and more complex, being the formation and subsequent caseation of tubercle. From the hyperplasia may proceed an inflammatory process, involving not only the gland but the adjacent connective tissue and skin; suppuration takes place, abscesses form, and fistulous tracks and sinuses are made by the discharge of pus. The first step in the caseation of the gland is an enlargement by hyperplasia, then miliary tubercles form, or, without them, cheesy masses develop in distinct layers from the hyperplastic materials, and ultimately the whole gland becomes caseous. It is a disputed question whether there is a necessary development of the miliary tubercle precedent to cheesy degeneration, or whether the process of caseation develops out of the new hyperplastic materials. It is probable, as stated above, that both processes share in the production of the result. The cutaneous manifestations of scrofula consist in eczematous and impetiginous eruptions, situated on the face, scalp, or behind the ears; and at the nose prominent pustules of impetigo with thick yellow crusts and suppurating beneath, the adjacent nasal mucous membrane ulcerating, are the characteristic appearances. The mucous manifestations of scrofula are usually situated at or near the junction of the membrane with the external integument, and the cutaneous lesions are associated with the mucous. Thus, impetigo of the lip is coincident with a scrofulous coryza; otitis externa with retro-auricular eczema; catarrhal conjunctivitis with eczema of the neighboring cheek. Strumous coryza after some years becomes an ozæna, and affects by contiguity the post-nasal fossa. The mucous membrane of the larynx and bronchi, of the genito-urinary tract, and of the intestinal canal, may also be attacked. The broncho-pulmonary membrane is a favorite seat of strumous changes, and here they manifest a strong tendency to ulcerative action. The connective tissue is affected by abscesses; the joints become the seat of chronic synovial disease, of erosions, caries, etc.; the periosteum inflames, the bones also, and caries and necrosis are ultimate results of the changes, or the primary disease may arise in the spongy portion of bone, especially in the vertebra, and the epiphyses of the long bones. In the viscera the most important of the lesions due to scrofula are those of the lungs—cheesy pneumonia, phthisis, etc., and those of the cerebellum, producing large, cheesy nodules. Amyloid degeneration of the liver,

spleen, and kidney; caseous infiltration of the supra-renal capsules and tuberculosis of the testes are also products of the strumous diathesis.

**Symptoms.**—There are two distinct types of the scrofulous constitution, the light and the dark, the *irritative* and the *torpid*. In the former the skin is white and transparent, the veins showing through with great distinctness, and blushing taking place with extreme facility; the hair is soft, long, and fine in texture, and usually of light shade; the eyes are large, blue, and brilliant, the pupils dilated, the sclerotic pearly; the muscles are soft and flabby, the weight in proportion to size small; the mental development is precocious, and puberty anticipates the usual period.\* The torpid form is characterized by a thick, coarse, and rather dark skin, a considerable preponderance of adipose tissue, the muscles being weak and relaxed; the body is gross, the appearance puffy, the habit torpid and heavy; the head is relatively large, the nose short and stubby, the upper lip thick and prominent; the neck is thick and deformed by enlarged thyroid or other enlarged glands; the abdomen is swollen and rather protuberant; the legs small and relatively short. The intellectual powers correspond to the physical—they are slow, inactive, and wanting in strength. Although typical examples of these two forms are met with, many cases consist of a mingling of these types. They present the usual pathological conditions from infancy up. They are subject to attacks of coryza, to scrofulous ophthalmia, to otorrhœa and discharges from behind the ears, to vesicular and pustular eruptions, etc. Slight wounds of the skin are followed by protracted suppuration, by enlargement of the connected chain of lymphatics, and they heal with difficulty. During the first dentition obstinate impetiginous eruptions appear on the face and scalp (milk-crust), and, if the eruptive diseases attack these strumous subjects, severe nasal catarrh, otorrhœa, and unhealthy ulcerations linger long afterward. After the second dentition, the lymphatic glands begin to enlarge, and the *scrofulides*, or scrofulous skin affections, make their appearance—as erythema, eczema, impetigo, ecchyma, and also lupus. Then follow affections of the mucous membranes, which are usually catarrhal, the discharge being yellow, thick, and drying easily, but it is highly irritating, causing about the nose, for example, obstinate eczema. The nose and the ear are special seats of scrofulous suppuration and discharge. The eye is affected by scrofulous ophthalmia, which is remarkable for its persistence and severity, and for the little damage done to the organ, if the affection be appropriately treated. The mucous membrane of the bronchi is a favorite seat of scrofulous inflammation, leading to caseous phthisis and tuberculosis. The lymphatic glands, as has been described, are affected in two

\* "General Pathology," Wagner, translated by Drs. Van Duyn and Seguin, New York, 1876, p. 458.



modes—by a simple hyperplasia, and by cheesy degeneration and tuberculosis. When the affected glands become very large, forming great bundles, the surrounding connective tissue undergoing inflammation, the change consists in a cheesy degeneration and tuberculosis. Abscesses may form by suppuration of the connective tissue; but these are superficial. When suppuration occurs in the substance of the gland, the skin overlying it is attached, becomes a characteristic bluish-red color, and ultimately breaks, the gland is exposed, and an ulcer is formed, having undermined, irregular, and livid margins. The ulcer thus formed may spread for some distance under the skin, and sinuses extend in various directions, and often burrowing quite widely. Healing of such scrofulous ulcers does not take place until the remains of the cheesy gland are finally extruded, and a large, unsightly, often thick and indurated cicatrix is left. Sometimes the glands enlarge enormously, but do not inflame and suppurate. Such bunches are often seen on both sides of the neck, filling in the whole space from the jaw to the sternum, and extending into the mediastinum. When large numbers of glands enlarge in this way, phthisis is more apt to follow than in the other form characterized by suppuration, according to the author's observation. The most severe of the scrofulous affections are those of the bones and joints, notably fungous arthritis (Billroth). This disease appears most frequently in the knee, but attacks the other joints also, is very chronic in course, and terminates either fatally or in an ankylosed joint. Scrofula also attacks internal parts by affections of the lymphatics, as *tabes mesenterica*, or more frequently as cheesy pneumonia. The nutrition of the body does not necessarily fail. Large ulcers on the surface are not incompatible with very good health and considerable *embonpoint*; but protracted suppuration of bone, disease of the mesentery, etc., make serious inroads on the vital powers, but the mischief induced by the amyloid degeneration, caused by protracted suppuration, is much greater.

**Course, Duration, and Termination.**—The course of scrofula is essentially chronic. When one group of troubles disappears, another group comes on the stage. Its course is much influenced by the particular direction taken by the morbid process, whether it attacks the external lymphatics or those of the mesentery, the nasal mucous membrane or the bronchial, etc. In many instances the morbid influence expires about the period of puberty; in others at this period phthisis develops. During the course of scrofula, general miliary tuberculosis may come on, or the protracted suppuration may cause amyloid degeneration of important internal organs, or a tuberculosis of the cerebellum may arise. So many elements enter into the solution of the problem that the duration can not be very definitely expressed, and the termination is affected by so many possible complications that no exact limits can be set for it.

**Treatment.**—When acquired, the treatment of scrofula is a slow, difficult, and unsatisfactory procedure. Better results are obtained by prevention when the existence of a scrofulous diathesis is suspected. Preventive measures, which must begin at birth, consist in saving the child from all those evil hygienic influences which are the chief exciting causes. A scrofulous mother should not nurse her child, which should be put to the breast of a healthy and vigorous wet-nurse. When feeding begins, the diet should be properly proportioned, and should not be composed of more than the necessary amount of starchy food. Abundance of plain, substantial, and easily digested aliment should be supplied to the growing child; its clothing should be arranged to protect the body, allow the limbs free motion, and afford the necessary warmth; confinement in-doors, especially to dark and damp habitations, should be prevented, and, if practicable, a healthy country life should be followed up to puberty, and the educational training should be conducted with reference to these essentials of the bodily training. If scrofula has already appeared under any of its modes of manifestation, the hygienic rules just referred to are even more necessary, but unfortunately are attended with less success. As faulty nutrition is an important factor, our remedial measures should be early directed to improve the assimilative functions. The mineral acids and the bitters are very useful here. One of the most serviceable remedies for promoting constructive metamorphosis is the lactophosphate of lime, which is best administered in the form of sirup. For this may be substituted the "phosphates" in the form of the compound sirup; but the former is more efficient. Cod-liver oil is of great utility in scrofula, but it is better to reënforce the oil with the lactophosphate of lime. If suppuration is going on, the sulphides, according to Ringer, may be depended on to secure the rapid closure and healing of the surface; but the author regrets to say that he has not succeeded so well with these remedies. If anæmia is a marked feature, the chalybeates are useful. The author finds the sirup of the iodides of iron and manganese a very efficient preparation. Iodine has had, since its first discovery, considerable repute as a remedy for scrofula, but this, originally derived from observation of its effects on simple goitre, has not been confirmed by further experience of its use in the enlarged glands of scrofula. While this is true, it is also a fact that the iodides of iron are more efficient than the other chalybeates. Other remedies advocated for scrofula are the chlorides of calcium and barium, and they deserve a suitable trial in obstinate or protracted cases. A number of topical applications have been proposed. The most efficient in our experience is the ointment of the red iodide of mercury. This can not be used when inflammation has begun in the skin. When scrofulous abscesses form, the pus should be drawn off with an aspirator, and the cavity then injected with tincture of iodine. When there are open ulcers, an ex-



cellent application is iodoform mixed with tannin, the powder being blown by the insufflator into all the crevices.

#### ACUTE MILIARY TUBERCULOSIS.

**Definition.**—*Acute miliary tuberculosis* is a febrile affection due to the deposit, generally, through the body, of the gray tubercle-granule. It should not be confounded with *phthisis florida*, which is an acute caseous pneumonia.

**Causes.**—The gray granulation, or miliary tubercle, consists of a fine reticulation of fibers, with a mass of epithelioid cells and granules, and the *bacillus tuberculosis*—the specific element. In acute miliary tuberculosis these minute bodies are widely distributed throughout the system. In the lungs they arise from the irritation of old lesions, from cheesy lymphatics, etc., and they are developed in various organs by the irritation of caseous deposits, of suppuration, of the products of serous and mucous inflammations, etc. Acute miliary tuberculosis is one mode of dying from consumption. That the gray granulation is deposited throughout the body under the influence of certain kinds of irritation, it is necessary that a peculiar vulnerability of the constitution exist—in other words, that it be of the scrofulous type. These deposits of miliary tubercle may occur at any age, but most usually from puberty to middle life.

**Pathological Anatomy.**—In the brain, miliary granulations develop from the endothelium of the lymph-spaces, and are therefore found chiefly in connection with the pia mater. They occur also in the other membranes, and in the choroid. In the lungs they are contained in greater numbers than elsewhere, and are usually associated with and dependent on other changes in these organs. Nevertheless, both lungs may be infiltrated throughout with the gray granule, when free from any source of irritation. In that case the infection is found to proceed from some other source—from the bronchial glands, genito-urinary tract, or elsewhere. In addition to the tubercular deposition, the mucous membrane of the bronchi is generally hyperæmic, and the congestion increases from the main bronchi downward. There is also increased secretion, the mucus having a somewhat adhesive and viscid character. Miliary granules are quite abundantly distributed in the pleura and peritoneum, as in the pia mater. The liver, spleen, and kidneys, and the mucous membrane of the intestinal canal, are also more or less infiltrated. About the site of each granulation there is a patch of hyperæmia, due to the presence of an irritating material. As so many organs are simultaneously invaded, it follows that their functions must be disordered. As the new formation develops from the vessels, some serious changes might be expected in the composition of the blood. Although not adequately studied, enough is known to show that the

blood is much altered. In the lungs, hypostasis takes place, and in various dependent situations the blood transudes. The blood itself is dark, and not readily coagulable. The heart is soft and flabby and its tissue easily torn. The spleen is also enlarged, the pulp much increased, and of a dark-brown color.

**Symptoms.**—Acute miliary tuberculosis may arise in the course of phthisis, when, therefore, are exhibited the phenomena of a new, sudden, and general infection in addition to the previously existing malady. It may begin in those who have apparently good health, because the source of infection is dormant. It is with the latter class that we have to deal here; the former have been sufficiently considered in the chapters on phthisis. As the symptoms of pulmonary, or cerebral, or of intestinal disturbance may predominate in different cases, divisions may be made accordingly; but, without refining so far, it will suffice to describe the disease as a whole, referring to these peculiarities in passing. The disease sets in, after several days of general *malaise*, with a chill followed by fever, or there is more or less chilliness for the first day. The fever soon rises to a considerable elevation; there are headache, *tinnitus aurium*, wakefulness, or sleep disturbed by dreams, epistaxis sometimes; the countenance is dull, the eyes heavy, and the prostration is great from the beginning. The appetite is gone, the bowels are confined, but are moved copiously by mild laxatives, and the urine is scanty and high-colored. Soon after the onset of the disease, a short, dry cough, which is very harassing, comes on, but the most important symptom connected with the respiratory organs is a greatly increased rapidity of breathing, the res-

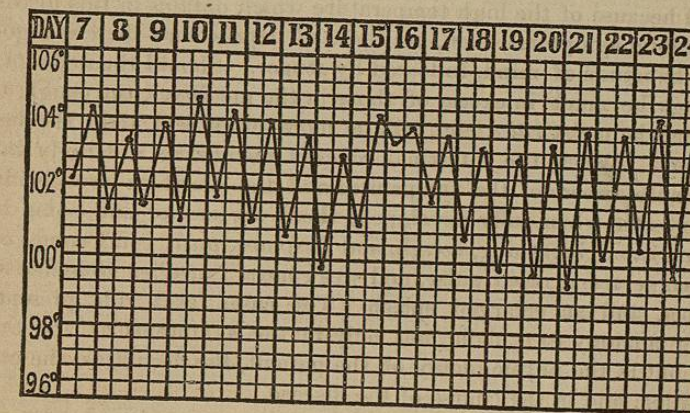


Fig. 56.—Temperature Curves of Acute Miliary Tuberculosis.

pirations numbering forty, fifty, even sixty per minute. The pulse is correspondingly increased, rising during the maximum to 140, 160, or higher, and falling not below 120. The tension of the pulse is low



(dicrotic) and the action of the heart is feeble. The fever is usually of the remittent type of continued fever, or it has more of the remittent quality of malarial fever, or of hectic. The periods of remissions are characterized by sweats. The circulation in the extremities is feeble; the finger-nails are blue, the lips and nose have also a cyanotic hue, and the countenance soon becomes dusky. On auscultation, some moist, crackling *râles* are audible over the chest, but there is no special change in the sonority. The difficulty of breathing, noted at the outset, increases and really amounts to dyspnoea. The tongue becomes dry; sordes accumulate about the teeth; food is rejected; the abdomen swells with tympanites; diarrhoea supervenes, the stools being thin and having a light-yellow color; the spleen can be made out considerably enlarged, and occasionally rose-spots, not unlike those of typhoid, appear on the abdominal wall. After the first few days of headache, vertigo, and disturbed sleep, delirium occurs, but at this period the mental disturbance is only at the time of awaking from sleep; by the end of the first week it has become nearly constant. In some cases, so preponderant is the deposit of gray granulations in the meninges of the brain that the symptoms are those of acute meningitis. In a majority of the cases, however, there is delirium of the low-muttering character. As the case progresses, a condition of somnolence comes on; the delirium is less and less active, and the stupor soon passes into coma. When this condition of the cerebral functions is reached, the dyspnoea, before so marked a feature, ceases to affect the respiratory center. When there is little or no deposit of miliary granules in the cerebral meninges, the functions of the brain are disordered because of the high temperature which obtains in this disease. The cerebral symptoms, then, are those of depression—there is a good deal of hebetude of mind, followed by stupor. Should the deposits in the lungs be much in excess of those in the meninges, the cough, the dyspnoea, the moist *râles*, etc., will be more prominent than the head symptoms. When the intestinal mucous membrane is largely infiltrated with tubercle, the tympanites and the diarrhoea are decided. In every case when fully developed, there are stupor and some low delirium, rapid breathing, cough, and dyspnoea, until coma comes on; high temperature, rapid pulse, and weak heart; swollen abdomen and diarrhoea, and an enlarged spleen. The cases, as a rule, present a striking analogy to typhoid, not only in the symptoms as above detailed, but in the physiognomy of the patient, the decubitus, the utter prostration, and in the course of the disease.

**Course, Duration, and Termination.**—The course of an acute miliary tuberculosis is that of an acute febrile affection. The severity is determined by the extent of the tubercular deposits. The high temperature which prevails at the maxima is a measure of the diffusion of the tubercle-granules, but the fever in turn contributes to the gravity

of the case, by inducing the same parenchymatous changes which occur in typhoid. The cases assume somewhat different features, as above pointed out, whether the cerebral, the pulmonary, or the intestinal lesions predominate. The most usual type is that of a severe fever, having bronchial and intestinal complications, and more or less mental disturbance due to high temperature, and hence frequently confounded with typhoid fever. The duration varies somewhat in the different cases, being about four weeks in the largest number, but it may last six weeks or even three months. It is hardly doubtful that death is the invariable termination. The mode of dying is by exhaustion and failure of the heart, by pulmonary obstruction and dyspnoea, and by a gradually deepening coma.

**Treatment.**—The consideration of the treatment of acute miliary tuberculosis is a rather barren subject, since it does not appear that any remedy has the least influence over the disease. The treatment must hence be symptomatic, and confined to remedies for relieving the abnormal temperature, or for maintaining the power of the heart.

#### RICKETS.

**Definition.**—*Rickets* is a constitutional disease of childhood, characterized by a disorder of nutrition in which the growth of the bones is irregular, calcification is imperfect, and deformities ensue. It is also called *osteomalacia*, *rachitismus*, *rachitis*, etc.

**Causes.**—Rickets occurs everywhere, but there are certain parts of the globe where the cases are more numerous than elsewhere, because the conditions are more suitable. Over-populated communities, the people poor, and living in dark and damp habitations, insufficiently fed and clothed, are the social circumstances under which rickets develops. It is common in the great cities of England, and of Europe generally, and rather infrequent in this country. Parry,\* it is true, reports that "at least twenty-eight per cent. of all the sick children, between one month and five years old, that have come under his observation during the last three years, have been rachitic." This statement is based on observations in the children's department at the Philadelphia Hospital. Meigs and Pepper, also, of Philadelphia, hold, on the contrary, that rickets is much more common in Europe than in this country. As Gee finds that the proportion of "30.3 per cent. of sick children under two years of age were rickety," and as the proportion for the principal cities of Germany is 25 per cent. for Dresden, 13.4 per cent. for Prague, and 11.1 per cent. for Berlin, this country is rather to be compared with England.† It seems to the

\* "The American Journal of the Medical Sciences," January, 1872, "Observations on the Frequency and Symptoms of Rachitis," etc., by John S. Parry, M.D., etc.

† Senator, in Ziemssen's "Cyclopædia," vol. xvi, article "Rickets."