

Typhous *intestinal hæmorrhage* and *intestinal perforations* are exceedingly rare in children; their symptoms and consequences differ in no respect from those occurring in adults, and it is assumed that they are sufficiently familiar to the reader.

In some malignant epidemics, a croupous process of the large intestines becomes associated with the disease during the third or fourth week, when the children will discharge dysenteric stools, sink rapidly into a state of collapse, and perish comatose, or during a convulsive attack. At the autopsy, an extensively-developed croupous membrane is found upon the mucous membrane of the large intestines, accompanied by ulcerations in various stages, such as have been more minutely described in dysentery.

The *spleen* is generally enlarged, but its change is demonstrated by physical examination with much more difficulty than is usually supposed, this difficulty being subject to unavoidable and incalculable fluctuations. In a healthy child of one to two years old, a slight dulness over a space of barely one inch in length, and one-half an inch in breadth, may be detected on the left side, between the eighth and ninth ribs. A perpendicular line drawn from the middle of the axillary cavity to the great trochanter intersects this spot. The normal spleen lies with its long axis parallel to that of the body, the lower border projecting a little forward; but, when it becomes enlarged, its position becomes more and more horizontal; still the lower end always remains slightly deeper than the upper. In progressive enlargement, the lower border grows forward and downward, reaching toward the cartilaginous border of the ribs, and pushes itself anteriorly along the abdominal wall, while the upper posterior end of the spleen develops posteriorly along the course of the ninth rib toward the spinous processes, so that, in percussing the back between the spleen and spinal column, only a narrow sonorous stripe is now found. The larger the spleen becomes, the more does it pass out of the horizontal into the perpendicular position. In typhus fever the spleen may become enlarged to three or four fold its normal size, and the hypertrophy is found to be disproportionately greater in its longitudinal diameter than transversely.

The splenic tumor of typhus is always easily movable, and with every deep inspiration is pushed downward, a fact that may be more easily ascertained by percussion than by pressure with the finger over the border of the ribs. It is particularly remarkable how difficult it is to feel a hypertrophied typhus-spleen, which often projects over the borders of the ribs. This is explicable by its extreme softness and

great mobility. The principal amount of swelling of the spleen takes place in the first and second week; in the third week it begins to decrease, and on the fourth has become reduced to its normal size.

The tympanites of the alimentary canal, which is naturally sometimes variable, according to the predominance of the catarrh and the retardation of the peristaltic action, is a great obstacle to the examination of the enlarged spleen. The increased amount of space occupied by the intestines is not effected at the expense of the abdominal walls alone, but at that of the rest of the abdominal viscera also. The liver turns its sharp border more and more upward, and presses the diaphragm further up, *but the spleen is pushed upward and backward, and invaginates itself in the distended intestines*, in which position even a very decidedly enlarged spleen cannot be detected by percussion. The diagnosis of typhus fever would therefore frequently be impossible, if the demonstration of the splenic tumor were to be regarded as essential. It does not, by any means, follow from this, that the percussion of the spleen is to be omitted as useless; it should only be borne in mind that a greater dulness in the splenic region is not constant, and that consequently a well-marked typhus fever may exist without such dulness.

Embolie inflammation of the spleen arises only in pyæmia, and is rarely seen except in children in hospital.

The morbid alterations of the respiratory organs are just as constant as those of the digestive organs. All typhous children have bronchitis and cough, but those under five or six years of age regularly swallow the mucus which is loosened by cough and thrown into the fauces. The more intense the disease, the more insignificant and less frequent is the cough; not that the bronchitis is milder, but that the sensibility of the mucous membrane is so blunted that the accumulated masses of mucus no longer excite the acts of coughing. On auscultating the lungs, large and small sibilant râles are heard everywhere. The accumulated mucus ultimately produces an occlusion of the smaller bronchi, and the well-known *hypostatic splenization* then results. These are only to be found in the posterior and lowest parts of the lungs, diminishing the resonance upon percussion in these regions. But the well-declared dulness of a pneumonic lung is not found in these cases, and the detecting of the finer variations of the percussion-sound is rendered very difficult here, by the circumstances that the splenization, in most instances, occurs in both lungs, and therefore a comparison of the percussion-sounds on both sides is impracticable. Sometimes distinct bronchial respiration is heard over the splenized portions, but whether at first, or when the splenization

takes place, or at the end, when, in rarer instances, it undergoes resolution, can any pathognomonic crepitation, such as is heard in pneumonia, be discovered. As the splenization increases, the breathing becomes accelerated, the *alæ nasi* rise with every inspiration, a symptom upon which, in the difficulties attending the physical examination of the chest of restless children, too much attention cannot be bestowed. Slight cyanosis at length supervenes, the cerebral symptoms become intensified, the frequency of the pulse augmented, and the children slowly succumb. Small splenizations seem to be capable of undergoing resolution, larger ones almost always destroy life. The convalescence, when splenization has taken place, is always protracted, and the cough does not disappear entirely till after many months.

*Lobular pneumonia* is frequently met with in the dissections of children who die of typhus, and may occur in the splenized as well as in the sound parts. They are recognized by their firm, fixed exudation, and the granular appearance of the cut surfaces. We have no diagnostic signs for this condition; for the accelerated respiration, the movements of the *alæ nasi*, and the extraordinarily rapid pulse, are equally constant in a splenization, in a diffused typhous bronchitis without splenization, and in lobular pneumonia. Such circumscribed consolidations of the pulmonary tissues cannot be detected by auscultation and percussion.

*Œdema of the lungs* is also frequently observed in the dissections, and seems to be the effects of prolonged imperfect respiration during the last hours of life. Pulmonary tuberculosis may develop itself rapidly in children who inherit such a disposition. It does not usually appear till after recovery from the fever, but is much rarer after typhus than after measles, as a result of which it manifests itself in a great many children. Recurrence of fever, increased cough, and expectoration, allow its existence to be surmised, though the physical examination seldom positively confirms this suspicion in the beginning. The *bronchial glands* are frequently found so much enlarged as to have aggravated the dyspnoea, but their hypertrophy cannot be diagnosticated.

*Abscesses of the larynx* are said to have occurred, though I have not met with a simple laryngeal abscess in my dissections. In some there were present perichondritis and necrosis of the cartilages. Usually the laryngeal affection first comes on in the third or fourth week of a severe typhus, and belongs to the secondary symptoms. The patients suddenly become hoarse, then completely aphonic, and are attacked by a barking croupous cough and fever; the most violent dyspnoea soon becomes superadded, and they die of frightful suffocation. At the autopsy, more or less extensive necrosis of the

laryngeal cartilages is found; the necrosed pieces of cartilage are bathed in sanguinolent serum, and the glottis is cedematous. Cases of spontaneous recovery, with permanent hoarseness and even aphonia, are said to have occurred, but the most experienced physicians regard necrosis of the larynx as fatal. In adults with typhous laryngeal necrosis, laryngotomy is attended by tolerably favorable results. I have seen some individuals in whom it was performed with success, and would not hesitate for a moment to undertake the operation, should I again chance to have a child with necrosis of the larynx under treatment.

Now, although, catarrhal laryngitis may also come on in typhus fever, as it may indeed in any other disease, and disappear spontaneously, or, by the aid of counter-irritants, in a few days, still hoarseness in a typhous child must always excite the greatest anxiety, and it is advisable to be ready to perform tracheotomy, so that it may be instantly done when the dyspnoea becomes so serious as to endanger life.

The *skin* of typhous children exhibits manifold alterations. A number of bright spots appear from time to time, between the fifth and tenth days after the invasion of the fever, upon the breast and abdomen, but very seldom and sparsely on the rest of the body. These spots vary in size from a pin's head to that of a lentil, disappear on pressure, but instantly return, with uniform redness, so that it is impossible to decide whether the redness recurs from the centre to the periphery, or *vice versa*. *Roseola typhosa, taches lenticularis*. Generally they are on a level with the skin, only exceptionally do they become elevated above it after the manner of morbilli; they have no connection with the hair-follicles, and sudoriparous glands, and are not perceptible to the patients themselves.

It is not always very easy to distinguish between roseola typhosa and flea-bites. But flea-bites are brought into the disease, fade more and more daily, and are not replaced by new ones, because fleas forsake all febrile patients, while the exanthema of typhus fever does not appear for some days after the child has been seriously sick.

The eruption of the typhous exanthema does not take place at once, the course is by no means typical; some spots remain for a longer, others for a shorter period; while some have already faded, others appear again on new places, and herein we have important distinctions from the acute exanthemata. Typhous roseola always lasts several days; when an exacerbation of the fever takes place, it becomes darker; when a remission ensues, paler, and finally fades to the normal color of the skin, having passed through a brownish or yellowish-red tint. Almost all seriously sick typhous children present these

roseola spots; in milder forms of typhus abdominalis they are not seen. The number of spots is of less consequence in reference to the prognosis than the color and duration of the eruption; the bluer the spots, the more dangerous is the condition.

The *perspirations* are seldom critical in typhus fever. Some children perspire from the very beginning, though the typhous symptoms are becoming more and more aggravated; others pass into a perfect convalescence with a barely moist skin.

In most typhous children *miliaries* appear in great numbers. They have no critical and still less any unfavorable signification, and it is wholly inexplicable how such a dreadful fear of these harmless little sudamina has arisen among the laity of all classes. The manner of their origin is extremely simple. As a result of the cessation of the perspiration at the commencement of the fever, the epithelial cells lining the excretory ducts of the sudoriparous glands become dry, are cast off, but not washed away, forming a dam, which the perspiration, that has been arrested for some time, but which now, suddenly reestablished and profusely secreted, is unable to break through, thus causing an elevation of the occluded orifice, and the similarly desiccated layer of epidermis surrounding it, to the extent of a pin's head in circumference. After two, or, at the longest, three days, these epidermal caps burst, and the perspiration oozes out uninterruptedly through the once more pervious and cleansed passage. Microchemical investigations give evidence that the contents of the miliaries are not a serous exudation of the cutis, but pure sweat, and, by placing the cap of a miliary vesicle under the microscope, it will be easy for one to convince himself that the mouth of a sweat-gland exists in its centre, which is recognized by the concentric layer of the epidermic cells, and is never seen open, but always closed by larger and smaller granules.

These miliary vesicles are found largest and in greatest abundance upon places where cutaneous irritants, sinapisms, or ung. cinereum,\* have been applied. There they often attain the size of a lentil; the skin, after they burst, peels off in large patches, almost as in scarlatina, and the new cuticle for a long time has a brighter color than that by which it is surrounded. This phenomenon is also easily explained, for, by the use of unguents, the ducts of the sweat-glands are still more completely closed up, and by rubefacients a congestion of the cutis is produced, in which naturally the glandular canals must become implicated. The miliaries can be regarded as critical only to the extent that they show that the long-interrupted secretion of the sweat has again become established, a truly desirable and encouraging symptom.

\* Oxyd of mercury ointment.—Tr.

*Furuncles, abscesses of the cellular tissue, and bed-sores*, have totally different significations. During convalescence, an extremely painful furunculosis, principally upon the head and nape of the neck, sometimes becomes superadded, causing the child much suffering for many weeks, greatly retarding its complete recovery. The numerous subcutaneous abscesses, which appear as sequelæ of the disease, produce a like result.

Cleanly-kept children are attacked by bed-sores at a much later period than adults, and the sores are less extensive. The epidermis usually sloughs off from several small places on the back, over the sacrum, nates, or trochanters, and leaves a superficial ulcer, which, as a rule, heals by the application of some simple astringent ointment. Extensive cutaneous destruction of the skin over the sacrum, where it becomes blue and gangrenous suddenly, and sloughs off in a couple of days, may occur, perhaps, in badly-ventilated hospitals; however, I have never met with them in private practice.

On the lower extremities *petechiæ* are sometimes seen in typhous children, who lie in very damp, miserable rooms, and are affected with scurvy. They differ in no respect from those observed in common scorbutus.

*Facial erysipelas* is sometimes seen in the adult as a local manifestation of a pyæmic inflammation of the superior maxillary cavities, but I have never yet observed it in children.

The *head and nervous symptoms* are not so marked in typhous children as would be supposed from their general irritability. Most of the milder cases run their course, attended only by mental apathy and general depression of the spirits. In severer cases, delirium of various degrees, at first by night, later also in the daytime, comes on, followed by many hours of profound coma. The division of *febris nervosa* into a *versatilis* and *stupida* can be entertained no more in children than in adults, and only when one or the other condition has been continuous for several days may the therapeutic indication possibly become changed. Sometimes the delirium lasts only one, at other times several days, generally, however, two to three weeks, when it ceases, not at once, but gradually, and leaves behind great irritability, and weakness of memory, which in some children may remain permanent for life. Sometimes the sensorium clears up after a profuse epistaxis, after an intestinal hæmorrhage, or after a profuse diarrhoea.

The muscular weakness of typhous children is exceedingly great; most of them lie perfectly quiet upon the back, and are not even able to sit up. The usual tympanitis is, in part, also attributable to a

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paralysis of the muscular coat of the intestines; the hardness of hearing may be explained more simply by the fact of a mechanical interruption in the transmission of the sound, which ensues more as a result of catarrh of the Eustachian tubes, than by the toxic effect of typhous blood. The muscular weakness peculiar to typhus fever is to be distinguished from a partial paralysis of the lower extremities, which is protracted disproportionately into the convalescence, but finally passes off spontaneously, no matter whether the much-lauded electricity has been resorted to or not.

In regard to the *urine* of typhous children, and the uropoëtic system, and genitals, but little can be reported, on account of the impossibility of properly collecting the urine, and the subordinate signification of the infantile genitals in particular. I once saw diphtheritis of the vagina, and resulting gangrene of the labiæ majora and minora in a girl two years old. She belonged to a wealthy family, and was very well nursed; but, notwithstanding the most energetic use of escharotics and a general tonic and stimulating treatment, death ensued in a very few days.

*Metastases*, in the sense of the older school, do not occur in typhus fever. In these were included phlebitis, furunculosis, cutaneous abscesses, embolic inflammations of the parenchymatous organs, and gangrene. But since the time that the misplacement of the coagulæ and the causes of the formation of emboli have, mainly through the labors of *Virchow*, been more accurately ascertained, and since the time that the pyæmic process and its occurrence in the various cavities and organs have been more thoroughly investigated, all those theories have completely changed. Although all the circumstances are not yet fully explained, still this much has been elucidated: that they depend in greater part upon mechanical disturbance of the circulation, and hence we are not compelled to have recourse to the mysterious metastases.

Actual *relapses* but very rarely occur in children; though scarcely any typhous child progresses steadily toward a complete recovery without a longer or shorter interruption, because, urged by a keen appetite, they will eat indiscreetly if food is furnished them, and, when unable to get it, will swallow wholly undigestible substances, such as paper, etc. In children with an hereditary disposition, tuberculosis is the most frequent sequel to which they succumb after many months; in scrofulous persons, profusely-secreting exanthemata, eczema, impetigo, and malignant otorrhœa, ensue, along with which the tympanum generally becomes perforated, and the bones of the ear are discharged. The *finale* of this painful, tedious, and annoying result is total deafness. Noma is one of the exclusive complica-

tions of typhus fever of children which occasionally supervenes during convalescence, and principally attacks them in badly-ventilated and damp localities. We have already spoken of this affection at p. 97.

*Therapeutics*.—It is much easier to harm a typhous child with medicine than to do it good. Much injury *may be done* by the administration of *emetics* or drastic *cathartics*, although the premonitory symptoms of typhus fever may often seem to indicate such medication. I frankly confess that I have occasionally been led into this error, and have administered to an intensely congested and constipated child, presenting a white furred tongue, an emetic consisting of ipecacuanha ℥j, tart. stibiat. gr. j, and I have uniformly observed, as an apparent result, that the fever which followed was of the highest grade. That this should have been a mere coincidence, is, I think, altogether out of the question, and hence I deem it necessary to speak decidedly against the use of tartar emetic in all cases of children presenting the least symptoms of typhus fever.

Those prophylactic measures minutely described in text-books (such as ventilation, proper nourishment, occupation, etc.) certainly deserve the utmost encouragement, but they are, in most instances, more easily prescribed than secured. One has quite enough to contend with in having the typhous child transferred from the small back room, occupied by the whole family, into the so-called parlor, a comparatively vacant room, containing only a few articles of luxury. In more commodious residences, two communicating rooms should be retained and appropriated to the use of the sick child, for by this means only can a thorough ventilation be obtained. Admitting the question of infection to be extremely problematical, it is nevertheless advisable, if only to maintain the necessary quietude, that no children, and, at the most, only two adult persons, be allowed in the room with the sick child. The temperature of the room should never rise above 65° F., the covering should always be light, the mattresses tolerably hard, made of sea-weeds, straw, or horse-hair. If the typhous symptoms are already fully developed, it is advisable to have the hair cut short, by which a proper amount of cooling of the congested head is secured. Cold-water applications to it, which the laity generally carry out by dipping a thin piece of cotton cloth in cold water and spreading it out between two dry ones, and then tying it over the forehead, cools but for a minute at the most. It very soon rises to the temperature of the skin, and then it heats rather than cools, as one may easily convince himself by seeing and feeling children so treated. I do not believe that cold compresses laid upon the forehead give much relief, for, as they become warm very soon, they require to be often changed, and this act annoys the

child, and thus do more harm than good. If the child be too young to listen to reason, or delirious in consequence of the disease, this manner of applying cold will not answer at all, and we will have to limit ourselves to douching the closely-sheared head every hour with cold water, holding it over a basin, while the body is protected by a cloth wrapped around the neck.

The treatment of typhus fever for the first few days must be purely expectant, for the reason that the diagnosis cannot be certainly made out, and, as has already been stated, all energetic remedies, among which may be included leeches to the temples, for the purpose of combating congestion, are injurious. Hence, we must limit ourselves, when constipation exists, to the administration of some mild acidulous drinks, composed of any agreeable vegetable acid, or to a few drops of acid Halleri, while, if diarrhoea has already become superadded, the mucilaginous agents are more appropriate. In this connection, I can say of calomel, that when given several times in medium doses, say two to four grains, it procures a certain but gentle evacuation of the bowels, without being followed by such profuse diarrhoea as tart. stibiât. or the other drastic remedies. An abortive effect from medication is, of course, altogether out of the question. This expectant treatment having been pursued for from ten to fourteen days, and neither improvement nor aggravation of the disease having become manifest, a diet of more nutritious aliment should be commenced.

The diet of typhous children depends upon their age and former manner of living. Many children, who, while in health, mainly lived upon milk food, will not taste bouillon and demulcent soups at all, which, in adults, are considered the most appropriate nutriment; and there is therefore no other alternative than to allow them also during the fever small quantities of milk, or coffee with milk, several times a day, although it cannot be denied that the diarrhoea is thereby aggravated, and that large coagulæ of undigested milk may sometimes be found in the stools. We must endeavor, by the aid of thick mucilaginous drinks, a thick decoction of salep-water, gum-water, rice-water, etc., to counteract the inevitable irritation from the lactic acid of the milk consumed. Children seriously ill of typhus require nothing else than cold water, and for days will refuse all other drinks, even milk and soups, and they do not become more emaciated than others who partake of nourishment several times a day. It is therefore very questionable whether the food administered to typhous children is generally assimilated. When collapse becomes very threatening, or in commencing splenization, and the pulse begins to sink, a tonic and stimulating diet is urgently called for.

In coffee we have a convenient and easily-procurable stimulating remedy, which, on account of its agreeable taste, is preferred to all other excitants, such as camphor, musk castoreum, ammoniacum, etc. With one cupful of strong, sweetened coffee, containing but little milk, the powers of the system will often revive, and the circulation receive new impetus. In addition, beef-broth with yolk of eggs must be tried, and may also be administered per anum. Camphor is very difficult to administer to children, and usually causes vomiting. Musk also behaves in the same way, besides communicating its disagreeable odor to the whole house. Cold affusions usually recall consciousness, invigorate the respiratory functions, and induce perspiration. If there be several unconscious discharges from the bowels daily, tepid baths of 98° F. should be employed, in which the children may be kept from five to ten minutes, or sufficiently long to thoroughly clean them. Miliary, roseola typhosa, and bronchitis, are not to be regarded as contraindicating these baths.

Now, if by the third or fourth week a lively appetite has set in, the utmost precaution will have to be exercised. Mucilaginous and beef soups, milk, coffee, and milk-broth, may be continued till complete constipation, freedom from fever, and a clean tongue, take place; then well-prepared chicken or veal may be tried. Fat nutriment and green vegetables should be avoided for a long time; indeed, it is best to defer giving them till the children are able to go about.

With this simple, expectant treatment, the majority of the cases will terminate favorably. Should any symptoms become especially threatening, they will, of course, have to be specially attended to.

The best remedy for the fever and congestion of the head is cold. The means by which this is accomplished are: cool temperature of the room, from 58 to 64° F., light coverings, hair cut short, pillow of horse-hair encased in soft deerskin, hourly cold douching of the head, cold affusions of the whole body, once or at most twice daily, and a bladder filled with ice to the head—this, however, is applicable only to large children when not delirious. I have never yet seen any benefit from sinapisms applied to the nape of the neck, the calves of the legs, or the feet. The redness and great sensitiveness of the skin, which last for several days, and which invariably result from those sinapisms, always excite sick children and make them still more restless. Blisters should never be applied to a typhous child. They heal very slowly at best, frequently become covered with a diphtheritic exudation, and even gangrenous.

The best remedy for the excitement, sleeplessness, and delirium, in this disease, is laudanum. One drop less than the number of years.