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*Intestinal Hemorrhage*

A very fair account of the Intestinal  
Hemorrhage. Doubtful hemorrhage, always  
present, the intestinal hemorrhage,  
& the inflamed so far permanence.

*On*  
*Tubercular Meningitis*

By tubercular meningitis we understand cerebral inflammation as it occurs in children of strumous constitution; and this affection we think better so designated than by its more common name of acute hydrocephalus. The latter term (from ὕδωρ, water, and κεφαλή, the head), signifying an excess of fluid within the cranium, has the advantage of long established usage, but it is an unhappy appellation, as it refers to only one circumstance connected with the malady, which, so far from pointing to the essence of the disease, is only a common effect of it, and which, being a frequent concomitant of other morbid conditions, must be regarded an accidental production, and as not meriting a prominent place in the description of the affection. Objections it is true may likewise be advanced against the use of the term meningitis, seeing that the inflammation is rarely limited to the membranes of the brain, but in the majority of instances these are involved, and in using this term we convey a more correct idea of the pathology of the affection. — Other names which have been applied to the disease are, granular meningitis, arachnitis of the base, & perofulous inflammation of the brain.

Although known to some of the earlier writers, this, with other affections of the nervous system which we now to differ in most important particulars, was long classed under the general head of convulsions. Dr. Whytt, in a work entitled "Observations on the Dropsy in the Brain", published in the year 1768, was the first who accurately described the disease, and since his time it has generally been recognised as a distinct malady. His account of its symptoms and progress is excellent, but he was led to form an erroneous conception regarding its pathology from attaching undue importance to the occurrence of serous effusion. Subsequent observation showed, that so far from being a dropsy, as he supposed, an increased amount of fluid is not invariably present; that there is no relation between the quantity of fluid effused and the severity of the symptoms or the rapidity of their progress; and that in almost every instance it is associated with important organic alterations, some of which are the products of an inflammatory process. Even in cases where the dropsy was the most prominent of the morbid phenomena, changes in the membranes although inconsiderable were noticed to be peculiar; and the fluid poured out was no longer regarded, a mere

dropsical effusion, but the result of previous inflammation. And, as the pathological anatomy of the disease was studied with greater minuteness, a further advance was made towards a knowledge of its true pathology. Guersant in 1827 called attention to the coexistence of granulations in the meninges and tubercles in the lungs and bronchial glands; Papavoine, Becquerel and other French observers showed these granulations were of a tubercular nature; and the experience of Vallix, Pilliet + Barthez, West, & others, has so clearly established the fact, that tubercular deposit in the membranes is an almost constant characteristic of the disease, that the tubercular feature is now definitely believed to be the most important in its pathology.

In describing the various characteristics of tubercular meningitis, we shall begin with the post-mortem appearances, since they afford the most unequivocal evidence of its real nature. These may be arranged in two classes, according as they are the result of inflammation or tubercular deposit.

In some instances the calvarium and dura-mater are found unusually adherent; and the parietal layer of the arachnoid is dry and slightly opaque, but generally it is not sensibly changed. Nor do the membranes covering the upper surface of the

brain usually present a striking appearance, although adhesion of the layers of the arachnoid has been noticed when the attack has been acute; and Becquerel and others have recorded cases where the secretion of the arachnoid sac was altered and somewhat increased. Much more frequently this fluid is suppressed, & the arachnoid, losing its transparency, is dull and adhesive, and even assumes an opalescent aspect, particularly along the course of the summit convolutions. Sometimes the pia mater is the seat of considerable capillary injection: - it presents a florid red appearance, and its vessels seem increased in number from the inflammatory congestion. But effusion of fluid into its meshes, and into the subarachnoid space is a much more frequent occurrence. This fluid may ~~pro~~ lactescent but generally it is transparent & colourless, and when viewed through the arachnoid has the appearance of a transparent jelly overlying the convolutions. Occasionally the tissue is infiltrated here & there with a soft whitish semi-transparent lymph; but more frequently there are deposits of a puriform character occupying the sulci, and following the course of the vessels.

It is, however, at the base of the brain that the evidence of inflammatory action is most manifest; and the appearances are so important & characteristic that some French writers have named the affection

arachnitis of the base. Dr West states, that in 37 out of 42 cases in which he carefully noted the condition of the membranes, those at the base of the brain ~~were~~ <sup>found</sup> to be the seat of disease more or less extensive, and always more considerable than that which existed at the vertex. The morbid alterations are most marked in the interpeduncular space, which presents a peculiar appearance. The pia mater is opaque and very much thickened; its vessels are enlarged; and it is infiltrated with a semi-transparent sero-gelatiniform matter, which is sometimes of a greenish colour, and so abundant as greatly to obscure the relation of the parts beneath. The optic commissure, the third and fourth nerves, and the infundibulum, are often completely imbedded in it, and it sometimes extends backwards over the front of the pons Carolii and medulla oblongata. Over a corresponding surface the arachnoid is thickened and viscid, while the loss of its usual transparency is much more extensive, and besides there is very frequently effused between it and the pia mater a quantity of yellowish flaky lymph, particularly about the longitudinal fissure and olfactory bulbs, whence it extends outwards & upwards along the course of the Sylvian fissures.

But we also find morbid changes quite different from those of mere inflammation. The existence of certain granulations, to which we have

already incidentally referred, had been noticed by Richat  
 and others, but it is only since a comparatively recent  
 period that their importance has been fully recognised.  
 These granulations, seated for the most part in the pia  
 mater and along the course of the vessels, are small  
 lenticular bodies, about the size of a pin's head, and  
 either yellowish and friable, or whitish and opalescent,  
 and difficult to crush by pressure. "They are sometimes",  
 says Dr West, "met with in what would seem an earlier  
 stage, when they appear like small opaque spots of a  
 dead white colour, much smaller than a pin's head, and  
 communicating no perceptible roughness to the mem-  
 brane. This appearance is often observed in the arachnoid  
 covering the cerebellum, and those parts of the base of  
 the brain where the arachnoid is stretched across from  
 one part of the organ to another. The flattened yellowish  
 bodies are usually seen at the convexity of the brain, &  
 on either side of the hemispheres. They generally follow  
 the course of the vessels that ramify in the pia mater,  
 and accordingly occupy the sulci between the convolutions  
 much deeper than their summit. The firm grey bodies  
 are mostly seen about the pons, or imbedded in the pia  
 mater in the neighbourhood of the optic nerves, or  
 projecting from the surface of the membranes that  
 cover the medulla oblongata. They are also often de-  
 -posited in the arachnoid lining the occipital bone,  
 and are then sometimes collected in considerable numbers

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around the foramen magnum. These bodies sometimes of a grey, at other times of a yellow colour, are likewise met with though less frequently in the substance of the velum interpositum, or imbedded in the choroid plexuses, and in both of these situations they are sometimes very abundant."

These bodies, however, are not always easily recognised, and no doubt their presence is sometimes overlooked. They may not be visible while the pia mater is in contact with the hemispheres, and yet, when this membrane is stripped off and held to the light, they may be easily detected especially in those portions which dip down between the convolutions

Some observers, it must be noticed, among whom is Bouchut, who thinks them fibro-plastic formations, deny these granular bodies to be tubercular in their nature; but this is contrary to the opinion of the great majority of writers. Dr West does not doubt their tubercular character and for the following reasons -

- 1<sup>st</sup>. That they are always associated with tubercle elsewhere.
- 2<sup>d</sup>. That their abundance is not in proportion to the amount of inflammatory mischief.
- 3<sup>d</sup>. That they are sometimes met with in cases where no head symptoms were observed during life, and unconnected with any sign of inflammation after death; and
- 4<sup>th</sup>. That their chemical composition and their microscopic structure are identical with those of tubercle in other organs of the body.

But, besides these granulations, tubercular matter is also found in the plexus of lymph met with at the base of the brain, and over the symmetrical convolutions of the longitudinal fissure. From its soft consistence, and from its being intimately mixed up with the exudation, this, it is considered probable, is produced during the inflammatory attack, to which the existence of the tubercles is supposed antecedent. Even the latter would seem to be deposited but a short time before showing symptoms of their presence, as Dr Wilks states he was on several occasions unable to discover any trace of them in children who had died of general tuberculosis, but without head symptoms. They would therefore seem to act as foreign bodies, & to determine inflammation of the enclosing textures.

The brain commonly presents an unusual size, and looks as if it had been subjected to pressure, the anfractuositie being much flattened, and the sulci almost obliterated. When cut into, sometimes the vascularity seems increased, but to the eye it otherwise presents a normal appearance. However, as the roof of the lateral ventricles is approached, touch will often detect a diminution in its consistency.

Sometimes the whole mass is softened, as is shown by its adhering to the knife and the rupture of the cortical layers on the detachment of the pia mater, while, at other times, it is spongy, as if from the infiltration of fluid.

The ventricles are almost always found to contain a more than normal quantity of fluid, which is sometimes present in such amount as to cause considerable dilatation. Generally it has the appearance of a limpid colourless serum, but it may be slightly milky, and contain shreds of lymph. A change in the state of the lining membrane of the ventricles very commonly accompanies this excess of fluid; - often it is opaque; sometimes it is thick, tough, & almost of leathery consistence; and in other and rarer instances it presents a granular aspect. - Another condition frequently associated with the presence of fluid in the ventricles, is diminution in the consistency of the brain pulp, and this varies in degree from slight softening to almost complete diffuence. The parts most commonly affected are the septum lucidum, fornix, corpus callosum, and less frequently the free surfaces of the corpus striatum and optic thalami. Since these changes are not found to bear any certain relation to the quantity of fluid contained in the ventricles, they would therefore seem due to an inflammatory process going on in the organ, though some think them the result of mere maceration or ventricular effusion. This is a much contraverted point; still there can be little doubt the former view is the correct one, since Herricks and West have shown that cerebral softening

and ventricular effusion do not always coexist; since Rokitansky has proved that softening of the brain substance fails to produce a like effect; and lastly since the microscope demonstrates the presence of inflammatory products.

Considerable patches of tubercular matter are sometimes found lying beneath the pia mater, and slightly indenting the cortical substance. These would seem to originate in the pia mater, to which they are adherent. Occasionally, also, isolated rounded masses are met with, either completely imbedded in the cerebral substance, or, when disposed in the cortical layers, projecting slightly so as to touch the membranes. The latter, however, are rare, and generally associated with peculiar symptoms during the lifetime of the patient, which lead to the suspicion that the disease is complicated. They occurred in four of the forty three cases detailed by Dr. West.

As an evidence of the general tuberculous disposition, similar lesions are found in other parts of the economy. The most frequent seats of tubercular deposit are the lungs and bronchial glands; and next in succession rank the spleen, liver, glands of the mesentery, and intestines. Sometimes the glands of the intestine ulcerate, and thus give rise to diarrhoea. Intussusception too of the small intestine is common, but the invaginated part is easily pulled out, and shows no signs of inflammation.

From the constancy with which tubercular deposits are found after death, and from their more or less general diffusion, it seems very evident that the tubercular element is the most important in the disease: and etiological considerations tend to corroborate this inference.

Long and extended observation has proved, that there is undoubtedly a hereditary predisposition to the disease.

The robust children of healthy parents are rarely or never attacked, while, on the other hand, its favourite subjects are weakly children, with large superficial glands, and a marked liability to bronchial catarrhs. Their parents present the characteristics of the strumous diathesis, & it is no uncommon association to find one or other labouring under phthisis; while the family history shows the tendency to a similar dyscrasia in the more immediate relatives. In twenty out of twenty-seven instances, in which the health of the relatives was made the subject of special inquiry by Dr West, it was ascertained that either the father, mother, aunt, or uncle had died of phthisis. Moreover it is a frequent occurrence to find the disease selecting several victims from the same family. Thus, six children, born of the same parents, have been known to die successively at the age of two years; & Dr Cheyne mentions ten in one family having been cut off by this fatal disorder.

It can be no local accidental affection, which thus limits its ravages to particular families; it must depend on some general disposition of the system; and hence the constitution of a patient supposed to be labouring under it comes to be a most important point both as regards diagnosis and treatment.

But while this vitiated state of the entire economy gives rise to special conditions, under which the disease can alone show itself, other causes though secondary in importance often concur to influence its development

Thus age is a strong predisposing circumstance. Tubercular meningitis is essentially a disease of infancy and childhood; - a circumstance to be attributed to the rapid development of the brain at this period of life. The period of the maximum number of deaths is differently stated by different authors, but may be set down as occurring between the third and sixth years. In Trousseau's practice the disease proved fatal to <sup>a</sup> child only 3 months old, and Dr Gregory relates a case where death occurred at the advanced age of fourthy. Such however are extreme cases, the disease being rare before the ninth month and after the 12<sup>th</sup> year. The period of death in 43 cases, as given by Dr West, was as follows. In 5 the patients were under a year; 9 were under 3 years of age; 23 between 3 and 6; 5 between 6 and 9; and 1 between 10 and 11 years old.

As was to be expected the influences of sex and season are of little or no value as causes of predisposition.

Malnutrition, inadequate clothing, and impure air, must, however, not be overlooked, since they tend to favour the stromous diathesis. All circumstances, too, which cause cerebral irritation or congestion, are to be regarded as exciting causes. Among the more important of these may be mentioned, the repression of scalp eruptions, the irritation attending difficult and painful dentition, sudden fright, and the influence of the eruptive fevers, and other diseases.

Sometimes too the disease is developed in consequence of mechanical injuries, such as blows on the head, or falls from a height. All such causes are however to be regarded of secondary importance in the etiology of the affection, since the irritation or congestion which they occasion merely favours the development of tubercular meningitis in consequence of the pre-existence of a morbid disposition. Without this all other causes are inadequate to account for the disease, and, at best, must be considered as merely accessory.

Thus then it seems established that the great predisposing cause is the tubercular diathesis, and that this in time manifests itself by the formation of granulations, which, either in themselves or in combination with causes, determine an inflammatory attack.

We come next to examine the symptoms of tubercular meningitis. These vary very much in different cases, and in the different modes of attack; but it is common to describe the disease as presenting three more or less distinct stages. Such a division, however, can scarcely be established on any sure basis, and must be regarded very much a matter of convenience.

In the first or premonitory stage, which has been variously termed the stage of turgescence, the stage of increased sensibility, and the period of incubation, the symptoms, considered in themselves, are not of such a nature as to excite serious apprehension. The indications are those of slight cerebral congestion, disorder of the nutritive function, and general febrile disturbance, the derangements being of a transient intermittent character. Marked changes are noticed in the disposition and habits of the child. At times it is playful and talkative, but such happy moods will often speedily and unaccountably, <sup>settle</sup> into periods of dullness and taciturnity. Whilst amusing itself with toys, these seem suddenly to lose their interest and the child sits pondering as if lost in thought; or, casting them aside in a peevish manner, it runs off to its mother's lap, its head in her lap, and, complaining of weariness and headache, wishes to be lifted on her knee or put to bed, from which in a little time rises apparently quite well. Generally

there is obvious alteration of sensation and intelligence. The child appears acutely sensitive; - little frightens it, it starts at every trifling noise; while it will often talk like one more advanced in years, and exhibit a peculiar brightness of eye and thoughtfulness of expression. At other times, it becomes very irritable, and resists every effort made for its amusement; - "nothing allures it; neither the caresses of its mother, which it receives with indifference, nor the seductions of other children, which it repulses with anger". Occasionally, too, the little patient, while in a cheerful fit and running at play, falls down suddenly from an attack of vertigo; or, feeling the dizziness coming, stands still as if in a reverie, until it collects itself, when it either resumes play, or, feeling alarmed, seeks the protection of its mother or nurse. If the child is old enough to walk there will often be noticed an unsteadiness in its gait; and sometimes one foot is dragged after the other as if from feebleness in the affected limb. The general irritability is also well marked at night by the unwonted watchfulness, the intolerance of light, and the disturbed slumbers. The child is put to rest with difficulty, carefully turns its face from the light, & is very restless during sleep, when it lies with partially closed eyes, grinds its teeth, clenches its fists, & rolls about its head. Moreover it is apt to awake at any slight noise, and, as if haunted by

apparitions, will even start up in alarm without any  
 apparent cause. During the whole of this period there  
 is evident derangement of the digestive system. The  
 tongue is usually rather moist, coated with a white  
 or yellowish fur in the centre, and red at the tips and  
 edges. The appetite is generally defective, though some-  
 times it is very capricious; and frequently the child  
 manifests peculiar likings, and is difficult to satisfy  
 in the way of food. The thirst is not considerable. Not  
 unfrequently there is nausea and irritability of the  
 stomach, vomiting sometimes occurring sponta-  
 neously, but generally only after taking food. As a  
 general rule the bowels are torpid from the first,  
 but sometimes constipation is observed to alternate  
 with diarrhoea. The evacuations are of an unhealthy  
 character, - frequently clay-coloured, sometimes pale  
 green, usually scanty, and always very offensive.  
 The pulse is at first but little altered, beyond varying  
 somewhat at different times, but, as the symptoms  
 become more pronounced, it is accelerated, - ranging  
 about 120 or 130 in children three or four years old, -  
 and often unequal in its force and frequency. The  
 cutaneous secretion is diminished, and the skin is  
 dry and harsh, but excepting the heat of head the  
 temperature of the surface is not considerable.  
 There is no continued fever, but marked exacerbations  
 occur at irregular intervals, when the skin becomes

burning, the pulse accelerated, and the thirst increased.

As the above symptoms increase in severity, the child loses its former healthy aspect. The features become pale and attenuated; the eye loses its expression and becomes surrounded with a dark halo; and listlessness and languor alternate with periods of marked excitement.

The duration of this stage is liable to great variation. When the disease is very acute, it may be measured by hours, and, on the other hand, when it sets in gradually with slight symptoms, which sometimes intermit for days, it may extend over several weeks. The average duration as given by Dr West is 4 or 5 days, by which time if the symptoms have not been arrested by treatment, they gradually increase in severity and pass into the second stage, in which they unequivocally indicate the nature of the affection. According to the division of Whytt, which was based on the characters of the pulse, this stage is distinguished by the pulse being "slow and irregular; and by other writers it is described as the period of invasion, inflammation, or diminished sensibility. The symptoms which in the former stage are not always so pronounced as to be characteristic, are now more continuous, and their import is no longer a matter of doubt. They may be characterized generally as those of depression. The excitability of the first

stage gives place to heaviness and stupor. There are now no longer intervals of cheerfulness; the countenance has assumed an anxious aspect; the child is averse to being disturbed, and lies on its back in a listless drowsy condition. Sometimes a peculiar vacant apathetic expression is assumed, which in some cases amounts to an almost idiotic look, and to which much importance has been attached by some writers. The intellect however is not impaired, and, if old enough, the child answers what questions are put to it rationally, but in a short pettish manner and in an unnaturally imperious tone. The closed eyelids and corrugated eyebrow now indicate that the retina has become acutely sensitive to light; and the child lies with its face turned from the light, it may be moaning piteously and uttering at times a sharp wailing cry, which Comdet regarded pathognomonic and termed the "hydrocephalic shriek." The skin continues harsh; the features are pale; the nostrils dry; and the lips anemic. Generally the scalp is hot and tender; there is increased pulsation of the carotids, and marked throbbing of the anterior fontanelle, if the skull is not completely ossified; and the little sufferer often complains of intense headache, sometimes limited to a particular spot. Towards night there is almost always an exacerbation of the symptoms, - the uneasiness and

restlessness are much increased, the pain in the head becomes more severe, + not infrequently there are periods of delirium. Toward this stage the pulse varies considerably. At first it is quick and slightly irregular, as in the first stage, but soon it becomes fluctuating ~~as in the first~~ or distinctly intermittent, and with this change it becomes much slower, falling sometimes from 120 to the natural standard in a few hours. With the diminution in frequency it is likewise diminished in strength, although any slight exertion, such as the erect posture, or removal from bed readily causes considerable acceleration. Unless on rare occasions the little patient is now quite indifferent to food. Vomiting may continue for a day or two at the commencement but usually it ceases during this stage. The bowels continue very torpid, and the evacuations procured with difficulty are often dark coloured and scanty. It is not easy to determine the state of the pupils, as the eyelids are very frequently firmly closed, and the child struggles to resist any attempt to raise them. Generally however they are not much affected, though there may be slight oscillation of the pupil, or squinting perhaps confined to one eye. As the disease advances the temperature of the body sometimes becomes very low; the breathing becomes slightly interrupted, the abdomen

is shrunken; and there is great emaciation.

The prominent features of the third stage are coma, paralysis, and convulsions. The system seems now completely exhausted, and drowsiness gradually increasing the child sinks into a profound stupor. To this state, however, delirium with twitching of the muscles and spasmodic movements of the limbs, is a common prelude. The child mutters or moans incoherently, tosses about its body and incessantly rolls its head, with a wild expression and staring eye. Convulsions more or less general succeed. The eye is turned up, the face reddens, the respirations cease, the muscles of the trunk contract, and there are sudden jerking of the extremities, with twitching of the fingers & toes. These convulsive movements, which generally affect one side more than another, last but a short time, and passing off leave the child very prostrate, and generally, more or less hemiplegic. Other similar attacks succeed, separated at first by considerable intervals, but increasing in frequency as the disease advances. In the intervals the child lies in a state of complete insensibility, with the paralyzed limbs stretched out, the unaffected leg semiflexed, and the hand raised towards the head. The pulse at the beginning of this stage rises considerably and loses its

irregularity; and when the state of stupor is fully established, it becomes small, feeble, and extremely rapid, numbering 140, 160, and even it is said 200 pulsations in a minute. Paralysis of the levator muscle has now caused drooping of the eyelids; the conjunctiva is suffused, the cornea glassy, and the pupil dilated; while in most cases there is some degree of strabismus. A strong light even approximated to the eye no longer causes uneasiness; the pupil is either permanently distended, (showing complete insensibility of the retina), or at best it acts sluggishly and exhibits feeble oscillations.

The face is livid and collapsed, but alternations of flushing and pallor still continue to occur as in the earlier stages; and even though the skin is dry and the surface cold there are occasional outbursts of profuse perspiration. The respiration is peculiar and characteristic of cerebral mischief. It is very irregular and interrupted, - a long sighing inspiration succeeds a period of hurried short breathing, and is followed by a considerable pause. Besides convulsions and automatic movements, there is sometimes well marked tetanic spasm. The neck is extended and the occiput thrust into the pillow; the eyes are fixed the teeth clenched, the limbs rigid, and there are marked carpo-pedal contractions.

As death approaches the eyes become glazed and blood-shot; the regularity of the features is destroyed, the power of deglutition is lost, cold clammy sweats break out about the head, the breathing is loud and stertorous, and generally the painful scene terminates in a fit of convulsions. The duration of this stage may be 8 or ten days, but usually it is much shorter, and not unfrequently a fit of convulsions carries off the child at an early period of its development.

The above may be regarded as the symptoms of tubercular meningitis in its more usual form but as we have already noticed different cases present great variation both in their symptoms and progress. The symptoms differ as to the period of their occurrence, their sequence, and their severity. Thus convulsions may come on at an early or late period of the disease; they may be general or limited to one side; and they may merely cause prostration though more generally paralysis. Again, as regards progress, the disease may be insidiously developed and run a tedious course; or it may be intermittent and deceive the practitioner by delusive appearances of amendment; or it may be hyperacute and assume the form of so called waterstroke, coma & convulsions occurring early, & cutting off the child in a few days.

Instances are however rare in which real tubercular meningitis runs a fatal course before the elapse of a week and the cases in which it has proved fatal in from 24 to 48 hours, and for which Golis proposed the name of waterstroke were very probably examples of simple meningitis or intense cerebral congestion. Cases however occur in which the disease proves rapidly fatal when secondary to some other affection, or springs up in the course of the irritative fever attending dental evolution, or the febrile disturbance which sometimes accompanies vaccination.

To determine the duration of the disease exactly is, however, not always easy, from the dubiety of the symptoms in the early part of its course. According to Green the average duration is about four weeks. Of 28 cases that came under the observation of Rilliet and Barthez, the average course was about 22 days; and West states the medium duration of 42 cases of which he kept a complete record at 20 days. Of these 42 cases, that which ran the most rapid course terminated fatally in five days; death took place in 11 more before the 14<sup>th</sup> day; in 18 others during the third week, and in 6 during the fourth week. In the remaining 6 cases indications of cerebral disturbance had existed for four, six, or eight weeks; but death took place in every instance in less than 21 days, after the appearance of well marked symptoms of hydrocephalus. He concludes we are

warranted in stating that the disease usually runs its course in from two to three weeks.

In whatever form it occurs this is one of the most formidable diseases of infancy: and the prognosis is always very unfavourable. Recoveries are sufficiently rare even during the first stage and when once the disease has unequivocally declared itself, almost every patient dies. Moreover, it must be observed regarding the reported cases of cure during the premonitory stage, that there is very often room for doubting that they would have turned out cases of real tubercular meningitis.

On this point Kellie observes, that since the tubercular nature of the disease has been recognised, not a single authenticated recovery has been published by any French physician. One of his patients however made a temporary recovery even after the third stage had set in. Five years afterwards the child died from a recurrence of former symptoms, and on a post-mortem examination the old lesions at the base of the brain were readily distinguishable from the effects of recent disease. In discussing this subject West states his experience as follows: 'The cases are but very few in which I have seen any other than a fatal issue follow on even the premonitory symptoms of water on the brain. Once I saw recovery take place after the second

stage of hydrocephalus had commenced, and once I watched with surprise the gradual subsidence of the disease, though convulsions had already taken place, and had been followed by coma. This patient, however, "never regained flesh, nor recovered the look of health, nor the manners of a child;" and from the unsteady gait, and vacant smile it was evident the disease was only temporarily subdued.

Seeing that the disease is essentially tubercular, that its subjects are children, and that its termination is almost always unfavourable, it needs scarcely be added that the treatment is difficult and most unsatisfactory, and that it must be employed to combat the mere threatenings of the disease, if with any hope of success.

The prophylactic treatment accordingly is of the utmost importance. In families in which there is an hereditary predisposition to the disease, the greatest care should be bestowed on the nurture of the children, and the earliest attention paid to any deviation from the healthy condition. In these cases West recommends that the mother should not suckle her infants, that a healthy wetnurse should be procured, and that the child should not be weaned until it has cut four molar teeth. After weaning the diet should

be nourishing, but simple and unstimulating, milk and farinaceous food forming the chief elements. In these circumstances, too, the children should if possible be brought up in the country; they should be warmly clad; and encouraged to take free exercise in the open air. Every precaution should be employed to prevent exposure to the contagion of the eruptive fevers and the other diseases to which childhood is liable. Their mental culture is not to be neglected but the tendency to intellectual precocity, common in such children is on no account to be fostered. The state of the digestive organs should be particularly attended to, and if constipation occur, it should at once be relieved by some simple laxative. In addition to these general prophylactic measures we must endeavour to improve and fortify the constitution by general tonics and antispasmodic remedies such as cod liver oil, syrup of the iodide of iron, and compound syrup of the phosphates.

If an attack of the disease is threatened, - if especially there is nausea and heat of head, small doses of Calomel or grey powder may be administered; and if there is marked cerebral congestion one or two leeches may be applied to the head - a recurrence of such attacks would warrant the insertion of a seton in the neck, as such derivative treatment has sometimes appeared to ward off an attack of the disease.

The three great remedies that have usually been relied on, when the disease has been fully established are depletion, purging, and the exhibition of mercury.

As might have been expected from the pathology of the disease, blood-letting is found to be useless unless as a means of relieving cerebral congestion. With this object a few leeches may be applied behind the ear or to the vertex of the head.

As in other cerebral diseases free purgation is found to be very beneficial. Various remedies have been employed, but calomel followed by a solution of sulphate of magnesia, or given with scammony or jalap, is perhaps most commonly used.

Mercury had once a high reputation, but experience has shown, that beyond its purgative effect it has no power to cut short the disease.

While the indications of cerebral congestion remain benefit will often be derived from the application of cold to the head: and blisters applied to the same part are not to be neglected after the period of excitement has subsided.

If convulsions have occurred, and coma supervened all treatment is comparatively useless.

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